FINAL DRAFT

AMENDMENT

ISO 20080:2019 FDAM 1

ISO/TC 22/SC 31

Secretariat: DIN

Voting begins on: **2021-08-19**

Voting terminates on: **2021-10-14**

Road vehicles — Information for remote diagnostic support — General requirements, definitions and use cases

AMENDMENT 1

iTeh STVéhicules routiers—Information pour support de diagnostic à distance — Exigences générales, définitions et cas d'utilisation (StameNDEMENT 1 teh. ai)

ISO 20080:2019/FDAmd 1 https://standards.iteh.ai/catalog/standards/sist/158dc914-4038-492f-9a84-518231676328/iso-20080-2019-fidamd-1

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Road vehicles — Information for remote diagnostic support — General requirements, definitions and use cases

AMENDMENT 1

Annex A

Replace Annex A with the following:

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Annex A

(informative)

Implementation based on ISO 20078 - Road Vehicles - Extended Vehicle (ExVe) - Web Services

A.1 Introduction

A.1.1 General

This annex contains a web service specification of the use cases listed in this document. The web service specification is based on the ISO 20078:2021¹⁾ series. All web services are defined as REST APIs, using JSON for the transfer of content.

The ISO 20078:2021 series is indispensable for implementing web services according to this annex.

A.1.2 Security

All REST APIs are using OAuth2 compatible framework for access control, OpenID Connect compatible framework for identification purposes and ATTPS for securing the transfer, see ISO 20078-3:2021 for details. The exact details of how to obtain access is described by each offering party.

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A.1.3 Error codes

ISO 20080:2019/FDAmd 1

A.1.3.1 ISO 20078

https://standards.iteh.ai/catalog/standards/sist/158dc914-4038-492f-9a84-518231676328/iso-20080-2019-fdamd-1

The HTTP status codes (error codes) listed for each REST API are described in ISO 20078-2:2021.

A.1.3.2 General error conditions

General error conditions are valid for all use cases. <u>Table A.1</u> presents the mapping of error conditions in 5.5 to REST API errors:

Table A.1 — Mapping of error conditions to REST API

Error condition	HTTP status code	ExveErrorId	Example
Request currently not possible to perform by the ExVe	503	20080-1000	{ "dtcReadout": { "id": "abcde-12345-ghjke-67474",
			"messageTimestamp": "2016-02-24T09:23:46Z",
			"exveErrorId": "20080-1000",
			"exveErrorMsg": "Request currently not possible to perform by the ExVe",
			"vehicleId": "12345678909876543"
			}
			}

¹⁾ Second edition under preparation. Stage at the time of publication: ISO/FDIS 20078 (all parts).

A.1.3.3 Use case specific error conditions

Use case specific errors are mapped to HTTP status codes in each REST API.

A.2 Resources

A web service is exposing access to one or more resources. To be able to access a resource through a web service, access needs to be granted. This can be done either directly to the resource or through a container.

<u>Table A.2</u>, maps the ISO 20080 (this document) use cases to REST APIs and resources. In some cases, mapping of a use case to a REST API provides little standardization benefit, as it is highly offering-party specific.

UC	Use case name	REST API	Resource(s)	Comment
01	Use case discovery	resourceReadout	Not applicable	
02	Identify ECUs installed in the vehicle	ecuReadouts	ECU readout	
03	Read diagnostic trouble codes (DTCs)	dtcReadouts	DTC readout	
04	Read readiness codes	readinessCodeReadouts	Readiness code readout	
05	Read DTC snapshot data	dtcSnapshotReadout	DTC snapshot readout	
06	Read selected diagnostic parametric dynamic data	parameterReadout ds.itel	Parameter readout	
07	Read malfunction indicator status https://stand	malfunctionIndicatorReadout ards.iteh.ai/catalog/standards/sist/158	Malfunction indicator readout 8-492f-9a84-	
08	Clear DTCs	clearDtcJob	Clear DTC job	
09	Adjust the settings of a selected system	Not applicable/no standard- ized API due to differences between offering parties.	Not applicable	System setting input and result are offering party specific.
10	Activation of actuators	Not applicable/no standard- ized API due to differences between offering parties.	Not applicable	Actuator input and result are offering party specific.
11	Activate a self-test routine	Not applicable/no standard- ized API due to differences between offering parties.	Not applicable	Self-test input and result are offering party specific.

