

ESBox LT Changelog

Saturn South Pty Ltd



Firmware Version: 8447

ESBox API

ESBox API protocol version 1.0 changes

- Fixes support for receiving the following API Protocol Version 1.0 only messages:
 - Common.ReadAttributes
 - Common.WriteAttributes
 - SS_ESB.NoFurtherMessages
 - SS_ESB.NotAuthenticated
 - SS_ESB.CloseConnection
 - SS_ESB.SendErrors
 - SS_ESB.GetESBoxOptions
 - SS_ESB.SetESBoxOptions
 - SS_ESB.GetDeviceList
 - SS_ESB.GetData
-

Firmware Version: 8423

Zigbee Stack Changes

- Fixes configuration of SS9005 devices for reporting.

Firmware Version: 8337

ESBox API

ESBox API failure recovery

- Improves API failure recovery.
- The API will no longer abort the connection for minor errors (such as mis-parsed messages, bad messages, etc.) and will instead continue and try to ignore the errors as much as possible.
- In future the errors will be logged and reported (they are currently available to some extent by viewing the (esbox)comms output in the terminal).

ESBox API-related changes

- Auto report fields in usrconf modified to support changes to protocol version 1.0 and 1.1 of the ESCo API.
 - New functionality is in beta or not functional.
 - Old functionality should remain unaffected (but not properly support API versioning for versions other than API protocol version 1.0).
- Note that some auxiliary functions around the auto-report functionality may not fully support these changes.

ESBox API changes (general)

- Changes ESCo timeout and ESCo poll interval to allow timeouts/intervals of up to 4294967 seconds (though values this high are not practical or useful).
- Improves debug output from API to reduce spamminess and increase relevance/usefulness.
- Adds ESCo Push API.
 - This is another entry-point to the API, currently available via the ESBox's HTTP server. The key difference between this and the usual Pull API is that the connection is initiated by the ESCo instead of the ESBox. This makes it ideal for on-demand polling in networks where the ESCo can reach the ESBox.
 - See ESCo API documentation.

ESBox API protocol

ESBox API protocol changes for all versions

- API multiple protocol version support.
 - The ESBox tries to determine the protocol version using all known versions of the protocol version field in the wrapper. If a valid protocol version field is found, that version is used for parsing and unwrapping the rest of the message (including for parsing message IDs etc.).
 - If a the message from the ESCo used a protocol version understood by the ESBox, it will respond using the same version.
 - If the ESBox is sending a message unprompted (Pull API), the ESBox will send its first message using the default protocol version as defined in usrconf.
 - usrconf setting EscCo.Ver controls the default version of the protocol to use. Values:
 - 0: 'API protocol integer version' 0 / API protocol version 1.0
 - 1: 'API protocol integer version' 1 / API protocol version 1.1

ESBox API protocol version 1.0 changes

- A small number of messages were changed to add new features or improve existing features.
- The changes are backwards compatible if servers correctly ignore extra/unknown fields in messages sent by the ESBox.
- In some cases, improvements are only available if the ESCo sends an updated message (i.e. adds a previously unimplemented flag to a message).
- Full list of API message changes:
 - Note: if a message is not included here, it may have been removed. Some messages that were available but not implemented fall into this category (SS_ESB AddRemoveGroup for example).
 - See API documentation for full details.
 - **RX (to ESBox) messages:**
 - **Common** (common to multiple clusters):
 - **Read Attributes:** no change
 - **WriteAttributes:** no change
 - **SS_ESB** (Saturn South ESBox cluster):
 - **NoFurtherMessages:** no change
 - **NotAuthenticated:** no functional change
 - Added support for Push API.
 - **CloseConnection:** no functional change
 - Added support for Push API.
 - **SendErrors:** minor functional change
 - Improved debug output.

- Incomplete.
- **GetESBoxOptions:** no change
- **SetESBoxOptions:** minor functional change
 - Improved dropped connection handling when using Push API.
- **RestartESBox:** major functional change
 - Restarts immediately instead of waiting 2 seconds before restarting.
- **SendUpdateToken:** no functional change
 - Added version 1.1 support.
- **GetErrors:** no change
- **GetDeviceList:** major functional change
 - Added support for Detailed flag.
- **RequestDeviceToLeave:** no change
- **LocateDevice:** no change
- **PermitJoining:** no change
- **GetAvailableData:** no change
 - Unimplemented.
- **GetData:** major functional change
 - Added configuration options.
 - Default configuration if options are omitted is unchanged from 7068.
- **GetLatestReadings:** no change
- **ClearDatabase:** no change
 - Unimplemented.
- **ConfigureDataLogging:** no change
 - Unimplemented.
- **SS_LC** (Saturn South Load Control cluster):
 - **GetWaveform:** major functional change
 - Implemented the GetWaveform functionality in the backend.
 - **BroadcastDispatch:** no change
- **OnOff** (Zigbee OnOff/Switch cluster):
 - **SwitchState:** no change
- **TX (from ESBox) messages:**
 - **Special:**
 - **Container:** functional changes
 - Added a Time field (current ESBox time) to the message container sent by the ESBox.
 - **SS_ESB** (Saturn South ESBox cluster):
 - **NoFurtherMessages:** no change
 - **SendErrors:** no change
 - Incomplete.

