



**Research & Vehicle Technology**  
**“Infotainment Systems Product Development”**

**Feature: FNV2 – FCI Protocol**

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

Version 1.1

**UNCONTROLLED COPY IF PRINTED**

Version Date: August 17, 2018

**FORD CONFIDENTIAL**



## Revision History

Date	Version	Notes	
September 29, 2017	1.0	Initial Release	
August 17, 2018	1.1	Updated Release	
	FCI-DOC-457323/B-Physical Mapping of Classes	MBORREL4: Updated table	
	STR-356633/B-Functional Definition	MBORREL4: Added REQ-275294, REQ-323053, REQ-323054	
	STR-568432/A-FTCP Message Interface	MBORREL4: New section/STR	
	FCI-FUN-REQ-275164/B-FTCP Command	MBORREL4: Updated req. title and content (editorial change only)	
	FCI-FUR-REQ-275165/B-Command Dest. Topic	MBORREL4: Updated content (editorial change only)	
	FCI-FUR-REQ-275713/B-Transaction ID	MBORREL4: Updated content (editorial change only)	
	FCI-FUR-REQ-275714/B-Command ID	MBORREL4: Updated content, added AlertResponse	
	FCI-FUR-REQ-275715/B-Payload	MBORREL4: Updated content (editorial change only)	
	FCI-FUR-REQ-275821/B-SoA Message - FTCP Command	MBORREL4: Updated req. title and content (editorial change only)	
	FCI-FUN-REQ-275166/B-FTCP CommandResponse	MBORREL4: Updated req. title (editorial change only)	
	FCI-FUR-REQ-275167/B-CommandResponse Dest. Topic	MBORREL4: Updated content (editorial change only)	
	FCI-FUR-REQ-275816/B-Transaction ID	MBORREL4: Updated content (editorial change only)	
	FCI-FUR-REQ-275805/B-Payload	MBORREL4: Updated content, new payload	
	FCI-FUR-REQ-275716/B-Correlation ID	MBORREL4: Updated content (editorial change only)	
	FCI-FUR-REQ-275822/B-SoA Message - FTCP CommandResponse	MBORREL4: Updated req. title and content, new payload	
	FCI-FUN-REQ-275294/B-FTCP Alert	MBORREL4: Updated req. title (editorial change only)	
	FCI-FUR-REQ-275295/B-Alert Dest. Topic	MBORREL4: Updated content (editorial changes only)	
	FCI-FUR-REQ-275817/B-Transaction ID	MBORREL4: Updated content (editorial changes only)	
	FCI-FUR-REQ-275806/B-Payload	MBORREL4: Updated table, new content	
	FCI-FUR-REQ-275820/B-Correlation ID	MBORREL4: Updated content (editorial changes only)	
	FCI-FUR-REQ-275823/B-SoA Message - FTCP Alert	MBORREL4: Updated req. title and table, new content	
	FCI-FUN-REQ-323048/A-FTCP AlertResponse	MBORREL4: New function	
	STR-568426/A-Requirements	MBORREL4: New section/STR	
	FCI-FUR-REQ-323049/A-AlertResponse Dest. Topic	MBORREL4: New req.	
	STR-568427/A-SoA Message Header	MBORREL4: New req.	
	FCI-FUR-REQ-323050/A-Transaction ID	MBORREL4: New req.	
	FCI-FUR-REQ-275714/B-Command ID	MBORREL4: Updated content, added AlertResponse	
	STR-568428/A-SoA Message Payload	MBORREL4: New section/STR	
	FCI-FUR-REQ-323051/A-Payload	MBORREL4: New req.	
	STR-568429/A-SoA Message Construct	MBORREL4: New section/STR	



