# FRD-REQ-321367/B-###UC\_F\_IVSU### Define Attributes for ECU Configuration Parameters

|  |  |  |
| --- | --- | --- |
| Purpose |  | To define the different type of variables in the VSCS |
| Actors |  | D&R, Cloud, Vehicle, Dealer |
| Precondition |  | Engineer wants to create a new direct configuration |
|  |  |  |
| Main Flow | M1 | The variables in the direct configuration shall be identified with the following flag:   * Customer changeable (customer can modify them in the vehicle) * Feature (MFAL, EC) * Subscribe able (to be changed after customer subscribes) * Always (for other parameters) |
|  |  |  |
| Alternative Flow 1 |  |  |
|  |  |  |
| Post-condition |  |  |

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| --- | --- | --- | --- | --- |
| **Requirement ID:** REQ-321367 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
|  | | | |  |
| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** |  |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| B | 13-Sep-2018 11:32 | Gill, Balwinder (bgill51) | OTA Cloud, VSCS | |

# FRD-REQ-321370/B-###UC\_F\_IVSU### VSCS Generation and storing in the cloud

|  |  |  |
| --- | --- | --- |
| Purpose |  | Generating updated VSCS and notifying the cloud to store the updated information |
| Actors |  | VSEM, OTA Cloud |
| Precondition |  | VSCS was created by NetCom and released |
|  |  |  |
| Main Flow | M1 | Vehicle VSCS was generated from NetCom  VSEM notifies OTA Cloud for the new ECU VSCS and reason of change  OTA Cloud stores the updated ECU VSCS  OTA Cloud parses thru the ECU VSCS to only store the common ECU VSCS  OTA Cloud pairs the ECU VSCS section with the dependent software version of that ECU |
|  | M2 |  |
|  |  | VSCS was stored in the cloud and paired to the dependent software files versions |
| Alternative Flow 1 |  | Generating updated VSCS and notifying the cloud to store the updated information |
| Post-condition |  | VSEM, OTA Cloud |

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| **Requirement ID:** REQ-321370 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
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| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** |  |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| B | 13-Sep-2018 11:32 | Gill, Balwinder (bgill51) | OTA Cloud, VSCS | |

# FRD-REQ-321231/B-###R\_F\_IVSU### Direction Configuration Change Request (Service Action) Interface

To support Direct Configuration (DC) there shall be a user interface to allow DC and SWDL change request for updates to be submitted using ECU configuration from the VSEM, Vehicle Specific Configuration Specification (VSCS) interface or a similar interface that prompts for Program(s), ECU(s), DID(s), Byte(s) or Bits(s) and value as applicable. If the DC and/or SWDL change requires optional logic the interface shall provide a logical expression editor, using WERS feature codes or other options (TBD) specific to an OTA update. The Change Request (Service Action) interface shall provide an XML export of the ECU configuration data.

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| **Requirement ID:** REQ-321231 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
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| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** |  |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| B | 13-Sep-2018 11:37 | Gill, Balwinder (bgill51) | OTA Cloud, VSCS | |

# FRD-REQ-321233/B-###R\_F\_IVSU### VSCS DC Interface Support for OTA

The VSEM VSCS interface shall provide vehicle or ECU specific versions to the OTA Cloud for correlating it to the correct dependent software and for OTA Manifest creation.

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| --- | --- | --- | --- | --- |
| **Requirement ID:** REQ-321233 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
|  | | | |  |
| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** |  |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| B | 13-Sep-2018 11:38 | Gill, Balwinder (bgill51) | OTA Cloud, VSCS | |

# FRD-REQ-321234/B-###R\_F\_IVSU### VSCS consumption from the OTA cloud

The OTA Cloud shall be have an interface with the VSEM environment that stores VSCS. The VSCS format is currently XML and the OTA cloud shall be able to consume it and store it in the cloud database.

