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Resource Function Activation and Configuration API Conformance Profile

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INTRODUCTION

The following document is the REST API Conformance for the Resource Function Activation and Configuration API (TMF664).

API DESCRIPTION

The Resource Function Activation and Configuration API provides the standardized client interface to Hybrid Infrastructure Management Systems for provision, lifecycle management, Activation and Configuration of composite and atomic resource function.

A resource function represents a Network Service, VNF and PNF as well as a Network Flow path in ETSI NFV terminology.

RESOURCE MODEL CONFORMANCE

Resource Function API MANDATORY AND OPTIONAL RESOURCES

Resource Name	Mandatory or Optional	Comments
ResourceFunction	M	
ResourceFunction/Heal	O	
ResourceFunction/Scale	O	
ResourceFunction/Migrate	O	

Resource Function resource MANDATORY AND OPTIONAL ATTRIBUTES

Attribute Name	Mandatory or Optional	Comments
id	M (in response messages) O (otherwise)	Generated by the server and provided in the response upon resource function creation. Accepted in entity-creation requests if the server supports the incoming identifier as the reference to create new resources
href	M (in response messages) O (otherwise)	Value in response must be the same as the one set in Location header provided upon entity creation
Name	O	

Attribute Name	Mandatory or Optional	Comments
description	O	
type	O	
validFor	O	
@type	O	
@baseType	O	
@schemaLocation	O	
version	O	
role	O	
place	O	Mandatory for services where physical location is an important attribute.
Id	O	
href	M	
autoModification	O	
priority	O	
lifeCycleState	M (in response messages) O (otherwise)	
lifeCycleSubState	M (in response messages) O (otherwise)	

Attribute Name		Mandatory or Optional	Comments
schedule		O	
id		O	
href		M	
resourceFunctionConfig		M	
sap		M (in response messages) O (otherwise)	
id		O	
href		M	
resourceSpecification		M/O	Mandatory for intent based requests where the resource function is to be created from a resource specification.
Id		O	
href		M	
characteristics		M/O	Mandatory in situations where the resource specification requires certain characteristics to be set.
name		M	
valueType		M	Defines the value type of the value attribute. Can be object, array, string, number, boolean
value		M	

Attribute Name		Mandatory or Optional	Comments
feature		M/O	Mandatory in situations where the resource specification requires certain features to be set.
	name	M	
	listOfCharacteristics	M	
featureGroup			
	name	M	
	listOfCharacteristics	M/O	Either list OfCharacteristics or list OfFeatures needs to be provided
	listOfFeatures	M/O	Either list OfCharacteristics or list OfFeatures needs to be provided
resourceRelationship		M/O	Mandatory for detail based requests where a new composite resource function is being created from a number of other resource functions.
connectivity		M/O	
	source	M	
	target	M	
	relation	M	
relatedParty		O	Array of structures
	id	O	

Attribute Name		Mandatory or Optional	Comments
	href	M	
	role	M	

Resource Function/Heal resource MANDATORY AND OPTIONAL ATTRIBUTES

Attribute Name		Mandatory or Optional	Comments
	Id	M (in response messages) O (otherwise)	Generated by the server and provided in the response upon resource creation. Accepted in entity-creation requests if the server supports the incoming identifier as the reference to create new resources
	href	M (in response messages) O (otherwise)	
	resourceFunctionHref	M	
	cause	O	
	degreeHealing	M	
	healAction	M	
	healPolicy	O	
	Id	O	
	href	M	

Attribute Name	Mandatory or Optional	Comments
startTime	O	
additionalParms	O	Mandatory for services where physical location is an important attribute.
name	M	
value	M	
healStatus	M (in response messages) O (otherwise)	

ResourceFunction/Scale resource MANDATORY AND OPTIONAL ATTRIBUTES

Attribute Name	Mandatory or Optional	Comments
Id	M (in response messages) O (otherwise)	Generated by the server and provided in the response upon resource creation. Accepted in entity-creation requests if the server supports the incoming identifier as the reference to create new resources
href	M (in response messages) O (otherwise)	
resourceFunctionHref	M	
type	O	

Attribute Name	Mandatory or Optional	Comments
aspectId	M	
numberOfSteps	M	
schedule	O	
id	O	
href	M	
resourceFunctionConfig	M	
additionalParms	O	
name	M	
value	M	
scaleStatus	M (in response messages) O (otherwise)	

