# READ THIS BEFORE UPGRADING

**Warning: The user is strongly advised to review these release notes thoroughly before performing any update as existing information or functionality may be disrupted after performing the update.**

As mentioned in the installation manual at section 2.3.2, the user can choose to install any version higher or equal to 2.0.0, meaning that after installing this version it can be downgraded to a previous version (>=2.0.0).

Note that versions higher than 2.0.0 requires the new dual-band ZigBee USB dongle to operate with dual-band support. To operate in single-band mode GFI requires either the new Dual-band ZigBee USB dongle (recommended) or an old GFI 1.3.XE dongle - provided that before being used the dongle firmware is upgraded to the new ZigBee stack version.

If you are performing a fresh installation please check “System Requirements” section for details about minimum and recommended hardware requirements to run this tool.

## Release Notes

GIT for Industry (GFI) is a software tool, provided by Smart DCC, for anybody that wishes to check whether their interpretation of the Great Britain Specification Companion for smart meters (GBCS) is consistent with Smart DCC’s.

These release notes refer to version 4.3.0 of the GFI testing tool. Please check “System Requirements” section for details about minimum and recommended hardware requirements to install and run this tool.

For technical support please contact the GFI Support Team: GFISupport@smartdcc.co.uk

## Release Information

| Version Number | Release Date | Zigbee Stack Version | SEP | GBCS Compliance | DUIS Version | MMC Version |
|---|---|---|---|---|---|---|
| 4.3.0 | 28th January 2021 | Silabs 6.3.3 | 1.4 | GBCS 4.0 | 4.0 | 4.0 |

## Release Timeline

| Version Number | Release Date | Comments |
|---|---|---|
| **4.3.0** | 28/01/2021 | Full support of HAN persistence on GFI CH.<br>Fixed GBCS ECS46d<br>Bug fixes and stability improvement. |
| **4.2.9** | 26/11/2020 | Support for custom use cases.<br>Bug fixes. |
| **4.2.8** | 06/10/2020 | Memory management improvement. |
| **4.2.7** | 18/09/2020 | Bug fixes. |
| **4.2.6** | 15/09/2020 | Bug fixes and stability improvement. |
| **4.2.5** | 10/09/2020 | Bug fixes and stability improvement. |
| **4.2.4** | 31/08/2020 | Bug fixes and stability improvement. |
| **4.2.3** | 18/08/2020 | Stability improvement. |
| **4.2.2** | 12/08/2020 | Bug fixes and stability improvement. |
| **4.2.1** | 31/07/2020 | Added support for Zigbee HAN persistence on GFI CH. |
| **4.2.0** | 24/07/2020 | Business Scenarios aligned with GBCS 4.0.<br>Bug fixes and stability improvement. |
| **4.1.0** | 09/07/2020 | Added support for TCSO on GFI CH.<br>Updated ECS100 use case. |
| **4.0.1** | 26/06/2020 | Bug fixes. |
| **4.0.0** | 19/06/2020 | Uplift to GBCS version 4.0 as per CR1294.<br>New functionalities, bug fixes and stability improvement. |

| Version Number | Release Date | Comments |
|---|---|---|
| **3.3.0** | 08/05/2020 | Upgrade GFI to be officially compatible with Ubuntu 18.04.<br><br>Bug fixes and stability improvement. |
| **3.2.1** | 23/04/2020 | Bug fixes and stability improvement. |
| **3.2.0** | 13/03/2020 | Upgrade SiLabs Zigbee stack to version 6.3.3.<br><br>New functionality to change CH's date and time.<br><br>Bug fixes and stability improvement. |
| **3.1.1** | 31/01/2020 | Bug fixes and stability improvement. |
| **3.1.0** | 09/01/2020 | New functionalities. |
| **3.0.2** | 14/11/2019 | New functionalities. |
| **3.0.1** | 25/10/2019 | New functionalities, bug fixes and stability improvement. |
| **3.0.0** | 13/09/2019 | Uplift to GBCS version 3.2 as per CR1047<br><br>Business Scenarios aligned with GBCS3.2<br><br>New functionalities, bug fixes and stability improvement. |
| **2.1.6** | 02/09/2019 | New functionalities, bug fixes and stability improvement.<br><br>Business Scenarios aligned with GBCS0.8.2 |
| **2.1.5** | 17/06/2019 | New functionalities, bug fixes and stability improvement |
| **2.1.4** | 24/04/2019 | New functionalities, bug fixes and stability improvement |
| **2.1.3** | 06/03/2019 | New functionalities, bug fixes and stability improvement |
| **2.1.2** | 16/01/2019 | Bug fixes and stability improvement |
| **2.1.1** | 09/10/2018 | Bug fixes and stability improvement |
| **2.1.0** | 05/07/2018 | Upgrade SiLabs Zigbee stack to version 6.2.3.<br>Bug fixes. |

| Version Number | Release Date | Comments |
|---|---|---|
| **2.0.3** | 28/05/2018 | Bug fixes and stability improvement |
| **2.0.2** | 30/04/2018 | Bug fixes and stability improvement |
| **2.0.1** | 27/03/2018 | Bug fixes and stability improvement |
| **2.0.0** | 09/02/2018 | New dual-band ZigBee USB dongles required for subGHz operation.<br><br>Firmware upgrade required for single band 2.4GHz ZigBee USB dongles.<br><br>After update to GFI 2.0 the single band 2.4GHz ZigBee USB dongles will not work until its firmware is upgraded. |
| **2.0.0 RC2** | 04/12/2017 | Current release candidate version |
| **1.3.9E** | 03/10/2017 | Current public version |
| **2.0.0 RC1** | 25/08/2017 | Previous release candidate version |
| **1.3.8E** | 08/08/2017 | Previous public version |
| **1.3.*E** | 25/07/2016 | Enhanced version. New GFI tool architecture. GUI changes. Support for persistent HAN, multiple HAN devices and GPF functionality with mirror |
| **1.3.2** | 28/06/2016 | The 1.3.* release series updates ALL the supported Use Cases from GBCS v0.8.1 to GBCS v0.8.2 |
| **1.2.*** | 01/02/2016 | Partial list of use cases uplifted to GBCS v0.8.2 |
| **1.0.*** | 29/06/2015 | First industry public release of GFI. Supports all use cases specified in GBCS v0.8.1 |

## Before Updating

Please update the “GFI Update” tool using this link:

https://gfi-update.criticalsoftware.com/18/releases/LatestInstallerGFI.deb

Use the Upgrade button to confirm.

