

GS1 System Landscape

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1 0. Introduction

2 0.1. The Objective

3 Worldwide, hundreds of thousands of organisations use GS1 standards to support the
4 movement of goods, supply of services and exchange of information. All these organisations
5 need to be confident that the GS1 system is coherent and consistent and that their investment
6 in GS1 compliant systems will bring them the benefits of a genuinely common approach to
7 managing their interwoven value chains.

8 It is therefore vital that the various parts of the GS1 system fit together and that they are able to
9 support interoperability between organisations with a wide variety of processes based on many
10 different technology platforms. This is what is meant by GS1 system integrity. A
11 comprehensive, clear and documented description of the GS1 architecture is a necessary
12 starting point for the protection and promotion of this system integrity.

13 The objective of the GS1 System Landscape document is to provide a description of the
14 architecture as it currently exists. It is intended to be supplemented by another document taking
15 a forward-looking perspective and aimed at exploring how the GS1 system might be developed
16 and improved.

17 0.2. How the Objective is Achieved

18 The GS1 System Landscape document exists so that all involved in standards development
19 may better understand what standards make up the system, the nature of the different types of
20 standards and the dependencies between them. Through a shared understanding of what the
21 system is and of the interrelationships between its components, standards developers will be
22 able to ensure that new and modified standards fit properly into the framework and standards
23 users will be more likely to recognise opportunities to adopt the standards and to implement
24 them in a system compliant way.

25 The GS1 System Landscape is also intended to serve as a reference point to help navigation
26 towards an improved GS1 system. By describing the current system of standards it will be
27 possible to identify gaps that might be filled, duplications that might be removed and
28 inconsistencies that might be corrected. Here it should be emphasised that these improvements
29 do not have the goal of producing perfection, symmetry or elegance, but of meeting user needs.
30 Gaps will be filled to the extent that they represent a failure to deliver against user need;
31 duplications will be eliminated and inconsistencies corrected when they cause unjustifiable cost
32 to users. Changes to the GS1 system are made when the cost of change is justified by the
33 expected benefits and are developed and approved through an open, user-driven process.

34 0.3. Who is the Audience?

35 This document is intended to be read by those involved in the development and maintenance of
36 GS1 standards and those developing business functionality and checking where standards can
37 be used.

38 It will also be of interest to a broader audience including people who have chosen not to be
39 involved in the Global Standards Management Process and staff of Member Organisations
40 (MOs), user organisations and solution providers who develop and decide policies for GS1 or
41 who work with the standards but are not deeply involved in their operational aspects.

42 **0.4. What the GS1 System Landscape Does**

43 There are different GS1 standards which are designed to work together to support the
 44 processes of user organisations. This document provides a comprehensive inventory of the
 45 GS1 standards and catalogues and classifies them into topic areas. At a high level, this shows
 46 how the broad areas of standard fit together. For example, data is organised according to a
 47 syntax and carried in a message which is subject to a choreography. In other words, it provides
 48 a logically structured overview of GS1 standards.

49 Dependencies between the standards are explicitly called out, thus suggesting how system
 50 components fit together. In this way the GS1 System Landscape goes some way to showing
 51 how changes to one part of the system might affect or lead to change in another.

52 This GS1 System Landscape is not intended to replace any of GS1’s published specifications or
 53 guidelines. It is not in itself a normative document but includes numerous references (links) to
 54 normative materials.

55 The GS1 System Landscape is organised into sections, each of which describes a topic area for
 56 standards: identification, supplementary data, data representation, physical data carriers,
 57 business data, information distribution/discovery and communication. It will be revised
 58 periodically to remain current as the GS1 system evolves.

59

Business Objective	Section	Note
Identify	1. Identification 2. Supplementary data	Standards for the identification of items, locations, shipments, assets, etc.. and its associated data
Capture	3. Data representation 4. Physical data carriers	Standards for encoding and capturing data in physical data carriers
Share	5. Business data 6. Information distribution and discovery 7. Communication	Standards for sharing data between parties

60 **0.5. In Brief**

61 The GS1 System Landscape is designed to promote a greater understanding of what the GS1
 62 system is and the way it is intended to work. Mutual understanding of the system throughout the
 63 GS1 community will maximise consistency and coherence, both in development and
 64 implementation of the standards.

65 1. Identification

66 Identification is the foundation of the GS1 System.

67 In line with the [GS1 Architecture Principles](#) the Identification standards are defined
68 independently of carrier technology. Technology never alters the meaning of the GS1 data.

