

TReK 5.3.2 Release Notes

Visual Studio supported versions (Windows only): The extended support for Visual Studio 2012 expired on January 10, 2023. TReK 5.3.2 is the last release that will include Visual Studio 2012 libraries for the TReK Application Programming Interfaces (APIs). Additionally, the Visual Studio 2015 libraries were removed from this release. The Visual Studio 2017 libraries that are delivered are binary compatible with versions 2015, 2019, and 2022.

Known Issues with TReK 5.3.2

1. Print from the TReK Assistant (Help) does not work on Windows. This is a known issue with one of the third party software products used by TReK.
2. The IONizer application may crash in some off-nominal scenarios. This problem has been observed when the IONizer application doesn't have the needed privileges on the directory containing the ION configuration files. It is suggested that the IONizer application use configuration files that are located on a local disk. Using a shared drive is possible, but may require additional configuration to allow IONizer to access the shared drive. If you encounter this problem and need help resolving, please contact the TReK help desk.
3. A failover of the HOSC DTN server is not detected by the IONizer application and requires the user perform a manual restart of the ION processes.
4. There is a known performance issue with loading of metadata from the disk or the database. Loading a few small metadata definitions at one time should not be an issue, but you may notice a delay if loading a large number of metadata definitions or if a metadata definition contains a very large number of parameters. This can occur when using the TReK Data and TReK Command applications or working with metadata through the API.
5. The TReK Metadata application provides limited validation at this time.
6. Linux only: If a TReK application crashes on Linux some resources may not be cleaned up properly at this time. If you have stopped all TReK applications, use these commands to clean up:

```
> cd /dev/shm  
> rm sem.*  
> rm Trek*
```

If some TReK applications are still running you can selectively remove these resources. For example, if a command application connected to a destination named POIC crashed remove all files in /dev/shm that have POIC in the name.

7. Windows only: If a computer crashes or a hard reboot is forced, files used for shared memory may not be cleaned up properly on a Windows computer. If you have stopped all TReK applications, use these commands to clean up:

```
> cd c:/users/<username>/AppData/Local/Temp  
> del Trek*
```
8. When using the snapshot statistics view in TReK Data with fewer than 3 packets, extra blank cells are shown.

9. The TReK Playback application toolbar buttons to Activate and Deactivate the playback service can sometimes reflect the wrong state (e.g. Activate may be available when the playback service is already active). If this occurs, the Playback menu can be used to select the function needed. Using the Playback menu will also refresh the toolbar buttons so they reflect the correct state.
10. The batch and script files used for ION do not handle spaces in pathnames correctly. This is only an issue if you have a 'home' directory with a space (e.g., c:/users/my home directory or /home/my home directory).
11. If you find something not in this list, please report to trek.help@nasa.gov.

Things to Know about TReK 5.3.2

1. Beginning with TReK 5.1.1 all third party software is included with the TReK install. Previous versions of TReK required that third party software be installed separately. Prior to installing TReK 5.1.1 it is recommended that you uninstall all previous versions of TReK 4.x and 5.x as well as uninstall all third party software provided for TReK. *Note: It is safe to leave any version of TReK 3.x on your computer.*

For Windows, you can use the Add/Remove Programs feature to uninstall any version of TReK and also ION 3.3.1b which was used for TReK 5.0.1 and earlier. If you have TReK 5.1.0 installed, ION was provided as a separate installer. The uninstaller for ION-3.6.1 is available in the ION directory on your computer. The default location for the install was c:/ION.

For Linux, an uninstall script is provided on the webpage where you download TReK software. This script will uninstall all old versions of TReK and all third party products. You will likely see some 'not found' type errors when running this script as it searches for all versions of previously provided third party software. These errors can safely be ignored.

If you have any questions about or issues with the uninstall, please contact the TReK Help Desk at trek.help@nasa.gov.

2. Start scripts are provided on Linux to properly set up the environment before launching executables. If you are using the command line, it is suggested that you use the scripts as well.
3. The TReK CFDP Console application and ERIS Simulator must be started using a command line. These executables are located in the TReK Installation bin directory. Other applications can be started from the TReK menu.
4. A slash is required on the end of both the source and destination path for directory transfers in the CFDP GUI and CFDP Console.
5. The CFDP pause, resume, and cancel actions may appear to take a long time to work depending on the state of the CFDP engine at the time of the request.
6. The current CFDP configuration default values work well for local area network transfers of files when using Native CFDP. However, if you perform file transfers in a non-DTN delay

environment, you may need to change the values to always have successful file transfer. In those instances you will get a message about file transfers failing because of Ack/Nak limits being reached or inactivity timeout. It is suggested that you use the auto suspend and resume capability. This will help make the transfers more efficient by detecting the loss of signal (LOS) conditions. See the CFDP document for details.

7. After loading a new version of TReK, you should delete help cache directory (gov.nasa.msfc.trek). The location of the directory is operating system dependent:
Windows: C:\Users\\AppData\Local\gov.nasa.msfc.trek
Linux: /home/<username>/.local/share/gov.nasa.msfc.trek
8. Most Windows examples delivered are for older versions of Visual Studio. They can be updated to newer versions of Visual Studio as required. Please make sure that you get the .lib and .dll files that match the version of Visual Studio you are using.
9. Windows only - The TReK IONizer application will have a console window that opens in addition to the graphical user interface. You will also see a console windows for bpecho if that application is started as part of ION startup.
10. ION configuration files generated on a Windows computer and then moved to a Linux computer can have characters that cause problems with Linux scripting. You can fix this problem with a simple command line in the directory where the files are moved. The command line is:

```
sed -i -e 's/\r$//' *
```

