



EUROPEAN COMMISSION
DIRECTORATE-GENERAL
TAXATION AND CUSTOMS UNION
Digital Delivery of Customs and Taxation Policies
Customs Systems

Design Blueprint

ICS2

Date:	18/09/2020
Status:	Sent for acceptance (SfA)
Version:	2.40 EN
Author:	CUST-DEV3
Approved by:	DG TAXUD
Reference number:	DLV-480-6-62-3-4
Public:	DG TAXUD external
Confidentiality:	Publicly available (PA)

Document control information

Property	Value
Title	Design Blueprint
Subtitle	ICS2
Author	CUST-DEV3
Project owner	ICS2 team – ICS2 project team Leader
Solution provider	ICS2 team
DG TAXUD Project Manager	Bartlomiej BZDELA
Version	2.40 EN
Confidentiality	Publicly available (PA)
Date	18/09/2020

Contractor information

Property	Value
Framework Contract	Framework Contract - TAXUD/2013/CC/124
Specific Contract	Specific Contract n° 23 - TAXUD/2018/DE/148

Document history

The document author is authorised to make the following types of changes to the document without requiring that the document be re-approved:

- Editorial, formatting and spelling;
- Clarification.

To request a change to this document, contact the document author or project owner.

Changes to this document are summarised in the table in reverse chronological order (latest version first).

Version	Date	Description	Action ¹	Section
2.40	18/09/2020	Submitted for Acceptance (SfA) to DG TAXUD	I/R	All
2.30	04/09/2020	Update of the release 2 elaboration 2 phase <ul style="list-style-type: none"> • Aligned to new TEMPO format. Update submitted for SfR to DG TAXUD	I/R	Cover page and history table.
2.20	21/01/2020	Submitted for Acceptance (SfA) to DG TAXUD	I/R	All
2.10	03/01/2020	Including the update for Release 1 Construction 3. Implemented: <ul style="list-style-type: none"> • Aligned to new TEMPO format. Update submitted for SfR to DG TAXUD	I/R	Cover page and history table.
2.00	10/10/2019	Submitted for Acceptance (SfA) to DG TAXUD	I/R	All
1.90	17/09/2019	Including the update for Release 2. Only minor changes were implemented in section 6.8 and 9. Update submitted for SfR to DG TAXUD	I/R	All
1.80	10/05/2019	Submitted for Acceptance (SfA) to DG TAXUD	I/R	All

¹ Action: I=Insert R=Replace

Version	Date	Description	Action ¹	Section
1.70	06/05/2019	RTC35391: Implement the comments raised during the Member State and Trader review of the CTSS package sent to them on the 28/02/2019 in sections 1.3, 1.6, 2, 3.1, 3.1.1, 3.2, 6.4. Submitted for Review (SfR) to DG TAXUD	I/R	All
1.61	28/02/2019	Submitted for MS & Trade Representatives review	I/R	All
1.60	21/02/2019	Submitted for Acceptance (SfA) to DG TAXUD	I/R	All
1.50	05/02/2019	No changes implemented. Submitted for Review (SfR) to DG TAXUD	I/R	All
1.40	07/11/2018	Submitted for Acceptance (SfA) to Taxation and Customs Union DG.	I/R	All
1.30	15/10/2018	Including the monitoring and business statistics module. Update submitted for SfR to DG TAXUD	I/R	All
1.20	30/05/2018	Implementation of Member States & Trade representatives comments	I/R	All
1.10	27/04/2018	Implementing comments and suggestions from the STI PG	I/R	All
1.00	20/04/2018	Implementing QA3 and DG TAXUD review comments. Submitted for Acceptance (SfA) to Taxation and Customs Union DG.	I/R	All
0.10	04/04/2018	Implementing DG TAXUD review comments. Submitted for Review (SfR) to Taxation and Customs Union DG.	I/R	All
0.03	13/03/2018	Implementing DG TAXUD review comments. Submitted for Information (SfI3) to Taxation and Customs Union DG.	I/R	All
0.02	22/02/2018	Implementing DG TAXUD initial review comments. Submitted for Information (SfI2) to Taxation and Customs Union DG.	I/R	All
0.01	02/02/2018	First draft. Submitted for Information (SfI) to Taxation and Customs Union DG.	I/R	All

Configuration management: document location

The latest version of this controlled document is stored on CIRCABC.

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1 INTRODUCTION

1.1 DOCUMENT PURPOSE

The purpose of this document is to describe the design blueprint of the ICS2 system, focusing on the integration of the components located in the different domains (external, common and national). The ICS2 program is complex in the sense that it is envisioned to be implemented by a number of components in a number of domains, interacting with many other new and existing systems. This requires a clear and sound communication and understanding of all stakeholders about the systems involved and their interfaces.

This document is intended as a baseline of all systems relevant to the ICS2 program, their role in the program and their interface with the ICS2 system.

1.2 TARGET AUDIENCE

The target audience of this document are all stakeholders in the Member States and DG TAXUD involved in the implementation of ICS2, as well as the Trader Contact Group representing the traders.

Readers are assumed to have a good understanding of general IT architectural concepts and may belong to the following categories:

- ICS2 Specifications and Development team;
- DG TAXUD units responsible for ICS2 application;
- Member States responsible for the implementation of ICS2.

1.3 SCOPE

The scope of this document is to define:

- An insight on how the business processes of ICS2 and other functional requirements are implemented in IT components and interfaces;
- A view on the components and interfaces involved in the different domains (external, common and national);
- Information on the services provided by each component;
- An overview of procedural and operational aspects implied in the set up and functioning of the system.

In addition, the scope of this document is to take into account the different releases of ICS2.

1.4 STRUCTURE

The present document contains the following chapters:

- **Chapter 1 – Introduction:** describes the scope and the objectives of the document;
- **Chapter 2 – Overview:** provides a high-level overview of the system design;
- **Chapter 3 – Trader Interface:** provides a high-level overview of the Trader Interface components;
- **Chapter 4 – UUM&DS:** describes the UUM&DS system;
- **Chapter 5 – CCN2:** describes the CCN2ng platform;
- **Chapter 6 – Common Repository:** provides a high-level overview of the Common Repository component;
- **Chapter 7 – Reference systems:** provides a high-level overview of the Reference systems;

- **Chapter 8 – DDS2:** describes the DDS2 system;
- **Chapter 9 – CRMS2:** describes the CRMS2 system;
- **Chapter 10 – Smart and Secure Trade Lanes (SSTL):** describes the SSTL system;
- **Chapter 11 – ENS container status message (CSM):** provides information on the CMS project;
- **Chapter 12 – National Entry Systems (NES):** provides a high-level overview of NES components;
- **Chapter 13 – Operational and organisational aspects:** provides an overview of procedural and operational aspects;
- **Chapter 14 – Releases:** provides an overview of the components in the context of ICS2 releases.

