



# Introducing the Interoperability Test Bed

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Interoperability Test Bed  
European Commission, DIGIT

interoperable  
europe

# What is the Test Bed?

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**ITB**

Interoperability  
Test Bed

An online, intuitive and self-service platform for conformance testing of IT systems against semantic and technical specifications

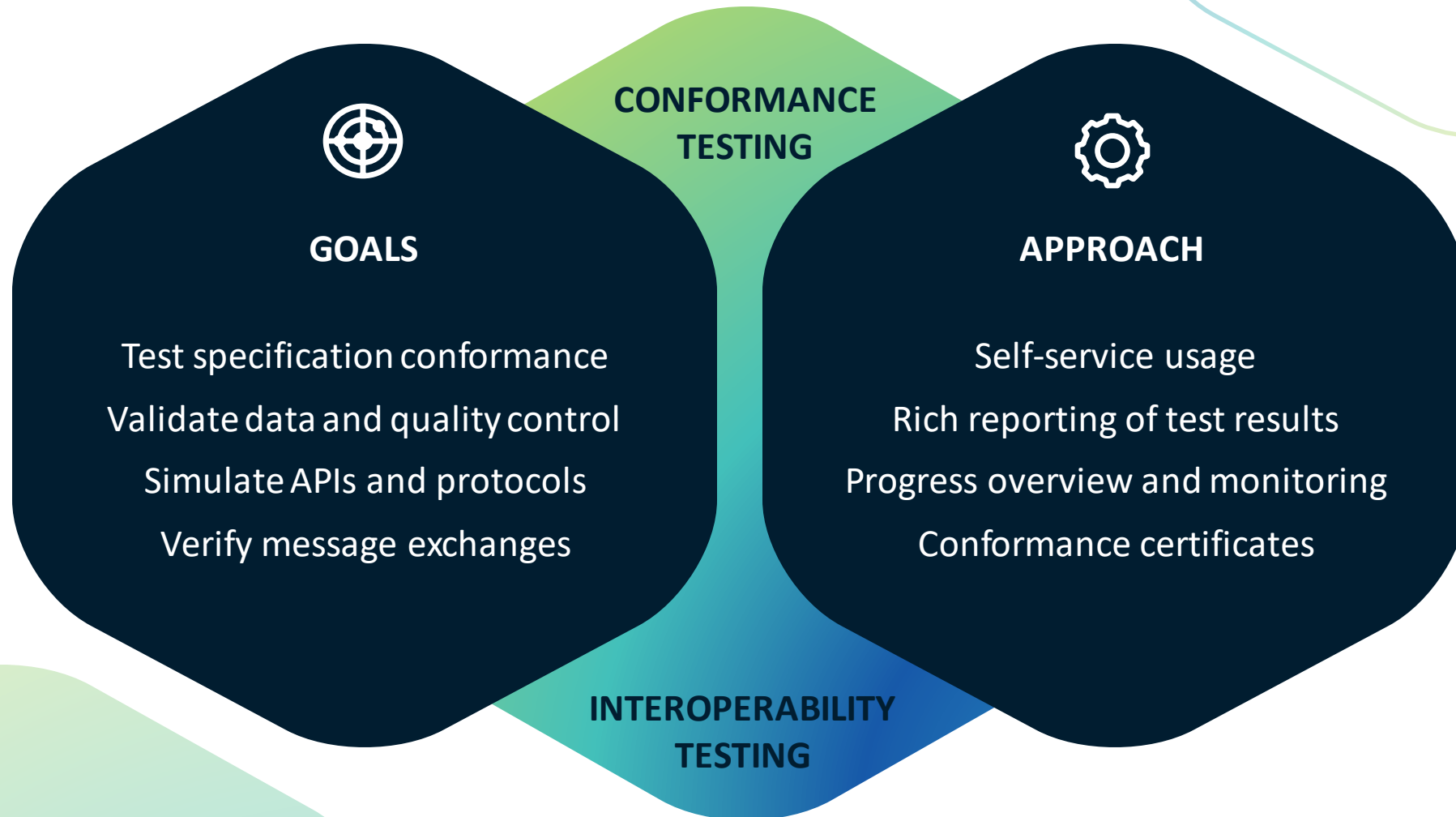


Powered by  
DIGIT



Standards based  
([GITB CWA](#))

# What can it be used for?



# Key services

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## VALIDATORS

Used for data validation  
Anonymous and stateless  
Multiple input channels  
Various reporting outputs  
Configuration-driven



## CONFORMANCE TEST BED

Used for conformance testing  
Account-based access  
Scenario-based test cases  
Rich monitoring and reporting  
Extensible capabilities

# Flexible usage models



## USE AS A DIGIT SERVICE

Use as services

Shared cloud-based instances  
Hosted and operated by DIGIT  
User-managed configuration  
Distinct setup per project