If you see a message with “^M” in it, you will have to use the above command line to fix the problem.
11. When using the EXPRESS library, an EXPRESS simulator is provided to simulate the Rack Interface Controller (RIC) capability. This simulator can be used for development and local testing, but is not certified for verification testing. You will need to use an ISS approved systems such as RAPTR or PRCU for verification testing.
12. Windows only: You should copy the required DLLs for any user developed application programs to your run directory or insure that the paths for the TReK installed DLLs will be picked up by your operating system. You can see this list of required DLLs in the TReK Help application for each library. If you fail to do this and have TReK 3.x installed, you could pick up one of the libraries that it installs in the system32 directory. TReK 5.x does not install any DLLs in system32.
13. TReK 3.x required that commands include 2-bytes of data to use for the checksum when sending any command to ISS or an ISS test article. TReK 5.x introduces the concept of a ‘trailer’ which is used for the checksum. More about how TReK 5.x handles data is available in the TReK Concepts document.
14. This release does not contain an equivalent of the Telemetry or Command Trainer from TReK 3.x. You can still use the TReK 3.x trainers to test the TReK 5.x applications. Don’t use the eris_sim_console that is part of TReK 5.x with the TReK Command application. It doesn’t simulate the command interface (only HPEG).
15. It is possible for the POIC systems to connect to a TReK Command application multiple times. This can occur when a ‘timeout waiting for command connection’ error occurs and you reactivate the command connection to try again. This will cause issues with the TReK Command

application and it is suggested that you restart if this ever occurs. If this error occurs more than once, it is suggested that you increase the timeout value for waiting for a connection (select preferences from the options menu in the Command application). This will allow more time for the POIC processing to take place prior to abandoning on the TReK side. The default value is 10 seconds (10,000 milliseconds). If you must change the value, it is suggested to wait for at least one minute (60,000 milliseconds).

16. If the TReK Data application is used to record data, and the 'None' packet type option is selected, the user must provide a configuration file that describes the format of the record file prior to playing the recorded data back using the TReK Playback application. The configuration file name must be the record file's base name with a '.con' extension and the file must be located in the record file's directory. The format of the configuration file is identical to the format of the Packet Header Processor (PHP) file and at a minimum, must include information about the size of the packets in the record file. The format of the PHP file may be found in the Record API section of TReK's Online Help.
17. If the VPN connection to the POIC is lost, the HOSC Login, HPEG, and Command applications will deactivate. For Windows the lost connection is immediately recognized and the session is deactivated. On Linux the lost connection is only recognized after the TCP keepalive attempts have been exhausted. This can take up to two minutes. If during this timeframe the user attempts any network related activity (e.g., starting a session or disabling idle check), the keepalive counters reset and it will be another two minutes before the lost connection is detected.
18. The recommended minimum screen resolution for TReK GUIs is 1280x1024.
19. The classes and enumerations provided in the windows namespace of the Telemetry .NET API are deprecated and will be removed in a subsequent release. These items are no longer needed to successfully use the API.
20. If a TReK application configuration file (e.g. TReK Data, TReK Command) is moved from one computer to another, opening the configuration file in a different environment may generate the "Invalid Configuration" error. This error can be generated if the file is invalid or if the file contains content information (e.g., a directory path, IP address) that is not compatible with the existing environment. If the content is not compatible with the environment, a text editor can be used to correct the content so the configuration file can be opened successfully.
21. The Command GUI can be used to set a flag to allow TReK to behave the same as TReK 3.x with respect to the AddHeaderAndUplinkCommand() function. In TReK 3.x this function required two extra bytes for the checksum. TReK 5.x no longer requires those bytes. The new flag (available on the Preferences dialog in the Command GUI) when turned on will remove those two extra bytes to mimic the TReK 3.x behavior. This will also change the TReK 5.x behavior for the InsertDataAndUplinkCommand() method of the CommandApi class. It should only be used if you are exclusively using the TReK 3.x compatible API.
22. Please use Port 9219 when logging into the HOSC. Port 9209 is no longer supported by the HOSC. If you have been using port 9209 in the TReK HOSC Login application, this will continue to be the default until you change it. The TReK HOSC Login application and the TReK ERIS Sim Console application use the Transport Layer Security (TLS) for all ports except 9209. The TReK

ERIS Sim Console application's eris_sim_properties.xml configuration file contains a port number configuration parameter that controls the port used by the simulator. When working with the simulator you are free to choose which ports to use, but we suggest using port 9219 for the simulator. If you wish to use TLS with TReK ERIS Sim Console, you can copy the eris_sim_properties.xml file from the install to your home directory and edit the IP address.

23. The CDEF schema changed after the 0.9.0 beta was delivered. Any CDEF files created with the previous version of the schema can be read in using the old schema file (CDEF-1.1.xsd) when importing in the Metadata application. All exported CDEF files will use the latest schema (CDEF.xsd). The CDEF schema will be changing again in a future TReK release.
24. The Telemetry Database structure changed in TReK 5.2.0. Telemetry Databases created with earlier versions need to be converted. The Metadata application provides the capability to convert a TReK database format.
25. If the VPN tunnel is disconnected on a Linux computer while ION/DTN is running, you should use the ION provided killm from a command line to shut down ION. If you use the ionstop command which is also used by the TReK IONizer GUI, the ionstop command will not complete.
26. When a TCP client connection is lost in TReK Data or TReK Playback, you will be alerted with a message in the main window message area. If the service can no longer perform its functions due to the lost connection it will automatically deactivate.
27. The CFDP application was updated to add a .txt extension automatically when a file is saved if the .txt extension is not provided. If a configuration file created with a previous version is opened and saved, the .txt extension will be added to the filename (leaving the original file without the .txt extension in the directory and possibly on the Most Recent File list).
28. The IONconfig application was updated to add a .xml extension automatically when a file is saved if the .xml extension is not provided. If a configuration file created with a previous version is opened and saved, the .xml extension will be added to the filename (leaving the original file without the .xml extension in the directory and possibly on the Most Recent File list).
29. The TReK Playback application Configure dialog does not handle playback rate values greater than 999999 correctly. Entering values larger than this can cause unexpected behavior.
30. The e-mail account password that is used to configure and manage the "Email and Text Settings" in TReK applications may not include the '@' character on Linux operating systems. If you include the '@' character in your password, you will not be able to log into your email account and you will see the error message: "login denied".
31. The e-mail and text API does not perform a validity check on the e-mail addresses that are used by the API. The e-mail request will not be processed by the e-mail server if it includes an invalid e-mail address.

If you discover anything that is not on the list, please contact the TReK Help desk at trek.help@nasa.gov.

