**UNNExT**
United Nations Network of Experts for Paperless
Trade and Transport in Asia and the Pacific

**Brief No. 13, May 2015**

# Towards An Enabling
# Environment for Paperless Trade

## ASEAN Single Window:
## A Regional Single Window for ASEAN Connectivity

A number of countries in the Asia-Pacific region are in the process of establishing national Single Window (SW) facilities. Single Windows would help to simplify trade processes and procedures, and improve transparency and predictability in international trade transactions. This means fewer complexities, less delays and lower costs of trade that can ultimately lead to improved competitiveness and more trade.

The Asia-Pacific region is also a home to a regional-level Single Window. The ASEAN Single Window (ASW), an initiative of the Association of Southeast Asian Nations (ASEAN), intends to expedite cargo clearance within the context of increased economic integration in ASEAN by providing an infrastructure for electronic data exchange and communication among its Member States. Each Member State is committed to implement a National Single Window (NSW) that serves as the single point of connectivity and communication with other ASEAN Member States' NSWs, enabling direct data exchange among Member States in a closed secure network via the ASW Gateway.

This Brief provides an overview on the evolution of the ASW, including background, implementation history, features and functions, challenges and lessons learnt, as well as the author's perspective on the future of the ASW in terms of ASEAN connectivity and the realization of the ASEAN Economic Community (AEC).

**UNITED NATIONS**
**ESCAP**
Economic and Social Commission for Asia and the Pacific

**UNECE**
United Nations Economic
Commission for Europe

## BACKGROUND

The ASEAN Leaders at their Bali Summit in October 2003 declared that the ASEAN Economic Community (AEC) shall be the goal of regional economic integration by 2020. At the 12th ASEAN Summit in January 2007, the Leaders agreed to expedite the establishment of the AEC by 2015. The AEC will establish ASEAN as both a single market and a single production base which shall comprise five core elements: (i) free flow of goods; (ii) free flow of services; (iii) free flow of investment; (iv) free flow of capital; and (v) free flow of skilled labour.

Building on the single window concept as a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfill all import, export, and transit-related regulatory requirements, it was deemed necessary to establish an ASEAN Single Window (ASW) to expedite customs clearance and enhance trade facilitation for cross-border trade.

In 2004, the ASEAN Economic Ministers agreed to establish the Inter-Agency Task Force to facilitate the establishment of the ASW. The Inter-Agency Task Force completed its task in the development of 'The Agreement to Establish and Implement the ASEAN Single Window' and 'The Protocol to Establish and Implement the ASEAN Single Window'.

The Agreement to Establish and Implement the ASEAN Single Window[1] was signed by ASEAN Economic Ministers on 9 December 2005. The Protocol to Establish and Implement the ASEAN Single Window[2], which included more technical provisions and annexes, was signed by ASEAN Finance Ministers on 20 December 2006. In November 2007, ASEAN Heads of State re-affirmed their ASW commitment by signing the Declaration on the ASEAN Economic Community Blueprint[3].

To implement the ASW, an ASW Steering Committee (ASWSC) was established as the decision-making body and was supported by two working groups namely: the Working Group on Technical Matters (TWG), and the Working Group on Legal and Regulatory Matters (LWG). The ASWSC reports to the Directors General of Customs and the Senior Economic Officials Meeting (SEOM).

## OBJECTIVE AND CHARACTERISTICS OF THE ASEAN SINGLE WINDOW

The objective of ASW is to expedite cargo clearance within the context of increased economic integration in ASEAN by providing an infrastructure for electronic data/information/document exchange and communication among Member States.

The core characteristics of the ASW are:
- The National Single Window (NSW) of a Member State is the national gateway that serves as the single point of connectivity and communication with other Member States' NSWs in the ASW environment;
- The ASW will connect NSWs of Member States providing a platform for electronic transactions within ASEAN and subsequently between an ASEAN hub and other ASEAN dialog partners. That is, the ASW network infrastructure will ultimately provide an international gateway connecting to other national single windows or regional single windows of non-ASEAN countries;
- Trade data between the sender and the recipient(s) are maintained and owned by the parties concerned and will reside in the national domain, which is under the purview of the respective Member State.

