



**7th Regional TAF TSI Workshop – Romania, Bulgaria, Greece
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TAF-TSI BENEFITS OF USING IN THE ROMANIAN RAILWAY SYSTEM

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AGENDA



- 1. Romanian Railways – IT Subsidiary “Informatica Feroviara S.A.”**
- 2. CFR - Enterprise Architecture**
- 3. CFR – Traffic IT System**
- 4. The CFR implementations of the SEDP plan**
- 5. CFR IT Projects - Ongoing developments**
- 6. Services provided by Informatica Feroviara in TAF-TSI area**
- 7. Q&A**

Informatica Feroviara



*One of the biggest
player on the
Romanian IT Market*

- **50** years of IT systems and technology for railway business, tailored and always modern vision.
- Continuous service and knowledge for better customer services.
- Our main clients are companies acting in the railway transport industry, either state owned or private.

Informatica Feroviara



Mission:

- **Informatica Feroviara is working to strengthen its position as the most important player in Romania for mission-critical application software, integrator and provider of IT services with maximum availability for rail transport.**

Our services and clients:

- **The IT services became important for any business and they can include:**
 - **Software as a Service (SaaS),**
 - **Platform as a Service (PaaS),**
 - **Infrastructure as a Service (IaaS),**
 - **Support services (Service Desk)**
- **We developed sectorial IT solutions for:**
 - **Infrastructure managers**
 - **Railway undertakings both for passengers and freight**

CFR – Traffic IT System 1/3



CFR IT system covers multiple business areas:

- **Planning: PCS, Routes, Atlas-IM, Atlas-RU**
- **Reporting: CRONOS**
- **Monitoring: FOCUS, FOCUS-RU, Traffic Monitoring Application using GPS Technology**
- **Analysis and synthesis: INFO-IM, INFO-RU, BI-CFR**
- **Using track charge: CALIPSO**
- **Performance Regime: web app**
- **Reference Files: RNE-CRD**
- **WIMO database: WIMO App**

CFR – Traffic IT System 2/3



1. Railway Undertakings (RUs)

- **ATLAS- RU** – operational plan update application
- **FOCUS – RU** - Train monitoring application
- **INFO-RU** - Information for RU's
- **BI-RU** – Business Intelligence for RU's
- **CICLOP** – Tool for conversion to digital form of information contained in trip sheets of locomotives and their personnel, calculation of benefits and technical activity indicators of locomotives.