Release History

Note on bug numbers: Starting with TReK Release 5.0.1 bug numbers are included with bug fixes. The bug numbers will have gaps as some bugs are not delivered and the same numbering system is used to keep track of help desk calls.

The following is a summary of the changes associated with each TReK release. Details on new capabilities and changes are available in the documentation for the appropriate item.

➤ Version 5.3.2

- Notes:
 - See bug fixes.
 - This version is compatible with the latest EHS release as of the date for the 5.3.2 release.
 - TReK installs include all required third party software. The third party software is installed in the TReK installation directory. Instructions for uninstalling the third party software from previous releases are available in the install instructions.
- New Processor or Libraries:
 - Generator – Supports generating data for any packet defined with TReK metadata. The 3.x Telemetry Trainer is no longer required to simulate packet data streams.
 - Python Library – A Python wrapper of the Telemetry, Command, and Data classes is now provided.
- Updated Processes or Libraries (includes change requests):
 - ERIS Sim Console – Added the POIC command interface to the simulator. The simulator now can be used with HOSC Login, HPEG, and Command applications. The 3.x Command Trainer is no longer required to simulate command connections.
 - Data – Added option to support release 3 naming of parameter extraction files.
- General Enhancements
 - Updated the Windows installer to include a TREK_DLL32 environment variable which will point to the latest version of the 32-bit DLLs in the install. This will allow payload teams that use 32-bit applications to add TREK_DLL32 to the PATH environment variable to automatically have access to the latest version of DLLs without having to copy. The TREK_DLL32 should be placed before TREKROOT/bin in the PATH.
- Bug Fixes:
 - Bug 1386 – Fixed issue with command bridge mapping feature for identifier values greater than 32-bits.
 - Bug 1399 – Fixed issue in the Data API SwitchSet that could cause a crashes if Validate() was not called prior to GetValidationErrors().
 - Bug 1400 - The Metadata application was allowing non-modifiable command fields to be changed which could lead to a crash.

- Bug 1403 – Fixed issue where expected state status was not properly cleared.
- Bug 1405 – Updated the main help page for the Device Services API to include the `trek_bp_attach_device_api.dll` as required when using bundle protocol.
- Bug 1406 – Fixed memory issue with the copy constructor for `SplineCalibrator`.
- Bug 1409 – The `track_item_array.h` file was missing from the install.
- Bug 1413 – Updated the outducs for STCP and TCP to include the deprecated name in the `start.bprc` file generated by IONconfig.
- Bug 1421 – Fixed Data application recording so a packet is not recorded when explicitly turned off.
- Bug 1422 – Fixed Data application forwarding so the same UDP socket can be used to forward to multiple destinations.
- Bug 1423 – Minor corrections to the Data User Guide Section 5.4.
- Bug 1424 – Need to add IONizer console application to install.
- Bug 1425 – Updated the `hands_pkt.xml` file for the PEP Ethernet API to generate a zero for the destination field.
- Bug 1429 – Minor corrections to the Data User Guide.
- Bug 1430 – Updated documentation to include information on app password and two-factor authentication when using email and texting.
- Bug 1431 – Packet interval is not saved correctly for parameter extraction tab in Data.
- Bug 1433 – Unable to format Boolean data types as either unsigned integer or user-defined.
- Bug 1434 – TReK Data Unix Domain Socket selection can now be saved and restored.
- Bug 1451 – Update to require a peer public key pathname when forwarding encrypted data.
- Bug 1454 – Updated TReK Data Reset Statistics to clear Extraction statistics.
- Bug 1462 – TReK Data did not open a configuration file correctly when the data store referenced in the configuration file was in use.
- Bug 1465 – The Configure Statistics Reset to Defaults capability was fixed so it does not reset the configuration and expand all settings.
- Bug 1468 – Corrected a performance issue for the TReK Command application on Linux.
- Bug 1473 – Engineering units were not always saved to the Packet XML file.
- Bug 1475 – Corrected issue with the TReK CFDP application's inability to transfer files at the desired speed for certain aggregate file transfer rates.
- Bug 1476 – Updated the TReK Metadata application to display the correct Library configuration after a configuration file is opened.
- Bug 1478 – A signed or unsigned integer parameter that required more than 32-bits would get truncated to 32-bits when updating a command.
- Bug 1488 – Corrected erroneous error message in TReK Data Global Manage Extraction capability.

- Bug 1489 – TReK Data did not correctly restore Service Forward Packet Yes/No settings after opening a configuration file.

➤ Version 5.3.1

- Notes:
 - See bug fixes.
 - This version is compatible with the latest EHS release as of the date for the 5.3.1 release.
 - TReK installs include all required third party software. The third party software is installed in the TReK installation directory. Instructions for uninstalling the third party software from previous releases are available in the install instructions.
- New Processes or Libraries:
- Updated Processes or Libraries (includes change requests):
 - IONizer Application – Added support for HOSC Dual Gateways and Quick Configure.
 - HOSC Login Application – Added the E-Mail and Text Capability.
- General Enhancements
 - None
- Bug Fixes:
 - Bug 1345 – Corrected the HOSC Login Application so the Role is displayed in the toolbar instead of Unknown when a user only has one role assigned.

➤ Version 5.3.0:

- Notes:
 - See bug fixes.
 - This version is compatible with the latest EHS release as of the date for the 5.3.0 release.
 - TReK installs include all required third party software. The third party software is installed in the TReK installation directory. Instructions for uninstalling the third party software from previous releases are available in the install instructions.
- New Processes or Libraries:
 - E-Mail and Text Library – Provides API for integration of e-mail and text capabilities into user developed programs.
 - EXPRESS Sim Console – Provides RIC interface for local, non-verification, testing for EXPRESS payloads.
- Updated Processes or Libraries (includes change requests):
 - CFDP Software – Added support for Safety Conditional Ku IP Services (SCKIPS) and E-Mail and Text capabilities.
 - Data Application – Added support for E-Mail and Text capabilities, Data Extraction, and GSE Packet Generation.
 - HOSC Login Application – Added support for E-Mail and Text capabilities.