FCI-FUR-REQ-323052/A-SoA Message - FTCP AlertResponse	MBORREL4: New req.
FCI-FUN-REQ-275296/B-FTCP Query	MBORREL4: Updated req. title (editorial change only)
FCI-FUR-REQ-275297/B-Query Dest. Topic	MBORREL4: Updated content (editorial change only)
FCI-FUR-REQ-275818/B-Transaction ID	MBORREL4: Updated content (editorial change only)
FCI-FUR-REQ-275809/B-Payload	MBORREL4: Updated content, new content
FCI-FUR-REQ-275824/B-SoA Message - FTCP Query	MBORREL4: Updated req. title and content, new content
FCI-FUN-REQ-275298/B-FTCP QueryResponse	MBORREL4: Updated req. title (editorial change only)
FCI-FUR-REQ-275299/B-QueryResponse Dest. Topic	MBORREL4: Updated content (editorial change only)
FCI-FUR-REQ-275819/B-Transaction ID	MBORREL4: Updated content (editorial change only)
FCI-FUR-REQ-275714/B-Command ID	MBORREL4: Updated content, added AlertResponse
FCI-FUR-REQ-275813/B-Payload	MBORREL4: Updated content (editorial change only)
FCI-FUR-REQ-275825/B-SoA Message - FTCP QueryResponse	MBORREL4: Updated req. title and content (editorial change only)
FCI-FUN-REQ-323053/A-Broadcasting Interface	MBORREL4: New function
568441/A-Requirements	MBORREL4: New section/STR
FCI-FUR-REQ-323055/A-Broadcast Dest. Topic	MBORREL4: New req.
FCI-FUR-REQ-323057/A-Broadcasted Data	MBORREL4: New req.
FCI-FUR-REQ-323237/A-Broadcast Message	MBORREL4: New req.
FCI-FUN-REQ-323054/A-FCI Service Interface	MBORREL4: New function
568442/A-Requirements	MBORREL4: New section/STR
FCI-FUR-REQ-323056/A-GenService Dest. Topic	MBORREL4: New req.
FCI-FUR-REQ-323147/A-Generic Services	MBORREL4: New req.
FCI-FUR-REQ-323238/A-Generic Service Message	MBORREL4: New req.
STR-356694/B-Appendix: Reference Documents	MBORREL4: Updated references



# Table of Contents

REVISION HISTORY .....	2
1 OVERVIEW .....	5
2 ARCHITECTURAL DESIGN.....	6
2.1 FCI-CLD-REQ-275218/A-FCI Server.....	6
2.2 FCI-CLD-REQ-275219/A-FCI OnBoardClient.....	6
2.3 FCI-CLD-REQ-275220/A-FCI OffBoardClient.....	6
2.4 Physical Mapping of Classes .....	6
3 FUNCTIONAL DEFINITION .....	7
3.1 FTCP Message Interface .....	7
3.1.1 FCI-FUN-REQ-275164/B-FTCP Command.....	7
3.1.2 FCI-FUN-REQ-275166/B-FTCP CommandResponse.....	8
3.1.3 FCI-FUN-REQ-275294/B-FTCP Alert .....	10
3.1.4 FCI-FUN-REQ-323048/A-FTCP AlertResponse .....	12
3.1.5 FCI-FUN-REQ-275296/B-FTCP Query .....	13
3.1.6 FCI-FUN-REQ-275298/B-FTCP QueryResponse.....	15
3.2 FCI-FUN-REQ-323053/A-Broadcasting Interface .....	16
3.2.1 Requirements .....	16
3.3 FCI-FUN-REQ-323054/A-FCI Service Interface .....	18
3.3.1 Requirements .....	18
4 APPENDIX: REFERENCE DOCUMENTS.....	20



# 1 Overview

In the FNV2 architecture, the responsibility of sending and receiving FTCP communication has moved from the TCU to the ECG. The ECG will contain an application, the Ford-Cloud Interface (FCI), that will manage all incoming and outgoing FTCP commands, queries, responses, and alerts. In doing so, all Ethernet capable modules (and other applications on the ECG itself) wishing to request some form of FTCP communication must do so utilizing the SoA messaging defined in this FCI-Protocol SPSS.

The below sections will detail the required fields/headers that must be included when requesting each type of FTCP communication, as well as the payload. The FCI will use this information when communicating between the vehicle and cloud, although this SPSS focuses on the vehicle to FCI interface only.



## 2 Architectural Design

### 2.1 FCI-CLD-REQ-275218/A-FCI Server

The FCI Server is responsible for the tasks listed below:

- Receive and Transmit SoA message requests to/from the FCI OnBoardClient.
- Pack, Encrypt, and Transmit FTCP command responses, queries, and alerts to the FCI OffBoardClient.
- Receive, Decrypt, and Unpack FTCP commands and responses from FCI OffBoardClient

Please review the implementation guide/block diagram to locate the FCI Server class

### 2.2 FCI-CLD-REQ-275219/A-FCI OnBoardClient

The FCI OnBoardClient is responsible for the tasks listed below:

- Transmit and Receive SoA message requests to/from the FCI Server as required (by any Feature for which they must provide some functionality).

Please review the implementation guide/block diagram to locate the FCI OnBoardClient class

### 2.3 FCI-CLD-REQ-275220/A-FCI OffBoardClient

The FCI OffBoardClient is responsible for the tasks listed below:

- Transmit and Receive FTCP messages to/from the FCI Server as required (by any Feature for which they must provide some functionality).

Please review the implementation guide/block diagram to locate the FCI OffBoardClient class

### 2.4 Physical Mapping of Classes

The table below shows an example of how the logical classes that make up the FNV2-FCI Protocol can be mapped into physical modules/entities. This mapping is an example only and does not necessarily carryover to other carlines or vehicle architectures.