1.5 REFERENCE DOCUMENTS

Ref.	Title	Reference	Version	Date
R01	ICS2 BPM L4 Process Description	ICS2-CFSS-BPML4 Process Description	1.14 1.22	29/11/2019 31/03/2020
R02	ICS2 Definitions	ICS2-CFSS-Definitions	1.10	15/10/2018
R03	ICS2 Business Rules Dictionary	ICS2-Business Rules Dictionary	1.1.12 1.2.2	04/02/2020 31/03/2020
R04	CRMS2 Architecture Overview	CRMS2 Architecture Overview	1.40	05/06/2019
R05	EU Customs Trader Portal Architecture Overview	CD3-EUCTP-AO	1.10	11/06/2020
R06	CCN2 Integration Manual	CCN2-CIMA	14.00	16/06/2020
R07	ICS2 Design Document for National Applications	ICS2 DDNA	2.80	21/07/2020
R08	ICS2 Interface Control Document	ICS2 ICD	1.90	10/05/2019
R09	Transition Strategy & Plan for Import Control System (ICS2)	ICS2 Transition Plan Strategy	1.4.1	07/12/2018
R10	Smart and Secure Trade Lanes (SSTL) Architecture Overview	CD3-SSTL-Architecture Overview	1.0	03/05/2018
R11	e-SENS AS4 conformant solutions	https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/e-SENS+AS4+conformant+solutions	N/A	N/A
R12	ICS2 STI Vision Document	CD3-ICS2-STI-VIS	2.02	01/12/2017
R13	ICS2 CR Vision Document	CD3-ICS2-CR-VIS	3.10	30/05/2018
R14	CRMS2 Release 1 Vision Document	N/A	1.1	06/06/2018
R15	e-SENSE AS4 Profile	https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/Access+Point+specifications	1.14 1.15 (eDelivery Community Draft)	31/10/2018 18/12/2018

Table 1: Reference documents

1.6 APPLICABLE DOCUMENTS

Ref.	Title	Reference	Version	Date
A01	Framework Contract	TAXUD/2013/CC/124	N/A	11/11/2013
A02	Specific Contract n° 23	TAXUD/2018/DE/128	N/A	01/05/2019
A03	CUST-DEV3 Framework Quality Plan	CD3-FQP	1.30	14/05/2020
A04	CD3-SC23-RfE-Offer-QTMR480-ICS2 - STI CR - Release 2 Elaboration Iteration 2-Technical Part-v1.00	CUSTDEV3	1.00	16/07/2020

Table 2: Applicable documents

1.7 ABBREVIATIONS & ACRONYMS

For a better understanding of the present document, the following table provides a list of the principal abbreviations and acronyms used.

See also the ‘list of acronyms’ on TEMPO.

Acronym	Definition
AS4	Applicability Statement 4
CA	Certificate Authority
CCN2ng	Common Communication Network version 2 new generation
CDMS	Customs Decisions Management System
COFE	Customs Office Of First Entry
CR	(ICS2) Common Repository
CRC	Common Risk Criteria
CRMS2	Customs Risk Management System
CRS	Customs Reference System
CSM	ENS-Container Status Message
CS/RD2	Central Services/Reference Data2
CUS	Customs Union and Statistics number
DDS2	Data Dissemination System
EBTI	European Binding Tariff Information
ECICS2	European Customs Inventory of Chemical Substances 2
ENS	Entry Summary Declaration
EO	Economic Operator
EORI	Economic Operators Registration and Identification number
EUCTP	EU Customs Trader Portal
HTI	ICS2 Harmonised Trader Interface
ICS2	Import Control System 2
IMO	International Maritime Organization
IMS	Involved Member State

INF	Information sheets
ITSP	IT Service Provider
JRC	Joint Research Centre
MRN	Master Reference Number
MS	Member State
NDPS	National Declaration Processing Systems
NES	National Entry Systems
NTI	National Trader Interface
OLAF	European Anti-Fraud Office
OMS	Other Member State
PSD	Preliminary Solution Design
RMS	Responsible Member State
SSTL	Smart and Secure Trader Lanes
STI	Shared Trader Interface
TAPAS	DG TAXUD AS4 Access Point
TARIC3	Tarif Intégré de la Communauté 3
TES	Trans-European System
TI	ICS2 Trader Interface
TLS	Transport Level Security
TSS	Technical Service Specifications
UUM&DS	Uniform User Management and Digital Signatures

Table 3: Abbreviations and acronyms

1.8 DEFINITIONS

For a **better** understanding of the present document, the following table provides a list of the principal terms used.

See also the ‘glossary’ on TEMPO.

Term	Definition
Applicability Statement 4 (AS4)	An open standard for the secure and payload-agnostic exchange of Business-to-Business documents using Web services.
Trader interface	The trader interface is responsible for implementing the interactions with the economic operators in the context of the ICS2 program, by implementing the trader relevant part of the ICS2 common specification.
ENS lifecycle	The ENS lifecycle is a term used to reference to the end-to-end process of the ENS statuses, from its filing until the final state of presentation, and where relevant performance of customs controls and documentation of results.

Sender	The present document refers to the term "sender" as the system sending the technical messages to the TI. This can be a system implemented by the EO lodging the ENS filings or by an IT Service Provider. The sender is understood as a system actor in the ICS2 system context and is the one authenticated and authorised from the system security point of view.
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Table 4: Definitions

2 OVERVIEW

It is assumed that the reader is aware of the functional context of the ICS2 system as described in the ICS2 Business Process Description ([R01]). The most significant events that occur throughout the ENS Lifecycle (as indicated in the ICS2.0 STI and CR Vision [R13 and R12]) are described below:

- Submission of ENS filing: The Economic Operator lodges an Entry Summary Declaration (ENS) filing to the Customs Office Of First Entry (COFE) through the ICS2 Trader Interface which validates the filing, generates an MRN and forwards it to the ICS2 Common Repository;
- Risk analysis: The risk analysis process is the responsibility of the Responsible Member State, taking into consideration the results of e-Screening performed and provided by each Involved Member State and Other Member State, and the manual review and risk mitigation conducted by the respective MS's official, in case of hits generated through the process. This results in the conclusion of the risk analysis process by deciding on the risk mitigation actions that may be needed from the side of the EOs or the customs controls that may need to be performed by the competent Customs Offices;
- Submission of Arrival Notification: The Economic Operator submits an Arrival Notification to the competent national systems (Port or Airport community systems). Subsequently, that national system will submit the Arrival Notification to the ICS2 Common Repository. It is also possible that the Arrival Notification will be submitted directly from the Economic Operator to the ICS2 Trader Interface;
- Submission of Presentation Notification: The Economic Operator presents the goods (and presentation notification) to the customs authorities. The respective Customs Office is responsible for the processing of the presentation notification, the registering of the presentation event into the ICS2 Common Repository, correlating it with the relevant consignment, and determining which type of controls, if any, need to be performed.