- HPEG Application – Added support for E-Mail and Text capabilities.
 - IONizer Application – Added support for E-Mail and Text capabilities.
- General Enhancements
 - None
- Bug Fixes:
 - Bug 1198 – Changed how TReK queries for ERIS reauthentication. Previously TReK polled frequently which could generate pop up messages when the request failed. TReK now polls only until successfully getting a reply. TReK will internally trigger reminder messages at 60, 30, and 10 to the user about reauthenticating prior to the login session expiring. The login expiration time is now displayed in the HOSC Login toolbar after successful login.
 - Bug 1266 – Updated the TelemetryApi to allow registering for packet arrival notification prior to the packets being activated. Additionally, if a packet is deactivated and activated again, the Data application will automatically reregister notifications that were in the list at deactivation. This eliminates the need for user programs to restart to register for packet arrival notification. The TReK 3.x Telemetry API uses the TelemetryApi and also has this update.
 - Bug 1271 – The start scripts for Linux were updated to use /bin/bash instead of /bin/sh. Some users reported problems unless the script used /bin/bash on Debian based systems.
 - Bug 1274 – The IONconfig application would sometimes not open all of the ducts for a configuration.
 - Bug 1275 – Three TBDs were corrected in the C++ Command API documentation: GetStatusItem(), SetConfigurationItem(), and SetBlockingFlag().
 - Bug 1283 – The HPEG application was always showing the Ground Node ID was set to zero. The message now reflects the value selected during activation.
 - Bug 1286 – In rare instances receiving a GSE packet that did not match the metadata could produce an unexpected API error (28018 – unable to load file). This error has been resolved and the function will return an appropriate error code.
 - Bug 1292 – Updated the IONconfig and IONizer applications and associated documents to remove the “proxy” option for ION. The auto configuration option is recommended when starting ION to communicate through the HOSC DTN gateway. It is not necessary to regenerate ION configuration files.
 - Bug 1294 – The TReK Command application was updated to set the Activate button to the correct state following a lost command connection.
 - Bug 1295 – Dynamically loading and freeing the ANSI-C APIs for command and telemetry will no longer cause a memory leak.
 - Bug 1308 – Updated the Metadata application packet tab to correctly handle a dropped item when there is an item in the packet selected at the time of the drop.

- Bug 1313 – Updated the E-Mail and Text Settings dialog to correctly handle deleting a Dropbox.
- Bug 1314 – Updated the E-Mail and Text Settings dialog to correctly handle a duplicate dropbox error.
- Bug 1317 – A resource leak in the ANSI-C Command API could cause memory and threads to be unnecessarily created which could lead to performance issues.
- Bug 1321 – Updated the Command application to correctly handle a scenario which caused the number of command track items to exceed the specified configuration.
- Bug 1324 – The interface message logging capability in the HOSC Login, HPEG, and Command applications was enhanced to add a time stamp to the user defined names and delete log files that are older than seven days.
- Bug 1327 – The Data application was updated to correctly handle data input checks for user specified recording properties on the Service Dialog Record tab.
- Bug 1328 – The Data application was updated to correct service statistics displayed in the packet key row.
- Bug 1330 – Fixed issue where an HPEG destination could have a proxy IP address displayed, but the Start Session button was enabled.
- Bug 1336 – Fixed bug in random subset processing that would cause the Data application to crash.

➤ Version 5.2.2:

- Notes:
 - See bug fixes.
 - This version is compatible with the latest EHS release as of the date for the 5.2.2 release.
 - TReK installs include all required third party software. The third party software is installed in the TReK installation directory. Instructions for uninstalling the third party software from previous releases are available in the install instructions.
- New Processes or Libraries:
 - None
- Updated Processes or Libraries (includes change requests):
 - None
- General Enhancements
 - None
- Bug Fixes:
 - Bug 1263 – A bug was introduced in TReK 5.2.1 that would incorrectly increase the bit rate of CFDP file transfers if there is an extended period time between file transfers.

- Bug 1264 – The TReK Data application service dialog was updated to correctly handle multicast address group information and perform additional error checks.
- Bug 1265 – The TReK Data dialog that describes status characters now includes both definitions for a status character when the character has one meaning for TReK and a different meaning for the HOSC.
- Bug 1267 – Now filtering out reauth_status error messages that occasionally occur from a background check for reauthentication times in HOSC Login.

➤ Version 5.2.1:

- Notes:
 - See bug fixes.
 - This version is compatible with the latest EHS release as of the date for the 5.2.1 release.
 - TReK installs include all required third party software. The third party software is installed in the TReK installation directory. Instructions for uninstalling the third party software from previous releases are available in the install instructions.
- New Processes or Libraries:
 - TReK Settings Application.
- Updated Processes or Libraries (includes change requests):
 - TReK CFDP – Updates include support for Recent Files List, Command Line Arguments, and the capability to configure whether the most recent transaction goes to the bottom or the top of the transaction list. Also added the capability to automatically reduce the size of a Native CFDP NAK (i.e., missing gaps) packet if the transport medium cannot support the size of the packet.
 - TReK Command – Updates include support for Recent Files List and Command Line Arguments.
 - TReK Data – Updates include support for Recent Files List and Command Line Arguments.
 - TReK IONConfig – Updates include support for Recent Files List and Command Line Arguments.
 - TReK Metadata – Updates include support for Recent Files List and Command Line Arguments.
 - TReK Playback – Updates include support for Recent Files List and Command Line Arguments.
- General Enhancements
 - The location of the trek_workspace can be specified using an environment variable. Reference the TReK Settings application for details.
- Bug Fixes:
 - Bug 1022 – Upgraded GetAPIReturnCodeAsString (trek_user_api) and GetCommandAPIReturnCodeAsString (trek_cmd_user_api) to include strings

that are new to TReK 5.x. Some of the new strings are longer than the original 70 bytes in TReK 3.x. If the user program allocates enough space, the string will be completely populated. If not enough space is allocated, the string will be truncated to fit.

