

# Design Guidelines for Adoption of an Information Infrastructure for International Trade in the Global Supply Chain Over Sea

Copenhagen Business School:

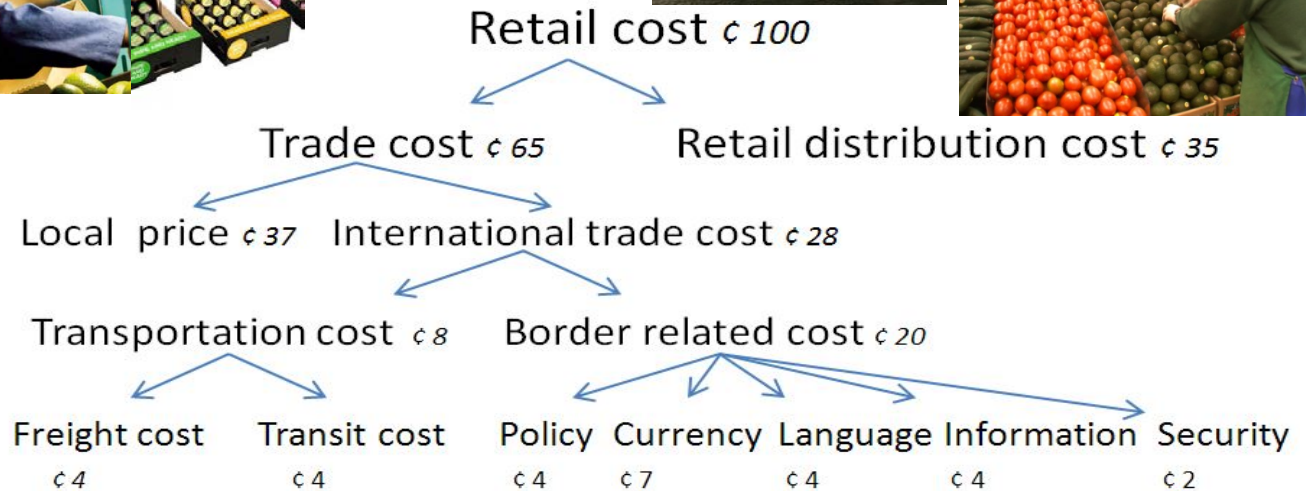
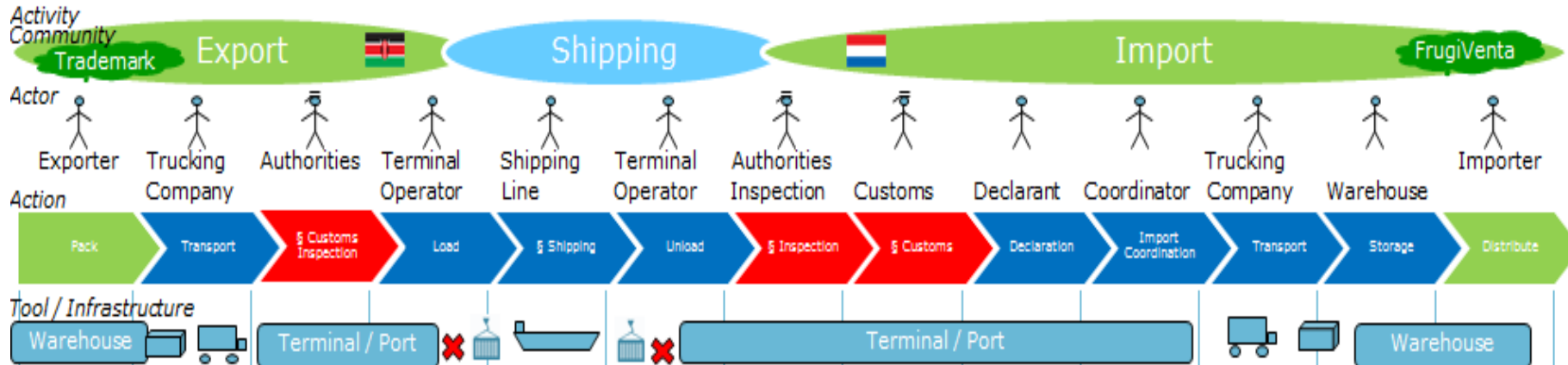
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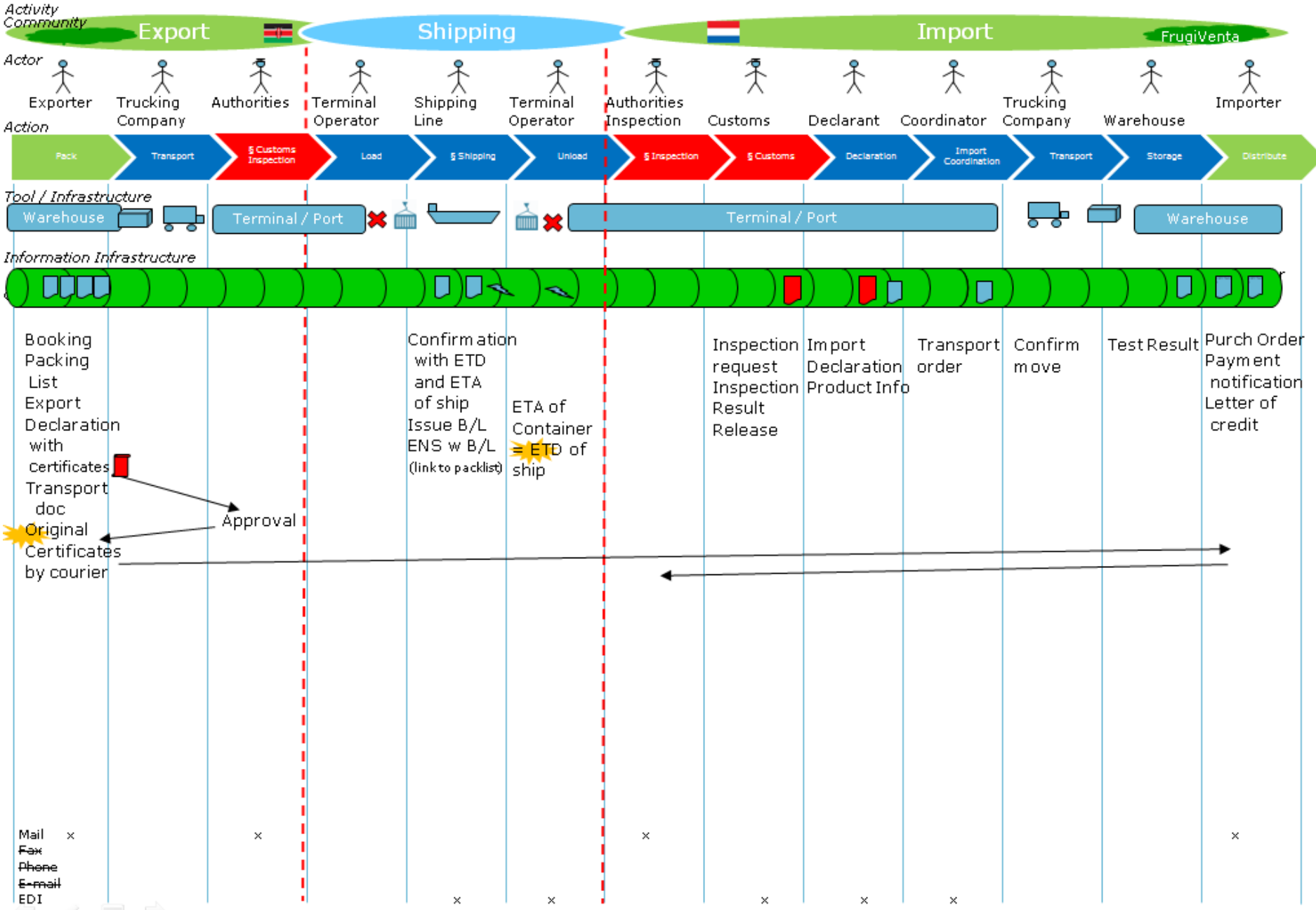
# Avocado Export Kenya-Netherlands

