

Distr.: General
9 May 2017

ENGLISH ONLY

Economic Commission for Europe

Inland Transport Committee

Working Party on Customs Questions affecting Transport

**Informal Ad hoc Expert Group on Conceptual and
Technical Aspects of Computerization of the TIR Procedure**

Twenty-sixth session

Geneva, 18-19 May 2017

Item 4 (a) of the provisional agenda

eTIR pilot projects

UNECE-IRU eTIR pilot project between Iran and Turkey

Note by the secretariat

I. Introduction

1. The Expert Group may wish to take note of the results of the UNECE-IRU eTIR pilot project between Iran (Islamic Republic of) and Turkey, as presented in the project's final report contained in Annex, and discuss its implications for the computerization of the TIR procedure.

Annex

Final Report of the UNECE/IRU eTIR Pilot Project between the Islamic Republic of Iran and the Republic of Turkey

May 2017

1. Key project features

I. Full project title	UNECE-IRU eTIR pilot project between the Islamic Republic of Iran and the Republic of Turkey	
II. Short project title	UNECE-IRU eTIR pilot project	
III. Implementing Entities	UNECE IRU	
IV. Start date	03/2015	
VI. End date	02/2017	
VII. Beneficiary countries	Iran (Islamic Republic of) and Turkey	
VIII Implementing partners		Other partners Customs administrations from Iran and Turkey National TIR associations from Iran and Turkey

2. Summary of results

In the framework of this project, IRU, Turkish customs and Iranian customs IT systems have been amended to allow the handling of TIR transports fully electronically. A lightweight version of the eTIR international system was developed and deployed at UNOG ICTS to ensure the replication and the storage in a customs controlled environment of all the data exchanged between both countries.

In the course of this eTIR pilot project, 84 eTIR guarantees were issued, 64 out of which were used by the holders to successfully conduct eTIR transports, whereas 20 remained unused. All messages required for the good conduct of the eTIR procedure were transmitted by the holders, associations and customs in due course and processed in real time.

The eTIR international system at UNECE was deployed in the course of Step 1 and receives the data related to all eTIR transports from the IRU systems in real time. Those data are available to both customs administrations for querying at any time.

The print-at-home TIR Carnet¹ was introduced at the request of the customs administrations, not only as an accompanying document but also to comply with the requirement of the TIR Convention that the TIR Carnet holder has to manually sign the TIR Carnet.

Stakeholders did not report any incidents or delays caused by the introduction of the eTIR processes described above. All stakeholders, in particular TIR Carnet holders, have expressed their satisfaction with the conduct of the eTIR transports and indicated that they would rather continue with the computerized procedure than going back to the paper based procedure.

3. Detailed review of achievements and implementation

In order to launch and complete this project in a rapid and cost effective manner, stakeholders agreed to deviate from the specifications contained in the eTIR Reference Model on the following aspects:

1. Some of the tasks attributed to the eTIR international system, according to the eTIR Reference Model, were performed by the IRU system. However, this did not prevent stakeholders from receiving all required data in real-time.
2. The messages sent by customs were not the standard eTIR messages. However, taking into consideration that both countries had specific safety and security (S&S) data requirements (i.e. data neither contained in the TIR Carnet nor in the eTIR standard messages), the use of eTIR standard message alone would not have sufficed and still would have required sending, in parallel, additional S&S messages.
3. The sending of advance cargo information could only be done via TIR-EPD, as it ensured the link with the issuance of eGuarantees at IRU and allowed the authentication of the participating transport operators by means of usernames and passwords, used to access the TIR-EPD system.
4. Print-at-home TIR Carnets had to be used to ensure that participating transport operators could manually sign them, since the mutual recognition of the authentication of transport operators has, as yet, no legal basis in the TIR Convention nor could it be included in the Terms of Reference (ToR) of the UNECE-IRU pilot project.

Table 1 - Review of Performance Indicators

Expected Accomplishment	Indicator of achievement (T0)	Indicator of achievement (T1)	Comments
EA1. Lightweight version of eTIR international system is developed, effectively maintained	No eTIR international system	The lightweight version of the eTIR international system receives and stores the data related to all the eTIR transports in real time.	The lightweight version of the eTIR international system was developed, secured and deployed at UNOG ICTS (under the management of UNECE). It receives and stores the data related to eTIR transports and makes it available to the participating customs administrations.