Resource Function/Migrate resource MANDATORY AND OPTIONAL ATTRIBUTES

Attribute Name	Mandatory or Optional	Comments
Id	M (in response messages) O (otherwise)	Generated by the server and provided in the response upon resource creation. Accepted in entity-creation requests if the server supports the incoming identifier as the reference to create new resources

Attribute Name	Mandatory or Optional	Comments
href	M (in response messages) O (otherwise)	
resourceFunctionHref	M	
adminStateModification	O	
sapsToRemove	O	
id	O	
href	M	
sapsToAdd	O	
id	O	
href	M	
priority	O	
startTime	O	
completionMode	O	Mandatory for services where physical location is an important attribute.
place	M	
id	O	
href	M	
migrateStatus	O	

API OPERATIONS CONFORMANCE

For every single resource use the following templates and define what operations are optional and what operations are mandatory.

Resource Function MANDATORY AND OPTIONAL OPERATIONS

Uniform API Operation	Mandatory/Optional	Comments
GET	M	GET must be used to retrieve a representation of a resource
POST	M	POST must be used to create a new resource
PUT	O	PUT must be used to completely update a resource identified by its resource URI
PATCH (JSON-MERGE)	M	PATCH must be used to partially update a resource
DELETE	M	DELETE must be used to remove a resource
Notification	O	Notifications when a Resource Function is created, modified and deleted.

Resource Function/Heal MANDATORY AND OPTIONAL OPERATIONS

Uniform API Operation	Mandatory/Optional	Comments
GET	M	GET must be used to retrieve a representation of a resource
POST	M	POST must be used to create a new resource
PUT	O	PUT must be used to completely update a resource identified by its resource URI
PATCH (JSON-MERGE)	O	PATCH must be used to partially update a resource
DELETE	O	DELETE must be used to remove a resource

Resource Function/Scale MANDATORY AND OPTIONAL OPERATIONS

Uniform API Operation	Mandatory/Optional	Comments
GET	M	GET must be used to retrieve a representation of a resource
POST	M	POST must be used to create a new resource

Uniform API Operation	Mandatory/Optional	Comments
PUT	O	PUT must be used to completely update a resource identified by its resource URI
PATCH (JSON-MERGE)	O	PATCH must be used to partially update a resource
DELETE	O	DELETE must be used to remove a resource

Resource Function/Migrate MANDATORY AND OPTIONAL OPERATIONS

Uniform API Operation	Mandatory/Optional	Comments
GET	M	GET must be used to retrieve a representation of a resource
POST	M	POST must be used to create a new resource
PUT	O	PUT must be used to completely update a resource identified by its resource URI
PATCH (JSON-MERGE)	O	PATCH must be used to partially update a resource
DELETE	O	DELETE must be used to remove a resource

API GET FILTERING OPERATION CONFORMANCE

Definitions

Filtered Search: A filtered search can be applied using query parameters in order to obtain only the resource entities that meet the criteria defined by the filtering parameters included in the query request. Several elements can be applied to the filtered search. In that case logic, a logical AND is applied to combine the criteria (e.g.:?severity=<value> &status=<value>)

Filtered Data (Attribute selection): In order to apply a filter and limit the number of attributes included in the response, the GET request can include the “?fields=” query parameter. Several elements can be applied to the filter. In that case, a logical AND is applied to combine the values (e.g.:?fields=severity,status) will provide in the response only the values assigned to attributes category and channel. Attribute selection capabilities are the same for collections retrieval and individual resource queries

Filtering in Resource Function resource

Attribute name	Filtered search	Filtered search	Attribute Selection	Attribute Selection
	First Level	N Level	First Level	N Level
id	NA	NA	N/A	NA
href	NA	NA	N/A	NA
Name	O	NA	M	NA
description	O	NA	M	NA
type	O	NA	M	NA
validFor	O	NA	M	NA
@type	O	NA	M	NA
@baseType	O	NA	M	NA
@schemaLocation	O	NA	M	NA

Attribute name	Filtered search	Filtered search	Attribute Selection	Attribute Selection
	First Level	N Level	First Level	N Level
version	M	NA	M	NA
role	O	NA	M	NA
place	O	NA	M	NA
autoModification	O	NA	M	NA
priority	O	NA	M	NA
lifeCycleState	M	NA	M	NA
lifeCycleSubState	M	NA	M	NA
schedule	O	NA	M	NA
sap	M	NA	M	NA
resourceSpecification	M	NA	M	NA
characteristics	O	NA	M	NA
feature	O	NA	M	NA
featureGroup	O	NA	M	NA
resourceRelationship	NA	NA	M	NA
connectivity	NA	NA	M	NA
relatedParty	O	NA	M	NA

