



HDTN Software Version Description Document v2.0.0 (VDD 2.0.0)



National Aeronautics and
Space Administration

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Space Operations Mission Directorate (SOMD)
Space Communications and Navigation (SCaN)
High-Rate Delay Tolerant Networking (HDTN) Project
John H. Glenn Research Center
CAGE Code No.: 1QFP5
21000 Brookpark Road, Cleveland, Ohio 44135

HDTN Software Version Description Document for v2.0.0 (VDD 2.0.0)



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PREFACE

Space Communications and Navigation (SCaN) is developing new communications technologies to increase the amount of science data returned on future space missions. The High-Rate Delay Tolerant Networking (HDTN) project at NASA Glenn Research Center (GRC) will provide reliable internetworking as a high-speed path for moving data between spacecraft payloads, and across communication systems that operate on a range of different rates.

This document describes the version 2.0.0 software produced by the HDTN project.

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DOCUMENT HISTORY LOG

Status (Preliminary/ Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
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SIGNATURE PAGE

Prepared By:

Eric Brace
HDTN Software Configuration Management Lead
NASA John H. Glenn Research Center

Concurred By:

José A. Lombay-González
HDTN Software Lead
NASA John H. Glenn Research Center

Rachel M. Dudukovich
HDTN Software Engineering Lead
NASA John H. Glenn Research Center

Wade A. Smith
HDTN Software Quality Assurance Lead
NASA John H. Glenn Research Center

Approved By:

John J. Nowakowski
HDTN Project Manager
NASA John H. Glenn Research Center

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1.3 Document Overview

This VDD covers all applicable version description data for HDTN software, including (but not limited to):

- list of materials
- software source list and version data
- any related documentation attached to the version of software described
- known issues and missing features
- any other applicable notes

The content of this VDD is tailored to meet the requirements of NASA Procedural Requirement (NPR) 7150.2, NASA Software Engineering Requirements. NPR 7150.2 requires that a software version description is provided for each software release.

This document is developed using GRC-SW-TPLT-SVD Software Version Description Template maintained by the GRC Software Engineering Process Group (SEPG) and formatted per HTDN-TPLT-023 High-Rate Delay Tolerant Networking (HDTN) Document Template provided by Configuration Management.

1.4 Software Naming Convention

This section describes the nomenclature identifying the HDTN releases and the location of the Git repository where applicable software artifacts are located.

Git automatically identifies versions of the repository by calculating a SHA-1 checksum for the entire repository with each commit. At any time, the repository can be “tagged” using the Git “tag” command to assign a human-readable version number to the current version of the repository. This version can then be referred to at any time using the assigned version number. Using the Git “show” command, the SHA checksum, author, date of the last commit, title line, and full commit message for the repository at the time the version tag was created may be retrieved.

Each time a new software build is created for release, a new tag is created for the current version of the source code repository. Each new tag is named using a semantic versioning number scheme. Version numbers follow a pattern of “X.Y.Z” where:

- ‘X’ is the major version number indicating changes driven by new or modified requirements
- ‘Y’ is the minor version number indicating changes driven by external interfaces or behavior
- ‘Z’ is the patch version number indicating changes driven by bug fixes

2.0 REFERENCE DOCUMENTS

This section lists the document number, revision, title, and effective date of each document referenced in this VDD.

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Table 2-1: Reference Documents

Document Number	Revision	Document Title	Effective Date
GRC-SW-TPLT-SVD	A	Software Version Description Template	2009 SEP 01
HDTN-ADD-016	baseline	HDTN Architecture and Design Document (ADD)	2025 MAY 29
HDTN-CR-004	baseline	Changes to Software Requirement Specification (SRS) to Update Requirements Status Based on The Development of Test Cases (Rev B).	2025 JUL 24
HDTN-PLAN-002	baseline	HDTN Configuration and Data Management Plan (CDMP)	2023 NOV 08
HDTN-PLAN-003	baseline	HDTN Software Development and Management Plan (SDMP)	2024 JAN 17
HDTN-PLAN-004	baseline	HDTN Software Configuration Management Plan (SCMP)	2024 JAN 17
HDTN-REQ-008	B	HDTN Software Requirements Specification (SRS)	2025 JUL 24
HDTN-RPT-045	baseline	HDTN v2.0.0 Software Test Report	2025 AUG 21
HDTN-SCR-005	baseline	Software Change Request for v1.3.1	2024 MAY 23
HDTN-SCR-006	baseline	Updates to README for V 1.3.1	2024 MAY 24
HDTN-SCR-008	baseline	Improvements of CI/CD pipeline and applications.	2025 SEP 04
HDTN-SWDD-017	baseline	HDTN Software Data Dictionary	2024 NOV 18
HDTN-TEST-038	baseline	HDTN Flight Software Inspection Test Procedures	2025 JUL 30
HDTN-TEST-039	baseline	HDTN Software Test Procedure (STPr)	2025 JUL 25
HDTN-USER-036	baseline	HDTN User Guide for v2.0.0	2025 JUL 18
NPR 7150.2	D	NASA Software Engineering Requirements	2022 MAR 08
RFC 4838	2015 OCT 14	Delay-Tolerant Networking Architecture	2007 APR
RFC 5050	2020 JAN 21	Bundle Protocol Version 6	2007 NOV
RFC 9171	2025 AUG 11	Bundle Protocol Version 7	2022 DEC 14
RFC 9173	2022 JUN 21	Default Security Contexts for Bundle Protocol Security	2022 JUN 21

3.0 VERSION DESCRIPTION

This section describes the contents of the HDTN software release. It identifies the version and location of files that are included with and used to generate the software; supporting utilities, scripts, files, and their location; the issue tracking system; media generation; and the associated procedures and documents.

3.1 Inventory of Materials Released

No physical materials have been generated as part of this HDTN software release.

3.2 Inventory of Software Contents

This section contains the lists of release, deployment, and source files used to generate the HDTN executable.

3.2.1 Compiled Executable and Installer Files

The HDTN software release does not include files created by the build process. Instructions for building and installing HDTN software are provided in HDTN-USER-036 HDTN User Guide for v2.0.0.

3.2.2 Required COTS Libraries

This section lists commercial off-the-shelf (COTS) utilities and libraries needed to build, install, operate, or maintain HDTN software. These libraries and utilities are not included as part of the released HDTN software and must be obtained separately. Table 3-1: Commercial Off-the-Shelf Utilities, and Supporting Files documents each utility or

library and compatible version, along with its developer, release date, and source where the utility or library may be obtained.

Table 3-1: Commercial Off-the-Shelf Utilities, and Supporting Files

Developer	Utility or Library	Version	Release Date	Source	Notes
CMake.org	CMake	3.16.3	2020 JAN 21	https://github.com/Kitware/CMake	
Boost.org	Boost	1.66.0	2017 DEC 18	https://www.boost.org	included with Red Hat Linux 8
Boost.org	Boost	1.69.0	2018 DEC 12	https://www.boost.org	required for TCPCLv4 TLS v 1.3
Boost.org	Boost	1.70.0	2019 APR 12	https://www.boost.org	required for HTTPS/WSS support for Web User Interface
ZeroMQ.org	ZeroMQ	4.34	2021 JAN 17	https://github.com/zeromq/libzmq	
GNU.org	gcc	9.3.0	2020 MAR 12	https://gcc.gnu.org	Debian 8.3.0-6
OpenSSL.org	OpenSSL	1.1.1f	2020 MAR 31	https://www.openssl.org	optional; needed to support BPsec
Adam Kennedy	Strawberry Perl	5.32.1.1	2021 JAN 24	https://strawberryperl.com	
GStreamer Team	GStreamer	1.20.0	2022 FEB 03	https://gstreamer.freedesktop.org	required for streaming

3.2.3 Software Source Files

This section documents the source files included in the HDTN software release. These files are used to generate HDTN libraries and executables.

Source files are released through the HDTN public release repository at <https://github.com/nasa/HDTN>. A direct link to the tagged release in the repository and the first 8 characters of the SHA-1 hash for the commit to the repository are documented in Table 3-2: HDTN Release Repository Commit Information. Integrity of any local git repository clone can be checked by comparing the clone SHA-1 hash value against the value recorded in the table.

Table 3-2: HDTN Release Repository Commit Information

Release URL	First 8 of SHA-1 (Git)
https://github.com/nasa/HDTN/releases/tag/v2.0.0	EAF7B387

The filename and MD5 hash of each source file contained in the HDTN software release are documented in Table 3-3: HDTN Source Files. Integrity of individual source files is verifiable by calculating the MD5 hash value of the file and comparing against the value recorded in the table.

In Windows operating systems, MD5 hashes for files are calculated in the Windows command prompt using the following command:

```
certutil -hashfile <filename> MD5
```

In Linux operating systems, MD5 hashes for files are calculated using the following command:

```
md5sum <filename>
```

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In macOS operating systems, MD5 hashes for files are calculated in the Terminal window using the following command:

```
md5 <filename>
```

Table 3-3: HDTN Source Files

Source File	Last 8 of MD5 Hash
.\gitignore	5D047E35
.\gitlab\issue_templates\bug.md	07DD2567
.\gitlab\issue_templates\nfr.md	A6CB0D38
.\gitlab-ci.yml	2BB14313
.\add_hdt_n_package_export.cmake	43404FEA
.\boost_test_link_type.cmake	597508EC
.\building_on_windows\build_boost.bat	23DF5BDB
.\building_on_windows\build_generic_cmake_project.bat	CB76147A
.\building_on_windows\build_openssl.bat	B1BF5B51
.\building_on_windows\hdt_n_windows_cicd_unit_test.ps1	860C1463
.\building_on_windows\readme_building_on_windows.md	6BD4E678
.\building_on_windows\test_fail.bat	D74CC922
.\CHANGELOG.md	D6195BC5
.\ci\cloc.sh	3CFF36C8
.\ci\count_issues.py	F93FB7F8
.\ci\detect_high_ccm.py	26441E13
.\civetweb_builder.cmake	B3CBAE48
.\CMakeLists.txt	4A0B2566
.\common\bpcode\.\gitignore	75242EC9
.\common\bpcode\apps\bpfiletransfer\include\BpFileTransfer.h	5BE18EB3
.\common\bpcode\apps\bpfiletransfer\include\BpFileTransferRunner.h	2EE7C0FD
.\common\bpcode\apps\bpfiletransfer\src\BpFileTransfer.cpp	6444B86A
.\common\bpcode\apps\bpfiletransfer\src\BpFileTransferMain.cpp	D15F9156
.\common\bpcode\apps\bpfiletransfer\src\BpFileTransferRunner.cpp	827FFCF3
.\common\bpcode\apps\bpfiletransfer\www\index.html	4645513B
.\common\bpcode\apps\bpfiletransfer\www\modal-websocket-disconnect.css	58EEF9B7
.\common\bpcode\apps\bpngen\include\BpGenAsync.h	FE45E3FF
.\common\bpcode\apps\bpngen\include\BpGenAsyncRunner.h	94F8EF2C
.\common\bpcode\apps\bpngen\src\BpGenAsync.cpp	B8D4A750
.\common\bpcode\apps\bpngen\src\BpGenAsyncMain.cpp	322610E4
.\common\bpcode\apps\bpngen\src\BpGenAsyncRunner.cpp	468087F4
.\common\bpcode\apps\bping\include\BPing.h	C4EB33B2
.\common\bpcode\apps\bping\include\BPingRunner.h	0E73AE27
.\common\bpcode\apps\bping\src\BPing.cpp	9708C553
.\common\bpcode\apps\bping\src\BPingMain.cpp	EA3741F5
.\common\bpcode\apps\bping\src\BPingRunner.cpp	E685A120
.\common\bpcode\apps\bpreceivefile\include\BpReceiveFile.h	ACFDA0EF
.\common\bpcode\apps\bpreceivefile\include\BpReceiveFileRunner.h	01BA6AB2
.\common\bpcode\apps\bpreceivefile\src\BpReceiveFile.cpp	256FA61F
.\common\bpcode\apps\bpreceivefile\src\BpReceiveFileMain.cpp	5D8ECC75
.\common\bpcode\apps\bpreceivefile\src\BpReceiveFileRunner.cpp	D1BCF355
.\common\bpcode\apps\bpreceivepacket\include\BpReceivePacket.h	4E564066
.\common\bpcode\apps\bpreceivepacket\include\BpReceivePacketRunner.h	CB007341
.\common\bpcode\apps\bpreceivepacket\src\BpReceivePacket.cpp	D4C98B56
.\common\bpcode\apps\bpreceivepacket\src\BpReceivePacketMain.cpp	34F60F7C

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.\common\bpcodec\apps\bpreceivepacket\src\BpReceivePacketRunner.cpp	E73DF1DB
.\common\bpcodec\apps\BpReceiveStream\include\BpReceiveStream.h	07F05E51
.\common\bpcodec\apps\BpReceiveStream\include\BpReceiveStreamRunner.h	F1ECD12B
.\common\bpcodec\apps\BpReceiveStream\src\BpReceiveStream.cpp	AA01DE0E
.\common\bpcodec\apps\BpReceiveStream\src\BpReceiveStreamMain.cpp	57410C63
.\common\bpcodec\apps\BpReceiveStream\src\BpReceiveStreamRunner.cpp	0D759511
.\common\bpcodec\apps\bpsendfile\include\BpSendFile.h	77A4F236
.\common\bpcodec\apps\bpsendfile\include\BpSendFileRunner.h	1010FC91
.\common\bpcodec\apps\bpsendfile\src\BpSendFile.cpp	BCCF303D
.\common\bpcodec\apps\bpsendfile\src\BpSendFileMain.cpp	95A3023E
.\common\bpcodec\apps\bpsendfile\src\BpSendFileRunner.cpp	40A932A6
.\common\bpcodec\apps\bpsendpacket\include\BpSendPacket.h	0C537337
.\common\bpcodec\apps\bpsendpacket\include\BpSendPacketRunner.h	A1415EA7
.\common\bpcodec\apps\bpsendpacket\src\BpSendPacket.cpp	2093E497
.\common\bpcodec\apps\bpsendpacket\src\BpSendPacketMain.cpp	6E14FA2A
.\common\bpcodec\apps\bpsendpacket\src\BpSendPacketRunner.cpp	BBBC807F
.\common\bpcodec\apps\BpSendStream\include\BpSendStream.h	0F0D33FB
.\common\bpcodec\apps\BpSendStream\include\BpSendStreamRunner.h	C12EF4D7
.\common\bpcodec\apps\BpSendStream\src\BpSendStream.cpp	C10ECAA0
.\common\bpcodec\apps\BpSendStream\src\BpSendStreamMain.cpp	3EBCE24F
.\common\bpcodec\apps\BpSendStream\src\BpSendStreamRunner.cpp	DB1640AE
.\common\bpcodec\apps\bpsink\BpSinkAsync.cpp	5D1C6D56
.\common\bpcodec\apps\bpsink\BpSinkAsyncMain.cpp	F48E7536
.\common\bpcodec\apps\bpsink\BpSinkAsyncRunner.cpp	1A1AFBEB
.\common\bpcodec\apps\bpsink\include\BpSinkAsync.h	F5CC44AA
.\common\bpcodec\apps\bpsink\include\BpSinkAsyncRunner.h	CAF2931E
.\common\bpcodec\apps\CMakeLists.txt	801154DA
.\common\bpcodec\BpAppPatternsLibConfig.cmake.in	557BD003
.\common\bpcodec\BpcodecConfig.cmake.in	48111ED6
.\common\bpcodec\CMakeLists.txt	6D8BD79E
.\common\bpcodec\include\app_patterns\BpSinkPattern.h	590371F4
.\common\bpcodec\include\app_patterns\BpSourcePattern.h	736BFC09
.\common\bpcodec\include\codec\bpv6.h	8470E8A3
.\common\bpcodec\include\codec\Bpv6Fragment.h	84E93D14
.\common\bpcodec\include\codec\Bpv6FragmentManager.h	B3712F8F
.\common\bpcodec\include\codec\bpv7.h	BD30DF18
.\common\bpcodec\include\codec\Bpv7Crc.h	22D77371
.\common\bpcodec\include\codec\BundleViewV6.h	ED57D3B7
.\common\bpcodec\include\codec\BundleViewV7.h	BD75F314
.\common\bpcodec\include\codec\Cbhe.h	5BCFA4B7
.\common\bpcodec\include\codec\Cose.h	5C3D9AD3
.\common\bpcodec\include\codec\CustodyIdAllocator.h	9159E1FA
.\common\bpcodec\include\codec\CustodyTransferManager.h	6A5F25E6
.\common\bpcodec\include\codec\PrimaryBlock.h	9EDDA744
.\common\bpcodec\README.md	860EB6C0
.\common\bpcodec\src\app_patterns\BpSinkPattern.cpp	7DCEB314
.\common\bpcodec\src\app_patterns\BpSourcePattern.cpp	436EFA46
.\common\bpcodec\src\codec\Bpv6AdministrativeRecords.cpp	D5D5DF70
.\common\bpcodec\src\codec\Bpv6CanonicalBlock.cpp	0AA13652
.\common\bpcodec\src\codec\Bpv6CbhePrimaryBlock.cpp	D487A215
.\common\bpcodec\src\codec\Bpv6ExtensionBlocks.cpp	7A83B928

