

**Research & Vehicle Technology**

**“Infotainment Systems Product Development”**

**Feature – Sentinel**

**ECG Subsystem Part Specific Specification (SPSS)**

Version 1.3

**UNCONTROLLED COPY IF PRINTED**

**Version Date: July 26, 2022**

**FORD CONFIDENTIALF**

**Revision History**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date** | **Version** | **Notes** | | | |
| **October 8, 2021** | **1.0** | **Initial Release** |  | | |
|  |  |  | |  |
| **November 4, 2021** | **1.1** |  | | |
|  | MD-REQ-392355/C-StartVideoStreamCommand | | | semani4:Revise API |
|  | MD-REQ-411558/B-PublishRecordingStatusChange | | | semani4:revise api |
|  | MD-REQ-411285/B-StopRecord\_Request | | | semani4:error Detail Updated |
|  | MD-REQ-406933/B-Record\_Request | | | semani4:error Detail Updated |
|  | MD-REQ-392356/C-StartVideoStreamCommandResponse | | | semani4:updated API |
|  | MD-REQ-392353/C-VideoStreamingStatusUpdateAlert | | | semani4: added more parameters |
|  | MD-REQ-392359/C-StreamSessionStatusUpdateAlert | | | Semani4: added more paramters |
|  | STNL-UC-REQ-415545/C-Alarm Detection | | | semani4:remove IPPT token |
|  | STNL-UC-REQ-426898/B-Set Record Timer | | | semani4:remove IPPT Token |
|  | STNL-REQ-415553/B- Alarm Detection | | | semani4: removing ippt token |
|  | STNL-REQ-425900/B-Set Record Timer | | | semani:removing IPPT token |
|  | STNL-UC-REQ-415472/B-Record-Cloud | | | semani4:no metadata info needed |
|  | STNL-UC-REQ-443937/B-Stop Record to Cloud | | | semani:Replace IPPT token expires with AWS Kinesis auth token |
|  | STNL-REQ-415480/B-Record to Cloud | | | semani4:Remove metadata statement |
|  | STNL-REQ-443639/B-Stop Record to Cloud | | | semani4:Replace IPPT token expires with AWS Kinesis auth token |
|  |  |  | |  |
| **November 9, 2021** | **1.2** |  | | |
|  | STR-891313/B-Use Cases | | | semani4:removing OTA requirement |
|  | STNL-UC-REQ-409094/B-Low Battery | | | semani4:added sentinel reference |
|  | STR-891314/B-Requirements | | | semani4:removing OTA requirement |
|  | STNL-REQ-415503/B-Low Battery | | | semani4:added sentinel reference |
|  |  |  | |  |
| **July 26, 2022** | **1.3** |  | | |
|  | STR-891270/B-Overview | | | nthukkan: Revised to update regions |
|  | STR-891271/B-Architectural Design | | | nthukkan: Revised to add new CLD |
|  | STNL-CLD-REQ-427711/B-CameraManager | | | nthukkan: Updated CLD for additional tasks |
|  | STNL-CLD-REQ-505060/A-PDCCameraViewService | | | nthukkan: Added CLD |
|  | STNL-CLD-REQ-507157/A-ADASCameraViewService | | | nthukkan: Added CLD |
|  | DOC-891272/B-Physical Mapping of Classes | | | nthukkan: Added new class |
|  | MD-REQ-392355/D-StartVideoStreamCommand+ | | | semani4:updated parameter |
|  | MD-REQ-392355/E-StartVideoStreamCommand+ | | | nthukkan: updated requirement |
|  | MD-REQ-392355/F-StartVideoStreamCommand | | | nthukkan: Updated to add and delete commands |
|  | IR-REQ-423317/C-PublishStreamStatus+ | | | nthukkan: refer to camera manager specification |
|  | IR-REQ-423317/D-PublishStreamStatus | | | nthukkan: refer to camera manager specification |
|  | MD-REQ-411558/C-PublishRecordingStatusChange | | | nthukkan: renamed interface |
|  | MD-REQ-411285/C-StopRecordingReq | | | nthukkan: renamed interface |
|  | MD-REQ-406933/C-StartRecordingReq | | | nthukkan: renamed interface and updated parameters |
|  | MD-REQ-392356/D-StartVideoStreamCommandResponse+ | | | semani4:updated parameter |
|  | MD-REQ-392356/E-StartVideoStreamCommandResponse | | | nthukkan: updated to remove a parameter |
|  | IR-REQ-404260/F-StartStream | | | nthukkan: refer to camera manager specification |
|  | IR-REQ-404261/F-StopStream | | | nthukkan: refer to camera manager specification |
|  | IR-REQ-415420/D-CommenceReservedStream | | | nthukkan: refer to camera manager specification |
|  | IR-REQ-424678/C-CancelReservedStream | | | nthukkan: refer to camera manager specification |
|  | MD-REQ-392353/D-VideoStreamingStatusUpdateAlert+ | | | semani4:updated parameter |
|  | MD-REQ-392353/E-VideoStreamingStatusUpdateAlert | | | nthukkan: added parameters |
|  | MD-REQ-392359/D-StreamSessionStatusUpdateAlert | | | semani4:updated parameter |
|  | STR-891275/B-General Requirements | | | nthukkan: Revised STR to add Req's - 505061, 509477, 509497 |
|  | STNL-REQ-505061/A-China Program Exclusion for Sentinel requirements | | | nthukkan: New req indicating China program exclusions |
|  | STNL-REQ-509477/A-Availability of Camera Views | | | nthukkan: New Req |
|  | STNL-REQ-509497/A-Camera Configurations | | | nthukkan: New Req |
|  | STR-891276/B-Functional Definition | | | nthukkan: Revised to update |
|  | STR-891361/C-Use Cases | | | nthukkan: Revised to add New use-cases |
|  | STNL-UC-REQ-415545/D-Alarm Detection | | | nthukkan: revised to add note |
|  | STNL-UC-REQ-425358/B-Intrusion Detection Notification Cloud and Monitor Existing Stream | | | nthukkan: revised to add note |
|  | STNL-UC-REQ-415470/B-Reserve video stream | | | nthukkan: revised to update |
|  | STNL-UC-REQ-423308/B-Video Stream-Send to cloud and Accept | | | nthukkan: Revised to add note |
|  | STNL-UC-REQ-415471/B-Video Stream - Commence Stream to both VRP and Cloud Ready | | | nthukkan: Revised to update the use-case |
|  | STNL-UC-REQ-510557/A-Initiate Timer Expires - Initiate Video | | | nthukkan: New use-case |
|  | STNL-UC-REQ-510717/A-Initiate Timer Expires - End Session | | | nthukkan: New use-case |
|  | STNL-UC-REQ-426898/C-Set Record Timer | | | nthukkan: Revised to add note |
|  | STNL-UC-REQ-426899/B-Record Timer Expires | | | nthukkan: Revised to add note |
|  | STNL-UC-REQ-426897/B-Video Stream-Stop | | | nthukkan: Revised to add China conditions |
|  | STR-891362/B-Requirements | | | nthukkan: revised to add New Requirements |
|  | STNL-REQ-415553/C- Alarm Detection | | | nthukkan: revised to add note |
|  | STNL-REQ-415557/B-Intrusion Detection Notification Cloud and Monitor Existing Stream | | | nthukkan: revised to add note |
|  | STNL-REQ-415495/B-Reserve Video Stream | | | nthukkan: revised to Update |
|  | STNL-REQ-425917/B-Request VRP for StartRecording | | | nthukkan: Revised to add Note |
|  | STNL-REQ-415493/B-Video Stream Send to Cloud and Accept | | | nthukkan: revised to Add Notes |
|  | STNL-REQ-415494/B-Video Stream-Commence Stream to both VRP and Cloud Ready | | | nthukkan: Revised to update the Req |
|  | STNL-REQ-510418/A-Initiate Timer expires - Initiate Video | | | nthukkan: New Req |
|  | STNL-REQ-510457/A-Initiate Timer expires - End Session | | | nthukkan: New Req |
|  | STNL-REQ-425900/C-Set Record Timer | | | nthukkan: Revised to modify spellings |
|  | STNL-REQ-425921/B-Record Timer Expires | | | nthukkan: Revised to add Note |
|  | STNL-REQ-415491/B-Video Stream -Stop | | | nthukkan: revised to update the requirement |
|  | STNL-UC-REQ-415465/B-Record to USB | | | nthukkan: revised to update |
|  | STNL-UC-REQ-415472/C-Record-Cloud | | | nthukkan: Revised to add Note |
|  | STNL-UC-REQ-415466/B-Stop Record to USB | | | nthukkan: Revised to update |
|  | STNL-UC-REQ-443937/C-Stop Record to Cloud | | | nthukkan: Revised to add Note |
|  | STNL-REQ-415480/C-Record to Cloud | | | nthukkan: Revised to add Note |
|  | STNL-REQ-443639/C-Stop Record to Cloud | | | nthukkan: Revised to add Note |
|  | STNL-UC-REQ-409094/C-Low Battery | | | nthukkan: Revised to update post-conditions |
|  | STNL-REQ-415503/C-Low Battery | | | nthukkan: Revised to add Note |

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# Overview

The purpose of this document is to describe the feature function requirements for “Sentinel” Feature. This document describes the usage of the Sentinel Feature in the vehicle from different actor’s perspective.

Sentinel feature is a connected intelligent system offering security services to the users against theft and intrusion inside the truck bed, cargo area and surrounding the vehicle particularly for commercial vehicle customers

Sentinel feature is an integrated security system that enables the user to

* Detect intruders using AJAR sensors (or any sensor in the combined sensor module), Perimeter sensors which includes inclination and Ultrasonic Sensors.
* Send a notification to the user about the detected intrusion,
* Start recording the video feed from the vehicle cameras locally on the vehicle and on the cloud,
* Enable streaming directly to a subscription app on the customer’s mobile device.

