



ARTS POSLog V6.0

Volume 6: Transaction Item Links Technical Specification

February 10, 2014 – Last Call Working Draft

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1. Abstract

1.1 Overview

1.2 In Scope for this Volume

Which kinds of transaction links should be considered in this volume?

This is what we have within the schema and where it is already referenced:

- "Resume"
- "DeferredBill"
- "ReceiptReprint"
- "Reservation"
- "SuggestedItem"
- "RetrospectiveLoyalty"
- "PaidOut"

1.3 Out of Scope for this Volume to be found in another volume

- ("Return" – volume 8)
- ("LayAway" – volume 16)
- ("Voided" - volume 13)

2. Referenced Documents

- **ARTS Technical Committees Development Process V6.0.4 2009/11/30**
- **ARTS XML Best Practices V2.2 2010/11/11**
- **ARTS Best Practice for Process Modeling V1.0.0 2011/01/04**
- **ARTS SOA Best Practices Technical Report V1.2**
- **ARTS XML Interface Conformance Tool Manual V1.0 2005/08/11**

These documents are available for download from <http://nrf.com>

3. ARTS Common Header

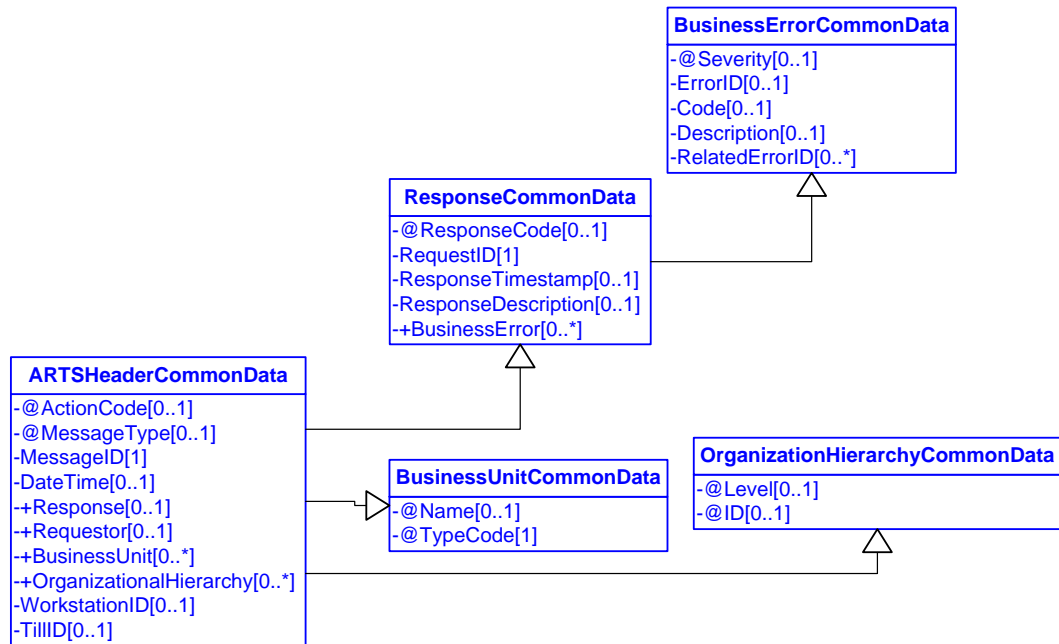


Figure 1: ARTS Common Header Domain View

The ARTS common header is used in all service name schemas. It provides the ability to set session level information and return business error information in one standard format to all SOA implementations.

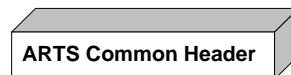


Figure 2: ARTS Common Header Representation

Since this structure is common to all service name schemas, it will not be replicated below. In place of the details, the attached box will be used to represent this complex type structure.

4. Use Case: Importing Transaction(s) from External Systems (V6.0)

Brief Description

When the content of the Retail Transaction is imported from another system – for example a self-scan system it is required to maintain references to the equivalent transaction in that other system.

To accomplish this TransactionLink complex type is used to point a particular line item to the original Customer Order Transaction and line item from which it was imported. One can also point the entire transaction to the Customer Order Transaction from which it was derived by using the Transaction Link at the Transaction Level.