## INSTALL ON-PREMISE

Use as components

Public Docker images  
Hosted and operated by users  
Allows internal integrations  
Allows access restrictions

# Rich documentation



## TEST BED JOINUP SPACE

Introduction and details  
Documentation links  
Releases and news  
User stories



## ONLINE DOCUMENTATION

User guides  
Developer guides  
Documentation  
Tutorials

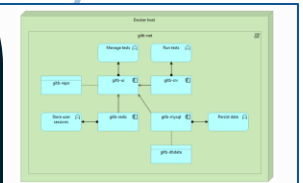
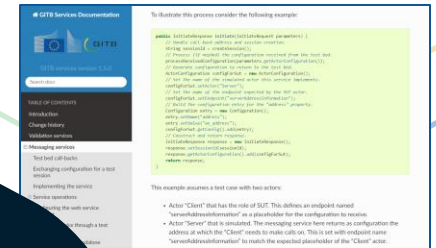
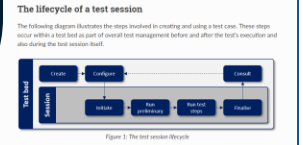


Figure 2 illustrates the interrelations and functions of test bed containers.

The following table summarizes the configuration options specific to the test bed that you should be aware of and potentially adapt for your installation:

Component	Section/Property	Description
Test Bed	Test Bed	This is the platform for the test bed.



**Step 1: Create**  
Before we can start testing we need to create a test suite and at least one contained test case. The test suite will define actions matching the specification's requirements, and the test cases will each define one actor from the ones configured in the SUT. Other actors will be defined as being simulated.

**Step 2: Configure**  
The actor that is identified as the SUT may have one or more optional or required configuration parameters that need to be provided. These are verified before test execution to ensure



The image features a dark blue background with intricate, glowing patterns of green and light blue particles and lines. These patterns form a central, somewhat circular shape with elongated, tapering extensions on the left and right sides, resembling a stylized flower or a complex network structure. The particles are densely packed in the center and become sparser towards the edges. The overall effect is a sense of dynamic energy and interconnectedness.

Validators

# Validator syntax support

ITB

RDF validator

Validate **RDF** data  
with [SHACL shapes](#)

ITB

XML validator

Validate **XML** data  
with [XSDs](#) and  
[Schematron](#)

ITB

CSV validator

Validate **CSV** data  
with [Table Schema](#)

ITB

JSON validator

Validate **JSON** data  
with [JSON Schema](#)



