RNECCS
Common Components System

TAF TSI Regional Workshop

7 March 2018, Bucharest, Romania

RNECCS
Common Components System

Introduction

Legal background

- **Telematics Application for Freight Services and**
- **Telematics Application for Passenger Services**

EC Regulation 1305/2014 and 454/2011

Both Regulations require from Rail Industry to support certain business processes by exchanging of standardized messages.

Involved Actors are:
- Infrastructure Manager (IM)
- Railway Undertakings (RU)
- Waggon keeper (WK)
- Station Master (SM)

4.2.11.1 Reference Files

For the operation of freight trains on the European network the following reference files must be available and accessible to all service providers (IMs, RUs, logistic providers and fleet managers)...

Centrally stored and administrated:

- Reference File of the Coding for all IMs, RUs, Service provider companies
- Reference File of the Coding of Locations (Primary and subsidiary)

Regulation 1305/2014

4.4.1 Data Quality

- For data quality assurance purposes, the originator of any TSI message will be responsible for the correctness of the data content of the message at the time when the message is sent.

- Where the source data for data quality assurance purposes is available from the databases provided as part of the TSI, the data contained within those databases must be used for data quality assurance.

Regulations

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Common Components Systems

CRD   CI   CA

RailNetEurope (RNE)

TAF TSI Common Components Group (CCG)

RU/IM TELEMATICS JOINT SECTOR GROUP (JSG)

TAF TSI Standard

The CCG General Assembly on 9 December 2014 approved the transfer of the Common Components to RNE with all the verification transfer conditions successfully implemented. The CCG was dissolved on 31 December 2014.

As of 1 January 2015, RNE is in charge of further development, maintenance and on-going operations of the TAF – TAP TSI Common Components.

TAF TSI Functions Grouped

Joint IM-RU Functions

- Reference Files
- Common Interface
- Short Term Path Request
- Train Preparation
- Train Running Information
- Train Forecast
- Service Disruption
- Deviations from plan (TAP)
- (Train Identifiers)

RU (fright) Only Functions *

- Consignment Note Data
- WIMO
- Wagon Movement
- Shipment ETA

* Commercial part of TAP is not considered in the table

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- **Central Reference Files Database (CRD)**
  - aka Central Repository Domain

- **Certificate Authority (CA)**

- **Common Interface (CI)**

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CRD - Central Reference File Database

- The Location Reference File which uniquely identifies physical rail points (e.g. stations, customer sidings, loading places)

- The Partner Reference File uniquely identifies all rail actors who exchange information (Company Codes)

- TAF TSI Metadata (self contained schemas)

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CI - Common Interface

- TAF/TAP TSI Common Interface (CI) for data exchange among IMs, RUs and WKs
  - Peer to peer communication tool
  - Locally installed in customer's datacentre
  - Could be also used to exchange messages for any schema provided

CA - Certification Authority

- All actors require a X509 certificate for secure communication
  - CA is established with RNE Root CA
  - X509 certificates issued by RNE

Central Reference File Database

Reference Files

- Country (ISO 3166)
- Location Reference File
  - Primary Location
  - Subsidiary Location
    - Subsidiary Location Type
- The Partner Reference File
- TAF TSI Metadata

Reference Files

Location Reference File

- The Country code is as part of Location Code.
- Locations are unique per Country

Partner Reference File

- Each company actor must have unique company code assigned by UIC
- The company code becomes part of the location code
- Company code is a precondition for the usage of the Common Interface
  - It is used in TAF/TAP messages to identify senders and receivers

Get registered as Company

- Apply for a Company code at European central entity

- At the time being this is UIC, independent if company is UIC member or not

- It is the same as known by "RICS" code

- Apply at http://www.uic.org/rics

- After registration the company code will be maintained in the Central Reference File Database (CRD)