The following diagram gives an overview of the design blueprint of the ICS2 system. It is implemented by several components as described in the sections below. It can be broken down to the following main components:

- An Economic Operator system, optionally using an IT service provider, which implements the necessary AS4 access point to be able to communicate with the trader interface;
- A Trader Interface, providing both system to system interactions and a web user interface. At least the Shared Trader Interface (STI) will be developed, and Member States have the option to implement their own National Trader Interface (NTI);
- The UUM&DS system used by the trader interface for cross border identification, authentication and authorization of Economic Operators or their representatives or their IT Service Provider if they use one;
- The ICS2 Common Repository managing the ENS lifecycle, the risk analysis process, the analytical services, and the opt-ins for a shared e-Screening module and a shared risk management support module;
- The National Entry Systems (NES) grouping all relevant Member State systems;
- The Customs Risk Management System (CRMS2);
- The Smart and Secure Trader Lanes (SSTL);
- The ENS-Container Status Message system (CSM);
- Reference systems and their publication on the Europa website (DDS2);

- Risk Management Support (RMS);
- eScreening module.

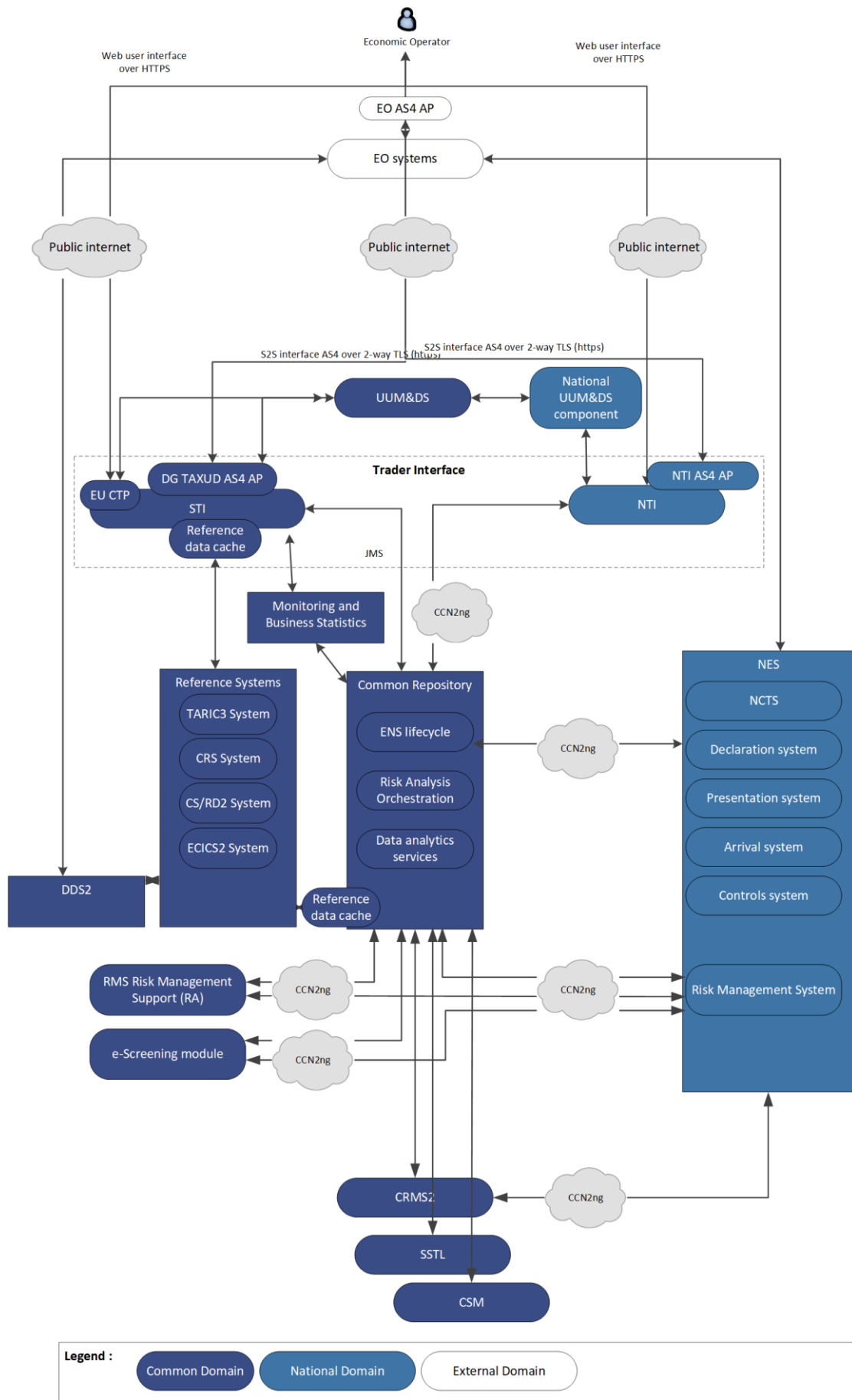


Figure 1: Overview

3 TRADER INTERFACE

The trader interface is responsible for implementing the interactions with the economic operators in the context of the ICS2 program, by implementing the trader relevant part of the ICS2 common specifications. The trader interface consists of several components. First, there is the distinction between the shared trader interface (STI) and the national trader interface (NTI). Member states can select to opt-in to use the STI as the implementation of the Trader Interface, or they can select their own national implementation as NTI. Secondly, the trader can select to use a system to system interface or a web user interface.

To keep the diagrams and explanation clear, the system to system interaction with the trader for both the STI and NTI will be presented first. After that, their web user interface will be discussed.

3.1 SYSTEM TO SYSTEM INTERACTION

The system to system interaction between an Economic Operator and the ICS2 system is implemented by several components as described below. It can be broken down to the following main components:

- An Economic Operator system which incorporates the necessary AS4 access point to be able to communicate with the trader interface;
- The shared and national trader interfaces, each having the necessary AS4 access points as the interface to the AS4 access point of the EO system, with their trader message archive and possibly a reference data cache;
- The UUM&DS system used by the AS4 access point of both the NTI and STI for cross border identification, authentication and authorization of the Sender registered for submitting messages to the TI.

It is important to note that the Economic Operators may make use of an IT Service provider's services for the sending of messages containing ENS filings. In this case and as is common practice today in many MS, the authentication and authorisation to access the system is done for this ITSP who is sending the messages on behalf of the EO.

The information mentioned above applies only to system to system interactions and due to difficulty in the operational practice to have the EO authenticating while the ITSP is the one accessing the system.