Available as **DIGIT** services

See the [RDF](#), [XML](#), [CSV](#), [JSON](#) guides



Available on **Docker Hub**

See the [RDF](#), [XML](#), [CSV](#), [JSON](#) images



# Validator setup as DIGIT service

## STEP 1

Define configuration



Validator configuration

Validation rules

Customisations

## STEP 2

Share configuration



Configuration  
by Test Bed team

## STEP 3

Use validator APIs



Web interface  
for users



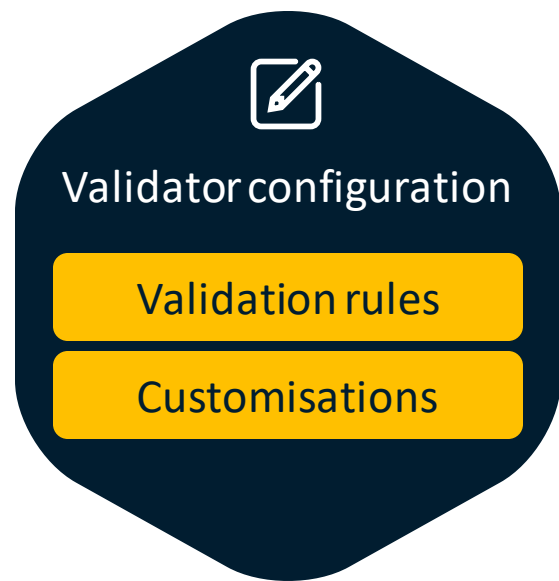
Web services  
for apps



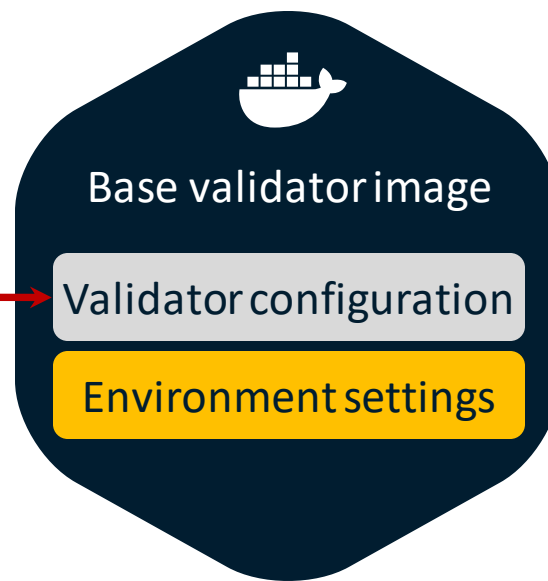
Command-line  
for scripts

# Validator setup on-premise

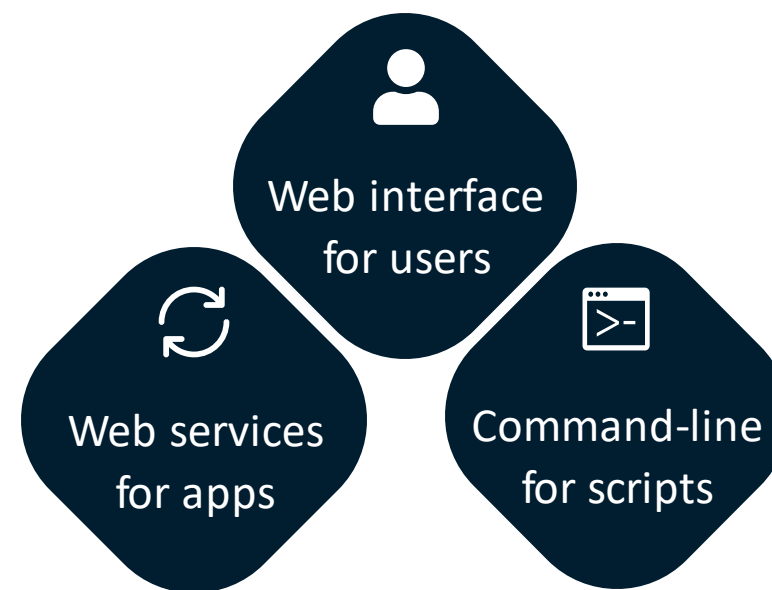
**STEP 1**  
Define configuration



**STEP 2**  
Create validator



**STEP 3**  
Use validator APIs





# Validator demo

Validation of an electronic invoice  
using the [eInvoicing validator](#)

The background features a complex, abstract pattern of particle trails. These trails are composed of numerous small, glowing points that form larger, organic shapes. The colors range from a deep, dark blue to a vibrant green, with some areas appearing to have a slight orange or yellow tint. The overall effect is reminiscent of a network visualization or a data flow diagram. The text 'Conformance Test Bed' is centered in a clean, white, sans-serif font, providing a clear focal point against the intricate background.

# Conformance Test Bed

# Conformance testing capabilities



## VALIDATION

XSD

Schematron

XPath

JSON Schema

Table Schema

GraphQL

SHACL

RegExp

ASiC

...



## MESSAGING

HTTP

HTTPS

eDelivery

SOAP

REST

UN/FLUX

AS2

AS4

TCP

UDP

...