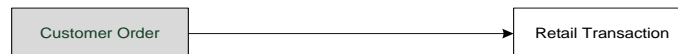
4.1 Scenario: Self-Scan

Brief Description

The customer is provided with a mobile scanning device when entering the shop. He uses that device in order to scan the items he wants to buy immediately while walking along the aisles.

After the customer has caught all items he wanted to buy he goes to a POS/checkout kiosk in order to finish his purchase.

In this context, the mobile scanning system is the external system where a customer order is created. And at the POS/checkout kiosk a retail transaction is created for that.



Scenario Description

Bill grabs a mobile scanning device. He starts walking along the aisles. First he takes a coke, scans it and puts it into his bag. Then he takes a chocolate bar, scans it and put it into his bag. He notices that the promotion currently active for the chocolate bar hasn't fired. He goes to the POS and asks the cashier for assistance. The cashier downloads the two positions from Bill's mobile scanning device. Then he corrects the price of the chocolate bar. Bill pays cash. The cashier finishes the transaction.

Assumption

Pre-Conditions

Post-Conditions

Data

Line items – one per each position the cashier has downloaded from the mobile scanning device:

- ItemType = "Stock"
- EntryMethod = "SelfScan"
- POSItemID = the scanned barcode

- TransactionLink = identification of concerning customer order and position therein which was created on the mobile scanning device by the customer
 - TransactionID
 - LineltemSequenceNumber
- ExtendedAmount

4.1 ARTS XML Conformance XML Instance Document - Self-Scan

```
<?xml version="1.0" encoding="UTF-8"?>
<POSLog xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.nrf-arts.org/IXRetail/namespace/
  ../POSLogV6.0.0.xsd"
  xmlns="http://www.nrf-arts.org/IXRetail/namespace/" MajorVersion="6"
  MinorVersion="0" FixVersion="0">
  <Transaction>
    <BusinessUnit><UnitID Name="HighStreet">100</UnitID></BusinessUnit>
    <WorkstationID>POS5</WorkstationID>
    <SequenceNumber>100</SequenceNumber>
    <OperatorID>John</OperatorID>
    <RetailTransaction>
      <Lineltem EntryMethod="SelfScan">
        <ScanData TypeCode="Barcode">123123</ScanData>
        <SequenceNumber>1</SequenceNumber>
      </Lineltem>
    </RetailTransaction>
  </Transaction>
</POSLog>
```

4.1a ARTS XML Conformance XML Instance Document - Self-Scan conversion

```
<?xml version="1.0" encoding="UTF-8"?>
<POSLog xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.nrf-arts.org/IXRetail/namespace/
  ../POSLogV6.0.0.xsd"
  xmlns="http://www.nrf-arts.org/IXRetail/namespace/" MajorVersion="6"
  MinorVersion="0" FixVersion="0">
  <Transaction>
    <BusinessUnit><UnitID Name="HighStreet">100</UnitID></BusinessUnit>
    <WorkstationID>POS5</WorkstationID>
    <SequenceNumber>200</SequenceNumber>
    <OperatorID>John</OperatorID>
    <RetailTransaction>
      <Lineltem EntryMethod="SelfScan">
        <Sale ItemType="Stock">
          <ItemID Type="SKU">1234</ItemID>
          <ExtendedAmount>1.00</ExtendedAmount>
          <TransactionLink>
            <TransactionID>100</TransactionID>
            <LineltemSequenceNumber>1</LineltemSequenceNumber>
          </TransactionLink>
        </Sale>
      </Lineltem>
    </RetailTransaction>
  </Transaction>
</POSLog>
```

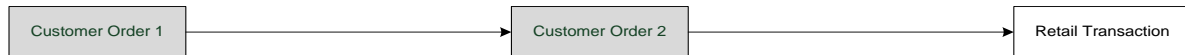
```
</Sale>
</LineItem>
</RetailTransaction>
</Transaction>
</POSLog>
```

4.2 Scenario: Source Link

Brief Description

The customer places an order by phone. Later, he calls again and changes the content of his original order. The ordered goods are delivered to the store where the customer picks them up.