## HISTORY AND CURRENT STATUS

In a study into the best fit architecture design for the ASW, Member States had imposed the following criteria:
- Bilaterally exchanged information must not be available to the third party and must not be routed through a third location; and
- Communication medium must (1) be a closed secure network, (2) connect geographically remote areas, (3) be highly available, robust and reliable, (4) guarantee information delivery, (5) be scalable, extensible and expandable, and (6) be easy to maintain and operate.
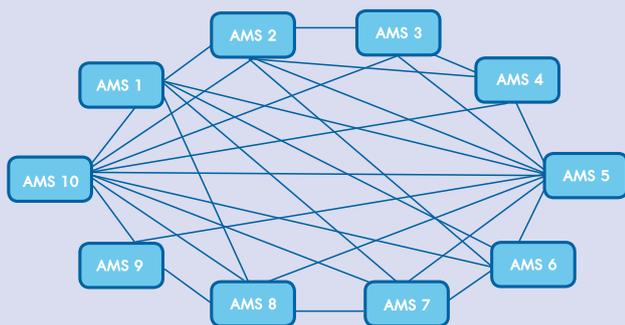
In view of the above criteria, a totally decentralized model allowing every Member State to develop its own gateway application, as in the leased line bilateral link model (Figure 1) was deemed to be impractical in terms of operation and maintenance. The star-like link model was also ruled out because of the possibility of sensitive trade data going through a central server/system (Figure 2).

---

[1] http://www.asean.org/communities/asean-economic-community/item/agreement-to-establish-and-implement-the-asean-single-window-kuala-lumpur-9-december-2005-2
[2] http://asw.asean.org/archives/agreements/item/protocol-to-establish-and-implement-asean-single-window
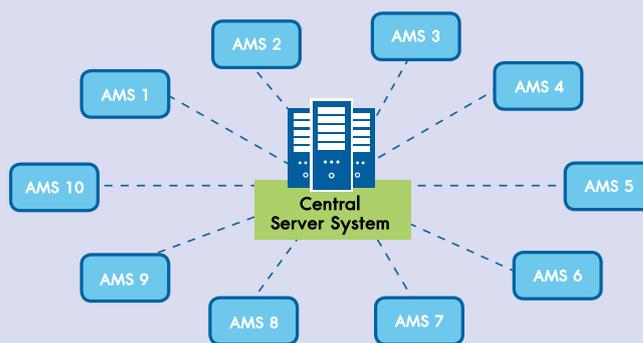[3] http://www.asean.org/archive/5187-10.pdf

## Figure 1:
## Leased Line Bilateral Link Model



## Figure 2:
## Star-Like Connectivity



Striking a balance between the two extreme models, Member States had agreed on a model that enabled distributed hosting of a regionally developed ASW Gateway Application and centralized hosting of the regional services (depicted in Figure 3). Such a model was deemed to provide flexibility and ability to bridge heterogeneous environments with the adoption of common standards and clear understanding of national responsibilities vis-a`-vis regional responsibilities.

Initial work started in 2010 to establish a technical architecture design that would allow NSWs of Member States to exchange data directly between each other but provide Regional Services (RS) such as storage and management of common reference data and tracking transaction statistics. Actual content of trade data and information exchanged would not be retained in the RS.

Faced with budget constraints, Member States decided to pilot a scaled-down version of the architecture design between November 2011 and March 2013. Concurrently, an ASW Legal Framework Protocol (LFP) that would govern the cross-border exchange of electronic data in the ASW environment was drafted and finalized in September 2014.

Since 2007 when the ASW Steering Committee, Technical Working Group and Legal Working started functioning, many activities have been completed. Table 1 shows achievements accomplished to-date.