## PROCESSING

ASiC

ZIP

SBD

Timestamps

Signatures

Digests

Templates

UUIDs

Tokens

Webhooks

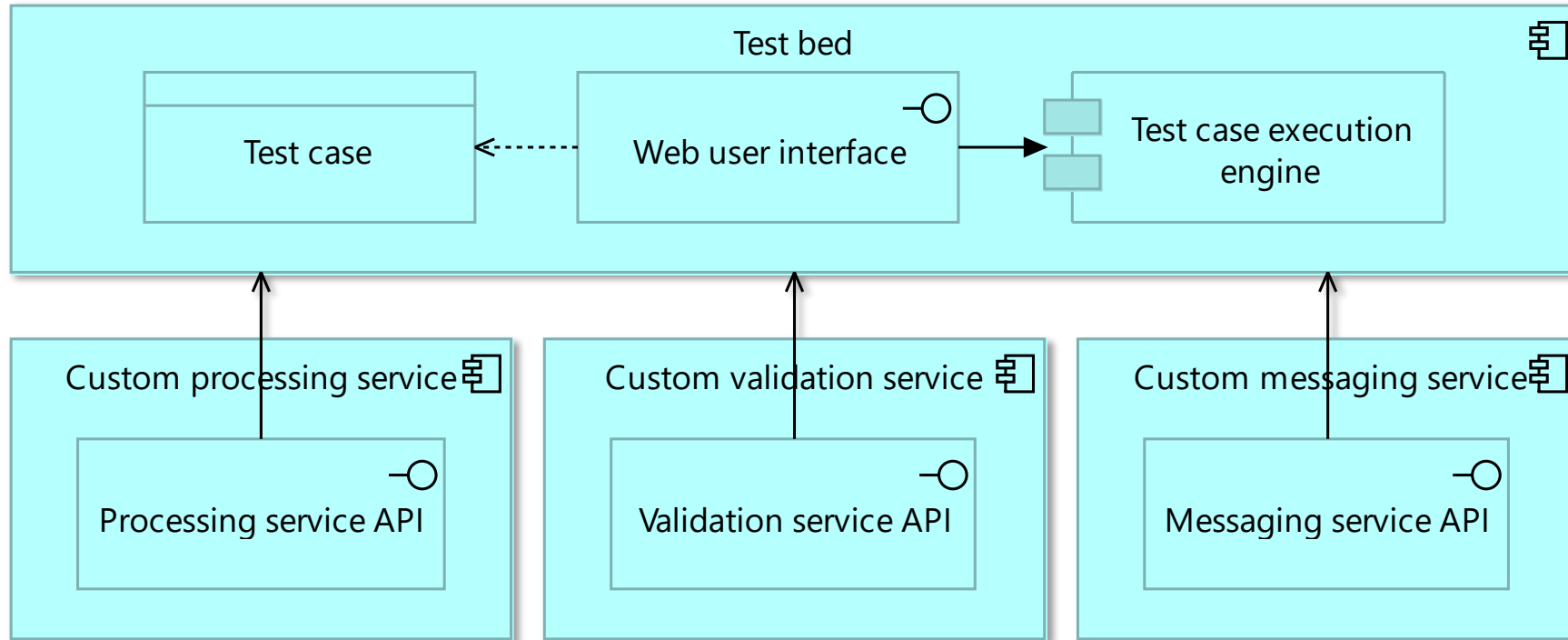
RegExp

XPath

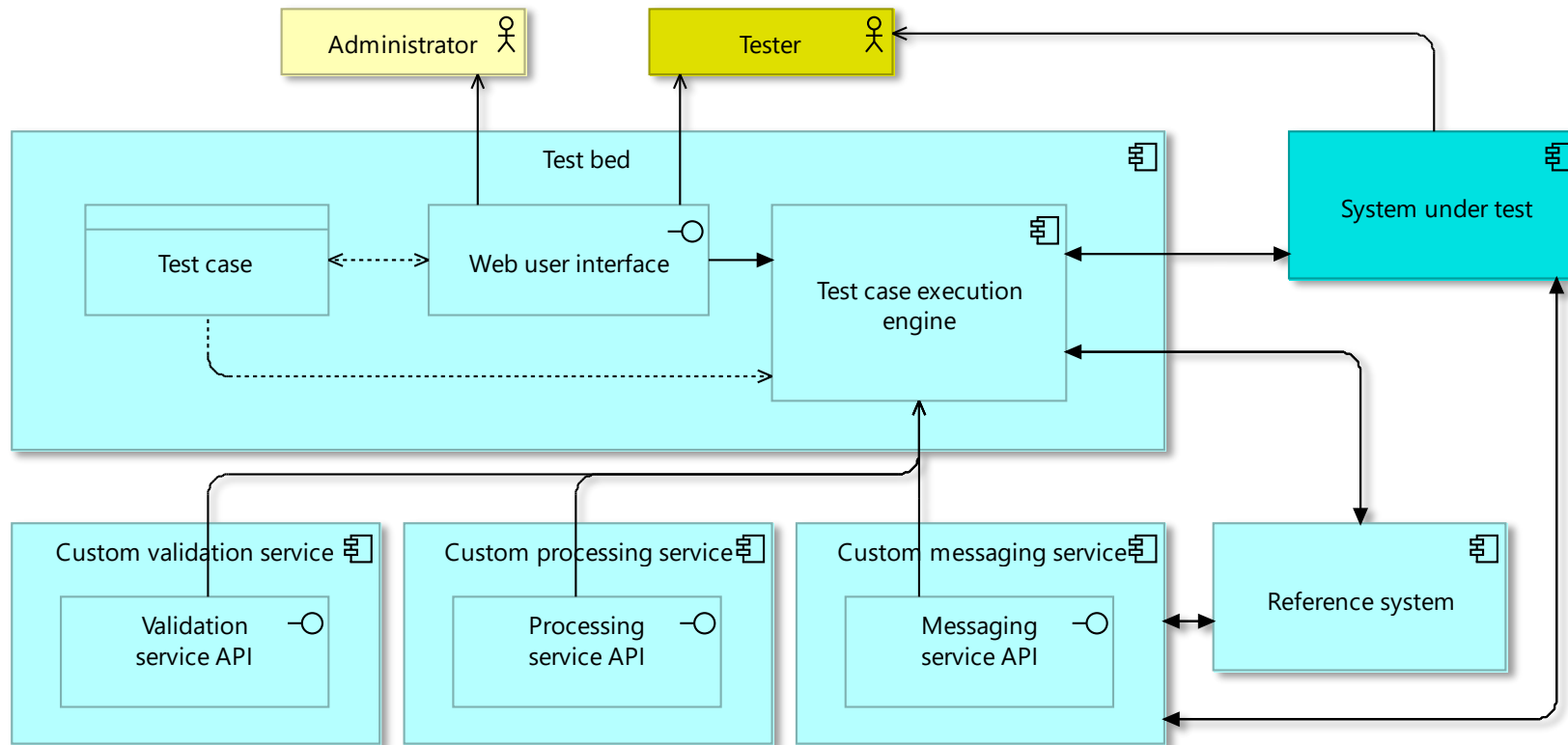
...