Logical Class	Physical Allocation
FCIServer	ECG FCI
FCIOnBoardClient	TCU, ECG App, SYNC App
FCIOffBoardClient	SDN



## 3 Functional Definition

### 3.1 FTCP Message Interface

#### 3.1.1 FCI-FUN-REQ-275164/B-FTCP Command

##### 3.1.1.1 Requirements

###### 3.1.1.1.1 FCI-FUR-REQ-275165/B-Command Dest. Topic

Any FCIONBoardClient that needs to receive an FTCP Command must first subscribe to the Command Destination Topic. This topic shall be used in the Service ID defined in REQ-275712.

<b>Command Dest. Topic</b>	SERVICES/REQUEST/FNV/FTCP/COMMAND/<svc-id>
----------------------------	--

##### 3.1.1.1.2 SoA Message Header

###### 3.1.1.1.2.1 FCI-FUR-REQ-275712/A-Service ID

The Service ID is predefined for each type of FTCP communication. This is the destination Topic for the SoA message being sent/received. The sender of the SoA Message (FCIServer or FCIONBoardClient) shall set the Service ID to the applicable FTCP Topic, as defined in this SPSS.

###### 3.1.1.1.2.2 FCI-FUR-REQ-275713/B-Transaction ID

The Transaction ID is a string value that the FCIServer or FCIONBoardClient uses/sets to track their FTCP communication requests and responses.

For an FTCP Command:

- The FCIServer shall set the Transaction ID to a unique string. This string shall consist of "FCI\_#" where # denotes a rolling counter (ex. FCI\_1)

###### 3.1.1.1.2.3 FCI-FUR-REQ-275714/B-Command ID

The Command ID is an FTCP message name defined in the FTCP protofiles that indicates the FTCP Command, FTCP QueryResponse, or FTCP AlertResponse type. The string must first be registered to the Service Manager (ex. "LockCommand", "UnlockCommand", "onlinetraffic").

##### 3.1.1.1.3 SoA Message Payload

###### 3.1.1.1.3.1 FCI-FUR-REQ-275715/B-Payload

The SoA Message Payload is the actual FTCP protofile content itself. This is the original/raw FTCP information sent between the FCIOffBoardClient and FCIONBoardClient, via the FCIServer.

In the case of an FTCP Command, the FCIServer shall set the Payload to the FTCP Command Message.

##### 3.1.1.1.4 SoA Message Construct

###### 3.1.1.1.4.1 FCI-FUR-REQ-275821/B-SoA Message - FTCP Command

FTCP Command – SoA Message		
Value Type	Parameter	Description
Header		
string	Service ID	SERVICES/REQUEST/FNV/FTCP/COMMAND/<svc-id>
string	Transaction ID	"FCI_#" (ex. FCI_1)
string	Command ID	FTCP Command name (ex. "LockCommand")
Payload		
string	Payload	FTCP protofile's {FTCP Command Message}



### 3.1.2 FCI-FUN-REQ-275166/B-FTCP CommandResponse

#### 3.1.2.1 Requirements

##### 3.1.2.1.1 FCI-FUR-REQ-275167/B-CommandResponse Dest. Topic

Any FCIONBoardClient that needs to transmit an FTCP CommandResponse must publish a SoA message to the CommandResponse Destination Topic. This topic shall be used in the Service ID defined in REQ-275712.

<b>CommandResponse Dest. Topic</b>	SERVICES/REQUEST/FNV/FCI/FTCP/RESPONSE
------------------------------------	--

##### 3.1.2.1.2 SoA Message Header

###### 3.1.2.1.2.1 FCI-FUR-REQ-275712/A-Service ID

The Service ID is predefined for each type of FTCP communication. This is the destination Topic for the SoA message being sent/received. The sender of the SoA Message (FCIServer or FCIONBoardClient) shall set the Service ID to the applicable FTCP Topic, as defined in this SPSS.

###### 3.1.2.1.2.2 FCI-FUR-REQ-275816/B-Transaction ID

The Transaction ID is a string value that the FCIServer or FCIONBoardClient uses/sets to track their FTCP communication requests and responses.

For an FTCP CommandResponse:

- The FCIONBoardClient shall set the Transaction ID to the string value of the Transaction ID received in the originating FTCP Command.

##### 3.1.2.1.3 SoA Message Payload

###### 3.1.2.1.3.1 FCI-FUR-REQ-275805/B-Payload

The SoA Message Payload is the actual FTCP protofile content itself. This is the original/raw FTCP information sent between the FCIOffBoardClient and FCIONBoardClient, via the FCIServer.