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Source File	Last 8 of MD5 Hash
.\common\bpcodec\src\codec\Bpv6Fragment.cpp	71BE6D0F
.\common\bpcodec\src\codec\Bpv6FragmentManager.cpp	C2EFB1D4
.\common\bpcodec\src\codec\Bpv6MetadataExtensionBlock.cpp	27E0EF6B
.\common\bpcodec\src\codec\Bpv7AdministrativeRecords.cpp	E74C1851
.\common\bpcodec\src\codec\Bpv7BpSecExtensionBlocks.cpp	1EDD48B8
.\common\bpcodec\src\codec\Bpv7CanonicalBlock.cpp	B1DFE342
.\common\bpcodec\src\codec\Bpv7CbhePrimaryBlock.cpp	6B74E116
.\common\bpcodec\src\codec\Bpv7Crc.cpp	A64D9EDF
.\common\bpcodec\src\codec\Bpv7ExtensionBlocks.cpp	F5E1F0A0
.\common\bpcodec\src\codec\BundleViewV6.cpp	32C9C6F5
.\common\bpcodec\src\codec\BundleViewV7.cpp	9A77B117
.\common\bpcodec\src\codec\Cbhe.cpp	3EC806B8
.\common\bpcodec\src\codec\CustodyIdAllocator.cpp	33833FA5
.\common\bpcodec\src\codec\CustodyTransferManager.cpp	B1D0BD7C
.\common\bpcodec\src\codec\ZlibCrc32cCombine.cpp	D0986FDA
.\common\bpcodec\test\bplib_bundle	4468B08E
.\common\bpcodec\test\bundle.bpbis-16.cbor	CE4566FC
.\common\bpcodec\test\ion_bundle	E74DFC3A
.\common\bpcodec\test\TestAggregateCustodySignal.cpp	80113690
.\common\bpcodec\test\TestBpsecDefaultSecurityContexts.cpp	62CFD725
.\common\bpcodec\test\TestBpSinkPattern.cpp	2EC15B12
.\common\bpcodec\test\TestBpv6Fragmentation.cpp	07D7E313
.\common\bpcodec\test\TestBpv7Crc.cpp	12E9063B
.\common\bpcodec\test\TestBundleViewV6.cpp	38749D06
.\common\bpcodec\test\TestBundleViewV7.cpp	27674F50
.\common\bpcodec\test\TestCustodyIdAllocator.cpp	1115DEDA
.\common\bpcodec\test\TestCustodyTransfer.cpp	9DB693CC
.\common\bpsec\BpsecLibConfig.cmake.in	C7D155E8
.\common\bpsec\CMakeLists.txt	A812A6A6
.\common\bpsec\include\BpSecBundleProcessor.h	DAF2DDCB
.\common\bpsec\include\BpSecPolicyManager.h	D09F980E
.\common\bpsec\include\InitializationVectors.h	23BEABCA
.\common\bpsec\src\BpSecBundleProcessor.cpp	6B101408
.\common\bpsec\src\BpSecPolicyManager.cpp	1E5124DB
.\common\bpsec\src\InitializationVectors.cpp	58D73461
.\common\bpsec\test\TestBpsecDefault.cpp	4FCE2846
.\common\bpsec\test\TestBpSecPolicyManager.cpp	ADF45D21
.\common\bpsec\test\TestInitializationVectors.cpp	24ABABFF
.\common\cgr\CMakeLists.txt	067DBF95
.\common\cgr\HDTNCgrLibConfig.cmake.in	CB88EF3F
.\common\cgr\include\libcgr.h	7A5AC435
.\common\cgr\src\libcgr.cpp	E2C92223
.\common\cgr\test\TestDijkstra.cpp	F94FC268
.\common\cgr\test\TestYen.cpp	5CE19B44
.\common\config\CMakeLists.txt	47E1A11D
.\common\config\HDTNConfigLibConfig.cmake.in	8F54A5E8
.\common\config\include\BpSecConfig.h	2CFCF5CF
.\common\config\include\HdtnConfig.h	AB82FBC2
.\common\config\include\HdtnDistributedConfig.h	22D4AC1A
.\common\config\include\InductsConfig.h	4AAE1715
.\common\config\include\OutductsConfig.h	D8A1B265

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Source File	Last 8 of MD5 Hash
.\common\config\include\StorageConfig.h	BD3FDB0D
.\common\config\src\BpSecConfig.cpp	CE6206DD
.\common\config\src\HdtnConfig.cpp	43B11894
.\common\config\src\HdtnDistributedConfig.cpp	6094EA94
.\common\config\src\InductsConfig.cpp	3CE3560A
.\common\config\src\OutductsConfig.cpp	855436F5
.\common\config\src\StorageConfig.cpp	5324E36E
.\common\config\test\bpsec_test.json	9C5A497E
.\common\config\test\inducts.json	3B0453C8
.\common\config\test\outducts.json	847708DF
.\common\config\test\storage.json	0C065B0E
.\common\config\test\TestBpSecConfig.cpp	085185F6
.\common\config\test\TestHdtnConfig.cpp	66FBF001
.\common\config\test\TestHdtnDistributedConfig.cpp	BBA71AAC
.\common\config\test\TestInductsConfig.cpp	1843685C
.\common\config\test\TestOutductsConfig.cpp	58A9A866
.\common\config\test\TestStorageConfig.cpp	5780CD5C
.\common\include\HdtnVersion.hpp	53DE16C8
.\common\include\message.hpp	2246BA36
.\common\include\stats.hpp	9B445AA4
.\common\induct_manager\CMakeLists.txt	BCFE0DC3
.\common\induct_manager\include\BpOverEncapLocalStreamInduct.h	EC6975CC
.\common\induct_manager\include\Induct.h	2014DB01
.\common\induct_manager\include\InductManager.h	02560E88
.\common\induct_manager\include\LtpInduct.h	3ED2FFB0
.\common\induct_manager\include\LtpOverEncapLocalStreamInduct.h	B297445B
.\common\induct_manager\include\LtpOverIpcInduct.h	1B2870D2
.\common\induct_manager\include\LtpOverUdpInduct.h	74B4C01B
.\common\induct_manager\include\SlipOverUartInduct.h	FD9C4400
.\common\induct_manager\include\StepInduct.h	5C489FA3
.\common\induct_manager\include\TcpIInduct.h	79F63C0F
.\common\induct_manager\include\TcpIV4Induct.h	99549D7E
.\common\induct_manager\include\UdpInduct.h	A8606582
.\common\induct_manager\InductManagerLibConfig.cmake.in	8B873F16
.\common\induct_manager\src\BpOverEncapLocalStreamInduct.cpp	A031BF91
.\common\induct_manager\src\Induct.cpp	11598615
.\common\induct_manager\src\InductManager.cpp	AB7EF2E2
.\common\induct_manager\src\LtpInduct.cpp	73A8E775
.\common\induct_manager\src\LtpOverEncapLocalStreamInduct.cpp	73CB017B
.\common\induct_manager\src\LtpOverIpcInduct.cpp	A378213A
.\common\induct_manager\src\LtpOverUdpInduct.cpp	0C5F37A9
.\common\induct_manager\src\SlipOverUartInduct.cpp	E6E579FD
.\common\induct_manager\src\StepInduct.cpp	6D33192C
.\common\induct_manager\src\TcpIInduct.cpp	9AFFD966
.\common\induct_manager\src\TcpIV4Induct.cpp	E8A73118
.\common\induct_manager\src\UdpInduct.cpp	BAE39E2C
.\common\logger\CMakeLists.txt	EE087C39
.\common\logger\include\Logger.h	23C302B8
.\common\logger\LoggerLibConfig.cmake.in	029F78DF
.\common\logger\src\Logger.cpp	F10DBC95
.\common\logger\unit_tests\LoggerTests.cpp	EC4ACEE1

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.\common\ltp\apps\ltp_file_transfer\include\LtpFileTransferRunner.h	5DB8DCF7
.\common\ltp\apps\ltp_file_transfer\src\LtpFileTransferMain.cpp	CC83E37E
.\common\ltp\apps\ltp_file_transfer\src\LtpFileTransferRunner.cpp	19C70119
.\common\ltp\CMakeLists.txt	2752EE90
.\common\ltp\include\Ltp.h	3D586488
.\common\ltp\include\LtpBundleSink.h	EB829BF3
.\common\ltp\include\LtpBundleSource.h	6D262FDD
.\common\ltp\include\LtpEncapLocalStreamEngine.h	C6E31232
.\common\ltp\include\LtpEngine.h	559E7992
.\common\ltp\include\LtpEngineConfig.h	628546CF
.\common\ltp\include\LtpFragmentSet.h	93537C86
.\common\ltp\include\LtpIpcEngine.h	20EB08A7
.\common\ltp\include\LtpNoticesToClientService.h	D3EB82B2
.\common\ltp\include\LtpOverEncapLocalStreamBundleSink.h	47BB5A27
.\common\ltp\include\LtpOverEncapLocalStreamBundleSource.h	15C1BC60
.\common\ltp\include\LtpOverIpcBundleSink.h	EAAA3832
.\common\ltp\include\LtpOverIpcBundleSource.h	6A10224D
.\common\ltp\include\LtpOverUdpBundleSink.h	133BD292
.\common\ltp\include\LtpOverUdpBundleSource.h	68AE8C2B
.\common\ltp\include\LtpRandomNumberGenerator.h	FB4A9AAE
.\common\ltp\include\LtpSessionReceiver.h	6C5B6A79
.\common\ltp\include\LtpSessionRecreationPreventer.h	E9A7956E
.\common\ltp\include\LtpSessionSender.h	6C64CE44
.\common\ltp\include\LtpTimerManager.h	5FF529AC
.\common\ltp\include\LtpUdpEngine.h	CE64D0C1
.\common\ltp\include\LtpUdpEngineManager.h	79AFDA25
.\common\ltp\LtpLibConfig.cmake.in	3FD5B81E
.\common\ltp\src\Ltp.cpp	58351DF5
.\common\ltp\src\LtpBundleSink.cpp	D826A2BE
.\common\ltp\src\LtpBundleSource.cpp	A30A1FCB
.\common\ltp\src\LtpEncapLocalStreamEngine.cpp	3B91B174
.\common\ltp\src\LtpEngine.cpp	F3CE8BEB
.\common\ltp\src\LtpFragmentSet.cpp	4FE0BC3D
.\common\ltp\src\LtpIpcEngine.cpp	EE17D656
.\common\ltp\src\LtpOverEncapLocalStreamBundleSink.cpp	5F7F5095
.\common\ltp\src\LtpOverEncapLocalStreamBundleSource.cpp	07E7B2AC
.\common\ltp\src\LtpOverIpcBundleSink.cpp	668292B7
.\common\ltp\src\LtpOverIpcBundleSource.cpp	7427911B
.\common\ltp\src\LtpOverUdpBundleSink.cpp	2186A419
.\common\ltp\src\LtpOverUdpBundleSource.cpp	47019B49
.\common\ltp\src\LtpRandomNumberGenerator.cpp	EF3C15A8
.\common\ltp\src\LtpSessionReceiver.cpp	A0F1CBC2
.\common\ltp\src\LtpSessionRecreationPreventer.cpp	9301EA2F
.\common\ltp\src\LtpSessionSender.cpp	0F433775
.\common\ltp\src\LtpTimerManager.cpp	05DD2582
.\common\ltp\src\LtpUdpEngine.cpp	7B696F23
.\common\ltp\src\LtpUdpEngineManager.cpp	E2055E9D
.\common\ltp\test\TestLtp.cpp	6A6A0B03
.\common\ltp\test\TestLtpEngine.cpp	7777E326
.\common\ltp\test\TestLtpFragmentSet.cpp	5980B8D3
.\common\ltp\test\TestLtpRandomNumberGenerator.cpp	170EFAC7

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.\common\ltp\test\TestLtpSessionRecreationPreventer.cpp	DE8EAC02
.\common\ltp\test\TestLtpTimerManager.cpp	7E519E53
.\common\ltp\test\TestLtpUdpEngine.cpp	76A55E67
.\common\masker\CMakeLists.txt	001D5EDC
.\common\masker\HDTNMaskerLibConfig.cmake.in	096B77E9
.\common\masker\include\Masker.h	A5A216E5
.\common\masker\include\RedundantMasker.h	6225C2AC
.\common\masker\include\ShiftingMasker.h	A9ED7F93
.\common\masker\src\Masker.cpp	1E3B9A7F
.\common\masker\src\RedundantMasker.cpp	1B7ADEFA
.\common\masker\src\ShiftingMasker.cpp	B52D7447
.\common\outduct_manager\CMakeLists.txt	EE63287B
.\common\outduct_manager\include\BpOverEncapLocalStreamOutduct.h	3EF6AE70
.\common\outduct_manager\include\LtpOutduct.h	D5EB4449
.\common\outduct_manager\include\LtpOverEncapLocalStreamOutduct.h	2731970D
.\common\outduct_manager\include\LtpOverIpcOutduct.h	4CE1F5DD
.\common\outduct_manager\include\LtpOverUdpOutduct.h	598C11C6
.\common\outduct_manager\include\Outduct.h	71C57357
.\common\outduct_manager\include\OutductManager.h	978DE6B7
.\common\outduct_manager\include\SlipOverUartOutduct.h	493B041C
.\common\outduct_manager\include\StepOutduct.h	98CEDBC4
.\common\outduct_manager\include\TcpclOutduct.h	CBABD1AC
.\common\outduct_manager\include\TcpclV4Outduct.h	3A9515DA
.\common\outduct_manager\include\UdpOutduct.h	FC75E09E
.\common\outduct_manager\OutductManagerLibConfig.cmake.in	1EEFF5D0
.\common\outduct_manager\src\BpOverEncapLocalStreamOutduct.cpp	CEC7A079
.\common\outduct_manager\src\LtpOutduct.cpp	C411531C
.\common\outduct_manager\src\LtpOverEncapLocalStreamOutduct.cpp	C45DDF7F
.\common\outduct_manager\src\LtpOverIpcOutduct.cpp	36337F1A
.\common\outduct_manager\src\LtpOverUdpOutduct.cpp	9FB1B83F
.\common\outduct_manager\src\Outduct.cpp	EE4F1466
.\common\outduct_manager\src\OutductManager.cpp	464468DB
.\common\outduct_manager\src\SlipOverUartOutduct.cpp	BA1518D4
.\common\outduct_manager\src\StepOutduct.cpp	40141ADB
.\common\outduct_manager\src\TcpclOutduct.cpp	61B2FD22
.\common\outduct_manager\src\TcpclV4Outduct.cpp	252A19A7
.\common\outduct_manager\src\UdpOutduct.cpp	B2A74608
.\common\slip_over_uart\CMakeLists.txt	AC82FA91
.\common\slip_over_uart\include\slip.h	91C79C96
.\common\slip_over_uart\include\UartInterface.h	68E76D57
.\common\slip_over_uart\SlipOverUartLibConfig.cmake.in	61841A7F
.\common\slip_over_uart\src\slip.c	516CF187
.\common\slip_over_uart\src\UartInterface.cpp	A07AD730
.\common\slip_over_uart\test\TestSlip.cpp	B7249E74
.\common\stats_logger\CMakeLists.txt	7F1B06F8
.\common\stats_logger\include\StatsLogger.h	A17EBD4C
.\common\stats_logger\src\StatsLogger.cpp	54F72849
.\common\stats_logger\StatsLoggerLibConfig.cmake.in	E5047504
.\common\stats_logger\unit_tests\StatsLoggerTests.cpp	CC174C90
.\common\step\CMakeLists.txt	5D706C25
.\common\step\include\StepBundleSink.h	6C03A7B7