# Custom capability extensions



# Conformance testing overview



**ADMINISTRATOR**

- Configure tests
- Monitor progress
- Manage users

**TESTER**

- Manage organisation
- Execute tests
- Review results



# Test Bed demo

Test execution, reporting and monitoring  
for testers and administrators



## FIND OUT MORE

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[News](#)

[Value proposition](#)

[Developer guides](#)

[Tutorials](#)

## TRY IT YOURSELF

Go to <https://www.itb.ec.europa.eu/itb>  
and click “Try out our demos”

## CONTACT US

Send your questions  
and feedback to  
[DIGIT-ITB@ec.europa.eu](mailto:DIGIT-ITB@ec.europa.eu)



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[DIGIT-INTEROPERABILITY@ec.europa.eu](mailto:DIGIT-INTEROPERABILITY@ec.europa.eu)



<https://joinup.ec.europa.eu/collection/interoperable-europe/interoperable-europe>





# Annex A

Validator demo screenshots

## Validator input



# eInvoice Validator

This is a service offered by the European Commission's DIGIT as part of the [Digital Europe Programme](#), allowing you to validate electronic invoices against the requirements of the [European Standard on eInvoicing](#). This service is also available via [REST API](#) and [SOAP API](#), with complete eInvoicing conformance testing supported through the [eInvoicing Test Bed](#).

Questions and feedback on this service can be sent to [EC-EINVOICING-SUPPORT@ec.europa.eu](mailto:EC-EINVOICING-SUPPORT@ec.europa.eu).

File to validate

File



Select file...

Validate as

Validate

This service is powered by the Interoperability Test Bed, a conformance testing service offered by the European Commission's DG DIGIT for projects involved in the delivery of cross-border public services. Find out more [here](#).

## Validator result overview

### Validation result

#### Overview

**Date:** 2021-06-10T09:07:30.701Z  
**File name:** invoice.xml  
**Validation type:** UBL Invoice XML  
**Result:** FAILURE  
**Errors:** 25  
**Warnings:** 17  
**Messages:** 0

[View annotated input](#) [Download XML report](#) [Download PDF report](#)

#### Details

✘ [BR-CO-10]-Sum of Invoice line net amount (BT-106) =  $\Sigma$  Invoice line net amount (BT-131).

**Test:**  $(\text{xs:decimal}(\text{cbc:LineExtensionAmount}) = (\text{round}(\text{sum}(\text{cac:InvoiceLine}|\text{cac:CreditNoteLine})/\text{xs:decimal}(\text{cbc:LineExtensionAmount})) * 10 * 10) \text{ div } 100))$

✘ [BR-CO-13]-Invoice total amount without VAT (BT-109) =  $\Sigma$  Invoice line net amount (BT-131) - Sum of allowances on document level (BT-107) + Sum of charges on document level (BT-108).

**Test:**  $((\text{cbc:ChargeTotalAmount}) \text{ and } (\text{cbc:AllowanceTotalAmount}) \text{ and } (\text{xs:decimal}(\text{cbc:TaxExclusiveAmount}) = \text{round}((\text{xs:decimal}(\text{cbc:LineExtensionAmount}) + \text{xs:decimal}(\text{cbc:ChargeTotalAmount}) - \text{xs:decimal}(\text{cbc:AllowanceTotalAmount})) * 10 * 10) \text{ div } 100)) \text{ or } (\text{not}(\text{cbc:ChargeTotalAmount}) \text{ and } (\text{cbc:AllowanceTotalAmount}) \text{ and } (\text{xs:decimal}(\text{cbc:TaxExclusiveAmount}) = \text{round}((\text{xs:decimal}(\text{cbc:LineExtensionAmount}) - \text{xs:decimal}(\text{cbc:AllowanceTotalAmount})) * 10 * 10) \text{ div } 100)) \text{ or } ((\text{cbc:ChargeTotalAmount}) \text{ and } \text{not}(\text{cbc:AllowanceTotalAmount}) \text{ and } (\text{xs:decimal}(\text{cbc:TaxExclusiveAmount}) = \text{round}((\text{xs:decimal}(\text{cbc:LineExtensionAmount}) + \text{xs:decimal}(\text{cbc:ChargeTotalAmount})) * 10 * 10) \text{ div } 100)) \text{ or } (\text{not}(\text{cbc:ChargeTotalAmount}) \text{ and } \text{not}(\text{cbc:AllowanceTotalAmount}) \text{ and } (\text{xs:decimal}(\text{cbc:TaxExclusiveAmount}) = \text{xs:decimal}(\text{cbc:LineExtensionAmount})))$

## Validator result details

Validation

Overview

Date:

File name:

Validation type:

Result:

Errors:

Warnings:

Messages:

View annotated

Details

✘ [BR-CO-10] - Sum of Invoice line net amount (BT-106) =  $\Sigma$  Invoice line net amount (BT-131).