(EU project **CORE** (2014-2018), 70 partners, 49M budget)

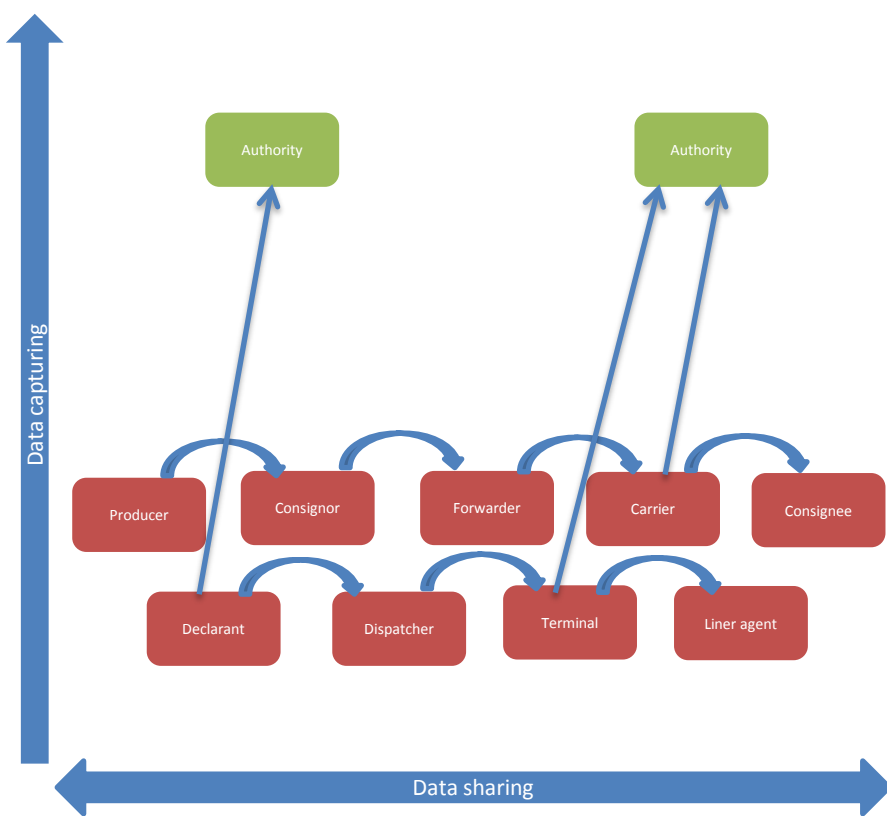




# Proposed document / information flow for international trade

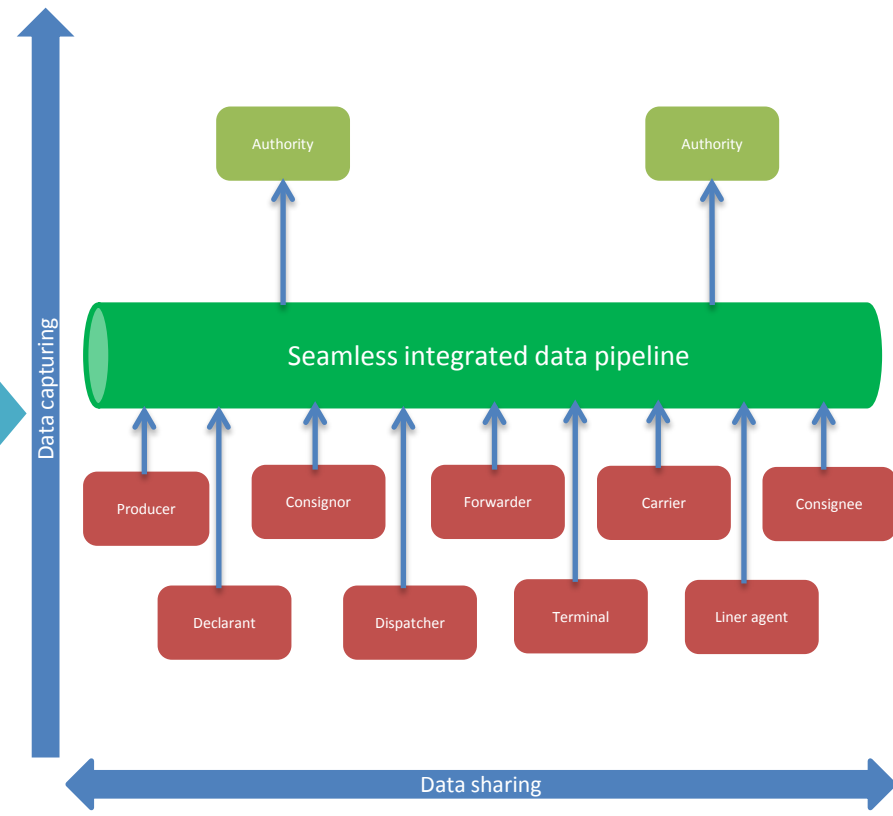


# Design Concepts for Information Infrastructure for International Trade



## Today: Peer to peer communication

- Data is reentered several times