Table A.2 — Mapping of use cases to REST APIs

ISO 20078-2:2021 defines new syntax for resource versioning (used in Accept and Content-Type HTTP headers). Existing implementations of ISO 20080 based on the ISO 20078:2019 series version can still be used. For new implementations, support of the ISO 20078:2021 series is recommended (see <u>Table A.3</u> for details).

Table A.3 — Mapping of REST API resource representation used in ISO 20080:2019 and ISO 20080:2019/Amd. 1:2021 versions

UC	REST API	Resource version according to ISO 20078-2:2019	Resource version according to ISO 20078-2:2021
01	resourceReadout	application/x.exve.org.resourcereadout.v1+json	application/json; exve-resourceversion=re-sourcereadout.v1.0
02	ecuReadouts	application/x.exve.org.ecureadout.v1+json	application/json; exve-resourceversion=e-cureadout.v1.0
03	dtcReadouts	application/x.exve.org.dtcreadout.v1+json	application/json; exve-resourceversion=dt-creadout.v1.0

Table A.3 (continued)

UC	REST API	Resource version according to ISO 20078-2:2019	Resource version according to ISO 20078-2:2021
04	readinessCodeReadouts	application/x.exve.org.readinesscodereadout. v1+json	application/json; exve-resourceversion= readinesscodereadout.v1.0
05	dtcSnapshotReadout	application/x.exve.org.dtcsnapshotreadout.v1+json	application/json; exve-resourceversion= dtcsnapshotreadout.v1.0
06	parameterReadout	application/x.exve.org.parameterreadout.v1+json	application/json; exve-resourceversion= parameterreadout.v1.0
07	malfunctionIndicatorReadout	application/x.exve.org.malfunctionIndicatorreadout.v1+json	application/json; exve-resourceversion= malfunctionindicatorreadout.v1.0
08	clearDtcJob	application/x.exve.org.cleardtcjob.v1+json	application/json; exve-resourceversion= cleardtcjob.v1.0

A.3 REST API information model

The rest API information model in Figure A.1 is compiled from the use cases in this document and used as a base for designing the REST APIs.

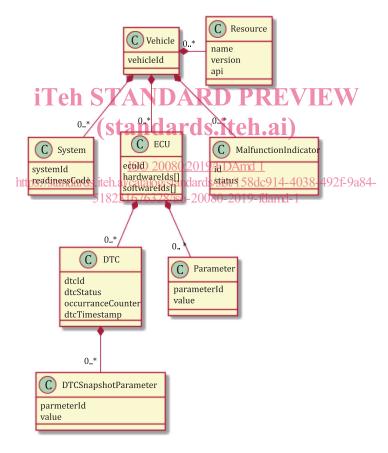


Figure A.1 — REST API information model

A.4 REST APIS

A.4.1 Use case 01 - resourceReadout

The resourceReadout API follows the asynchronous interaction pattern, as the processing time of the request can vary dependent on the offering party implementation (see Figure A.2). In some cases, it is possible to return the result immediately, whereas sometimes the accessing party needs to poll the API until the result is ready.

The accessing party starts by posting a resource readout request (see <u>Table A.4</u>). If the result is available immediately, the result is returned directly (see <u>Table A.5</u>). If the result is not available immediately, a status is returned instead of the readout. The accessing party is supposed to poll the request status until the processing is completed. When the processing is completed, the accessing party will receive the result.