¹ TIR Carnet printed by the holder after the eGuarantee is issued by the national association under the central management of the IRU and the holder having provided all the required data using the TIR-EPD application.

EA2. IRU systems are updated to handle eTIR pilot transports	IRU systems were used to handle the transmission of Safe TIR data and of electronic pre-declarations.	The IRU systems handle in real time the processing of eTIR transports, from the emission of eGuarantees to the final discharge, in line with the ToR of the UNECE/IRU eTIR pilot project and the technical specifications document.	IRU modified various portals (customs, holders and associations) to manage the emission of eGuarantees and enabled the exchange of eTIR transport data. It has also developed a “trusted data exchange” module to replicate all data in the eTIR international system.
EA3. Iranian and Turkish systems are updated to handle eTIR pilot transports	The Iranian and Turkish systems were used to handle TIR operations, the transmission of Safe TIR data (RTS) and the reception of electronic pre-declarations (TIR-EPD).	The Iranian and Turkish systems can process all the messages required for the management of TIR operations electronically, as specified in the ToR and the technical specifications.	The Iranian and Turkish systems were amended to ensure the management of eTIR operations and the communication of the required data to the IRU. Neither Iran nor Turkey tested the querying of the data in the eTIR international.
EA4. Successful conduct of eTIR pilot transports	No eTIR transport had been conducted.	More than 50 eTIR transports should be conducted during both phases of the project.	64 TIR transports were successfully conducted in the framework of this project.

Table 2 - Review of Activities

Activities implemented	Comments
E.A.1. Lightweight version of the eTIR international system is developed and effectively maintained.	
A.1.1. Develop, secure and deploy the system.	The eTIR international system was developed by IRU, as well as secured and deployed by UNECE in the UNOG ICTS data centre.
A.1.2. Maintain the system through: - hosting the system - running the necessary infrastructure (hardware, software, network and internet access); - ensuring adequate backup and recovery procedures; - liaising with the UNECE ISU and UNOG ICTS.	The eTIR international system is securely running in the UNOG ICTS data centre, with all standard security and backup procedures in place.
A.1.3. Provide support and guidance to Turkish and Iranian customs administrations in connecting to the system.	The web services to query data from the eTIR international system have been implemented but neither Iran nor Turkey has implemented a querying mechanism.
A.1.4. Update the system to handle amendments to declarations.	Due to the lack of qualified candidates, UNECE was not in a position to hire a person to make the necessary development. However, this remained without consequences since none

	of the TIR Carnet holders made an amendment to the declarations in the course of any of the eTIR transports carried out.
E.A.2. IRU systems are updated to handle eTIR pilot transports	
A.2.1. Enable the issuance of eGuarantees using the association portal.	IRU systems are generating eGuarantees once the association has approved an order received from the holder using the association portal.
A.2.2. Enable holders to order and manage eGuarantees via the holder portal.	The holder portal was successfully modified to allow holders to order and manage their eGuarantees.
A.2.3. Enable the querying by customs of all data related to eGuarantees via the customs portal.	When querying the status of eGuarantees from in the customs portal, customs receive all data sent by previous customs authorities, including seals numbers.
A.2.4. Transmit data received from customs to the lightweight version of the eTIR international system hosted at UNECE.	The IRU trusted data exchange system was developed and forwards to UNECE all data using the standard eTIR messages.
A.2.5. Include advanced features such as the amendment of the declaration, print-at-home Carnets, as well as distance payment by holders, data entry by holder commercial partner, references to previous/subsequent customs procedure, attached documents.	The possibility for holders to amend their declaration after the beginning of the eTIR transport was successfully implemented and tested but was not used in operational mode during the pilot. Print-at-home Carnets can be printed by holders from the holder portal. Additional improvements were implemented by IRU to further facilitate the exchange of information between holders and customs.
E.A.3. Updated Iranian and Turkish systems.	
A.3.1. Prepare a technical specification document.	IRU prepared a technical specification document based on which Iranian and Turkish customs updated their systems to exchange appropriate TIR information with the IRU systems.
A.3.2. Update the Iranian customs system to exchange TIR messages with the IRU systems	Existing messages were amended by customs: - EPD notification (EPD015): inclusion of the itinerary; - Release for Transit(EPD029): inclusion of cargo-seals-itinerary data. New messages were implemented: - TIR guarantee/transport data (RTS-EGIS); - Cancellation decision (EPD09); - No release for transit (EPD051); - Exit notification (RTS-SafeTIRUpload); - Update Seal (EPD025); - Amendment mechanism.
A.3.3. Update the Turkish customs system to exchange TIR messages with the IRU systems	Existing messages were amended by customs: - Release for Transit: Inclusion of cargo-seals-itinerary data. New messages were implemented :