In this context, an order is created for the first call. Another order is created for the second call. It changes the first order. Finally at the POS a retail transaction is created which resolves this.



This is a synchronization issue between POSLog and the ARTS Data Model. In the data model, every Customer Order Transaction is aggregated into one Customer Order. POSLog XML doesn't create a new Customer Order Transaction when one of the items is changed. It creates a new Line Item with a link to the line item being changed. In POSLog XML a Customer Order Transaction is an entire transaction.

In RTI each Customer Order Transaction from the source to the POS acts in a similar fashion to the ARTS Data Model and can be a separate transaction for each line item. However the return path must be an entire transaction, as that is what will be presented to the customer. It is up to the POS to create this aggregated Customer Order Transaction.

When finished, the POSLog XML Customer Order Transaction is converted (basically changing its label) to a Retail Transaction. With everything self-contained, anyone using this information in the retail ecosystem is not required to follow a link of separate transactions to figure out what happened.

Assumption

Write up the two options – changing an existing order and creating linked order.

Pre-Conditions

Post-Conditions

Scenario Description

Brian calls the book store and orders the new volume of the Garden Dictionary. A few minutes later he remembers that he hasn't got bought a present for his friend yet. So he calls the book store again and increases the count of ordered copies of the Garden Dictionary to 2. Additionally, he orders a greeting card. The assistant at the phone tells him that the ordered goods will be available in the shop the next day. So Brian goes to

the shop on the next afternoon. He picks up the two copies of the Garden Dictionary and the greeting card there.

Data

1st Line item:

- ItemType = "Stock"
- EntryMethod = "Keyed"
- ItemID
- ExtendedAmount

2nd Line item:

- Cancel the first line item
- ItemType = "Stock"
- EntryMethod = "Keyed"
- ItemID
- ExtendedAmount
- Item Link to the canceled item

3rd Line item (the 2 copies of the Garden Dictionary):

- ItemType = "Stock"
- EntryMethod = "Keyed"
- ItemID
- ExtendedAmount
- Quantity

4th Line item (the greeting card):

- ItemType = "Stock"
- EntryMethod = "Keyed"
- ItemID
- ExtendedAmount

4.2 ARTS XML Conformance XML Instance Document – Source Link (original transaction)

```
<?xml version="1.0" encoding="UTF-8"?>
<POSLog xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.nrf-arts.org/IXRetail/namespace/
  ../POSLogV6.0.0.xsd"
  xmlns="http://www.nrf-arts.org/IXRetail/namespace/" MajorVersion="6"
  MinorVersion="0" FixVersion="0">
  <Transaction>
    <BusinessUnit><UnitID Name="HighStreet">100</UnitID></BusinessUnit>
    <WorkstationID>POS5</WorkstationID>
    <SequenceNumber>4294967295</SequenceNumber>
    <OperatorID>John</OperatorID>
    <CustomerOrderTransaction OrderChannel="CallCenter">
      <!-- Book Order -->
      <LineItem>
```

```
<Sale ItemType="Stock">
  <POSIdentity>
    <POSItemID>01234567890123</POSItemID>
  </POSIdentity>
  <ExtendedAmount>4.89</ExtendedAmount>
</Sale>
<SequenceNumber>1</SequenceNumber>
</LineItem>
</CustomerOrderTransaction>
</Transaction>
</POSLog>
```