- Data is summarized
- Data is pushed to the next in line
- Limited visibility



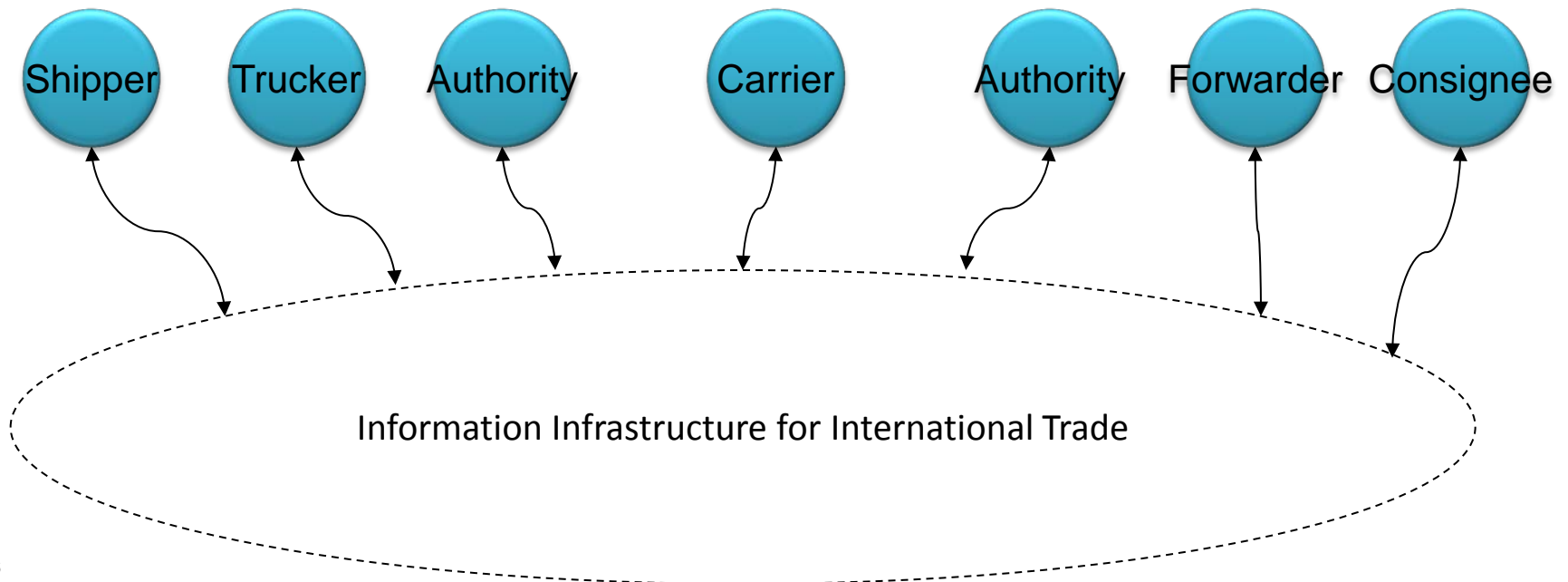
## Future: Shared communication

- 'Get the data from the source'
- Piggy backing on purpose for data
- Data is pulled when needed
- Increased visibility