	<ul style="list-style-type: none"> - Discharge (EPD045) ; - TIR guarantee/transport data (RTS-EGIS); - Cancellation decision (EPD09); - No release for transit (EPD051); - Exit notification (RTS-SafeTIRUpload), - Automatic Technical Rejection (EPD917); - Update Seal (EPD025); - Amendment mechanism.
E.A.4. Conduct of eTIR pilot transports.	
A.4.1. Train associations and transport operators	IRU organized various workshops to train holders and associations on how to handle eTIR transports.
A.4.2 Undertake test transports.	All stakeholders took part in two successful test transports, in which the electronic procedure was used in parallel to the normal paper procedure.
A.4.3 Undertake eTIR pilots (Phase 1).	During phase 1, 39 eGuarantees were issued, 26 out of which were used by holders to successfully perform eTIR transports.
A.4.4 Undertake eTIR pilots (Phase 2).	During phase 2, 45 eGuarantees were issued, 38 out of which were used by holders to successfully perform eTIR transports.

4. Challenges/problems encountered

Table 3 - Challenges and Actions

Description of challenges	Action(s) taken to solve the issue, if any
Interruption of the synchronization between IRU and UNECE systems starting 1 January 2017.	After having noticed that the synchronization between the IRU and the UNECE systems had stopped functioning, UNECE and IRU analysed the content of both databases and the IRU resent the missing data before the synchronization was resumed. The problem was due to a parameter defining the end of the authorization of the guarantee chain that was erroneously set at 31.12.2016.
In November 2016, the recruitment of an IT staff at UNECE was interrupted due to a lack of qualified applications.	Considering the short time until the end of the project, it was decided not re-advertise the post. The recruitment of an IT staff working to maintain and further develop the eTIR international system at UNECE will be resumed when a new MoU will be signed between both organizations.
The current version of the TIR Convention being the only legal basis to conduct eTIR transports,	After having carefully considered various methods of authentication of TIR Carnet holders

<p>customs administrations insisted on the requirement for the TIR Carnet holder to manually sign TIR Carnets.</p>	<p>(see Annex 2), the print-at-home TIR Carnet was introduced at the request of customs administrations, not only as an accompanying document but also to comply with the requirement of the TIR Convention that the TIR Carnet holder has to manually sign the TIR Carnet.</p>
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5. Good practices and key lessons learned

The project has demonstrated that, even without a legal basis in the TIR convention, the TIR system can work electronically.

6. Sustainability

UNECE and IRU will continue their joint efforts to computerize the TIR procedure. The systems developed under this project will continue to operate and will be further improved to ensure future steps towards the full computerization of the TIR procedure.

A new MoU between IRU and UNECE is under preparation and will ensure the required funding for UNECE to maintain and improve the eTIR international system.

7. Multiplier effects

This project has showcased (and will continue to do so) to all other Contracting Parties to the TIR Convention that the TIR procedure can work fully electronically.

Other countries have already indicated their interest in undertaking pilots of their own to move towards a fully computerized TIR system.

8. Stakeholders' evaluation

By means of surveys, all stakeholders (the 2 customs administrations, the 2 national associations and the 6 holders) have provided their evaluation of the project and made recommendations for the future. The detailed results are contained in Annex 1.

Satisfaction

In summary, customs, associations and transport operators are very satisfied with the outcome of the pilot project. On average, their satisfaction scores are, respectively, 8.25, 8.5 and 7.75 (out of 10).

Feedback

The stakeholders reported numerous benefits, such as faster procedures, decrease of costs thanks to the reduction of TIR Carnets handling procedures, higher accuracy of the system and safer procedures, due to more effective risk management and online monitoring of the transports. It was also felt that the system will allow future enhancements for the transport sector such as remote payment possibilities, or more facilitation to access transport data.

Overall, the stakeholders were of the view that the efforts to further computerize the TIR procedure should be pursued. They also made proposals to further improve the procedure and the systems, e.g. full paperless procedure through appropriate authentication mechanisms, extension of eTIR to all customs offices and holders of the two countries, data exchange between holders and their commercial partners, link with import/export procedures, alternative ways for C2C data exchange and validation of the status of the guarantee.