4.2b ARTS XML Conformance XML Instance Document – Source Link (changed transaction)

```
<?xml version="1.0" encoding="UTF-8"?>
<POSLog xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.nrf-arts.org/IXRetail/namespace/
  ../POSLogV6.0.0.xsd"
  xmlns="http://www.nrf-arts.org/IXRetail/namespace/" MajorVersion="6"
  MinorVersion="0" FixVersion="0">
  <Transaction>
    <BusinessUnit><UnitID Name="HighStreet">100</UnitID></BusinessUnit>
    <WorkstationID>POS5</WorkstationID>
    <SequenceNumber>4294967295</SequenceNumber>
    <OperatorID>John</OperatorID>
    <CustomerOrderTransaction OrderChannel="CallCenter">
      <!-- Original line item -->
      <!-- (must not eliminate or change for loss prevention reasons) -->
      <LineItem>
        <Sale ItemType="Stock">
          <POSIdentity>
            <POSItemID>01234567890123</POSItemID>
          </POSIdentity>
          <ExtendedAmount>4.89</ExtendedAmount>
        </Sale>
        <SequenceNumber>1</SequenceNumber>
      </LineItem>
      <!-- Cancels the original line item being changed -->
      <LineItem CancelFlag="true">
        <Sale ItemType="Stock">
          <POSIdentity>
            <POSItemID>01234567890123</POSItemID>
          </POSIdentity>
          <ExtendedAmount>4.89</ExtendedAmount>
          <ItemLink>1</ItemLink>
        </Sale>
        <SequenceNumber>2</SequenceNumber>
      </LineItem>
      <!-- add New line item with change in quantity (2 books) -->
      <LineItem>
```

```
<Sale ItemType="Stock">
  <POSIdentity>
    <POSItemID>01234567890123</POSItemID>
  </POSIdentity>
  <ExtendedAmount>9.78</ExtendedAmount>
  <Quantity>2</Quantity>
</Sale>
<SequenceNumber>3</SequenceNumber>
</LineItem>
<!-- New items added (Greeting Card) to order -->
<LineItem>
  <Sale ItemType="Stock">
    <POSIdentity>
      <POSItemID>asdfasdf</POSItemID>
    </POSIdentity>
    <ExtendedAmount>1.05</ExtendedAmount>
  </Sale>
  <SequenceNumber>4</SequenceNumber>
</LineItem>
</CustomerOrderTransaction>
</Transaction>
</POSLog>
```

5. Use Case: Transaction Link – Organizational Hierarchy

Brief Description

Where a Retailer is running a POS System from a single server, and this covers many trading "Companies", there may be several Retail Stores with an ID of "0001" (typically where the Companies were grouped through acquisition, or where they cover different Geographic areas). To distinguish between Company A Store 0001 and Company B Store 0001 in POSLog, both are necessary in the Transaction Link.

5.1 Scenario: Return

Brief Description

This is to show the use of the organizational hierarchy to link purchases made in two stores with the same store number but in different hierarchies.

Volume 8 deals more completely with Returns.

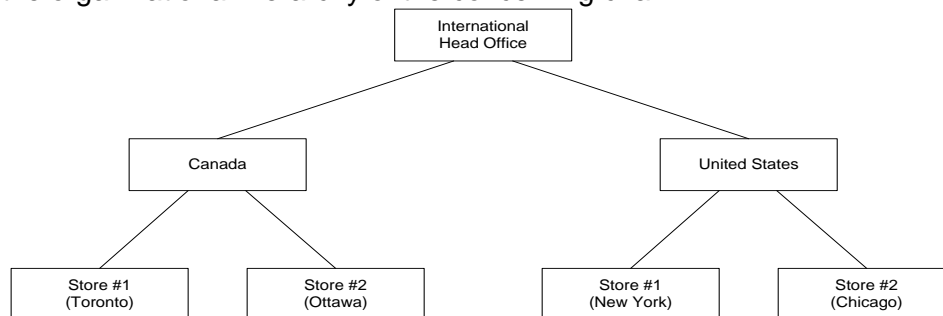
Scenario Description

The customer buys an electronic device while he is on vacation, but it breaks almost immediately. So after having returned home he complains about it at a local store belonging to the same chain.

Scenario Description

Curt is on vacation in Chicago. He buys a hairdryer at the Chicago location of the Hairdryer Company on 11/11/2013. After returning home the hairdryer broke, he returns it in his home town Ottawa.