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| **Requirement ID:** REQ-321234 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
|  | | | |  |
| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** |  |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| B | 13-Sep-2018 11:38 | Gill, Balwinder (bgill51) | OTA Cloud, VSCS | |

# FRD-REQ-307841/C-###UC\_F\_IVSU### Direct Configuration Change

|  |  |  |
| --- | --- | --- |
| Purpose |  | Ensure configurable vehicle content can be managed via OTA |
| Actors |  | Cloud, VSCS, VSEM |
| Precondition |  | A change in the configuration of a vehicle has occurred because an issue was identified, and improvement was introduced or new functionality was introduced with software updates |
|  |  |  |
| Main Flow | M1 | VSCS file was updated for an ECU  ECU VSCS change shall be used as an event to trigger the Cloud to ingest the file  ECU VSCS file shall be ingested along with the reason of change  VSEM shall only provide the delta of change to the cloud and not a complete ECU VSCS  ECU VSCS shall be tied to the dependable software or application  The new configuration or the modified configuration values shall be send to the vehicle |
|  |  |  |
|  | M2 | ECU VSCS shall be parsed to identify variables that are tied to Features or Functions based on MFAL and ECs  Customer subscribes to a new feature that requires a configuration change or request a feature/function to be turned On or Off  The Vehicle feature management shall track the VIN specific status and request the OTA Cloud to modify the configuration for that variable  A trigger shall be send to the vehicle for the new configuration to get modified. |
| Alternative Flow 1 |  | Customer/Service changes a configuration value in the vehicle  The new values are posted in the cloud to be stored |
|  |  |  |
| Alternative Flow 2 |  | A feature changes a configuration value in the vehicle  The new values are posted in the cloud to be stored |
| Alternative Flow 3 |  | ECU replacement shall request the cloud for the latest software for that ECU and the latest configuration values for that vehicle |
| Post-condition |  | The configuration values and the cloud shall get updated with the new values  Configuration values that are customer changeable thru the vehicle will not be modified by the cloud or service |

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| --- | --- | --- | --- | --- |
| **Requirement ID:** REQ-307841 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
|  | | | |  |
| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** | F-REQ-305209/B-###R\_FNC\_Vehicle\_HMI\_015### Feature Disable by Service |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| C | 13-Sep-2018 11:30 | Gill, Balwinder (bgill51) | OTA Cloud, VSCS, Service, Fast OTA, Slow OTA | |

# FRD-REQ-321377/B-###UC\_F\_IVSU### Types of Direct Configurations

|  |  |  |
| --- | --- | --- |
| **Purpose** |  | Define the type of Configuration needed |
| **Actors** |  | D&R, Cloud, Feature Owner, Vehicle, ECUs |
| **Precondition** |  |  |
|  |  |  |
| **Main Flow** | M1 | Variables in the configuration files shall be tagged for its purpose and the region applicable  Purpose  Regional Regulatory  Global Regulatory  Connected Feature  Vehicle Feature  Etc  Region (continent, state, country):  US  Russia  North America |
|  |  |  |
| **Post-condition** |  |  |

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| --- | --- | --- | --- | --- |
| **Requirement ID:** REQ-321377 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
|  | | | |  |
| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** |  |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| B | 13-Sep-2018 11:32 | Gill, Balwinder (bgill51) | OTA Cloud, VSCS, Custer, Fast OTA, Slow OTA, Vehicle SDN | |

# FRD-REQ-321379/B-###UC\_F\_IVSU### DC Update after a Strategy Software Memory Map Change

|  |  |  |
| --- | --- | --- |
| Purpose |  | Perform software update and DC OTA on single or multi-valued parameters updating the values or the logic as required |
| Actors |  | VSCS, All ECUs |
| Precondition |  | ECU released a new software where the direct configuration memory mapping was modified |
|  |  |  |
| Main Flow | M1 | Along with the new software the D&R shall release a configuration file that includes detailed information on the re-map of the old parameters to the new ones |
|  | M2 |  |
|  |  |  |
| Post-condition |  | Service update only  ECU has a deviation in the system for this use case |

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| **Requirement ID:** REQ-321379 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
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| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** |  |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| B | 13-Sep-2018 11:32 | Gill, Balwinder (bgill51) | ECG, OTA Cloud, VSCS, Service, Fast OTA, Slow OTA | |