## Table 1: Major Achievements of ASW Implementation

| February 2010 | Completion of MoU on the implementation of the ASW Pilot Project |
|---|---|
| February 2011 | Completion of architecture design of the ASW |
| August 2012 | Completion of Sustainability Study |
| September 2012 | ASW/NSW Symposium |
| March 2013 | Completion of Scaled-down ASW Pilot Project for connectivity testing between ASW gateways |
| May 2013 | Launching of the ASW web portal |
| December 2013 | Business Process Analysis for regional transactions |
| September 2014 | Completion of final draft of ASW Legal Framework Protocol |

There are also some on-going activities of ASW such as:

**(i) Data Harmonization on identified transactions and relevant data/information/documents for cross-border trade** Data harmonization and standardization enables interoperability of heterogeneous systems/ SWs, i.e., by converging towards a language understood by all these systems. Though data harmonization process could be initiated based on either existing documents or business processes, it is deemed more appropriate to conduct data harmonization based on data requirement identified from re-engineered business process, i.e., to conduct Business Process Analysis (BPA) to streamline the prioritized business process to be implemented first, before carrying out the process of data harmonization and standardization. BPA is a pre-requisite

to effective data harmonization, since it will actually help determine which data or piece of information the actors involved in the process really require, and in which format. The BPA conducted in 2013 had identified a few business processes which involved documents that could be implemented in the ASW such as phyto-sanitary certificate, commercial invoice & packing list, export manifest summary and freight booking & confirmation information. This on-going data harmonization effort includes re-engineering and streamlining of these identified processes as well as finalization of the data that need to be harmonized and standardized.

**(ii) Full-fledged ASW Pilot Project -** As of end 2014, the scaled-down implementation of the ASW Pilot with seven (7) participating Member States was confined to connectivity testing between ASW gateways hosted by individual Member States for the exchange of two documents, namely the ATIGA Form D (an ASEAN Preferential Certificate of Origin) and the ASEAN Customs Declaration Document (ACDD, for export information exchange).  The full-fledged ASW Pilot Project is an extension to cover the full end-to-end testing for the said documents as well as for additional documents to be agreed by Member States. It is envisaged that the remaining three (3) Member States would be ready to participate in the full-fledged pilot and all ten (10 Member States to pilot test a  few more types of documents so that the technical evaluation to be conducted on the ASW Pilot Project would be based on an environment

more similar to the real 'live' environment. Only then will the results of the technical evaluation be reliable and effectively help decision makers on the way forward for the rollout of the ASW to the 'live' environment.

**(iii) Determine the business model and governance model to sustain the operation of ASW -** The best fit business model and a good governance model are critical success factors of  'live' implementation of ASW. Thus, Member States have to finalize their review on the governance and business models recommended under the Sustainability Study which was conducted in 2012 and make a decision before the ASW move on to the 'live' environment. If Member States are seeking dependable source of revenue to operate the ASW, they need to consider whether to operate the ASW on a basis of for-profit or not-for-profit (that is, minimal revenue to cover solely the cost of ASW operation). Theoretically, revenue for ASW operation could be provided by a number of sources such as annual AMS contribution, annual ASEAN Fund contribution or user fees. A good governance model will ensure efficient continued oversight and effective accountability with optimum operating cost to oversee the ASW operation.

**(iv) Capacity building and awareness programme -** Capacity building and awareness is an on-going activity at regional level for new participating officials and at national level for government agencies concerned as well as the industry players.

## OVERALL ARCHITECTURE AND FUNCTIONALITIES OF ASW

The overall business and architectural environment of the NSW and ASW coexistence is depicted in Figure 3.