- Bug 1169 – Fixed error in CFDP GUI that pulled a path from an incorrect table.
- Bug 1171 – Corrected an issue with TLS sockets that failed to detect an ungraceful shutdown event which caused a spike in CPU usage in the HOSC Login application.
- Bug 1176 – Updated the HPEG API to include the ability to retrieve the onboard proxy IP address. Also updated to retrieve the following destination information: status, enablement, forward link status, return link status, and location.
- Bug 1177 – Fixed issue with the Command API that could incorrectly return destination not found if the Command destination was deactivated after the Command API was used.
- Bug 1178 – Added missing error checks for the fragmentation dropboxes to prevent acceptance of invalid data.
- Bug 1179 – The data format was not used correctly when requesting user input in the Command application due to an error in the Data API. This required integer data to always be entered as decimal even if the input data type assigned in the database was hexadecimal.
- Bug 1183 – The Data application incorrectly displayed an invalid value information message.
- Bug 1184 – The Data application now correctly responds to network events such as lost socket.
- Bug 1185 – Added missing error check for unique destination names in the Data and Playback applications.
- Bug 1188 – CFDP was unable to achieve the desired data rate on Windows in some instances. A change was made to use a timeout with higher accuracy.
- Bug 1190 – TReK data was incorrectly forwarding all packets in the forward list if all packets had forwarding turned off.
- Bug 1191 – Enhanced the cleanup of API resources to minimize the need for manual user deletion. For example, if the computer loses power it should no longer be necessary to manually delete files in order to restart TReK applications.
- Bug 1192 – TReK HOSC Login application was updated to remove hour-glass that appeared on top of login prompt dialogs.
- Bug 1193 – Updated TReK Playback to handle socket events (accept connection, lost connection, etc.).
- Bug 1194 – TReK Data and TReK Playback were incorrectly encrypting or transforming when forwarding to multiple addresses in a single service.

- Bug 1195 – TReK Data and TReK Playback were incorrectly transforming and then encrypting in a single forwarding service.
- Bug 1199 – CFDP applications could crash if a CFDP primitive length was 257 to 260 bytes in length.
- Bug 1200 – Could not add a transformer to a forwarding socket that was used to forward to multiple addresses.
- Bug 1203 – A memory leak was fixed associated with reading/writing XML files.
- Bug 1212 – CFDP deactivation does not clean up ciphers associated with cryptography dropboxes.
- Bug 1213 – TReK Data incorrectly allowed cryptography key changes while services were active.
- Bug 1214 – TReK HPEG temporarily displays destination information from previous activations during a subsequent activation.
- Bug 1215 – CFDP Transactions are now cleared when the CFDP service is deactivated in the TReK CFDP application.
- Bug 1216 – Added missing TCP Keep Alive call for the command socket used to communicate with RAPTR in TReK Command.
- Bug 1217 – Added the capability to set the maximum number of command track items to display in the TReK Command application to improve performance.
- Bug 1218 – Corrected the CFDP application so Cryptography Settings cannot be edited when the CFDP service is active.
- Bug 1221 – Fixed a memory leak in the CFDP application.
- Bug 1224 – A temporary file was not deleted when the UpdateCommand or SendThisCommand methods of the CommandApi class were called.
- Bug 1225 – Updated the CFDP application to show the Fragmentation Size is not applicable when defining a defrag dropbox.
- Bug 1227 – Fixed small memory leak in trek_user_api for all 'get calibrated string' functions.
- Bug 1229 – Updated the TReK HOSC Login Application to check for an invalid Local IP address.
- Bug 1230 – Corrected a memory leak in the TReK Command Application associated with Command Communication Messages.
- Bug 1231 – Updated the TReK Command application to correct the error message that is displayed when the Command Bridge Destination Port field is empty.
- Bug 1232 – Fixed a memory exception that could occur in the third-party XML library when user APIs were included in a multi-threaded application.
- Bug 1237 – Fixed issue with trek_user_api where a packet that did not match the metadata could cause data retrieval to be delayed and possibly missed.
- Bug 1247 – Fixed an issue in how TReK GUIs respond to multiple lost TCP Client connections.

- Bug 1249 – Fixed issue with Playback not forwarding all the packets from a playback file to all the servers connected to a single listener in Playback’s forwarding dialog.
- Bug 1250 – Fixed issue with TReK Data GUI’s statistics not turning a TCP client or server device green when segments were being received but no packets were getting built because a data description filter of “None” was associated with the TCP client or server device.
- Bug 1251 – Corrected references in the TReK Playback User Guide that said Unknown instead of UserDefined. Revised the invalid packet type error message in the Playback application.
- Bug 1253 – Updated the TReK Data Manage Cryptography Settings dialog so the cryptography settings could be cleared.
- Bug 1254 – Added a validation check to the TReK Command Configure dialog to check for an invalid Firewall IP Address on the General tab or the Command Bridge tab.
- Bug 1256 – Corrected the TReK Metadata application Refresh Library function so Expected State Alarm information is refreshed correctly.
- Bug 1257 – Corrected the TReK Metadata application so the correct library items are displayed after performing an Import.

➤ Version 5.2.0:

- Notes:
 - See bug fixes.
 - This version is compatible with the latest EHS release as of the date for the 5.2.0 release.
 - TReK installs include all required third party software. The third party software is installed in the TReK installation directory. Instructions for uninstalling the third party software from previous releases are available in the install instructions.
 - Beginning with this version TReK is now available on RHEL 7.x and 64-bit Windows.
- New Processes or Libraries:
 - Added Crypt GUI – used to generate cryptography keys.
- Updated Processes or Libraries (includes change requests):
 - CFDP Console – Added support for cryptography.
 - CFDP GUI – Added support for cryptography.
 - Command GUI – Added support for the following command preference options:
 - Pad Non-String Variable Length Command Fields
 - Terminate String Command Fields
 - Data API – Added support for multi syllable parameters, switching, and formats.
 - Data GUI – Added support for cryptography.
 - Device Services API – Added support for cryptography.