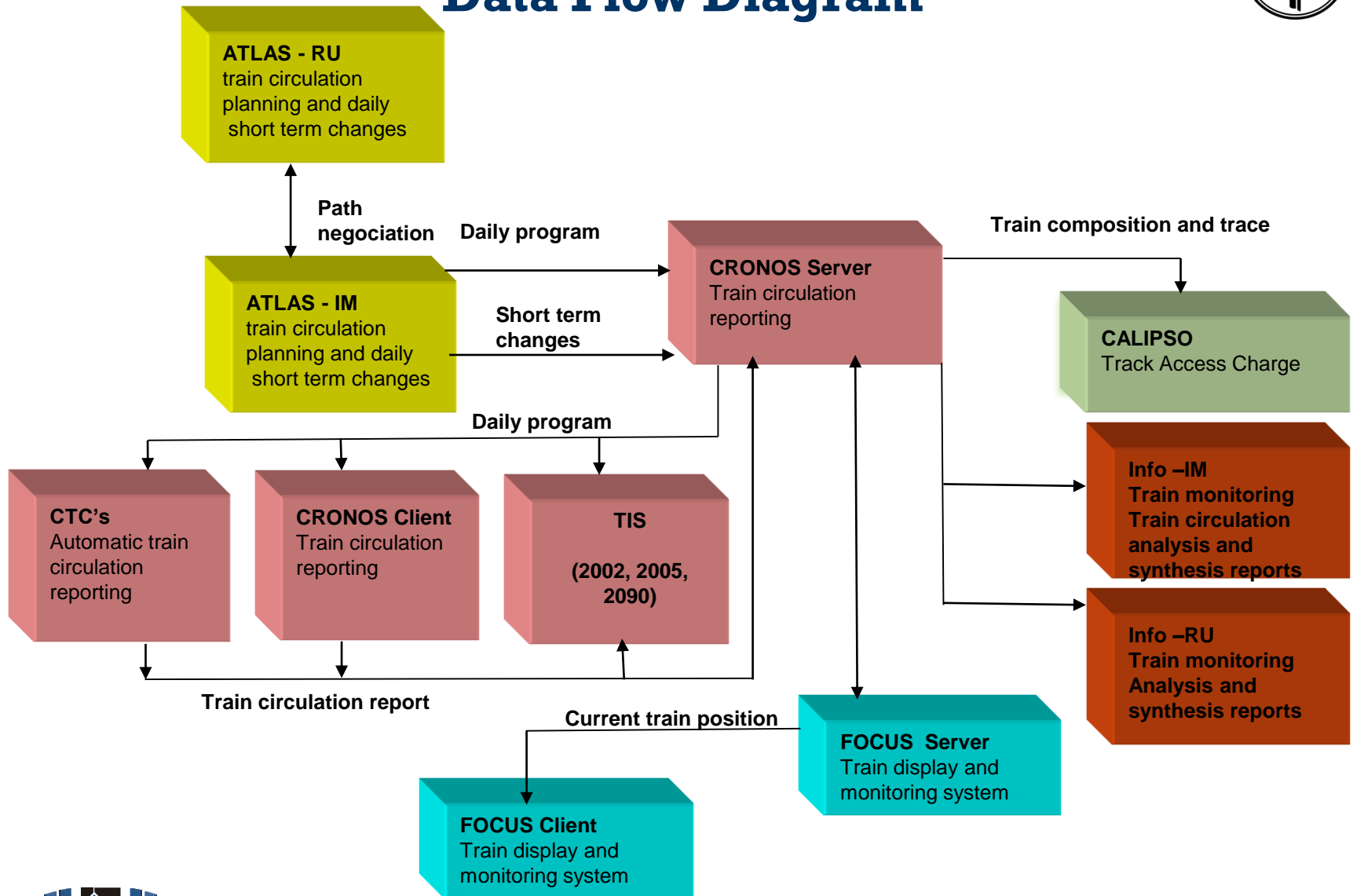
CFR – Traffic IT System 3/3



2. Infrastructure Manager (IM)

- **ROUTES** – Timetable application
- **ATLAS- IM** - Operational plan update and running train performance analysis
- **CRONOS** - Reporting of running train application
- **FOCUS** - Monitoring of running train application
- **CALIPSO** - Track Access Charge application

IRIS Model System – Circulation Data Flow Diagram



Planning Apps 1/2



- **PCS** – Path Coordination System - International timetable application
- **ROUTES:**
 - Yearly timetable application
 - All the path technical characteristics can be defined (or modified): brake percentage, maximum speed, running time, stopping time, length, tonnage, etc.
 - Interface with ATLAS-IM
 - Sends the paths to ATLAS-IM

Planning Apps 2/2



- **ATLAS-RU**

- Receive all the paths from ATLAS-IM
- RU can send path request messages to ATLAS-IM based on TAF-TSI messages (Path request, Path details, Path accepted, Path refused, Path confirmed)
- NOT all the path technical characteristics can be modified: only stopping time, length, tonnage and text
- The brake percentage, maximum speed and running time are **unchangeable**

- **ATLAS-IM**

- Receives all the paths from ROUTES
- Receives path request messages from ATLAS-RU
- NOT all the path technical characteristics can be modified: only stopping time, length, tonnage and text
- The brake percentage, maximum speed and running time are **unchangeable**