# Initial Design of The Information Infrastructure for International Trade for one Trade Lane (MAERSK, Henrik Hvid Jensen)

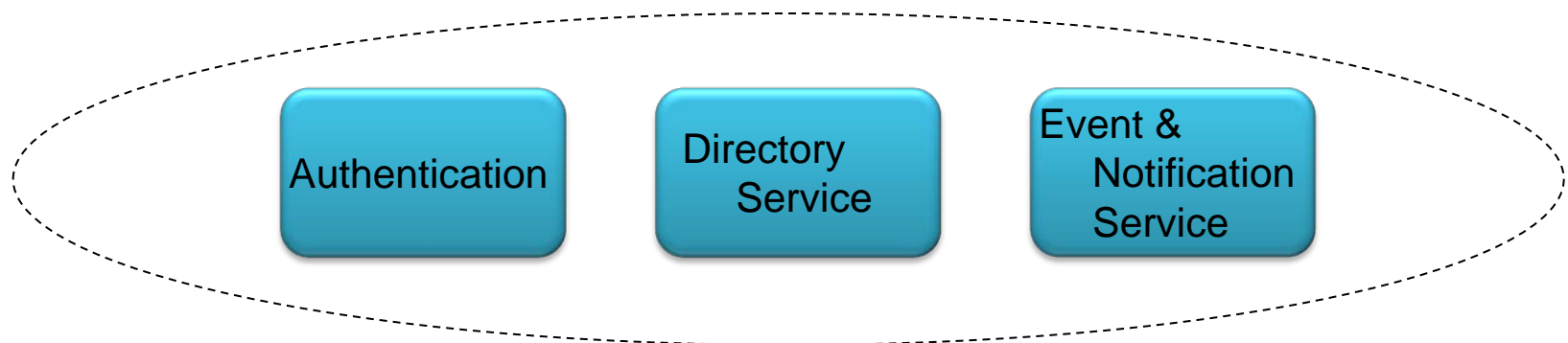
The Information Infrastructure for International Trade is a service based facility to allow partners in the supply chain to share accurate original data

- It can connect any number of trading partners
- There is no central data hub and only a minimum of data is stored to run the service
- There is no browser, no mobility, it is purely service based



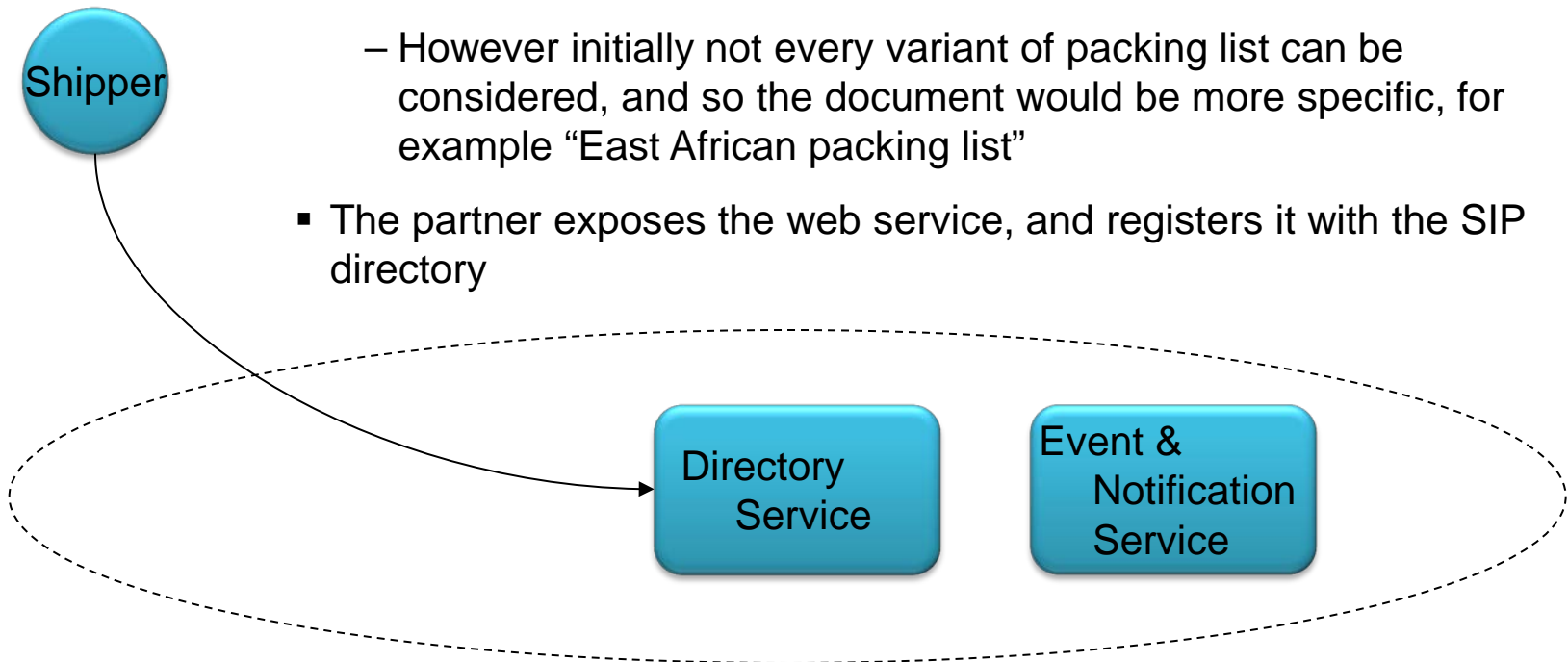
# Initial Design of The Information Infrastructure for International Trade