Figure 3: ASW Overall Architecture and Function
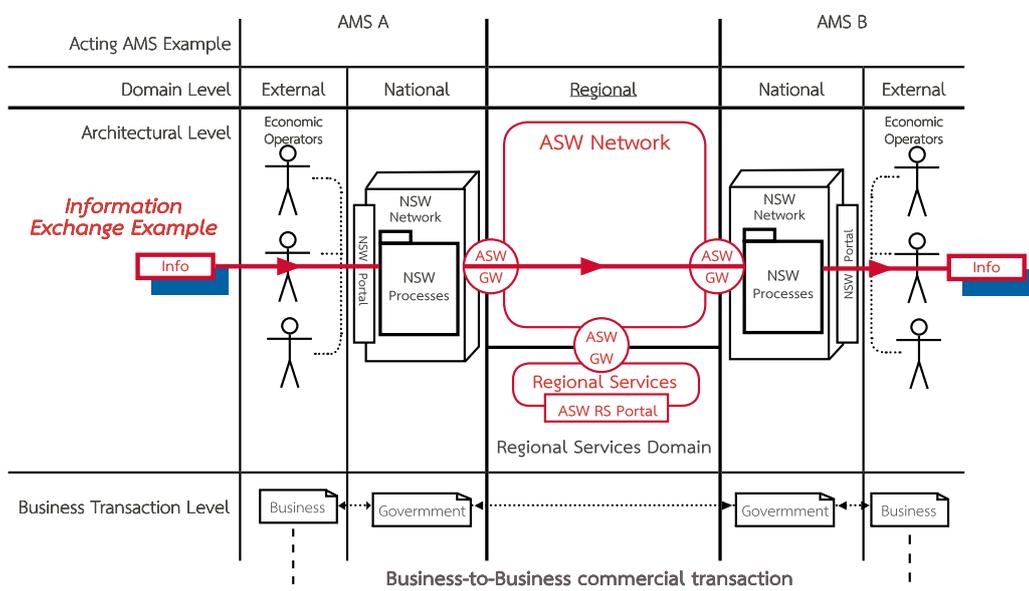
The ASW is composed of 3 main domains: National Domain, External Domain, and Regional Domain: (1) The National Domain represents the network infrastructure hosted by each of the Member States including existing national customs systems. The individual Member State will be responsible for the national domain network, including its security; (2) The Regional Domain consists of a close secure ASW Network and Regional Services; and, (3) The External Domain refers to the network used by economic operators and the trading community. The External Domain does not have direct access to the Regional Domain for the purposes of preserving the integrity and confidentiality of the data exchanged through the Regional Domain.

The ASW network will allow for the communication between the Member States and the Regional Services. All Member States must have the means to access the ASW Network. The ASW Gateway constitutes the single point of access to the ASW network for a Member State. The ASW Gateway provides the facility for the information exchange through the ASW Network. The Regional Services consist of a set of applications that will be accessible by Member States via the ASEAN closed secure network. Regional Services do not participate in the business transactions between Member States but provide supporting services to the ASW. These applications include:

● A Reference Data Services (RDS) application serves to manage the master copy of the regionally agreed reference data and disseminate changes to all ASW Gateways. Reference data covers both national reference data, (e.g. a list of Customs office codes or Authorized Economic Operator codes, which each Member State is responsible to maintain and update) and regional reference data (e.g. ASEAN Harmonized Tariff Code, country names and codes, currency codes, etc.) which would be maintained by a regional management team;

● Management Information System (MIS) application allows the collection and consolidation of relevant statistics and makes them available to Member States; and

● Portal allows authorized personnel to effect and/or view on-line changes to Reference Data and Management Information.

In the ASW network architecture, communication takes place in three distinct stages as depicted in Figure 4: (1) Local NSW to local ASW gateway, i.e., communication within the same country; (2) Local ASW gateway to remote ASW gateway (another ASW gateway at a remote site), i.e., cross-border communication; (3) Remote ASW gateway to remote NSW (If the local NSW is at the country sending a document, this communication will be within the receiving country).

For sending data from local NSW to local ASW gateway, local NSW application makes a connection to ASW gateway to transfer data. For NSW to receive data, messages received by local ASW Gateways from other remote ASW Gateways are put into queues for retrieval by their local NSWs. The NSW application will fetch the data via a secure channel and transfer it into the NSW for further processing. ASW Gateways do not initiate connections with the NSWs. The ASW Gateway to ASW Gateway communication occurs at the Regional level via the ASW IP-VPN Network.