The readout status and the completed readout will be available for a limited time after being created. This time is specified by the offering party.

resourceReadouts offering party accessing party POST vehicles/{vehicleId}/resourceReadouts alt [Result available] 201 OK (Content) [Result not available] 202 Accepted Location: vehicles/{vehicleId}/resourceReadouts/{ID} loop [until complete or fail] GET vehicles/{vehicleId}/resourceReadouts/{ID} standards.iteh.ai) 200 OK Content: {"Status": "Pending|InProgress|Complete|Fail", https://standarde.iteh.ai/catalog/standarde. accessing party offering party

Figure A.2 — resourceReadouts sequence diagram

POST vehicles/{vehicleId}/resourceReadouts						
Description	This API creates a readout of available resources to the accessing party for one vehicle. If the result is available immediately, the result is returned. If the result is not available, a location to the resource readout is returned. This location shall be polled until the result is available.					
Parameters	vehicleId	string	string required The vehicle identifier of the vehicle to read from			
Request headers	Host	required	quired According to HTTP/1.1 RFC 2616			
	Authorization	required Bearer (token)				
	Accept	required	application/json; exve-resourceversion=resourcereadout.v1.0; charset=utf-8			
Response head- ers	Location	Absolute URI of the /resourceReadouts endpoint				

Table A.4 — POST resourceReadout

Table A.4 (continued)

```
Response (suc- 201
                         Example (result available immediately):
cess)
                         "resourceReadout": {
                            "id": "abcde-12345-ghjke-67474",
                            "asyncStatus": "Complete",
                            "messageTimestamp": "2016-02-24T09:23:46Z",
                            "vehicleId": "12345678909876543",
                            "resources": [
                                "name": "DTC Readout",
                                "version": "1",
                                "api":
                         "https://example.org/vehicles/12345678909876543/dtcReadouts"
                                "name": "ECU Readout",
                             iT versionT: ANDARD PREVIEW
                         "apı": (standards.iteh.ai)
"https://example.org/vehicles/12345678909876543/ecuReadouts"
                                            ISO 20080:2019/FDAmd 1
                          https://standards.iteh.ai/catalog/standards/sist/158dc914-4038-492f-9a84-
                                      518231676328/iso-20080-2019-fdamd-1
                202
                        Result is not available immediately. Location of resourceReadout will be returned, e.g.
                         vehicles/{vehicleId}/resourceReadouts/{id}, see location header.
Error codes
                400
                         Bad request
                401
                        Unauthorized
                403
                         Forbidden
                404
                         Not found
                406
                        Not acceptable
                500
                        Internal server error
                501
                         Not implemented
                503
                         Service unavailable
                505
                        Version not supported
                                      Access to any resource will give access to this API.
Access
                Any resource
ISON schema
                See Clause A.5.
```

Table A.5 — GET resourceReadout

GET vehicles/{vehicleId}/resourceReadouts/{id}				
·	This API returns a readout of available resources to the accessing party for one vehicle. The id of the readout is returned when posting the request. If the resource readout is not completed, the readout status is returned. If the resource readout is completed, the result is returned.			

 Table A.5 (continued)

Parameters	vehicleId		string	required	The vehicle identifier of the vehicle to read from	
	id		string	required	Id of the DTC readout	
Request headers	Host		required	According	According to HTTP/1.1 RFC 2616	
	Authorization		required	Bearer {token}		
	Accept		required	application charset=ut	/json; exve-resourceversion=resourcereadout.v1.0; f-8	
Response headers	Content-Type applicatio		application/	json; exve-r	esourceversion= resourcereadout.v1.0;charset=utf-8	
Response (suc-	200	Examp	le (result ava	ilable):		
cess)		{				
		"resou	urceReadout	": {		
		"io	d": "abcde-	12345-ghjl	ke-67474",	
		"as	syncStatus": "Complete",			
		"me	essageTimestamp": "2016-02-24T09:23:46Z",			
		"ve	ehicleId": "12345678909876543",			
		"re	esources": [
			{			
	i	Γeh	"version":	"l",	PREVIEW	
			(standa	ards.it	eh.aı)	
		"http:	s://example ISO 200	.org/vehic	cles/12345678909876543/dtcReadouts" Amd	
	https://		s. teh.ai/catalog/s 5{18231676328		158dc914-4038-492f-9a84- 019-fdamd-1	
			"name": "E	CU Readout	t",	
			"version":	"1",		
			"api":			
		"http:	s://example	.org/vehic	cles/12345678909876543/ecuReadouts"	
			}			
]			
		}				
		}				