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.\common\step\include\StepBundleSource.h	F385749B
.\common\step\src\StepBundleSink.cpp	11088B20
.\common\step\src\StepBundleSource.cpp	1EBB3178
.\common\step\StepLibConfig.cmake.in	5DBE00A9
.\common\streaming\BpInduct\include\GStreamerAppSinkInduct.h	12314DFB
.\common\streaming\BpInduct\include\GStreamerShmInduct.h	018C4705
.\common\streaming\BpInduct\src\GStreamerAppSinkInduct.cpp	D7409E50
.\common\streaming\BpInduct\src\GStreamerShmInduct.cpp	CED776FF
.\common\streaming\BpOutduct\include\GStreamerAppSrcOutduct.h	DB4C13E9
.\common\streaming\BpOutduct\src\GStreamerAppSrcOutduct.cpp	232C11C7
.\common\streaming\CMakeLists.txt	B26DECFE
.\common\streaming\Dockfile	A56A8B5D
.\common\streaming\include\AsyncListener.h	173D456B
.\common\streaming\include\DtnFrameQueue.h	0BD2DD97
.\common\streaming\include\DtnRtp.h	1CC6A921
.\common\streaming\include\DtnRtpFrame.h	114B3684
.\common\streaming\include\DtnUtil.h	D9217FE4
.\common\streaming\Makefile	1FD5318D
.\common\streaming\README.md	CB43A3D4
.\common\streaming\src\DtnFrameQueue.cpp	2FF7B244
.\common\streaming\src\DtnRtp.cpp	7E70A6A0
.\common\streaming\StreamingLibConfig.cmake.in	184BAEFB
.\common\tpcl\CMakeLists.txt	CB15F97C
.\common\tpcl\include\BidirectionalLink.h	F51F5595
.\common\tpcl\include\Tpcpl.h	317B852B
.\common\tpcl\include\TpcplBundleSink.h	D4C8E735
.\common\tpcl\include\TpcplBundleSource.h	BFF1591D
.\common\tpcl\include\TpcplV3BidirectionalLink.h	5236EC2C
.\common\tpcl\include\TpcplV4.h	652503D5
.\common\tpcl\include\TpcplV4BidirectionalLink.h	65118A9D
.\common\tpcl\include\TpcplV4BundleSink.h	5312495F
.\common\tpcl\include\TpcplV4BundleSource.h	C8088382
.\common\tpcl\src\Tpcpl.cpp	5EEE7D2B
.\common\tpcl\src\TpcplBundleSink.cpp	AFCF8AD2
.\common\tpcl\src\TpcplBundleSource.cpp	51E5B747
.\common\tpcl\src\TpcplV3BidirectionalLink.cpp	F3295431
.\common\tpcl\src\TpcplV4.cpp	99AD1787
.\common\tpcl\src\TpcplV4BidirectionalLink.cpp	FFE62EA9
.\common\tpcl\src\TpcplV4BundleSink.cpp	AD3B12EF
.\common\tpcl\src\TpcplV4BundleSource.cpp	8DF29467
.\common\tpcl\TpcplLibConfig.cmake.in	87B67122
.\common\tpcl\test\TestTpcpl.cpp	E913065C
.\common\tpcl\test\TestTpcplV4.cpp	65DE401F
.\common\telemetry_definitions\CMakeLists.txt	FFC8D044
.\common\telemetry_definitions\include\TelemetryDefinitions.h	D88A270A
.\common\telemetry_definitions\include\TelemetryServer.h	3E6BB812
.\common\telemetry_definitions\src\TelemetryDefinitions.cpp	5A88218C
.\common\telemetry_definitions\src\TelemetryServer.cpp	54F3FBEE
.\common\telemetry_definitions\TelemetryDefinitionsConfig.cmake.in	1DB7DBA8
.\common\telemetry_definitions\test\TestTelemetryDefinitions.cpp	9F1EAAC5
.\common\telemetry_definitions\test\TestTelemetryServer.cpp	B25AF325

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.\common\udp\CMakeLists.txt	87697144
.\common\udp\include\UdpBundleSink.h	BC28EF45
.\common\udp\include\UdpBundleSource.h	A9928D37
.\common\udp\src\UdpBundleSink.cpp	F6D362AE
.\common\udp\src\UdpBundleSource.cpp	A5DAC6BA
.\common\udp\UdpLibConfig.cmake.in	0AF016AD
.\common\util\CMakeLists.txt	9477DDA4
.\common\util\HDTNUtilConfig.cmake.in	29CF90ED
.\common\util\include\BinaryConversions.h	60225150
.\common\util\include\BundleCallbackFunctionDefines.h	1A4437E6
.\common\util\include\CborUint.h	889536DE
.\common\util\include\CcsdsEncap.h	9D52CEA1
.\common\util\include\CcsdsEncapDecode.h	A1392C4C
.\common\util\include\CcsdsEncapEncode.h	53B86BFF
.\common\util\include\CircularIndexBufferSingleProducerSingleConsumerConfigurable.h	9017F95C
.\common\util\include\CpuFlagDetection.h	B9F5922E
.\common\util\include\DeadlineTimer.h	3B8C95FA
.\common\util\include\deprecated\RateManagerAsync.h	A33971DC
.\common\util\include\dir_monitor\basic_dir_monitor.hpp	7EA7C877
.\common\util\include\dir_monitor\dir_monitor.hpp	73BA1D8D
.\common\util\include\dir_monitor\fssevents\basic_dir_monitor_service.hpp	42AA6EA6
.\common\util\include\dir_monitor\fssevents\dir_monitor_impl.hpp	22DF9655
.\common\util\include\dir_monitor\inotify\basic_dir_monitor_service.hpp	9A81C8FD
.\common\util\include\dir_monitor\inotify\dir_monitor_impl.hpp	957B4B53
.\common\util\include\dir_monitor\kqueue\basic_dir_monitor_service.hpp	C46E2DAA
.\common\util\include\dir_monitor\kqueue\dir_monitor_impl.hpp	A80B1022
.\common\util\include\dir_monitor\windows\basic_dir_monitor_service.hpp	1F424B34
.\common\util\include\dir_monitor\windows\dir_monitor_impl.hpp	064C19A2
.\common\util\include\DirectoryScanner.h	EF6C61B2
.\common\util\include\EncapAsyncDuplexLocalStream.h	B31F55C2
.\common\util\include\EnumAsFlagsMacro.h	469E9C10
.\common\util\include\Environment.h	023FAB6D
.\common\util\include\ForwardListQueue.h	D5638895
.\common\util\include\FragmentSet.h	3FA4F6D2
.\common\util\include\FreeListAllocator.h	6D42FC03
.\common\util\include\JsonSerializable.h	243DD403
.\common\util\include\LtpClientServiceDataToSend.h	01950B1D
.\common\util\include\MemoryInFiles.h	81E0525F
.\common\util\include\PaddedVectorUInt8.h	F03DEDA1
.\common\util\include\Sdnv.h	2007D80A
.\common\util\include\SignalHandler.h	E8DF6A90
.\common\util\include\TcpAsyncSender.h	C9817A8B
.\common\util\include\ThreadNamer.h	C9580EBF
.\common\util\include\TimestampUtil.h	9BAE51B7
.\common\util\include\TokenRateLimiter.h	8FDEA58E
.\common\util\include\UdpBatchSender.h	7D6994D5
.\common\util\include\Uri.h	12D7D3BC
.\common\util\include\UserDataRecycler.h	B913BDCE
.\common\util\include\Utf8Paths.h	3DC8F8BE
.\common\util\include\zmq.hpp	3E6377D3
.\common\util\src\BinaryConversions.cpp	E1F9992F

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.\common\util\src\CborUint.cpp	8694F15B
.\common\util\src\cgr_tables\cgrTable.json	51C13BFC
.\common\util\src\cgr_tables\convertCpToJson.py	48288857
.\common\util\src\cgr_tables\global.ionrc	3C0D1B97
.\common\util\src\CircularIndexBufferSingleProducerSingleConsumerConfigurable.cpp	FE6410F2
.\common\util\src\CpuFlagDetection.cpp	88C9DCA4
.\common\util\src\DeadlineTimer.cpp	588C8729
.\common\util\src\deprecated\RateManagerAsync.cpp	23D234A8
.\common\util\src\DirectoryScanner.cpp	F3E5971F
.\common\util\src\Environment.cpp	8BE50917
.\common\util\src\FragmentSet.cpp	A08F6747
.\common\util\src\JsonSerializable.cpp	ACB20EFA
.\common\util\src\LtpClientServiceDataToSend.cpp	AD18F2E9
.\common\util\src\MemoryInFiles.cpp	399059F6
.\common\util\src\Sdnv.cpp	8E90DDC4
.\common\util\src\SignalHandler.cpp	F62E33E7
.\common\util\src\TcpAsyncSender.cpp	57D9E526
.\common\util\src\ThreadNamer.cpp	C2773CB4
.\common\util\src\TimestampUtil.cpp	19AD0A23
.\common\util\src\TokenRateLimiter.cpp	4ECCA6D5
.\common\util\src\UdpBatchSender.cpp	393D60D0
.\common\util\src\Uri.cpp	0F715337
.\common\util\src\Utf8Paths.cpp	99E1C47D
.\common\util\test\deprecated\TestRateManagerAsync.cpp	1A3D6ECF
.\common\util\test\dir_monitor\check_paths.hpp	7F98AB97
.\common\util\test\dir_monitor\directory.hpp	59978D6A
.\common\util\test\dir_monitor\test_async.cpp	A11714B7
.\common\util\test\dir_monitor\test_sync.cpp	F83DAF73
.\common\util\test\TestCborUint.cpp	B93B7A91
.\common\util\test\TestCcsdsEncap.cpp	A7956F86
.\common\util\test\TestCircularIndexBuffer.cpp	72EC7452
.\common\util\test\TestCpuFlagDetection.cpp	69EBEE7F
.\common\util\test\TestDeadlineTimer.cpp	659E62DB
.\common\util\test\TestDirectoryScanner.cpp	2CCDDC80
.\common\util\test\TestEnumAsFlagsMacro.cpp	B3F11E61
.\common\util\test\TestForwardListQueue.cpp	3446A57D
.\common\util\test\TestFreeListAllocator.cpp	1E135907
.\common\util\test\TestJsonSerializable.cpp	4D982947
.\common\util\test\TestMemoryInFiles.cpp	25114406
.\common\util\test\TestPaddedVectorUInt8.cpp	9BABB6FE
.\common\util\test\TestSdnv.cpp	06FE0D9D
.\common\util\test\TestTimestampUtil.cpp	B8F83B92
.\common\util\test\TestTokenRateLimiter.cpp	BFFF838D
.\common\util\test\TestUdpBatchSender.cpp	2C8BE2BC
.\common\util\test\TestUri.cpp	39D7882C
.\common\util\test\TestUserDataRecycler.cpp	C7383CE0
.\common\util\test\TestUtf8Paths.cpp	569481CD
.\config_files\bpsec\ipn1.1_con.json	B6B8BE93
.\config_files\bpsec\ipn1.1_con_plus_int.json	FE9FE527
.\config_files\bpsec\ipn1.1_confidentiality.key	122C46A6
.\config_files\bpsec\ipn1.1_int.json	68FB0BE6

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.\config_files\bpsec\ipn1.1_integrity.key	59F5B46D
.\config_files\bpsec\ipn10.1_con.json	208BB8FA
.\config_files\bpsec\ipn10.1_con_plus_int.json	1FDC146D
.\config_files\bpsec\ipn10.1_confidentiality.key	D7758E70
.\config_files\bpsec\ipn10.1_int.json	6F4710E6
.\config_files\bpsec\ipn10.1_integrity.key	5BFE20E5
.\config_files\bpsec\ipn2.1_con.json	6C851CA1
.\config_files\bpsec\ipn2.1_con_plus_int.json	0E4E44B1
.\config_files\bpsec\ipn2.1_confidentiality.key	122C46A6
.\config_files\bpsec\README_bpsec_config.txt	89A96514
.\config_files\hdt\hdt\distributed_defaults.json	9BD18D03
.\config_files\hdt\hdt\DTNME.json	D9A7C76F
.\config_files\hdt\hdt\egress2tcpcl_port4557flowid1_port4558flowid2.json	850C05ED
.\config_files\hdt\hdt\egress2tcpclv4_port4557flowid1_port4558flowid2.json	68D72AE6
.\config_files\hdt\hdt\egress2tcpclv4tls_port4557flowid1_port4558flowid2.json	4F4D2893
.\config_files\hdt\hdt\ingress1ltp_port4556_egress1ltp_port4558flowid2.json	4551DEF3
.\config_files\hdt\hdt\ingress1ltp_port4556_egress1tcpcl_port4558flowid2.json	FB31E14F
.\config_files\hdt\hdt\ingress1ltp_port4556_egress2ltp_port4557flowid1_port4558flowid2.json	BD7044E8
.\config_files\hdt\hdt\ingress1ltpipc_port4556_egress1ltpipc_port4558flowid2.json	BCD603E7
.\config_files\hdt\hdt\ingress1step_port4556_egress1bpencap_namedpipe_flowid2.json	BA03B3F8
.\config_files\hdt\hdt\ingress1step_port4556_egress1bpencap_unixsocket_flowid2.json	5D38E71D
.\config_files\hdt\hdt\ingress1step_port4556_egress1ltp_port4558flowid2.json	0076694B
.\config_files\hdt\hdt\ingress1step_port4556_egress1ltp_port4558flowid2_batchsend_smallmtu.json	6C05070A
.\config_files\hdt\hdt\ingress1step_port4556_egress1ltpdelayproxy_disksessions_flowid2.json	9E1DE254
.\config_files\hdt\hdt\ingress1step_port4556_egress1ltpdelayproxy_disksessions_longdelay_flowid2.json	BD744058
.\config_files\hdt\hdt\ingress1step_port4556_egress1ltpdelayproxy_flowid2.json	505C7A74
.\config_files\hdt\hdt\ingress1step_port4556_egress1ltpdelayproxy_flowid2_50Mbps.json	891B1D57
.\config_files\hdt\hdt\ingress1step_port4556_egress1ltpdelayproxy_flowid2_50Mbps_largepipeline.json	B58E18D3
.\config_files\hdt\hdt\ingress1step_port4556_egress1ltpencap_namedpipe_flowid2.json	52151770
.\config_files\hdt\hdt\ingress1step_port4556_egress1ltpencap_unixsocket_flowid2.json	3DCCCF48
.\config_files\hdt\hdt\ingress1step_port4556_egress1step_port4558flowid2.json	32CE916A
.\config_files\hdt\hdt\ingress1step_port4556_egress1step_port4558flowid2_bpgencustodyxfer.json	CE2832CF
.\config_files\hdt\hdt\ingress1step_port4556_egress2step_port4557flowid1_port4558flowid2.json	8663FCFA
.\config_files\hdt\hdt\ingress1tcpcl_port4556.json	0C9E5077
.\config_files\hdt\hdt\ingress1tcpcl_port4556_egress1tcpcl_port4557flowid1.json	71122344
.\config_files\hdt\hdt\ingress1tcpcl_port4556_egress1tcpcl_port4558flowid2.json	9A0FD33D
.\config_files\hdt\hdt\ingress1tcpcl_port4556_egress1tcpcl_port4558flowid2_autofragmentsize9993.json	61E01804
.\config_files\hdt\hdt\ingress1tcpcl_port4556_egress1tcpcl_port4558flowid2_bigpipeline.json	7A1CE81D
.\config_files\hdt\hdt\ingress1tcpcl_port4556_egress1tcpcl_port4558flowid2_tinycb.json	91D0AED9
.\config_files\hdt\hdt\ingress1tcpcl_port4556_egress1udpfast_port4558flowid2_bpgencustodyxfer.json	DA8966F9