## Figure 4: Data Flow from NSW to NSW via the ASW Network

NSW A → ASW Gateway A → ASW Network → ASW Gateway B → NSW B

# CHALLENGES IN ASW DEVELOPMENT

Many challenges are encountered in the ASW development and implementation such as:

● ASEAN's decision making is based on consensus. With ten (10) Member States at different levels of economic development, the interest and expectations on ASW are relatively diverse and coming to terms with each Member State's objectives on various matters can take time;

● In the current ASEAN environment, individual Member States have their own customs regime and legislation as well as different levels of automation, and it takes time to have all Member States to be ready at the same time and same level for ASW 'live' implementation;

● Planning and preparation costs could be high and up-front financial support is required. Thus, financial constraints remain an issue and implementation of the ASW Pilot is very much dependent on external funding;

● Operating and maintaining the ASW at the regional level will require more than Information and Communications Technology personnel to manage the ASW Regional Services and the ASW network. It will require, among other elements, a sustainable source of revenue, a budget to manage expenditures, and agreed location(s) to house human resourcesand the Regional Services server. Despite having a business model recommended by an appointed consultant in a sustainability study, decision-making on the agreed business model to govern and sustain the ASW operation could take longer than expected;

● Effective regional and NSW Legal Frameworks (e.g. mutual recognition of digital signatures, functional equivalence of paper and electronic documents, data confidentiality, liability, etc.) need to be in place and such legal matters tend to be complex;

● The NSW is one of the pre-requisites in the ASW implementation and its implementation has its own many sub-challenges (e.g. political will, national champion, business process re-engineering, data harmonization, public awareness, involvement of government agencies other than customs, etc.); and

● Business process reengineering needs to be carried out to streamline the cross-border processes, followed by data harmonization. Apart from having to get all Member States to agree on the regional processes, sourcing of expertise for these tasks is difficult and usually requires significant financial support.

# LESSONS LEARNED FROM ASW DEVELOPMENT

As in many regional projects, it is crucial to have the commitment at the Heads of State, including the trade and finance ministers, to kick start and support the on-going work for the development and implementation of the ASW.

Subsequently in the process of ASW development, specific lessons were learned such as:

● A clear and feasible vision from senior officials was necessary. For example, a regional SW system for centralized processing of all forms for all countries in a region may not be a practical objective due to reasons as follows:

(i) high volume of transactions will jam up a centralized system leading to issues of system capacity and performance;

(ii) a centralized system pose a high risk of single point of failure;

(iii) data confidentiality could be compromised for it passes through third party hardware.

● It was essential to have an institutional set-up for relevant officials to discuss and agree on functionalities and other technical as well as legal matters such as Steering Committee for decision makers, Technical Working Group for technical officials to discuss on technical matters and implementation activities, and Legal Working Group for legal officials to discuss on legal matters;

● Intellectual leadership is important to provide fresh ideas and learn from others' experiences. If a leader of a working group has an innovative mindset and expertise in areas such as single window environment, cross border paperless trade, customs processes and trade facilitation, he/she will have a broader perspective on matters raised by members, moderate the discussion more efficiently, be able to share new ideas or ideas learned through networking with other experts. As a result, members have clearer vision.

● Legal gap analysis for a single window environment at the national level, including looking at impediments to cross-border exchanges, should start as early as possible as issuing new or amended legislation can be a very lengthy process; and

● Regional legal impediments should be reviewed as early as possible. For example, the existing Operation Certification Procedure (OCP) under the ASEAN Trade in Goods Agreement (ATIGA) impedes the realization of paperless ATIGA Form D as the OCP mandates a manual signature of the approving party on the paper document of ATIGA Form D. The amendment process of the OCP to enable the acceptance of a digitally-signed electronic ATIGA Form D could take time. If the issue is not resolved for the end-to-end testing, it will have adverse impact on the full-fledged ASW Pilot Project and subsequently the ASW 'live' implementation.