- There are three main components to the SIP
  - The **Authentication** will act as an authentication and authorisation engine to validate certificates and service security
  - The **Directory Service** where businesses can register and search for Web services. It will act as a one stop repository to publish & consume services providing proxy end points after service look up
  - The **Event & Notification Service** will act as a hub for events and allow publishers to indicate when events have occurred and documents are ready to be consumed



# The Shipping Information Pipeline – Directory Service

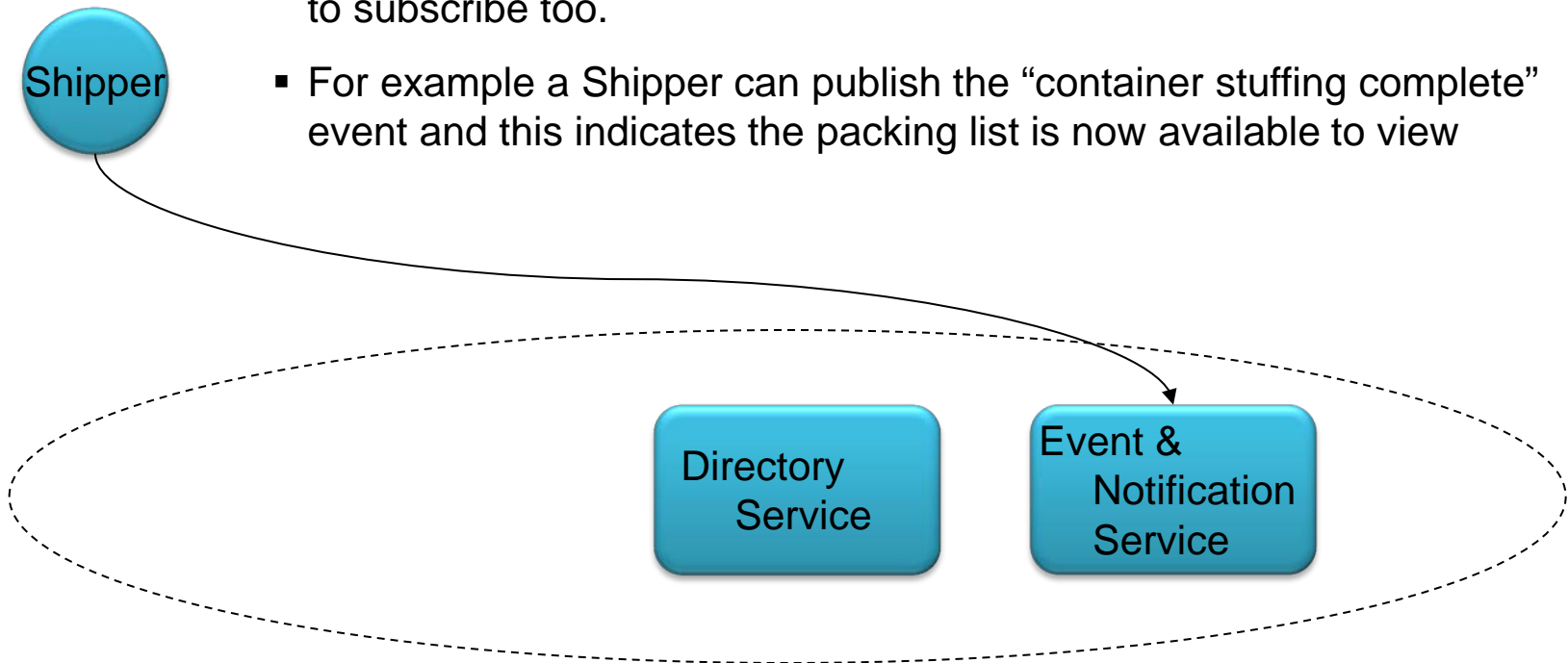
- The Directory Service will define the documents that can be shared. These will be the key documents that provide the original data source throughout the shipment process
  - The documents will be defined and standardized. An example document would be a “packing list”.
    - However initially not every variant of packing list can be considered, and so the document would be more specific, for example “East African packing list”
  - The partner exposes the web service, and registers it with the SIP directory