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Source File	Last 8 of MD5 Hash
.\config_files\hdt\hdt\ingress1tcpcl_port4556_egress2tcpcl_port4557flowid1_port4558flowid2.json	D35BF58B
.\config_files\hdt\hdt\ingress1tcpclv4_port4556.json	CCDD70F8
.\config_files\hdt\hdt\ingress1tcpclv4_port4556_egress1tcpclv4_port4557flowid1.json	D5241683
.\config_files\hdt\hdt\ingress1tcpclv4_port4556_egress1tcpclv4_port4558flowid2.json	1F312E58
.\config_files\hdt\hdt\ingress1tcpclv4_port4556_egress1tcpclv4_port4558flowid2_autofragmentsize9993.json	DBE9F117
.\config_files\hdt\hdt\ingress1tcpclv4tls_port4556.json	B74598E1
.\config_files\hdt\hdt\ingress1tcpclv4tls_port4556_egress1tcpclv4tls_port4557flowid1.json	66D95349
.\config_files\hdt\hdt\ingress1tcpclv4tls_port4556_egress1tcpclv4tls_port4558flowid2.json	916CE80E
.\config_files\hdt\hdt\ingressluart_egress1tcpcl_port4558flowid2.json	FE433CC4
.\config_files\hdt\hdt\ingressludp_port4556_egress1step_port4558flowid2.json	F2196D70
.\config_files\hdt\hdt\ingressludp_port4556_egressludp_port4558flowid2_0.8Mbps.json	C74D3BFC
.\config_files\hdt\hdt\ingressludp_port4556_egress2udp_port4557flowid1_port4558flowid2_0.8Mbps.json	DA0D8242
.\config_files\hdt\hdt\node1_cfg.json	EE6CB800
.\config_files\hdt\hdt\node1_ltp.json	E4E4A491
.\config_files\hdt\hdt\node1_step.json	0B54481E
.\config_files\hdt\hdt\node1_tcpcl.json	AB9F8009
.\config_files\hdt\hdt\node2_cfg.json	E1129D5D
.\config_files\hdt\hdt\node2_ltp.json	B3B904C6
.\config_files\hdt\hdt\node2_step.json	DF198768
.\config_files\hdt\hdt\node2_tcpcl.json	FEA91E7C
.\config_files\hdt\hdt\node3_cfg.json	661CFF45
.\config_files\hdt\hdt\node4_cfg.json	BDC9D084
.\config_files\hdt\hdt\routing_test.json	D35BF58B
.\config_files\hdt\hdt\SDIL.json	3D0ACA95
.\config_files\hdt\masker_test_01.json	923FD496
.\config_files\hdt\masker_test_02.json	D913D4EF
.\config_files\hdt\sender_hdt\config_ltp.json	D691339F
.\config_files\hdt\sender_hdt\config_ltp_plus_custody.json	A68480D8
.\config_files\inducts\bpsgen_one_step_port4560.json	7B5791E7
.\config_files\inducts\bpsgen_one_tcpcl_port4560.json	2C11629E
.\config_files\inducts\bpsink_one_bpencap_namedpipe.json	FB575B91
.\config_files\inducts\bpsink_one_bpencap_namedpipe2.json	3476B1AE
.\config_files\inducts\bpsink_one_bpencap_unixsocket2.json	EFB562B4
.\config_files\inducts\bpsink_one_ltp_delaysim.json	3DF0C04A
.\config_files\inducts\bpsink_one_ltp_delaysim_disksessions.json	7EBCF586
.\config_files\inducts\bpsink_one_ltp_delaysim_disksessions_longdelay.json	892C5819
.\config_files\inducts\bpsink_one_ltp_port4557.json	2E3F619A
.\config_files\inducts\bpsink_one_ltp_port4558.json	3DF0C04A
.\config_files\inducts\bpsink_one_ltpencap_namedpipe.json	8055CEB2
.\config_files\inducts\bpsink_one_ltpencap_unixsocket.json	870CD6D6
.\config_files\inducts\bpsink_one_ltpipc.json	AAFCEE56
.\config_files\inducts\bpsink_one_step_port4557.json	23A05EF5
.\config_files\inducts\bpsink_one_step_port4558.json	B0A2A2F3
.\config_files\inducts\bpsink_one_step_port4558_2NodesTest.json	D49CFF8C
.\config_files\inducts\bpsink_one_step_port4560_routing.json	CBEA66D5

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Source File	Last 8 of MD5 Hash
.config_files\inducts\bpsink one tcpcl port4557.json	3E51918A
.config_files\inducts\bpsink one tcpcl port4558.json	F763E390
.config_files\inducts\bpsink one tcpcl port4558 tinycb.json	683F2F5D
.config_files\inducts\bpsink one tcpclv4 port4557.json	4EF3C354
.config_files\inducts\bpsink one tcpclv4 port4558.json	B81B1240
.config_files\inducts\bpsink one tcpclv4 port4558 autofragmentsize9997.json	D5812DCA
.config_files\inducts\bpsink one tcpclv4tls port4557.json	7C6909C4
.config_files\inducts\bpsink one tcpclv4tls port4558.json	24BF819A
.config_files\inducts\bpsink one udp port4557.json	D6507386
.config_files\inducts\bpsink one udp port4558.json	1D9EA766
.config_files\inducts\bpsink one udp port4558 tinycb.json	0E1159A6
.config_files\inducts\bpsink two tcpclv4 port4557 port4559.json	210952C6
.config_files\inducts\inducts.json	5B08E8DB
.config_files\outducts\bpngen one ltp port4556 thisengineid200.json	9D1C4F63
.config_files\outducts\bpngen one ltp port4556 thisengineid200 1000mtu.json	ADDEA791
.config_files\outducts\bpngen one ltp port4556 thisengineid200 1000mtu checkpointevery10th.json	574384C5
.config_files\outducts\bpngen one ltp port4556 thisengineid200 50Mbps.json	9D1C4F63
.config_files\outducts\bpngen one ltp port4556 thisengineid201.json	5C0F342D
.config_files\outducts\bpngen one ltpipe directtobpsink.json	C17BD229
.config_files\outducts\bpngen one ltpipe directtobpsink batchsend.json	117689DF
.config_files\outducts\bpngen one ltpipe thisengineid200.json	BEF855CC
.config_files\outducts\bpngen one step port4556.json	178376CA
.config_files\outducts\bpngen one step port4556 2NodesTest.json	C5E63263
.config_files\outducts\bpngen one step port4556 routing.json	12A8F783
.config_files\outducts\bpngen one tcpcl port4556.json	2A1D948C
.config_files\outducts\bpngen one tcpcl port4556 allowrxcustodysignals.json	D0488020
.config_files\outducts\bpngen one tcpcl port4556 autofragmentsize9997.json	213007BE
.config_files\outducts\bpngen one tcpcl port4556 bigpipeline.json	97BBFB23
.config_files\outducts\bpngen one tcpclv4 port4556.json	5C3CC87B
.config_files\outducts\bpngen one tcpclv4 port4556 custody.json	EE2F4DF3
.config_files\outducts\bpngen one tcpclv4tls port4556.json	D574E774
.config_files\outducts\bpngen one uart.json	7F4E3E69
.config_files\outducts\bpngen one udp port4556 0.05Mbps.json	AE6379DE
.config_files\outducts\bpngen one udp port4556 0.5Mbps.json	AE6379DE
.config_files\outducts\bpsink one step port4556.json	3BEBD482
.config_files\outducts\bpsink one step port4557.json	4DBB1FBA
.config_files\outducts\bpsink one tcpcl port4556.json	6C915967
.config_files\outducts\bpsink one tcpcl port4556 allowrxbundles.json	263ED5B9
.config_files\outducts\bpsink one tcpclv4 port4556 allowrxbundles.json	93081B0C
.config_files\outducts\bpsink one tcpclv4tls port4556 allowrxbundles.json	3D14D0BC
.config_files\outducts\udp7132.json	F8A365F3
.config_files\storage\storageConfig.json	EC4DD801
.config_files\storage\storageConfigRelativePaths.json	8067D0AA
.containers\docker\debian-minimal\Dockefile	1D4AC50F
.containers\docker\debian-minimal\README.md	29D1D2F6
.containers\docker\docker compose\docker-compose.yml	F7310027
.containers\docker\oracle linux\Dockefile	CAF74CE5
.containers\docker\ubuntu\Dockefile	CBBE08D8
.containers\kubernetes\hdtm 10 node cluster.yaml	57BE48C2
.cpp standard detection.cmake	8567FC3D

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Source File	Last 8 of MD5 Hash
.\git_hash_detection.cmake	C10042C3
.\hardware_acceleration.cmake	CABC75C7
.\hardware_acceleration_neon.cmake	2FB51B64
.\kill.sh	01790F73
.\KnownIssues.md	730C5001
.\LICENSE.md	490DFCA8
.\module\cli\CMakeLists.txt	5DDE0883
.\module\cli\HDTNCliLibConfig.cmake.in	3B0AA28D
.\module\cli\include\HdtnCliRunner.h	15FF692B
.\module\cli\README.md	1D747D18
.\module\cli\src\HdtnCliMain.cpp	CE6CF604
.\module\cli\src\HdtnCliRunner.cpp	AE2D002D
.\module\cli\test\contact_plan.json	E1D80D73
.\module\cli\test\hdtn_config.json	E4E4A491
.\module\cli\test\TestHdtnCliRunner.cpp	21A7C650
.\module\egress\CMakeLists.txt	CF351F55
.\module\egress\EgressLibConfig.cmake.in	3EB59BE2
.\module\egress\include\EgressAsync.h	3EA94119
.\module\egress\include\EgressAsyncRunner.h	0633C716
.\module\egress\src\egress.cpp	3DF488B2
.\module\egress\src\EgressAsync.cpp	084B823C
.\module\egress\src\EgressAsyncRunner.cpp	6C7A071A
.\module\encap_repeater\CMakeLists.txt	20D2D794
.\module\encap_repeater\src\EncapRepeater.cpp	64CE2FDF
.\module\hdtn_one_process\CMakeLists.txt	2AAC7362
.\module\hdtn_one_process\HdtnOneProcessLibConfig.cmake.in	8DB83917
.\module\hdtn_one_process\include\HdtnOneProcessRunner.h	B15BFF65
.\module\hdtn_one_process\src\HdtnOneProcessMain.cpp	55AB08AF
.\module\hdtn_one_process\src\HdtnOneProcessRunner.cpp	D3DBDFA5
.\module\ingress\CMakeLists.txt	C305FF8D
.\module\ingress\include\ingress.h	D2E4FFF8
.\module\ingress\include\IngressAsyncRunner.h	E9C890E9
.\module\ingress\IngressLibConfig.cmake.in	554EDFAC
.\module\ingress\src\ingress.cpp	948B3BC9
.\module\ingress\src\IngressAsyncRunner.cpp	DEC6A522
.\module\ingress\src\receive.cpp	E75B32E7
.\module\router\CMakeLists.txt	02739CFA
.\module\router\contact_plans\100nodes.json	9301BBD4
.\module\router\contact_plans\10nodes.json	1CEBD55B
.\module\router\contact_plans\200nodes.json	FECFD8DA
.\module\router\contact_plans\50nodes.json	BC748DD6
.\module\router\contact_plans\cgrTutorial.json	04291EBF
.\module\router\contact_plans\contactPlan.json	1DDEF2AC
.\module\router\contact_plans\contactPlan_RoutingTest.json	7DA8589D
.\module\router\contact_plans\contactPlan2.json	1C5BE66B
.\module\router\contact_plans\contactPlan2Nodes.json	216D1130
.\module\router\contact_plans\contactPlan3.json	E5DA76DA
.\module\router\contact_plans\contactPlanCutThroughMode_0.8Mbps.json	23D924BE
.\module\router\contact_plans\contactPlanCutThroughMode_100Gbps.json	9F4DC9B8
.\module\router\contact_plans\contactPlanCutThroughMode_10Gbps.json	C3ED585F
.\module\router\contact_plans\contactPlanCutThroughMode_50Mbps.json	57CF354B

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.\module\router\contact_plans\contactPlanCutThroughMode_unlimitedRate.json	8439BEF9
.\module\router\contact_plans\contactPlanCutThroughModeBreakBetween12And15Seconds.json	FDB372C1
.\module\router\contact_plans\contactPlanCutThroughModeStartAfter15Sec.json	58D298FA
.\module\router\contact_plans\contactPlanIpn2.1.json	68C10007
.\module\router\contact_plans\contactPlanLcrd.json	41FA8F3D
.\module\router\contact_plans\contactPlanStorageMode.json	420515AA
.\module\router\contact_plans\contactPlanStorageMode_0.8Mbps.json	B850D2E2
.\module\router\contact_plans\lon_4nodes_long.json	1A1B071C
.\module\router\contact_plans\masker_test.json	3149BC20
.\module\router\include\router.h	90E4E414
.\module\router\include\RouterRunner.h	2E17E6DA
.\module\router\RouterLibConfig.cmake.in	5CA59F79
.\module\router\src\main.cpp	02116E22
.\module\router\src\router.cpp	02F70AAA
.\module\router\src\RouterRunner.cpp	A0899F33
.\module\router\unit_tests\RouterTests.cpp	105552BB
.\module\storage\CMakeLists.txt	52053E9B
.\module\storage\deprecated\BundleStorageManager.cpp	BFAED5DC
.\module\storage\deprecated\BundleStorageManager.h	BDA79050
.\module\storage\deprecated\MemoryManagerTree.cpp	B0B98FF3
.\module\storage\deprecated\MemoryManagerTree.h	F803D15E
.\module\storage\doc\storage.pptx	9CDFAD83
.\module\storage\include\BundleStorageCatalog.h	82FB1CB3
.\module\storage\include\BundleStorageConfig.h	B361ABF9
.\module\storage\include\BundleStorageManagerAsio.h	B02DF329
.\module\storage\include\BundleStorageManagerBase.h	A4F87A63
.\module\storage\include\BundleStorageManagerMT.h	DDB9B304
.\module\storage\include\CatalogEntry.h	2C3CD5D9
.\module\storage\include\CustodyTimers.h	B78189FB
.\module\storage\include\HashMap16BitFixedSize.h	3E47EDB8
.\module\storage\include\main.h	07042A49
.\module\storage\include\MemoryManagerTreeArray.h	78B19381
.\module\storage\include\StartStorageRunner.h	2D4AA08B
.\module\storage\include\StorageRunner.h	43A85EEA
.\module\storage\include\ZmqStorageInterface.h	2F0DC16F
.\module\storage\Makefile	F4561178
.\module\storage\README.md	9EE7E8D7
.\module\storage\src\BundleStorageCatalog.cpp	679B7EEC
.\module\storage\src\BundleStorageManagerAsio.cpp	C28AA597
.\module\storage\src\BundleStorageManagerBase.cpp	1559681D
.\module\storage\src\BundleStorageManagerMT.cpp	18DFE536
.\module\storage\src\CatalogEntry.cpp	F4A7CD43
.\module\storage\src\CustodyTimers.cpp	F8BB6EA7
.\module\storage\src\HashMap16BitFixedSize.cpp	428F95AF
.\module\storage\src\main.cpp	CC7207C5
.\module\storage\src\MemoryManagerTreeArray.cpp	3E96133C
.\module\storage\src\StartStorageRunner.cpp	FF2D83A6
.\module\storage\src\StorageRunner.cpp	AA347DC1
.\module\storage\src\test\StorageSpeedTestMain.cpp	35C2F956
.\module\storage\src\ZmqStorageInterface.cpp	FBD359F8