9. Funding

Each participating entity was in a position to fund its own costs, with the exception of UNECE.

On 24 March 2015, the Executive Secretary of UNECE and the Secretary General of IRU signed a Memorandum of Understanding (MoU) in which IRU agreed to provide 290'000 USD to fund the UNECE activities for a year.

Further to an exchange of letters (dated 30 September and 20 October 2016), the Executive Secretary of UNECE and the Secretary General of IRU agreed to extend the MoU until the end of February 2017 and to additional funding of 45'733 USD.

Table 4 – Additional funding

Contributing Entity/Donor	Purpose	Amount raised	
		Cash (USD)	In-Kind
IRU	Extend the project until February 2017	45'733	

10. Conclusions and recommendations

The UNECE-IRU eTIR pilot project between the Islamic Republic of Iran and the Republic of Turkey has been a success from multiple perspectives. First, 64 eTIR transports have been conducted with success and all stakeholders received all the data required to undertake their tasks in real time. Furthermore, all problems encountered in the framework of the project could be rapidly and effectively resolved. Finally, the survey shows that all stakeholders are very satisfied with the project, while, at the same time, proposing further improvements.

This project not only demonstrated that the computerization of the TIR procedure is feasible, but the procedures implemented in the frame of this pilot could serve as a basis for similar projects in any Contracting Party that wishes to make progress towards the full computerization of the TIR procedure.

The feedback from the stakeholders also provided great ideas on how to further improve the systems for future projects and, ultimately, for a larger scale computerization of the TIR procedure.

In view of the above and further to the proposals made by all stakeholders, UNECE and IRU recommend the following:

1. For future projects, the possibility to submit advance cargo information by other means than TIR-EPD should be explored.
2. While it is recommended to explore options for C2C data exchange that do not involve the private sector, future projects could continue to use the IRU systems for the operational exchange of data until adequate and stable financing of the eTIR international system has been secured, allowing to set up a fully redundant system monitored 24/7. At the same time, the eTIR international system could be further improved to ensure the tractability and non-repudiation of the messages exchanged between customs and the IRU system.
3. The print-at-home TIR Carnet should be replaced in the future (possibly only after the entry into force of the eTIR legal provisions) by a simpler accompanying document and adequate authentication methods to replace the manual signature of the print-at-home TIR Carnet.
4. The use of eTIR standard messages should be encouraged in further projects. At the same time, Contracting Parties (in GE.1) should be reminded that, as long as S&S data requirements are not included in eTIR messages, the usage of the standard eTIR messages will require that transport operators have to send S&S data separately, most likely requiring the services of customs brokers.

Finally, Iran and Turkey, and by extension any other TIR Contracting Party, are strongly encouraged to take part in or launch new projects to make further progress in the computerization of the TIR procedure.

In the meantime, taking into account the successful conduct of the first 64 eTIR transports and pending the signature of a new MoU between UNECE and IRU, which would ensure the sustainability of the “lightweight” eTIR international system and allow further developments, stakeholders in Iran and Turkey are encouraged to continue undertaking eTIR transports between both countries, possibly allowing more transport operators and involving additional customs offices.

ANNEX 1 - Detailed results of the evaluation survey

Topic/feed-back reported by stakeholder	Customs	Associations	Transport operators
Overall score given to the pilot project by stakeholder (10 is the maximum)	8.25	8.5	7.75
Benefits reported			
Faster, less bureaucracy, less workload, less paper management	X	X	
Cheaper procedure, no TIR Carnets stock		X	
Higher accuracy		X	
Safer, more effective risk analysis	X	X	
Allowed enhancements (electronic payment project)		X	
Online monitoring of the transport	X		
eguarantee worked properly	X		
Drawbacks and difficulties reported			
Initial difficulties to convince holders, exporters and importers to participate		X	
Not all customs offices were involved		X	X
Obligation to still use paper TIR Carnet for the declaration	X	X	X
Customs approval and exchange of messages sometimes too slow			X
Lack of preparation and training of customs officers			X
No link with export/import procedures			X
Summary declaration has to be entered additionally			X
Missing access to consignor's details.			X
E-signature could not be implemented	X		
Declarations' Amendment was not possible/could not be tested (<i>it was implemented in the course of the project, but there was no opportunity to test the functionality after its implementation</i>)	X		X
Next developments proposed			
Enable commercial partners to enter data for the holder		X	
100% paperless		X	X
Link with export and import declarations		X	
Incidents management (computerization of the Procès-verbal de constat)		X	
All customs offices and holders of both countries to be included		X	
Guarantees to be available outside working hours			X
Conduct intermodal TIR transports			X
More customs offices, more holders, more countries to be involved			X
More training of customs officers			X
Generate error messages			X