This is the organizational hierarchy of the concerning chain:



Data

Line Item:

- ItemType = "Stock"
- EntryMethod = "Scanned"
- POSItemID = the scanned barcode
- TransactionLink = identification of the selling transaction and position therein
 - BusinessUnit
 - OrganizationalHierarchy
 - Level = "District"
 - ID
- ExtendedAmount

5.1 ARTS XML Conformance XML Instance Document – Organizational Hierarchy

```
<?xml version="1.0" encoding="UTF-8"?>
<POSLog xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.nrf-arts.org/IXRetail/namespace/
  ../POSLogV6.0.0.xsd"
  xmlns="http://www.nrf-arts.org/IXRetail/namespace/" MajorVersion="6"
  MinorVersion="0"
  FixVersion="0">
  <Transaction>
    <BusinessUnit>
      <UnitID Name="HighStreet">100</UnitID>
    </BusinessUnit>
    <WorkstationID>POS5</WorkstationID>
    <SequenceNumber>4294967295</SequenceNumber>
    <OperatorID>John</OperatorID>
    <RetailTransaction>
      <LineItem>
        <Sale ItemType="Stock">
          <POSIdentity>
            <POSItemID>01234567890123</POSItemID>
          </POSIdentity>
          <ExtendedAmount>4.89</ExtendedAmount>
          <TransactionLink>
            <BusinessUnit>100</BusinessUnit>
            <WorkstationID>1</WorkstationID>
            <BusinessDayDate>
              <Date>2013-11-11</Date>
            </BusinessDayDate>
            <!-- Chicago Hairdryer Company in the 3rd District -->
            <OrganizationalHierarchy Level="District"
ID="3">100</OrganizationalHierarchy>
              <SequenceNumber>1</SequenceNumber>
            </TransactionLink>
          </Sale>
          <SequenceNumber>1</SequenceNumber>
        </LineItem>
      </RetailTransaction>
    </Transaction>
  </POSLog>
```

6. Use Case: Multiple Customer Order Sources

Brief Description

If a transaction imports a set of items from another transaction, then the link to the original transaction needs to be maintained. This is completed through a Transaction Link element against each LineItem/Sale.

However where the set of items is relatively large, e.g. import 20 items from a customer order + 10 items from a previous receipt (return of a complete transaction) this results in a large number of duplicated transaction links.

Suggest creating transaction level transaction links representing the import event (e.g. scan of receipt - also log EntryMethod, date time); the individual items can then have a single pointer to the transaction link thus reducing the volume of the outbound xml while retaining the integrity of the data.

While looking at this also considers that there should be logging of the entry of a transaction link (lookup) which may not have been found, or may have been in an invalid state - this falls under the domain of logging events during a retail transaction.

6.1 Scenario: Multiple Counters

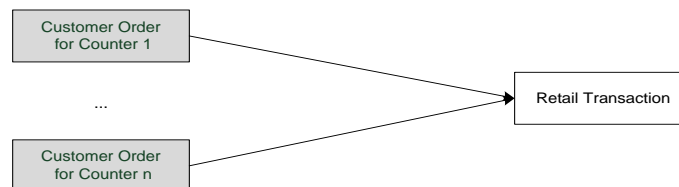
Ties to Volume 1 Customer Order Transaction: Use Case 6: Multiple Revenue Centers.

Brief Description

The customer orders items at several counters inside the store. At each counter he gets a bag with the items he ordered there. A barcode which encrypts the order number and bag total is clipped on the bag. Finally he goes to the POS in order to pay.

There are multiple items purchased at the deli, ham, cheese, bagels. The customer is given the items with one customer order transaction. When the customer gets to the checkout stand the POS retrieves the customer order transaction, imports the list of items and maintains a link back to the original transaction and line items. The solution is to have one line item that is the transaction link back to the original transaction with each following line item having an item link to this line item.

In this context, the scales at the counters are the external systems where customer orders are created. And the retail transaction which is created at the POS finally resumes those customer orders.



Assumption

Pre-Conditions

Post-Conditions

Scenario Description

Lilly goes to the cheese counter where she orders some parmesan cheese. The assistant weighs it and puts it into a bag. He clips the barcode containing the scales' order number and some additional information onto the bag.

Next Lilly goes to the meat counter where she orders 2 sausages. The assistant at this counter weighs them and puts them into a bag. He clips another barcode containing the scale's order number and some additional information onto that bag.

Lilly proceeds to the POS. The cashier scans both barcodes. The POS identifies the customer orders by the order numbers which are encrypted in the barcodes.