The requirements on the functionality are described either as use cases or as conventional functional decomposition. This document only defines the functionality on an abstract level, focusing on what the system SHALL perform, not detailing how.

Model Year: MY23 and beyond

Region: EU, NA and China

# Architectural Design

## STNL-CLD-REQ-415443/A-VRPInterfaceServer

The VRPInterfaceServer is responsible for the tasks listed below:

* Receiving data and status from SentinelInterfaceServer
* Receives Input and sends Request to the SentinelInterfaceServer
* Records data and Video to the In-vehicle Storage device

## STNL-CLD-REQ-415444/A-SentinelInterfaceServer

The SentinelInterfaceServer is responsible for the tasks listed below:

* Monitoring and handling active function and data.
* Receive Request from the VRPInterfaceServer OffBoardCommunicationServer.
* Transmitting data and status to VRPInterfaceServer, OffBoardCommunicationServer.
* Request video from the CameraService via CameraManager
* Receive video from ADAS
* Receive information from CameraManager and transmit it to VRPInterfaceServer, OffBoardCommunicationServer.

## STNL-CLD-REQ-427710/A-SentinelOffBoardServer

The SentinelOffBoardServer is responsible for the tasks listed below:

* Streams and records video from the SentinelInterfaceServer.
* Streams video to the Ford Pass App

## STNL-CLD-REQ-427711/B-CameraManager

The CameraManager is responsible for the tasks listed below:

* Setup connection between ADASCameraViewService, PDCCameraViewService and SentinelInterfaceServer to stream the Video

## STNL-CLD-REQ-427881/A-ExternalSentinelTriggerServer

The ExternelSentinelTriggerServer is responsible for the tasks listed below:

* Send PerimeterAlarm\_ST message to the SentinelInterfaceServer

## STNL-CLD-REQ-427882/A-OffBoardCommunicationServer

The OffBoardCommunicationServer is responsible for the tasks listed below:

* Receive and Send FTCP data and status from and to SentinelInterfaceServer

## STNL-CLD-REQ-505060/A-PDCCameraViewService

The PDCCameraViewService is responsible for the tasks listed below:

* Sends video to Camera Manager

## STNL-CLD-REQ-507157/A-ADASCameraViewService

The ADASCameraViewService is responsible for the tasks listed below:

* Sends video to Camera Manager

## Physical Mapping of Classes

The table below shows an example of how the logical classes that make up the Sentinel feature can be mapped into physical modules. This mapping is an example only and does not necessarily carryover to other carlines or vehicle architectures.

|  |  |
| --- | --- |
| **Logical Class** | **Physical Module (ECU)** |
| SentinelInterfaceServer | ECG |
| SentineIOffBoardServer | AWS Cloud |
| ExternelSentinelTriggerServer | BCM |
| VRPInterfaceServer | VRP function SYNC (USB-VRP) |
| CameraManager | Camera stream Service (ECG) |
| OffBoardCommunicationServer | Ford Cloud |
| PDCCameraViewService | Phoenix Domain Controller |
| ADASCameraViewService | ADAS |

## Logical Signal Mapping

The CAN signals mentioned throughout this document shall refer to the CAN signal’s logical name. The logical names shall be mapped to their actual CAN signal names. Please use the table below to perform the mapping. The InfoCAN database file is the master file for the actual CAN signal names. Note: There may be cases where the actual CAN signal name is used in this documentation.

|  |  |
| --- | --- |
| **Logical Name** | **CAN Signal Name** |
| IgnitionStatus\_St | Ignition\_Status |
| PerimeterAlarm\_ST | Perimeter\_Alarm\_Status\_ET |
| Remote\_Start\_Status | Remote\_Start\_Status |

## STNL-IIR-REQ-415445/A-SentinelInterfaceServer\_Rx

The interface client shall receive the following signals for the feature to work as needed.

### MD-REQ-415447/A-IgnitionStatus\_St

Message Type: Status

Signal used to indicate ignition state.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| IgnitionStatus\_St | - | - | Indicates ignition state |
|  | Unknown | 0x0 |  |
|  | Off | 0x1 |  |
|  | Accessory | 0x2 |  |
|  | Run | 0x4 |  |
|  | Start | 0x8 |  |
|  | Invalid | 0xF |  |

### MD-REQ-427641/A-PerimeterAlarm\_ST

Message Type: Status

This Message is received to know the Status of the Perimeter Alarm

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Perimeter\_Alarm\_Status\_ET |  |  |  |
|  | 0x0 | Disarmed |  |
|  | 0x1 | Prearmed |  |
|  | 0x2 | Armed |  |
|  | 0x3 | Activated |  |

### MD-REQ-392355/F-StartVideoStreamCommand

Message Type: FTCP

This FTCP message is used to issue a command to start video streaming for a desired camera

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| StartVideoStreamCommand | - |

|  |  |  |
| --- | --- | --- |
| **Parameters** | | **Values** |
|  | |  |
| *Video Streaming Type* | | (Refer to protofile) |
|  |  |  |
|  | *Live Streaming* | (Refer to protofile) |
|  | *Event Recording* | (Refer to protofile) |
|  | *Live with Manual Recording* | (Refer to protofile) |
| *CameraViewData* |  | (Refer to protofile) |
|  | *VideoQualityConfigData (optional)* | (Refer to protofile) |
|  | *CameraViewData (Repeated)* | (Refer to protofile) |
|  | *VideoStreamingType (Optional)* | (Refer to protofile) |

Note: The names of the parameter are subject to change per the Protofile

The CameraViewID can be a repeated field which can take upto three values.

### MD-REQ-392362/B-StopVideoStreamCommand

Message Type: FTCP

This FTCP message is used to issue a command to stop an active video stream

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| StopVideoStreamCommand | - |

### IR-REQ-423317/D-PublishStreamStatus

***Purpose:*** This API will allow the consumer to enable or disable an on demand, on change broadcast of video stream statuses.

***Message Pattern:*** On Demand, on Change Broadcast

***Request Topic:*** SERVICES/REQUEST/CAMERA\_MANAGER/STREAM\_STATUS

***Response Topic:*** < Consumer Provided >

***Data Topic:*** SERVICES/DATA/CAMERA\_MANAGER/STREAM\_STATUS

Notes:

* When a stream status changes to failed, it is expected that the consumer will still send a stop stream request. This will indicate that the consumer has processed the failure and allow Camera Manager to clean up data and return to a normal state.
* Once a stream is successfully terminated, the stream info will be removed from the broadcast.

|  |  |  |  |
| --- | --- | --- | --- |
| **Message Name** | **Data Type** | **Message Element Name** | **Description** |
| PublishStreamStatusReq | enum | \_api\_version | see \_ApiVersion Enumeration in the info.proto file. |
|  | enum | publish\_request\_type | Used to identify if the request is to enable or disable the broadcast, see PublishRequestType enum. |
| PublishStreamStatusRsp | enum | resp\_status | Status of the request, see RespStatus enum. |
|  | array | stream\_statuses | Nested message of repeated stream statuses and configs. Included in response message so consumer gets current data rather than waiting for a re-broadcast.  See Data Structure StreamStatuses |
| PublishStreamStatus | enum | \_api\_version | Version of API |
|  | array | stream\_statuses | Nested message of repeated stream statuses and configs. See Data Structure StreamStatuses |

### MD-REQ-411558/C-PublishRecordingStatusChange

The VRPInterfaceServer shall send PublishRecordingStatus to notify change in the status of recording.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | |
| **Method Type** | | | On-Change | | | | | |
| **QoS Level** | | | Default (unless otherwise specified, ex. 0, 1, 2) | | | | | |
| **Retained** | | | N/A or Yes, No | | | | | |
|  | | | | | | | | |
| **R/O** | **Name** | | | **Type** | **Literals** | **Value** | **Description** |
| **Request (\_Rq)** | | | | | | | | |
| R | PublishRecordingStatus | | | Structure | RecordingSessionStatus |  | Broadcast the status of any in-progress recording requests as the status changes. Statuses may change from in-progress, to paused, back to in-progress, to completed, or may go into one of several failed states |
|  | RecordingSessionStatus | recording\_id | | Int32 |  |  | Identifies the recording request session. |
|  | recording\_status | | ENUM |  |  | Status of the video recording |
|  |  | |  | READY | 0X0 | Video Recorder Service is Ready to record a pre-reserved video stream. |
|  |  | |  | RECORDING | 0X1 | Recording is in progress |
|  |  | |  | COMPLETE | 0X2 | Recording session has completed |
|  |  | |  | PAUSED | 0X3 | Recording is paused |
|  |  | |  | OUT\_OF\_SPACE | 0X4 | Recording terminated due to insufficient available storage Space |
|  |  | |  | FAILED | 0X5 | Recording terminated for an unanticipated reason |
|  |  |  | |  | RECORDING\_SPACE\_WARNING | 0X6 | Recording is still in progress, but device is running out of space. |
|  |  |  | |  | Stopped | 0X7 |  |
|  |  | View Name | | String |  |  | Name of camera view being recorded or the word “metadata” to indicate the status of the data logging. |
|  |  | Segment Number | | Int |  |  | Number for the segment currently being recorded. |
| **Response (\_Rsp)** | | | | | | | | |
|  | NA | | |  |  |  |  |
|  | | | | | | | | |

### MD-REQ-392348/A-Remote\_Start\_Status

Message Type: Status

The signal is used to report the status of Remote Start State

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Remote\_Start\_Status | - | - | The status of Remote Start |
|  | Null | 0x0 |  |
|  | Remote | 0x1 |  |
|  | Unknown | 0x2 |  |
|  | Invalid | 0x3 |  |

## STNL-IIR-REQ-415448/A-SentinelInterfaceServer\_Tx

The SentinelInterfaceServer shall transmit the following messages.