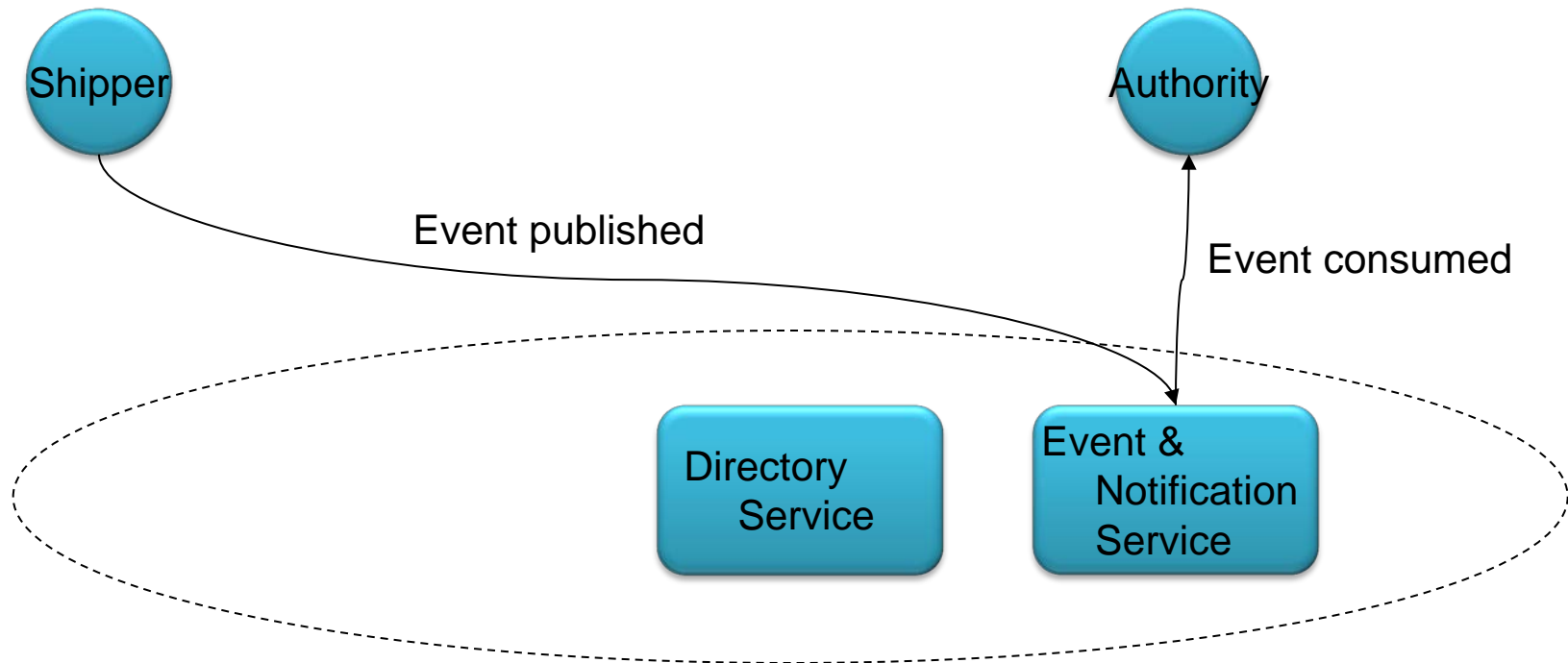
# The Shipping Information Pipeline – Event Service

- The Event & Notification Service will define the events that can be published and shared
  - The events will indicate that the consignment is at a particular stage or milestone in its journey, and/or a new document is now available to subscribe too.
  - For example a Shipper can publish the “container stuffing complete” event and this indicates the packing list is now available to view