Reference File Location

- ## Location
  - is a place, a geographic point, inside or outside the rail network, which is needed to be identified for operational, technical, administrative or statistical purposes. This can be either a Railway or a Customer location
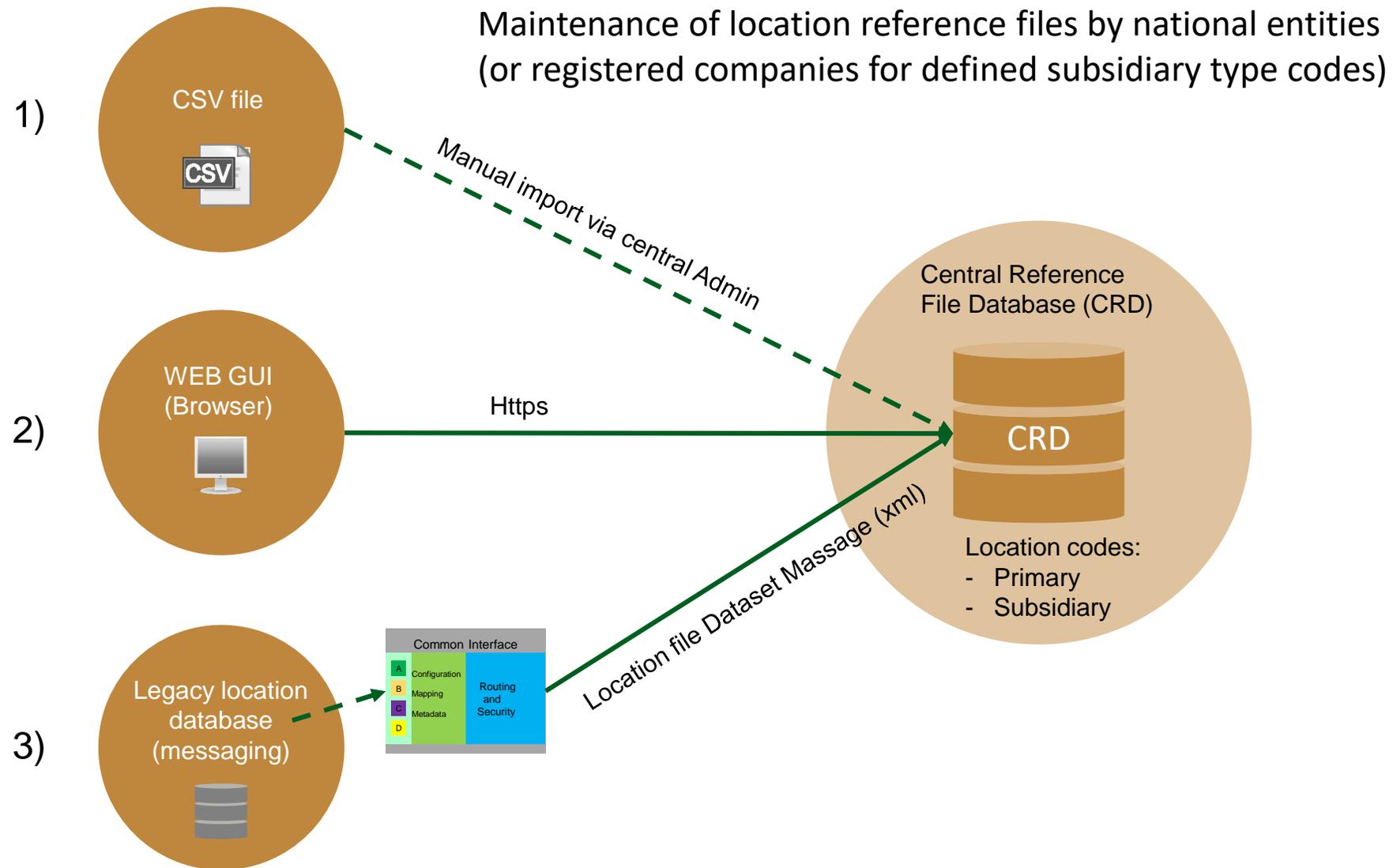
- ## Primary Location
  - This location is a network rail point managed by an Infrastructure Manager (IM).
  - Code is managed nationally by an allocation entity
    - May be an Infrastructure Manager
    - May be a national Location entity

Subsidiary Location

- Subsidiary Location identifies a location as a part of primary location e.g. a junction, a signal, a marker point, etc. This may be a non-rail point or a rail point that is not managed by an Infrastructure Manager (IM).