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.\module\storage\StorageLibConfig.cmake.in	D2DE1EFE
.\module\storage\unit tests\BundleStorageManagerMtTests.cpp	B3410216
.\module\storage\unit tests\deprecated\BundleStorageManagerMtAsFifoTests.cpp	ECB7E994
.\module\storage\unit tests\deprecated\MemoryManagerTreeTests.cpp	3BA3D70E
.\module\storage\unit tests\MemoryManagerTreeArrayTests.cpp	3A6441D3
.\module\storage\unit tests\TestBundleStorageCatalog.cpp	B58516D9
.\module\storage\unit tests\TestBundleUuidToUint64HashMap.cpp	71A9C9E2
.\module\storage\unit tests\TestCustodyTimers.cpp	AF04403E
.\module\storage\unit tests\TestStorageRunner.cpp	95FE5503
.\module\telem cmd interface\CMakeLists.txt	E058679A
.\module\telem cmd interface\HdtnTelemLibConfig.cmake.in	C353B275
.\module\telem cmd interface\include\BeastWebsocketServer.h	D0875ECD
.\module\telem cmd interface\include\CivetwebWebsocketServer.h	AACD43B4
.\module\telem cmd interface\include\Telemetry.h	D001C1CC
.\module\telem cmd interface\include\TelemetryConnection.h	170B1790
.\module\telem cmd interface\include\TelemetryConnectionPoller.h	CE2D511C
.\module\telem cmd interface\include\TelemetryLogger.h	AF215BB6
.\module\telem cmd interface\include\TelemetryRunner.h	7348E12C
.\module\telem cmd interface\include\TelemetryRunnerProgramOptions.h	50D8AEB5
.\module\telem cmd interface\include\WebsocketServer.h	C383CA6B
.\module\telem cmd interface\src\BeastWebsocketServer.cpp	886C755A
.\module\telem cmd interface\src\CivetwebWebsocketServer.cpp	F1BF791A
.\module\telem cmd interface\src\gui\bpsec_page.html	BCB39EED
.\module\telem cmd interface\src\gui\config_page.html	6495FCF3
.\module\telem cmd interface\src\gui\css\style.css	3F84F9DF
.\module\telem cmd interface\src\gui\hdtn d3 gui\d3.v5.min.js	618A4CB4
.\module\telem cmd interface\src\gui\hdtn d3 gui\d3 context menu.js	4CB778F4
.\module\telem cmd interface\src\gui\hdtn d3 gui\Disk.js	CDC778CF
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.\module\telem cmd interface\src\gui\hdtn d3 gui\hdtn.js	E19F3624
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.\module\telem cmd interface\src\gui\hdtn d3 gui\index.html	ED490BBF
.\module\telem cmd interface\src\gui\hdtn d3 gui\modal-websocket-disconnect.css	58EEF9B7
.\module\telem cmd interface\src\gui\hdtn d3 gui\ParseHdtnConfig.js	90ABCDF2
.\module\telem cmd interface\src\gui\hdtn d3 gui\RectComponents.js	D7938F55
.\module\telem cmd interface\src\gui\hdtn d3 gui\StraightWire.js	B3031454
.\module\telem cmd interface\src\gui\hdtn d3 gui\styles.css	54ABE60E
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.\module\telem cmd interface\src\gui\hdtn d3 gui\ToolTip.js	76FD0345
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.\module\telem cmd interface\src\gui\index.html	96C60225
.\module\telem cmd interface\src\gui\resources\arrow-down-circle.svg	097EC53C
.\module\telem cmd interface\src\gui\resources\arrow-up-circle.svg	E7F8C37E
.\module\telem cmd interface\src\gui\resources\config.svg	9EA3880F
.\module\telem cmd interface\src\gui\resources\home.svg	0CD536C6
.\module\telem cmd interface\src\gui\resources\incoming.svg	BC3F025D
.\module\telem cmd interface\src\gui\resources\moon.svg	C3F8E2C5
.\module\telem cmd interface\src\gui\resources\statistics.svg	5A8034A4

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Source File	Last 8 of MD5 Hash
.\module\telem cmd interface\src\gui\resources\storage.svg	D5745F85
.\module\telem cmd interface\src\gui\resources\sun.svg	F1CAD5FF
.\module\telem cmd interface\src\gui\Scripts\plotly-2.6.3.min.js	E578ECF1
.\module\telem cmd interface\src\gui\Scripts\rate_calculator.js	B38DF3A4
.\module\telem cmd interface\src\gui\Scripts\web_gui.js	389FCD84
.\module\telem cmd interface\src\gui_v2\eslintrc.json	54C61A88
.\module\telem cmd interface\src\gui_v2\.gitignore	ACD512AA
.\module\telem cmd interface\src\gui_v2\CMakeLists.txt	962B4D7B
.\module\telem cmd interface\src\gui_v2\jsconfig.json	8233423E
.\module\telem cmd interface\src\gui_v2\next.config.mjs	8D316A11
.\module\telem cmd interface\src\gui_v2\package.json	DE197DC8
.\module\telem cmd interface\src\gui_v2\package-lock.json	D7BAD052
.\module\telem cmd interface\src\gui_v2\postcss.config.js	AAA7D81C
.\module\telem cmd interface\src\gui_v2\src\app\app.js	AC6474D0
.\module\telem cmd interface\src\gui_v2\src\app\config\config_fields\array_field.js	F6EA8C42
.\module\telem cmd interface\src\gui_v2\src\app\config\config_fields\components\select.js	844CDDF2
.\module\telem cmd interface\src\gui_v2\src\app\config\config_fields\components\switch.js	A9F74082
.\module\telem cmd interface\src\gui_v2\src\app\config\config_fields\components\text_field.js	8DBA8D08
.\module\telem cmd interface\src\gui_v2\src\app\config\config_fields\field.js	DDCD1D4C
.\module\telem cmd interface\src\gui_v2\src\app\config\config_fields\utils.js	7E013B5C
.\module\telem cmd interface\src\gui_v2\src\app\config\page.js	CFBA05CA
.\module\telem cmd interface\src\gui_v2\src\app\config\review_modal.js	2481E423
.\module\telem cmd interface\src\gui_v2\src\app\config\setup\bpsec.js	595E7BBB
.\module\telem cmd interface\src\gui_v2\src\app\config\setup\contact_plan.js	EB1467C3
.\module\telem cmd interface\src\gui_v2\src\app\config\setup\distributed.js	B05305A5
.\module\telem cmd interface\src\gui_v2\src\app\config\setup\hdtm.js	CBADA95A
.\module\telem cmd interface\src\gui_v2\src\app\config\tab_content.js	C2820A10
.\module\telem cmd interface\src\gui_v2\src\app\config\tab_panel.js	DC16975A
.\module\telem cmd interface\src\gui_v2\src\app\config\tabs.js	02F05AF7
.\module\telem cmd interface\src\gui_v2\src\app\favicon.ico	641E50DC
.\module\telem cmd interface\src\gui_v2\src\app\globals.css	7DD97FEA
.\module\telem cmd interface\src\gui_v2\src\app\header.js	397B5692
.\module\telem cmd interface\src\gui_v2\src\app\layout.js	43F87EF7
.\module\telem cmd interface\src\gui_v2\src\app\page.js	15B35880
.\module\telem cmd interface\src\main.cpp	301177BF
.\module\telem cmd interface\src\Telemetry.cpp	B701EF9E
.\module\telem cmd interface\src\TelemetryConnection.cpp	FE21CF8C
.\module\telem cmd interface\src\TelemetryConnectionPoller.cpp	C494043B
.\module\telem cmd interface\src\TelemetryLogger.cpp	F0FDFDB1
.\module\telem cmd interface\src\TelemetryRunner.cpp	1BB9BA4F
.\module\telem cmd interface\src\TelemetryRunnerProgramOptions.cpp	E232D6FE
.\module\telem cmd interface\src\WebsocketServer.cpp	5C371B4E
.\module\telem cmd interface\unit tests\TelemetryConnectionPollerTests.cpp	0200C50E
.\module\telem cmd interface\unit tests\TelemetryConnectionTests.cpp	0643166B
.\module\telem cmd interface\unit tests\TelemetryLoggerTests.cpp	7B04380C
.\module\telem cmd interface\unit tests\TelemetryRunnerProgramOptionsTests.cpp	64C295EF
.\module\telem cmd interface\unit tests\TelemetryRunnerTests.cpp	6CDEB152
.\module\udp delay sim\CMakeLists.txt	675D65E9
.\module\udp delay sim\include\UdpDelaySim.h	4F8DCBF6
.\module\udp delay sim\include\UdpDelaySimRunner.h	8C7A2F10

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Source File	Last 8 of MD5 Hash
.\module\udp_delay_sim\src\UdpDelaySim.cpp	9E8F2BC8
.\module\udp_delay_sim\src\UdpDelaySimMain.cpp	3375E737
.\module\udp_delay_sim\src\UdpDelaySimRunner.cpp	00761810
.\module\udp_delay_sim\UdpDelaySimLibConfig.cmake.in	A4B00916
.\package.json	F15A5369
.\package-lock.json	534E7C75
.\README.md	1F98B58F
.\runscript.sh	7CA07B47
.\tests\compatibility_tests\ion_stepcl\2.bench.step\bench.bprc	CDBE1B42
.\tests\compatibility_tests\ion_stepcl\2.bench.step\bench.ionconfig	C97BADD9
.\tests\compatibility_tests\ion_stepcl\2.bench.step\bench.ionrc	2D6CAEB7
.\tests\compatibility_tests\ion_stepcl\2.bench.step\bench.ionsecre	D61C81D1
.\tests\compatibility_tests\ion_stepcl\2.bench.step\bench.ipnrc	1D3E2EC1
.\tests\compatibility_tests\ion_stepcl\2.bench.step\ionstart	5A9A083F
.\tests\compatibility_tests\ion_stepcl\2.bench.step\ionstop	313A8941
.\tests\compatibility_tests\ion_stepcl\cleanup	A719C13F
.\tests\compatibility_tests\ion_stepcl\step-hdtn	74DC9CA8
.\tests\compatibility_tests\ion_tcpcl\2.bench.tcp\bench.bprc	4E82E657
.\tests\compatibility_tests\ion_tcpcl\2.bench.tcp\bench.ionconfig	58058F03
.\tests\compatibility_tests\ion_tcpcl\2.bench.tcp\bench.ionrc	2D6CAEB7
.\tests\compatibility_tests\ion_tcpcl\2.bench.tcp\bench.ionsecre	D61C81D1
.\tests\compatibility_tests\ion_tcpcl\2.bench.tcp\bench.ipnrc	0205E934
.\tests\compatibility_tests\ion_tcpcl\2.bench.tcp\ionstart	5A9A083F
.\tests\compatibility_tests\ion_tcpcl\2.bench.tcp\ionstop	313A8941
.\tests\compatibility_tests\ion_tcpcl\cleanup	D7D40EA1
.\tests\compatibility_tests\ion_tcpcl\tcp-hdtn	23C98E79
.\tests\compatibility_tests\Testing with ION.docx	B749EFF3
.\tests\flight_test_9_30_2021\scripts\nuc\kill.sh	4C44FBCF
.\tests\flight_test_9_30_2021\scripts\nuc\nuc_bpger bidirectional tcp.json	EF002A9B
.\tests\flight_test_9_30_2021\scripts\nuc\nuc_bpger custody induct.json	735CDA87
.\tests\flight_test_9_30_2021\scripts\nuc\nuc_bpger step.json	7EFEA7C3
.\tests\flight_test_9_30_2021\scripts\nuc\nuc_hdtn config ltp.json	657824D0
.\tests\flight_test_9_30_2021\scripts\nuc\nuc_hdtn config ltp frag.json	3C4B17A5
.\tests\flight_test_9_30_2021\scripts\nuc\nuc_hdtn config ltp plus custody.json	56FE8463
.\tests\flight_test_9_30_2021\scripts\nuc\nuc_hdtn config step.json	33F728F6
.\tests\flight_test_9_30_2021\scripts\nuc\nuc_hdtn config tcpcl.json	B7B31F33
.\tests\flight_test_9_30_2021\scripts\nuc\nuc_hdtn config tcpcl custody.json	D400D869
.\tests\flight_test_9_30_2021\scripts\nuc\rcv_files	DCC5AE05
.\tests\flight_test_9_30_2021\scripts\nuc\rcv_files_custody	046395ED
.\tests\flight_test_9_30_2021\scripts\nuc\release_all	79D80EEA
.\tests\flight_test_9_30_2021\scripts\nuc\run_hdtn oneprocess ltp	523F23ED
.\tests\flight_test_9_30_2021\scripts\nuc\run_hdtn oneprocess ltp_custody	FF437A02
.\tests\flight_test_9_30_2021\scripts\nuc\run_hdtn oneprocess ltp_frag	346DDDF0
.\tests\flight_test_9_30_2021\scripts\nuc\run_hdtn oneprocess step	23B4FC31
.\tests\flight_test_9_30_2021\scripts\nuc\run_hdtn oneprocess tcpcl	986400B6
.\tests\flight_test_9_30_2021\scripts\nuc\run_hdtn oneprocess tcpcl_custody	B18DA747
.\tests\flight_test_9_30_2021\scripts\nuc\run_scheduler	74357387
.\tests\flight_test_9_30_2021\scripts\nuc\send_files	85DBB85F
.\tests\flight_test_9_30_2021\scripts\nuc\send_files_bidirectional_tcp	CBD46597
.\tests\flight_test_9_30_2021\scripts\nuc\send_files_custody	15B7147D
.\tests\flight_test_9_30_2021\scripts\nuc\sha.sh	EB2863AB

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.\tests\flight test 9 30 2021\scripts nuc\start ltp frag send.sh	887DF935
.\tests\flight test 9 30 2021\scripts nuc\start ltp receive.sh	418C4378
.\tests\flight test 9 30 2021\scripts nuc\start ltp send.sh	0C096230
.\tests\flight test 9 30 2021\scripts nuc\start step receive.sh	C3675C66
.\tests\flight test 9 30 2021\scripts nuc\start step send.sh	1E5388A8
.\tests\flight test 9 30 2021\scripts nuc\start tcp receive.sh	9ED567B1
.\tests\flight test 9 30 2021\scripts nuc\start tcp send.sh	6DE32498
.\tests\flight test 9 30 2021\scripts nuc\start tcp send custody.sh	E444FB52
.\tests\flight test 9 30 2021\scripts tantalus\kill.sh	4C44FBCF
.\tests\flight test 9 30 2021\scripts tantalus\rcv files	DCC5AE05
.\tests\flight test 9 30 2021\scripts tantalus\rcv files bidirectional tcp	452101C0
.\tests\flight test 9 30 2021\scripts tantalus\rcv files custody	046395ED
.\tests\flight test 9 30 2021\scripts tantalus\release all	B4CE811A
.\tests\flight test 9 30 2021\scripts tantalus\run hdtm oneprocess ltp	73FFF1DB
.\tests\flight test 9 30 2021\scripts tantalus\run hdtm oneprocess ltp custody	782F6AB9
.\tests\flight test 9 30 2021\scripts tantalus\run hdtm oneprocess step	1C0BCB15
.\tests\flight test 9 30 2021\scripts tantalus\run hdtm oneprocess tcpcl	4A89C734
.\tests\flight test 9 30 2021\scripts tantalus\run hdtm oneprocess tcpcl custody	5FD05FE8
.\tests\flight test 9 30 2021\scripts tantalus\run scheduler	741043CF
.\tests\flight test 9 30 2021\scripts tantalus\send files	85DBB85F
.\tests\flight test 9 30 2021\scripts tantalus\send files custody	15B7147D
.\tests\flight test 9 30 2021\scripts tantalus\sha.sh	3D9578AD
.\tests\flight test 9 30 2021\scripts tantalus\start ltp frag receive.sh	B98D8189
.\tests\flight test 9 30 2021\scripts tantalus\start ltp receive.sh	8E1A4BEE
.\tests\flight test 9 30 2021\scripts tantalus\start ltp send.sh	606BC801
.\tests\flight test 9 30 2021\scripts tantalus\start step receive.sh	521904F2
.\tests\flight test 9 30 2021\scripts tantalus\start step send.sh	5AEEE6A2
.\tests\flight test 9 30 2021\scripts tantalus\start tcp custody receive.sh	18388EFA
.\tests\flight test 9 30 2021\scripts tantalus\start tcp receive.sh	6CD6CEFD
.\tests\flight test 9 30 2021\scripts tantalus\start tcp send.sh	568D345E
.\tests\flight test 9 30 2021\scripts tantalus\tantulus bpsink bidirectional tcp.json	5AFFE2FB
.\tests\flight test 9 30 2021\scripts tantalus\tantulus hdtm config ltp.json	DD68B1E0
.\tests\flight test 9 30 2021\scripts tantalus\tantulus hdtm config ltp plus custody.json	911EBD47
.\tests\flight test 9 30 2021\scripts tantalus\tantulus hdtm config step.json	71025D8F
.\tests\flight test 9 30 2021\scripts tantalus\tantulus hdtm config tcpcl.json	77667ED7
.\tests\flight test 9 30 2021\scripts tantalus\tantulus hdtm config tcpcl custody.json	AF691BC6
.\tests\flight test 9 30 2021\scripts tantalus\wait.sh	481424FE
.\tests\integrated tests\CMakeLists.txt	B3D12E02
.\tests\integrated tests\src\bp sink pattern.cpp	6B214818
.\tests\integrated tests\src\cgr tests.cpp	247813E8
.\tests\integrated tests\src\integrated tests.cpp	694D4CA6
.\tests\integrated tests\src\integrated tests deprecated.cpp	ED09564C
.\tests\integrated tests\src\it test main.cpp	284855A2
.\tests\integrated tests\src\test.txt	CB72A86E
.\tests\ltp 4 second rtt delay\mu bpsink	385554D5
.\tests\ltp 4 second rtt delay\mu bpsink step.json	19EB73CE
.\tests\ltp 4 second rtt delay\mu hdtm config ltp.json	E661F229
.\tests\ltp 4 second rtt delay\mu run hdtm oneprocess ltp	CC95D062
.\tests\ltp 4 second rtt delay\rho bpgen	4A53CF20
.\tests\ltp 4 second rtt delay\rho bpgen step.json	C02998CB
.\tests\ltp 4 second rtt delay\rho hdtm config ltp.json	66DD47DF