- HPEG GUI – Updated to include support for latest interface version which includes updates for visiting vehicles.
 - IONconfig GUI – Can now set the maximum event queue size for CFDP.
 - Metadata GUI
 - Added support for multi syllable parameters, switching, and formats.
 - Added support to add an EHS PDSS Payload Pass-Thru packet to a TReK Database.
 - Added support to convert a TReK database format.
 - Playback GUI – Added support for cryptography.
- Bug Fixes:
 - Bug 939 – Added support for switching of calibrators, limits, enumerators, and expected states.
 - Bug 941 – Added support for multi syllable parameters.
 - Bug 958 – Added support for switching in CDEF.
 - Bug 970 – No longer generating warning messages on CDEF export if a data type is changed to match what was in the CDEF import.
 - Bug 978 – Added support for multi formats for a single APID.
 - Bug 980 – Release 3 compatible API now reports ‘c’ status character on calibration error.
 - Bug 984 – Increased maximum string available from the Release 3 compatible API from 1024 to 8192 bytes.
 - Bug 1013 – Added support for multiple payloads in a single CDEF file.
 - Bug 1038 – Adding a calibrator to a non-numeric data type could cause the Metadata GUI to crash.
 - Bug 1043 – CDEF exports now correctly set the FormatCodesMSID.
 - Bug 1111 – When logging interface messages, HPEG no longer crashes if a very large message is received.
 - Bug 1117 – Added support to allow setting of the CFDP max event queue size when generating ION configuration files.
 - Bug 1121 – Reworked the startion_autoconfig .bat and .sh files to work with ION-3.6.2. Some of the parsing had to be updated to match ION changes. You should replace these startion_autoconfig files in your node_XXXX directories for all ground nodes. The stopion.sh file now will call ionstop to shut down an ION DTN node on Linux. You must regenerate your configuration files to get this update. If you do not wish to regenerate the configuration files, you can run ionstop directly from the command line. You do not have to update the stopion.sh files if you use IONizer.
 - Bug 1127 – CDEF imports now validate that the sum of the syllable lengths for parameters is equal to the parameter length.
 - Bug 1129 – POIC databases allow counter dependency parameters to have a counter offset value of 0. In this case the dependency is only met if that

dependency parameter value is equal to the start counter value. Note: This is not allowed in CDEF and will fail on export until the CDEF schema is updated.

- Bug 1144 – When using the 3.x compatible ANSI-C telemetry API, the auto renaming feature for GSE parameters now works. Auto-renaming is done to allow previous versions of user programs to use the original parameter name without change to match the new name mangling TReK provides to allow for multiple GSE parameters with the same name, but different processing (unprocessed, converted, and calibrated).
- Bug 1145 – Corrected the TReK Data application so it presents the correct error message and exits when Cancel is pushed in the Data Store Exists dialog.
- Bug 1147 – Corrected memory overwrite issue in Parameter::GetValueAsString() associated with fixed length strings.
- Bug 1148 – Corrected the TReK Playback application so it displays the correct configuration status after a configuration file is opened.
- Bug 1149 – Corrected the TReK Playback application so it returns to the correct state after a failed activation.
- Bug 1150 – Corrected the TReK Data application so the pattern matching capability only uses the last pattern entered instead of all the patterns entered since the application was started.
- Bug 1155 – Corrected the TReK GUI applications so they would not fail to create sockets if the application's Help dialog is in use.

➤ Version 5.1.1:

- Notes:
 - See bug fixes.
 - This version is compatible with the latest EHS release as of the date for the 5.1.1 release.
 - Beginning with this release TReK installs include all required third party software. The third party software is installed in the TReK installation directory. Instructions for uninstalling the third party software from previous releases are available in the install instructions.
- New Processes or Libraries:
 - Added PEP Ethernet library.
- Updated Processes or Libraries (includes change requests):
 - HOSC Login GUI – Added capability to turn on message logging to help track issues when using the ERIS interface.
 - HPEG GUI – Added capability to turn on message logging to help track issues when using the HEPG interface. Note: previous versions of TReK had a 'hidden' feature to turn on this logging. If you used that in the past, this is its replacement.

- Command GUI – Added capability to turn on message logging. The message log consists of the data that is displayed in the View dialog. Added the capability to set queue information for the Command Bridge socket.
 - Command GUI – Added the capability to change the font size and control how colors are displayed in command status dialogs.
 - All GUIs – Added the capability to prepend the time tag to the filename that is generated when exporting messages.
- Bug Fixes:
 - Bug 988 – Added additional information to the Metadata User Guide that describes what files are generated when using CDEF.
 - Bug 989 – Update partial database conversion to use “unspecified bytes” for all data types that are not support by TReK 5.x. This aligns behavior with CDEF imports.
 - Bug 996 – The Release 3.x API now correctly reports expected state errors with an ‘E’ status character.
 - Bug 1003 – Subset lengths that required a ‘fill data’ parameter included the length of the subset id in the calculation and were two bytes too long.
 - Bug 1006 – The Data Application now cleans up unused shared memory from processes that used the API, but no longer exist.
 - Bug 1007 – In some off nominal scenarios it is possible for a version number to be incorrectly overwritten in an XML file.
 - Bug 1009 – Retrieval of parameter values that were in a random subset packet (ISS APID 876) would fail.
 - Bug 1011 – Corrected typo in Data Tutorial.
 - Bug 1014 – Updated the handling of limits so that levels 1/2/3 in the API translate to low violation and 4/5 translate to high. If a partial database was used to export a packet definition, then the packet should be exported again to use these settings. A new partial database is not necessary.
 - Bug 1021 – Updated the TReK Migration Guide to include more information about the Command API.
 - Bug 1024 – The EXPRESS header template now has a correct offset for the length. If you generated packets with previous versions of the EXPRESS headers, you should regenerate the packets. It is possible to modify existing packets to fix the issue. Contact trek.help@nasa.gov if you would like assistance in modifying the packets.
 - Bug 1036 – Updated incorrect figure reference in Metadata User Guide.
 - Bug 1051 – Fixed issue that prevented an unsigned integer limit alarm from being exported.
 - Bug 1052 – Fixed some minor issues with column types in the Command Database Definition and Telemetry Database Definition Documents.
 - Bug 1067 – The Configure Statistics Recording capability was not functional. This was corrected and this capability has been moved from the Configure

Statistics dialog to the Options menu in the TReK Data and TReK Playback applications. The capability was renamed to Configure Statistics Snapshot Recording.