The Username and Password are the same used to access the documentation of this release.

⚠ For users owning a 2.4GHz single band ZigBee USB stick (e.g. 1.3.9E), it is required to upgrade its internal firmware enable use with the GFI >= 2.0.0 or you will not be able to use the GFI after the update. Please make sure that you have the necessary tools (ISA3 – Ember Debug Adapter) to flash the new firmware of the ZigBee USB stick.

The new dual-band ZigBee USB dongles, required for subGHz operation, have a delivery period estimated between 1 to 2 months.

Please read carefully section 2.3 of the installation manual.

The scenario and property file formats in versions higher than 2.0.0 are incompatible with previous versions. Attempting to open or run tests created with previous versions of the tool will result in failure.

The user may still use the Export functionality for backup purposes – However, the tests will need to be re-created using version 2.0.0 or later of the tool.

Users are strongly advised to read the updated documentation in order to be familiar with the architectural and user interface changes, namely in order to configure and start the Communication Hub service.

The installation process will create a backup of the existing GFI installations files into a zip file which will be saved to /opt/gfi-backups/.

## List of Changes by Release

### What's New: 4.3.0 Stable

Added support for GPF persistence. After a soft shutdown and a soft start, the mirror configuration and tunnelling information are retained.

Fixed GBCS ECS46d use case to allow 120 scheduler entries.

### What's New: 4.2.9 Stable

Implemented support for custom (non-GBCS) use cases.

Added support for SCPI messages on the GFI CH.

### What's New: 4.2.8 Stable

Added more information for the user when starting or stopping the GFI CH from the GUI.

### What's New: 4.2.7 Stable

Stability improvement..

### What's New: 4.2.6 Stable

Fixed the value of the "access request specification" parameter on ECS46d's response.

### What's New: 4.2.5 Stable

Stability improvement.

### What's New: 4.2.4 Stable

Fixed ECS26c. Added Supplementary Remote Party to the response when applicable.

## What's New: 4.2.3 Stable

Stability improvement.

## What's New: 4.2.2 Stable

Stability improvement.

## What's New: 4.2.1 Stable

Implemented Zigbee HAN persistence on GFI CH. After a soft shutdown and a soft start, the PanID and the previous link-keys are retained.

## What's New: 4.2.0 Stable

Updated SMITEn-Lite to GBCS version 4.0.

Aligned Business Scenarios with GBCS 4.0.

## What's New: 4.1.0 Stable

Added support for TCSO (Trust Centre Swap Out) on GFI CH.

Updated ECS100 to add the Supplementary Remote Party Counter as per IRP629.

## What's New: 4.0.1 Stable

Fixed CS02f cryptography.

## What's New: 4.0.0 Stable

Uplift to GBCS version 4.0 as per CR1294, supporting new GBCS use cases: CS02f; CS02g; CCS07; ECS46d; ECS47a; ECS61d; ECS61e; ECS100; ECS101; ECS102 and ECS200.

## What's New: 3.3.0 Stable

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|---|
| Upgraded GFI to be officially compatible with Ubuntu 18.04. |
| Implemented CRP535 as per specification. CRP535 adds the facility to restore devices that have been removed from the HAN, re-using the TC Link Key. |
| Fixed GFI Comms Hub ZigBee localtime attribute to match BST. |

## What's New: 3.2.1 Stable

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|---|
| Fixed GFI Comms Hub to update the ZigBee localtime attribute. |
| Improved CRP535 (Restoring removed devices from the HAN) implementation. |
| Included extra files to compile advanced custom use cases. |
| Improved date display. On execution Reports, the date fields will no longer be displayed as NEVER or NOW and the full date format will be used instead. |

## What's New: 3.2.0 Stable

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|---|
| Fixed the GPF Event log to return events in the correct order (from the oldest to the most recent). |
| New functionality to change the CH time. |
| Fixed the CS05b to use with firmware image files up to 750 KB (as per GBCS). |
| Upgrade SiLabs Zigbee stack to version 6.3.3. |

## What's New: 3.1.1 Stable

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|---|
| Fixed Upgrade Time value on UpgradeEndResponse command from CH. |
| Fixed Credit Remaining in the CS01b report to support negative values. |

## What's New: 3.1.0 Stable

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|---|
| New functionality to force corrupted messages on GUI. |
| New functionality to force corrupted messages on GFI. |
| New functionality to allow the user to define the OTA images path on GUI. |
| New command on GFI CH CLI for sending a broadcast or unicast notify-image. |
| Added support to CS05b use case on GFI, for real Zigbee devices. |
| New functionality to allow the user to access the GFI CH CLI through a telnet connection. |
| New functionality on GUI to open a telnet connection to the GFI CH. |

## What's New: 3.0.2 Stable

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|---|
| New functionality that allows transfer of OTA image to sleepy device. |
| New functionality that allows transfer of OTA image to non-sleepy devices. |
| New functionality to support the Firmware Distribution Alert, alert from device to Remote Party. |
| New functionality to support bound clusters. |

## What's New: 3.0.1 Stable

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|---|
| New functionality on GUI to support the generation of UTRN codes for local delivery. |
| New functionality that allows the user to sign and/or verify a firmware image. |
| New functionality on GUI to support the use of the sign and verify tool. |
| Added new use case CS05b – emulated mode only. |

## What's New: 3.0.0 Stable

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|---|
| Uplift to GBCS version 3.2 as per CR1047. |
| Business scenarios aligned with the GBCS version 3.2. |
| The new use case GCS24a is now supported as defined by CR229. |
| The new use case ECS35g is now supported as defined by CR243. |
| The new use case CCS07 is now supported as defined by CR1047. |
| Change scenario functionality now supports the import and export of the devices details table. |
| Change scenario functionality now allows the user to select a specific device to be changed in the scenario files. |
| The version of SMITEn-Lite was uplifted to version 3.0.0. |
| The GCS20r use case is now updated to support an alternative response as defined by IRP550. |
| Implemented the change of tenancy as defined by CR1093. |

## What's New: 2.1.6 Stable

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| New funcionatlity on GUI to allow the user to change the test scenarios. |
| Business scenarios aligned with GBCS version 0.8.2 |
| On ECS46a the error parameters were moved to the correct section on GUI. |
| On ECS29d the parameter AverageRMSVoltageMeasurementPeriod was fixed to use the values set by the user. |
| On CS03 it was added an iteration with the device type set to type1PrepaymentInterfaceDevice. |
| On ECS46a/ECS46c the default values were corrected. |
| Fixed the incorrect publish price. The value is now reported to HAN devices in milipence/kWh. |