Table A.5 (continued)

```
Example (result not available):
                       "resourceReadout": {
                          "id": "abcde-12345-ghjke-67474",
                          "asyncStatus": "InProgress",
                          "asyncWait": 10000,
                          "asyncEstimatedComplete": "2016-02-24T09:24:00Z",
                          "messageTimestamp": "2016-02-24T09:23:46Z",
                          "vehicleId": "12345678909876543"
Error codes
               400
                       Bad request
               401
                       Unauthorized
               403
                       Forbidden
               404
                       Not found
               406
                       Not acceptable
                       Internal server error NDARD PREVIEW
               500
                       Not implemented tandards
               501
               503
                       Service unavailable
               505
                       Version not supported 20080:2019/FDAmd 1
               Any resources://standardAcdesscoanysresourceswill give access to this API.
Access
                                    518231676328/iso-20080-2019-fdamd-1
ISON schema
               See Clause A.5.
```

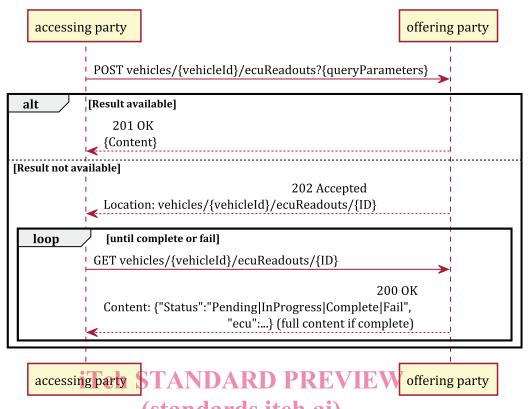
A.4.2 Use case 02 - ecuReadouts

The ecuReadout API follows the asynchronous interaction pattern, as the processing time of the request can vary dependent on the offering party implementation (see <u>Figure A.3</u>). In some cases, it is possible to return the result immediately, whereas sometimes the accessing party needs to poll the API until the result is ready.

The accessing party starts by posting an ECU readout request (see <u>Table A.6</u>). If the result is available immediately, the result is returned directly. If the result is not available immediately, a status is returned instead of the readout. The accessing party is supposed to poll the request status until the processing is completed (see <u>Table A.7</u>). When the processing is completed, the accessing party will receive the result.

The readout status and the completed readout will be available for a limited time after being created. This time is specified by the offering party.

ecuReadouts



(standards.iteh.ai) Figure A.3 — ecuReadouts sequence diagram

ISO 20080:2019/FDAmd 1

https://standards.iteh.ai/catalog/standards/sist/158dc914-4038-492f-9a84-5182316/6324/60-2005T_0ecuReadout

POST vehicles/{vehicleId}/ecuReadouts/ecuId={ecuId}					
Description	This API creates a readout of ECUs for one vehicle. If the result is available immediately, the result is returned. If the result is not available, a location to the ECU readout is returned. This location shall be polled until the result is available.				
Parameters	vehicleId	string	required	The vehicle identifier of the vehicle to read from	
	ecuId	string	optional	Return this ECU id only Default: Return all ECUs	
Request headers	Host	required	According t	to HTTP/1.1 RFC 2616	
	Authorization	required	d Bearer {token}		
	Accept	required	application/json; exve-resourceversion=ecureadout.v1.0; charset=utf-8		
Response head- ers	Location	Absolute URI of the /ecuReadouts endpoint			