ATLAS-RU



- The implementation of **Path Request** Function:
 - Path Request (RU → IM)
 - Path Details (IM → RU)
 - Path Confirmed (RU → IM)
 - Path Details Refused (RU → IM)
 - Path Canceled (RU → IM)
 - Path NotAvailable (IM → RU)

Reporting Apps



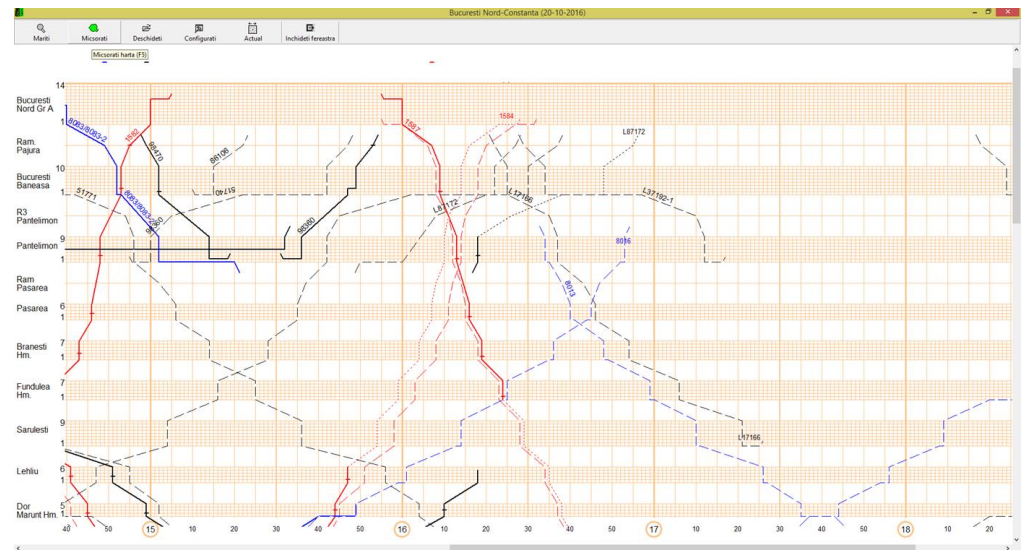
- **CRONOS** - Application for real train passage in stations reporting:
 - Receives paths from ATLAS-IM in each reporting station.
 - **Manual** data input:
 - The signallers report the train arrival, departure or passing times, as they occur.
 - The reasons for delays are also reported.
 - **Automatic** data input:
 - Where CFR has rehabilitation works, the CTCs are connected with CRONOS using an interface
 - The CTC receives the paths from ATLAS
 - The CTC sends the real passage of trains to CRONOS

Monitoring Apps 1/2



- FOCUS, FOCUS-RU - The application is used to show in real time the running trains
- The information can be displayed in many forms:

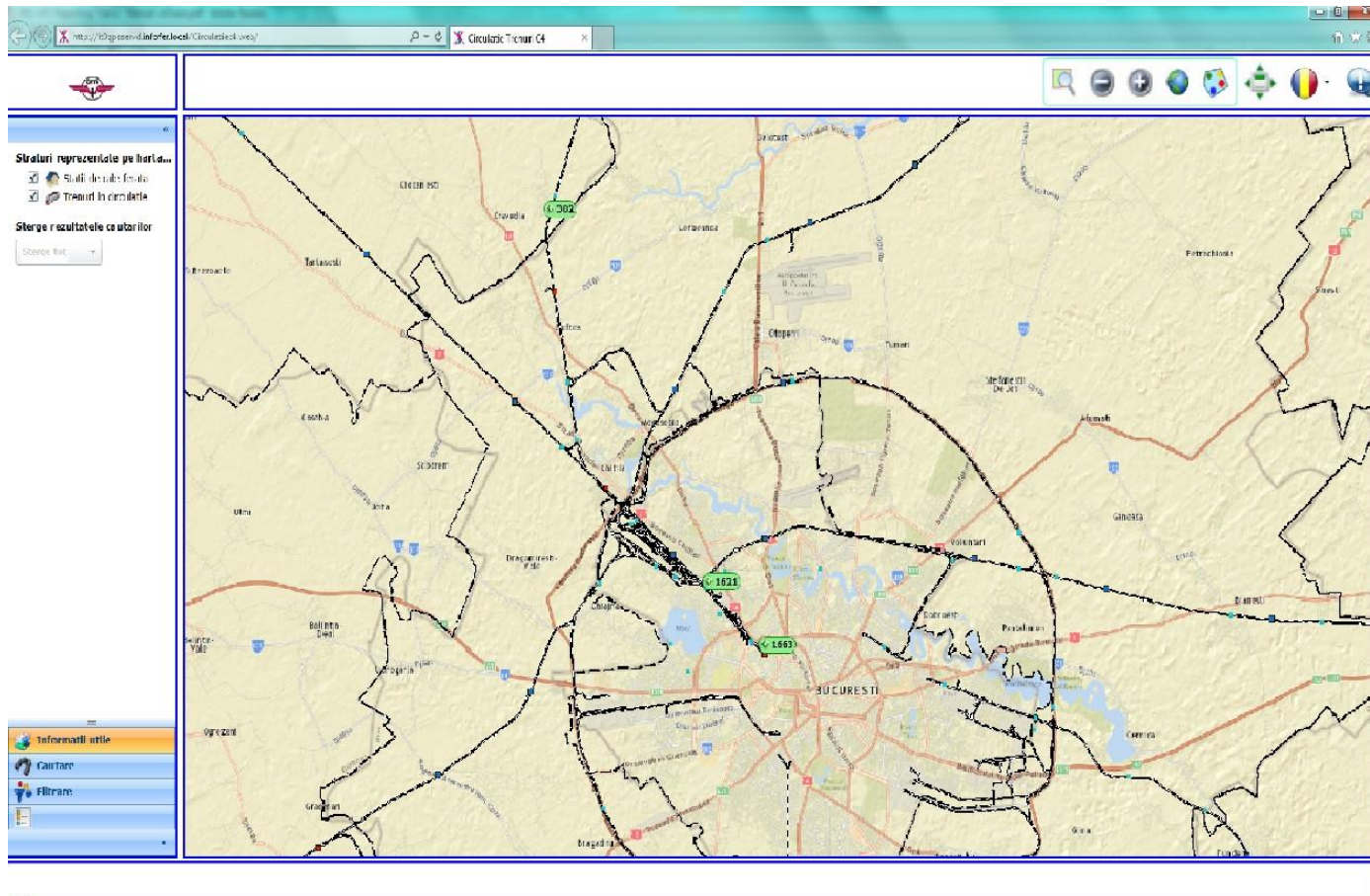
- Space – time diagram
- On a schematically map
- On a station's layouts
- On a scrolling list



Monitoring Apps 2/2



○ Traffic Monitoring Application using GPS Technology



TUI calculation App



- CALIPSO - Application for Using Track Charge (fee) automatic calculation
 - It is based on real passage of the running train reporting messages received from CRONOS. After the signaler reports the train arrival in the destination station CRONOS server sends a message regarding train path and gross tonnage to CALIPSO.
 - In CALIPSO each train data can be reviewed and modified by an accepted user before an invoice is emitted.
 - The application has it's own constant dataset – railway network data, tariffs, accepted RUs

Analysis and statistical reports



- All data inside IRIS system are available in real time (online, based on controlled acces) on a dedicated web page for:
 - IM (CFR) can see all the trains
 - RUs – every RU can see only trains operated by itself
 - Passengers (only passengers' trains)

Performance Regime



- Implementation of Directive 2012/34/UE
- Specific part of Analysis and synthesis reports
- Highlights indicators concerning delays from either operative or archived data

CRONOS Regim performanta

Trenuri intarziate [operativ 10 zile]

Intarzieri la destinatie sau in statii cu oprire
Explicatii si incadrare intarzieri

CNCF CFR SA

Intarzieri La destinatie
 In statii cu oprire

Sosiri destinatie din data ora

Pana in data ora

Intarzieri mai mari de minute

Explicatii intarzieri Da Nu Numai Internet Explorer

Incadrare intarzieri Da Nu

43 trenuri CNCF CFR SA, sosiri destinatie 13.01.2015 ora 05-14.01.2015 ora 05. Intarzieri mai mari de 10 minute.