Lilly pays for her purchase.

Data

Line items – one per each resumed customer order position:

- ItemType = "Stock"
- EntryMethod = "Weighed"
- ItemID
- TransactionLink = identification of concerning customer order and position therein which was created on the scales at the counter
 - TransactionID
 - LineItemSequenceNumber
- ExtendedAmount

6.1 ARTS XML Conformance XML Instance Document – Multiple Counters

```
<?xml version="1.0" encoding="UTF-8"?>
<POSLog xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.nrf-arts.org/IXRetail/namespace/
  ../POSLogV6.0.0.xsd"
  xmlns="http://www.nrf-arts.org/IXRetail/namespace/" MajorVersion="6"
  MinorVersion="0" FixVersion="0">
  <Transaction>
    <BusinessUnit><UnitID Name="HighStreet">100</UnitID></BusinessUnit>
    <WorkstationID>POS5</WorkstationID>
    <SequenceNumber>4294967295</SequenceNumber>
    <OperatorID>John</OperatorID>
    <RetailTransaction>
      <!-- Parmesan Cheese from scale -->
      <LineItem EntryMethod="Weighed">
        <Sale ItemType="Stock">
          <POSIdentity>
            <POSItemID>01234567890123</POSItemID>
          </POSIdentity>
          <ExtendedAmount>8.79</ExtendedAmount>
        </Sale>
      </LineItem>
    </RetailTransaction>
  </Transaction>
</POSLog>
```

```
        <TransactionID>1</TransactionID>
        <LineItemSequenceNumber>1</LineItemSequenceNumber>
    </TransactionLink>
</Sale>
    <SequenceNumber>1</SequenceNumber>
</LineItem>
<!-- Sausages from different scale -->
<LineItem EntryMethod="Weighed">
    <Sale ItemType="Stock">
        <POSIdentity>
            <POSItemID>01234567890123</POSItemID>
        </POSIdentity>
        <ExtendedAmount>4.89</ExtendedAmount>
        <TransactionLink>
            <TransactionID>234</TransactionID>
            <LineItemSequenceNumber>1</LineItemSequenceNumber>
        </TransactionLink>
    </Sale>
    <SequenceNumber>1</SequenceNumber>
</LineItem>
</RetailTransaction>
</Transaction>
</POSLog>
```

6.2 Scenario: Recalled Items

Scenario Description

Fred bought a new shirt that was recalled by the factory for bad buttons.

Data

- Transaction link back to the original transaction.

6.2 ARTS XML Conformance XML Instance Document - Transaction Line for recalled/imported items

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- UseCase: Item Purchase from shelf -->
<!-- Note: This example includes no optional data, and shows the most minimal set of -->
>
<!-- data required to record a sale -->
<POSLog xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.nrf-arts.org/IXRetail/namespace/
  ../POSLogV6.0.0.xsd"
  xmlns="http://www.nrf-arts.org/IXRetail/namespace/" MajorVersion="6"
  MinorVersion="0" FixVersion="0">
    <Transaction>
      <BusinessUnit><UnitID Name="HighStreet">100</UnitID></BusinessUnit>
      <WorkstationID>POS5</WorkstationID>
```



```
<SequenceNumber>4294967295</SequenceNumber>
<OperatorID>John</OperatorID>
<RetailTransaction>
  <LineItem Action="Recall">
    <!-- the Shirt -->
    <Sale ItemType="Stock">
      <POSIdentity>
        <POSItemID>01234567890123</POSItemID>
      </POSIdentity>
      <ExtendedAmount>12.90</ExtendedAmount>
      <!-- the original transaction on which this shirt was bought -->
      <TransactionLink>
        <TransactionID>123123</TransactionID>
      </TransactionLink>
    </Sale>
    <SequenceNumber>1</SequenceNumber>
  </LineItem>
</RetailTransaction>
</Transaction>
</POSLog>
```

7. Document History

8. Version History

Version 1.0

Overview

New Features

Sections	Description of Change
	-

Minor fixes

Deprecation

Sections	Description of Change
	-

Compatibility/Dependencies Issues

Previous Document

9. GLOSSARY

Term	Definition