In the case of an FTCP CommandResponse, the FCIONBoardClient shall structure the Payload into an FciCommandResponse message with the following parameters:

message FciCommandResponse			
Value Type	Parameter		Description
optional bytes	ftcpCommandResponse		This is the Payload set to the FTCP Command Message
optional Delivery Confirmation	deliveryConfirmation		This is the Delivery Confirmation message
	message deliveryConfirmation		
	Value Type	Parameter	Description
	optional bool	sentConfirmation	This is a request for the FCIServer to send a delivery confirmation message after the FTCP CommandResponse is delivered to the FCIOffBoardClient
	optional string	deliveryConfirmation Endpoint	This is the Destination Topic the FCIONBoardClient is subscribed to and requesting the delivery confirmation message be published to from the FCIServer





### 3.1.2.1.3.2 FCI-FUR-REQ-275716/B-Correlation ID

The Correlation ID is a uint32 value that the FCIOOnBoardClient uses/sets to pass the cloudMessageID (from FTCP protofile) to the FCIOffBoardClient.

For an FTCP CommandResponse:

- The FCIOOnBoardClient shall set the Correlation ID to the uint32 value of the cloudMessageID received in the originating FTCP Command.

### 3.1.2.1.4 **SoA Message Construct**

#### 3.1.2.1.4.1 FCI-FUR-REQ-275822/B-SoA Message - FTCP CommandResponse

FTCP CommandResponse – SoA Message			
Value Type	Parameter	Description	
Header			
string	Service ID	SERVICES/REQUEST/FNV/FCI/FTCP/RESPONSE	
string	Transaction ID	Trans. ID from original FTCP Command (ex. FCI_1)	
Payload			
bytes	ftcpCommandResponse	FTCP protofile's {FTCP CommandResponse Message} (contains Correlation ID)	
Delivery Confirmation	deliveryConfirmation	This is the Delivery Confirmation message	
	message deliveryConfirmation		
	Value Type	Parameter	Description
	bool	sentConfirmation	True/False
	string	deliveryConfirmation Endpoint	Destination Topic for delivery confirmation message



### 3.1.3 FCI-FUN-REQ-275294/B-FTCP Alert

#### 3.1.3.1 Requirements

##### 3.1.3.1.1 FCI-FUR-REQ-275295/B-Alert Dest. Topic

Any FCIONBoardClient that needs to transmit an FTCP Alert must publish a SoA message to the Alert Destination Topic. This topic shall be used in the Service ID defined in REQ-275712.

<b>Alert Dest. Topic</b>	SERVICES/REQUEST/FNV/FCI/FTCP/ALERT
--------------------------	-------------------------------------

#### 3.1.3.1.2 SoA Message Header

##### 3.1.3.1.2.1 FCI-FUR-REQ-275712/A-Service ID

The Service ID is predefined for each type of FTCP communication. This is the destination Topic for the SoA message being sent/received. The sender of the SoA Message (FCIServer or FCIONBoardClient) shall set the Service ID to the applicable FTCP Topic, as defined in this SPSS.

##### 3.1.3.1.2.2 FCI-FUR-REQ-275817/B-Transaction ID

The Transaction ID is a string value that the FCIServer or FCIONBoardClient uses/sets to track their FTCP communication requests and responses.

For an FTCP Alert:

- *Correlated Alert* - The FCIONBoardClient shall set the Transaction ID to the string value of the Transaction ID received in the originating FTCP Command.
- *Non-Correlated Alert* - The FCIONBoardClient shall set the Transaction ID to a unique string. This string shall consist of "featureName\_ALERT\_#" where # denotes a rolling counter (ex. CONTROL-MY-CAR\_ALERT\_1)

#### 3.1.3.1.3 SoA Message Payload

##### 3.1.3.1.3.1 FCI-FUR-REQ-275806/B-Payload

The SoA Message Payload is the actual FTCP protofile content itself. This is the original/raw FTCP information sent between the FCIOffBoardClient and FCIONBoardClient, via the FCIServer.

In the case of an FTCP Alert, the FCIONBoardClient shall structure the Payload into an FciAlert message with the following parameters:

message FciAlert		
Value Type	Parameter	Description
optional bytes	ftcpAlert	This is the Payload set to the FTCP Alert Message
optional string	alertResponseEndpoint	This parameter can be set with the topic string the component subscribes to, to receive a SOA message containing the corresponding ALERT_RESPONSE. FCIServer will store this endpoint, topic, to publish ALERT_RESPONSE.
optional int32	drxConfig	This is a configurable value for DRX Mode
optional uint32	qos	This is the Quality of Service (Qos) value for sending an alert message
optional Delivery Confirmation	deliveryConfirmation	This is the Delivery Confirmation message
	message deliveryConfirmation	
	Value Type	Parameter
	optional bool	sentConfirmation
		This is a request for the FCIServer to send a delivery confirmation message after the FTCP Alert is delivered to the FCIOffBoardClient



	optional string	deliveryConfirmation Endpoint	This is the Destination Topic the FCIONBoardClient is subscribed to and requesting the delivery confirmation message be published to from the FCIServer
--	-----------------	-------------------------------	---

#### 3.1.3.1.3.2 FCI-FUR-REQ-275820/B-Correlation ID

The Correlation ID is a uint32 value that the FCIONBoardClient uses/sets to pass the cloudMessageID (from FTCP protofile) to the FCIOffBoardClient.

