GS1 US

The Global Language of Business

Explore Critical Tracking Events (CTEs) and Key Data Elements (KDEs)

Traceability begins when a product is uniquely identified. It could be from product harvest to product creation by assigning a Global Trade Item Number® (GTIN®) to uniquely identify it.

From this point forward, there are various points in a supply chain at which data should be captured in order to document product movement. These points are referred to as Critical Tracking Events (CTEs).

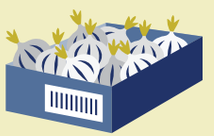
The following example demonstrates how to apply "visibility standards" via Electronic Product Code Information Services (EPCIS) to describe the what, when, where, and why of CTEs from the harvest of an onion to the selling of the finished good in the grocery store.

Choose a product scenario and see how CTEs and KDEs are applied for traceability

Packed Onions

Finished Goods

Packed Onions



Packed Onions

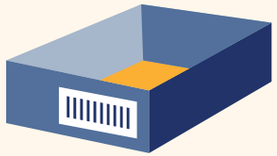
Finished Goods

Harvest

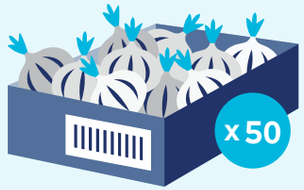
Onions Dug and Clipped in Field

Transform

Packaging Materials



Packed Onions



Transport

Packed Onions Shipped to Packing Shed

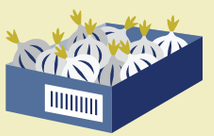
Packed Onions Received at Packing Shed

	Key Data Element Name	EPCIS Translation	Attribute Value
Type	-	EPCIS Event Type	Object
When	Date/Time	Event Time	2018-10-16 07:00:00.000 GMT-04:00
	-	Record Time	2018-10-16 16:00:00.000 UTC
What	Item (GTIN)	GTIN	00614141000012*
	Lot or Batch or Serial #	Lot	20180330F101
	Quantity	Quantity	100
	Unit of Measure	UOM	Bushel
Where	-	Read Point	0614141012350
	-	Biz Location	0614141012350
Why	-	Biz Step	Commissioning
	-	Disposition	Active
	Activity Type	Biz Transaction Type	ProdOrder
	Activity ID	Biz Transaction ID	WO234
	-	ILMD (mda:)	harvestdate 2018-10-16

*This GTIN is the individual onion

Onions (input) are harvested in the field into bushels, then loaded into “packaging materials” (input). Packed onions are the output. These onions are loose in the bushels; they are not packed in the field in the form of a finished good. Sometimes they are packed into sacks or bins instead of bushels.

Packed Onions



Packed Onions

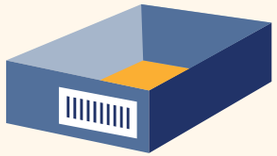
Finished Goods

Harvest

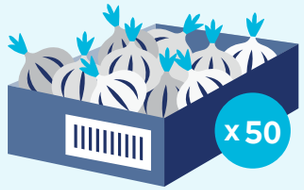
Onions Dug and Clipped in Field

Transform

Packaging Materials



Packed Onions



Transport

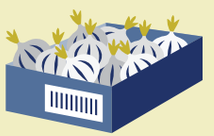
Packed Onions Shipped to Packing Shed

Packed Onions Received at Packing Shed

	Key Data Element Name	EPCIS Translation	Attribute Value
Type	-	EPCIS Event Type	Object
When	Date/Time	Event Time	2018-10-16 00:00:00.000 GMT-04:00
	-	Record Time	2018-10-16 04:00:00.000 UTC
What	Item (GTIN)	GTIN	00123452000036
	Lot or Batch or Serial #	Lot	XJ23456
	Quantity	Quantity	50
	Unit of Measure	UOM	
Where	-	Read Point	0012345000119
	-	Biz Location	0012345000119
Why	-	Biz Step	Commissioning
	-	Disposition	Active
	Activity Type	Biz Transaction Type	ProdOrder
	Activity ID	Biz Transaction ID	WO234

Packaging materials have been previously created for use. This input step identifies the packaging materials to be used in this transformation step.