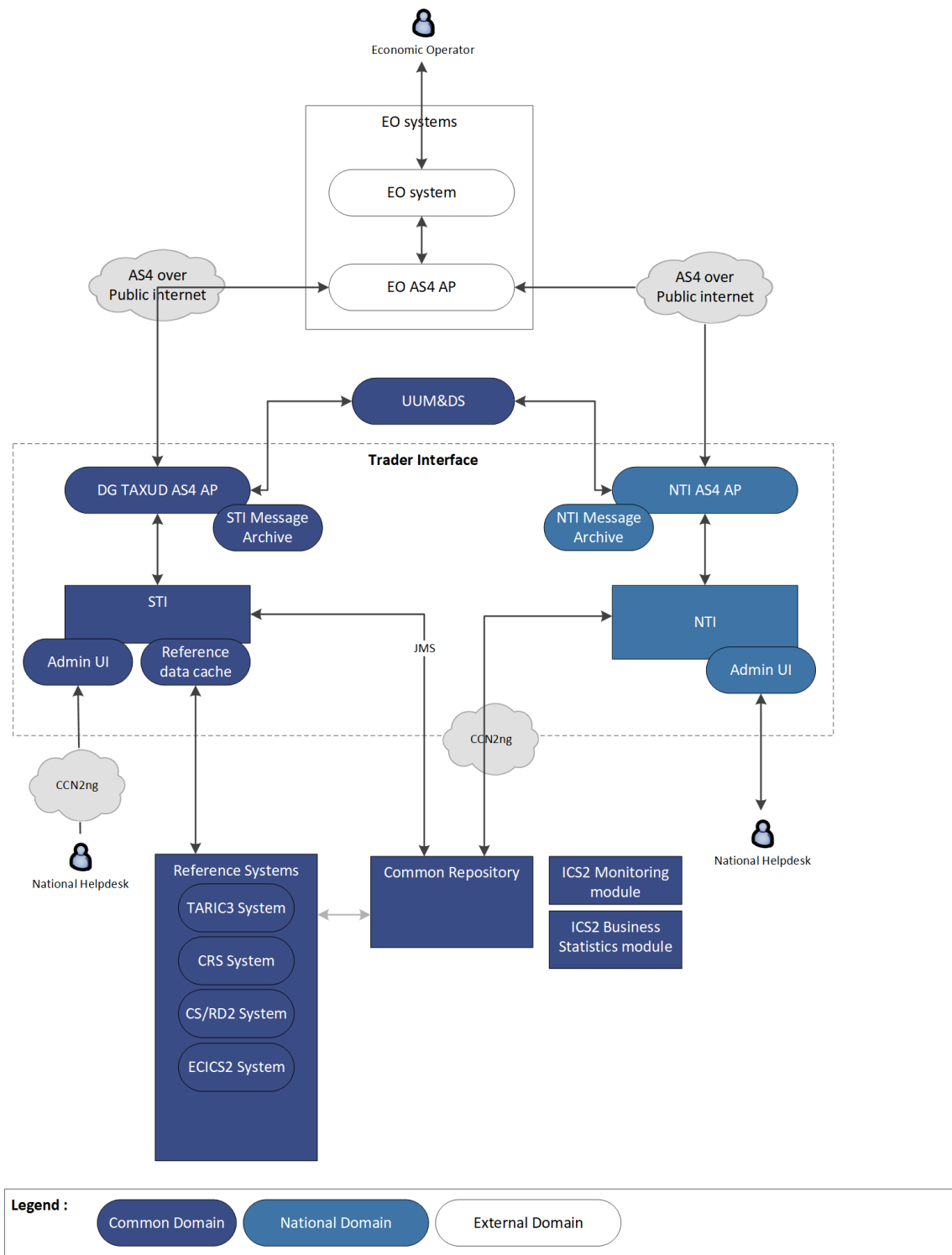


Figure 2: Trader Interface System to System

3.1.1 Economic Operator systems

The Economic Operator systems are responsible for sending and receiving ICS2 messages from and to the Trader Interface using AS4 as a business message exchange protocol as profiled in the eDelivery AS4 specifications (also known as e-SENS AS4 [R15]). A mandatory component in that system is the AS4 access point software implemented by the EO itself or by an IT Service Provider. The sender (either EO or ITSP) implementing these specifications has to pass

the conformance testing according to the e-SENS AS4 profile. A list of such vendors is made available by CEF eDelivery as defined in [R11].

In order to send and receive messages, the sender needs to be registered by Customs. This registration authorises the Economic Operator to exchange messages with the STI/NTI. It does not represent a Customs role on itself but an operational role in the systems security administration. Optionally, an Economic Operator can select an IT service provider to assume this operational role and be responsible for sending and receiving the necessary ICS2 messages to the ICS2 trader interface. In this case, the IT Service Provider must be registered by Customs and will be the one authenticated and authorised from the system security perspective. This does not represent a Customs role on itself but an operational role in the systems security administration.

3.1.2 STI and NTI

The STI and NTI provide the services required by the ENS filing processes, be it a filing, amendment or invalidation. Such filing received by the STI or NTI will be validated both syntactically (the format of the message) and semantically (the message content must follow the rules and conditions as specified in the ICS2 common specifications) relying on data obtained using the reference data services of the TARIC3, CRS, CS/RD2 and ECICS2 IT Applications, loaded in a high available cache to allow very fast access. Successfully validated filings are subsequently forwarded to the ICS2 CR system component for further validation. In case of a new ENS filing, a unique MRN will be created.

The STI and NTI provide the notification services as well that are required to process notifications and requests from the ICS2 CR system as obtained by the STI CR interface and forward them to the Economic Operators taking into account the preference of the Economic Operators concerning notifications. Through these preferences, Economic Operators can indicate through which channel they want to be notified (the user interface or the system-to-system interface, and in case of system-to-system the specific access point to be contacted through), and if they want to subscribe to optional notifications. It must be noted that by default, responses and notifications are sent to the communication channel (and access point in case of system-to-system interaction) by which a trader initiated the ENS filing. Only in case, this is unknown, the preferences are used to identify this. Preference management will be available via the web user interface only as of release 2 (see section 14). Until then and given the limited number of EOs involved in release 1, the trader preferences will be managed via operational communication with the help desks.

In order to address the response messages, the Trader Interface must keep track of the identity of the sending party as received in the original message. This allows it to match a functional reply to the receiving party of destination when it takes the sending role.

A mandatory component in NTI/STI is the AS4 Access Point (TAPAS is the name used for the STI AS4 access point) which is responsible for sending and receiving ICS2 messages from and to the traders following the eDelivery AS4 profile specification to ensure interoperability and easy adaptation by the Economic Operator systems as it provides the implementation of the reliability and non-repudiation requirements in a standardized and well documented way. Each trader interacting in a system-to-system way with ICS2 will have one or more such AS4 Access Points, and each TI (STI and NTIs) will have one Access Point. The trader must declare the Access Point to each TI (STI and NTIs) to allow the TI to resolve the physical address when establishing the 2-way TLS secured communication.

The AS4 Access point at TI side will receive and send all ICS2 messages but will not store them long term. This is the responsibility of the STI and NTI Message Archive, which will store the sealed messages archive in order to keep a historical repository of all received messages.

To allow the MS helpdesk user to consult the status of sent and received messages in case of problems, they will have access to a web user interface. However, this UI will only allow direct access to messages in the transactional database and not to the Historical Message archive which is to be consulted via a call to DG TAXUD service desk.

To monitor the service quality of the STI, events will be sent to the ICS2 Monitoring and Business Statistics module that will allow to measure the response times and throughput of all provided services.

To collect the necessary business statistics, events will be sent to the ICS2 Monitoring and Business Statistics module that, aggregated, will result in the necessary statistics.

3.2 USER TO SYSTEM INTERACTION

The ICS2 trader interface web user interface offered to an Economic Operator is implemented by the shared and national trader web interfaces. In the case of the shared trader interface, this web interface will be provided as part of the EU Customs Trader Portal, a DG TAXUD project that provides a unified portal to the traders for a number of business domains (INF, EBTI, CDMS and - from ICS2 release 2 - ICS2 as well). The UUM&DS system will manage cross border identification, authentication and authorization of Economic Operators or their representatives for both the NTI and STI.