- **SendESBoxOptions:** no change
- **SendDeviceList:** major functional change
 - Added support for Detailed flag.
- **SendAvailableData:** no change
 - Unimplemented.
- **SendData:** major functional change
 - Added support for configuration options in GetData.
- **SendLatestReadings:** no change
- **SS_LC** (Saturn South Load Control cluster):
 - **DispatchReport:** no functional change
 - Added version 1.1 support.
 - **UFLSReport:** no functional change
 - Added version 1.1 support.

ESBox API protocol version 1.1 added

- Added support for API protocol version 1.1.
- The support is provisional and in some cases incomplete.
- Some messages may change in future versions. Where this is likely the documentation (see example messages) indicates predicted changes and provides suggestions for implementation using the beta protocol.
- Full list of API messages added:
 - Note: if a message appears missing, its functionality may have been rolled into a compound message (such as putting PermitJoining in ExecuteDeviceManagementOperation_1_1) or the version 1.0 message may be the current newest version and apply for version 1.1 as well. Consult the API documentation for more details.
 - See API documentation for full details.
 - **RX (to ESBox) messages:**
 - **Common** (common to multiple clusters):
 - **ReadAttributes_1_1:** added
 - **WriteAttributes_1_1:** added
 - **SS_ESB** (Saturn South ESBox cluster):
 - **NoFurtherMessages_1_1:** added
 - **NotAuthenticated_1_1:** added
 - **CloseConnection_1_1:** added
 - **GetSupportedVersions_1_1:** added
 - **SendErrors_1_1:** added
 - Incomplete.
 - **GetESBoxOptions_1_1:** added
 - Likely to change (backwards compatible).
 - **SetESBoxOptions_1_1:** added
 - Likely to change (backwards compatible).
 - **RestartESBox_1_1:** added

- **GetUpdateStatus_1_1**: added
 - Likely to change (backwards compatible).
- **GetStatus_1_1**: added
 - Unimplemented
- **ExecuteTerminalCommand_1_1**: added
 - Likely to change (backwards compatible).
- **GetTerminalOutput_1_1**: added
- **GetDir_1_1**: added
 - May change (backwards compatible).
- **ExecuteFilesystemOperation_1_1**: added
 - Likely to change (backwards compatible).
- **GetFile_1_1**: added
 - Likely to change (backwards compatible).
- **GetDeviceList_1_1**: added
 - May change (backwards compatible).
- **ExecuteDeviceManagementOperation_1_1**: added
 - Likely to change (backwards compatible).
- **GetData_1_1**: added
 - May change (backwards compatible).
 - Note: GetLatestReadings' functionality is incorporated into GetData_1_1 for version 1.1 of the API. There is a slight change to how getting LatestReadings works using this method however. See example messages for full details.
- **TX (from ESBox) messages:**
 - **SS_ESB (Saturn South ESBox cluster):**
 - **NoFurtherMessages_1_1**: added
 - **SendSupportedVersions_1_1**: added
 - **SendErrors_1_1**: added
 - Incomplete.
 - **SendESBoxOptions_1_1**: added
 - Likely to change (backwards compatible).
 - **SendUpdateStatus_1_1**: added
 - Incomplete.
 - Likely to change (backwards compatible).
 - **SendDeviceList_1_1**: added
 - May change (backwards compatible).
 - **SendDeviceManagementResult_1_1**: added
 - Likely to change (backwards compatible).
 - **SendStatus_1_1**: added
 - Unimplemented.
 - **SendTerminalOutput_1_1**: added
 - May to change (backwards compatible).

- **SendDir_1_1:** added
 - May change (backwards compatible).
- **SendFile_1_1:** added
 - May change (backwards compatible).
- **SendFilesystemOperationResult_1_1:** added
 - Likely to change (backwards compatible).
- **SendData_1_1:** added
 - Likely to change (backwards compatible).