Table A.6 (continued)

```
Response (suc- 201
                                                                        Example (result available immediately):
cess)
                                                                        "ecuReadout": {
                                                                                 "id": "abcde-12345-ghjke-67474",
                                                                                 "asyncStatus": "Complete",
                                                                                  "messageTimestamp": "2016-02-24T09:23:46Z",
                                                                                 vehicleId": "12345678909876543",
                                                                                 "receivedTimestamp": "2016-02-24T09:23:46Z",
                                                                                  "ecus": [
                                                                                                      "ecuId": "ABC",
                                                                                                      "hardwareIds": ["1234567"],
                                                                                                      "softwareIds": ["9876543"]
                                                                                           }, {
                                                                                                      "ecuId": "DEF",
                                                                                                      "hardwareIds": ["2345678"],
                                                                                    iTe "software Ids":) A"8976543DIREVIEW
                                                                                           * (standards.iteh.ai)
                                                                                                      "hardware Ids": 0080 2019/FDAm 1
                                                                           https://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.fitewa.re.I.ds://standasb.f
                                                                                                      518231676328/iso-20080-2019-fdamd-1
                                                                                  }
                                              202
                                                                        Result is not available immediately. Location of ecuReadout will be returned, e.g. ve-
                                                                       hicles/{vehicleId}/ecuReadouts/{id}, see location header.
Error codes
                                              400
                                                                        Bad request
                                              401
                                                                       Unauthorized
                                              403
                                                                       Forbidden
                                              404
                                                                       Not found
                                              406
                                                                       Not acceptable
                                              500
                                                                       Internal server error
                                              501
                                                                       Not implemented
                                              503
                                                                       Service unavailable
                                              505
                                                                       Version not supported
                                              ECU readout
                                                                                                              Full access to this API
Access
                                              See Clause A.5.
ISON schema
```

Table A.7 — GET ecuReadout

```
GET vehicles/{vehicleId}/ecuReadouts/{id}
```

Table A.7 (continued)

Description	This API returns the ECU readout for one vehicle. The id of the readout is returned when posting the request. If the ECU readout is not completed, the readout status is returned. If the ECU readout is completed, the result is returned.						
Parameters vehicleId		string	required	The vehicle identifier of the vehicle to read from			
	id		string	required	id of the ECU readout		
Request headers	Host		required	According to HTTP/1.1 RFC 2616			
	Authorization		required	Bearer {token}			
Accept			required	application/json; exve-resourceversion=ecureadout.v1.0; cl set=utf-8			
Response head- ers	Content-	Туре	application/	json; exve-r	esourceversion=ecureadout.v1.0; charset=utf-8		
Response (suc-	200	Examp	le (result ava	ilable):			
cess)		{					
		"e	cuReadout":	{			
			"id": "abc	de-12345-	ghjke-67474",		
			"asyncStat	us": "Comp	plete",		
			"messageTimestamp": "2016-02-24T09:23:46Z",				
			"vehicleId": "12345678909876543",				
	Teh SreceivedTimestamp": P'2016-02-24T09:/23:46Z",						
	1.		"ecus": (standards.iteh.ai)				
			ISO 70	Id":01"ABC	And 1		
	https://	standards			158dd213145638-492f-9a84-		
			518231676328 sof	k <mark>iso-20080-2</mark> twareIds	019-fdand-1 1876543"]		
			}, {				
			"ecu	Id": "DEF'	1,		
			"har	dwareIds":	: ["2345678"],		
					: ["8976543"]		
			}, {				
				Id": "GHI'	·,		
					; :["3456789"],		
					: ["7896543","7896555"]		
			1	cwarerus .	. [70,0043 , 70,0000]		
			J				
			J				
		, }					
l		}					