✘ [BR-CO-13] - Invoice total amount without VAT (BT-109) =  $\Sigma$  Invoice line net amount (BT-131) - Sum of allowances on document level (BT-107) + Sum of charges on document level (BT-108).

✘ [BR-CO-16] - Amount due for payment (BT-115) = Invoice total amount with VAT (BT-112) - Paid amount (BT-113) + Rounding amount (BT-114).

✘ [BR-CO-13] - Invoice total amount without VAT (BT-109) =  $\Sigma$  Invoice line net amount (BT-131) - Sum of allowances on document level (BT-107) + Sum of charges on document level (BT-108).

Test: ((cbc:ChargeTotalAmount) and (cbc:AllowanceTotalAmount) and (xs:decimal(cbc:TaxExclusiveAmount) = round((xs:decimal(cbc:LineExtensionAmount) + xs:decimal(cbc:ChargeTotalAmount) - xs:decimal(cbc:AllowanceTotalAmount)) \* 10 \* 10) div 100)) or (not(cbc:ChargeTotalAmount) and (cbc:AllowanceTotalAmount) and (xs:decimal(cbc:TaxExclusiveAmount) = round((xs:decimal(cbc:LineExtensionAmount) - xs:decimal(cbc:AllowanceTotalAmount)) \* 10 \* 10) div 100)) or ((cbc:ChargeTotalAmount) and not(cbc:AllowanceTotalAmount) and (xs:decimal(cbc:TaxExclusiveAmount) = round((xs:decimal(cbc:LineExtensionAmount) + xs:decimal(cbc:ChargeTotalAmount)) \* 10 \* 10) div 100)) or (not(cbc:ChargeTotalAmount) and not(cbc:AllowanceTotalAmount) and (xs:decimal(cbc:TaxExclusiveAmount) = xs:decimal(cbc:LineExtensionAmount))))

XML content

Close

```
157 <cbc:TaxableAmount currencyID="DKK">2750.00</cbc:TaxableAmount>
158 <cbc:TaxAmount currencyID="DKK">330.00</cbc:TaxAmount>
159 <cac:TaxCategory>
160 ✘ [BR-CL-17]-Invoice tax categories MUST be coded using UNCL5305 code list
    <cbc:ID schemeID="UNCL5305">AA</cbc:ID>
161 <cbc:Percent>12</cbc:Percent>
162 <cac:TaxScheme>
163 <cbc:ID>VAT</cbc:ID>
164 </cac:TaxScheme>
165 </cac:TaxCategory>
166 </cac:TaxSubtotal>
167 </cac:TaxTotal>
168 <cac:LegalMonetaryTotal>
169 <cbc:LineExtensionAmount currencyID="DKK">415000.00</cbc:LineExtensionAmount>
170 <cbc:TaxExclusiveAmount currencyID="DKK">4250.00</cbc:TaxExclusiveAmount>
171
```





# Annex B

Test Bed demo screenshots



## Welcome page



# Welcome to the Interoperability Test Bed

The Interoperability Test Bed is a platform for self-service conformance testing against semantic and technical specifications.

Click to log in

**Assigned a new role by an administrator?** [Confirm your new role.](#)

**New to the Test Bed?** [Register in a public community](#) or [try out our demos.](#)

To connect to the Test Bed you need to first authenticate using your EU Login account. If you are new to EU Login follow [this tutorial](#) to get started.

**Privacy note:** By connecting you consent to the use of cookies to manage your session. Please refer to our [legal notice](#) for more information.

**Migration note:** If you have been using a functional account to log in click [here](#) to migrate it to EU Login. Step-by-step instructions are available in [this guide](#).



[User guide](#) | [Legal notice](#) | [Find out more](#) | 1.22.0

## Home page

Home

Home

Home

MY TESTS

- My conformance statements
- My test sessions
- My organisation


<< Collapse menu

# Welcome to the Interoperability Test Bed

To get started with available tests click on the **My conformance statements** from the menu.

From that point you will be able to register a **system** to test for and define for it one or more **conformance statements**. To launch a test select a conformance statement and execute one or more of its defined **tests**.

Click [here](#) for information on the Test Bed. Questions and feedback can be provided to [DIGIT-ITB@ec.europa.eu](mailto:DIGIT-ITB@ec.europa.eu).