# EXPECTED BENEFITS OF ASW

Since the ASW architecture ensures correct routing of electronic data across national and regional domains, it is expected to provide various benefits to the government as well as to the business such as:

● Pre-arrival information received through the ASW will enable border control officials to begin risk management on electronically processed information before arrival of goods so that subsequent clearance of physical cargo will be expedited.

● Electronic cross-border data exchange through the ASW could support a customs transit regime providing uninterrupted overland connectivity and facilitating movement of goods across the borders.

● The ASW will help improve track and trace capability of documents as the physical cargo moves across borders.

● The regional services of the ASW ensure synchronized control and standardized reference tables among participating governments.

● The ASW helps harmonize regional procedures and encourages Member States to carry out business process re-engineering to streamline procedures at the national level.

● The ASW ensures compatibility of all participating Member States with international open communication standards and ensures that each of those Member States can then exchange data securely and reliably with any trading partners that use international open communication standards.

# FUTURE OF ASW

For ASW to be effective and bring forth benefits to its stakeholders, more need to be done to broaden its scope of regional transactions for cross-border exchange of data within ASEAN and also between ASEAN and its dialog partners.  Activities that could add value to the ASW include:

(i)  Implementing the ASEAN Customs Transit System for the exchange of data in a single transit declaration through the ASW secure network to facilitate free flow of goods within ASEAN;

(ii)  Finalizing regional business processes for exchange of data through the ASW to support pre-arrival information for cargo clearance and risk assessment by the Customs Authority;

(iii)  Launching a regional trade repository for trade related information of each Member State to be readily accessible by traders anytime and anywhere; and,

(iv)  Establishing a mutual recognition mechanism to implement a regional Authorized Economic Operator Program within ASEAN.

Besides enhancing compliance by traders, the ASW should reduce the volume of trade-related paperwork required of traders by making them shared electronically. For example, with a single customs transit declaration to be submitted at the country of departure and shared via the ASW with the transit and destination countries, repetitive submission of the customs transit  declaration to Customs Authorities can be avoided.  In addition, the ASW should try to minimize time & costs associated with cargo clearance in the logistics and supply chain, for example by enabling sharing of trade-related documents electronically via the ASW prior to arrival of goods.

The ASW aims at providing a closed secure network to channel electronic trade data and information within ASEAN and eventually with its dialog partners. The current ASW Pilot Project has not adopted Multiprotocol Label Switching Virtual Private Network (MPLS-VPN). ASEAN may need to review the security level of the current ASW network architecture in the pilot project including data security, in preparation for the implementation of the ASEAN Customs Transit System and connectivity with other non-ASEAN systems or single windows.

An effective business model including good governance is essential for the ASW to sustain its operation and maintenance in the 'live' implementation to reliably deliver trade facilitation services in the coming years. Intellectual leadership will continue to be important in this regard, and participation of ASEAN Member States in UNNExT and the regional arrangement for the facilitation of cross-border paperless trade under negotiation at ESCAP would provide a useful framework both to learn from the experience of non-ASEAN members in exchanging data and information across borders for trade facilitation, as well as to ensure that the electronic data exchange protocols eventually developed through this broader regional arrangement would be built upon the work done by the Member States in the context of the ASW.

We welcome your feedback as well as expressions of interest in our work on trade facilitation. For further information, please write to Director, Trade and Investment Division, ESCAP

E-mail: escap-tid@un.org

Website: http://unnext.unescap.org/

The United Nations Network of Experts for Paperless Trade and Transport in Asia Pacific (UNNExT) provides a networking and knowledge-sharing platform for policy makers, practitioners and technical experts to bridge the implementation gaps between the countries with different level of trade facilitation. Its mission is to establish an ongoing community of knowledge and practice to facilitate the implementation of single window and paperless trade and Transport in the Asia-Pacific region. The UNNExT intends to enhance capacity of itsmembers to make informed decisions about policy issues at stake and to implement related international instruments and standards. It is operated jointly by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the United Nations Economic Commission for Europe (ECE).

Visit UNNExT at: http://unnext.unescap.org/