- Subsidiary location without Primary location is not possible.
  - It is always in combination with a Primary Location.

- Subsidiary locations have "subsidiary type code"

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How to feed the Reference files

Maintenance of location reference files by national entities (or registered companies for defined subsidiary type codes)

1) **CSV file**

CSV

Manual import via central Admin

2) **WEB GUI (Browser)**

Https

3) **Legacy location database (messaging)**

Common Interface

A — Configuration
B — Mapping
C — Metadata
D

Routing and Security

Location file Dataset Massage (xml)

Central Reference File Database (CRD)

CRD

Location codes:
- Primary
- Subsidiary

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Initial Population

- Ask for import templates at RNE by Email
  support.ccs@rne.eu

- Deliver an CSV file with the qualified Location coding by email to RNE
  support.ccs@rne.eu

- Find more information in the TAF / TAP sector handbook in chapter 9

  http://taf-jsg.info/?page_id=280

  http://taf-jsg.info/wp-content/uploads/2015/11/20151112_TAP_TAF_RU_IM_Sector-Handbook_v2.1.2_1.1.pdf

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Reference file distribution
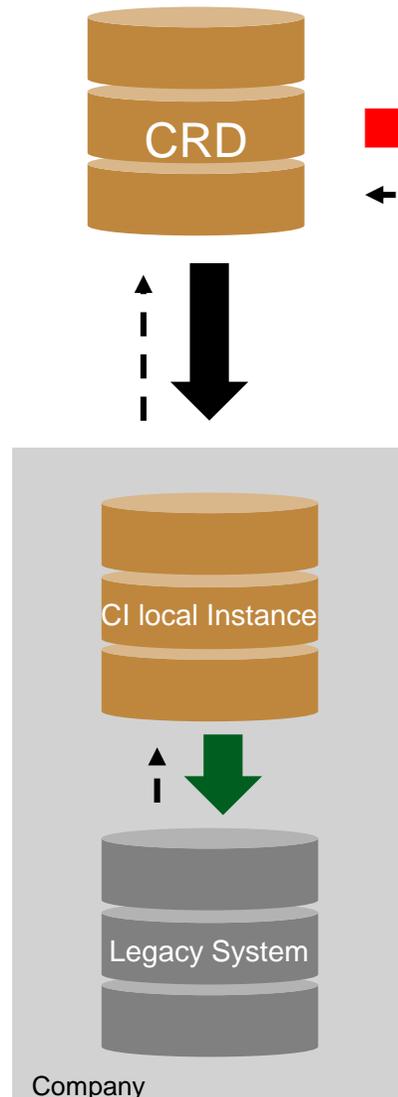
- Reference file download via authenticated WS directly to a legacy system
  - Filter parameters
- Search Export via HMI
  - Filter parameters (e.g. last modified date, country, subsidiary type code)

- Replication Reference files via Web Service (WS) to Local Instance
  - Filter parameters (e.g. last modified date, country, subsidiary type code)
  - Scheduler defined by Local Instance of CI

- Search and export via Browser on Local Instance
- Reference file download via WS to Legacy System
  - Filter parameters (e.g. last modified date, country, subsidiary type code)
  - Scheduler to be defined by Legacy System

CRD Rollout Status

At least 1 large IM published

In Progress

Not populated yet

Non ex CCG IM

Primary Locations
61.900 for 40 IM

02/2018

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6 July 2018

Common Interface

4.2.12.6. Common interface

The common interface is mandatory for each actor in order to join the rail interoperability community