Tren	Relatia	Plecare	Sosire Program	Sosire Reala	Statia	Min	Explicatii intarzieri				
							Din statia	Pana/ In statia	Minute	Cod	Explicatie
68352/	Tecuci-Buzau	13.01.2015 01:27	12.01.2015 23:03	13.01.2015 05:31	Buzau	388		Condrea Hm	8	Fp	Fp - Restrictii de viteza cauzate de forta majora
								Sureia Hm	6	Fp	Fp - Restrictii de viteza cauzate de forta majora
					Tecuci			Bordeasca Noua Hm	12	Fp	Fp - Restrictii de viteza cauzate de forta majora

Business Intelligence



- Based on traffic information there is a data warehouse developed and implemented.
- Actually CFR has a profesional tool for top management.

DBTest2 x | Mircelb - [] [] []

https://bicftrafficinfofer.ro/pentaho/api/repos/%3Ahome%3Ainfra%3ADBTest2.wcdf/generatedContent

Bar chart showing traffic volume in Tb km for years 2010-2016, split into C/Tb km and M/Tb km.

An	Tb km	Pondere (%)
2010	20.168.197	18,8%
2011	52.454.053	37,3%
2012	14.220.058	10,1%
2013	10.788.888	7,7%
2014	10.852.298	7,7%
2015	9.172.510	6,5%
2016	17.300.947	12,3%

Horizontal bar chart showing traffic volume in Minute int for years 2010-2016.

Evolutia [TbKm] defalcata pe OTF

Show 10 entries Search:

Dim otr.Denumire	Dim zile.Anul	Tb km
CN CFR SA	2010	23846749.7
CN CFR SA	2011	32540516
CN CFR SA	2012	48264596.3
CN CFR SA	2013	48722936.8
CN CFR SA	2014	65768658.1
CN CFR SA	2015	86454542.6
CN CFR SA	2016	83795298
33 ICIM Arad	2010	524047.2
CARGOTRANS VAGON SA	2010	1202722341.6
CARGOTRANS VAGON SA	2011	1511609055.8

Showing 1 to 10 of 178 entries

Previous 1 2 3 4 5 ... 18 Next

Valori asociate poligoanelor (ex: Minute intarziere trafic calatori)

[Dim graf Den reg] [Den reg] [Cluj]

Regiune	Tb km	Pondere (%)
Cluj	394.791	15,7%
Alte regiuni	908.130	36%
Alte regiuni	157.259	6,2%
Alte regiuni	293.089	11,6%
Alte regiuni	220.147	9%
Alte regiuni	200.990	8%
Alte regiuni	338.839	13,5%

International systems



- **PCS** – Path Coordination System
- An exchange messages application between CFR and MAV IT systems, named **IM-Comm**
- Implemented and working Common Components
 - Common Interface
 - Common Repository Database
- Train Information System **TIS**
 - 2002, 2005 and 2090 messages are already implemented
- **WIMO** database according TAF – TSI specifications
 - Contains technical and administrative wagon data
 - Commercial and events data in progress
- **CIS** – Charging Information System