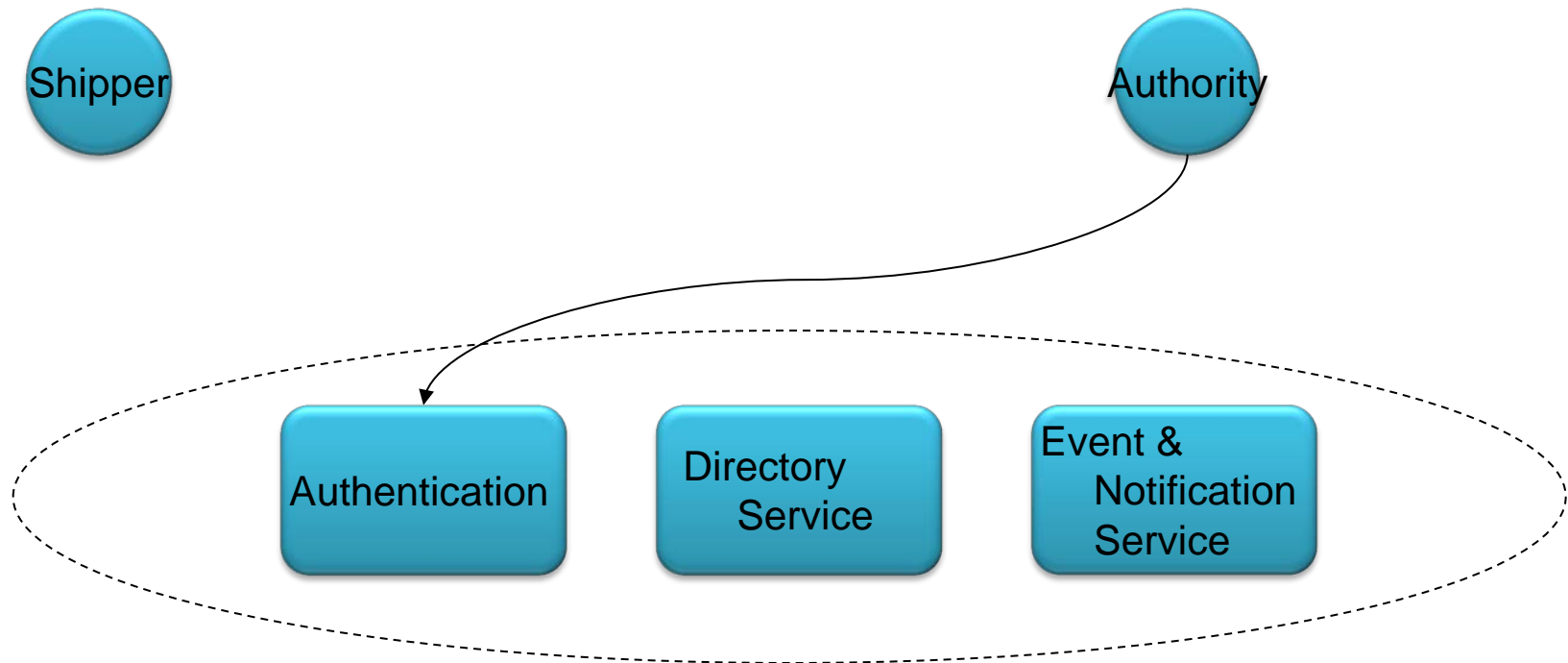
# The Shipping Information Pipeline – Event Service

- The Subscribers to the event can consume the relevant information. In this case the Authority subscribes to the “container stuffing complete” event and uses its own internal rule engine to evaluate and determine the next action



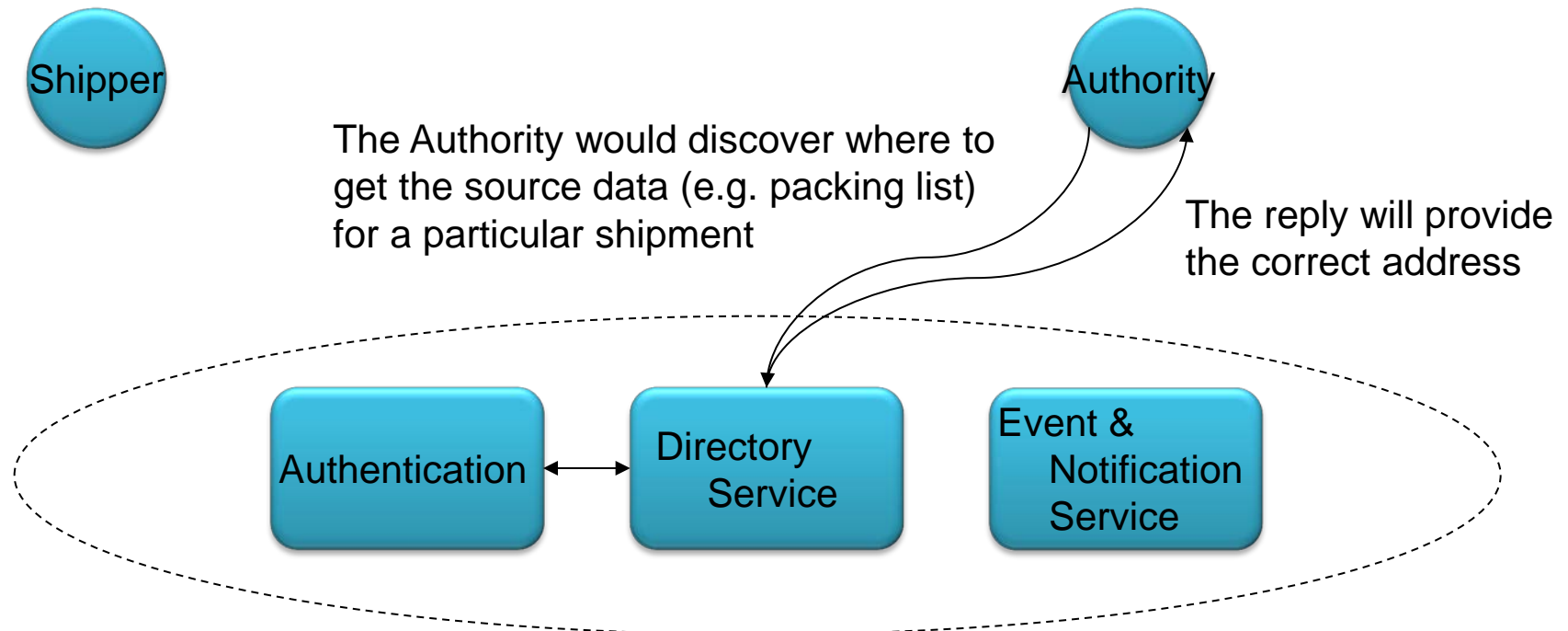
# The Shipping Information Pipeline – Authentication

- As all the service providers and consumers are outside the security domain/firewall of the SIP infrastructure they need to be trusted/authenticated through the authentication engine. One option being public key encryption.