## What's New: 2.1.5 Stable

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| New functionality on GUI. Now is possible to import a workspace. |
| On ECS02 the "NumberOfAlerts" parameter was changed from input to output parameter. |
| On GCS02 and GCS03 it was removed the "Response" suffix from some input parameters. |
| Some default iterations were updated on ECS17d, GCS16b and GCS41. |
| The GPF's handler for Notifications Flags was updated. No longer requires the "ManufacturerName" and "ModelIdentifier" attributes to be mirrored. Now, for all Static Data, the GPF only requires the Attribute Reporting Status attribute with value 0x01 (Attribute Reporting Complete) to unset the respective flags. |
| On GCS21b, in a successful scenario, the value defined in "Price.ReadAttributes.CommandID" parameter is being checked against the value in the response received. |

## What's New: 2.1.4 Stable

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| The ZigBee Publish Price Command on GPF to send the value in KWh on HAN requests was corrected. |
| Add new advice in GUI when the stack versions in NCP and Host are not the same. |
| Add new JSON command to check stack versions in use by the NCP and Host. |
| Change version name on the released packages. |

## What's New: 2.1.3 Stable

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| Fixed the misleading DeviceLogCHF.hanIdentifier parameter type of CS14 on GUI. |
| Improvement on the process that detects all the GFI instances. |
| Addition of a collapse button to the Tests and Campaigns tree view on GUI. |
| Fixed the problem regarding GSME being suspended when reading the suspension period. |

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| New messages codes, PECS01 (0x0116) and PECS02 (0x0117), to be logged on ECS35a emulated use case. |
| Corrected the number of switching rules on default iterations of ECS01a ECS01c, to be compliant with 200 switching rules across all Day Profiles stated by SMETS. |
| Implemented on CH the functionality to work on multiple ZigBee modes ("Sub Ghz", "GHz" or "Dual"). |
| Addition of missing result check on ECS07 and ECS18. |

## What's New: 2.1.2 Stable

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| Fixed response of Tariff when read from HAN after a second configuration. This did not affect WAN response. |
| Fixed the wrong behaviour when adding a new Non-DisablementCalendar/TariffSwitchingTable to the GPF. |
| Fixed GPF not properly respond to GetCurrentPrice request from PPMID next day after the HAN is established. |
| Fixed incorrect device log restore in the CH upon a CCS03. |
| Triage Tool updated with GBCS 2 use cases. |
| Updated default iterations of CS03 to include a certificate with the expected encryption method. |
| Fixed the BillingPeriodStartTime value returned by GPF in GCS21d. |
| Fixed the incorrect construction of the PublishPriceMatrix by the GPF. |
| Fixed the inconsistency in the resource naming and missplacing of CS04. |

## What's New: 2.1.1 Stable

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| Add support to Tap-off command for GCS25a. |
| Fixed PriceMatrix/BlockThreshold attributes not being properly updated. |
| Fixed inconsistent resource naming in ECS47. |

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| Fixed inconsistent resource naming in GCS38 and GCS28. |
| Fixed CS10a success response payload. |
| Correct the input parameters on tariff use cases. |
| Fixed GFI CH not logging to the atg-testing-tool. |
| Fixed Auto-correction of encondings not following the IRP205, causing CS02a PPMID to fail. |
| Updated GCS20r in alignment with CR329. |
| Updated GCS20 in alignment with CR329. |
| Updated CS02b in alignment with CR329. |
| Fixed ENUMERATED and INTEGER ASN1 data type are treated as same in CS02a/CS02b. |
| Fixed GUI not properly handling a CH exception when successfully launched. |
| Fixed GPF limiting the number of samples returned in response to GCS61. It was limited to 200 samples. |
| Fixed GFI failure when running use case ECS47 when not checking the ACCESS_RESPONSE_TYPE parameter. |
| Fixed input parameters on iterations of CS02b, CS06 CS10a, ECS01a, ECS01b, ECS01c, ECS01d, ECS02, ECS03, ECS08, ECS08a, ECS12, ECS28a, ECS46c, GCS01a, GCS01b, GCS02, GCS03, GCS05, GCS61. |

## What's New: 2.1.0 Stable

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| Upgrade to SiLabs stack version 6.2.3.<br><br>Use the desktop icon "GFI Flash Firmware" to upgrade the dongle Zigbee stack |
| Fixed issue where the GFI report was not showing data for json element "remotePartySeqNumberChanges" present at the alert when CS02b was set as future dated. |

## What's New: 2.0.3 Stable

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| Fixed issue where CH fails to receive APS ack in Sub GHz network on high traffic situation. |
| Fixed uninitialized local variable in Silabs stack. |
| Added a new desktop item to update the firmware of dual-band dongles. |

## What's New: 2.0.2 Stable

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| Implemented support on GPF for commands including the Supplementary Remote Party KA Certificate. |
| Fixed Silabs stack bug in Sampled IDs. Profile Data Log and Daily Consumption Log were swapped between each other. |
| Added check of Certification request key usage and HW serial number in the response for CS02c and CS02e. |
| Added check of the json in the response for CS02a and CS02b. |
| Fixed the logic associated with the Notification Flags as per GBCS specification. Fixed the following flags: Push All Static Data (Basic Cluster, Metering Cluster, Prepayment Cluster) and Push Historical Metering/Prepay Data Attribute Set. |
| Improved stability of CH tunnelling when the client closes the tunnel while transferring data. |
| Added print of GENERAL_SIGNING_MESSAGE in the report for the GCS21b and GCS21f commands. |
| Fixed bug in expected parameter "CountSuccess" for CS02a. It was comparing with 0 if empty. |
| Removed Tunnelling cluster from ESI endpoint. |

## What's New: 2.0.1 Stable

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| Fixed Energy scan trigger when no channel is selected for SubGHz Channels page 31. |
| Fixed Duty Cycle suspension broadcast to do not suspend GSME. |
| GFP mirror attribute 0x0306 from cluster 0x0702 is accessible to all devices in the HAN if it is read individually with read attribute command. |