69 1.1. GS1 Identification Keys

70 The purpose of a GS1 Identification Key is to identify something. They have the following
71 characteristics:

- 72 ■ They are globally unique in the sense that each value is used once only within each key
73 type and within specified timeframes.
- 74 ■ Once its type is established (e.g., from a GS1 Application Identifier), the key is capable
75 of serving its purpose of identification on its own, without additional qualifiers, attributes,
76 or extensions.
- 77 ■ Some keys identify a class (e.g., a GTIN) while others identify a specific instance (e.g.,
78 SSCC).
- 79 ■ When it is read from a physical entity the key gives the message that this entity (or one
80 of this class of entity, as appropriate to the key type) is present at the read point.
- 81 ■ All GS1 Identification Keys are unique and unambiguous within their domain. The
82 domain is broadly defined as the intended area of application of the key. For example:
 - 83 □ Trade Items: any item (product or service) upon which there is a need to retrieve
84 pre-defined information and that may be priced, or ordered, or invoiced at any point
85 in any supply chain.
 - 86 □ Logistic Units: an item of any composition established for transport and/or storage
87 that needs to be managed through the supply chain.
 - 88 □ Assets: physical entities of some value or importance treated as an inventory item.
 - 89 □ Locations: any location that needs to be uniquely identified for use in the supply
90 chain or has meaning within a business scenario.

91 Generally speaking each GS1 Identification Key is associated with a concept in the real world.
92 The GS1 Identification Keys may then be used in an electronic record or file, in a database, in
93 an electronic message, on the item, or any other data context. Thus the GS1 Identification Keys
94 can be used in Electronic Commerce to link database information to the physical entity
95 unambiguously within their defined domain.

- 96 □ When used in support of business applications all GS1 Identification Keys require
97 the appropriate syntax for correct storage and transfer, and to ensure they are
98 interpreted correctly (See Section 3.1).

99 A GS1 Company Prefix assigned to a user company shall entitle that user company to create
100 any of the GS1 Identification Keys. The single exception is when a GS1 Member Organisation
101 issues complete GS1 Identification Keys, one by one. In these circumstances a complete GS1
102 Identification Key shall not be considered as a GS1 Company Prefix.

103 1.1.1. GTIN (Global Trade Item Number)

104 *Normative References:*

- 105 ■ The [GS1 General Specifications](#)

106 *Abstract:*

107 GTINs are numeric and are terminated with a Check Digit. They are composed using one of the
108 four data structures: GTIN-8; GTIN-12; GTIN-13; or GTIN-14. When any of these GTINs is used
109 in a data carrier or other application requiring a fixed-length data string of 14-digits, the GTINs
110 less than 14-digits in length must be prefixed by one or more leading zeroes. These leading
111 zeroes simply act as filler characters. The presence or lack of these leading zeroes does not
112 change the GTIN concerned.

113 The GTIN identifies items that are traded and usually links to information about those items.
114 Trading Partners use GTINs to communicate about items that they price, order or invoice and
115 this supports the automation of business processes.

116 Trade Items are those that are always produced in the same version and composition (e.g.,
117 type, size, weight, contents, and design) that may be sold at any point in the supply chain.

118 *Dependencies:*

- 119 ■ None:

120 □ The business context is, of course, required. For example if a product needs to be
121 identified, syntax is required to denote the GTIN. The party that allocated the GTIN
122 has to provide trading partners with the pre-defined characteristics of the trade item
123 to which the GTIN is assigned (e.g., the product name, product brand, net quantity
124 (weight, volume, or other dimension), logistic measures, etc.)

125 *Supplementary or attribute data:*

- 126 ■ Supplementary or attribute data that cannot be looked up by reference to the GTIN,
127 may also be associated with a GTIN and encoded in a physical data carrier (bar code or
128 RFID tag); see Section 2.1. Examples include Batch Number and Expiry Date.

129 *See also:*

- 130 ■ Section 1.2.1. for information on the Serialized GTIN.

131 **1.1.1.1. Special case of GTIN-14 using indicator digit 9**

132 A Variable Measure Trade Item is an item with pre-defined characteristics, such as the nature of
133 the product or its contents, but, unlike a Fixed Measure Trade Item, it has at least one
134 characteristic that varies. The variable characteristic could be weight, dimension, number of
135 items contained or volume information.