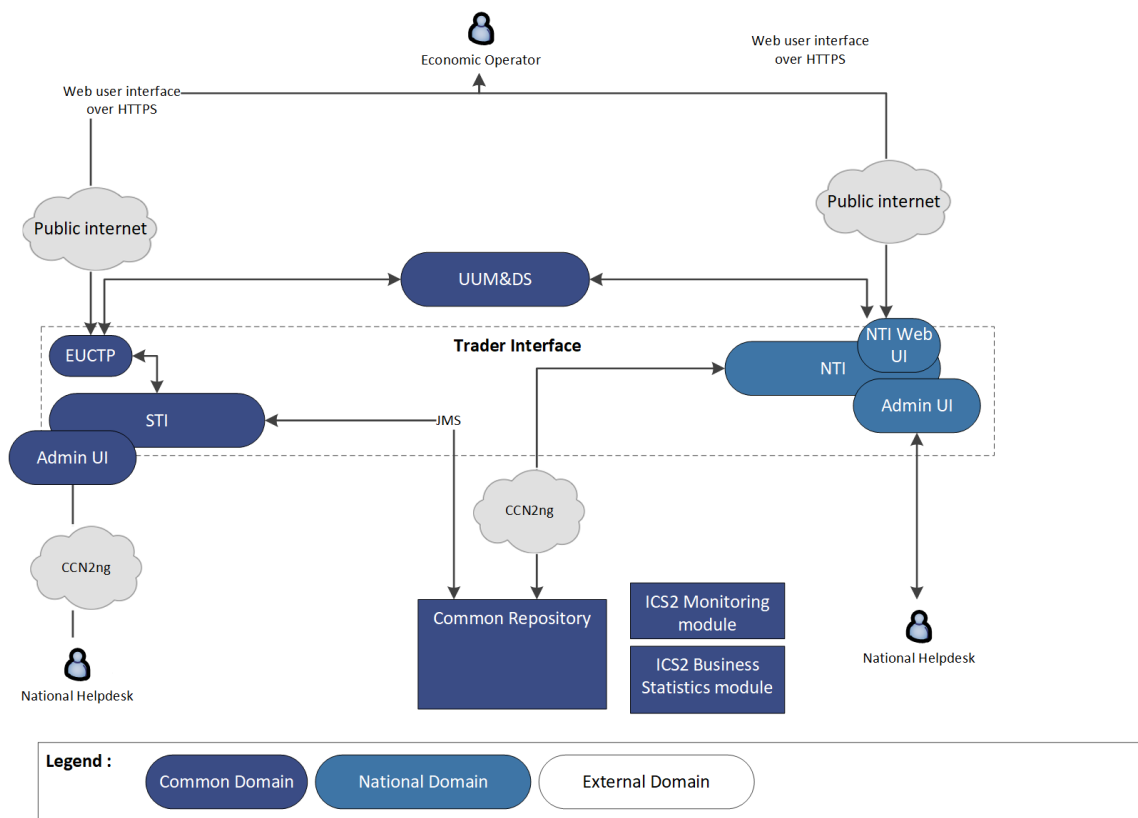


Figure 3: Trader Interface web user interface

The STI and NTI web interfaces provide the web capabilities to the Economic Operator required by the ENS filing processes, be it a filing, amendment or invalidation. Such filing submitted and received in the STI or NTI web interface will be validated using the same mechanisms as the system to system interaction and a response to the Economic Operator will be visible in the notification list of the web interface, including the generated MRN in case of a first-time

registration. As in system to system interaction, successfully validated filings are subsequently forwarded to the ICS2 CR system component.

The STI and NTI web interfaces provide the services that are required to process notifications and requests from the ICS2 CR system and show them to the Economic Operators in the notification list of the web interface.

They also provide services to allow EO to manage their communication preferences, indicating through which channel they prefer to be notified (the user interface or the system-to-system interface, and in case of system-to-system the specific access point to be contacted through), and if they want to subscribe to optional notifications. It must be noted that by default, responses and notifications are sent to the communication channel (and access point in case of system-to-system interaction) by which a trader lodged the ENS filing. Only in case this is unknown, the preferences are used to identify this.

The STI web interface will be built as a module in the EU Customs Trader Portal (EU CTP). The EU Customs Trader Portal system is a communication platform between the Traders and the Customs Authorities allowing information exchanges on multiple business domains (Information Sheets INF for Special Procedures, Binding Tariff Information, ...). In the context of the ICS2 STI web interface, it will manage all web user interface submissions from the traders and notifications towards the traders.

To allow the MS helpdesk to help the trader users with the communication preferences, they will have access to a web user interface as well. This web interface allows to view and edit communication preferences of traders.

To monitor the service quality of the STI, events will be sent to the ICS2 Monitoring and Business Statistics module that will allow to measure the response times and throughput of all provided services.

To collect the necessary business statistics, events will be sent to the ICS2 Monitoring and Business Statistics module that, aggregated, will result in the necessary statistics.

4 UUM&DS

ICS2 STI will use UUM&DS for cross border identification, authentication and authorization of Economic Operators or their representatives for user-to-system interactions. UUM&DS will also be used by IT Service Providers (when the EO chooses to outsource the sending of messages to an IT Service Provider) as the Sender of messages, for system-to-system communication.

For the web user interface used by the trader and European Commission users, UUM&DS will be used to allow federated identification and authentication of trader users.

For the system-to-system communication, Sender authorization will be done through the use of a certificate that will also be used to seal the messages sent to the TI. The AS4 access point will validate that the certificate is provided by a Trusted Certificate Authority² known by UUM&DS. In addition UUM&DS services will be used to validate that the certificate belongs to the Sender (EO, Customs representative or IT Service Provider) and that this Sender is authorized to exchange messages with ICS2. To this end Senders intending to interact with ICS2 will have to register their full chain of certificate(s) in order to validate them through UUM&DS³.

In principle there will be two ways for registering a Sender via UUM&DS⁴:

- The federated model: in that case, the MS is responsible for registering the EO and to implement a SAML interface that will be invoked by UUM&DS as described in the MS TSS of UUM&DS published to MS;
- The second way is to register centrally (in a UUM&DS module) the EO and their certificate.

² A Trusted Certificate Authority corresponds to a CA belonging to a list of CAs agreed as accepted by Customs Authorities of any MS or by the EC for the access to ICS2 system via the TI.

³ UUM&DS federates this validation service to the Member States unless they select to use the central UUM&DS solution. It should also be noted that it will be possible to upload multiple certificates simultaneously for the same purpose and same user.

⁴ Certificate management and registration will be implemented in UUM&DS release 2, please refer to UUM&DS documentation for further information.