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.\tests\ltp 4 second rtt delay\rho run hdtm oneprocess ltp	693D58D4
.\tests\ltp 4 second rtt delay\xi data segment proxy	91FCBE93
.\tests\ltp 4 second rtt delay\xi report segment proxy	B13BBAC9
.\tests\test scripts linux\BPsec Tests\kill.sh	B19B1D3D
.\tests\test scripts linux\BPsec Tests\runtime bpgen bpv7 LTP bcb.sh	63721B12
.\tests\test scripts linux\BPsec Tests\runtime bpgen bpv7 LTP bcb bib.sh	8A1B5245
.\tests\test scripts linux\BPsec Tests\runtime bpgen bpv7 LTP bib.sh	781DCBD8
.\tests\test scripts linux\BPsec Tests\runtime bpgen bpv7 STCP wBPsec bcb.sh	A2D833CC
.\tests\test scripts linux\BPsec Tests\runtime bpgen bpv7 STCP wBPsec bib.sh	082CBBBE
.\tests\test scripts linux\BPsec Tests\runtime bpgen bpv7 STCP wBPsec bib bcb.sh	75CE864F
.\tests\test scripts linux\BPsec Tests\runtime bpgen bpv7 withBPsec.sh	9EA309BB
.\tests\test scripts linux\BPsec Tests\runtime bpgen bpv7 withBPsecLTP.sh	7A6700C1
.\tests\test scripts linux\BPsec Tests\runtime bpgen bpv7 withBPsecTCP.sh	167ECC51
.\tests\test scripts linux\BPsec Tests\runtime bpgen bpv7 withBPsecUDP.sh	4FB011B7
.\tests\test scripts linux\CustodyTransfer Regression Test\gitignore	B446DA46
.\tests\test scripts linux\CustodyTransfer Regression Test\ init .py	ECF8427E
.\tests\test scripts linux\CustodyTransfer Regression Test\adminrecord.py	0F40E95D
.\tests\test scripts linux\CustodyTransfer Regression Test\backgroundprocess.py	7E73B24A
.\tests\test scripts linux\CustodyTransfer Regression Test\configs\bpsink-in.json	2C33A708
.\tests\test scripts linux\CustodyTransfer Regression Test\configs\bpsink-out.json	91A03B0D
.\tests\test scripts linux\CustodyTransfer Regression Test\configs\contact plan.json	351EDA3F
.\tests\test scripts linux\CustodyTransfer Regression Test\configs\hdtm.json	0635151E
.\tests\test scripts linux\CustodyTransfer Regression Test\README.md	DFC4567E
.\tests\test scripts linux\CustodyTransfer Regression Test\test.py	BB101013
.\tests\test scripts linux\FPrime Test\packetscript.sh	0D8354FE
.\tests\test scripts linux\FPrime Test\udpreceiver.py	BDE6FECC
.\tests\test scripts linux\FPrime Test\udpsender.py	6B6C1BC3
.\tests\test scripts linux\fragmentation\gitignore	B6567D52
.\tests\test scripts linux\fragmentation\breceivefile-in.json	3900FC8B
.\tests\test scripts linux\fragmentation\breceivefile-out.json	BDB4E55D
.\tests\test scripts linux\fragmentation\bpsendfile-in.json	410B868D
.\tests\test scripts linux\fragmentation\bpsendfile-out.json	57115D32
.\tests\test scripts linux\fragmentation\contact plan.json	318C6966
.\tests\test scripts linux\fragmentation\hdtmA.json	CC206A72
.\tests\test scripts linux\fragmentation\hdtmB.json	34409446
.\tests\test scripts linux\fragmentation\runtime.sh	5BABEF6B
.\tests\test scripts linux\kill.sh	9D2D59CF
.\tests\test scripts linux\LCDR File Transfer Test\README.md	3B425A71
.\tests\test scripts linux\LCDR File Transfer Test\receiver\ipn1.1 integrity.key	59F5B46D
.\tests\test scripts linux\LCDR File Transfer Test\receiver\ipn2.1 con.json	F10C6400
.\tests\test scripts linux\LCDR File Transfer Test\receiver\ipn2.1 con int.json	4E3F4F22
.\tests\test scripts linux\LCDR File Transfer Test\receiver\ipn2.1 con plus int.json	5EF054D9
.\tests\test scripts linux\LCDR File Transfer Test\receiver\ipn2.1 confidentiality.key	DF4C336B
.\tests\test scripts linux\LCDR File Transfer Test\receiver\ipn2.1 int.json	DF45EAA7
.\tests\test scripts linux\LCDR File Transfer Test\receiver\ipn2.1 integrity.key	59F5B46D
.\tests\test scripts linux\LCDR File Transfer Test\receiver\kill.sh	F1FB09DC
.\tests\test scripts linux\LCDR File Transfer Test\receiver\rcv files	4EE8FDA1
.\tests\test scripts linux\LCDR File Transfer Test\receiver\rcv files bpsec confidentiality	07CB696A
.\tests\test scripts linux\LCDR File Transfer Test\receiver\rcv_files_bpsec_confidentialityIntegrity	B1D7B2B1
.\tests\test scripts linux\LCDR File Transfer Test\receiver\rcv files bpsec integrity	C4FCCA54

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.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\rcv_files_custody	BE75AE62
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\rcv_files_tcpcl	63AFE06E
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\received\test.txt	3C3DB0F5
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\receiver_bpsink_custody_outduct.json	9D035D23
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\receiver_bpsink_step.json	19EB73CE
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\receiver_bpsink_tcpcl.json	F9872235
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\receiver_hdtm_config_ltp.json	549C1BBF
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\receiver_hdtm_config_ltp_custody.json	E8955C48
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\receiver_hdtm_config_tcpcl.json	1D832F23
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\run_hdtm_oneprocess_ltp	33D67896
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\run_hdtm_oneprocess_ltp_custody	128F5C1A
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\run_hdtm_oneprocess_tcpcl	19A6CB57
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\sha.sh	246372C1
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\start_ltp_receive.sh	98BF8648
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\start_ltp_receive_bpv6.sh	98BF8648
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\start_ltp_receive_bpv7.sh	2D0075F9
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\start_tcpcl_receive.sh	2F85604E
.\tests\test_scripts_linux\LCRD File Transfer Test\receiver\wait.sh	72BB0467
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\flightdata\test.txt	3C3DB0F5
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\ipn1.1_con_int.json	A774A830
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\ipn1.1_con.json	D8E9535E
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\ipn1.1_confidentiality.key	122C46A6
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.\tests\test_scripts_linux\LCRD File Transfer Test\sender\ipn1.1_integrity.key	59F5B46D
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\kill.sh	F1FB09DC
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\run_hdtm_oneprocess_ltp	813D0FF5
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\run_hdtm_oneprocess_ltp_custody	415F20AE
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\run_hdtm_oneprocess_tcpcl	809121A6
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\send_files_bpv6	7FDD0014
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.\tests\test_scripts_linux\LCRD File Transfer Test\sender\send_files_tcpcl	C272E03C
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\sender_bpger_custody_induct.json	735CDA87
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\sender_bpger_step.json	B583932E
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\sender_bpger_tcpcl.json	7EA1486B
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\sender_hdtm_config_ltp.json	08E20E1C
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\sender_hdtm_config_ltp_plus_custody.json	E3A0ABBA
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\sender_hdtm_config_tcpcl.json	1D45AB87
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\sha.sh	6C3F1444

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.\tests\test_scripts_linux\LCRD File Transfer Test\sender\start_ltp_send_bp6.sh	839A2FF0
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\start_ltp_send_bp7.sh	7FF27147
.\tests\test_scripts_linux\LCRD File Transfer Test\sender\start_tcpcl_send.sh	C93AC680
.\tests\test_scripts_linux\LCRD File Transfer Test\set_ltp_rate.py	35985FBF
.\tests\test_scripts_linux\LTP 2Nodes Test\kill.sh	B19B1D3D
.\tests\test_scripts_linux\LTP 2Nodes Test\README.md	51A137BD
.\tests\test_scripts_linux\LTP 2Nodes Test\runscript_receiver_ltp.sh	95282474
.\tests\test_scripts_linux\LTP 2Nodes Test\runscript_receiver_ltp_wBPSec.sh	40A6DEEA
.\tests\test_scripts_linux\LTP 2Nodes Test\runscript_sender_ltp.sh	732DA4C1
.\tests\test_scripts_linux\LTP 2Nodes Test\runscript_sender_ltp_wBPSec.sh	B5467DD8
.\tests\test_scripts_linux\Race Regression\bp6gen.json	6B556CC8
.\tests\test_scripts_linux\Race Regression\bpsink.json	71E47CF0
.\tests\test_scripts_linux\Race Regression\contact-plan.json	01D9926E
.\tests\test_scripts_linux\Race Regression\hdtm.json	5B48F15B
.\tests\test_scripts_linux\Race Regression\README.md	9BA261F0
.\tests\test_scripts_linux\Race Regression\reloader.py	FAD5EED7
.\tests\test_scripts_linux\Race Regression\runscript.sh	C5B8FC2B
.\tests\test_scripts_linux\Routing Test\node1\runscript_node1.sh	5C06A943
.\tests\test_scripts_linux\Routing Test\node2\runscript_node2.sh	1468EAD3
.\tests\test_scripts_linux\Routing Test\node3\runscript_node3.sh	0FB88C59
.\tests\test_scripts_linux\Routing Test\node4\runscript_node4.sh	C7EB757E
.\tests\test_scripts_linux\run_api_commands.py	5646D74A
.\tests\test_scripts_linux\run_bpsink_test.sh	F6DF77B9
.\tests\test_scripts_linux\runscript_bp6gen_bp6.sh	B9081E17
.\tests\test_scripts_linux\runscript_bp6gen_bp6_10GB.sh	09826DB3
.\tests\test_scripts_linux\runscript_bp6gen_bp6_LTP.sh	BECDB40F
.\tests\test_scripts_linux\runscript_bp6gen_bp6_STCP.sh	80344392
.\tests\test_scripts_linux\runscript_bp6gen_bp6_TCP.sh	77C7B886
.\tests\test_scripts_linux\runscript_bp6gen_bp6_UDP.sh	E14A32BA
.\tests\test_scripts_linux\runscript_bp6gen_bp6_withoutBPSecSTCP.sh	FCEC5E83
.\tests\test_scripts_linux\runscript_bping_bp6 bping_tcpcl.sh	9E1DCBD8
.\tests\test_scripts_linux\runscript_bundles_to_scheduler.sh	4FA1697E
.\tests\test_scripts_linux\runscript_distributed.sh	C12C1F4A
.\tests\test_scripts_linux\runscript_flight_test.sh	AD6A05DE
.\tests\test_scripts_linux\runscript_gui.sh	84FA4F11
.\tests\test_scripts_linux\runscript_routing_test.sh	5A23848B
.\tests\test_scripts_linux\runscript_schedulerCutThroughMode_ltp.sh	2DAEF611
.\tests\test_scripts_linux\runscript_schedulerCutThroughMode_tcpcl.sh	EAB94178
.\tests\test_scripts_linux\runscript_schedulerStorageMode_ltp.sh	29F3F417
.\tests\test_scripts_linux\SendReloadContactPlanMsg.py	A950AC6F
.\tests\test_scripts_linux\STCP 2Nodes Test\README.md	F9C3C73D
.\tests\test_scripts_linux\STCP 2Nodes Test\runscript_receiver_step.sh	F3412A3B
.\tests\test_scripts_linux\STCP 2Nodes Test\runscript_sender_step.sh	13A8F4D7
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_1_Node_Test\kill.sh	6BB752C6
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_1_Node_Test\runscript_h264_streaming_LTP_one_node.sh	805F423B
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_1_Node_Test\runscript_h264_streaming_STCP_one_node.sh	D621CBB1
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_1_Node_Test\runscript_h264_streaming_TCPCL_one_node.sh	373979B3

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Source File	Last 8 of MD5 Hash
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_1_Node_Test\runcscript h265 streaming LTP one node.sh	BB742AFF
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_1_Node_Test\runcscript h265 streaming STCP one node.sh	7FA76C75
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_1_Node_Test\runcscript h265 streaming TCPCL one node.sh	4123982E
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_2_Nodes_Test\kill.sh	6BB752C6
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_2_Nodes_Test\runcscript receiver h264 ltp streaming.sh	F21355C4
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_2_Nodes_Test\runcscript receiver h265 ltp streaming.sh	81FA3562
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_2_Nodes_Test\runcscript sender h264 ltp streaming.sh	F8387613
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_2_Nodes_Test\runcscript sender h265 ltp streaming.sh	E8AE3AA7
.\tests\test_scripts_linux\Streaming\file_streaming\README.md	2979D7F2
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_1_Node_Test\kill.sh	6BB752C6
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_1_Node_Test\runcscript file streaming h264va LTP one node.sh	64EF0E1E
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_1_Node_Test\runcscript file streaming h264va STCP one node.sh	7F3173B7
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_1_Node_Test\runcscript file streaming h264va TCPCL one node.sh	A3F5103D
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_1_Node_Test\runcscript file streaming h265va LTP one node.sh	85FBEF21
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_1_Node_Test\runcscript file streaming h265va STCP one node.sh	2C035842
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_1_Node_Test\runcscript file streaming h265va TCPCL one node.sh	7C79D884
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_2_Nodes_Test\kill.sh	6BB752C6
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_2_Nodes_Test\runcscript receiver va h264 ltp streaming.sh	CB5B3BD6
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_2_Nodes_Test\runcscript sender va h264 ltp streaming.sh	05A18350
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_2_Nodes_Test\runcscript sender va h264 ltp streaming.sh	9F3B74FA
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_2_Nodes_Test\runcscript sender va h265 ltp streaming.sh	4C9CB2A2
.\tests\test_scripts_linux\TCPCL 2Nodes Test\README.md	2A1B8ADD
.\tests\test_scripts_linux\TCPCL 2Nodes Test\runcscript receiver tcpcl.sh	298E0D79
.\tests\test_scripts_linux\TCPCL 2Nodes Test\runcscript sender tcpcl.sh	79E11A0C
.\tests\test_scripts_linux\test ltpipc fast cutthrough nohdtm	4410511D
.\tests\test_scripts_linux\test ltpipc fast cutthrough nohdtm batchsend	250912F0
.\tests\test_scripts_linux\test masker 01.sh	0ED67342
.\tests\test_scripts_linux\test masker 02.sh	4BD86DE2
.\tests\test_scripts_linux\test step to bpencap repeater fast cutthrough.sh	296FDB06
.\tests\test_scripts_linux\test step to ltp fast cutthrough batchsend smallmtu.sh	32FA9AEC
.\tests\test_scripts_linux\test step to ltpdelayproxy oneprocess los ratelimited.sh	23E0A77C