Packed Onions



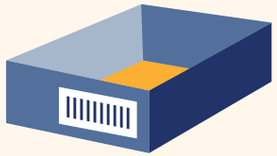
Packed Onions

Finished Goods

Harvest

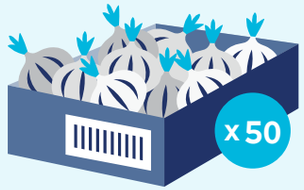
Onions Dug and Clipped in Field

Packaging Materials



Transform

Packed Onions



Transport

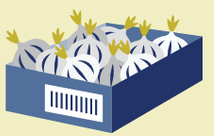
Packed Onions Shipped to Packing Shed

Packed Onions Received at Packing Shed

	Key Data Element Name	EPCIS Translation	Attribute Value
Type	-	**EPCIS Event Type**	Transformation
When	**Date/Time**	**Event Time**	2018-10-16 13:00:00.000 GMT-04:00
	-	**Record Time**	2018-10-16 20:00:00.000 UTC
What: Input	**Item (GTIN)**	**GTIN**	00614141000012
	Lot or Batch or Serial #	**Lot**	20180330F101
	Quantity	**Quantity**	100
	Unit of Measure	**UOM**	Bushel
What: Input	**Item (GTIN)**	**GTIN**	00123452000036
	Lot or Batch or Serial #	**Lot**	XJ23456
	Quantity	**Quantity**	50
	Unit of Measure	**UOM**	-
What: Output	**Item (GTIN)**	**GTIN**	00614141100002
	Lot or Batch or Serial #	**Lot**	20180330F10112
	Quantity	**Quantity**	50
	Unit of Measure	**UOM**	Bin
Where	-	**Read Point**	0614141012350
	-	**Biz Location**	0614141012350
Why	-	**Biz Step**	Commissioning
	-	**Disposition**	Active
	Activity Type	**Biz Transaction Type**	ProdOrder
	Activity ID	**Biz Transaction ID**	WO456
	-	**ILMD (mda:)**	productiondate 2018-10-16

The harvested onions (input) are put into the packaging materials (input) to create the cases of packed onions (output) for shipment to the shed.

Packed Onions



Packed Onions

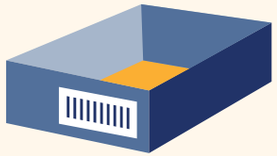
Finished Goods

Harvest

Onions Dug and Clipped in Field

Transform

Packaging Materials



Packed Onions

Transport

Packed Onions Shipped to Packing Shed

Packed Onions Received at Packing Shed

	Key Data Element Name	EPCIS Translation	Attribute Value
Type	-	EPCIS Event Type	Object
When	Date/Time	Event Time	2018-10-17 08:00:00.000 GMT-04:00
	-	Record Time	2018-10-17 12:00:00.000 UTC
What	Item (GTIN)	GTIN	00614141100002
	Lot or Batch or Serial #	Lot	20180330F10112
	Quantity	Quantity	50
	Unit of Measure	UOM	-
Where	-	Read Point	0614141012350
	-	Biz Location	0614141012350
Why	-	Biz Step	Shipping
	-	Disposition	In Transit
	Activity Type	Biz Transaction Type	DesAdv
	Activity ID	Biz Transaction ID	ASN123
	-	Sources	00614141012353
	-	Destinations	0061414130011

Packed onions are shipped to the Packing Shed.

Packed Onions

Packed Onions

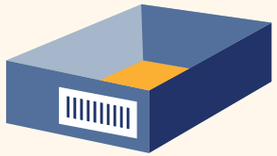
Finished Goods

Harvest

Onions Dug and Clipped in Field

Transform

Packaging Materials



Packed Onions

Transport

Packed Onions Shipped to Packing Shed

Packed Onions Received at Packing Shed

	Key Data Element Name	EPCIS Translation	Attribute Value
Type	-	EPCIS Event Type	Object
When	Date/Time	Event Time	2018-10-18 8:00:00.000 GMT-04:00
	-	Record Time	2018-10-18 12:00:00.000 UTC
What	Item (GTIN)	GTIN	00614141100002
	Lot or Batch or Serial #	Lot	20180330F10112
	Quantity	Quantity	50
	Unit of Measure	UOM	-
Where	-	Read Point	0061414130011
	-	Biz Location	0061414130011
Why	-	Biz Step	Receiving
	-	Disposition	In Progress
	Activity Type	Biz Transaction Type	RecAdv
	Activity ID	Biz Transaction ID	RA123

Packed onions received at Packing Shed.

Finished Goods

Packed Onions

Finished Goods

Transform

Create Finished Goods

Transport

Ship Finished Goods

Receive

Receive Finished Goods

Deplete

Finished Goods Sold at Point of Sale

Destroy Unsaleable Finished Goods

	Key Data Element Name	EPCIS Translation	Attribute Value
Type	-	**EPCIS Event Type**	Transformation
When	**Date/Time**	**Event Time**	2018-10-18 00:00:00.000 GMT-04:00
	-	**Record Time**	2018-10-18 04:00:00.000 UTC
What: Input	**Item (GTIN)**	**GTIN**	00614141100002
	Lot or Batch or Serial #	**Lot**	20180330F10112
	Quantity	**Quantity**	25
	Unit of Measure	**UOM**	-
What: Output	**Item - Finished Goods - (GTIN)**	**GTIN**	00614141300068
	Lot or Batch or Serial #	**Lot**	2018040G11440
	Quantity	**Quantity**	15
	Unit of Measure	**UOM**	Bag
Where	-	**Read Point**	0061414130011
	-	**Biz Location-**	0061414130011
Why	-	**Biz Step**	Commissioning
	-	**Disposition**	Active
	Activity Type	**Biz Transaction Type**	ProdOrder
	Activity ID	**Biz Transaction ID**	WO789

Finished goods are created (bags of onions) for transport to final point of sale.