GET /resourceFunction/

Filtered Search: A filtered search can be applied using the following filtering criteria

- Version: To obtain all resource functions with a particular version.
- lifeCycleState: To obtain all resource functions with a particular state.
- lifeCycleSubState: To obtain all resource functions with a particular lifeCycleSubState within a state
- sap: Obtain resource function providing a particular service access point.
- resourceSpecification: To obtain the list of Resource Functions created from a particular specification.
- other optional attributes as defined in the table above

Filtered Data: A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of Resource Function resource definition

GET /resourceFunction /{ID}

Filtered Search: A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of Customer resource definition

Filtering in ResourceFunction/Heal resource

Attribute name	Filtered search	Filtered search	Attribute Selection	Attribute Selection
	First Level	N Level	First Level	N Level
Id	NA	NA	N/A	NA
href	M	NA	N/A	NA
cause	O	NA	M	NA
degreeHealing	O	NA	M	NA

Attribute name	Filtered search	Filtered search	Attribute Selection	Attribute Selection
	First Level	N Level	First Level	N Level
healAction	O	NA	M	NA
healPolicy	O	NA	M	NA
startTime	O	NA	M	NA
additionalParms	O	NA	M	NA
healStatus	M	NA	M	NA

GET /resourceFunction/Heal

Filtered Search: A filtered search can be applied using the following filtering criteria

- resourceFunctionHref: To obtain all the heal tasks against a particular resource function specified by the href.
- status: To obtain the list of heal tasks with a particular status.
- other optional attributes as defined in the table above

Filtered Data: A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of Resource Function resource definition

GET /resourceFunction/Heal /{ID}

Filtered Search: A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level ResourceFunction/Heal

Filtering in ResourceFunction/Scale resource

Attribute name	Filtered search	Filtered search	Attribute Selection	Attribute Selection
	First Level	N Level	First Level	N Level
id	NA	NA	N/A	NA
href	NA	NA	N/A	NA
resourceFunctionHref	M	NA	M	NA
Type	O	NA	M	NA
aspectId	O	NA	M	NA
numberOfSteps	O	NA	M	NA
schedule	O	NA	M	NA
startTime	O	NA	M	NA
additionalParms	O	NA	M	NA
scaleStatus	M	NA	M	NA

GET /resourceFunction/Scale

Filtered Search: A filtered search can be applied using the following filtering criteria

- resourceFunctionHref: To obtain all the scale tasks against a particular resource function specified by the href.
- status: To obtain the list of scale tasks with a particular status.
- other optional attributes as defined in the table above

Filtered Data: A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of ResourceFunction/Scale resource definition

GET /resourceFunction/Scale /{ID}

Filtered Search: A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of ResourceFunction/Scale resource definition

Filtering in ResourceFunction/Migrate resource

Attribute name	Filtered search	Filtered search	Attribute Selection	Attribute Selection
	First Level	N Level	First Level	N Level
Id	NA	NA	NA	NA
href	NA	NA	NA	NA
resourceFunctionHref	M	NA	M	NA
adminStateModification	O	NA	M	NA
sapsToRemove	O	NA	M	NA
sapsToAdd	O	NA	M	NA
priority	O	NA	M	NA
startTime	O	NA	M	NA
completionMode	O	NA	M	NA
place	O	NA	M	NA
migrateStatus	M	NA	M	NA

GET /resourceFunction/Migrate

Filtered Search: A filtered search can be applied using the following filtering criteria

- resourceFunctionHref: To obtain all the Migrate tasks against a particular resource function specified by the href.
- status: To obtain the list of Migrate tasks with a particular status.
- other optional attributes as defined in the table above

Filtered Data: A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of ResourceFunction/Migrate resource definition

GET /resourceFunction/Migrate /{ID}

Filtered Search: A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of ResourceFunction/Migrate resource definition

API POST OPERATION CONFORMANCE

POST to /resourceFunction

This Uniform Contract operation is used to create a ResourceFunction resource in the server.