### MD-REQ-411285/C-StopRecordingReq

The VRPInterfaceServer shall receive a request to Stop the entire Recording session via StopRecordingReq.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | |
| **Method Type** | | On-Change | | | | |
| **QoS Level** | | Default (unless otherwise specified, ex. 0, 1, 2) | | | | |
| **Retained** | | N/A or Yes, No | | | | |
|  | | | | | | |
| **R/O** | **Name** | | **Type** | **Literals** | **Value** | **Description** |
| StopRecord\_Request **(\_Rq)** | | | | | | |
| R | Recording\_ID | | String | - |  | The Id for the recording session |
| StopRecordingRsp **(\_Rsp)** | | | | | | |
| o | Error Message | | String |  |  | VRPInterfaceServer shall send an Error message with signature file failed for one or more views |
| R | RequestStatus | | Enumeration |  |  |  |
|  |  | |  | RequestStatus\_Success | 0x0 | SUCCESS |
|  |  | |  | RequestStatus\_Fail | 0x1 | FAIL |
| o | Recording\_status | | ENUM |  |  |  |
|  |  | |  | READY | 0X0 | Video Recorder Service is Ready to record a pre-reserved video stream. |
|  |  | |  | RECORDING | 0X1 | Recording is in progress |
|  |  | |  | COMPLETE | 0X2 | Recording session has completed |
|  |  | |  | PAUSED | 0X3 | Recording is paused |
|  |  | |  | OUT\_OF\_SPACE | 0X4 | Recording terminated due to insufficient available storage Space |
|  |  | |  | FAILED | 0X5 | Active Recording terminated for an unanticipated reason |
|  |  | |  | RECORDING\_SPACE\_WARNING | 0X6 | Recording is still in progress, but device is running out of space. |
|  |  | |  | Stopped | 0X7 | Stopped due to a Stop Request |
| R | ErrorDetail | | Enumeration |  |  |  |
|  |  | |  | None | 0x0 | No Error |
|  |  | |  | Command\_not\_Recognised | 0x1 | Unknown command in SOA request |
|  |  | |  | Unknown\_Error | 0x2 | Failed due to an unexpected error |
|  |  | |  | Invalid\_Request | 0x3 | Invalid request structure or parameters |
|  |  | |  | Not\_Supported | 0x4 | Request cannot be supported by the particular camera view requested, for instance specifying a resolution that is not supported by the camera for that view. |
|  |  | |  | DEVICE\_ID\_NOT\_Specified | 0x5 | Start Recording request was received with “Devices To Consider” set to specified only, but no device Id was provided |
|  |  | |  | Storage\_Device\_Not\_Found | 0x6 | Requested Storage Device cannot be found. |
|  |  | |  | INSUFFICIENT\_SPACE | 0x7 | Specified storage device does not have sufficient space for the recording or to begin a recording session. |
|  |  | |  | NO\_PRETESTED\_DEVICE\_WITH\_SPACE | 0X8 | This error occurs when the consumer requested a recording using the “Include\_Pretested” option but no pre-tested devices were found, or none had sufficient space. |
|  |  | |  | SPECIFIED\_DEVICE\_IS\_INVALID\_FORMAT | 0X9 | This error is for invalid format for the USB device |
|  |  | |  | NO\_SUITABLE\_DEVICE\_WITH\_SPACE | 0xA | This error occurs when the consumer requested a recording using the “Include\_Any” option but no suitable devices were found, or none had sufficient space. |
|  |  | |  | CAMERA\_VIEW\_NOT\_AVAILABLE | 0xB | Requested Camera View is not available for streaming. |
|  |  | |  | CAMERA\_VIEW\_NOT\_RESPONDING | 0xC | Camera Controller is not responding. |
|  |  | |  | QUEUE\_FULL | 0XD | Request queue is full, try request again later. |
|  |  | |  | Encryption\_Failure | 0XE | Encryption Failure |
|  |  | |  | RecordingID\_Not\_Inprogress | 0XF |  |
| R | RecordingID | | String | - |  | The Id for the recording session |

### MD-REQ-406933/C-StartRecordingReq

The VRPInterfaceServer shall receive the start the video recording request via StartRecordingReq.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | |
| **Method Type** | | | On-Change | | | | | | |
| **QoS Level** | | | Default (unless otherwise specified, ex. 0, 1, 2) | | | | | | |
| **Retained** | | | N/A or Yes, No | | | | | | |
|  | | | | | | | | | |
| **R/O** | **Name** | | | | **Type** | **Literals** | | **Value** | **Description** |
| **Request (\_Rq)** | | | | | | | | | |
| R | Feature\_short\_name | | | | String |  | | 0-15 Characters | Feature name of requesting feature  Size limit=15 charecters |
| R | DeviceSelectionStrategy | | | | Enum |  | |  |  |
|  |  | | | |  | Specified\_Only | | 0x0 | Record only to Feature specified USB StorageDeviceID  If StorageDeviceID not available/not connected then there will be an error and recording will not begin |
|  |  | | | |  | INCLUDE\_PRETESTED | | 0x1 | Record to any USB storage device that has been tested and verified as suitable for recording in the vehicle |
|  |  | | | |  | INCLUDE\_ANY | | 0x2 | Attempt to record to any USB Storage device currently connected, whether tested and verified or not. Only if device proves to be unsuitable, will there be an error. |
| O | StorageDevice\_ID | | | | String |  | | 0-36 Charecters | Storage device id to which data/video will be recorded to  May be a UUID |
| O | RecordingMode | | | | Enum |  | |  | Mode to use for files creation and out of memory conditions. Continuous or loop. |
|  |  | | | |  | Continuous | | 0X0 | Recording is performed continuously without any sort of loop back to overwrite earlier segment of the recording. |
|  |  | | | |  | Loop | | 0X1 | Recording is performed in a loop mode. File segments are created of the specified segment duration, until the recording duration is reached. Then the system will “loop back” and overwrite the files for the first segment, then the second segment. This creates a recording of a set duration, consisting only of events that far back in time. |
| O | recording\_duration | | | | Int32 | - | | 0-n seconds | Amount of time to record the camera view(s). |
| O | SegmentDuration | | | | Int32 | - | | 0-n seconds | Duration of each video segment.  Note: Used if desired to make the video into smaller subsegments. (Required for loop mode)  (not used for Sentinel) |
| O | out\_of\_space\_strategy | | | | Enum |  | |  | Determines what VRP shall do when running out of space |
|  |  | | | |  | Terminate recording. | | 0X0 | Stop recording and send out of space error |
|  |  | | | |  | Delete from older session only | | 0X1 | Delete the unprotected oldest recording session in the memory for the requesting feature. |
|  |  | | | |  | Delete oldest from any session | | 0X2 | Delete the oldest unprotected recording file in this recording session for the requesting feature. |
|  | storage\_limit\_percent | | | | Uint32 |  | |  | Percentage of the Total Storage Space that the feature should be limited to, for instance limit the feature to use only 80% of the total storage space. |
| o | IP Address | | | | String |  | |  | Optional IP address where the view will stream |
| o | Port Address | | | | Unit32 |  | |  | Optional Port where the view will stream. |
| R | CameraViewName | | | | String |  | |  | Name of the view to be recorded as found in the camera manager published list of camera views |
| O | FrameRate | | | | ENUM |  | |  | This enumeration provides the list of supported Frame rates for camera configurations. The desired framerate should be specified when starting a recording, else the current camera setting will be used. |
|  |  | | | |  | FPS\_30 | | 0x0 |  |
|  |  | | | |  | FPS\_15 | | 0x1 |  |
|  |  | | | |  | FPS\_10 | | 0x2 |  |
|  |  | | | |  | FPS\_60 | | 0x3 |  |
| O | Resolution | | | | ENUM |  | | 0-n mpix | Resolution of the video stream to record. |
|  |  | | | |  | RES\_1280\_BY\_800 | | 0x0 | This is a high-resolution setting |
|  |  | | | |  | RES\_640\_BY\_480 | | 0x1 | This is a medium resolution setting |
|  |  | | | |  | RES\_480\_BY\_360 | | 0x2 | This is a low-resolution setting |
|  |  | | | |  | RES\_1920\_BY\_1080 | | 0x3 |  |
|  |  | | | |  | RES\_1280\_BY\_720 | | 0x4 |  |
| R | Bitrate | | | | ENUM |  | |  | This enumeration provides the list of supported Bitrates for camera configurations. The desired Bitrate should be provided when starting a recording, else the camera’s current setting will be used. |
|  |  | | | |  | KBPS\_10000 | |  |  |
|  |  | | | |  | KBPS\_5000 | |  |  |
|  |  | | | |  | KBPS\_1000 | |  |  |
| O | recording\_session\_name | | | | String |  | | UTF-8 encoded or 7-bit ASCII text | Optional name for the recording Session |
| R | MetadataToRecord |  | | Enum | |  | |  | Repeating values |
| Date | | String | |  | | 0X0 | Date in mm-dd-yyyy format. |
| Time | | Int | |  | | 0X1 | Time of day in 24 hour format, like 21:15:12 |
| Vehicle Speed | | Int | |  | | 0X2 | Vehicle Speed as displayed in the Instrument Panel, either in Miles per hour (mph) or kilometers per hour (km/h) |
| Vehicle Location | | ENUM | |  | | 0X3 | GNSS information on the Vehicle’s location, including the information below |
|  | |  | | Latitude | 0X0 |  | In degree format, DDD° MM' SS.S" [N / S]. Sample - 32° 18' 23.1" N |
|  | |  | | Longitude | 0X1 |  | In degree format, DDD° MM' SS.S" [W / E]. Sample - 122° 36' 52.5" W |
|  | |  | | Altitude | 0X2 |  | Feet or meters above Mean Sea Level (MSL) |
|  | |  | | Heading | 0X3 |  | Compass direction |
| VIN | | String | |  | | 0X4 | The Vehicle Identification Number of the vehicle where the recording was made. |
| Accelerator Pedal Position | | String | |  | | 0X5 | A percentage interpretation of the Accelerator pedal position:  0% = released pedal.  100% = maximum pedal. |
| Braking Torque | | String | |  | | 0X6 | Indication of braking force in newton\*meters (nm).  Includes braking applied by:  - Driver request (brake pedal)  - Adaptive Cruise Control system  - Collision Mitigation by Braking (CMbB) system |
| Braking Indication | | Enum | |  | | 0X7 | Indicates if the driver is braking by pushing on the brake pedal refer BpedMove\_D\_Actl |
|  | |  | | Driver | 0X0 |  |  |
|  | |  | | Autonomous | 0X1 |  |  |
|  | |  | | No Braking | 0X2 |  |  |
|  | |  | | Unknown | 0X3 |  |  |
| Perimeter Alarm Triggers | | String | |  | | 0X8 | The current trigger for a perimeter alarm event. Refer to the signal PrmtrAlrmEvnt\_D\_Stat |
| R | encrypt\_videfile | | | | Boolean |  | |  | Should the recording be encrypted or not. |
|  |  | | | |  | No | | 0X0 |  |
|  |  | | | |  | Yes | | 0X1 |  |
| R | encrypt\_metadata\_file | | | | Boolean |  | |  | Should the metadata be encrypted or not. |
|  |  | | | |  | No | | 0X0 |  |
|  |  | | | |  | Yes | | 0X1 |  |
| R | PowerSeverity | | | | Int32 |  | |  | Power severity level of the feature used to vote to keep the Video source to be powered. (not used by sentinel) |
| StartRecordRsp **(\_Rsp)** | | | | | | | | | |
| R | RequestStatus | | | | Enumeration |  | |  |  |
|  |  | | | |  | RequestStatus\_Success | | 0x0 | SUCCESS |
|  |  | | | |  | RequestStatus\_Fail | | 0x1 | FAIL |
| R | ErrorDetail | | | | Enumeration |  | |  |  |
|  |  | | | |  | None | | 0x0 | No Error |
|  |  | | | |  | Command\_not\_Recognised | | 0x1 | Unknown command in SOA request |
|  |  | | | |  | Unknown\_Error | | 0x2 | Failed due to an unexpected error |
|  |  | | | |  | Invalid\_Request | | 0x3 | Invalid request structure or parameters |
|  |  | | | |  | Not\_Supported | | 0x4 | Request cannot be supported by the particular camera view requested, for instance specifying a resolution that is not supported by the camera for that view. |
|  |  | | | |  | DEVICE\_ID\_NOT\_Specified | | 0x5 | Start Recording request was received with “Devices To Consider” set to specified only, but no device Id was provided |
|  |  | | | |  | Storage\_Device\_Not\_Found | | 0x6 | Requested Storage Device cannot be found. |
|  |  | | | |  | INSUFFICIENT\_SPACE | | 0x7 | Specified storage device does not have sufficient space for the recording or to begin a recording session. |
|  |  | | | |  | NO\_PRETESTED\_DEVICE\_WITH\_SPACE | | 0X8 | This error occurs when the consumer requested a recording using the “Include\_Pretested” option but no pre-tested devices were found, or none had sufficient space. |
|  |  | | | |  | SPECIFIED\_DEVICE\_IS\_INVALID\_FORMAT | | 0X9 | This error is for invalid format for the USB device |
|  |  | | | |  | NO\_SUITABLE\_DEVICE\_WITH\_SPACE | | 0xA | This error occurs when the consumer requested a recording using the “Include\_Any” option but no suitable devices were found, or none had sufficient space. |
|  |  | | | |  | CAMERA\_VIEW\_NOT\_AVAILABLE | | 0xB | Requested Camera View is not available for streaming. |
|  |  | | | |  | CAMERA\_VIEW\_NOT\_RESPONDING | | 0xC | Camera Controller is not responding. |
|  |  | | | |  | QUEUE\_FULL | | 0XD | Request queue is full, try request again later. |
|  |  | | | |  | Encryption\_Failure | | 0XE | Encryption Failure |
|  |  | | | |  | WRONG\_DISK\_FORMAT | | 0XF | Available USB/SD Card is improperly formatted |
| R | RecordingID | | | | String | - | |  | The Id for the recording session |
| O | StorageDevice\_ID | | | | String | - | | 0-36 Charecters | Storage device id to which data/video will be recorded to |