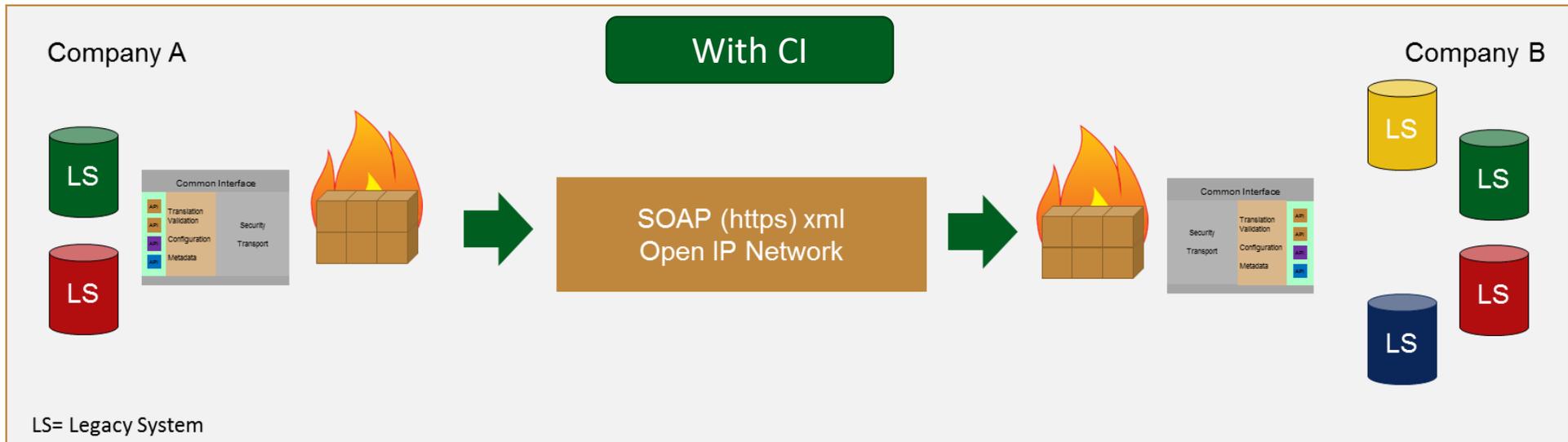The common interface has to be able to handle:

- message formatting of outgoing messages according to the metadata
- signing and encryption of outgoing messages
- addressing of the outgoing messages