# FRD-REQ-307845/C-###UC\_F\_IVSU### Service Update while an OTA in progress

|  |  |  |
| --- | --- | --- |
| **Purpose** |  | A service update can occur at any time |
| **Actors** |  | Service, Vehicle, Cloud |
| **Precondition** |  | An OTA update is in progress |
|  |  |  |
| **Main Flow** | M1 | ECU1 inactive memory is being updated via OTA in the background  Service is updating ECU2 over CAN that is not being updated in the background thru OTA  The ECU2 shall complete its update via diagnostic reflash that service triggered  The ECU1 being updated in the background thru OTA shall continue without a failure |
|  | M2 | Service is updating an ECU over CAN that is being updated in the background thru OTA  Diagnostic Re-flash shall update the active memory of the ECU  The ECU being updated in the background thru OTA shall complete the service program  The cloud shall be updated with the latest information  The OTA Client ECU shall evaluate if the target ECU shall continue the OTA update or cancel that update because it is the same version as the service update or it is not eligible any more |
|  | M3 | Service is updating the client module that is programming another ECU  The client module shall update its software in the inactive memory partition  The client module shall pause the program of the other ECU and resume once its own re-flash is complete |
| **Alternative Flow 1** |  | The update fails to complete  The error shall be reported to the cloud |
|  |  |  |
| **Post-condition** |  | Service update shall always occur in the active partition |

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| --- | --- | --- | --- | --- |
| **Requirement ID:** REQ-307845 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
|  | | | | |
| **Acceptance Criteria** | | | | **V&V Method** |
|  | | | |  |
| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** |  |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| C | 13-Sep-2018 11:30 | Gill, Balwinder (bgill51) | ECG, OTA Cloud, Service, Netcom | |

# FRD-REQ-307868/C-###R\_F\_IVSU### Software Signing

Every software file shall be automatically signed after it is released and after a differential is generated. Software signing is required independent of the type of re-flash that occurs via OTA.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID:** REQ-307868 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
|  | | | |  |
| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** | F-REQ-305588/A-###FNC\_SIM\_R\_00001### FilesIntegrityCheck  F-REQ-305447/A-###FNC\_OTA\_SM\_R\_00014### Diff Update Approach |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| C | 13-Sep-2018 11:34 | Gill, Balwinder (bgill51) | OTA Cloud, Netcom, Fast OTA, Slow OTA | |

# FRD-REQ-307928/C-###R\_F\_IVSU### Ford Plant IVSU Verification

EOL shall:

1. read VIN, FESN (or serial number for the modules that do not support FESN) and Security Package ID which shall be saved in Ford’s back end
2. read DID(s) to verify the hash of the OTA signed commands

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| **Requirement ID:** REQ-307928 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
|  | | | |  |
| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** |  |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| C | 13-Sep-2018 11:43 | Gill, Balwinder (bgill51) | OTA Cloud, Plant System, Netcom, Fast OTA | |

# FRD-REQ-321347/B-###UC\_F\_IVSU### Partial Networking

|  |  |  |
| --- | --- | --- |
| **Purpose** |  | To reduce the battery consumption during an OTA operation |
| **Actors** |  | Vehicle |
| **Precondition** |  | OTA is operating during ignition off |
|  |  |  |
| **Main Flow** | M1 | OTA Client in the vehicle is woken up and requires doing some operation that requires waking up another node.  The OTA client will send a wake up request to the required component  The required component will wake up and start communicating  The rest of the vehicle busses shall stay asleep |
|  | M2 | OTA Client in the vehicle is woken up and requires doing some operation that requires waking up a non-powered at all time component  The OTA client will send a request to power up the vehicle bus (ISPR)  The vehicle is awake  The components that are not going to interface with the OTA client shall go back to sleep  The OTA client and the required component shall complete the necessary operation  The OTA Client shall request for the vehicle power to shut down |
|  |  |  |
| **Post-condition** |  | Customer shall not be able to detect any abnormalities unless the OTA Client notifies them thru the vehicle display |

|  |  |  |  |  |
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| **Requirement ID:** REQ-321347 | | | | |
| **Legacy ID:** | | | | |
| **Rationale** | | | | |
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| **Acceptance Criteria** | | | | **V&V Method** |
|  | | | |  |
| **Notes** | | | | |
|  | | | | |
| **Type** | |  | **Source**  **(Person)** |  |
| **Priority** | |  | **Source**  **(Parent element)** |  |
| **Status** | |  | **Owner** |  |
| **Change Log** | | | | |
| **Version** | **Date** | **Author** | **Change** | |
| B | 13-Sep-2018 11:31 | Gill, Balwinder (bgill51) | ECG, OTA Cloud, Netcom, Fast OTA, Slow OTA | |