Notification by email when new messages are available			X
Simplify data entry			X
Enhance reporting features			X
Establish the legal basis for the eTIR system in the TIR Convention	X		
Include Customs to Customs (C2C)	X		
Validation of the e-guarantee should be done in the system	X		
Test «amend declaration»	X		
Time required in man/days (average of stakeholders figures reported)			
For implementation of the messages	95		
Training of own staff	20	3	3
Training of partners		3.5	2.5

X: the stakeholder reported this feedback in the questionnaire

ANNEX 2 - Authentication of TIR Carnet holders

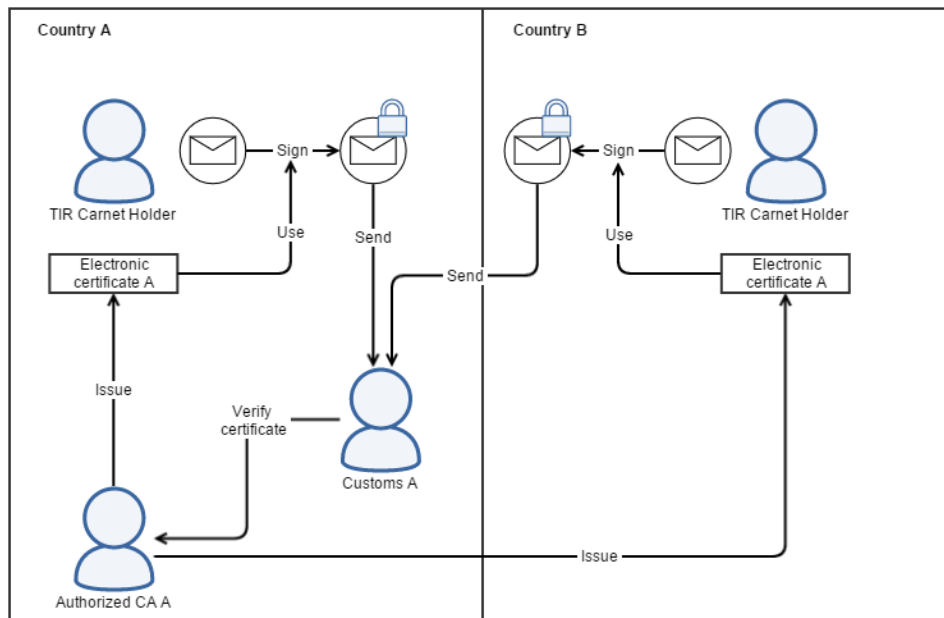
From the perspective of customs administrations, the authentication of TIR Carnet holders for the purpose of submitting a customs declaration can be a requirement. However, this can be ensured in different ways, with or without electronic signatures. The following parts introduce various options and present some of their advantages and drawbacks.

Authentication by means of an electronic signature

The following options are based on direct communications between TIR Carnet holders and customs administrations. The same mechanisms can be applied in case the messages are signed within and sent by a third party system.

Option 1 - Use of nationally recognized electronic certificates

Each country allowing the use of electronic signatures for legally binding documents also recognizes one or a number of certifications authorities (CA) that issue electronic certificates containing the keys required to electronically sign official documents. Therefore, as a first option, TIR Carnet holders could request and use electronics certificates from the countries where they want to submit electronic declarations.