5 CCN2NG

CCN2ng is the trans-European exchanges platform and will be used to expose the service operations between the ICS2 TI (NTI and STI) and the ICS2 Common Repository, as well as between the ICS2 Common Repository and the NES ([R06]). As well it is used as a federated authentication and authorisation mechanism to allow Member State business and helpdesk users to access the ICS2 STI and ICS2 CR web interfaces.

In the context of service operations, the CCN2ng platform offers the added value of exposing asynchronous web services using the one-way message exchange pattern to ensure a decoupled communication between the parties⁵, as well as other added value services such as security, federated governance, monitoring, interoperability and auditing.

⁵ Replies are similarly sent back over an asynchronous web services using the one-way message exchange pattern

6 COMMON REPOSITORY

The ICS2 Common Repository system is the common domain IT component of the ICS2 system that will provide the common referential and storage of the ENS data (including lifecycle validation), that will make the relevant ENS data (individually or merged by consignment) available to the MS customs and that will make the consolidated ENS data available for risk analysis to the relevant MS. It will also collect and share the risk analysis results amongst MS, and provide data analytic tools.

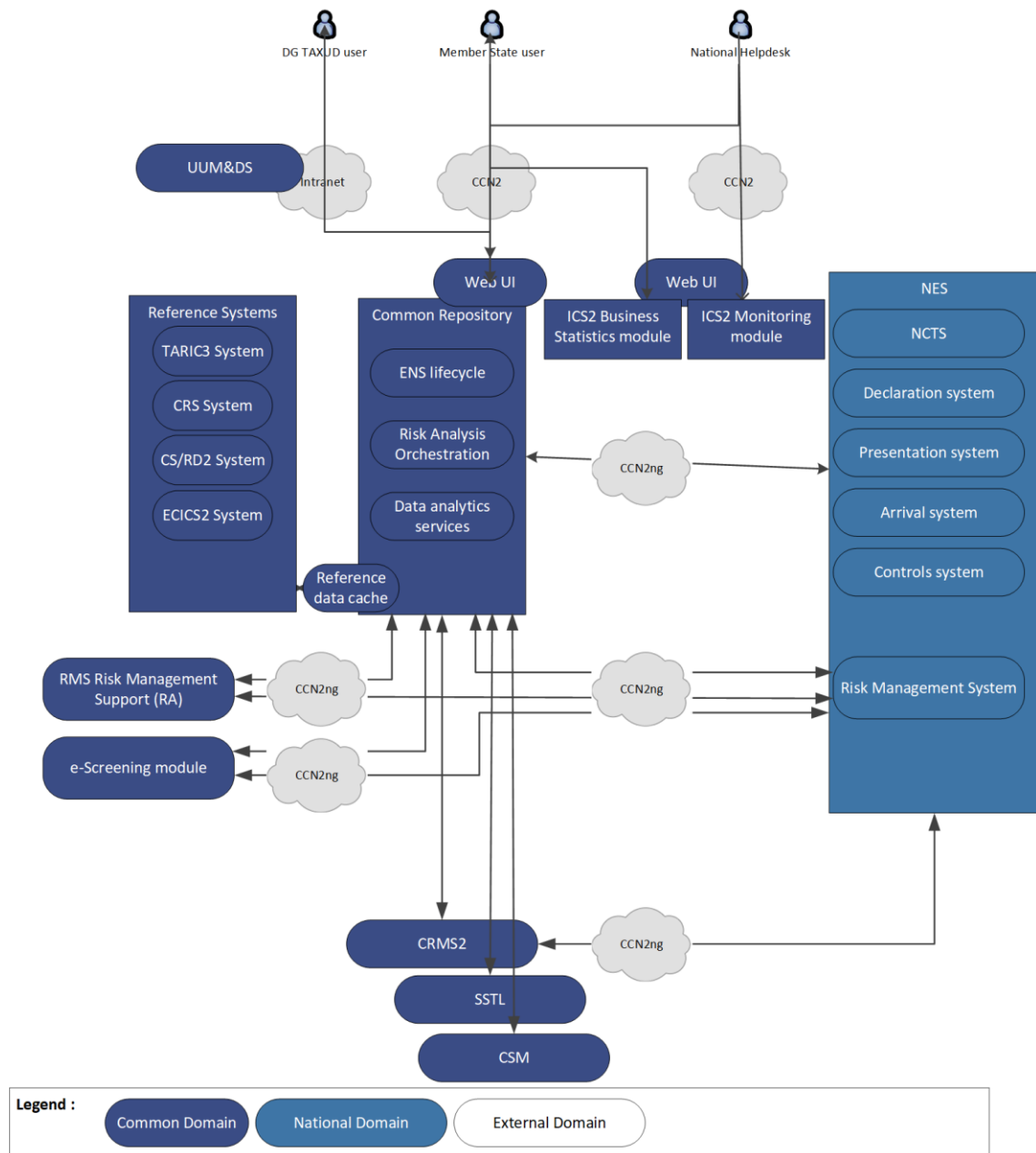


Figure 4: ICS2 Common Repository

6.1 ENS LIFECYCLE COMPONENT

The ICS2 CR ENS lifecycle component implements all the activities required by the ENS Lifecycle and Risk Analysis Preparation groups of processes. The entities managed by this component are the ENS filing, the full ENS (either incoming from HTI or resulting from the linking process), ENS goods item, control decisions, arrival notifications and presentation

results. As is the case for the STI and NTI, the semantic validation of the received ENS filings relies on data obtained using the reference data services of the TARIC3, CRS, CS/RD2 and potentially the ECICS2 IT Application, loaded in a high available cache to allow very fast access. Such semantic validation is repeated here (even though it should be done already in the TI) to further ensure data coherence in the ICS2 CR.

6.2 RISK ANALYSIS ORCHESTRATION COMPONENT

The ICS2 CR Risk Analysis Orchestration component implements all the activities required by the Common Repository to orchestrate the Risk Analysis execution by the RMS and the E-Screening by the identified IMS and to report the results.

This component communicates mainly with NES but can also send notifications to the ICS2 TI (for example for requesting additional information or reporting the completion of risk analysis).

ENS filing data related to the ENS lifecycle and for Risk Analysis is retained for this purpose up to 2 years from the moment of the ENS filing.

6.3 CR WEB USER INTERFACE

The ICS2 CR web user interface allows access to MS helpdesk and ICS2 business users to execute ENS queries, view business rules, view OMS parameters and view timers.

6.4 MONITORING AND BUSINESS STATISTICS WEB USER INTERFACE

The ICS2 Monitoring and business statistics web user interface allows access to MS helpdesk and ICS2 business users from MS and DG TAXUD to:

- Display an ICS2 monitoring dashboard;
- Query Messages: when issues are reported on particular messages, helpdesk users will be able to query messages correlated to an MRN display them;
- Query Errors: helpdesk users will be able to query errors and display them, as well as display messages correlated to an error;
- Display business service monitoring: a user can consult the graphical view of predefined metrics to monitor the functional health of CR and STI services;
- View the availability overview and manage unavailability reports;
- Consult Business Statistics.

6.5 MONITORING AND BUSINESS STATISTICS MODULE

The ICS2 monitoring and business statistics module will collect monitoring and business statistics events from the ICS2 CR and STI.