136 The Variable Measure Trade Item is identified by a GTIN together with information about the
137 variable data. The GTIN is a special application of the GTIN-14 Data Structure which has the
138 digit 9 in the Indicator position to denote that the item identified is a Variable Measure Trade
139 Item. This must be processed together with the variable information of the same trade item (see
140 Section 2.1).

141 *Dependencies:*

- 142 ■ When carried in a physical data carrier GTINs assigned to Variable Measure Trade
143 items have a mandatory association with a GS1 Application Identifier for Trade
144 Measures (see Section 2.1).

145 **1.1.2. GLN (Global Location Number)**

146 *Normative References:*

- 147 ■ The [GS1 General Specifications](#)

- 148 *Abstract:*
- 149 GLNs are a fixed length 13-digit numbers composed of a GS1 Company Prefix, a Location
150 Reference and a Check Digit.
- 151 The GLN supports the identification of physical, legal, or functional entities to the level of
152 precision required by the business process.
- 153 Physical Location Use Case
- 154 If a trading partner is expected to deliver an item to an individual store, the store will be
155 assigned a GLN. If the trading partner is expected to deliver the item to an individual fridge in
156 the store, a GLN should be assigned to that fridge.
- 157 Legal Location Use Case
- 158 Legal entities (companies, governments, etc.) receive and send orders electronically. The
159 GLN is used to identify the trading partners in such transactions.
- 160 Functional Entity Use Case
- 161 While a single GLN may meet all the business needs of a very small organisation, larger,
162 more complex organisations may have more than one GLN to represent individual
163 functional entities within the organisation. For example a hospital may have a separate
164 GLN for its billing department or a company using eCom may use individual GLNs for
165 each EDI mailbox.
- 166 *Dependencies:*
- 167 ■ None.
- 168 □ The business context is, of course, required. For example if a location needs to be
169 identified, syntax is required to represent the GLN. The GLN is usually assigned by
170 the party owning or controlling the location who should also provide trading partners
171 the required information associated with each GLN so that the relevant information
172 can be retrieved from a database by reference to the GLN.
- 173 *Supplementary or attribute data:*
- 174 ■ Supplementary, or attribute data that cannot be looked up by reference to the GLN, may
175 be associated with a GLN when encoded in a physical data carrier (bar code or RFID
176 tag) see Section 2.1.
- 177 *See also:*
- 178 ■ Section 1.2.2 for information on the Extended GLN.

179 **1.1.3. SSCC (Serial Shipping Container Code)**

- 180 *Normative References:*
- 181 ■ The [GS1 General Specifications](#)
- 182 *Abstract:*
- 183 SSCCs are a fixed length 18-digit number composed of an Extension Digit, GS1 Company
184 Prefix, a Serial Reference and a Check Digit.
- 185 The SSCC supports the identification of logistic units, for example the identification of a pallet of
186 goods, combined with the use of the Despatch Advice for automated goods receipt.
- 187 *Dependencies:*
- 188 ■ None.

- 189 □ The business context is, of course, required. For example if a logistic unit needs to
190 be identified, syntax is required to represent the SSCC.

191 *Supplementary or attribute data:*

- 192 ■ In principle, the SSCC provides a unique reference number that can be used as the key
193 to access information regarding the logistic unit in computer files. However, attributes
194 relating to the logistic unit (e.g., ship to information, logistic weights) are also available
195 and may be associated with an SSCC when encoded in a physical data carrier (bar
196 code or RFID tag) see Section 2.1.

197 **1.1.4. GIAI (Global Individual Asset Identifier)**

198 *Normative References:*

- 199 ■ The [GS1 General Specifications](#)

200 *Abstract:*

201 GIAIs are variable length up to 30 alpha numeric characters composed of a GS1 Company
202 Prefix and an Individual Asset Reference. They support a diverse range of business
203 applications (e.g., recording the life-cycle history of aircraft parts).

204 *Dependencies:*

- 205 ■ None.
- 206 □ The business context is, of course, required. For example if an asset needs to be
207 identified, syntax is required to represent the GIAI. The organisation who issues the
208 GIAI can normally be expected to provide the required database information
209 regarding the item to which the GIAI is attached, etc.

210 *Supplementary or attribute data:*

- 211 ■ There are no GS1 Application Identifiers for supplementary data that may be associated
212 with a GIAI when encoded in a physical data carrier (bar code or RFID tag).