Network Overview View Configuration TCCCom Send Dashboard Corridors Info

21 3348 53hionescu RNETIS Train Information System

Search Reset Save Layer Aut Circle Single train

Filter

Current filter

<unnamed>

User network: all

Train type: International, National, Passenger, Freight, Unknown

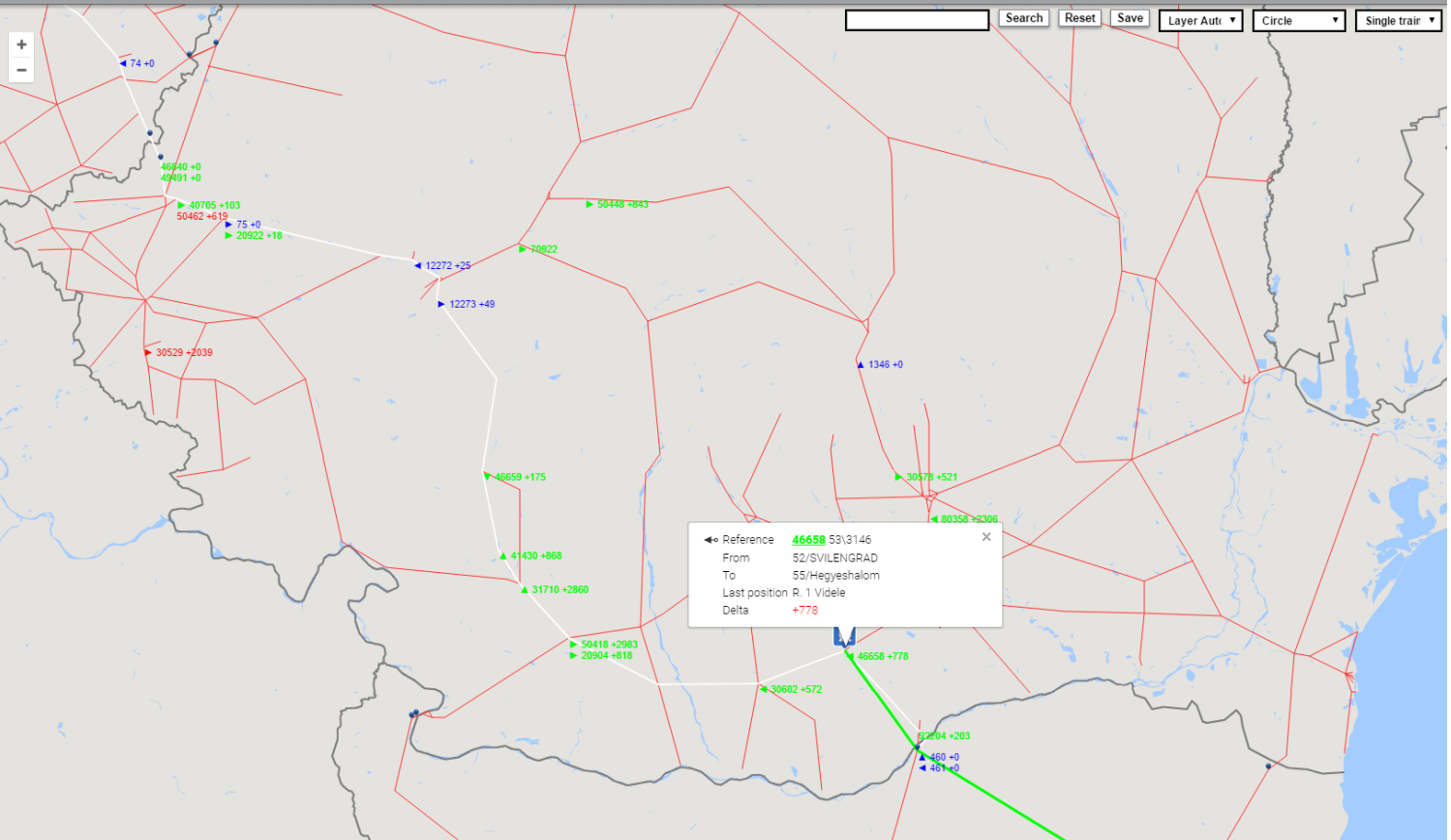
Save Clear Edit

Saved filters

Name

No filters present

Load filter



Reference 46658 53\3146
From 52/SVILENGRAD
To 55/Hegyeshalom
Last position R. 1 Videle
Delta +778