- authenticity verification of the incoming messages
- decryption of incoming messages
- conformity checks of incoming messages according to metadata
- handling the single common access to various databases
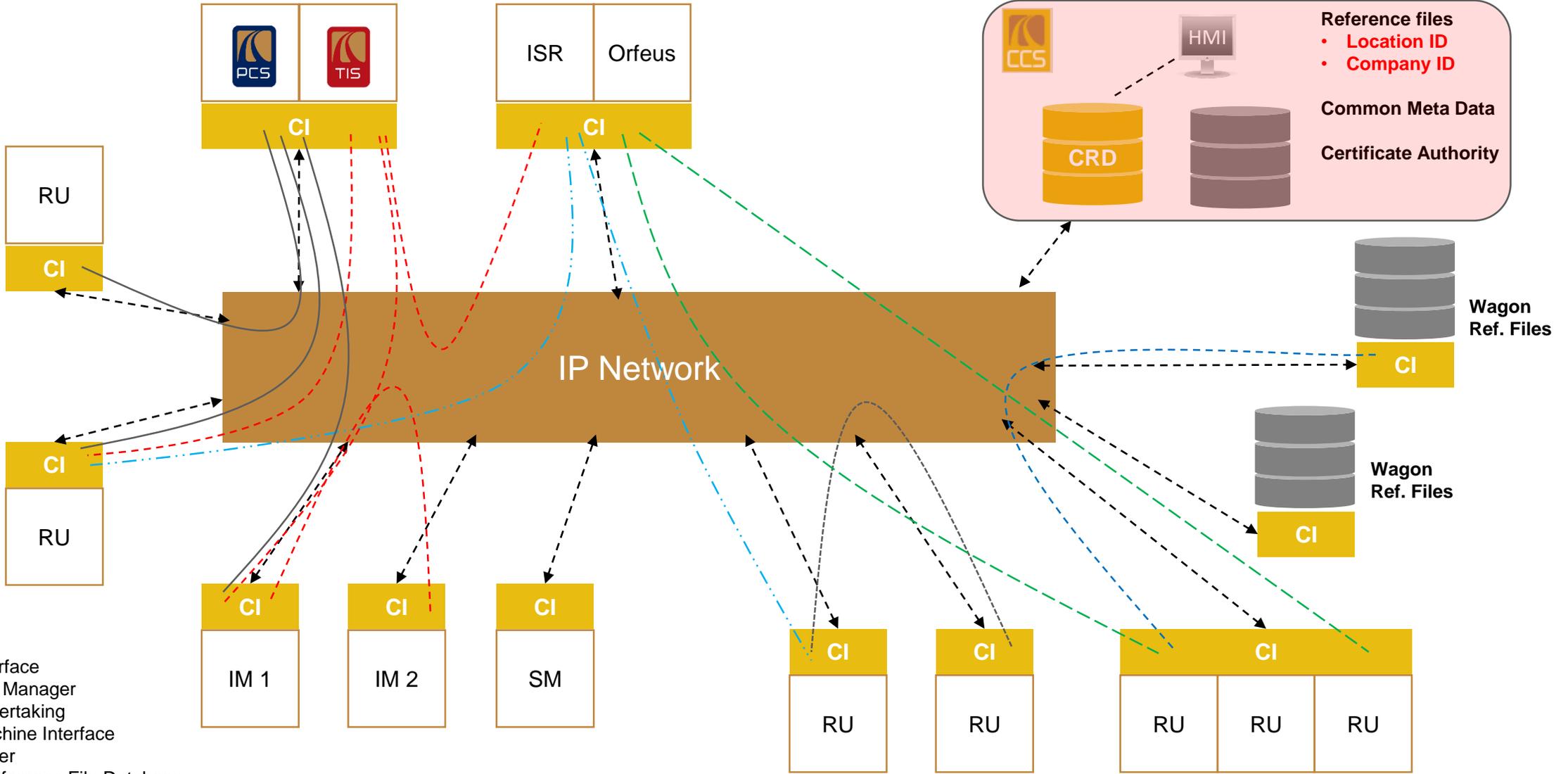
CI Reference Implementation