To allow users to query messages and errors, the ICS2 CR and STI will send events to this module containing the necessary information of each message received and each error encountered.

To allow users to consult the service monitoring, relevant response times are collected for steps in the business processes (for instance the time it takes between a trader lodging an ENS filing and the response with the assigned MRN).

To allow users to consult business statistics, the ICS2 CR and STI will send events aggregated per day that will create the necessary statistics.

6.6 ANALYTICS SERVICES

Analytics services will be provided as a set of components that DG TAXUD and Member States users can use (as indicated in the ICS2.0 STI and CR Vision [R13 and R12]). These components will provide capabilities to enable real-time analysis, data analysis and analytical

products. These products will provide the necessary IT solutions for the analysis of the ENS lifecycle data: configure rules, evaluate the efficiency of risk rules, test new rules, analyse historical data, build learnings from the past events and results (i.e. controls). This component will also provide a capacity to enable fast automated enrichment of ENS to support the risk analysis process of the MS. It will provide a real-time query engine that will pre-process and enrich ENS data with information that can be selected from the ENS historical data stored in the Common Repository.

For each ENS partial/full submission, automatic enrichment of the ENS data for the purposes of risk analysis will be performed at a common level. This requires real-time access to EU ENS historical data.

The data analytics component will provide functionalities for analytics techniques on ENS data for risk management purposes. This is required to enable risk evaluation, the identification of new common risk criteria, risk rules and patterns, analytical products to support risk analysis of ENS by the RMS and intelligence building.

The analytics services are not yet fully evaluated and will be covered by a dedicated project starting with an inception phase and vision document.

6.7 SHARED E-SCREENING MODULE

A shared e-Screening module will be provided as an optional component that Member States can use (as indicated in the ICS2.0 STI and CR Vision [**R13** and **R12**]). This component will provide IT services to execute the e-screening process, i.e.

- run the common risk criteria (CRC) category 2 rules against national sensitive data;
- allow MS users to configure the rules used;
- allow MS users to upload the necessary sensitive data encrypted using a secured channel and to store the data in a secure and segregated environment.

A user interface will also be provided to manually assess the outcomes the automated analysis, to mitigate the risks.

The component will implement the services to interact with the ICS2 CR who will orchestrate the feedback of the results from the IMS to the RMS that needs that assessment to complete its analysis. Another service will be also provided to send the outcomes of the automated analysis to the IMS national system that is running the e-screening process i.e. manual risk mitigation and decision. (This might be necessary in case the MS decides to carry out the manual assessment in already existing national screens/user interfaces and would prefer to use this solution).

The shared e-Screening module will not be covered in any of the incoming 3 releases but potentially in a 4th release which would have their own dedicated project.

6.8 SHARED RISK MANAGEMENT SUPPORT MODULE

A Shared risk management support module will be provided as an optional component that Member States can use (as indicated in the ICS2.0 STI and CR Vision [**R13** and **R12**]). This component will provide IT services to execute automated part of the common risk criteria (CRC) category 1 rules against the national or trans-European data stored in the Common Repository, define the risk scores and provide the outcomes of that analysis to the MS risk management system for manual mitigation. In this case, the opt-in MS will need to develop the web user interface that will be used for the manual mitigation.

The shared risk analysis support module is not yet fully evaluated and will be covered by a dedicated project starting with an inception phase and vision document.

7 REFERENCE SYSTEMS

The ICS2 system interacts with several central systems to consult reference data used during validation.

As not all these systems are high available, and to reduce the dependencies with external systems, the option selected for the ICS2 STI and the ICS2 CR is to synchronize these reference data (daily or in any other configurable frequency) in a high-available persistent storage. This information is then loaded in a high available cache to allow very fast access to these reference data during validation.

For the ICS2 NTI and NES replication mechanisms towards Member States applications exist and can be used by the Member States to acquire up to date reference data.

For the traders the data of the reference systems will be shared over DDS2 as explained in section 8 below.

The following reference data systems are used.

7.1 TARIC3

The TARIC3 IT application is an existing DG TAXUD application that manages commodity codes and tariff measures based on goods classification, and implements services used by the ICS2 system to consult and validate goods codes.

7.2 CRS

The CRS IT application is an existing DG TAXUD application and implements the services to validate the necessary authorisations and the trader information required by the ICS2 STI processes defined above.

This application is a reference system centralising up to date information of traders managed by other acquisition points such as the EOS IT application that is the acquisition point to manage trader contact information and the unique holder of EORI number. For the ICS2 STI system, the CRS IT application will provide a service to retrieve the EORI information of a trader to be stored in the local cache.

Once an ENS filing has been registered, the ICS2 STI system will not subscribe to the lifecycle events (revoke, suspend, ...) of the underlying EORI information to update the ENS filings.

7.3 CS/RD2

The CS/RD2 IT application is an existing DG TAXUD application and implements the services to provide and validate reference data required by the ICS2 STI and CR processes defined above. The ICS2 code lists are added to this application and existing ones (country codes, custom office lists, ...) will be reused.

7.4 ECICS2

The European Customs Inventory of Chemical Substances (ECICS2) IT application is an existing DG TAXUD application and lists chemical names in a number of EU languages (currently mainly eleven) along with their tariff classification in the European Community's Combined Nomenclature (eight-digit CN codes). Each product listed in ECICS is identified by the CUS number, assigned by DG Taxation and Customs Union, which is an easy identifier to search the database and to communicate with Customs. The CUS numbers received in the ENS filings will be validated against this database.

8 DDS2

The DDS2 application is used to publish data on the Europa website. It is used in the context of ICS2 to publish the necessary reference data to be used by the EO systems:

- The TARIC DDS2 module allows to search and validates goods codes;
- The EOS DDS2 module allows to validate EORI numbers⁶;
- In the case of CS/RD2 code lists, the data relevant for the Economic Operators are going to be made available via generic XML to download. Moreover, DG TAXUD is studying the possibility to implement a new module for ICS2 code lists itself, including the customs office codes, dangerous codes, UN/LOCODE, UN/ECE rec 21, UN/ECE rec 28 and others;
- The ECICS DDS2 module allows searching for chemical substances and their CUS code.

⁶ With a web service to be used for EORI validation:
http://ec.europa.eu/taxation_customs/dds2/eos/news/newstar.jsp

9 CRMS2

In the area of the external border control by Customs, the Risk Information Form (RIF) and later Customs Risk Management System (CRMS) functionalities have been in place for almost 15 years. The system was computerised in 2005 and has evolved regularly to adapt to new risk analysis requirements and needs ([R14]).

The new version of the Customs Risk Management System (CRMS2) will provide support for the end users (customs officers at the border and national risk targeting experts) to collaborate between MS Customs offices and between them and the European Commission about a potential or actual risk (see [R04]). It is a human to human system that can help the decision-making process to decide on controls or to report seizures to inform other MS. It also provides support for MS to work together on the elaboration of new risk criteria and to help organise common activities in case of crisis to ensure a common and coordinated approach. It is a collaborative platform. The actual risk analysis and management engines are under national responsibilities and deployed separately in each MS.