For an FTCP Alert:

- *Correlated Alert* - The FCIONBoardClient shall set the Correlation ID to the uint32 value of the cloudMessageID received in the originating FTCP Command.
- *Non-Correlated Alert* - The FCIONBoardClient shall not set a Correlation ID (not needed).

#### 3.1.3.1.4 SoA Message Construct

##### 3.1.3.1.4.1 FCI-FUR-REQ-275823/B-SoA Message - FTCP Alert

FTCP Alert – SoA Message		
Value Type	Parameter	Description
Header		
string	Service ID	SERVICES/REQUEST/FNV/FCI/FTCP/ALERT
string	Transaction ID	<b>If correlated</b> – Trans. ID from original FTCP Command. (ex. FCI_1) <b>If not correlated</b> – “featureName_ALERT_#” (ex. CONTROL-MY-CAR_ALERT_1)
Payload (message FciAlert)		
bytes	ftcpAlert	FTCP protofile’s {FTCP Alert Message} (contains Correlation ID)
string	alertResponseEndpoint	Alert Topic for alert response message
int32	drxConfig	0x00 - 0x07
uint32	qos	0x0 - 0x2
Delivery Confirmation	deliveryConfirmation	Delivery Confirmation message
	message deliveryConfirmation	
	Value Type	Parameter
	bool	sentConfirmation
	string	deliveryConfirmation Endpoint
		Description
		True/False
		Destination Topic for delivery confirmation message



### 3.1.4 FCI-FUN-REQ-323048/A-FTCP AlertResponse

#### 3.1.4.1 Requirements

##### 3.1.4.1.1 FCI-FUR-REQ-323049/A-AlertResponse Dest. Topic

Any FCIONBoardClient that needs to receive an FTCP AlertResponse must first subscribe to the AlertResponse Destination Topic. This topic shall be used in the Service ID defined in REQ-275712.

<b>AlertResponse Dest. Topic</b>	SERVICES/REQUEST/FNV/FTCP/ALERT_RESPONSE/<svc-id>
----------------------------------	---

##### 3.1.4.1.2 SoA Message Header

###### 3.1.4.1.2.1 FCI-FUR-REQ-275712/A-Service ID

The Service ID is predefined for each type of FTCP communication. This is the destination Topic for the SoA message being sent/received. The sender of the SoA Message (FCIServer or FCIONBoardClient) shall set the Service ID to the applicable FTCP Topic, as defined in this SPSS.

###### 3.1.4.1.2.2 FCI-FUR-REQ-323050/A-Transaction ID

The Transaction ID is a string value that the FCIServer or FCIONBoardClient uses/sets to track their FTCP communication requests and responses.

For an FTCP AlertResponse:

- The FCIServer shall set the Transaction ID to the string value of the Transaction ID received in the originating FTCP Alert.

###### 3.1.4.1.2.3 FCI-FUR-REQ-275714/B-Command ID

The Command ID is an FTCP message name defined in the FTCP protofiles that indicates the FTCP Command, FTCP QueryResponse, or FTCP AlertResponse type. The string must first be registered to the Service Manager (ex. "LockCommand", "UnlockCommand", "onlinetraffic").

##### 3.1.4.1.3 SoA Message Payload

###### 3.1.4.1.3.1 FCI-FUR-REQ-323051/A-Payload

The SoA Message Payload is the actual FTCP protofile content itself. This is the original/raw FTCP information sent between the FCIOffBoardClient and FCIONBoardClient, via the FCIServer.

In the case of an FTCP AlertResponse, the FCIOffBoardClient shall set the Payload to the FTCP AlertResponse Message.