# The Shipping Information Pipeline – Service Detail

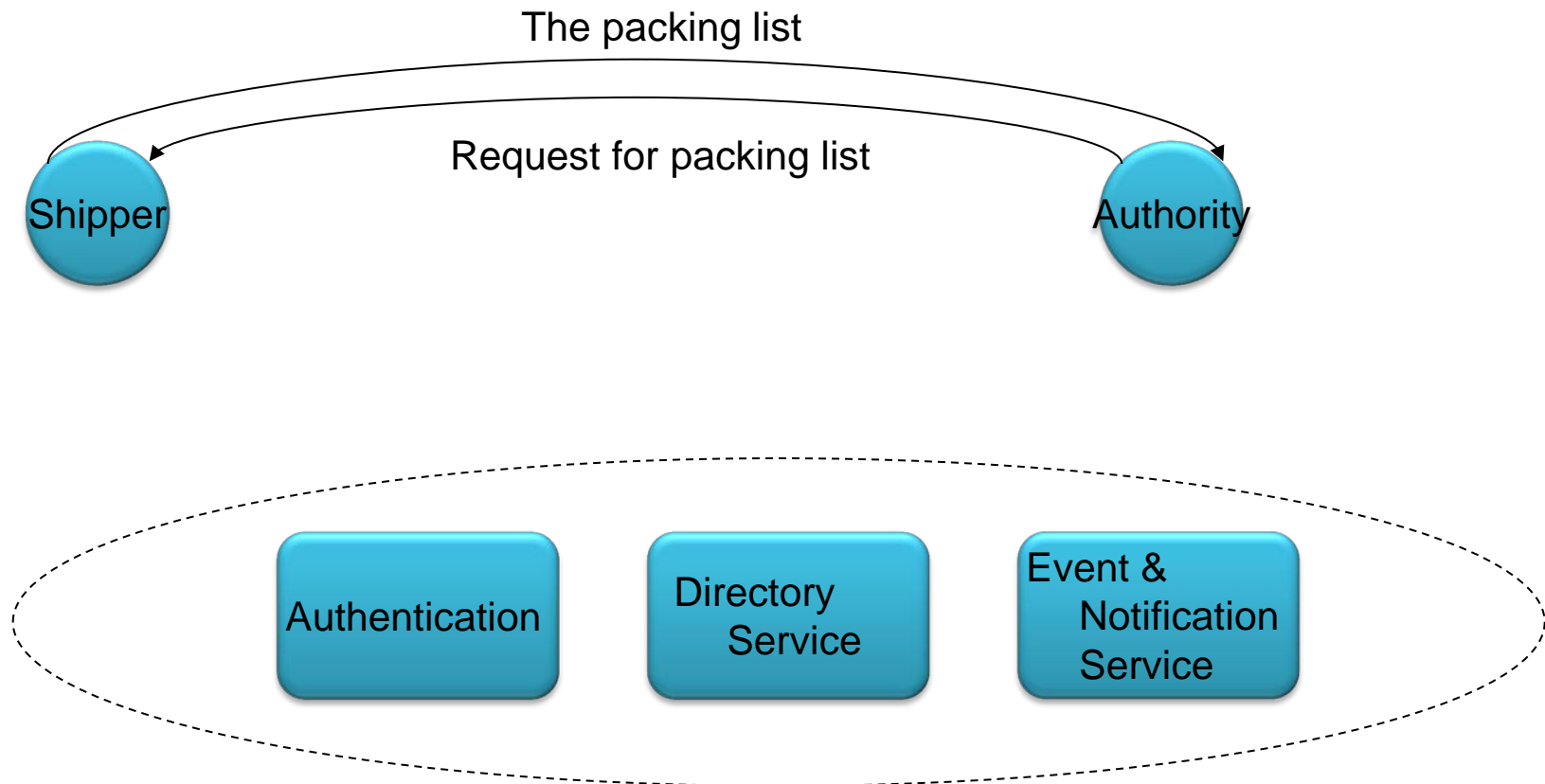
- As all the service providers and consumers are outside the security domain/firewall of the SIP infrastructure they need to be trusted/authenticated through the authentication engine
- The query request would then use the service registry to discover where to get the proxy end point of the required service to be invoked



One security option would be public key encryption

# The Shipping Information Pipeline – Service Request

- At the appropriate time defined by internal business rules the authority will invoke shippers service to retrieve the packing list



# Benefits

Importers identified the following benefits of the Information Infrastructure:

1. Accurate **Estimated Time of Departure** (ETD) of vessel with containers from port of origin
  2. Accurate **Estimated time of Arrival** (ETA) and later **Actual Time of Arrival** (ATA) at port of destination of the vessel,
  3. Accurate ETA and ATA of unload of a specific container
  4. Earlier information about selection for inspection(s) and scan
  5. Better planning of inspection(s) and scan including opening hours
  6. Accurate time of exit from terminal area.
- **Total benefit: 50% reduction of lead time of cargo unloading in a port**
    - importer can also better plan the pickup of the container instead of constantly checking if the container has been unloaded.