Advantages

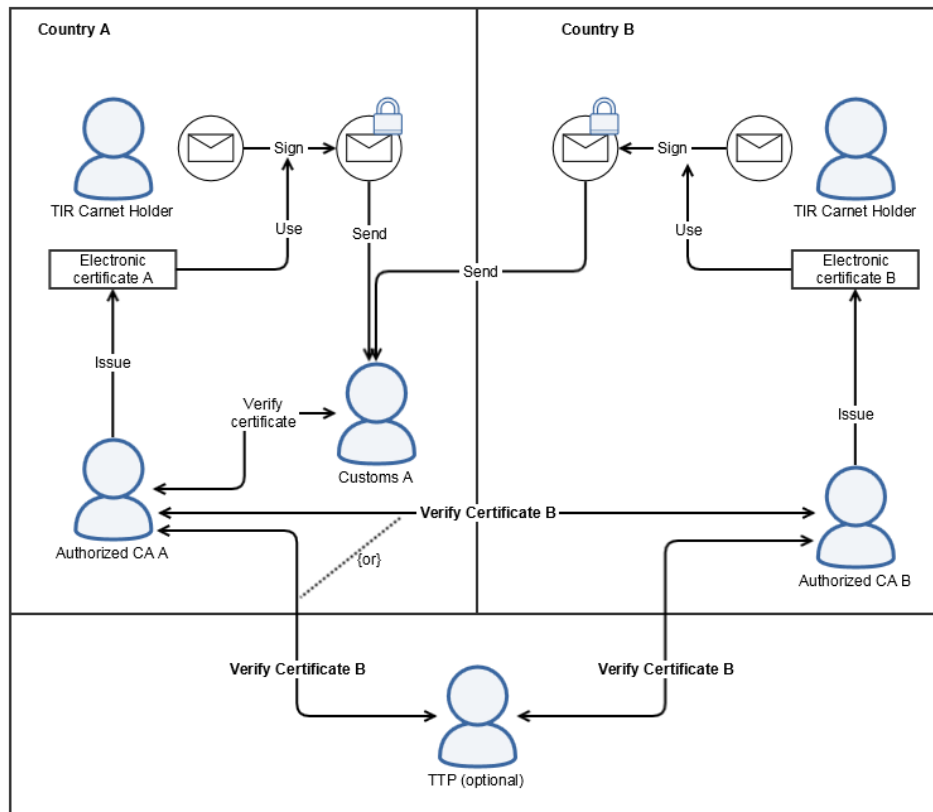
- No need to establish new CAs or ensure communication between existing ones.
- Relatively easy to implement in the framework of a pilot project involving only 2 countries.

Drawbacks

- Some countries might only issue certificates to natural or legal persons resident in that country.
- TIR Carnet holders would need to obtain and use a different certificate for each country where they would like to submit electronic declarations. They would need to follow the different national procedures and comply with all different national requirements to obtain all the necessary electronic certificates. Theoretically, each TIR Carnet holder could need 58 different certificates.

Option 2 - Mutual recognition of electronic certificates

Each country would issue electronic certificates to TIR Carnet holders in their own country. TIR Carnet holders would use their national certificates to sign messages to any country and customs would rely on their national CA to verify the validity of foreign certificates. This could either be done directly between CAs or via a Trusted Third Party (TTP) that would redirect any verification request to the adequate CA. This option was explained in detail at the 24th session of GE.1.



Advantages

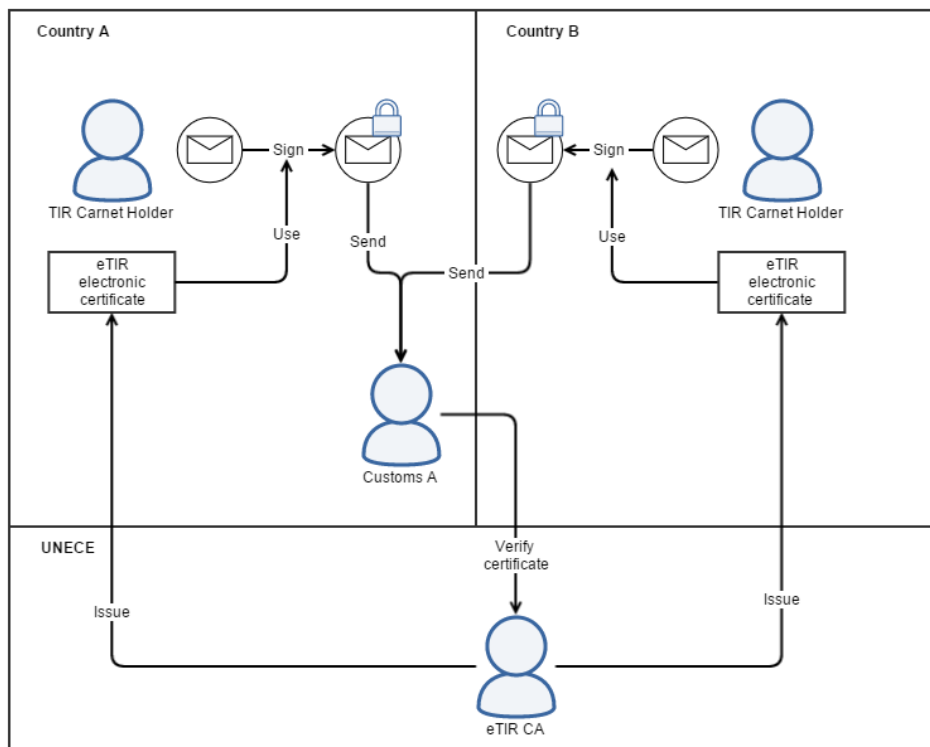
- TIR Carnet holders would only need one electronic certificate to electronically sign messages to any customs administration.