213 **1.1.5. GRAI (Global Returnable Asset Identifier)**

214 *Normative References:*

- 215 ■ The [GS1 General Specifications](#)

216 *Abstract:*

217 GRAI has an overall structure variable length up to 30 alpha numeric characters which is
218 comprised of a mandatory, fixed length, asset type identification and optional, variable length,
219 serial number. The GRAI supports the identification of Returnable Assets. The GRAI is often
220 used to identify a container of products identified with GTINs. (For example, product is traded at
221 a unit-load pallet level and is identified with a GTIN, the physical pallet upon which the product
222 is transported is not traded but acts as a returnable transport item and is identified with a GRAI.
223 The GTIN supports the trading process of the product and the GRAI supports applications
224 related to the returnable pallet such as pallet-pooling.)

225 A Returnable Asset is a reusable package or transport equipment of a certain value, such as a
226 beer keg, a gas cylinder, a plastic pallet, or a crate. The GS1 System identification of a
227 Returnable Asset, the Global Returnable Asset Identifier (GRAI), enables tracking as well as
228 recording of all relevant data.

229 *Dependencies:*

- 230 ■ None.

- 231 □ The business context is, of course, required. For example if an asset needs to be
 232 identified, syntax is required to represent the GRAI. The organisation who issues
 233 the GRAI can normally be expected to provide the required database information
 234 regarding the item to which the GRAI is attached.

235 *Supplementary or attribute data:*

- 236 ■ There are no GS1 Application Identifiers for supplementary data that may be associated
 237 with a GRAI when encoded in a physical data carrier (bar code or RFID tag).

238 **1.1.6. GSRN (Global Service Relationship Number)**

239 *Normative References:*

- 240 ■ The [GS1 General Specifications](#)

241 *Abstract:*

242 GSRNs are fixed length 18 digit numbers composed of a GS1 Company Prefix, a Service
 243 Reference Number and a Check Digit.

244 The GSRN is used to identify the recipient of services in the context of a service relationship.
 245 This provides a means for the service provider to store data relevant to services provided to the
 246 recipient, for example the GSRN can be used for patient identification enabling hospitals to
 247 store information about the medical characteristics of the individual together with details of
 248 treatment they have received.

249 *Dependencies:*

- 250 ■ None.
- 251 □ The business context is, of course, required. For example where a service
 252 relationship needs to be identified, syntax is required to represent the GSRN. The
 253 organisation who issues the GSRN can normally be expected to provide the
 254 required database information regarding the service relationship which the GSRN
 255 identifies.

256 *Supplementary or attribute data:*

- 257 ■ There are no GS1 Application Identifiers for supplementary data that are specifically
 258 associated with a GSRN when encoded in a physical data carrier (bar code or RFID
 259 tag).

260 **1.1.7. GDTI (Global Document Type Identifier)**

261 *Normative References:*

- 262 ■ The [GS1 General Specifications](#)

263 *Abstract:*

264 GDTIs are a variable length up to 30 numeric characters which is comprised of a mandatory,
 265 fixed length, document type identification and optional, variable length, serial number. They are
 266 used to identify *documents* that cover any official or private papers that infer a right (e.g., proof
 267 of ownership) or obligation (e.g., notification of a call for military service) upon the bearer. The
 268 first part of the GDTI identifies the type of document (e.g., military service paper) and the
 269 optional serial number the individual instance (e.g., the details of an individual military service
 270 paper addressed to a person).

271 *Dependencies:*

- 272 ■ None.

- 273 □ The business context is, of course, required. For example where a document type
274 needs to be identified, syntax is required to represent the GDTI. The organisation
275 who issues the GDTI can normally be expected to provide the required database
276 information regarding the document to which the GDTI is attached.

277 *Supplementary or attribute data:*

- 278 ■ There are no GS1 Application Identifiers for supplementary data that may be associated
279 with a GDTI when encoded in a physical data carrier (bar code or RFID tag).

280 1.1.8. GINC (Global Identification Number for Consignments)

281 *Normative References:*

- 282 ■ The [GS1 General Specifications](#)

283 *Abstract:*

284 GINCs are a variable length up to 30 alpha-numeric characters composed of a GS1 Company
285 Prefix and a Consignment Reference. They may be used to identify a logical grouping of goods
286 (one or more physical entities) intended to be transported as a whole. The GINC is allocated by
287 a freight forwarder (or a carrier acting as a freight forwarder). Typically it encodes a House Way
288 Bill Number.