 [User guide](#) | [Contact support](#) | [Legal notice](#) | [Find out more](#) | 1.22.0

## List of conformance statements (specifications to test for)

The screenshot displays the 'My conformance statements' page. At the top, there is a blue header with the text 'My conformance statements' and the European Union flag. Below the header, a breadcrumb trail reads 'Home > My organisation > Demo system > Conformance statements'. The main content area is titled 'Conformance statements' and features a search bar with the text 'Search statements...'. To the left of the search bar is a 'System' dropdown menu set to 'Demo system'. To the right are buttons for 'Show statements...' and 'Download report'. Below the search bar, there is a table of conformance statements:

Statement Name	Timestamp	Progress	Status
Core Public Service Vocabulary Application Profile (CPSV-AP)	27-03-2024 17:27:52	100.0%	0 ✓ 1 ✗ 0 ⚠
Electronic invoicing	27-03-2024 17:33:22	100.0%	0 ✓ 1 ✗ 0 ⚠

At the bottom of the page, there is a blue footer with the GITB logo on the left and navigation links on the right: 'User guide', 'Contact support', 'Legal notice', 'Find out more', and '1.22.0'. The European Union flag and 'European Commission' logo are located in the bottom right corner of the overall image.

# Conformance statement details

The screenshot displays a web application interface for managing conformance statements. At the top, there is a blue header with the text 'My conformance statements' and a breadcrumb trail: 'Home > My organisation > Demo system > Conformance statements > Core Public Service Vocabulary Application Profile (CPSV-AP)'. A sidebar on the left contains navigation icons for home, settings, list, and expand. The main content area is titled 'Conformance statement details' and includes the following elements:

- Organisation:** Demo organisation
- System:** Demo system
- Core Public Service Vocabulary Application Profile (CPSV-AP):** CPSV-AP offers a common data model for describing public services offered by public administrations. The CPSV-AP standardises the semantics of personal milestones, including having a child, beginning education, looking for a new job, as well as professional changes such as starting or financing a company, hiring an employee.
- Status:** FAILURE
- Last update:** 27-03-2024 17:27:52
- Test results:** 0 ✓ 1 ✗ 0 ⏸
- Progress bar:** 100.0% (red)
- Actions:** Download report, View system, Back
- Conformance tests:** Search test cases... Show tests... Interactive execution
- Test Suite:** COS-HARVESTER-1 (Test suite that simulates the collection of public service metadata from National endpoints (FI and EE) and their exposure as CPSV-AP.)
- Test Case:** COS-HARVESTER-1 test case 1 (multi-step, 27-03-2024 17:27:52)

The footer contains the GITB logo and links for User guide, Contact support, Legal notice, Find out more, and version 1.22.0.



# Test session (before starting)

**My conformance statements**

Home > My organisation > Demo system > Conformance statements > Core Public Service Vocabulary Application Profile (CPSV-AP)

**Test execution** Go to conformance statement Stop Reset Start

Test case	Description	Status
COS-HARVESTER-1 test case 1	Illustrate message exchange and validation taking place in the aggregation of public service metadata.	<span>Info</span> <span>Settings</span>

**Session** b6629bbe-3dec-4ebe-91d1-a130757b6ab7 Download report View log

**Sequence Diagram:**

- Participants: EU Portal (SUT), Harvester, FSC (FI), MKM (EE), Test Engine
- Messages:
  - EU Portal (SUT) → Harvester: Send request
  - Harvester → FSC (FI): Send request to FI
  - FSC (FI) → Harvester: Receive response from FI
  - Harvester → MKM (EE): Send request to EE
  - MKM (EE) → Harvester: Receive response from EE
  - Harvester → EU Portal (SUT): Receive response
- Test Engine internal actions:
  - Transform FI data
  - Transform EE data
  - Aggregate data
  - Validate aggregated data

**Footer:** GITB | [User guide](#) | [Contact support](#) | [Legal notice](#) | [Find out more](#) | 1.22.0

# Test session (during execution)

**My conformance statements**

Home > My organisation > Demo system > Conformance statements > Core Public Service Vocabulary Application Profile (CPSV-AP)

**Test execution** Go to conformance statement Stop Reset Start

Test case	Description	Status
COS-HARVESTER-1 test case 1	Illustrate message exchange and validation taking place in the aggregation of public service metadata.	<span>?</span> <span>⚙️</span>

**Session** b6629bbe-3dec-4ebe-91d1-a130757b6ab7 Download report View log

**Sequence Diagram:**

```
sequenceDiagram
    participant SUT as EU Portal (SUT)
    participant Harvester
    participant FSC as FSC (FI)
    participant MKM as MKM (EE)
    participant TE as Test Engine

    SUT->>Harvester: Send request
    Harvester->>FSC: Send request to FI
    FSC-->>Harvester: Receive response from FI
    Harvester->>MKM: Send request to EE
    MKM-->>Harvester: Receive response from EE
    Harvester-->>SUT: Receive response

    Note over TE: Transform FI data
    Note over TE: Transform EE data
    Note over TE: Aggregate data
    Note over TE: Validate aggregated data
```

**Test Engine Steps:**



- Transform FI data 📄
- Transform EE data 📄
- Aggregate data ⚙️
- Validate aggregated data ⚙️