Drawbacks

- Direct communication between CA might not be realistic in some political contexts.
- The establishment of a TTP could be costly and take a long time to set up.
- The procedures to obtain electronic certificates vary from country to country. This might be an issue for the mutual recognition of those certificates. Possibly minimum requirements would have to be defined internationally.

Option 3 - Creation of an eTIR certification authority

A central certification authority could be created for the sake of signing electronic TIR messages. The procedure to issue those certificates could be part of the registration of authorized TIR Carnet holders in the ITDB.



Advantages

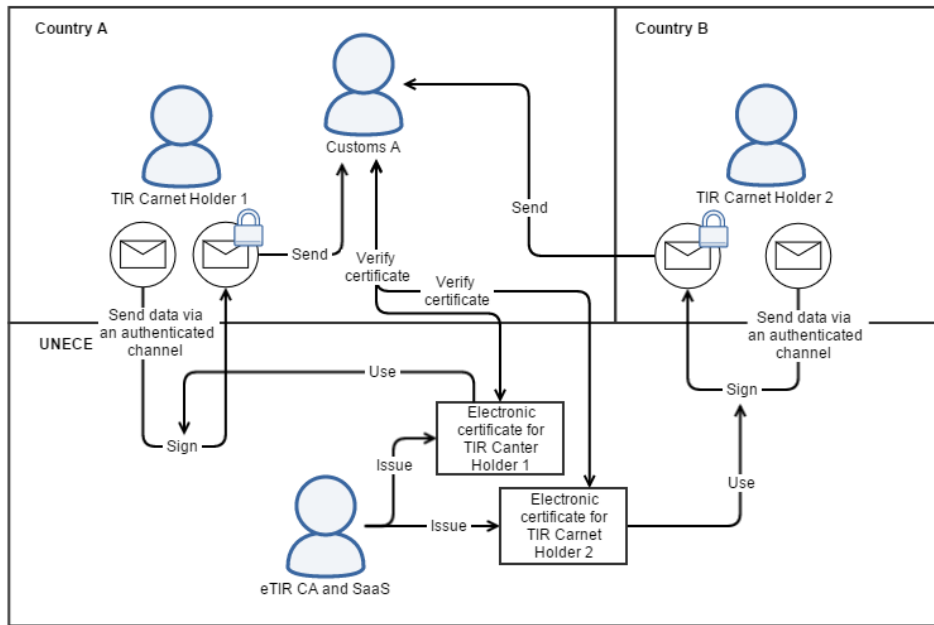
- TIR Carnet holders only require one electronic certificate to electronically sign messages to any customs administration.
- The procedure to obtain certificates would be identical for all TIR Carnet holders.

Drawbacks

- The formal establishment of the eTIR CA for all contracting parties could be costly and take a considerable time.

Option 4 - Signature as a service by the eTIR CA

This option is built on top of the infrastructure put in place for option 3. In addition, the eTIR CA also has the responsibility to sign the messages, thus providing Signature as a service (SaaS) functionalities.



Advantages

- No requirement for TIR Carnet holders to store the certificates (private key part): no risk of loss or copy, usable from anywhere.