### MD-REQ-392356/E-StartVideoStreamCommandResponse

Message Type: FTCP

This FTCP message is used to respond to a command to start video streaming for a desired camera

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| StartVideoStreamCommandResponse | - |

|  |  |
| --- | --- |
| **Parameters** | **Values** |
| cmdStatus (optional) | (Refer to protofile) |
| errorDetail (optional) | (Refer to protofile) |
| CameraViewStatus (Repeated) | (Refer to protofile) |

Note : The CameraViewStatus is the new parameter added to capture all three camera views and its status

The Parameter names are subject to change per the protofile.

### MD-REQ-392363/B-StopVideoStreamCommandResponse

Message Type: FTCP

This FTCP message is used to respond to a command to stop an active video stream

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| StopVideoStreamCommandResponse | - |

|  |  |
| --- | --- |
| **Parameters** | **Values** |
| cmdStatus (optional) | (Refer to protofile) |
| errorDetail (optional) | (Refer to protofile) |

### IR-REQ-404260/F-StartStream

***Purpose:*** This API will allow the consumer to start a video stream of a single camera view.

It can also be used to “reserve” a stream for a coordinated start by setting the “reserve\_for\_coordinated\_start” parameter to True. The consumer will receive the intended multicast IP address and port, allowing all recipients to connect to the address and join the multicast group prior to the stream starting.

If a stream is reserved, then the consumer that reserved it must send a Commence Reserved Stream request in order to start the video streaming. If a commence or cancelation request is not received in a reasonable amount of time, the reservation will be automatically canceled or started depending on the presence of other consumers for that stream.

***Message Pattern:*** Request / Response

***Request Topic:*** SERVICES/REQUEST/CAMERA\_MANAGER/STREAM\_CONTROL

***Response Topic:*** < Consumer Provided >

Notes:

* If the requested resolution, framerate, and bitrate are not supported by the requested view, it will still stream but at the default settings for that view.
* Subsequent requests for an already streaming view will be directed to the in-progress stream, with the existing configuration (resolution, framerate, and bitrate). The consumer must still send a stop request when no longer interested in the view.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Message Name** | | **Data Type** | **Message Element Name** | **Description** | |
| StartStreamReq | | enum | \_api\_version | Version of the software interface. see \_ApiVersion Enumeration in the info.proto file. | |
|  | | Enum  CameraView | camera\_view | The view requested. | |
|  | | Enum  Resolution | resolution | Desired resolution for the stream | |
|  | | Enum  FrameRate | frame\_rate | Desired frame rate for the stream | |
|  | | Enum  BitRate | bit\_rate | Desired bitrate for the stream | |
|  | | uint32 | power\_severity\_level | Power severity of the feature or function for use when voting to power the camera controllers with VPSM.  NOTE: all key off activities need to be evaluated by power supply team, Hussein Berry or Z Deljevic, in order to get severity assigned. | |
|  | | string | client\_id | Client Id of the consumer, for use in power requests to VPSM in order to power the camera controller. | |
|  | | bool | reserve\_for\_coordinated\_start | When set to true Camera Manager will reserve a multicast port for the stream request, but not initiate the stream until it receives a commence reserved stream request.  Default will be False | |
| StartStreamRsp | | Enum  RespStatus | response\_status | Status of request. | |
|  | | uint32 | stream\_id | Stream\_id is an auto generated uid by Camera Manager for each video stream. This is used later to change or stop the stream. | |
|  | | string | ip\_address | Multicast IP Address where the stream can be received (recipient must bind and join the multicast group). | |
|  | | uint32 | port | Multicast port where the stream can be received. | |
|  | | Enum  StreamType | stream\_type | Type of stream the consumer will be joining.  This can help the consumer determine if the stream is already in progress or a reserved stream that will not start until the reserving client sends a commence request. | |
|  | Enum  CameraView | | camera\_view | The view requested. |

### IR-REQ-404261/F-StopStream

***Purpose:*** This API will allow the consumer to stop a particular video stream. If there is more than one recipient of the stream, then Camera Manager will only stop the video stream when the last recipient sends a stop request.

***Message Pattern:*** Request / Response

***Request Topic:*** SERVICES/REQUEST/CAMERA\_MANAGER/STREAM\_CONTROL

***Response Topic:*** < Consumer Provided >

Note: It is the consumers responsibility to make sure stop requests are successful. This may mean retrying until a successful response is received, particularly in the event of a communication disruption or system crash. The consumer should persist knowledge about active video streams, and upon restart, ensure that it sends stop requests for any streams that were in process prior to the failure.

|  |  |  |  |
| --- | --- | --- | --- |
| **Message Name** | **Data Type** | **Message Element Name** | **Description** |
| StopStreamReq | enum | \_api\_version | Version of the software interface. see \_ApiVersion Enumeration in the info.proto file. |
|  | uint32 | stream\_id | Stream Id that is to be stopped. |
|  | Enum  CameraView | camera\_view | The view to be stopped. |
|  | string | client\_id | Client Id of the consumer, for use in power requests to VPSM in order to appropriately remove vote to power the camera controller. |
| StopStreamRsp | enum | response\_status | Status of request, see RespStatus enum. |
|  | uint32 | stream\_id | Stream\_id is an auto generated uid by Camera Manager for each video stream. This is sent in the response for consistency and to help consumer with any tracking. |

### IR-REQ-415420/D-CommenceReservedStream

***Purpose:*** This interface will allow the consumer to initiate video streaming for a view that was reserved using the “reserve for coordinated start” parameter of the start stream request.