Zigbee Stack Changes

- Adds ZigBee network profiling tool.
 - Provides reconstructable time-series data, which can be analysed and help diagnose network issues.
- Adds a timeout when refreshing a node to ensure that the process doesn't stall.
- Internal changes to better track reporting state of node.
- Adds Silent OTA mode, which configurably disables or reduces reporting from nodes while an OTA update is in progress. This ensures that network traffic is minimised, reducing the time to perform an OTA and improving reliability.
 - Reporting of switch state is retained to ensure that the current switch-state is always kept up to date for all nodes with switches.
- Modifies internal NVM node list structure to improve memory usage, write times, access times and safety.
- Improves performance of network refresher, which is responsible for managing and configuring nodes when they join and once they are joined to the network.
- Adds additional default device configurations for iiNet wall plug and newer Saturn South devices.
- Adds and modifies a number of usrconf options. For details see Device Configuration Settings documentation.
- Miscellaneous Zigbee stack improvements and bugfixes.

End Device Configuration (alpha)

- Adds alpha version of End Device Config (EDConf) system.
 - Not enabled by default.
 - Not enabled for all usages.
 - Only available for testing.
 - Consult Saturn South for details.

General ESBox Changes

SNTP client added

- When active, the client periodically try to override the current ESBox time with the time as determined by the SNTP client.
- Configuration (usrconf):
 - Ntp.En:
 - 1: Enable
 - 0: Disable
 - Default: 0
 - Ntp.Addr:
 - The ntp server to connect to (FQDN or IP)
 - Default: pool.ntp.org
- See Device Configuration Settings documentation for more details.

Client SSL key size changed

- Changes client SSL keys from 512 to 2048 bits.

Bugfixes, optimisation and standardisation

- Stream database (SDB)
 - Fixes bug with Stream Database (SDB), which could cause readings to be dropped when they shouldn't be, and could in some cases cause readings to never make it to Latest Readings with some SDB filter settings.
 - Improves SDB and Latest Readings performance and memory usage.
 - Fixes SDB to properly obey settings in usrconf.
 - Standardises printing of SDB to json and improves/expands what can be printed.
- Latest readings
 - Standardises printing of latest readings non-destructive to json.
- Data handling
 - Adds support for 24-bit values in readings module (SDB, latest readings).
- Updater
 - Adds measures to reduce memory and CPU usage when starting the updater process. This helps to ensure that the updater can run, even with a high load on the ESBox. If used, the feature will stop and free memory from the zigbee stack all volatile readings (latest readings) module.
 - See Device Configuration Settings for configuration details.

- Exposes metrics and provides detailed status visibility about the update process.
- Secure NVM
 - Improves safety of writing attributes stored in secure non-volatile memory (such as HAN address, link key, etc.).
- Terminal, ESBox status and debugging
 - Standardises printing of ESBox status to json.
 - Standardises printing of terminal output to json.
 - Adds better exception/crash debugging information.
 - A summary and notification that an exception occurred is printed to the terminal at startup. The line will appear something like:
 - Exception log: 0x00000004 @ 0x9D000000
 - The first hex word is the cause and the second is the exception address. These values can be useful for determining the cause of an issue in consultation with Saturn South.
 - A file with more detailed information about the failure is also generated.
 - The file is generated at /.crashlog
 - This file can be useful for determining the cause of an issue in consultation with Saturn South.
 - The file can be downloaded by entering 'wedit /.crashlog' at the terminal and then pressing 'download'.
- Webapp (server-side)
 - Changes webapp permit joining to toggle permit joining instead of being an explicit turn on or turn off command.
 - Note: the button text may not reflect this change in the current versions of the web-app client-side code. The button will act as a toggle nevertheless.
 - Adds neighbour table data to webapp device list.
 - Note: this data may not be displayed by the client-side code.
 - Adds additional information about registered updates in webapp updates list.
 - Note: this data may not be displayed by the client-side code.
 - Standardises rendering of webapp data to json.
- Internal
 - Devconf and usrconf system.
 - Autoconfiguration for ZigBee networks when reporting intervals/etc. are changed: ZigBee nodes will now be automatically reconfigured with new settings in some cases.
 - Commissioning verification and validation improvements.
 - Regular network scan to enable detailed network metrics.
 - Fixed, more streamlined and more consistent debug messages.
 - Nicer (actually readable) filenames in memory profiling system.
 - Improved out-of-memory messages.
 - Improves and makes more consistent printed memory profiling data.

- Changes and updates filesystem API for more consistent rendering (to JSON) and manipulation of the filesystem and files.
- Adds better parsing for json literals (not supported for all messages – see example messages for details).
- Improves ROM usage (MIPS 16).
- Fixes memory usage of parsing input strings to the terminal.
- Fixes and changes to terminal commands, parser structure, etc.
- Fixes a potential memory leak in tar tool.