- Bug 1078 – Fixed issue in Command application that overwrote message category settings on a New or File Open.
- Bug 1079 – Corrected code that saves Queue settings in applications that have this capability.
- Bug 1082 – Corrected issue that prevented retrieval of the CCSDS packet using a Get...RawValue() function when the packet type was GSE or GSE_MERGE in the Release 3 compatible telemetry API.

➤ Version 5.1.0:

- Notes:
 - See bug fixes.
 - This version is compatible with the latest EHS release as of the date for the 5.1.0 release.
- New Processes or Libraries:
 - None
- Updated Processes or Libraries (includes change requests):
 - HOSC Login GUI – Added capability to use TLS sockets.
 - Metadata GUI – Added CDEF import and export.
 - IONizer GUI – Updates to support ION 3.6.1.
 - IONconfig GUI – Updates to support ION 3.6.1
- Bug Fixes:
 - Bug 864 – Telemetry databases created from partial database downloads now create an additional parameter for the data zone of the packet with a length corresponding to the length of the packet. This allows the Data application to automatically calculate the length correctly. In previous releases, some packet may have required users to identifier the length prior to activating the packet.
 - Bug 871 – The Command application now writes warning messages when a configuration file is opened that references metadata files that cannot be found.
 - Bug 875 – The CommandApi::SendBinaryCommand method now rejects zero length buffers.
 - Bug 879 – Some figures in the Metadata Tutorial were updated to align with the current version of software.
 - Bug 881 – The migration guide now has information about copying DLLs into user application directories.
 - Bug 902 - The Metadata application's 'Convert EHS Partial Database into TReK Database' capability did not work correctly when the path for the new database was outside the trek workspace. When this scenario occurred, the Convert created the database but it did not contain the correct information and the

Convert dialog did not display any messages in the dialog message area. This has been fixed.

- Bug 903 – Processing of random subset data (e.g., APID 876) could cause the displays to show some data is missing. Data from any subset can now be used.
- Bug 904 – String data types were incorrectly converted from EHS partial database files. Also, the SEXP data type from MSFC-STD-1274 was mapped to SFIXED instead of SNULL in the TReK database.
- Bug 933 – The “Convert EHS Partial Database Files Into TReK Database” dialog in the Metadata application was updated to correct the formatting of the error message displayed when the partial database files cannot be located.
- Bug 934 – The “Configure” dialog in the Command application now saves Firewall information.
- Bug 936 – Additional information explaining the location and purpose of the CFDP Dropbox Successful Path Location was added to user guides and online help.
- Bug 946 – The TReK Command application now sets all configuration fields back to the default value on File New.
- Bug 948 – The “Convert EHS Partial Database Files Into TReK Database” dialog in the Metadata application was updated to correct the formatting of the error message displayed when command partial database files cannot be located.
- Bug 967 – Updated the Metadata application to make the Database Name field on the Database tab read-only since this field should not be modified by typing in the field.
- Bug 981 – The EXPRESS API was updated to fix a timing issue that could cause the API to not detect the RIC connection.

➤ Version 5.0.1:

- Notes:
 - See bug fixes.
 - This version is compatible with the latest EHS release as of the date for the 5.0.1 release.
- Bug Fixes:
 - Bug 810 - The Parameter dialog in the TReK Data application now only displays the correct packet key/parameter combinations. It was possible in some cases for an incorrect combination to be shown. If an incorrect parameter/packet key combination was selected when defining a custom display or monitor set, the parameter value could not be displayed or monitored.
 - Bug 811 - TReK Data Displays can only support data values up to 1024 characters. In previous versions displaying a value larger than this would lock up the application. This issue is resolved.
 - Bug 814 - The RAPTR/PRCU destination for commanding now uses the correct length when sending a command to RAPTR or PRCU.

- Bug 815 – Application specific help for the HOSC Login application did not work for Linux.
- Bug 816 - The TReK 3.x compatible Command API function `AddHeaderAndUplinkCommand()` could not be run without modifying user code. TReK 3.x required an extra two bytes for the checksum to be provided which is no longer needed in TReK 5.x. The default behavior in TReK 5.x is to send the data exact as received by the `AddHeaderAndUplinkCommand()` function. A change has been made to provide a TReK 3.x API Compatibility mode. This change is described in the Things to know section in the release notes, the Command User Guide, and the API documentation.
- Bug 818 – The Getting Started Guide was updated to include descriptions for the template and licenses directories in the install.
- Bug 820 – A Data Format column was added to the Command Update dialog in the Command application, the Collection Tab in the Metadata application, and the Packet Tab in the Metadata application. The Metadata application Parameter Details dialog was also updated to include a Data Format option.
- Bug 821 – Updated the libraries help to change the maximum time that can be represented on Linux to the year 2038.
- Bug 826 – `GetNext...()` API functions did not properly loop through the data if the 'next' parameter was not available in a packet leading to confusing error codes and the possibility of missing data. The functions will now internally loop to find the next parameter in the packet. If the last packet in the queue contains the requested parameter, a subsequent call will return SUCCESS and produce a stale status character. If the last packet in the queue does not contain data, the function will return 'no data available' (i.e., there are more packets, but none contain the data requested).
- Bug 829 – The examples for `GetNextConvertedIntegerValue`, `GetOneNextRawValue`, `GetOneNextCalibratedDoubleValue`, `GetOneNextCalibratedStringValue`, and `GetOneNextConvertedStringValue` in the libraries help were updated to include other return codes that can indicate success.
- Bug 832 – The `AddHeaderAndUplinkCommand` function in TReK 3.x did not require a single modifiable field to work. In TReK 5.0 it required a single modifiable field. The underlying code `CommandApi::InsertDataAndSendCommand` was updated to allow any command to be used. A temporary single modifiable field command is automatically created by the method to enable all commands to be used with these APIs.
- Bug 833 – If a POIC string was configured to use a simulated time an error message was returned when sending commands indicating the time stamp was not within +/- one minute of the POIC time. POIC destinations now

continuously resync an internal offset to properly set the time stamp for all messages to the POIC.