***Message Pattern:*** Request / Response

***Request Topic:*** SERVICES/REQUEST/CAMERA\_MANAGER/ STREAM\_CONTROL

***Response Topic:*** < ConsumerProvided>

Note:

The commence stream request can fail for all the same reasons as a start stream request, including the camera being in use to provide a different view. This is because in the initial release:

* Camera Manager does not have information on what specific camera is required for each view.
* The Camera Services on the camera controllers, are not providing reservation functionality.

|  |  |  |  |
| --- | --- | --- | --- |
| **Message Name** | **Data Type** | **Message Element Name** | **Description** |
| CommenceStreamReq | enum | \_api\_version | Version of software interface see \_ApiVersion Enumeration in the info.proto file. |
|  | uint32 | stream\_id | Unique identifier of the stream, that was established by Camera Manager when the stream was reserved. |
|  | string | client\_id | Client Id of the consumer. |
| CommenceStreamRsp | Enum  RespStatus | response\_status |  |
|  | uint32 | stream\_id | Stream\_id is an auto generated uid by Camera Manager for each video stream. This is sent in response for consistency and so consumer can use for any tracking. |

### IR-REQ-424678/C-CancelReservedStream

***Purpose:*** This API will allow the consumer to cancel a stream reservation they created, in the event there is no longer a need for the video.

***Message Pattern:*** Request / Response

***Request Topic:*** SERVICES/REQUEST/CAMERA\_MANAGER/STREAM\_CONTROL

***Response Topic:*** < Consumer Provided >

|  |  |  |  |
| --- | --- | --- | --- |
| **Message Name** | **Data Type** | **Message Element Name** | **Description** |
| CancelReservedStreamReq | enum | \_api\_version | see \_ApiVersion Enumeration in the info.proto file. |
|  | uint32 | stream\_id | ID of the reserved stream to cancel. |
|  | string | client\_id | Client Id of the consumer. |
| CancelReservedStreamRsp | enum | response\_status | Status of request, see RespStatus enum. |
|  | uint32 | stream\_id | Stream\_id is an auto generated uid by Camera Manager for each video stream. This is sent in response for consistency and so consumer can use for any tracking. |

### MD-REQ-427885/A-AlarmTriggeredAlert

Message Type: FTCP

This alert is used to notify the OffBoardCommunicationServer that a PerimeterAlarm\_St has been received by the SentinelInterfaceServer and an intrusion has been confirmed.

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Alert** | **Description** |
| AlarmTriggeredAlert | Alert to describe an Intrusion has been detected |

### MD-REQ-392353/E-VideoStreamingStatusUpdateAlert

Message Type: FTCP

This FTCP message is used to provide an update to the camera video streaming status

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| VideoStreamingStatusUpdateAlert | - |

|  |  |  |
| --- | --- | --- |
| **Parameters** | **Values** | |
| cameraViewId (optional) | (Refer to protofile) | |
| videoStreamingStatus (optional) | (Refer to protofile) | |
| VideoStreamingLiteral (optional) | (Refer to protofile) |
| Start Time | (Refer to protofile) |
| End Time | (Refer to protofile) |

Note: The two parameters under Videostreaming Literal- unknown, Timer Expired are to be added in addition to already existing ones in the protofile not mentioned here in the SPSS. The names to these are subject to change in the protofile

### MD-REQ-392359/D-StreamSessionStatusUpdateAlert

Message Type: FTCP

This FTCP message is used to provide a status of the active video streaming session

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| StreamSessionStatusUpdateAlert | - |

|  |  |
| --- | --- |
| **Parameters** | **Values** |
| sessionStatus (optional) | (Refer to protofile) |
| streamSessionLiteral (optional) | (Refer to protofile) |

Note: The two parameters under Videostreaming Literal- unknown, Timer Expired are to be added in addition to already existing ones in the protofile not mentioned here in the SPSS. The names to these are subject to change in the protofile

# General Requirements

## STNL-REQ-415450/A-Operation Mode Condition

The SentinelInterfaceServer shall only allow the functionality defined by this SPSS when the Ignition\_Status =OFF or Remote\_Start\_Status =Remote.

## STNL-REQ-442880/A-Vehicle Battery Condition

The SentinelInterfaceServer shall apply its VPSM critical Severity logic for a given battery condition when the feature is in operating mode

## STNL-REQ-415451/A-Feature Configuration

The Sentinel feature shall have a configurable parameter to determine whether the vehicle supports this Feature. Refer to CCS spec for the same.

(this is will be common for Sentinel and MDV)

## STNL-REQ-415452/A-Missing Communication Strategy

Refer to NFN-REQ-416643/B-Communication Loss while Streaming in the CameraManager spec.

Refer to MDV-REQ-392288/C-Stream Communication Failed Alert when Video Streaming to OffBoard Video Server in the MDV SPSS.

## STNL-REQ-505061/A-China Program Exclusion for Sentinel requirements

The impact on China Program for Sentinel is as follows:

If the DID DE00 with parameter 7 is set to 011 (CHINA) then:

* SentinelInterfaceServer will not send any FTCP command responses or FTCP alerts to OffboardCommunicationServer
* SentinelInterfaceServer will not handle any FTCP commands from OffboardCommunicationServer
* SentinelInterfaceServer will not stream any video to SentinelOffBoardServer
* SentinelInterfaceServer will stream to VRPInterfaceServer without waiting for StartVideoStreamCommand from OffBoardCommunicationServer
* FTCP command responses are sent if the command is received, but they will all be failure responses. FTCP alerts are not sent.

Note 1: The functional requirements can give more detail on these.

Note 2: Refer to Subsystem Specific Diagnostic Specification (Part 2) for more details on DID DE00.

## STNL-REQ-509477/A-Availability of Camera Views

The SentinelInteraceServer shall only accept the INTCAM1, INTCAM2, NORMAL\_360 as desired view.

If the INTCAM1, INTCAM2 are not available for the desired view then the SentinelInteraceServer shall accept the FRONT\_ROW\_SEAT, SECOND\_ROW\_SEAT and NORMAL\_360.

## STNL-REQ-509497/A-Camera Configurations

The SentinelInteraceServer shall send use the following configurations for the Sentinel views:

a. View Name = NORMAL\_360

i. Resolution = RES\_1280\_BY\_800

ii. Framerate = FPS\_30

iii. Bitrate = KBPS\_10000

b. View Name = INTCAM1

i. Resolution = RES\_640\_BY\_480

ii. Framerate = FPS\_30

iii. Bitrate = KBPS\_10000

c. View Name = INTCAM2

i. Resolution = RES\_640\_BY\_480

ii. Framerate = FPS\_30

iii. Bitrate = KBPS\_10000

d. View Name = FRONT\_ROW\_SEAT

i. Resolution = RES\_1920\_BY\_1080

ii. Framerate = FPS\_30

iii. Bitrate = KBPS\_10000

e. View Name = SECOND\_ROW\_SEAT

i. Resolution = RES\_1920\_BY\_1080

ii. Framerate = FPS\_30

iii. Bitrate = KBPS\_10000

# Functional Definition

## STNL-FUN-REQ-415453/A-Sentinel Subscription and Enable/Disable Setting

### Requirements

#### STNL-REQ-415457/A-Subscription and Sentinel Enable/Disable

The SentinelInterfaceServer shall run/shutdown the feature based on enable/disable of the feature through the CCS menu selection.

## STNL-FUN-REQ-415543/B-Intrusion Detected and Video Streaming

### Use Cases

#### STNL-UC-REQ-415545/D-Alarm Detection

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, ExternelSentinelTriggerServer, SentinelOffBoardServer, OffBoardCommunicationServer |
| **Pre-conditions** | Operating Mode Conditions are met  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated  Sentinel is enabled |
| **Scenario Description** | If the ExternelSentinelTriggerServer sends a PerimeterAlarm\_ST=”0x3”/Activated signal to the SentinelInterfaceServer shall consider it as intrusion detected.  The SentinelInterfaceServer shall set the Initiate\_timer=20s to wait for video recipients to be ready prior to commencing the stream.  Note: If the DIDDE00 is set to 011 China then VRPInterfaceServer will be the only video recipient. |
| **Post-conditions** | reserve the video streams  send port/IP to VRP interface server  Set up the session with the SentinelOffBoardServer.  Note: If the DIDDE00 is set to 011 China then a session is not setup with SentinelOffBoardServer. |
| **List of Exception Use Cases** | Loss of connection with BCM |
| **Interfaces** | CAN, Ethernet |