The response to this operation must include a Location header set to /resourceFunction /{ID} where {ID} indicates the identifier assigned by the server to the new Resource Function resource created

POST	M	
Response Status Code 201 or 202	M	201 when the resource function can be created immediately and 202 when the transaction is long lived and where a Monitor object is returned.
Other Status Codes	NA	

The following table indicates attributes that are required to be sent when creating a new Resource Function resource as well as attributes with special considerations. All other attributes defining the resource are not required to be sent as part of the BODY of the POST request message:

Attribute name	Mandatory	Default	Rule
id	NA		Set by server
href	NA		Set by server
Name	N		
description	N		
type	N		
version	N		
role	N		

Attribute name	Mandatory	Default	Rule
place	N		
autoModification	N		
priority	N		
lifeCycleState	N		
lifeCycleSubState	N		
schedule	N		
sap	Y		
resourceSpecification	Y/N		Mandatory for intent based requests where resource function has to be created based on a specification.
characteristics	Y/N		Mandatory if the resource specification requires certain resource characteristics as mandatory.
feature	Y/N		Mandatory if the resource specification requires certain resource characteristics as mandatory.
featureGroup	Y/N		Mandatory if the resource specification requires certain resource characteristics as mandatory.
resourceRelationship	Y/N		Mandatory for detail based requests where a composite resource function has to be created from other resource functions.

Attribute name	Mandatory	Default	Rule
connectivity	Y/N		Mandatory for detail based requests.
relatedParty	N		

The response from the server must include a BODY with the contents of the new resource created or to be created, filled with at least the same information elements that were included in the request and are supported by the server. Notice that the value stored by the server may be different than the one set in the request.

If the POST request includes optional parameters (as per the model resource definition) that are not supported by the server, then the server must reject the request (replying with a 4xx error response) indicating the parameter not supported.

All the parameters listed above must be supported by the server when included in the request to create a new resource

The BODY of the response from the server must include attribute “href” set to the same value as the one in the Location header.

In case of 201, the server must include in the BODY of the response, even if they are not included in the request, the following attributes that are mandatory in the definition of a Resource Function as per the resource model defined

- id
- href
- status
- subStatus

The BODY of the response from the server must include attribute “href” (or “reference”) under each one of the entities within the resource function model that can be addressed individually and were included in the response. This applies to any of the following entities

- resourceFunction created as in the resourceRelationship structure.

POST to /resourceFunction/Heal

This Uniform Contract operation is used to create a resourceFunction/Heal resource in the server.

The response to this operation must include a Location header set to /resourceFunction/heal /{ID} where {ID} indicates the identifier assigned by the server to the new Product Offering resource created

POST	M	
Response Status Code 201	M	
Other Status Codes	NA	

The following table indicates attributes that are required to be sent when creating a new Heal resource as well as attributes with special considerations. All other attributes defining the resource are not required to be sent as part of the BODY of the POST request message:

Attribute name	Mandatory	Default	Rule
Id	NA		Set by server
href	NA		Set by server
resourceFunctionHref	M		
cause	N		
degreeHealing	Y		
healAction	Y		
healPolicy	N		
startTime	N		
additionalParms	N		
healStatus	NA		Set by server

The response from the server must include a BODY with the contents of the new resource created, filled with at least the same information elements that were included in the request and are supported by the server. Notice that the value stored by the

server may be different than the one set in the request (e.g.: severity may be differently understood by the server after processing than the one perceived by the requestor)

If the POST request includes optional parameters (as per the model resource definition) that are not supported by the server, then the server must reject the request (replying with a 4xx error response) indicating the parameter not supported.

All parameters in the table must be supported by the server when included in the request to create a new resource

The BODY of the response from the server must include attribute “href” set to the same value as the one in the Location header.

The server must include in the BODY of the response, even if they are not included in the request, the following attributes that are mandatory in the definition of a Heal as per the resource model defined

- id
- href
- healStatus

POST to /resourceFunction/Scale

This Uniform Contract operation is used to create a resourceFunction/Scale resource in the server.