**Footer:** GITB | [User guide](#) | [Contact support](#) | [Legal notice](#) | [Find out more](#) | 1.22.0

## Validation error details

Step report

Result	<b>FAILURE</b>	Time	2024-04-09 08:58
--------	----------------	------	------------------

xml  

sch  

Details ✖ 2 errors

- ✖ [BII2-T10-R051]-Sum of line amounts MUST equal the invoice line net amounts
- ✖ [BII2-T10-R052]-An invoice total without VAT MUST equal the sum of line amounts plus the sum of charges on document level minus the sum of allowances on document level

Close Download report

xml

```
162 <cbc:TaxAmount currencyID="DKK">330.00</cbc:TaxAmount>
163 <cac:TaxCategory>
164 <cbc:ID schemeID="UNCL5305">AA</cbc:ID>
165 <cbc:Percent>12</cbc:Percent>
166 <cac:TaxScheme>
167 <cbc:ID>VAT</cbc:ID>
168 </cac:TaxScheme>
169 </cac:TaxCategory>
170 </cac:TaxSubtotal>
171 </cac:TaxTotal>
172 <cac:LegalMonetaryTotal>
173 <cbc:LineExtensionAmount currencyID="DKK">415000.00</cbc:LineExtensionAmount>
174 <cbc:TaxExclusiveAmount currencyID="DKK">4250.00</cbc:TaxExclusiveAmount>
175 <cbc:TaxInclusiveAmount currencyID="DKK">4956.00</cbc:TaxInclusiveAmount>
176 <cbc:ChargeTotalAmount currencyID="DKK">100.00</cbc:ChargeTotalAmount>
177 <cbc:PayableRoundingAmount currencyID="DKK">1.00</cbc:PayableRoundingAmount>
178 <cbc:PayableAmount currencyID="DKK">4956.00</cbc:PayableAmount>
179 </cac:LegalMonetaryTotal>
180 <cac:InvoiceLine>
181 <cbc:ID>1</cbc:ID>
182 <cbc:InvoicedQuantity unitCode="C62" unitCodeListID="UNFCFRec20">1000</cbc:InvoicedQuantity>
183
```

✖ [BII2-T10-R051]-Sum of line amounts MUST equal the invoice line net amounts  
✖ [BII2-T10-R052]-An invoice total without VAT MUST equal the sum of line amounts plus the sum of charges on document level minus the sum of allowances on document level

Close Copy to clipboard

# Overview of executed tests

The screenshot displays the 'My test sessions' interface. At the top, there is a navigation bar with the title 'My test sessions' and a breadcrumb 'Home > My test sessions'. Below this, a filter section allows users to refine results by 'Specification group', 'Specification', 'Actor', 'Test suite', and 'Test case', all currently set to 'All'. A search bar is present for the 'Specification' filter, with a dropdown menu open showing options for 'CPSV-AP' and 'eInvoicing'. The main content area is divided into 'Active test sessions' and 'Completed test sessions'. The 'Completed test sessions' table shows two failed test runs:

Specification	Actor	Test case	System	Start time	End time	Result
eInvoicing	Invoice Provider	TC1: Upload valid invoice	Demo system	09-04-2024 08:58:13	09-04-2024 08:58:39	Failed
CPSV-AP	EU Portal	COS-HARVESTER-1 test case 1	Demo system	09-04-2024 08:55:23	09-04-2024 08:55:38	Failed

The footer contains the GITB logo and links for 'User guide', 'Contact support', 'Legal notice', and 'Find out more', along with the version number '1.22.0'.



# Conformance dashboard (administrator)

The screenshot displays the 'Conformance dashboard' for an administrator. The interface includes a navigation sidebar on the left with icons for home, search, and various user management functions. The main content area is titled 'Conformance statements' and features a filter bar with dropdowns for 'Demo account community', 'Demo organisation', and 'Demo system', along with a search box and buttons for 'Show statements...' and 'Download report'. The dashboard lists several conformance statements, each with a status indicator (green checkmark for success, red cross for failure) and a progress bar. The statements are:

- Demo domain**
  - Core Public Service Vocabulary Application Profile (CPSV-AP)**: Status: 0 success, 1 failure, 0 unknown. Progress: 100.0%. Actions: View statement, View system, View specification, Download report.
  - COS-HARVESTER-1**: Test suite that simulates the collection of public service metadata from National endpoints (FI and EE) and their exposure as CPSV-AP.
  - COS-HARVESTER-1 test case 1**: Status: multi-step. Date: 09-04-2024 08:55:38. Actions: Search, Info, Download, Print.
- Electronic invoicing**
  - Electronic invoice validation**: Test suite addressing basic tests in electronic invoicing using the UBL 2.1 specifications.
  - TC1: Upload valid invoice**: Status: xml validation. Date: 09-04-2024 08:58:39. Actions: Search, Info, Download, Print.

The footer contains the GITB logo and links for 'User guide', 'Contact support', 'Legal notice', 'Find out more', and version '1.22.0'.