IM-Comm



- It is a multilingual IT tool dedicated for ad-hoc and instant freight trains
- Based on an interface with Hungarian and Romanian IT systems the tool makes the connection between international trains at all common borders
- The tool can be developed on the other borders (between different IMs)
- In present used by 13 romanian RU's and 11 foreign RU's

CFR Major IT Projects



Project	Objectives	Period	Status
Integrated Railway Information System (IRIS)	The provision of basic information for activities in the most important sectors of the railways	1999 - 2003	√
IRIS Migration (IBRD 4757 RO – CFR / G – 2 – 03 / 2006)	Hardware and related software to increase processing capacity for IRIS database central servers	2008 - 2009	√
Corridor IV Rehabilitation – Curtici Border – Arad – Km614 (2010 RO 161 PR 20)	IRIS Infrastructure Extension	2013 - 2015	√
Strategic European Deployment Plan (SEDP)	Implementation of TAF-TSI specifications	2013 - present	Ongoing

SEDP: TAF-TSI Implementation

Functionality	Responsible	Impact	Deadline	Status
Reference Files	IM/RU	IM/RU	2013	√
Common Interface Implementation	IM/RU	IM/RU	2013	√
Rolling Stock Reference Database	RU/WK	RU/WK	2015	
WIMO Database	RU	IM/RU	2016	√
Wagon Movement	RU	RU	2016	
Path Request	IM/RU	IM/RU	2017	√
Train Running	IM/RU	IM/RU	2017	√
Consignment Data	RU	IM/RU	2017	
Train Composition	IM/RU	IM/RU	2018	
Train Ready	IM/RU	IM/RU	2018	
Service Disruption	IM/RU	IM/RU	2018	
Shipment ETA	RU	RU	2018	
Unique Train Identifiers	IM/RU	IM/RU	2020	

CFR TAF-TSI Implementations in Corridor IV Project



- **WIMO**
- Train exchange messages at the border – **IM-Comm**
- **TIS** Implementation
- **Traffic Monitoring Application** using GPS Technology
- **Common Interface** Implementation
- **Common Repository Database** – update
- Non TAF-TSI implementation:
 - **IRIS – TMS** Interface – Automatic reporting of the train circulation

CFR IT Projects: Ongoing developments



Informatica Feroviara developed new software products in the rehabilitation of Corridor IV project:

- An application that shows the position of trains reported by GPS technology on a geographical map, named **IRIS-GPS Reporting Trains**
- **IRIS - TMS interface** – an interface between IRIS system and Alstom's CTC system, named TMS (Traffic Management System)
- **IRIS – DCOS** (hot axel boxes detector) interface.

CFR IT Projects: CFR- RU's Interfaces



- Informatica Feroviara already developed an interface for Grup Feroviar Român (GFR) *based on web services*, an unidirectional data transmission regarding **Train Running Information**.
- Informatica Feroviara is implementing a *Common Interface based solution* in order to send the Train Running message to Rail Cargo Carrier Romania.

Services provided by Informatica Feroviara in TAF-TSI area



- TAF-TSI IT Consultancy Services, including Common Components
- Software development
 - On demand
 - SaaS
- Hosting Infrastructure (servers, network equipments) and Platforms (operating systems, databases, middleware - e.g. Common Interface)

Benefits of using TAF-TSI



- Easy access: wherever the internet is
- The management is in control anytime
- Detailed statistical reports
- Every information is recorded
- Possible connections with:
 - Other IT tools
 - Future developments

TAF TSI is essential for international railway business



CFR has improved its activity by implementing measures from the SEDP plan:

- Path Request (ATLAS)
- Train Running (TIS - Train Information System)
- IM-RU's data exchange (IM Comm)

CFR works for new implementations:

- Train Composition message



Thank you!

Questions and Answers

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