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| Added support to GFI CH for ECS26n-CHF. |
| Added support to GFI CH for ECS52-CHF. |
| Added support to GFI GPF for encrypted use cases with supplementary information. |
| Channel noisier and quieter thresholds from DBCH04 are now being respected. |
| Fixed Response Sequence Number behaviour on multiple ZSE/ZCL command of same type. |
| Fixed default iteration for GCS07 which contained invalid chars in message. |
| Fixed "Flow control for delivering Commands to ESME" in alignment with CRP528. |
| Improved stability of gfi-comms-hub by recovering from sporadic Silabs stack crashes. |
| FunctionalNotificationFlags bits 12,13 and 14 are now set permanently so that the GSME push all static data. |

## What's New: 2.0.0 Stable

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| GFI can now be installed in a machine running a non-Native GFI image without formatting the PC. Support only for Ubuntu 14.04 LTS. Please read the GFI Installation Manual |
| Update of GFI software does not require a registered ZigBee USB dongle connected. |
| Install process now creates a backup of the existing GFI installations files into a zip file which will be saved to /opt/gfi-backups/. This can be useful for recovery of user modified files. |
| Support for downgrade GFI to previous versions (>=2.0.0). |
| Silabs stack of the Dual-band ZigBee USB dongles can to be upgraded via the user USB connection. |
| Changes to GCS21f to detect malformed messages in Break on Error condition. |
| Changes to GCS21b to detect malformed messages in Break on Error condition. |
| Full support to GetCurrentPrice command received from the HAN or from the WAN. Price is calculated according to the GSME configuration. |
| Comms Hub alignment with IRP485 - CHs behaviour to support GSME retry after successful CKBEs. |

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| Dual-band GFI Comms Hub in alignment with CRP513. |
| GUI enhancements to configure the subGHz Comms Hub parameters. |
| GUI enhancements to control the radio transmit power. |
| GUI enhancements to control the serial connection with ZigBee USB dongle (baud rate and flow control). |
| Corrected Comms Hub tunnel ID behaviour. When receiving a RequestTunnel command from a client Device which has an active TunnelID registered with the server Device, return the existing ID. |

## What's New: 2.0.0 RC2

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| Upgrade to SiLabs stack version 6.0.0. |
| Dual-band GFI Comms Hub in alignment with CRP427 - 868 related changes. |
| Comms Hub alignment with IRP418 (support up to 16 devices). |
| Comms Hub alignment with CRP428 - Flow control for delivering Commands to ESME. |
| Comms Hub alignment with IRP510 - CH behaviour on 2nd CCS01. |
| Enhancements to emulated scenarios to support devices of type HCALCS and PPMID. |
| GUI enhancements to improve the support the definition of test cases for devices of type HCALCS and PPMID. |
| GUI enhancements to support the Segmented Processing feature in Basic Mode. |
| Alignment with IRP541. The IRP corrects the hexadecimal encoding of OBIS Codes of Prepayment Charge Objects used in ECS02, ECS03 and ECS26a. |
| Alignment of GBT implementation with the DSP. GBT data messages sent by the GFI ACB now set the window field to 6. |
| Adds missing attributes in CommsHub endpoints. |
| Resolves an issue where devices added to the CommsHub whitelist from the configuration (as opposed to being added using use case CCS01) were not shown when retrieving the list of devices using the "Fetch HAN Log Entries" option from the toolbar. |

The GUI incremental search in the log viewer window was improved to be case-insensitive.

## What's New: 2.0.0 RC1

The following use cases are now supported as defined by CRP411:

ECS29c – Set Voltage Configurations on ESME without counter reset

ECS29d – Set Voltage Configurations on polyphase ESME without counter reset

ECS29e – Reset RMS Voltage Counters on ESME

ECS29f – Reset RMS Voltage Counters on polyphase ESME

The following use cases are now supported as defined by CRP412:

ECS25a1 – Set Event Behaviours - ESME to HAN Device - Supplier

ECS25a2 – Set Event Behaviours - ESME audible alarm - Supplier

ECS25a3 – Set Event Behaviours - ESME logging - Supplier

ECS25b3 – Set Event Behaviours - ESME logging - Network Operator

ECS25r1 – Read non-critical event and alert behaviours - ESME- Supplier

GCS20r – Read non-critical event and alert behaviours - GSME- Supplier

ECS25r2 – Read non-critical event and alert behaviours - ESME- Network Operator

Meter Integrity Issue Warning Alert – ESME

Meter Integrity Issue Warning Alert – GSME

Frame control field errors were fixed as defined by IRP446.

GCS15d now supports a dynamic Latest End Time as defined by IRP448.

The following use case is now supported as defined by IRP474:

Update Prepayment Configuration on ESME

Field "otherRemotePartySpecialistFloorSeqNumber" in CS02b was renamed to "newRemotePartySpecialistFloorSeqNumber" as defined by IRP477.

The following use cases are now supported as defined by CRP518:

ECS30a – Set Billing Calendar on the ESME - all periodicities

ECS26l – Read ESME Configuration Data Device Information (Billing Calendar - all periodicities)

GCS21k – Read GSME Configuration Data Device Information (BillingCalendar - all periodicities)

GCS25a – Set Billing Calendar on the GSME - all periodicities

ECS48 – Configure daily resetting of Tariff Block Counter Matrix

The following use cases are now supported as defined by CRP513:

ECS26m – Read ESME Configuration Data Device Information (identity, type and supply tamper state)

ECS26n – Read CHF Configuration Data Device Information (CH identity and type)

GCS21m – Read GSME Configuration Data Device Information (identity, type and supply tamper / depletion state)

The following use cases are now supported by the gfi-testing-tool and by the GFI GUI (but not yet by the GFI CommsHub) as defined by CRP513:

DBCH01 – Read CHF Sub GHz Channel

DBCH02 – Read CHF Sub GHz Channel Log

DBCH03 – Read CHF Sub GHz Configuration

DBCH04 – Set CHF Sub GHz Configuration

DBCH05 – Request CHF Sub GHz Channel Scan

DBCH06 – Limited Duty Cycle Action Taken Sub GHz Alert

DBCH07 – Sub GHz Channel Changed Sub GHz Alert

DBCH08 – Sub GHz Channel Scan Request Assessment Outcome Sub GHz Alert

DBCH09 – Sub GHz Configuration Changed Sub GHz Alert

DBCH10 – Message Discarded Due to Duty Cycle Management Sub GHz Alert

DBCH11 – No More Sub GHz Device Capacity Sub GHz Alert

CCS06 – Read CHF device log and check HAN communications

The following use case is now supported by the gfi-testing-tool and by the GFI GUI (but not yet by the GFI CommsHub) as defined by CRP428:

Failure to Deliver Remote Party Message to ESME Alert

A new tool named “GFI Interface Tool” was added to the GFI distribution. This tool is a command line utility that acts as a simple interface module suitable for passing GBCS messages between GFI and a CommsHub CLI interface using the GFI Segmented Processing API.