The Common Interface Reference Implementation was build by the TAF TSI Common Components Group based on

- Requirements
  - TAF 4.2.14.7. Common interface
  - TAP 4.2.21.7. Common Interface for RU / IM Communication
  - TAF Appendix E : TAF TSI Appendix D.2: Appendix E COMMON INTERFACE
- European public tender
- Stakeholder funding
- EU Commission funding

Communications

Without CI

Company A

Company B

With CI

Company A

Company B

Common Interface

API Translation Validation
API Configuration
API Metadata
Security Transport

SOAP (https) xml
Open IP Network

Common Interface

Security Transport
Translation Validation API
Configuration API
Metadata API

LS= Legacy System

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Architecture Supporting Peer2Peer

Reference files
- **Location ID**
- **Company ID**

Common Meta Data

Certificate Authority

CRD

Wagon Ref. Files

Wagon Ref. Files

IP Network

RU

ISR | Orfeus

PCS | TIS
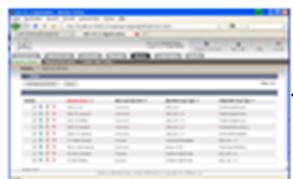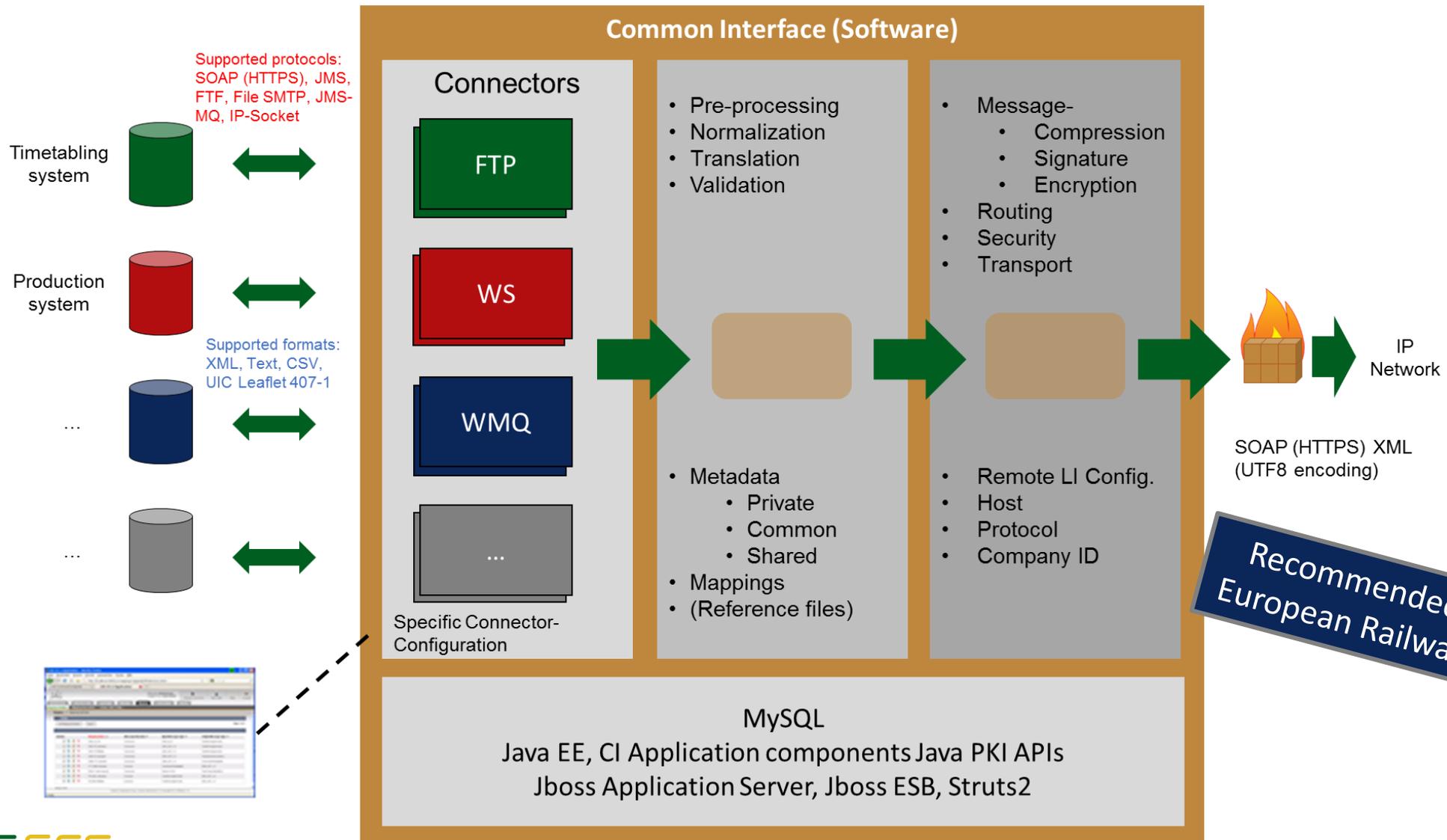
CI - Common Interface
IM - Infrastructure Manager
RU - Railway Undertaking
HMI - Human Machine Interface
SM - Station Master
CRD – Central Reference File Database

IM 1

IM 2

SM

RU

RU

RU | RU | RU

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Common Interface Reference Implementation

Common Interface (Software)

Supported protocols:
SOAP (HTTPS), JMS,
FTF, File SMTP, JMS-
MQ, IP-Socket

Timetabling
system

Production
system

Supported formats:
XML, Text, CSV,
UIC Leaflet 407-1

...

...

Connectors

FTP

WS

WMQ

...