#### STNL-UC-REQ-425358/B-Intrusion Detection Notification Cloud and Monitor Existing Stream

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, SentinelOffboardServer; OffBoardCommunicationServer |
| **Pre-conditions** | Operation mode conditions are met  Intrusion detected  SentinelInterfaceServer awake |
| **Scenario Description** | When a vehicle intrusion event is detected AlarmTriggeredAlert is received by the OffBoardCommunicationServer  The SentinelInterfaceServer shall receive ready from the VRPInterfaceServer and the OffBoardCommunicationServer.  Refer to STNL-REQ-509477/A-Availability of Camera Views for desired Camera views  SentinelInterfaceServer shall monitor PublishStreamStatus broadcast from the camera manager to check:  If any desired view is already streaming:   * Then the SentinelInterfaceServer shall verify:   + if the SentinelOffboardServer is receiving the same stream use the existing stream and the IP Address for the STNL-REQ-425917/A-Request VRP for StartRecording (for this stream reserve stream is not necessary and the start stream is also not received for this)   + SentinelInterfaceServer shall reserve the remaining two views with the Camera Manager and send to the VRPInterfaceServer.   + Once the reserve stream is confirmed then the SentinelInterfaceServer shall send STNL-REQ-425917/A-Request VRP for StartRecording and/Or wait to receive the StartVideoStreamCommand from the OffBoardCommunicationServer then read the status from the VRPInterfaceServer to send Commence Reserved request to the Camera Manager.   Else if it is not a desired view   * + If the SentinelInterfaceServer or SentinelOffboardServer is receiving one of the available views then the SentinelInterfaceServer shall request STNL-REQ-415491/A-Video Stream -Stop and send VideoStreamingStatusUpdateAlert to the SentinelOffboardServer   + SentinelInterfaceServer or SentinelOffboardServer is not receiving that view then continue to STNL-REQ-415495/A-Reserve Video Stream.   If sentinel views are streaming and any new StartVideoStreamCommand request comes from the OffboardCommnunicationServer the SentinelInterfaceServer shall reject that request.  Note: If the DID DE00 is set to 011 China, then the StartVideoStreamCommand request is not relayed from the OffboardCommnunicationServer and SentinelOffBoardServer will not stream any video. And VideoStreamingStatusupdateAlert will not be sent to OfBoardCommunicationServer. |
| **Post-conditions** | The SentinelInterfaceServer shall start recording to the VRP and sending video the cloud or start stream reserve  Note: If the DID DE00 is set to 011 China, then stream to cloud is not applicable. |
| **List of Exception Use Cases** | Lost communication with the camera manager  Lost Communication with the OffBoardCommunicationServer  Lost Communication with the SentinelOffBoardServer. |
| **Interfaces** | CAN, Ethernet |

#### STNL-UC-REQ-415470/B-Reserve video stream

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, CameraManager |
| **Pre-conditions** | Operation mode conditions are met  SentinelInterfaceServer awake  Intrusion detected  Alert is sent to the SentinelOffboardServer |
| **Scenario Description** | For all the other views where SentinelInterfaceServer does not already have a stream, send request to the CameraManager to start video streams (reserved) with StartStreamRq as referred in the IR-REQ-404260/C-StartStream in the CameraManagerService Spec.  The SentinelInterfaceServer shall send reserve request for the Sentinel views per STNL-REQ-509477/A-Availability of camera views, STNL-REQ-509497/A-Camera Configurations for the desired view. |
| **Post-conditions** | The connection with ports and IP address shall then be established with the SentinelInterfaceServer as a response. |
| **List of Exception Use Cases** | No response from camera manager |
| **Interfaces** | SOA |

#### STNL-UC-REQ-423308/B-Video Stream-Send to cloud and Accept

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, VRPInterfaceServer |
| **Pre-conditions** | Operation mode Conditions are met |
| **Scenario Description** | When the OffboardCommunicationServer sends StartVideoStreamCommand to the SentinelInterfaceServer then the SentinelInterfaceServer shall respond via MD-REQ-392356/B-StartVideoStreamCommandResponse to the OffboardCommunicationServer refer to the MDV-FUN-REQ-391508/A-Initiate Video Stream in the MDV SPSS for more details in the requirements.  Note: If the DID DE00 is set to 011 China, then the StartVideoStreamCommand will not be handled and StartVideoStreamCommandResponse will be a failure. |
| **Post-conditions** | SentinelInterfaceServer shall commence video to the cloud  Note: If the DID DE00 is set to 011 China, then stream to cloud is not applicable. |
| **List of Exception Use Cases** | Lost connection with the cloud  Poor internet connection |
| **Interfaces** | SOA |

#### STNL-UC-REQ-415471/B-Video Stream - Commence Stream to both VRP and Cloud Ready

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, CameraManager, SentinelOffboardServer, VRPInterfaceServer |
| **Pre-conditions** | Operation mode Conditions are met |
| **Scenario Description** | SentinelInterfaceServer shall request the CameraManager to commence the video to the VRPInterfaceServer and the SentinelOffboardServer with CommenceReservedStream API as referred in the IR-REQ-415420/A-CommenceReservedStream in the CameraManagerService Spec.  When all of the following conditions are met:  Condition 1:  • The SentinelInterfaceServer receives a ready broadcast message from the VRP to trigger Video Stream.  Condition 2:  • The SentinelInterfaceServer receives StartVideoStreamCommand from OffBoardCommunicationServer.  Condition 3:  • Initiate\_Timer has NOT expired.  Note: If the DID DE00 is set to 011 China the condition 2 is not applicable. The video can be commenced when only conditions 1 and 3 are true. |
| **Post-conditions** | Video is being to recorded to usb and being sent to the cloud. Cancel Initiate\_Timer.  Note: If the DID DE00 is set to 011 China then the video is only recorded to USB and not sent to Cloud. |
| **List of Exception Use Cases** | Lost connection with the cloud  Poor internet connection  Lost connection with Sync |
| **Interfaces** | SOA |

#### STNL-UC-REQ-510557/A-Initiate Timer Expires - Initiate Video

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, CameraManager, SentinelOffboardServer, VRPInterfaceServer |
| **Pre-conditions** | Operation mode Conditions are met |
| **Scenario Description** | When the Initiate\_Timer expires, SentinelInterfaceServer shall request the CameraManager to commence the video with CommenceReservedStream API as referred in the IR-REQ-415420/A-CommenceReservedStream in the CameraManagerService Spec.  When any of the following conditions are met:  Condition 1:  • The SentinelInterfaceServer receives a ready broadcast message from the VRP to trigger Video Stream.  Condition 2:  • The SentinelInterfaceServer receives StartVideoStreamCommand from OffBoardCommunicationServer.  If either of the VRPInterfaceServer or the OffBoardCommunicationServer respond after the stream has Commenced, then the SentinelInterfaceServer shall allow either of the servers to utilize the existing Stream.  Note: If the DID DE00 is set to 011 China then this Use-case is not applicable. |
| **Post-conditions** | Video is being to recorded to usb and being sent to the cloud.  Note: If the DID DE00 is set to 011 China, then stream to cloud is not applicable. |
| **List of Exception Use Cases** | Lost connection with the cloud  Poor internet connection  Lost connection with Sync |
| **Interfaces** | SOA |

#### STNL-UC-REQ-510717/A-Initiate Timer Expires - End Session

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, CameraManager, SentinelOffboardServer, VRPInterfaceServer |
| **Pre-conditions** | Operation mode Conditions are met |
| **Scenario Description** | When the Initiate\_Timer expires, SentinelInterfaceServer shall cancel the stream reservations when all of the following conditions are met:  Condition 1:  • The SentinelInterfaceServer has NOT received a ready broadcast message from the VRP to trigger Video Stream.  Condition 2:  • The SentinelInterfaceServer has NOT received StartVideoStreamCommand from OffBoardCommunicationServer.  Note: If the DID DE00 is set to 011 China condition 2 is not applicable |
| **Post-conditions** | Session gets cleaned up. Stream reservations get canceled and resources allocations are removed. |
| **List of Exception Use Cases** | Lost connection with the cloud  Poor internet connection  Lost connection with Sync |
| **Interfaces** | SOA |

#### STNL-UC-REQ-426898/C-Set Record Timer

|  |  |
| --- | --- |
| **Actors** | SentInterfaceServer, OffBoardCommunicationServer |
| **Pre-conditions** | Operation mode Conditions are met |
| **Scenario Description** | When SentinelInterfaceServer requests for CommenceVideoStream then SentinelInterfaceServer shall set the RecordTimer= 5 min to set duration of the recording. |
| **Post-conditions** | Video is being to recorded to usb and/or being sent to the cloud within the duration of the timer  Note: If the DID DE00 is set to 011 China, then the video recorded is not sent to cloud |
| **List of Exception Use Cases** | Lost connection with Sync  Lost connection with the cloud  Poor internet connection |
| **Interfaces** | SOA |

#### STNL-UC-REQ-426899/B-Record Timer Expires

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, VRPInterfaceServer, OffBoardCommunicationServer |
| **Pre-conditions** | Operation mode Conditions are met |
| **Scenario Description** | Once the RecordTimer= 5min timesout SentinelInterfaceServer shall request VRPInterfaceServer to stop recording via StopRecordRequest refer to VRP-REQ-407064/A-Stop Record in the VRP SPSS.  The SentinelIntrefaceServer shall send StreamSessionStatusUpdateAlert to the OffBoardCommunicationServer that the timer has timed out.  Note: If the DID DE00 is set to 011 China, then the StreamSessionStatusUpdateAlert is not sent. |
| **Post-conditions** | Video stops recording to usb and stream stops being sent to the cloud  Note: If the DID DE00 is set to 011 China, then no Video stream is sent to the Cloud |
| **List of Exception Use Cases** | Lost connection with Sync  Lost connection with the cloud  Poor internet connection |
| **Interfaces** | SOA |

#### STNL-UC-REQ-426897/B-Video Stream-Stop

|  |  |
| --- | --- |
| **Actors** | CameraManager, SentinelInterfaceServer, VRPInterfaceServer, SentinelOffboardServer |
| **Pre-conditions** | Operation mode Conditions are met |
| **Scenario Description** | SentinelInterfaceServer shall send StopStream for a view to the CameraManager as referred in the IR-REQ-404261/C-StopStream if and only if either of the conditions are met:   * If the Record Timer Expires. * If SentinelOffboardServer and VRPInterfaceServer have stopped receiving the video * If the DID DE00 is set to 011 China and the VRPInterfaceServer have stopped receiving the video |
| **Post-conditions** | Video Streaming Stops |
| **List of Exception Use Cases** | No response from the CameraManager |
| **Interfaces** | SOA |

### Requirements

#### STNL-REQ-415553/C- Alarm Detection

If the ExternelSentinelTriggerServer sends a PerimeterAlarm\_ST=”0x3”/Activated signal to the SentinelInterfaceServer shall consider it as intrusion detected.