More information on the GFI Interface Tool can be found in the Segmented Processing documentation.

## What’s New: 1.3.8E Stable

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| Support for responses to unsuccessful commands. |
| CHF is now able to handle a message sent from a GSME before the GPF mirror is created. |
| GFI acting as the GBT Initiator (sending commands) now sets streaming to 0 on the last window block. |
| Changes to ECS01c second iteration to correct an invalid number of switching rules. |
| Changes to ECS01c iterations to correct invalid script_selector values. |
| Corrections to the initialization values of some attributes in the GPF Prepayment cluster. |
| Messages to the GSME buffered by the CH are no longer lost after sending a Change of Tenancy command to the GPF. |
| GPF proxy event and security logs are now correctly exposed on the HAN. |
| Mirrored attribute HWVersion is now correctly exposed on the HAN. |
| GCS21j to the GPF now correctly returns the configuration data mirrored by the GSME. |
| Metering summation values are now correctly stored in the GPF mirror. |
| SupplyStatus attribute type corrected to ENUM8. |
| GPF now correctly supports GetSampledData on the HAN. |
| Scenario files no longer hardcode the system_datetime attribute and instead rely on the operating system time. |
| Triage tool now correctly decrypts encrypted data in a GCS15c response with supplementary remote party data. |

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| Alignment of GCS02, GCS03 and GCS21d with IRP446. |
| GCS15e now correctly reports entries in reverse chronological order and without duplicates. |
| ECS20c report now separates registerReadLog and prepaymentReadLog. |

## What's New: 1.3.7E Stable

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| New "Segmented Processing" functionality that adds the possibility to use the GFI software with a physical CH. Please refer to the "GFI Segmented Processing" document for more detailed information regarding this feature. |
| Alignment with IRP420 that corrects the command identifier values in the ZCL payloads of the alternate responses to GCS15d and GCS15e. |
| Alignment with IRP447 that corrects the data type of the attribute "Price Trailing Digits" in GCS21b. |
| Alignment with IRP469 that adds duplicated requests for the attributes "Debt Recovery Rates". |
| Alignment with IRP461 that resolves a GBCS ambiguity regarding which bits in the Originator Counter should be considered for the PTUT Truncated Originator Counter. |
| GFI CH now only closes its client tunnel after a TransferDataError command if the status code is 0x00 ("No such tunnel"). |
| Fixes an issue where the GFI CH would, after receiving *RequestTunnelResponse* command from a Device with a *TunnelStatus* of 0x02 (*No More Tunnel IDs*), request a new tunnel before receiving the responses confirming the closing of any active tunnels. |
| Fixes an issue where the GFI CH was sending a MirrorReportAttributeResponse command in response to every ReportAttributes command when it should be sent only to the last one. |
| Fixes the following issues when updating notification flags:<br>• The GetSampledData flag is not cleared after the sampled data is received.<br>• Flags are not updated after all GetNotifiedMessages are processed.<br>• Flags are not updated when they are read using a ZCL Read Attributes command.<br>• In some cases notification flags may not be updated after a Report Attributes due to an incorrect calculation of the current time. |
| The GFI CH now supports a new Sleepy End Device timeout parameter to set the aging timeout after which a device will receive a Leave Request and will have to rejoin the network. |

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| Because of incompatibilities between ZigBee stack manufacturers, the Leave Request with rejoin flag active sent by the CH may be rejected by the sleepy end device. The new parameter will allow GFI to work with all end devices implementing different stacks and at the same time keep the possibility of testing the Leave/Rejoin procedure after the aging out of the address table entries. |
| The GFI CH is now capable of handling Default Response commands arriving before the APS ACK message. |
| Fixes an issue where the GFI CH would in some cases incorrectly identify a device based on the MAC address. |
| The GFI GPF now returns the correct value of CurrentSummationDelivered in GCS13a. |
| The GFI GPF now responds to a GetCurrentPrice command from the HAN with a PublishPrice command. |
| CS02d iteration using an RSA certificate was removed. |
| GCS15b, GCS15c, GCS16a, GCS16b and GCS17 iterations from the GSME with supplementary remote parties were removed to align the tests with GBCS. |
| CS14 alert now correctly sends IEEE addresses and hashed keys in big endian. |
| CS03c iteration using an RSA certificate was removed. |
| Fixes an issue where GCS14 would only report zero in the “Tariff Information: Currency” most significant byte. |
| Fixes an issue where the GFI process would terminate with “segmentation fault” if the CS02b optional field “otherRemotePartySeqNumberChages” was left empty. |
| The first CCS03 iteration was changed to reduce the number of devices to a value allowed by the CH. |
| The number of expected samples in the second iteration of GCS61 was changed from 10 to 11 to align it with the iteration inputs. |
| CS10a to the GPF now supports requesting the GSME proxy log (Log ID 0x16). |
| CS10b to the GPF now supports requesting the GSME proxy log (Log ID 0x07). |
| Fixes an issue where GFI was incorrectly checking that the “Snapshot Cause” in GCS15c has exactly the value 0x00000002 instead of just checking that bit 1 was set. |