Specific Connector-
Configuration

- Pre-processing
- Normalization
- Translation
- Validation

- Metadata
  - Private
  - Common
  - Shared
- Mappings
- (Reference files)

- Message-
  - Compression
  - Signature
  - Encryption
- Routing
- Security
- Transport

- Remote LI Config.
- Host
- Protocol
- Company ID

IP
Network

SOAP (HTTPS) XML
(UTF8 encoding)

**Recommended by ERA
European Railway Agency**

MySQL
Java EE, CI Application components Java PKI APIs
Jboss Application Server, Jboss ESB, Struts2

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Certificate Authority (CA)

RNE acts as a Certificate Authority (CA) and provides X-509 certificates to support secure communication between partners, along with message-based encryption and signature.

X-509 certificates are requested for:

- SSL/TLS communication on HTTP between CI A and CI B, and between CI A / CI B and CRD

- Encryption of messages

- Signature of messages.

Only certificates from the RNE Certificate Authority (with the same root) will trust each other.
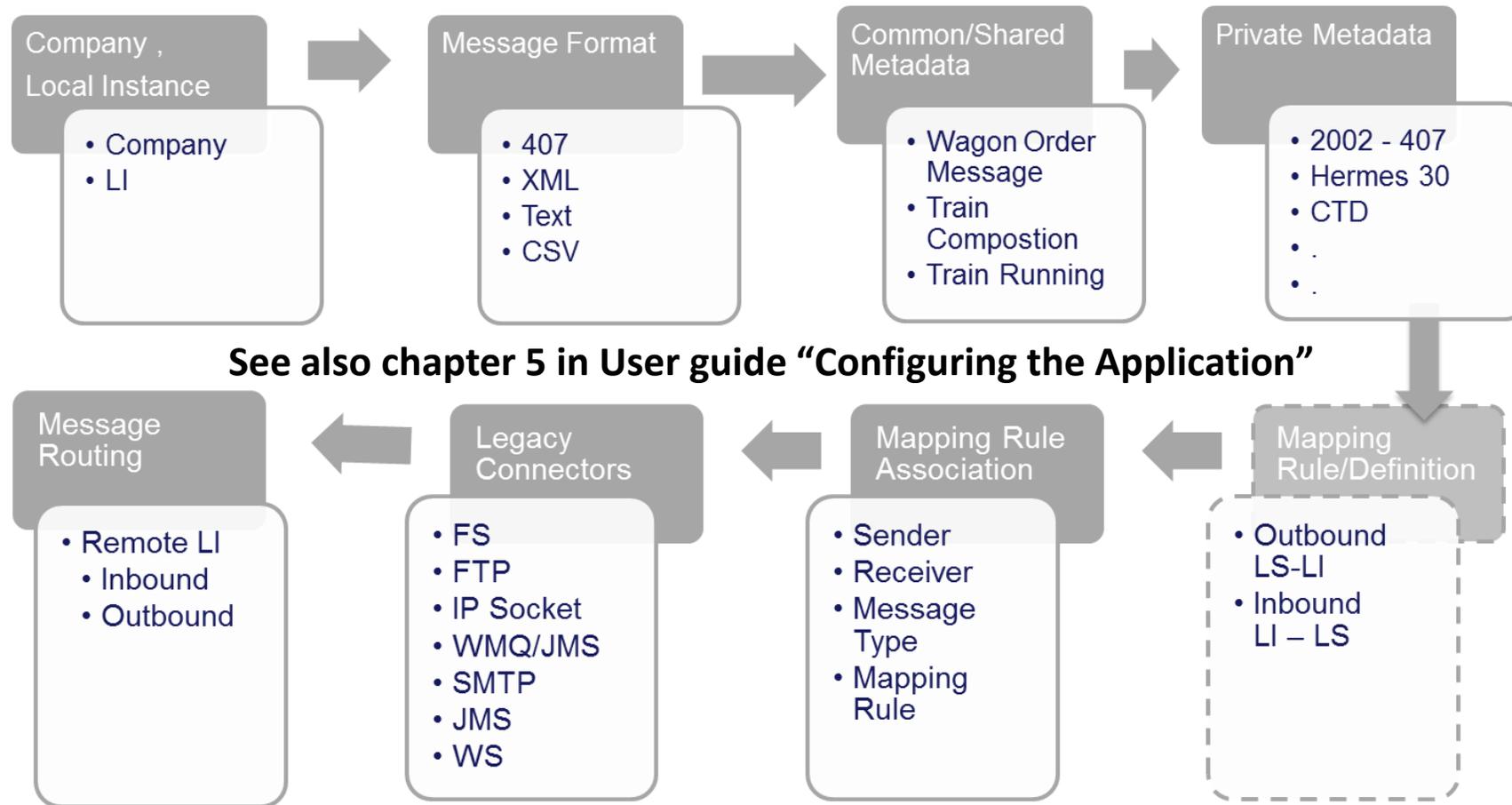
What can be expected?