##### 3.1.4.1.4 SoA Message Construct

###### 3.1.4.1.4.1 FCI-FUR-REQ-323052/A-SoA Message - FTCP AlertResponse

FTCP AlertResponse – SoA Message		
Value Type	Parameter	Description
Header		
string	Service ID	SERVICES/REQUEST/FNV/FTCP/ALERT_RESPONSE/<svc-id>
string	Transaction ID	Trans. ID from original FTCP Alert
string	Command ID	FTCP AlertResponse type (ex. "ECGProvisioningAlertResponse")
Payload		
string	Payload	FTCP protofile's {FTCP AlertResponse Message}



### 3.1.5 FCI-FUN-REQ-275296/B-FTCP Query

#### 3.1.5.1 Requirements

##### 3.1.5.1.1 FCI-FUR-REQ-275297/B-Query Dest. Topic

Any FCIONBoardClient that needs to transmit an FTCP Query must publish a SoA message to the Query Destination Topic. This topic shall be used in the Service ID defined in REQ-275712.

<b>Query Dest. Topic</b>	SERVICES/REQUEST/FNV/FCI/FTCP/QUERY
--------------------------	-------------------------------------

##### 3.1.5.1.2 SoA Message Header

###### 3.1.5.1.2.1 FCI-FUR-REQ-275712/A-Service ID

The Service ID is predefined for each type of FTCP communication. This is the destination Topic for the SoA message being sent/received. The sender of the SoA Message (FCIServer or FCIONBoardClient) shall set the Service ID to the applicable FTCP Topic, as defined in this SPSS.

###### 3.1.5.1.2.2 FCI-FUR-REQ-275818/B-Transaction ID

The Transaction ID is a string value that the FCIServer or FCIONBoardClient uses/sets to track their FTCP communication requests and responses.

For an FTCP Query:

- The FCIONBoardClient shall set the Transaction ID to a unique string. This string shall consist of "featureName\_QUERY\_#" where # denotes a rolling counter (ex. CONTROL-MY-CAR\_QUERY\_1)

##### 3.1.5.1.3 SoA Message Payload

###### 3.1.5.1.3.1 FCI-FUR-REQ-275809/B-Payload

The SoA Message Payload is the actual FTCP protofile content itself. This is the original/raw FTCP information sent between the FCIOffBoardClient and FCIONBoardClient, via the FCIServer.

In the case of an FTCP Query, the FCIONBoardClient shall structure the Payload into an FciQuery message with the following parameters:

message FciQuery		
Value Type	Parameter	Description
optional bytes	ftcpQuery	This is the Payload set to the FTCP Query Message
optional string	queryResponseEndpoint	This is the Destination Topic the FCIONBoardClient is subscribed to and requesting the QueryResponse be published to from the FCIOffBoardClient. The FCIONBoardClient shall set this parameter to the QueryResponse Dest. Topic defined in REQ-275299
optional Delivery Confirmation	deliveryConfirmation	Delivery confirmation message
	message deliveryConfirmation	
	Value Type	Parameter
	Description	
optional bool	sentConfirmation	This is a request for the FCIServer to send a delivery confirmation message after the FTCP Query is delivered to the FCIOffBoardClient
	optional string	deliveryConfirmation Endpoint
optional string	This is the Destination Topic the FCIONBoardClient is subscribed to and requesting the delivery confirmation message be published to from the FCIServer	

**3.1.5.1.4 SoA Message Construct****3.1.5.1.4.1 FCI-FUR-REQ-275824/B-SoA Message - FTCP Query**

FTCP Query – SoA Message		
Value Type	Parameter	Description
Header		
string	Service ID	SERVICES/REQUEST/FNV/FCI/FTCP/QUERY
string	Transaction ID	"featureName_ALERT_#" (ex. CONTROL-MY-CAR_ALERT_1)
Payload (message FciQuery)		
bytes	ftcpQuery	FTCP profile's {FTCP Query Message}
string	queryResponseEndpoint	SERVICES/REQUEST/FNV/FTCP/QUERY_RESPONSE/<svc-id>
Delivery Confirmation	deliveryConfirmation	Delivery confirmation message
	message deliveryConfirmation	
	Value Type	Parameter
	bool	sentConfirmation
	string	deliveryConfirmation Endpoint
		Description
		True/False
		Destination Topic for delivery confirmation message



### 3.1.6 FCI-FUN-REQ-275298/B-FTCP QueryResponse

#### 3.1.6.1 Requirements

##### 3.1.6.1.1 FCI-FUR-REQ-275299/B-QueryResponse Dest. Topic

Any FCIONBoardClient that needs to receive an FTCP QueryResponse must first subscribe to the QueryResponse Destination Topic. This topic shall be used in the Service ID defined in REQ-275712.

<b>QueryResponse Dest. Topic</b>	SERVICES/REQUEST/FNV/FTCP/QUERY_RESPONSE/<svc-id>
----------------------------------	---

##### 3.1.6.1.2 SoA Message Header

###### 3.1.6.1.2.1 FCI-FUR-REQ-275712/A-Service ID

The Service ID is predefined for each type of FTCP communication. This is the destination Topic for the SoA message being sent/received. The sender of the SoA Message (FCIServer or FCIONBoardClient) shall set the Service ID to the applicable FTCP Topic, as defined in this SPSS.