The response to this operation must include a Location header set to /resourceFunction/scale /{ID} where {ID} indicates the identifier assigned by the server to the new Product Offering resource created

POST	M	
Response Status Code 201	M	
Other Status Codes	NA	

The following table indicates attributes that are required to be sent when creating a new Scale resource as well as attributes with special considerations. All other attributes defining the resource are not required to be sent as part of the BODY of the POST request message:

Attribute name	Mandatory	Default	Rule
Id	NA		Set by server

Attribute name	Mandatory	Default	Rule
href	NA		Set by server
resourceFunctionHref	M		
type	N		
aspectId	Y		
numberOfSteps	Y		
schedule	N		
startTime	N		
additionalParms	N		
scaleStatus	NA		Set by server

The response from the server must include a BODY with the contents of the new resource created, filled with at least the same information elements that were included in the request and are supported by the server. Notice that the value stored by the server may be different than the one set in the request (e.g.: severity may be differently understood by the server after processing than the one perceived by the requestor)

If the POST request includes optional parameters (as per the model resource definition) that are not supported by the server, then the server must reject the request (replying with a 4xx error response) indicating the parameter not supported.

All parameters in the table must be supported by the server when included in the request to create a new resource

The BODY of the response from the server must include attribute “href” set to the same value as the one in the Location header.

The server must include in the BODY of the response, even if they are not included in the request, the following attributes that are mandatory in the definition of a Scale as per the resource model defined

- id
- href
- scaleStatus

POST to /resourceFunction/Migrate

This Uniform Contract operation is used to create a resourceFunction/migrate resource in the server.

The response to this operation must include a Location header set to /resourceFunction/migrate /{ID} where {ID} indicates the identifier assigned by the server to the new Product Offering resource created

POST	M	
Response Status Code 201	M	
Other Status Codes	NA	

The following table indicates attributes that are required to be sent when creating a new Migrate resource as well as attributes with special considerations. All other attributes defining the resource are not required to be sent as part of the BODY of the POST request message:

Attribute name	Mandatory	Default	Rule
Id	NA		Set by server
href	NA		Set by server
resourceFunctionHref	Y		
adminStateModification	N		
sapsToRemove	N		
sapsToAdd	N		
priority	N		
startTime	N		
completionMode	N		
place	N		
migrateStatus	NA		Set by server

The response from the server must include a BODY with the contents of the new resource created, filled with at least the same information elements that were included in the request and are supported by the server. Notice that the value stored by the server may be different than the one set in the request (e.g.: severity may be differently understood by the server after processing than the one perceived by the requestor)

If the POST request includes optional parameters (as per the model resource definition) that are not supported by the server, then the server must reject the request (replying with a 4xx error response) indicating the parameter not supported.

All parameters in the table must be supported by the server when included in the request to create a new resource

The BODY of the response from the server must include attribute “href” set to the same value as the one in the Location header.

The server must include in the BODY of the response, even if they are not included in the request, the following attributes that are mandatory in the definition of a Migrate as per the resource model defined

- id
- href
- migrateStatus

API PATCH OPERATION CONFORMANCE

This section defines which attributes are patchable.

Attribute name	Patchable	Comment
id	N	
href	N	
Name	Y	
description	Y	
type	Y	
version	Y	
role	Y	
place	N	Change in location is achieved through a Migrate task.
autoModification	Y	
priority	Y	
lifeCycleState	N	
lifeCycleSubState	N	
schedule	Y	
sap	N	Change in SAP is achieved through a Migrate task
resourceSpecification	Y	e.g. when a Resource Function needs to be upgraded to the next version of the resource specification.

Attribute name	Patchable	Comment
characteristics	Y	Those characteristics allowed to be patched by Resource Function Specification.
feature	Y	Those features allowed to be patched by Resource Function Specification.
featureGroup	Y	Those featureGroups allowed to be patched by Resource Function Specification.
resourceRelationship	Y	Mandatory for detail based requests where a composite resource function has to be created from other resource functions.
connectivity	Y	Mandatory for detail based requests.
relatedParty	Y	

API DELETE OPERATION CONFORMANCE

This section defines what operations can be used to delete a Resource Function resource.

DELETE /resourceFunction/{ID}

Response from the server will include the http 200 Ok code to confirm that the Resource Function has been deleted.

API CONFORMANCE TEST SCENARIOS

This section describes the test scenarios required for the basic CONNECT certification of Resource Function Activation and Configuration API.

Test Cases must be executed in the order defined for each resource because the result from one of the scenarios will be input for the next one.

Requests must be addressed to the endpoint provided for certification, specifically they must be addressed to the URI defined by the concatenation of the {apiRoot} and the specific resource, where the {apiRoot} is defined as {serverRoot}/resourceFunction, being {serverRoot} defines the certification endpoint.