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| The second iteration of GCS20, containing an invalid Event Configuraion, was removed. |
| Fixes an issue where GCS21a expected output parameter MeasurementPeriodStatus was being incorrectly processed. |
| Fixes an issue where GFI would not be able to decrypt sensitive data returned in a GCS61 response with a supplementary remote party. |
| Fixes an issue where the PTUT Supplier MAC was being derived from bits 63 to 32 of the 128 MAC calculation instead of bits 31 to zero. |
| Fixes several issues related with the GBT Header to align with the DLMS Green Book.<br><br>In data messages (where GFI is the GBT Initiator):<br><br>• The “streaming” bit is not set to zero in the last window block of each window and also in the last message block.<br>• The “window” should be set to 1 (because this window size refers to the ACK messages received by the Initiator).<br>• “block-number-ack” is always zero. It should match the block number of the last ACK.<br><br>In ACK messages (where GFI is the GBT Receiver):<br><br>• “last-block” should always be 1.<br>• “streaming” should always be zero. |
| GFI now always sends a GBT ACK after receiving the last block even if the block number is not a multiple of the window size. This was done to align GFI with the DSP solution even if it is not mandated neither by GBCS nor by the DLMS Green Book. |
| Fixes an issue where long-running tests (near 20 minutes or longer) with multiple test cases could produce failures with the error “CONTROL_RESPONSE not found”. |
| The GUI log search feature is now case-insensitive. |
| If a new GFI version adds new parameters to a test the GUI will automatically add those parameters to older versions of those tests avoiding the need to recreate them. |
| The GUI Counters dialog was simplified and unused and misleading information was removed. The counters are now unique by remote party identifier which aligns the GUI with the capabilities that are supported by GFI. |
| The GUI now automatically activates the CH log at startup. |
| The GUI now allows confirming or cancelling the deletion of multiple tests and test campaigns in a single step. |

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| Fixes a GUI issue where if a test identifier included the word “Properties” the test would not open in Basic Mode and the scenario icon would be the same as the properties icon. |
| The GUI New Test dialog now has a minimum and a default size has also been added when moving to the next or previous page. |
| The GUI CH Configuration dialog default size was increase to show the import and export buttons. |
| Fixes focus issues in the GUI when alternating between properties and scenario tabs. |
| Fixes an issue with GFI Triage Tool where a GCS15d containing sensitive data would not be successfully decrypted. |

## What’s New: 1.3.6E Stable

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| Fixed issue where the GFI CommsHub was not handling tunnel ids other tan 0x0000. |
| The timeout for delivering tunnel messages was increased from 10 to 60 seconds. |
| CS14 test case is now available in the GUI. |
| Fixed issue where GFI was not considering the supplementary remote party fields as inputs for the signature verification in critical responses and alerts. |

## What’s New: 1.3.5E Stable

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| Fixed issue where GFI Comms Hub GPF handling of the ZSE command GetNotifiedMessage would not support setting multiple notification flags in the same execution. |
| Fixed issue where GFI Comms Hub would create a log file with an incorrect month in the filename. |
| GFI will now ignore alerts originating from an unknown device or targeting an unknown remote party. The previous behaviour could cause a test to fail if during its execution GFI received an alert from an unknown device or targeting an unknown remote party. |
| Fixed issue where receiving two Default Responses for the same Transfer Data would cause the next message in queue to be deleted. |
| Pre-payment top up private key for Supplier2 added to scenario files. |

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| Fixed issue where a large payload in a GCS17 response would cause a test to fail. |
| Fixed issue affecting the check of the Snapshot Cause value in GCS15b, GCS15c, GCS16a and GCS16b where GFI would expect a constant value in the field instead of only checking that at least one of the relevant bits was set. |
| Test reports now show JSON inputs in the Input section. |

## What's New: 1.3.4E Stable

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| Fixed issue where the Comms Hub would crash after a non-successful addition or removal of a device. |
| Fixed issue where the Comms Hub would incorrectly interpret the Notification Flag attribute. |
| Fixed issue where the GPF would change the value of its own Device Type attribute if the GSME tried to mirror it. |
| Fixed issue where the Comms Hub would in some cases would incorrectly interpret the join timeout. |
| GPF now responds to a command from a device not in the white-list with a Default Response and with the reason set to NOT_AUTHORIZED. |
| Fixed issue where in some cases the Tunnel Messages Pending notification flag would not be cleared. |
| Fixed issue where undelivered messages would remain in a retry state forever. The Comms Hub will now discard messages after three unsuccessful delivery attempts. |

## What's New: 1.3.3E Stable

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| Corrected SupplyDepletion.State default value of the GCS24 test case iterations to align with GBZ templates. |
| ECS52, GCS38 CS06: Firmware version field is now shown as a byte array represented in hexadecimal. |
| Corrected Debt Recovery Frequency default value of the GCS04 test case iterations to align with GBZ templates. |

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| Removed "IncludeSupplementaryRemotePartyKACertificate" field from ECS17c test case iterations to align GBCS mapping table. |
| If a RequestTunnel command is issued from a GSME to GFI when there is an already active (or becoming active) tunnel GFI now responds with the same tunnel id instead of creating a new one. |
| GCS53 is now only checking if the End of Billing Period Snapshot in Snapshot Cause is set and ignores all other bits. |
| Added support for supplementary remote party fields to GCS17 use case. |
| The GFI GPF is now setting only 5 notification flags instead of 8. |
| Fixed response to Simple metering discovery. |
| Partner Link Key Exchange is enabled. |
| Fixed a bug that causes the stop test button to be enabled although the test has already finished. This prevented a new test to be run. |
| GFI is now reporting 0x01 to read attribute request for PhysicalEnviroment only on the ESI endpoint (EP2). |
| Fixed an issue occurring when adding a new device to an empty CH device log using CCS01. |
| Fixed limit of characters of installation credentials text input field of “Add device” GUI dialog. |
| The LocalTime attribute returned by Comms Hub now supports Daylight Saving Time. |
| GFI now sets the bit “Push All Static Data – Basic Cluster” on the attribute Functional Notifications Flags. |
| Fix the leave-rejoin process on the GFI Comms Hub. |
| Fixed an issue in the CHF device log that prevented devices to be correctly removed with a CCS02 command. |

## What’s New: 1.3.2E Stable

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| Support for persistent HAN (coordinator daemon for GFI). The HAN has support for one meter device and additional PPMID, IHD and CAD device. The coordinator daemon maintains a white- |

list of devices allowed to communicate over the HAN that can be maintained and read using the following CHF Use Cases:

- CCS01 Add Device to CHF device log
- CCS02 Remove device from CHF device log
- CCS03 Restore CHF Device Log
- CCS05/CCS04 Read CHF device log / Check HAN communications (by reading the CHF Communications Store)

The GUI application was changed to support the new coordinator daemon architecture.

Support for fake OTA server (GFI does not support OTA upgrades but needs to answer as such, for compatibility with a real Com Hub functionality and as expected by xSME).

A new emulated remote party named PPMID that provides the capability to send PCS01 and PCS02 use cases targeting a GSME (emulated or physical).

GPF component (part of the coordinator daemon). The GPF component supports mirroring of GSME through the ZigBee mirroring and GBCS Tapping Off (TOM) mechanisms. Mirrored data as well as GPF is made accessible both to the WAN through the applicable GBCS use cases and to the HAN.