###### 3.1.6.1.2.2 FCI-FUR-REQ-275819/B-Transaction ID

The Transaction ID is a string value that the FCIServer or FCIONBoardClient uses/sets to track their FTCP communication requests and responses.

For an FTCP QueryResponse:

- The FCIServer shall set the Transaction ID to the string value of the Transaction ID received in the originating FTCP Query.

###### 3.1.6.1.2.3 FCI-FUR-REQ-275714/B-Command ID

The Command ID is an FTCP message name defined in the FTCP protofiles that indicates the FTCP Command, FTCP QueryResponse, or FTCP AlertResponse type. The string must first be registered to the Service Manager (ex. "LockCommand", "UnlockCommand", "onlinetraffic").

##### 3.1.6.1.3 SoA Message Payload

###### 3.1.6.1.3.1 FCI-FUR-REQ-275813/B-Payload

The SoA Message Payload is the actual FTCP protofile content itself. This is the original/raw FTCP information sent between the FCIOffBoardClient and FCIONBoardClient, via the FCIServer.

In the case of an FTCP QueryResponse, the FCIOffBoardClient shall set the Payload to the FTCP QueryResponse Message.

##### 3.1.6.1.4 SoA Message Construct

###### 3.1.6.1.4.1 FCI-FUR-REQ-275825/B-SoA Message - FTCP QueryResponse

FTCP QueryResponse – SoA Message		
Value Type	Parameter	Description
Header		
string	Service ID	SERVICES/REQUEST/FNV/FTCP/QUERY_RESPONSE/<svc-id>
string	Transaction ID	Trans. ID from original FTCP Query
string	Command ID	FTCP QueryResponse type (ex. "AppAccessTokenQueryResponse")
Payload		
string	Payload	FTCP protofile's {FTCP QueryResponse Message}



## 3.2 FCI-FUN-REQ-323053/A-Broadcasting Interface

### 3.2.1 Requirements

#### 3.2.1.1 FCI-FUR-REQ-323055/A-Broadcast Dest. Topic

Any FCIONBoardClient that needs to receive FCI Broadcast data must first subscribe to the Broadcast Destination Topic.

<b>Broadcast Dest. Topic</b>	SERVICES/DATA/FNV/FCI/BROADCAST
------------------------------	---------------------------------

#### 3.2.1.2 FCI-FUR-REQ-323057/A-Broadcasted Data

FCIServer shall broadcast the following information:

1. FCIOffBoardClient Connection Status
  - a. The FCIServer shall broadcast the FCIOffBoardClient Connection Status Message to all subscribed FCIONBoardClients upon connection/disconnection to/from the FCIOffBoardClient
  - b. The FCIOffBoardClient Connection Status Message shall include the connection status and the corresponding interface (Cellular, WiFi, SDL, etc.)
2. Power State
  - a. The FCIServer shall broadcast the Power State Message upon change
  - b. The Power State Message includes the current power state info (such as full power, lpr, sleep mode, etc.)
3. SMS Messages
  - a. The FCIServer shall broadcast SMS type 2 or 3 messages upon reception
  - b. In the case of SMS Type 2, the Home URL, Ford APN, or both shall be included

#### 3.2.1.3 FCI-FUR-REQ-323237/A-Broadcast Message

Broadcast Message		
Value Type	Parameter	Description
optional uint32	timeStamp	Timestamp for data in UTC in seconds
optional BroadcastType	broadcastType	Broadcast Message Type
	broadcastType Message	
	Value Type	Parameter
	enum	BroadcastType
optional SdnConnStatus Message	sdnConnStatusMsg	Sdn Connection Status Message
	sdnConnStatusMsg Message	
	Value Type	Parameter
	enum	ConnInterfaceType
optional PowerState Message	powerStateMsg	Power State Message
	powerStateMsg Message	
	Value Type	Parameter
	enum	PowerStateType





			FPC = 2; // Full Power Ign OFF, Charging ON FPS = 3; // Full Power Ign OFF, Charging OFF LPR = 4; // Low Power Registered DWU = 5; // DRX Wake Up HSLP = 6; // High-Scan Sleep LSLP = 7; // Low-Scan Sleep DSLIP = 8; // Deep Sleep
optional SmsMessage	smsMsg		SMS Message
	smsMsg Message		
	Value Type	Parameter	Description
	enum	MessageType	TYPE_2 = 0; TYPE_3 = 1;
	enum	PayloadType	HURL = 0; FAPN = 1; HURL_FAPN = 2;
	string	sdnUrl	SDN URL
	string	fordApn	Ford APN



### 3.3 FCI-FUN-REQ-323054/A-FCI Service Interface

#### 3.3.1 Requirements

##### 3.3.1.1 FCI-FUR-REQ-323056/A-GenService Dest. Topic

Any FCIONBoardClient that needs to publish an FCI Service request must do so via the GenService Destination Topic.