The CI Reference Implementation supports:

- Multiple Instances, if desired

- Installation Support

- Documentation and User Manuals

- Service Desk
  - On-line Ticket Support
  - Telephone Support – Working Hours
  - Hot-line Support – 24 hour incident management

Legacy System Connectors

- ## LS (Legacy Systems)
  - Existing (or future) IT applications which will use CI to exchange messages

- ## LI is Local Instance of a Common Interface

- ## Connector
  - Part of the LI used to link a LS to CI (and vice-versa)
  - Connector Types are
    - File System
    - JMS / WMQ
    - "IP-Socket"
    - FTP (client)
    - Web Service (defined by CI)
    - JMS
    - SMTP

Company , Local Instance
- Company
- LI

Message Format
- 407
- XML
- Text
- CSV

Common/Shared Metadata
- Wagon Order Message
- Train Compostion
- Train Running

Private Metadata
- 2002 - 407
- Hermes 30
- CTD
- .
- .

See also chapter 5 in User guide "Configuring the Application"

Message Routing
- Remote LI
- Inbound
- Outbound

Legacy Connectors
- FS
- FTP
- IP Socket
- WMQ/JMS
- SMTP
- JMS
- WS

Mapping Rule Association
- Sender
- Receiver
- Message Type
- Mapping Rule

Mapping Rule/Definition
- Outbound LS-LI
- Inbound LI – LS

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Communication between LI

- **Web Service**
  - Communication between LIs is done using SOAP protocol over HTTPS.
  - For the SSL communication a X.509 certificate has to be obtained from the RNE CC Service Desk.

- **Heartbeat**
  - Heartbeat messages are exchanged to ensure connectivity among LIs.

- **Encryption, Signature, Compression**
  - Message based encryption, signature and compression are supported.
  - Configuration is done on sender/recipient basis because mutual agreements between partners are required.
  - The message can be digitally signed for security purposes. For signing a client certificate from the RNE is provided the same as for SSL and encryption.
  - The TAF/TAP message payload in the request can be encrypted for security.
  - The TAF/TAP message payload in the request can be compressed.

Troubleshooting and FAQ

RNE provides CCS Service Desk Management which acts as Helpdesk and Incident desk.

✓ Ticket tool

✓ Service requests

✓ FAQ Section

RNE CCS Helpdesk

- Getting Access to Helpdesk Application for Help

- Reporting Incidents through Helpdesk Application

- Weekday 9:00 – 17:00 Help Desk Support

- 24 * 7 Incident Support

- Helpdesk Mail

- Helpdesk Phones

License Models

- **Standard License**
  - Current license model applicable to a single company
  - Intended users are large IMs and RUs

- **Supplier License**
  - Comes in packages of 5 licenses for 5 different companies
  - Intended users are service provider companies or groups of small IMs, RUs, terminals, ports, etc.

- **Test License Model**
  - Free of charge but time limited
  - Intended users are software and service providers willing to build their own TAF TSI compliant CI

Status on Common Interface implementation

Standard License non RNE members	**32 Companies**
Standard License RNE members	**23 Companies**
Supplier License	**1 Company**
Test License	**9 Companies**

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How to become a CCS user?

Access to CCS for TAF and TAP actors is based on a user agreement that needs to be signed beforehand:

In order to become a CCS User Please provide the following information to support.ccs@rne.eu:

- – Name, company and department
- – Contact details (phone, e-mail, postal address)

More information about CCS can be found on our website at:

http://ccs.rne.eu