The SentinelInterfaceServer shall set the Initiate\_timer=20s to wait for video recipients to be ready prior to commencing the streams.

Note 1: Once the Alarm is detected then SentinelInterfaceServer shall take the responsibility to keep ADAS, Sync and the CAN Bus awake after the SentinelInterfaceServer up and Awake within 10-15 seconds.

Note 2: The inactivity timer(MDV-REQ-423351/A-T\_InactivityTimer) and inactivitygraceperiod(MDV-REQ-423349/A-T\_InactivityGracePeriod) timers are deactivated during the alarm detection is in progress.

Note 3: If the DIDDE00 is set to 011 China then, VRPInterfaceServer will be the only video recipient.

#### STNL-REQ-415557/B-Intrusion Detection Notification Cloud and Monitor Existing Stream

When a vehicle intrusion event is detected AlarmTriggeredAlert is received by the OffBoardCommunicationServer

The SentinelInterfaceServer shall receive ready from the VRPInterfaceServer and the OffBoardCommunicationServer

Refer to STNL-REQ-509477/A-Availability of Camera Views for desired Camera views

SentinelInterfaceServer shall monitor PublishStreamStatus broadcast from the camera manager to check:

If any desired view is already streaming:

* Then the SentinelInterfaceServer shall verify:
  + if the SentinelOffboardServer is receiving the same stream use the existing stream and the IP Address for the STNL-REQ-425917/A-Request VRP for StartRecording (for this stream reserve stream is not necessary and the start stream is also not received for this)
  + SentinelInterfaceServer shall reserve the remaining two views with the Camera Manager and send to the VRPInterfaceServer.
  + Once the reserve stream is confirmed then the SentinelInterfaceServer shall send STNL-REQ-425917/A-Request VRP for StartRecording and/Or wait to receive the StartVideoStreamCommand from the OffBoardCommunicationServer then read the status from the VRPInterfaceServer to send Commence Reserved request to the Camera Manager.

Else if it is not a desired view

* + If the SentinelInterfaceServer or SentinelOffboardServer is receiving one of the available views then the SentinelInterfaceServer shall request STNL-REQ-415491/A-Video Stream -Stop and send VideoStreamingStatusUpdateAlert to the SentinelOffboardServer
  + SentinelInterfaceServer or SentinelOffboardServer is not receiving that view then continue to STNL-REQ-415495/A-Reserve Video Stream.

If sentinel views are streaming and any new StartVideoStreamCommand request comes from the OffboardCommnunicationServer the SentinelInterfaceServer shall reject that request

Note- 1: If we reach more than three views the app will continue with the rest of the other two successful views.

Note -2: If the SentinelInterfaceServer detects a new intrusion the SentinelInterfaceServer shall ignore the trigger and continue to record until the 5 min timer ends. The timer shall not be reset due to the new intrusion

Note 3: If the DID DE00 is set to 011 China, then the StartVideoStreamCommand request is not relayed from the OffboardCommnunicationServer and SentinelOffBoardServer will not stream any video. VideoStreamingStatusUpdateAlert is not sent to the SentinelOffboardServer.

#### STNL-REQ-440357/A-Allow Remote Start

When the Sentinel is active and SentinelInterfaceServer is receiving Remote\_Start\_Status, then the SentinelInterfaceServer shall allow the Sentinel feature to continue to function. For details on how remote powertrain start is managed by the Mobile Device Viewer feature, refer to **MDV-FUN-REQ-391499/B-Mobile Device Viewer Feature Power Moding"**

#### STNL-REQ-415495/B-Reserve Video Stream

For all the other views where SentinelInterfaceServer does not already have a stream, send request to the CameraManager to start video streams (reserved) with StartStreamRq as referred in the IR-REQ-404260/C-StartStream in the CameraManagerService Spec.

The SentinelInterfaceServer shall send reserve request for the Sentinel views per STNL-REQ-509477/A-Availability of camera views, STNL-REQ-509497/A-Camera Configurations for the desired view.

#### STNL-REQ-425917/B-Request VRP for StartRecording

After the reserve stream successful or the SentinelInterfaceServer receives Inprogress Stream, then the SentinelInterfaceServer shall send the IP address and the port id via Record\_Request to VRPInterfaceServer. Refer to STNL-REQ-415479/A-Record to USB for more details on recording request.

Note 1: If there is a failure in the Record\_Request from the VRP or it is not received before the Intiate\_timer ends and StartVideoStreamCommand is received then the SentinelInterfaceServer shall stream to cloud per STNL-REQ-415493/A-Video Stream Send to Cloud and Accept

Note 2: If the DID DE00 is set to 011 China, then the video streamed is not sent to cloud.

#### STNL-REQ-415493/B-Video Stream Send to Cloud and Accept

When the OffboardCommunicationServer sends StartVideoStreamCommand to the SentinelInterfaceServer then the SentinelInterfaceServer shall respond via MD-REQ-392356/B-StartVideoStreamCommandResponse to the OffboardCommunicationServer refer to the MDV-FUN-REQ-391508/A-Initiate Video Stream in the MDV SPSS for more details in the requirements.

Note 1: If there is a failure in the StartVideoStreamCommand or it is not received before the Intiate\_timer ends and record\_Request was successful then the SentinelInterfaceServer shall stream to VRP per STNL-REQ-425917/A-Request VRP for StartRecording.

Note 2: If the DID DE00 is set to 011 China, then the StartVideoStreamCommand will not be handled and StartVideoStreamCommandResponse will be a failure.

#### STNL-REQ-415494/B-Video Stream-Commence Stream to both VRP and Cloud Ready

SentinelInterfaceServer shall request the CameraManager to commence the video to the VRPInterfaceServer and the SentinelOffboardServer with CommenceReservedStream API as referred in the IR-REQ-415420/A-CommenceReservedStream in the CameraManagerService Spec.

When all of the following conditions are met:

Condition 1:

* The SentinelInterfaceServer shall receive a ready broadcast message from the VRP to trigger Video Stream.

Condition 2:

* The SentinelInterfaceServer shall receive StartVideoStreamCommand from OffBoardCommunicationServer.

Condition 3:

* Initiate\_Timer has NOT expired and only one of the following has occurred:

Note: If the DID DE00 is set to 011 China the condition 2 is not applicable. The video can be commenced when only conditions 1 and 3 are true.

#### STNL-REQ-510418/A-Initiate Timer expires - Initiate Video

When the Initiate\_Timer expires, SentinelInterfaceServer shall request the CameraManager to commence the video with CommenceReservedStream API as referred in the IR-REQ-415420/A-CommenceReservedStream in the CameraManagerSpec when any of the following conditions are met:

* Condition 1: The SentinelInterfaceServer receives a ready broadcast message from the VRP to trigger Video Stream.
* Condition 2: The SentinelInterfaceServer receives StartVideoStreamCommand from OffBoardCommunicationServer.

If either of the VRPInterfaceServer or the OffboardCommunicationServer respond after the stream has Commenced, then the SentinelInterfaceServer shall allow either of the servers to utilize the existing Stream.

Note: If the DID DE00 is set to 011 China then this requirement is not applicable.

#### STNL-REQ-510457/A-Initiate Timer expires - End Session

When the Initiate\_Timer expires, SentinelInterfaceServer shall cancel the stream reservations and stop any streams when all of the following conditions are met:

* Condition 1: The SentinelInterfaceServer has NOT received a ready broadcast message from the VRP to trigger Video Stream.
* Condition 2: The SentinelInterfaceServer has NOT received StartVideoStreamCommand from OffBoardCommunicationServer.

Note: If the DID DE00 is set to 011 then Condition 2 is not applicable for China.

#### STNL-REQ-425900/C-Set Record Timer

When SentinelInterfaceServer requests for CommenceVideoStream, then SentinelInterfaceServer shall set the RecordTimer= 5 min to set duration of the recording.

Note: Once the timer starts then for any reason there is a stop record request from either VRPInterfaceServer or OffboardCommunicationServer then the SentinelInterfaceServer shall not accept a new startRecord /startstream request within this session until the timer expires.

#### STNL-REQ-425921/B-Record Timer Expires

Once the RecordTimer= 5min timesout SentinelInterfaceServer shall request VRPInterfaceServer to stop recording via StopRecordRequest refer to VRP-REQ-407064/A-Stop Record in the VRP SPSS.

The SentinelIntrefaceServer shall send StreamSessionStatusUpdateAlert to the OffboardCommunicationServer that the timer has timed out.

Note: If the DID DE00 is set to 011 China, then StreamSessionStatusUpdateAlert is not sent.

#### STNL-REQ-415491/B-Video Stream -Stop

SentinelInterfaceServer shall send StopStream for a view to the CameraManager as referred in the IR-REQ-404261/C-StopStream if and only if either of the conditions are met:

* If the Record Timer Expires.
* If SentinelOffboardServer and VRPInterfaceServer have stopped receiving the video
* If the DID DE00 is set 011 China, then the VRPInterfaceServer have stopped receiving the video

Note : The Streaming does not stop if either of the servers are still receiving the video.