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Source File	Last 8 of MD5 Hash
.\tests\test_scripts_linux\test_step_to_ltpdelayproxy_oneprocess_lossy_ratelimited_largepipeline.sh	5B3CD718
.\tests\test_scripts_linux\test_step_to_ltpencap_fast_cutthrough.sh	A7C127ED
.\tests\test_scripts_linux\test_tcpcl_file_transfer_cutthrough_oneprocess.sh	4E08E349
.\tests\test_scripts_linux\test-priority\.gitignore	3D46F5C1
.\tests\test_scripts_linux\test-priority\configs\contact_plan.json	78759B0E
.\tests\test_scripts_linux\test-priority\configs\expedited.json	BEED6691
.\tests\test_scripts_linux\test-priority\configs\hdtm.json	35164598
.\tests\test_scripts_linux\test-priority\configs\normal.json	7E606E7A
.\tests\test_scripts_linux\test-priority\configs\receive.json	D7F00A9D
.\tests\test_scripts_linux\test-priority\plot.py	65B67A1B
.\tests\test_scripts_linux\test-priority\README.md	9062044F
.\tests\test_scripts_linux\test-priority\test.py	367C1EE8
.\tests\test_scripts_linux\web_interface_separate_processes.sh	9D41377F
.\tests\test_scripts_windows\integrated_tests.bat	44DAFE99
.\tests\test_scripts_windows\test_bidirectional_tcpcl_storage_oneprocess_custodyxferr_acs.bat	203EED7E
.\tests\test_scripts_windows\test_bidirectional_tcpcl_storage_oneprocess_custodyxferr_rfc5050.bat	EFC74250
.\tests\test_scripts_windows\test_bidirectional_uart_storage_oneprocess_custodyxferr_rfc5050.bat	08795F31
.\tests\test_scripts_windows\test_bpger_step_infinite_reconnect.bat	19D1DCCF
.\tests\test_scripts_windows\test_bpger_tcpcl_infinite_reconnect.bat	5C578F81
.\tests\test_scripts_windows\test_bping_bidirectional_tcpcl_to_bpsink_oneprocess.bat	5456C0B8
.\tests\test_scripts_windows\test_bping_bidirectional_tcpcl_to_hdtm_oneprocess.bat	3380A2DE
.\tests\test_scripts_windows\test_bping_step_to_bpsink_oneprocess.bat	3E79761D
.\tests\test_scripts_windows\test_bping_step_to_hdtm_oneprocess.bat	E15C997F
.\tests\test_scripts_windows\test_bp7_bping_bidirectional_tcpcl_to_bpsink_oneprocess.bat	50564613
.\tests\test_scripts_windows\test_bp7_bping_bidirectional_tcpcl_to_hdtm_oneprocess.bat	37863839
.\tests\test_scripts_windows\test_bp7_bpsec_all_step_fast_cutthrough_oneprocess.bat	3168F467
.\tests\test_scripts_windows\test_bp7_ltp_fast_cutthrough.bat	72E65856
.\tests\test_scripts_windows\test_bp7_ltp_to_tcpcl_fast_cutthrough.bat	EE34C6BD
.\tests\test_scripts_windows\test_bp7_step_fast_cutthrough_oneprocess.bat	88BFBFF
.\tests\test_scripts_windows\test_bp7_storage_oneprocess.bat	5A2CB063
.\tests\test_scripts_windows\test_bp7_tcpclv4_fast_cutthrough_oneprocess.bat	8A4BC181
.\tests\test_scripts_windows\test_bp7_tcpclv4_fast_cutthrough_oneprocess_hdtm_outduct_to_induct.bat	91F0350A
.\tests\test_scripts_windows\test_bp7_tcpclv4tls_fast_cutthrough_oneprocess.bat	2F73A5E8
.\tests\test_scripts_windows\test_bp7_uart_to_tcpcl_fast_cutthrough_oneprocess.bat	2B89D461
.\tests\test_scripts_windows\test_bundles_to_scheduler.bat	4725F60D
.\tests\test_scripts_windows\test_gstreamer_step.bat	6D9C8A7A
.\tests\test_scripts_windows\test_libcgr.bat	726722DE
.\tests\test_scripts_windows\test_ltp_fast_cutthrough.bat	D88D44A1
.\tests\test_scripts_windows\test_ltp_fast_cutthrough_1000mtubpger.bat	1BD2B7BD
.\tests\test_scripts_windows\test_ltp_fast_cutthrough_1000mtubpgerregularcheckpoints.bat	D981FBA5
.\tests\test_scripts_windows\test_ltp_fast_cutthrough_bpger_resume.bat	5624943C
.\tests\test_scripts_windows\test_ltp_fast_cutthrough_rate_limited.bat	B3DDB9F6
.\tests\test_scripts_windows\test_ltp_fast_cutthrough_rate_limited_breakbpsink.bat	BB5911BD
.\tests\test_scripts_windows\test_ltp_multi_fast_cutthrough.bat	E6577F93
.\tests\test_scripts_windows\test_ltp_send_file.bat	E5BF24F3
.\tests\test_scripts_windows\test_ltp_send_file_500Mbps.bat	0CF69A1A

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.\tests\test scripts windows\test ltp send file batchudpsend.bat	57389EDC
.\tests\test scripts windows\test ltp send file delay sim proxy.bat	E1D317E7
.\tests\test scripts windows\test ltp send file delay sim proxy 500Mbps.bat	3B94EB28
.\tests\test scripts windows\test ltp to tcpcl fast cutthrough.bat	89C07724
.\tests\test scripts windows\test ltpipe fast cutthrough.bat	D608DEFE
.\tests\test scripts windows\test ltpipe fast cutthrough nohdtb.bat	63542935
.\tests\test scripts windows\test ltpipe fast cutthrough nohdtb batchsend.bat	FC44AAC5
.\tests\test scripts windows\test scheduler.bat	1BA43084
.\tests\test scripts windows\test step.bat	7F09D2C1
.\tests\test scripts windows\test step fast cutthrough.bat	29D399AB
.\tests\test scripts windows\test step fast cutthrough hdtbnoneprocess already running.bat	344DFC34
.\tests\test scripts windows\test step fast cutthrough oneprocess.bat	D4B0BD89
.\tests\test scripts windows\test step fast cutthrough oneprocess break between 12 and 15 seconds.bat	3AF9B631
.\tests\test scripts windows\test step fast cutthrough oneprocess slowbpsink.bat	BE84718F
.\tests\test scripts windows\test step fast cutthrough oneprocess sslwebgui.bat	3A370100
.\tests\test scripts windows\test step fast cutthrough startbpsink after hdtbnoneprocess.bat	26D03F70
.\tests\test scripts windows\test step hdtbnoneprocess infinite reconnect.bat	DB66B7E1
.\tests\test scripts windows\test step multi fast cutthrough.bat	9B03B452
.\tests\test scripts windows\test step multi fast cutthrough oneprocess.bat	EC301FF5
.\tests\test scripts windows\test step multi fast cutthrough oneprocess break between 12 and 15 seconds.bat	E538430D
.\tests\test scripts windows\test step storage oneprocess custodyxfer acs.bat	E777FA82
.\tests\test scripts windows\test step storage oneprocess custodyxfer rfc5050.bat	C8D8F846
.\tests\test scripts windows\test step to bpencap fast cutthrough.bat	DE276608
.\tests\test scripts windows\test step to bpencap repeater fast cutthrough.bat	D2BD0B2C
.\tests\test scripts windows\test step to ltp fast cutthrough batchsend smallmtu.bat	188A3332
.\tests\test scripts windows\test step to ltp fast cutthrough rate limited breakbpsink.bat	AB8E54D5
.\tests\test scripts windows\test step to ltp fast cutthrough rate limited breakhdtb.bat	F256829E
.\tests\test scripts windows\test step to ltpdelayproxy fast cutthrough oneprocess.bat	F4996AAE
.\tests\test scripts windows\test step to ltpdelayproxy fast cutthrough oneprocess brokenlink.bat	D15AAB89
.\tests\test scripts windows\test step to ltpdelayproxy fast cutthrough oneprocess disksessions.bat	9F66B32B
.\tests\test scripts windows\test step to ltpdelayproxy fast cutthrough oneprocess disksessions 20secRTT.bat	EB09ABA3
.\tests\test scripts windows\test step to ltpdelayproxy oneprocess los ratelimited.bat	419F98A5
.\tests\test scripts windows\test step to ltpdelayproxy oneprocess lossy ratelimited.bat	E5B98580
.\tests\test scripts windows\test step to ltpdelayproxy oneprocess lossy ratelimited largepipeline.bat	27045FF1
.\tests\test scripts windows\test step to ltpencap fast cutthrough.bat	87BA839C
.\tests\test scripts windows\test storage.bat	B0C5C442
.\tests\test scripts windows\test storage multi.bat	87486F33
.\tests\test scripts windows\test storage oneprocess.bat	96DF0F3C
.\tests\test scripts windows\test storage slowbpsink.bat	2E41BF7C
.\tests\test scripts windows\test storage with scheduler.bat	CCB64AB0
.\tests\test scripts windows\test tcpcl.bat	58F6687B
.\tests\test scripts windows\test tcpcl bpfiletransfer cutthrough oneprocess waitfornewfiles.bat	1766D7C5
.\tests\test scripts windows\test tcpcl fast cutthrough.bat	CA6B07D4
.\tests\test scripts windows\test tcpcl fast cutthrough autofragment.bat	FEF8E405

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Source File	Last 8 of MD5 Hash
.\tests\test_scripts\windows\test_tcpcl_fast_cutthrough_bigpipeline.bat	F7294BEF
.\tests\test_scripts\windows\test_tcpcl_fast_cutthrough_hdtnoneprocess_already_running.bat	176A4341
.\tests\test_scripts\windows\test_tcpcl_fast_cutthrough_oneprocess.bat	C186F982
.\tests\test_scripts\windows\test_tcpcl_fast_cutthrough_oneprocess_hdtn_induct_only.bat	9D24501D
.\tests\test_scripts\windows\test_tcpcl_fast_cutthrough_oneprocess_hdtn_outduct_only.bat	F5D0082A
.\tests\test_scripts\windows\test_tcpcl_fast_cutthrough_oneprocess_hdtn_outduct_to_induct.bat	73EE88ED
.\tests\test_scripts\windows\test_tcpcl_fast_cutthrough_startbpsink_after_hdtnoneprocess.bat	8EC969EA
.\tests\test_scripts\windows\test_tcpcl_fast_cutthrough_tinycb.bat	ECB9E6E2
.\tests\test_scripts\windows\test_tcpcl_file_transfer_cutthrough_oneprocess.bat	E7B3F559
.\tests\test_scripts\windows\test_tcpcl_file_transfer_cutthrough_oneprocess_waitfornewfiles.bat	E55F9003
.\tests\test_scripts\windows\test_tcpcl_multi_fast_cutthrough.bat	267C46F2
.\tests\test_scripts\windows\test_tcpclv4_fast_cutthrough_oneprocess.bat	8AEDC8E8
.\tests\test_scripts\windows\test_tcpclv4_fast_cutthrough_oneprocess_autofragment.bat	36AD3FFA
.\tests\test_scripts\windows\test_tcpclv4_fast_cutthrough_oneprocess_hdtn_induct_only.bat	C4B8579D
.\tests\test_scripts\windows\test_tcpclv4_fast_cutthrough_oneprocess_hdtn_outduct_only.bat	373B4E9A
.\tests\test_scripts\windows\test_tcpclv4_fast_cutthrough_oneprocess_hdtn_outduct_to_induct.bat	4495FDA3
.\tests\test_scripts\windows\test_tcpclv4tls_fast_cutthrough_oneprocess.bat	4F77187E
.\tests\test_scripts\windows\test_tcpclv4tls_fast_cutthrough_oneprocess_hdtn_induct_only.bat	E55091D0
.\tests\test_scripts\windows\test_tcpclv4tls_fast_cutthrough_oneprocess_hdtn_outduct_only.bat	5942E290
.\tests\test_scripts\windows\test_tcpclv4tls_fast_cutthrough_oneprocess_hdtn_outduct_to_induct.bat	C0C35E4D
.\tests\test_scripts\windows\test_udp.bat	A2EE926E
.\tests\test_scripts\windows\test_udp_fast_cutthrough.bat	8A334BA9
.\tests\test_scripts\windows\test_udp_file_transfer_acscustody_oneprocess.bat	3BEBDC82
.\tests\test_scripts\windows\test_udp_multi_fast_cutthrough.bat	C38C8D50
.\tests\test_scripts\windows\test_udp_to_stcp_fast_cutthrough_oneprocess.bat	76DD3CA2
.\tests\test_scripts\windows\unit_tests.bat	5A29B6BA
.\tests\test_scripts\windows\web_interface_separate_processes.bat	00D7273E
.\tests\unit_tests\CMakeLists.txt	533B4C4B
.\tests\unit_tests\src\test_main.cpp	78100900
.\tests\unit_tests_import_installation\CMakeLists.txt	32B80B6F
.\tests\unit_tests_import_installation\src\test_main.cpp	6BC993F7

3.3 Changes Incorporated

This section lists all changes incorporated between the releases of HDTN software v1.3.0 and v2.0.0.

3.3.1 Incorporated New Feature Requests

No New Feature Requests (NFRs) were incorporated in this HDTN software release.

3.3.2 Incorporated Capability Changes

A summary of changes in capabilities is captured in HDTN-USER-036 HDTN User Guide for v2.0.0.

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3.3.3 Incorporated Development Tasks

The Git Code Task ID, Title, and ID of any associated Change Request (CR) or Software Change Request (SCR) for each development task incorporated in this version of the HDTN software are recorded in Table 3-4: HDTN Software Changes Incorporated.

Table 3-4: HDTN Software Changes Incorporated

Git Task ID	Task Title	Associated CR
388	BpFileTransfer	HDTN-SCR-008
390	Add File Streaming Scripts for H.265	HDTN-SCR-005
391	Egress routing error causes storage to mark link down	HDTN-SCR-008
392	HDTN macOS pipelines fail to build	HDTN-SCR-005
393	Update version number and CHANGELOG for 1.3.1 hotfix	HDTN-SCR-005
395	Create WebsocketServer.cpp abstract class which hides implementation (regardless of whether Boost Beast or CivetWeb is being used).	HDTN-SCR-008
399	Implement code complexity pipeline for CI/CD	HDTN-SCR-008
N/A	README.md File Update for v1.3.1	HDTN-SCR-006
N/A	CHANGELOG.md File Update for v2.0.0	HDTN-SCR-008
N/A	README.md File Update for v2.0.0	HDTN-SCR-008

The ID and title of all Change Requests (CRs) and Software Change Requests (SCRs) incorporated in this version of the HDTN software are recorded in Table 3-5: HDTN Change Requests Incorporated.

Table 3-5: HDTN Change Requests Incorporated

ID	Title
HDTN-CR-004	Changes to Software Requirement Specification (SRS) to Update Requirements Status Based on The Development of Test Cases (Rev B).
HDTN-SCR-005	Software Change Request for v1.3.1
HDTN-SCR-006	Updates to README for V 1.3.1
HDTN-SCR-008	Improvements of CI/CD pipeline and applications.

3.3.4 Incorporated Source File Changes

This section documents any source files that were deleted from, modified for, or added in this HDTN software release.

3.3.4.1 Deleted Source Files

Table 3-6: HDTN Software Deleted Source Files lists the source files that were deleted in this release of the HDTN software.

Table 3-6: HDTN Software Deleted Source Files

Deleted Source File
.github\workflows\hdt_n_test_workflow.yml
.github\workflows\hdt_n_test_workflow_windows.yml

3.3.4.2 Modified Source Files

Table 3-7: HDTN Software Modified Source Files lists the source files that were modified in this release of the HDTN software.

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Table 3-7: HDTN Software Modified Source Files

Modified Source File
.\gitlab-ci.yml
.\CHANGELOG.md
.\ci\count_issues.py
.\common\bpcodec\apps\BpReceiveStream\src\BpReceiveStreamMain.cpp
.\common\bpcodec\apps\BpSendStream\src\BpSendStreamMain.cpp
.\common\bpcodec\apps\CMakeLists.txt
.\common\bpcodec\CMakeLists.txt
.\common\bpcodec\include\codec\Bpv7Crc.h
.\common\bpcodec\src\codec\Bpv7Crc.cpp
.\common\bpcodec\test\TestBpSinkPattern.cpp
.\common\bpcodec\test\TestBpv7Crc.cpp
.\common\include\HdtnVersion.hpp
.\common\logger\include\Logger.h
.\common\logger\src\Logger.cpp
.\common\logger\unit_tests\LoggerTests.cpp
.\common\util\include\DirectoryScanner.h
.\common\util\src\DirectoryScanner.cpp
.\common\util\test\TestJsonSerializable.cpp
.\kill.sh
.\module\egress\src\EgressAsync.cpp
.\module\storage\src\ZmqStorageInterface.cpp
.\module\telem_cmd_interface\CMakeLists.txt
.\module\telem_cmd_interface\include\TelemetryRunnerProgramOptions.h
.\module\telem_cmd_interface\src\TelemetryRunner.cpp
.\module\telem_cmd_interface\src\TelemetryRunnerProgramOptions.cpp
.\module\telem_cmd_interface\unit_tests\TelemetryRunnerProgramOptionsTests.cpp
.\module\telem_cmd_interface\unit_tests\TelemetryRunnerTests.cpp
.\README.md
.\tests\unit_tests\CMakeLists.txt

3.3.4.3 Added Source Files

Table 3-8: HDTN Software Added Source Files lists the source files that were added in this release of the HDTN software.