List of supported Use Cases where the target is explicitly the GPF:

- GCS59 Restore GPF Device Log
- GCS09 Set Change of Tenancy date on GPF
- GCS61 Read gas Daily Consumption Log
- GCS62 Backup GPF Device Log

List of Use Cases where the target is GPF or GSME:

- CS11 Clear ZigBee Device Event Log
- GCS21e Read GSME/GPF Configuration Data Device Information (device identity)
- CS10a Read ZigBee Device Event Log
- CS10b Read ZigBee Device Security Log

List of Use Cases where the GPF works as a mirror of GSME endpoint:

- GCS13a Read GSME Consumption Register
- GCS13c Read GSME Register (TOU)
- GCS13b Read GSME Block Counters
- GCS14 Read GSME Prepayment Register(s)
- GCS15b Read GSME Billing Data Log (change of mode / tariff triggered)
- GCS15c Read GSME Billing Data Log (billing calendar triggered)
- GCS15d Read GSME Billing Data Log (payment-based debt payments)
- GCS15e Read GSME Billing Data Log (prepayment credits)
- GCS16a Read GSME Daily Read log(s)
- GCS16b Read GSME Daily Read log(s) (prepayment)
- GCS17 Read GSME Profile Data Log
- GCS21f Read GSME Tariff Data
- GCS21b Read GSME Configuration Data Prepayment

- GCS21d Read GSME Configuration Data Device Information (BillingCalendar)
- GCS21j Read GSME Configuration Data Device Information (Payment Mode)
- GCS46 Read MPRN on the GSME
- GCS33 Read GSME Valve Status
- GCS38 Read GSME Firmware Version
- GCS60 Read Meter Balance for GSME

List of TOM commands:

- GCS01a Set Tariff and Price on GSME
- GCS05 Update Prepayment Configurations on GSME
- GCS07 Send Message to GSME
- CS11 Clear ZigBee Device Event Log (where the Command is addressed to the GSME)
- GCS23 Set CV and Conversion Factor Value(s) on the GSME
- GCS25 Set Billing Calendar on the GSME
- GCS44 Write Contact Details on GSME
- GCS01b Set Price on GSME

GPF Emulator component supporting the same Use Cases supported by the GPF component described above. Note that the GPF Emulator is aimed at protocol testing and doesn't provide full Use Case functionality nor does it support mirroring.

Resolution of an issue where if a RequestTunnel command was issued from a GSME to GFI when there was an already active (or becoming active) tunnel GFI would not respond with the same tunnel id and would instead create a new one.

The LED in the GFI USB ZigBee stick gives the following information:

- **OFF:** Comms Hub module not running
- **Steady ON Green:** Comms Hub started and HAN created
- **Red ON** for more than 5 sec: ZigBee Stack is not responding
- **Flashing Green:** HAN initialization issue (restart Comms Hub)

## What's New: 1.3.2 Stable

ECS68/GCS53: Date-time in response requirement was removed from this use cases. This change is made to align with IRP 439.

A new set of device certificates was integrated in GFI to fix a problem discovered where the old ones did not have the extension "Certificates Policies" marked as a critical extension.

In order to correct the issue raised by ALM issue 1353, GFI now encapsulates all DLMS sensitive payloads inside a DLMS Structure. This impacts the following use cases: ECS17b, ECS17d, ECS17e, ECS19, ECS20b, ECS20c, ECS21a, ECS21b, ECS22b, ECS66 and ECS68.

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| A bug was fixed on GFI where it would sometimes stop and hang amid ZigBee communications. |
| Fixed defect where wrong inputs were used to perform encryption and decryption when processing requests from unknown remote parties. Affected use cases: ECS20b, ECS20c, ECS21a, ECS21b, ECS22b, ECS66, GCS15b, GCS15c, GCS16a, GCS16b and GCS18. |
| Fixed defect in GCS15b where the response value of snapshot cause was always being checked against 0x00006008. GFI is now printing snapshot cause instead of checking against a specific value. |
| GCS21f supports the presence of the optional fields after the "Price (UINT32)" field in the GBZ Publish Price component. GFI now supports components with and without such fields (IRP 468). |
| Corrected CS02a iteration that was requesting a non-supported trust anchor cell from GSME. |
| GCS02 and GCS03 now support Alternate response status check other than 0x8B (NOT_FOUND). |
| Fixed defect in GCS21f that caused GFI GSME emulator to always respond with a default response even if the test input parameter “ATG.Control.EntriesFound” was set to True. |
| Changed GCS02 and GCS03 test cases to always checks the number of received alerts against the input expected parameter regardless of the response. |
| Fixed defect in GSME emulator that was returning a wrong DeviceIdentifier in ModelAndDeviceIdentifier attribute in GCS21e use case response. |
| Fixed Originator Counter values used in Pre-Payment Top Up use cases (CS01a and CS01b). |
| Fixed scalers values used in ECS01a, ECS01b, ECS01c, ECS01d, ECS24, ECS24b, both on test iteration and emulators store. |
| Fixed Billing Period Duration Type value from 0x03 to 0x23 in GCS21d response in emulated mode. |
| GCS17 Sample ID in response is now checked against 0 (zero). |
| Improved report information when a given test case tries to check a field that is not present in response message. This issue was first identified in GCS21f where a supplementary remote party id was expected in response but received a message without it causing a generic exception. From |

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| now on in similar situations one should see a check of the expected value against “Not Present” and the specific check should fail. |
| Fixed a defect where the alert code of CS06 alert was always being checked against 0x8F66. Now depending on response the alert code is check against 0x8F66 if SUCCESS and 0x8F67 otherwise. |
| When a certain field is not present on the message and we try to print it GFI currently prints a value of 0 configured to the appropriate type. |
| Publish Price Matrix command should always contain 4 prices when addressed to the GSME. GCS01a and GCS01b iteration were changed accordingly. |

## What’s New: 1.3.1 Stable

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| CS02d: Removed default iteration with RSA certificate from test case specification. |
| CS02d: Fixed failing signature validation in the response to CS02d command caused by GFI using device’s old public key to check the signature instead of the new public key.<br><br>The current functionality is that after a successful CS02d execution, GFI will use an updated device certificate for the device for the remainder of the run. |
| GCS13b: Changed Additional Header Frame Counter from 0x00 to 0x01 in acceptance criteria for response. |
| GCS21e: Added attribute HWVersion from BasicDeviceInformation to be read as part of the command. |
| Added verification of the message size. If GFI receives a message from a device bigger than 1200 bytes the maximum message size verification will fail, causing the test to fail. |
| GCS31: Removed default iteration without supplementary as the Use Case is only sent using supplementary logic. |
| GCS32/39: Removed unnecessary Set operations in the report before doing response checks. |

## What's New: 1.3 Stable

Added the certificate "OCARoot-ZB-chain-to-OCARoot-ZA.pem" to the ZBZ2 Org hierarchy. This is the certificate that should be used as the Certification Path Certificate in CS02b, rootBySupplier mode.