### White Box View

#### Activity Diagrams

##### STNL-ACT-REQ-415560/A-Intrusion Detected and Video Streaming

Activity Diagram



#### Sequence Diagrams

##### STNL-SD-REQ-415561/A-Intrusion Detected and Video Streaming\_VideoStreamIsNotExpectedStreamOrNotDesiredView

Sequence Diagram



##### STNL-SD-REQ-430957/A-Intrusion Detected and Video Streaming\_E1\_VideoStreamIsExpectedStream

Sequence Diagram



##### STNL-SD-REQ-430977/A-Intrusion Detected and Video Streaming\_E2\_VideoStreamIsNotDesiredView

Sequence Diagram



## STNL-FUN-REQ-415463/A-Record Video-USB/Cloud

### Use Cases

#### STNL-UC-REQ-415465/B-Record to USB

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, VRPInterfaceServer |
| **Pre-conditions** | Operation mode Conditions are met  VRPInterfaceServer is ON  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated  SentinelInterfaceServer is Sending SentinelMode.St as ON  ReserveStream is successful. |
| **Scenario Description** | When SentinelInterfaceServer shall send Start Record request to the VRPInterfaceServer. |
| **Post-conditions** | USB shall start recording and storing video  VRP broadcasts ready to record |
| **List of Exception Use Cases** | Lost connection with the Sync  USB not available |
| **Interfaces** | Ethernet |

#### STNL-UC-REQ-415472/C-Record-Cloud

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, SentInterfaceOffBoardServer |
| **Pre-conditions** | Power mode Conditions are met  SentInterfaceOffBoardClient, is ON  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated   * Internet and Cloud Connectivity is strong and connected * ReserveStream is successful. * Initiation for video streaming has been established from SentinelOffBoardServer * CommenceVideoStream has been Successful. * Set RecordTimer= 5min |
| **Scenario Description** | The SentinelInterfaceServer shall stream videos to SentinelOffboardServer |
| **Post-conditions** | Cloud shall start recording and storing video |
| **List of Exception Use Cases** | Lost connection with the TCU  Cloud connection not available |
| **Interfaces** | Ethernet |

Note: STNL-UC-415472/C is not applicable for China as the video is being streamed to Cloud.

#### STNL-UC-REQ-415466/B-Stop Record to USB

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, VRPInterfaceServer, ExternelSentinelTriggerServer |
| **Pre-conditions** | Power mode Conditions are met  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated |
| **Scenario Description** | The SentinelInterfaceServer shall stop recording to the USB when any of the following occur:  • One of the Sentinel Unavailable condition occurs (STNL-FUN-REQ-415498/A-Sentinel Feature Unavailable)  • Loss of connection with the VRPInterfaceServer  • STNL-REQ-425921/A-Record Timer Expires  • PublishRecordStatusChange reads error condition  SentinelInterfaceServer shall request stop recording via StopRecordRequest refer to VRP-REQ-407064/A-Stop Record in the VRP SPSS. |
| **Post-conditions** | Recording stops in USB |
| **List of Exception Use Cases** | Lost connection with the TCU  Lost connection with the Sync  USB not available  Cloud connection lost  Subscription expires |
| **Interfaces** | Ethernet |

#### STNL-UC-REQ-443937/C-Stop Record to Cloud

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, VRPInterfaceServer, ExternelSentinelTriggerServer |
| **Pre-conditions** | Power mode Conditions are met  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated |
| **Scenario Description** | SentinelInterfaceServer shall stop video stream to the SentinelOffBoardServer if any of the conditions are met:  • STNL-REQ-425921/A-Record Timer Expires  • AWS Kinesis auth token expires  • One of the Sentinel Unavailable condition occurs (STNL-FUN-REQ-415498/A-Sentinel Feature Unavailable)  • Communication Error  • Any Unknown Error  • StopVideoStreamCommand is received refer to MDV-REQ-392283/B-Stop Video Stream Command  SentinelInterfaceServer shall send StreamSessionStatusUpdateAlert to the OffboardCommunicationServer indicating the Stop in streaming |
| **Post-conditions** | Recording stops in Cloud |
| **List of Exception Use Cases** | Lost connection with the TCU  Lost connection with the Sync  USB not available  Cloud connection lost  Subscription expires |
| **Interfaces** | Ethernet |

Note: STNL-UC-REQ-44393/C-Stop Record to Cloud is not applicable as there is no video streamed to China

### Requirements

#### STNL-REQ-415479/A-Record to USB

The SentinelInterfaceServer shall request the VRPInterfaceServer via VRP-REQ-407061/A-Record from the VRP SPSS to record videos and meta data in the USB

The SentinelInterfaceServer shall record Date, time and Perimeter Alarm trigger as metadata.

#### STNL-REQ-415480/C-Record to Cloud

The SentinelInterfaceServer shall stream videos to SentinelOffboardServer via MDV-FUN-REQ-391508/A-Initiate Video Stream from the MDV SPSS to record videos to the SentinelOffboardServer.

Note: STNL-REQ-415480/C- Record to Cloud is not applicable in China as the video recorded is being sent to cloud.

#### STNL-REQ-415481/A-Stop Record To USB

The SentinelInterfaceServer shall stop recording to the USB when any of the following occur:

* One of the Sentinel Unavailable condition occurs (STNL-FUN-REQ-415498/A-Sentinel Feature Unavailable)
* Loss of connection with the VRPInterfaceServer
* STNL-REQ-425921/A-Record Timer Expires
* PublishRecordStatusChange reads error condition

SentinelInterfaceServer shall request stop recording via StopRecordRequest refer to VRP-REQ-407064/A-Stop Record in the VRP SPSS.

#### STNL-REQ-443639/C-Stop Record to Cloud

SentinelInterfaceServer shall stop video stream to the SentinelOffBoardServer if any of the conditions are met:

* STNL-REQ-425921/A-Record Timer Expires
* AWS Kinesis auth token expires
* One of the Sentinel Unavailable condition occurs (STNL-FUN-REQ-415498/A-Sentinel Feature Unavailable)
* Communication Error
* Any Unknown Error
* StopVideoStreamCommand is received refer to MDV-REQ-392283/B-Stop Video Stream Command

SentinelInterfaceServer shall send StreamSessionStatusUpdateAlert to the OffboardCommunicationServer indicating the Stop in streaming

Note: The following Enums will be used in StreamSessionStatusUpdateAlert to be sent per condition

* IPPT Token expires=” Token Expired
* Timer=” Record\_Timer\_Expired”
* Unknown Error=”Unknown”
* Communication Failure=”STREAM\_COMMUNICATION\_FAILED”

Note: STNL-REQ-443639/C-Stop Record to Cloud is not applicable to China as the video is streamed to cloud.

### White Box View

#### Activity Diagrams

##### STNL-ACT-REQ-425303/A-Stop Record to USB

Activity Diagram



##### STNL-ACT-REQ-444737/A-Stop record to Cloud

Activity Diagram



#### Sequence Diagrams

##### STNL-SD-REQ-428540/A-Stop record to USB

Sequence Diagram



##### STNL-SD-REQ-444717/A-Stop Record to Cloud

Sequence Diagram



## STNL-FUN-REQ-415498/A-Sentinel Feature Unavailable

### Use Cases

#### STNL-UC-REQ-409093/A-No Sentinel Subscription

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, SentinelOffboardServer, |
| **Pre-conditions** | Operation mode Conditions are met  SentInterfaceOffBoardServer is ON, SentinelOffboardClient is ON, SentinelInterfaceServer is ON  Subscription is available  User is Authenticated |
| **Scenario Description** | If no sentinel subscription is available, the SentinelInterfaceServer shall not work. |
| **Post-conditions** | Sentinel feature is not working per expected |
| **List of Exception Use Cases** |  |
| **Interfaces** | CAN, Ethernet |

#### STNL-UC-REQ-409094/C-Low Battery

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, |
| **Pre-conditions** | Operation mode Conditions are met  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated |
| **Scenario Description** | The SentinelInterfaceServer shall apply its VPSM Severity logic for the given battery conditions to Sentinel Feature to detect a Low Vehicle Battery condition.  The VPSM module will have the following severity in the conditions as mentioned below:  • When perimeter alarm is set(sentinel)- critical |
| **Post-conditions** | Sentinel feature is not working per expected  SentinelInterfaceServer shall send StreamSessionStatusUpdateAlert is sent to the OffboardCommunicationServer indicating the low battery status with ENUM = BATTERY\_THRESHOLD\_REACHED  Note: If the DID DE00 is set to 011 China, then the StreamSessionStatusUpdateAlert is not sent |
| **List of Exception Use Cases** | Lost Communication with VPSM |
| **Interfaces** | CAN, Ethernet |

### Requirements

#### STNL-REQ-415502/A-No Sentinel Subscription

If no sentinel subscription is available, the SentinelInterfaceServer shall not work.

#### STNL-REQ-415503/C-Low Battery

The SentinelInterfaceServer shall apply its VPSM Severity logic for the given battery conditions to Sentinel Feature to detect a Low Vehicle Battery condition.

The VPSM module will have the following severity in the conditions as mentioned below:

* When perimeter alarm(Sentinel) is set- critical

SentinelInterfaceServer shall send StreamSessionStatusUpdateAlert to the OffboardCommunicationServer indicating the low battery status with ENUM =BATTERY\_THRESHOLD\_REACHED

Note: If the DID DE00 is set to 011 China then the StreamSessionUpdateAlert is not sent.

# Appendix: Reference Documents

|  |  |
| --- | --- |
| Reference # | Document Title |
| 1 | MDV SPSS |
| 2 | VRP SPSS |
| 3 | Camera Manager Specification |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |
| 11 |  |
| 12 |  |
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