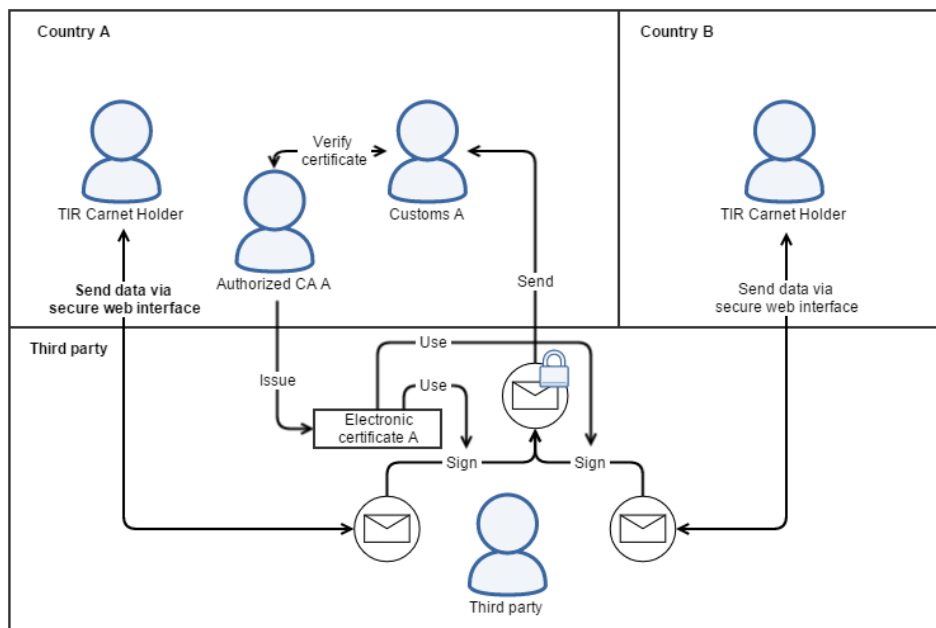
Drawbacks

- Same as for option 3;
- The Signature-as-a-Service must be highly available for signature process;
- The authentication of the TIR Carnet Holder by the SaaS provider needs to be defined and developed.

Other authentication methods

While electronic signatures using recognized electronic certificates would ensure the authentication of TIR Carnet holders submitting their declarations by means of electronic messages, other alternative methods can also be considered.

Option 5 - Delegation of authentication



Advantages

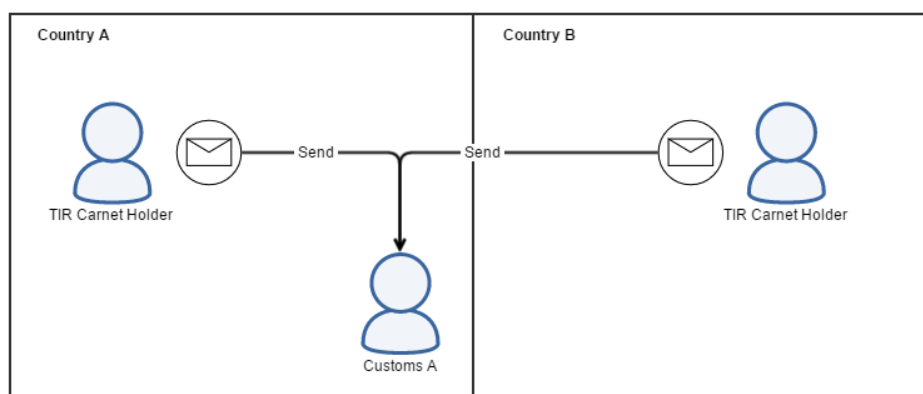
- This procedure was used for step 1 and proved to be successful.
- Such procedure is already in place in many countries to allow customs brokers to send data on behalf of TIR Carnet holders.

Drawbacks

- Electronic certificates are used but only to authenticate the third party that is responsible for sending the messages to customs.
- Customs need to trust that the third party has performed the authentication correctly. If the third party is IRU, this might require a provision to be included in the agreement between customs and the association (or a new agreement between customs and IRU) as well as in the contract (declaration of engagement) that binds the TIR Carnet holder with the association.

Option 6 - Authentication in person

In some countries the use of any authentication mechanism is not required at the moment of sending electronic messages. Instead, the TIR Carnet holder is deemed to have been authenticated when he, or his representative, provides a reference to the electronic message that he submitted when he presented himself at the customs office of departure with the goods and the vehicle.



Advantages

- This option does not require dealing with any electronic authentication mechanism.

Drawbacks

- Customs do not have an electronically signed document that proves the integrity of the message (another feature provided by the use of electronic signatures).