Improved compatibility of the installer. (A) Includes better compatibility when installing in legacy mode by using an MS-DOS partition table instead of a GUID partition table. (B) Improved compatibility when installing in EFI mode by adding the bootloader to a standard location, for machines that do not support the EFI variables to be mutated by the operating system (e.g. VirtualBox).

A new configuration option has been added to the gfi-installer.conf file that overrides the automatic detection of Legacy and EFI.

Both the installer and GFI operating system have been updated to use the Linux kernel 4.2.0 by default (instead of 3.16). This only affects new installations and not upgrades. This new version of the kernel has improved hardware compatibility.

If its required to update an existing GFI installation to use the updated kernel (i.e. some of the hardware attached to the system is not working), please consult the Ubuntu documentation https://wiki.ubuntu.com/TrustyTahr/ReleaseNotes#LTS_Hardware_Enablement_Stack for advice. Please be warned that this is a potentially dangerous operation and could result in needing to reinstall GFI from scratch.

## What's New: 1.3RC3

In the Scenario, corrected the issue related with the key agreement file for the Supplier2: changed from Z1-supplier2-ds.key to Z1-supplier2-ka.key.

CS02c, CS02d, CS02e and CS06: corrected the Business Target Name when a GSME is the target (changed from ESME1 to GSME1).

CS06: this Use Case was missing in the list of the ESME available Use Cases.

## What's New: 1.3RC2

Corrected the issue related with date-times in Commands. The deviation and status fields are now set to 0x8000 and 0xFF, respectively.

## What's New: 1.3RC1

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| GFI is using the latest pack of SMKI Organisation Test Certificates and Private Keys delivered by DCC at the beginning of **January 2016**. Two distinct OCA Hierarchy are included: ZAZ1 and ZBZ2. GFI is using the ZAZ1 pack. This SMKI pack supports CS02b anyByContingency mode. |
| All the supported Use Cases are now uplifted to GBCS v0.8.2. |
| Corrected the issue related with the signature verification in critical responses containing date-time. |
| Keys and certificates used by the Supplier 2 were updated to the ZAZ1 pack. In previous releases Supplier 2 was using the "other-user" keys and certificates contained in the Org-EE pack. |
| Extra protections added regarding the decryption of encrypted data. |
| Added a new ZigBee feature: in the event of an ESME reports a busy status while opening the tunnel, GFI tool will retry the open operation every 5 seconds. |
| Corrected the input parameters in the following list of Use Cases, where ACB was used as Business Originator without Supplementary Remote Party: ECS40, ECS61c, GCS21a and GCS31. |
| ECS25a: the number of characters in the "Alerts Configuration Settings" input parameter was corrected from 511 to 512. |
| CCS01, CCS02, CCS03, CCS05_CCS04: removed from the ESME list of available Use Cases. The target of these Use Cases is the CHF. |
| CS07 ESME: the target in the second iteration was corrected from GSME to ESME. |
| CS07 GSME: Use Case added to the list of available Use Cases. Was missing in the previous release. |
| FDRA-DLMS, GNCA-DLMS and GCA-DLMS: corrected the Business Originator of the second iteration. |
| ECS26i, ECS35c and ECS35d: removed from the ESME list of available Use Cases. The target of these Use Cases is the CHF. |
| Minor improvements in the Console Ouput. |

## System Requirements

The GFI testing tool Installer is supplied on a USB stick and requires a PC certified to run Ubuntu Linux 18.04 LTS with the minimum hardware requirements below.

Please note the GFI Installer completely wipes the Hard Drive/SSD on the target PC. Refer to the installation manual for step by step instructions on how to install GFI. The installation process, once booted into the installer should take approximately 3min on the reference hardware.

| Minimum | Recommended |
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| Core i3 CPU | Core i5 CPU |
| 2GB RAM | 8GB RAM |
| 128GB SATA 7200RPM | 128GB SSD or higher |
| UK spec and keyboard | UK spec and keyboard |
| Free USB 2.0 port | Free USB 2.0 or USB 3.0 port |
| Certified to run Ubuntu Linux 18.04 LTS | Certified to run Ubuntu Linux 18.04 LTS (Dell or Lenovo) |
| Intel graphics chipset i810 | Intel graphics chipsets newer than and including i810 (with the exception of GMA 500) |
| 1024x768 screen resolution | 1920x1080 screen resolution |

### Reference Hardware

Recommended UK Spec laptops for GFI.

**20DF004QUK** - ThinkPad Edge E550, Intel Core i5, 1x8GB DDR3L-1600, 128 GB SSD, Intel HD Graphics, 15.6" FHD Antiglare (1920x1080).

**20EVCTO1WW** - ThinkPad Edge E560, Intel Core i5, 1x8GB DDR3L-1600, 192 GB SSD, Intel HD Graphics, 15.6" FHD Antiglare (1920x1080).

## ZigBee Radio MAC Identifier

In case the User needs to check the ZigBee Radio MAC identifier the following options are available.

**Using the EZSPMAC tool (command line):**

1. Connect the ZigBee radio stick to the laptop. Ensure that only one USB device is connected to the laptop;
2. Open a Terminal;
3. Type the command: cd /opt/gfi/bin
4. Type the command: ./ezspmac /dev/ttyUSB0
5. The ZigBee Radio MAC identifier should be displayed.

## Documentation

The following documentation is available for GFI:

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| Installation Manual | A guide on how to install the Operating System and the GFI testing tool. |
| Technical Reference Manual | A technical reference manual for the GFI testing tool intended to provide detailed technical information for standard and advanced user operation and configuration. |
| User Manual | A guide on how to use the Graphical User Interface for the GFI testing tool with a Step-by-Step example. |
| Known Issues | A document detailing the known issues and limitations at the date of this release. |