- Bug 834 – (This bug is only applies to TReK code used as part of the On-Demand Test Environment (ODTE)). The ODTE TReK Command Bridge would not start correctly if a hard kill was performed on the code crashed. Additional code was added to remove the resources that were causing the issue.
- Bug 835 – The Metadata User Guide and Online Help were updated to include information about the EHS Partial Database Import capability.
- Bug 847 – The Data application now saves the number of buffers and buffer length information from the process tab.
- Bug 851 – The TReK Data Configure dialog did not respond to a double click in the value column after the value was modified. This has been corrected so that double clicking in the value column will always enable cell editing when the Apply checkbox is checked.
- Bug 852 – The TReK Playback application now correctly applies the packet transformation before forwarding the packet.
- Bug 856 – The TReK Metadata application did not correctly clear memory after a File New. Parameters defined on the Collection tab prior to the File New would reappear after a New configuration was performed and the Parameter Details dialog was accessed. The Metadata application now correctly clears memory after a File New.
- Bug 859 – The TReK Data application now writes a more specific error message when a configuration file fails to load due to a missing metadata file referenced in the configuration file.
- Bug 865 – The TReK Metadata application now generates an error message if length information isn't set when the Details button is pushed on the Collection tab.

➤ Version 5.0.0:

- Notes:
 - See bug fixes.
 - This version is compatible with the latest EHS release as of the date for the 5.0.0 release.
 - See Known Issues for important note about DTN.
- New Processes or Libraries:
 - Command GUI
 - Command ANSI-C API (Release 3.x Compatible)
 - Command C++ API
 - Command .Net API (Release 3.x Compatible)
 - Data GUI
 - Telemetry ANSI-C API (Release 3.x Compatible)
 - Telemetry C++ API
 - Telemetry .Net API (Release 3.x Compatible)

- Record API
- HOSC Login GUI
- Metadata GUI
- Playback GUI
- Removed Processes or Libraries:
 - GSE Convert GUI – this functionality is now part of the Metadata GUI
- Updated Processes or Libraries (includes change requests):
 - CFDP Console – Two versions are now available. The original version (trek_cfdp_console) is the same and allows for command line input and output. The new version (trek_cdef_console_bg) is intended for use in scripts when user interaction is not needed.
 - HPEG GUI – The login is now part of the HOSC Login GUI to allow logins to be shared with the Command GUI.
- Bug Fixes:
 - New scripts are provided for ION (DTN) that will allow auto reconfiguration of ION without the use of the TReK DTN Proxy. Occasionally the proxy would have issues after an LOS period. The proxy is still available for use, but the auto reconfiguration is now the recommended method to connect to the POIC for DTN.

➤ Version 4.4.0:

- Notes:
 - See bug fixes.
 - This version is compatible with EHS 19.x – 22.x.
 - See Known Issues for important note about DTN.
- New Processes or Libraries:
 - CFDP Service (Windows only)
- Updated Processes or Libraries (includes change requests):
 - Added drop box capability to CFDP Software (Console, GUI, Library, and Service)
- Bug Fixes:
 - The IONizer application will no longer erroneously report a missing process when running without a proxy. You must regenerate your configuration files to eliminate the issue. Also, missing processes are only reported once instead of every second.

➤ Version 4.3.0:

- Notes:
 - See bug fixes.
 - This version compatible with EHS 19.x, 20.x, and 21.x
- New Processes or Libraries:
 - HPEG API
 - GSE Convert GUI
- Updated Processes or Libraries (includes change requests):

- Added a new data type for EHS Converted Time to the Data API to support GSE Packets.
 - Parameter::GetValueAsString() will now return enumerations strings when available.
 - Bug Fixes:
 - Corrected memory leak in the CFDP Native library.
 - Packet::Extract() will no longer return an error if a zone is composed of a single variable length parameter and the length of the parameter is zero.
 - Enumerator::Get() will now return the minimum required buffer size if TREK_DATA_NOT_ENOUGH_SPACE is the return value.
- Version 4.2.1:
 - Notes:
 - See bug fixes.
 - All bug fixes are associated with HPEG and are not required for flight configurations.
 - This version compatible with EHS 19.0 and 20.0.
 - New Processes or Libraries:
 - None (bug fixes only)
 - Updated Processes or Libraries (includes change requests):
 - None (bug fixes only)
 - Bug Fixes:
 - HPEG application now queries POIC for user authentication timeout and informs user that re-authentication is required.
 - Linux issue with multiple user accounts and HPEG resolved.
 - HPEG now activates if POIC configuration does not match user account capabilities.
 - IONizer works on slow computers.
- Version 4.2.0:
 - Notes:
 - Added EXPRESS library.
 - This version compatible with EHS 19.0 and 20.0.
 - New Processes or Libraries:
 - EXPRESS Library
 - Updated Processes or Libraries (includes change requests):
 - None
 - Bug Fixes:
 - Bugs found during beta testing.
- Version 4.1.0:
 - Notes:
 - Added Delay Tolerant Networking (DTN) Capability.

- Updated HPEG interface with POIC. This version compatible with EHS 19.0 and 20.0.
 - Added TCP keep alive support.
 - Add support for spaces in filenames or path for CFDP file transfer functions.
 - New Processes or Libraries:
 - IONconfig Application
 - IONizer Application
 - IONizer Library
 - Updated Processes or Libraries (includes change requests):
 - CFDP Application
 - CFDP Console Application
 - CFDP Library
 - Device Services Library
 - HPEG Application
 - Bug Fixes:
 - Minor fixes for off-nominal conditions in CFDP library.
 - Minor fixes for return codes in Device Services library.
 - Bugs found during beta testing.
- Version 4.0.0:
- Notes:
 - Initial capabilities
 - New Processes or Libraries:
 - CFDP Application
 - CFDP Console Application
 - CFDP Library
 - Data Library
 - Device Services Library
 - ERIS Simulator Console Application
 - HPEG Application
 - TReK Assistant Application
 - User Calibrator Generator Console Application
 - Updated Processes or Libraries (includes change requests):
 - None (initial release)
 - Bug Fixes:
 - Bugs found during beta testing.