Resource Function resource TEST CASES

Nominal Scenarios

TC_ResFn_N1 – Create new Resource Function with minimum required information using intent based requests

- Send a POST message to {apiRoot}/ with the following contents in the BODY

```
{
  "sap": [
    {
      "id": "SAP-49876",
      "href": "http://serverlocation:port/resourceSpecification/SAP-49876"
    }
  ],
  "resourceSpecification": {
    "id": "RS-6789",
    "href": "http://serverlocation:port/resourceSpecification/RS-6789"
  },
  "resourceCharacteristic": [
    {
      "name": "bandwidth",
      "valueType": "string",
      "value": "100MB"
    }
  ]
}
```

- Wait for a response from the server with the following characteristics
 - Response Code 201-Created
 - Include a location header in the body set to `/{apiRoot}/resourceFunction/{IDrfn1}` where `{IDrfn1}` indicates the identifier assigned by the server to the new Resource Function resource
 - The response message includes all mandatory parameters (including description, severity and type that were not sent in the original request)
 - The body of the response matches the values set in the original request
- Send a GET message to `/{apiRoot}/resourceFunction/`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one Resource Function resource with ID set to `{IDrfn1}`, the same identifier as assigned by the server to the new resource created
 - The response message includes all mandatory parameters
 - The body of the response for the resource with identifier `{IDrfn1}` matches the values set in the original request
- Send a GET message to `/{apiRoot}/resourceFunction/{IDrfn1}`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The response message includes all mandatory parameters
 - The body of the response includes a Resource Function resource structure that matches the values in the original request

TC_ResFn_N2 – Create new Resource Function with set of all parameters supported by server in detail based mode

- Send a POST message to {apiRoot}/resourceFunction/ with the following contents in the BODY

```
{
  "name": "CDN Cluster",
  "description": "CDN capability spread across multiple geographies",
  "version": "1.2",
  "role": "Backup Media Store",
  "place": {
    "href": "http://serverlocation:port/place/4980",
    "id": "4980"
  },
  "autoModification": "scaleStorage",
  "priority": "2",
  "schedule": [
    {
      "id": "SCH-78906",
      "href": "http://serverlocation:port/resourceSpecification/SCH-78906"
    }
  ],
  "sap": [
    {
      "id": "SAP-49876",
      "href": "http://serverlocation:port/resourceSpecification/SAP-49876"
    }
  ],
  "resourceRelationship": [
    {
      "type": "contains",
      "resource": {
        "id": "1234",
        "href": "http://serverlocation:port/resourceFunction/1234"
      }
    }
  ],
}
```



```
"connectivity": [
  {
    "source": "http://serverlocation:port/resourceFunction/6789",
    "target": "http://serverlocation:port/resourceFunction/1234",
    "relationship": "AdjacentTo"
  }
],
"relatedParty": [
  {
    "id": "1234",
    "href": "http://serverlocation:port/partyManagement/partyRole/1234",
    "role": "Admin"
  }
]
}
```

- Wait for a response from the server with the following characteristics
 - Response Code 201-Created
 - Include a location header in the body set to `/{apiRoot}/resourceFunction/{IDrfn2}` where `{IDrfn2}` indicates the identifier assigned by the server to the new Resource Function resource
 - The response message includes all mandatory parameters (including the ones that were not sent in the original request)
 - The body of the response matches the values set in the original request
- Send a GET message to `/{apiRoot}/resourceFunction/`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one Resource Function resource with ID set to `{IDrfn2}`, the same identifier as assigned by the server to the new resource created and another Resource Function with ID set to `{IDrfn1}`.
 - The response message includes all mandatory parameters

- The body of the response for the resource with identifier {IDrfn2} matches the values set in the original request
- Send a GET message to `/{apiRoot}/resourceFunction/{IDrfn2}`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The response message includes all mandatory parameters
 - The body of the response includes a Resource Function resource structure that matches the values in the original request

TC_ResFn_N3 – Search for Resource Functions with specific characteristics

- Send a GET message to `/{apiRoot}/resourceFunction`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes at least two ResourceFunction resources referring to {IDrfn1} and {IDrfn2}
 - The body of the response for the resource with each identifier matches the values in the corresponding original request
- Send a GET message to `/{apiRoot}/resourceFunction?resourceSpecification.href="http://serverlocation:port/resourceSpecification/RS-6789"`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one ResourceFunction resource referring to {IDrfn1} and there is no reference to ResourceFunction resource {IDrfn2}
 - The response message includes all mandatory parameters
 - The body of the response for the resource with identifier {IDrfn1} matches the values in the original request