<b>GenService Dest. Topic</b>	SERVICES/REQUEST/FNV/FCI/GENSERVICE
-------------------------------	-------------------------------------

##### 3.3.1.2 FCI-FUR-REQ-323147/A-Generic Services

FCIServer shall provide the following services:

1. FCIOffBoardClient Connect/Disconnect
  - a. This service allows an FCIONBoardClient to send connect request message to the FCIServer with a required interface (cellular, wifi or SDL) type. The FCIServer shall then interface with the WIR feature to set up the corresponding interface connection, and use it to connect to the FCIOffBoardClient
2. FCIONBoardClient SMS Message
  - a. This service allows the FCIONBoardClient to send Type 1, Type 2 and Type 3 SMS messages to the FCIServer, which the FCIServer handles accordingly

##### 3.3.1.3 FCI-FUR-REQ-323238/A-Generic Service Message

FciGenericService Message				
Value Type		Parameter	Description	
optional ServiceType		serviceType	Service type: FCIOffBoardClient Connect/Disconnect or FCIOnBoardClient SMS Message	
		serviceType Message		
		Value Type	Parameter	Description
		enum	ServiceType	SDN_CONNECT = 0; TCU_SMS = 1;
optional bool		rpcResponseRequired	Request FCI to send a response message	
optional SdnConnStatus Message		sdnConnMsg	Sdn Connection Status Message	
		sdnConnMsg Message		
		Value Type	Parameter	Description
		enum	SdnConnectType	SDN_CONNECT_REQUEST = 0; SDN_DISCONNECT_REQUEST = 1;
		enum	SdnInterfaceType	UNKNOWN = 0; TCU_CELL = 1; TCU_WIFI = 2; SYNC_WIFI = 3; SYNC_SDL = 4;
		string	sdnUrl	SDN URL: FCI will connect to over the required interface
		string	ssid	Wifi Profile SSID
		string	password	Wifi Profile Password
optional TcuSmsMessage		tcuSmsMsg	TCU SMS Message	
		tcuSmsMsg Message		
		Value Type	Parameter	Description
		enum	MessageType	MT_FORD_TYPE_1 = 1;



			MT_FORD_TYPE_2 = 2; MT_FORD_TYPE_3 = 3;
	string	srcAddr	Source address of the received SMS message
	string	payload	SMS message payload



## 4 Appendix: Reference Documents

Reference #	Document Title
1	<b>FCI Cloud Interface Wiki:</b> <a href="https://www.eesewiki.ford.com/display/ecg/FNV2-Ford+Cloud+Interface+%3A+Topics+and+Interfaces">https://www.eesewiki.ford.com/display/ecg/FNV2-Ford+Cloud+Interface+%3A+Topics+and+Interfaces</a>
2	<b>Service Manager Wiki:</b> <a href="https://www.eesewiki.ford.com/pages/viewpage.action?pageId=24147944">https://www.eesewiki.ford.com/pages/viewpage.action?pageId=24147944</a>
3	<b>FCI API Wiki:</b> <a href="https://www.eesewiki.ford.com/display/ecg/FCI+API">https://www.eesewiki.ford.com/display/ecg/FCI+API</a>
4	<b>FNV2-Ford Cloud Interface - FCI API (libfciclient) Wiki:</b> <a href="https://www.eesewiki.ford.com/pages/viewpage.action?pageId=33134453">https://www.eesewiki.ford.com/pages/viewpage.action?pageId=33134453</a>
5	<b>FTCP Protofiles:</b> <a href="https://github.ford.com/FNV/idl/tree/master/ftcp">https://github.ford.com/FNV/idl/tree/master/ftcp</a>
6	<b>FCI FTCP Protofiles:</b> <a href="https://github.ford.com/FNV/idl/blob/master/fci/fci_ftcp_interface.proto">https://github.ford.com/FNV/idl/blob/master/fci/fci_ftcp_interface.proto</a>
7	<b>FCI Broadcast Protofiles:</b> <a href="https://github.ford.com/FNV/idl/blob/master/fci/fci_broadcast.proto">https://github.ford.com/FNV/idl/blob/master/fci/fci_broadcast.proto</a>
8	<b>FCI Service Protofiles:</b> <a href="https://github.ford.com/FNV/idl/blob/master/fci/fci_service.proto">https://github.ford.com/FNV/idl/blob/master/fci/fci_service.proto</a>