It is envisioned that the new CRMS2 system will interact with the ICS2 CR system using a dedicated operation exposed by CRMS2 supporting an Entry Summary Declaration (ENS) coming from ICS2. The CRMS2 operation will:

- Receive Input Message from external system;
- Interpret Message: Parse and convert to RIF, create Draft RIF;
- Store Message and Link to the Draft RIF;
- Notify interested users.

This will be further clarified as part of the elaboration phase of CR Release 3 and the CRMS2 project.

10 SMART AND SECURE TRADE LANES (SSTL)

The Smart and Secure Trade Lanes (SSTL) pilot project were launched in 2006 by the European Union and the People's Republic of China (PRC) to test specific safety and security related recommendations of the WCO SAFE Framework of Standards (see [R10]). The main aim was to test security measures applied to containers, to facilitate 'Customs-to-Customs' data exchange, to determine joint risk rules and to mutually recognise customs controls and trade partnership programs.

The SSTL pilot project is organised in the form of trade lanes between economic operators in the EU Member States on one side and economic operators in China and Hong Kong on the other side. The goods moved within the trade lane are transported between the participating ports. Information about the goods is exchanged between the customs authorities participating in the pilot project. Export declaration data is sent by the country of export before loading the goods into the container which will carry them to their final destination. Before the goods leave, the importing country may ask to perform control of the goods based on the risk analysis carried out on the data received from the export country. The export country would inform the importing country about the results of control. In case the goods are controlled upon their arrival to the importing country, the latter would inform the export country of the results of control. The pilot project will consist of two components:

- International exchanges between the EU and China and Hong Kong;
- EU internal exchanges between the EU MS and Commission.

In the context of this last component, the ICS2 system will also have access to the SSTL message repository as any MS, allowing ENS filings to be enriched with SSTL data. This will be further clarified as part of the elaboration phase of CR Release 3 and the SSTL project.

11 ENS CONTAINER STATUS MESSAGE (CSM)

The ENS-Container Status Message (CSM) pilot project brings together DG TAXUD and MS risk experts, the JRC and OLAF, exploring how the additional supply chain visibility provided by *container status messages* (CSM) could be exploited in real-time customs risk analysis. Based on the experience gained in the project, and the research work and prototypes developed by the JRC, this project developed a preliminary solution design (PSD) for the possible systematic integration of CSM data in real-time risk management. The PSD identifies three functional layers for *real-time* processing of CSM data against ENS extracts or other customs data. One of those layers – analytics services – is where the integration with ICS2 and ENS business workflows happens. This will be further clarified as part of the elaboration phase of CR Release 3 (and as part of data analytics), as described in the ICS2 CR Vision document ([R13]).

12 NATIONAL ENTRY SYSTEMS (NES)

The National Entry Systems (NES) is a generic name used for the national applications of the Member States that cover the following functionalities: processing of the ENSs at the Customs Office of First Entry or Subsequent Customs Office of Entry, risk analysis, arrival of means of transport, presentation of goods, control of goods.

The following national applications are identified as relevant in the context of ICS2.

12.1 RISK MANAGEMENT SYSTEM

The national risk management system is responsible to provide the services as defined in the ICS2 Design Document for National Applications ([R07]) to communicate e-risk analysis and e-screening analysis requests and results with the ICS2 CR application.

12.2 DECLARATION SYSTEMS

National Declaration Processing Systems (NDPS) manage customs declarations (except transit declarations) and declarations for Temporary Storage. These systems will specifically support the submission of ENS data to CR that was extracted from a given customs declaration (except transit declarations) or a declaration for temporary storage (Article 130 UCC).

National Import Control Application (NICA) systems might be considered required as well by some Member States to implement functionalities to support the submission of ENS data extracted from a given customs declaration or a declaration for temporary storage (Article 130 UCC), and to submit ENS declarations received to the ICS2 CR.

12.3 NEW COMPUTERISED TRANSIT SYSTEM (NCTS)

This system is foreseen to extract ENS data from declarations submitted to it (Article 130 UCC), and submit them to the CR. The decision, on which system will implement the aforementioned functionalities, is entirely a national responsibility.

12.4 NATIONAL ARRIVAL / PRESENTATION SYSTEM

The system(s) will support the submission of the Notifications of Arrival and Presentation Events to the ICS2 as defined in the ICS2 Design Document for National Applications ([R07]). The submission of the Notification of Arrival to the ICS2 is also offered directly to the Economic Operators via the ICS2 TI.

12.5 NATIONAL CONTROL SYSTEM

These systems will support the reception of control recommendations and ENS incorrect state messages as defined in the ICS2 Design Document for National Applications ([R07]).

13 OPERATIONAL AND ORGANISATIONAL ASPECTS

13.1 IMPLEMENTING AN NTI

Member states have the option to opt-in on the shared project for the delivery of the Shared Trader interface in collaboration with other MS and under the responsibility of the Commission as a system supplier⁷. In case a Member State decides to develop at the national systems' level a national trader interface (for the gathering of ENS data from trade) based on the common functional and technical specifications, they will have to:

- Implement the necessary services provided to the traders, as defined in the ICS2 Interface Control Document ([R08]);
- Implement support for MS helpdesk;
- Collect and share ICS2 related statistics;
- Implement the archive of trader messages;
- Implement the necessary services to interact with the ICS2 Common Repository, as defined in the ICS2 Design Document for National Administrations ([R07]).

⁷ For the first release of ICS2 no Member State has opted for implementing an NTI

14 RELEASES

The ICS2 Transition Strategy [R09] introduces the concept of a phased rollout of ICS2, based on different releases of TI and CR. This section gives an overview of each release in terms of supported components. It must be noted that the detailed functionality of the components per release is described in the ICS2 Transition Strategy [R09].

Release	Description	Components
Release 1	Postal by Air pre-loading and Air express pre-loading.	The ICS2 STI component for release 1 including: <ul style="list-style-type: none"> • System to system interface • ICS2 message archive
		The ICS2 CR component for release 1 including: <ul style="list-style-type: none"> • ENS lifecycle component • Risk analysis orchestration component • Web user interface • Monitoring and business statistics module
		Integration with reference systems
		The ICS2 DDS2 module
		UUM&DS S2S support
		NES for release 1
Release 2	In addition to Release 1, full Postal by Air, Air express and Air cargo (general).	The ICS2 STI component for release 2, extended with: <ul style="list-style-type: none"> • Web user interface for traders including preference management within the EU CTP
		The ICS2 CR component for release 2
		NES for release 2
		The shared ICS2 Risk analysis support module
		The ICS2 Analytics services for release 2
The integration of ICS2 with CRMS2		
Release 3	In addition to Release 2, Maritime, Rail and Road.	The above components for release 3, including integration with SSTL and CSM
Release 4 ⁸	The implementation of the e-	The above components

⁸ Release 4 is not in scope of the current Vision Documents and not confirmed yet.

Release	Description	Components
	Screening support functions of ICS2 for the implementation of the Common Risk Criteria and standards of category 2 (i.e. CRC2).	The ICS2 e-Screening module

Table 5: Releases