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Table 3-8: HDTN Software Added Source Files

Added Source File
.\gitlab\issue_templates\nfr.md
.\ci\detect_high_ccm.py
.\common\bpcodec\apps\bpfiletransfer\include\BpFileTransfer.h
.\common\bpcodec\apps\bpfiletransfer\include\BpFileTransferRunner.h
.\common\bpcodec\apps\bpfiletransfer\src\BpFileTransfer.cpp
.\common\bpcodec\apps\bpfiletransfer\src\BpFileTransferMain.cpp
.\common\bpcodec\apps\bpfiletransfer\src\BpFileTransferRunner.cpp
.\common\bpcodec\apps\bpfiletransfer\www\index.html
.\common\bpcodec\apps\bpfiletransfer\www\modal-websocket-disconnect.css
.\common\bpcodec\src\codec\ZlibCrc32cCombine.cpp
.\module\telem_cmd_interface\include\WebsocketServer.h
.\module\telem_cmd_interface\src\WebsocketServer.cpp
.\tests\test_scripts_linux\Race Regression\bpngen.json
.\tests\test_scripts_linux\Race Regression\bpsink.json
.\tests\test_scripts_linux\Race Regression\contact-plan.json
.\tests\test_scripts_linux\Race Regression\hdtm.json
.\tests\test_scripts_linux\Race Regression\README.md
.\tests\test_scripts_linux\Race Regression\reloader.py
.\tests\test_scripts_linux\Race Regression\runtime.sh
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_1_Node_Test\runtime_h265_streaming_LTP_one_node.sh
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_1_Node_Test\runtime_h265_streaming_STCP_one_node.sh
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_1_Node_Test\runtime_h265_streaming_TCPCL_one_node.sh
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_2_Nodes_Test\runtime_receiver_h265_ltp_streaming.sh
.\tests\test_scripts_linux\Streaming\file_streaming\only_video\Streaming_2_Nodes_Test\runtime_sender_h265_ltp_streaming.sh
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_1_Node_Test\runtime_file_streaming_h265va_LTP_one_node.sh
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_1_Node_Test\runtime_file_streaming_h265va_STCP_one_node.sh
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_1_Node_Test\runtime_file_streaming_h265va_TCPCL_one_node.sh
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_2_Nodes_Test\runtime_receiver_va_h265_ltp_streaming.sh
.\tests\test_scripts_linux\Streaming\file_streaming\video_with_audio\Streaming_2_Nodes_Test\runtime_sender_va_h265_ltp_streaming.sh
.\tests\test_scripts_windows\test_tcpcl_bpfiletransfer_cutthrough_oneprocess_waitfornewfiles.bat

3.4 Adaptation Data

This version of HDTN software does not contain any platform- or site-specific adaptation data.

3.5 Related Documents

Table 3-9: HDTN Software Related Documents lists documents used to generate this release of HDTN Test Framework software and related media by document number, applicable revision, and title with a description of the document's purpose in the development process.

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Table 3-9: HDTN Software Related Documents

Document Number	Revision	Document Title	Purpose
HDTN-PLAN-002	baseline	HDTN Configuration and Data Management Plan (CDMP)	CDMP provides clear instructions for management of documentation and data generated by the HDTN team.
HDTN-PLAN-003	baseline	HDTN Software Development and Management Plan (SDMP)	SDMP specifies the plans for developing and managing HDTN software.
HDTN-PLAN-004	baseline	HDTN Software Configuration Management Plan (SCMP)	SCMP defines activities and configuration items related to build and release of software.
HDTN-REQ-008	B	HDTN Software Requirements Specification (SRS)	SRS specifies the requirements to be met by HDTN software.
HDTN-ADD-016	baseline	HDTN Architecture and Design Document (ADD)	ADD outlines the architecture and design for HDTN software.
HDTN-SWDD-017	baseline	HDTN Software Data Dictionary (DD)	DD defines variables, data structures, inputs, outputs, commands, file system structures, telemetry, data files, and configuration files used in HDTN software.
HDTN-TEST-038	baseline	HDTN Flight Software Inspection Test Procedures	Inspection Test Procedure contains the test procedures for verification of the HDTN software requirements with the “inspection” verification method.
HDTN-TEST-039	baseline	HDTN Software Test Procedure (STPr)	STPr contains the test procedures for verification of the HDTN software requirements with the “demonstration” and “test” verification methods.
HDTN-RPT-045	baseline	HDTN v2.0.0 Software Test Report	Test Report documents the results from verification activities performed according to the Inspection Test Procedure and STPr.

3.6 Installation Instructions

Instructions for building and installing HDTN software are provided in HDTN-USER-036 HDTN User Guide for v2.0.0.

3.7 Possible Problems and Known Errors

This section identifies any possible problems or known errors.

3.7.1 Bug Reports

Table 3-10: HDTN Software Bug List lists all bugs opened, updated, or closed during development of this HDTN software release.

Table 3-10: HDTN Software Bug List

Git Task ID	Bug Title	Severity	Status	Associated Task IDs
183	Integrated test TestHDTNFileTransferTCPCL bugs	minor	Open	<i>none recorded</i>
293	The HDTN rate limit has been observed “sticking” at a certain values	minor	Closed	<i>none recorded</i>
308	use-after-free warning in integrated tests.cpp	minor	Deferred	<i>none recorded</i>
348	GitHub issue 55 - Unrecognized Option --dest-uri-eid=ipn:2.1 (NOTE: This bug is related to code that is not maintained by the HDTN project team.)	trivial	Open	GitHub Issue #55
553	BPSec - policy allows payload block that had security target removed to be forwarded.	minor	Open	<i>none recorded</i>
545	RTP Flags Masking Is Incorrect	minor	Open	<i>none recorded</i>
555	BPSec unable to target the BPv7 primary block with integrity	minor	Open	<i>none recorded</i>
557	bpgeen --duration with --cla-rate becomes inaccurate	minor	Open	<i>none recorded</i>
559	BPing's ping_data_t values not in network byte order	minor	Open	<i>none recorded</i>
560	BPSendfile --max-bundle-size-bytes not correct	minor	Open	<i>none recorded</i>
562	BPv6 forwards expired bundles that are not routed through storage	minor	Open	<i>none recorded</i>
563	If TCPCL link drops with bundles flowing, bundles fail to flow again when the link is restored	minor	Open	<i>none recorded</i>
566	Static Analysis Defects	trivial	Open	<i>none recorded</i>

3.7.2 Corrective and Preventative Action Reports

No Corrective and Preventative Action Reports (CAPAs) have been written against the HDTN software.

3.7.3 Possible Problems

3.7.3.1 Issue 559: BPing's ping_data_t Values Not in Network Byte Order

BPing sends a payload with a data structure consisting of a `u_int64` sequence and a Boost `ptime` `sendTime` object. These values are not in network byte order, so a system with different endianness will see different results if byte order is not accounted for.

Both `sequence` and `sendTime` should be values in network byte order, either as `u_int64` with `htonll()` applied, or SDNV or CBOR encoded values.

3.7.3.2 Issue 560: BPSendfile --max-bundle-size-bytes Not Correct

The `--max-bundle-size-bytes` option limits the size of the bundle payload but does not place a limit on the size of the bundle. Due to metadata in the payload and bundle header bytes, most bundles will be larger than `--max-bundle-size-bytes` specifies.

The `--max-bundle-size-bytes` should either place a strict limit on the maximum size of the bundle, or the option should be renamed to something like `--max-payload-bytes` which will accurately reflect the behavior.

3.7.3.3 Issue 566: Static Analysis Defects

There are 175 known static analysis defects recorded in the HDTN v2.0.0 source code. These defects have been reviewed by the development team. None of the defects are expected to have any negative impact on satisfying the software requirements.

3.7.4 Known Errors

3.7.4.1 Issue 183: Integrated Test TestHDTNFileTransferTCPCL Issues

Integrated test TestHDTNFileTransferTCPCL has the following issues:

- "it_TestHDTNFileTransferLTP" was misnamed in the log output.
- The file to be received may already exist, resulting in false positives.
 - Other integrated tests may also demonstrate this issue.
- Doesn't compare file contents
 - The hashes for each file are computed, but are never compared to one another.
- bpgen_one_tcpclv4_port4556_thisengineid200.json, used as the config for bpgen, does not seem to exist.

There are no known workarounds for this issue.

3.7.4.2 Issue 545: RTP Flags Masking Is Incorrect

In DtNRtpFrame.h the following masking is defined in lines 55-60:

```
#define RTP_VERSION_TWO_FLAG (3 << 15)
#define RTP_PADDING_FLAG (1 << 13)
#define RTP_EXT_FLAG (1 << 12)
#define RTP_CSRC_FMASK (15 << 11) // 1111 << 11
#define RTP_MARKER_FLAG (1 << 7)
#define RTP_PAYLOAD_MASK (127 << 0) // 1111111 << 0
```

This produces a mapping as follows:

Bit	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
RTP_VERSION_TWO_FLAG	1															
RTP_PADDING_FLAG			1													
RTP_EXT_FLAG				1												
RTP_CSRC_FMASK		1	1	1	1											
RTP_MARKER_FLAG									1							
RTP_PAYLOAD_MASK										1	1	1	1	1	1	1

This mask should match the structure of the RTP Header.

Bit	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
RTP_VERSION_TWO_FLAG	1	1														
RTP_PADDING_FLAG			1													
RTP_EXT_FLAG				1												
RTP_CSRC_FMASK					1	1	1	1								
RTP_MARKER_FLAG									1							
RTP_PAYLOAD_MASK										1	1	1	1	1	1	1

```
#define RTP_VERSION_TWO_FLAG (3 << 14)
#define RTP_PADDING_FLAG (1 << 13)
#define RTP_EXT_FLAG (1 << 12)
#define RTP_CSRC_FMASK (15 << 8)
#define RTP_MARKER_FLAG (1 << 7)
#define RTP_PAYLOAD_MASK (127 << 0)
```

There are no known workarounds for this issue.

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3.7.4.3 Issue 553: BPsec - Policy Allows Payload Block That Had Security Target Removed to Be Forwarded

HDTN passes this test if `FAIL_BUNDLE_FORWARDING` is used as the failure policy, but if `REMOVE_SECURITY_OPERATION_TARGET_BLOCK` is specified as the policy, the bundle is still forwarded. The selected policy action should be followed but `FAIL_BUNDLE_FORWARDING` is the only policy action that seems to work. Actions like `REMOVE_SECURITY_OPERATION` and `REMOVE_SECURITY_OPERATION_TARGET_BLOCK` result in the bundle being discarded instead of the appropriate blocks being removed.

There are no known workarounds for this issue.

3.7.4.4 Issue 555: BPsec Unable to Target the Bpv7 Primary Block with Integrity

There is no way to configure HDTN to target a BPv7 bundle primary block with a BIB.

According to RFC 9173, section 3, the primary block is an optional target for integrity.

There are no known workarounds for this issue.

3.7.4.5 Issue 557: bpngen --duration with --cla-rate Becomes Inaccurate

With `bpngen-async`, when `--duration` is used at the same time as `--cla-rate`, the duration becomes less accurate with increasing values for `--bundle-size`. For example, with `--duration 10 --bundle-size 100` and `--cla-rate 50000`, `bpngen` stops at 10s. However, with `--duration 10 --bundle-size 2000` and `--cla-rate 50000`, `bpngen` sends bundles for around 13s.

The duration of `bpngen` execution should not be dependent on bundle size or CLA rate settings.

There are no known workarounds for this issue.

3.7.4.6 Issue 562: BPv6 Forwards Expired Bundles That Are Not Routed Through Storage

Expired BPv6 bundles are not removed unless they are routed through storage and are forwarded instead.

Expired BPv6 bundles should not be forwarded regardless whether they are routed through storage.

There are no known workarounds for this issue.

3.7.4.7 Issue 563: If TCPCL Link Drops with Bundles Flowing, Bundles Fail to Flow Again When The Link Is Restored

When the TCPCL link drops with bundles flowing, bundles fail to flow again when the link is restored.

Bundles should resume flowing when the TCPCL link is restored.

Two nodes are needed to replicate the problem.

1. Disable/block the connection on the 2nd node.
 - a. The method for dropping the 2nd node needs to be either disabling the network interface or creating a firewall rule to drop all packets from the 1st node (e.g. `sudo iptables -A INPUT -s 10.10.1.240 -j DROP`). The same result is achieved using either method.
2. Wait until HDTN shuts down the outduct on the 1st node
3. Bring the 2nd node back up.

NOTE: If no bundles are in flight when the link drops, it comes back up OK and bundles are able to flow, even if bundles went to storage while the link was down.

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There are no known workarounds for this issue.

3.7.5 Unincorporated Changes

There are no outstanding change requests for this release of HDTN software.

3.7.6 Approved Waivers

No waivers have been approved for this release of HDTN software.

4.0 NOTES

There are no further notes for this release of HDTN software.

APPENDIX A GLOSSARY AND ACRONYMS

This section includes an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of terms and definitions needed to understand this document.

A.1 Glossary

Table A-1: Definitions contains an alphabetized list of definitions for special terms used in the document; that is, the terms are used in a sense that differs from or is more specific than the common usage for such terms.

Table A-1: Definitions

Term	Definition
Agency	NASA
Architecture and Design	A description of the mission elements, their interfaces, their logical and physical layout, and the analysis of the design to determine expected performance and margins; includes System Design Synthesis, System Design Analysis, and System Design Validation products.
Baseline	An agreed-to set of requirements, designs, or documents that will have changes controlled through a formal approval and monitoring process.
Configuration Management	(1) A systematic process for establishing and maintaining control and evaluation of all changes to baseline documentation, products (Configuration Items), and subsequent changes to that documentation which defines the original scope of effort. (2) The systematic control, identification, status accounting, and verification of all Configuration Items throughout their life cycle.
Product	Part of a system consisting of end products that perform operational functions and enabling products that perform life cycle services related to the end product or a result of the technical efforts in the form of a work product.
Program	Strategic investment by a mission directorate that has defined goals, objectives, architecture, funding level, and management structure supporting one or more projects.
Project	(1) Specific investment having defined goals, objectives, requirements, life cycle cost, a beginning, and an end; yields new or revised products or services that directly address NASA's strategic needs. (2) Unit of work performed in programs, projects, and activities.
System	The combination of elements (hardware, software, equipment, facilities, personnel, processes, and procedures) that function together to produce the capability to meet a need.
Waiver	Documented agreement intentionally releasing a program or project from meeting a requirement.

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A.2 Acronyms

Table A-2: Acronyms contains an alphabetized list of the definitions for abbreviations and acronyms used in this document.

Table A-2: Acronyms

Acronym	Definition
CAPA	Corrective and Preventative Action
CDMP	Configuration and Data Management Plan
CM	Configuration Management
COTS	Commercial Off-the-Shelf
CR	Change Request
CSCI	Computer Software Configuration Item
DTN	Delay Tolerant Networking
GRC	Glenn Research Center
HDTN	High-Rate Delay Tolerant Networking
ID	Identifier
MD5	Message Digest Algorithm 5
NASA	National Aeronautics and Space Administration
NFR	New Feature Request
NPR	NASA Procedural Requirements
OP	Operational Program
SCaN	Space Communications and Navigation
SCMP	Software Configuration Management Plan
SCR	Software Change Request
SDMP	Software Development and Management Plan
SEPG	Software Engineering Process Group
SHA	Secure Hash Algorithm
SOMD	Space Operations Mission Directorate
SW	Software
TBD	To Be Determined
TBR	To Be Resolved
URL	Universal Resource Locator
VDD	Version Description Document

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APPENDIX B TBD/TBR LIST

This appendix provides a list of all currently open To Be Determined (TBD)/To Be Resolved (TBR) items contained within this document.

Identification of TBD/TBR within the document is as follows.

Where a TBD/TBR is included within the text of this document, they **will** be incrementally numbered starting from VDD001 (preceded by a “-”, dash) and formatted in ***bold italics***. As an example: ***TBD-VDD001*** for TBD or ***TBR-VDD001*** for TBR.

Additionally, each TBD/TBR **will** be entered into the HDTN Software Development Folder repository as a git issue. Each task **will** be assigned to a software team member who will be responsible for addressing the need through to completion.

Completion is defined here such that the TBD/TBR is addressed within this document and its respective task is closed out.

Table B-1: TBD/TBR List provides the list of TBDs/TBRs identified in this document. Each entry includes a short description, the task ID, status, and section of the document where the issue is located. Items that are formatted via a strikethrough indicate the TBD/TBR is addressed or closed.

Table B-1: TBD/TBR List

TBD/TBR ID	Description	Task ID	Status	Section
TBD				
N/A	N/A	N/A	N/A	N/A
TBR				
N/A	N/A	N/A	N/A	N/A