Finished Goods

Packed Onions

Finished Goods

Transform

Create Finished Goods

Transport

Ship Finished Goods

Receive

Receive Finished Goods

Deplete

Finished Goods Sold at Point of Sale

Destroy Unsaleable Finished Goods

	Key Data Element Name	EPCIS Translation	Attribute Value
Type	-	**EPCIS Event Type**	Object
When	**Date/Time**	**Event Time**	2018-10-23 00:00:00.000 GMT-04:00
	-	**Record Time**	2018-10-23 04:00:00.000 UTC
What	**Item (GTIN)**	**GTIN**	00614141300068
	Lot or Batch or Serial #	**Lot**	2018040G11440
	Quantity	**Quantity**	10
	Unit of Measure	**UOM**	-
Where	-	**Read Point**	0061414130011
	-	**Biz Location**	0061414130011
Why	-	**Biz Step**	Shipping
	-	**Disposition**	In Transit
	Activity Type	**Biz Transaction Type**	DesAdv
	Activity ID	**Biz Transaction ID**	ASN789
	-	**Sources**	0061414130011
	-	**Destinations**	0840002030038

Finished goods are shipped to final point of sale.

Finished Goods

Packed Onions

Finished Goods

Transform

Create Finished Goods

Transport

Ship Finished Goods

Receive

Receive Finished Goods

Deplete

Finished Goods Sold at Point of Sale

Destroy Unsaleable Finished Goods

	Key Data Element Name	EPCIS Translation	Attribute Value
Type	-	EPCIS Event Type	Object
When	Date/Time	Event Time	2018-10-26 00:00:00.000 GMT-04:00
	-	Record Time	2018-10-26 04:00:00.000 UTC
What	Item (GTIN)	GTIN	00614141300068
	Lot or Batch or Serial #	Lot	2018040G11440
	Quantity	Quantity	10
	Unit of Measure	UOM	-
Where	-	Read Point	0840002030038
	-	Biz Location	0840002030038
Why	-	Biz Step	Receiving
	-	Disposition	In Progress
	Activity Type	Biz Transaction Type	RecAdv
	Activity ID	Biz Transaction ID	RA789
	-	Sources	0840002030038
	-	Destinations	-

Finished goods are received at final point of sale.

Finished Goods

Packed Onions

Finished Goods

Transform

Create Finished Goods

Transport

Ship Finished Goods

Receive

Receive Finished Goods

Deplete

Finished Goods Sold at Point of Sale

Destroy Unsaleable Finished Goods

	Key Data Element Name	EPCIS Translation	Attribute Value
Type	-	EPCIS Event Type	Object
When	Date/Time	Event Time	2018-10-26 00:00:00.000 GMT-04:00
	-	Record Time	2018-10-26 04:00:00.000 UTC
What	Item (GTIN)	GTIN	00614141300068
	Lot or Batch or Serial #	Lot	2018040G11440
	Quantity	Quantity	8
	Unit of Measure	UOM	-
Where	Event Locations (GLN)	Read Point	0840002030038
	Event Owner (GLN)	Biz Location	0840002030038
Why	-	Biz Step	Retail Selling
	-	Disposition	Retail Sold
	Activity Type	Biz Transaction Type	Receipt Transaction*
	Activity ID	Biz Transaction ID	POS 123
	-	Sources	-
	-	Destinations	-

*Receipt Transaction does not yet exist and would need to be developed

Finished goods (onions in the bag) are sold at point of sale.

Finished Goods

Packed Onions

Finished Goods

Transform

Create Finished Goods

Transport

Ship Finished Goods

Receive

Receive Finished Goods

Deplete

Finished Goods Sold at Point of Sale

Destroy Unsaleable Finished Goods

	Key Data Element Name	EPCIS Translation	Attribute Value
Type	-	EPCIS Event Type	Object
When	Date/Time	Event Time	2018-10-26 00:00:00.000 GMT-04:00
	-	Record Time	2018-10-26 04:00:00.000 UTC
What	Item (GTIN)	GTIN	00614141300068
	Lot or Batch or Serial #	Lot	2018040G11440
	Quantity	Quantity	2
	Unit of Measure	UOM	-
Where	Event Locations (GLN)	Read Point	0840002030038
	Event Owner (GLN)	Biz Location	0840002030038
Why	-	Biz Step	Destroying
	-	Disposition	Destroyed
	Activity Type	Biz Transaction Type	Work Order*
	Activity ID	Biz Transaction ID	WO456
	-	Sources	-
	-	Destinations	-

*Work Order does not yet exist and would need to be developed

Unsaleable finished goods (bags of onions) are destroyed.