- Send a GET message to `/{apiRoot}/resourceFunction?version=1.2`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one ResourceFunction resource referring to `{IDrfn2}` and there is no reference to ResourceFunction resource `{IDrfn1}`
 - The response message includes all mandatory parameters
 - The body of the response for the resource with identifier `{IDrfn2}` matches the values in the original request

TC_ResFn_N4 – Filtered retrieval of Resource Functions

- Send a GET message to `/{apiRoot}/resourceFunction/{IDrfn1}?fields=lifeCycleState`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one ResourceFunction resource referring to `{IDrfn1}` and including only attributes `id`, `href` and `state`, matching the values in the original request
- Send a GET message to `/{apiRoot}/resourceFunction/{IDrfn2}?fields=version,lifeCycleState,lifeCycleSubState`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one ResourceFunction resource referring to `{IDrfn2}` and including only attributes `id`, `href`, `version`, `lifeCycleState`, `lifeCycleSubState` matching the values in the original request

Notice that this test case is using parameters "version", "lifeCycleState" and "lifeCycleSubState" to filter the data included in the response but any other parameter could be used

TC_ResFn_N5 – Filtered Search and Filtered data response

- Send a GET message to `/{apiRoot}/resourceFunction?version=1.2&fields=lifeCycleState,lifeCycleSubState,autoModification`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one ResourceFunctionresource referring to {IDrfn2} and there is no reference to ResourceFunction resource {IDrfn1}
 - The body of the response for the resource with each identifier includes only attribute id,href,lifeCycleState,lifeCycleSubState and autoModification, matching the values in the corresponding original request

Notice that this test case is using the parameter "version" to filter the data included in the response but any other parameter could be used

TC_ResFn_N6 – Patch

- Send a PATCH message to `{apiRoot}/` with the following contents in the BODY

```
{
  "id": "IDrfn1",
  "href": "http://serverlocation:port/resourceFunction/IDrfn1",
  "name": "CDN Cluster Super",
  "description": "CDN capability spread across multiple geographies super ",
  "type": "Content Delivery V2",
  "version": "1.3",
  "role": "Backup Media Store"
}
```

- Wait for a response from the server with the following characteristics
 - Response Code 200-OK

Notice that this test case a few parameters like "version" to test the patch but any other parameter as per the table could be used.

- Send a GET message to `/{apiRoot}/resourceFunction/{IDrfn1}`

- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response for the resource with each identifier matches the values in the corresponding patch request for patched attributes and original request for other attributes.

TC_ResFn_N7 – Delete

- Send a Delete message to `/{apiRoot}/resourceFunction/{IDrfn1}`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
- Send a GET message to `/{apiRoot}/resourceFunction/{IDrfn1}`
- Wait for a response from the server with the following characteristics
 - Response Code 404-Not Found

Error Scenarios

TC_ResFn_E1 – Unknown Resource Function identifier

- Send a GET message to `/{apiRoot}/resourceFunction/{IDrfn3}`, where `{IDrfn3}` does not match any of the identifiers previously created in the server
- Wait for a response from the server with the following characteristics
 - Response Code 404-Not Found

TC_ResFn_E2 – Invalid Request – Missing mandatory parameter

- Send a POST message to `{apiRoot}/resourceFunction/` with the following contents in the BODY.

```

• {
•
•   "sap": [
•     {
•       "id": "SAP-49876",
•       "href": "http://serverlocation:port/resourceSpecification/SAP-49876
•     }
•   ],
•

```

```
• }
```

Notice that this request is missing mandatory parameter "resourceSpecification" but any other mandatory parameter could be used

- Wait for an error response from the server indicating the mandatory parameter is missing in the request

TC_ResFn_E3 – Invalid Request – Missing parameter mandatory in context

- Send a POST message to {apiRoot}/resourceFunction/ with the following contents in the BODY.

```
• {
•
•   "sap": [
•     {
•       "id": "SAP-49876",
•       "href": "http://serverlocation:port/resourceSpecification/SAP-49876"
•     }
•   ],
•   "resourceSpecification": {
•     "id": "RS-6789",
•     "href": "http://serverlocation:port/resourceSpecification/RS-6789"
•   },
•
• }
```

Notice that this request is missing mandatory parameters "resourceCharacteristic" when information element "resourceSpecification" is included in the request, but any other parameter that becomes mandatory based on the context could be used

- Wait for an error response from the server indicating the mandatory parameter is missing in the request