289 *Dependencies:*

- 290 ■ The SSCCs used to identify the physical entities that make up the logical grouping of
291 goods that has been consigned to a freight forwarder and is intended to be transported
292 as a whole.
- 293 ■ The organisation who issues the GINC can normally be expected to provide the
294 required database information regarding the shipping information.

295 *Supplementary or attribute data:*

- 296 ■ There are no GS1 Application Identifiers for supplementary data that may be associated
297 with a GINC when encoded in a physical data carrier.

298 1.1.9. GSIN (Global Shipment Identification Number)

299 *Normative References:*

- 300 ■ The [GS1 General Specifications](#)

301 *Abstract:*

302 GSINs are a fixed length 17-digit number composed of a GS1 Company Prefix, a Shipper
303 Reference and a Check Digit. They provide a globally unique number that identifies a logical
304 grouping of logistic units (one or more physical entities) for the purpose of a transport shipment
305 from that consignor (seller) to the consignee (buyer). The GSIN is a number assigned by a
306 consignor (seller) of goods.

307 *Dependencies:*

- 308 ■ The SSCCs used to identify the physical entities that make up the logical grouping of
309 logistic units transported as a shipment from one seller to one buyer.
- 310 ■ The organisation who issues the GSIN can normally be expected to provide the
311 required database information regarding the shipment information.

312 *Supplementary or attribute data:*

- 313 ■ There are no GS1 Application Identifiers for supplementary data that may be associated
314 with a GSIN when encoded in a physical data carrier.

315 1.2. Key extensions

316 *Normative References:*

- 317 ■ The [GS1 General Specifications](#)
- 318 ■ The [EPCglobal Tag Data Standard](#)

319 1.2.1. SGTIN (Serialized GTIN)

320 *Abstract:*

321 The Serialized GTIN is a context-dependent feature of the GTIN that is used to identify a
322 specific instance of a product or service identified by a GTIN. In most contexts (e.g. retail point-
323 of-sale), the serial number is not a requirement of the GTIN, but in RFID and in environments
324 when an EPC Uniform Resource Identifier (URI) representing a GTIN is required, a serial
325 number is required to ensure that the object is uniquely identified.

326 The Serialized GTIN is semantically equivalent to the concatenation of Application Identifier (AI,
327 see Section 2.1) 01 and AI 21.

328 1.2.2. eGLN (Extended GLN)

329 *Abstract:*

330 The Extended GLN is an optional feature of the GLN that may be used to subdivide a physical
331 location according to rules internal to the location itself. For example, a warehouse identified by
332 a GLN may map its internal storage locations (shelves, bins, lockers, etc.) to Extended GLNs.
333 An Extended GLN is the combination of a physical location GLN (AI 414) and a GLN Extension
334 (AI 254).

335 The Extended GLN's purpose is to increase the capacity of the GLN; locations may be identified
336 by a normal GLN or Extended GLN at the discretion of the identifying organisation. An
337 Extended GLN by definition is a sub-location within the GLN that precedes its extension.

338 The GLN Extension is not communicated to external trading partners except by mutual
339 agreement. For example, a manufacturer that requires that its products be stored in a regulated
340 temperature environment may acquire a warehouse map from its distributor so that it can
341 validate that the storage location recorded by the distributor is in fact in the temperature-
342 controlled area. Doing so would require that the distributor share the Extended GLN with the
343 manufacturer.

344 In bar codes, the combination of AI 414 and AI 254 is used to represent an Extended GLN. In
345 RFID and in the EPC Uniform Resource Identifier (URI), the SGLN EPC URI scheme is used to
346 represent either an Extended GLN or a GLN without extension.

347 1.3. Unclassified keys

348 1.3.1. GID (General Identifier)

349 *Normative References:*

- 350 ■ The [EPCglobal Tag Data Standard](#)

351 *Abstract:*

352 The General Identifier (GID) is a general-purpose object identifier that does not imply any
353 specific application. It may be used in circumstances where none of the existing identification
354 keys are sufficient and where other GS1 standards are not required.


355 1.4. RCN (Restricted Circulation Numbers)

356 *Normative References:*

- 357 ■ The [GS1 General Specifications](#)

358 A portion of the numbers that might have been used as GTINs is reserved by GS1 for use in
359 restricted areas. These Restricted Circulation Numbers (RCNs) are identification numbers that
360 look like GTINs, and are completely compatible with GTINs, but are strictly for use only in
361 closed environments. They provide a convenient resource for “closed loop” applications in
362 which GTINs might also be present.

363 Some of these RCNs are specified by GS1 as being for internal company use. Most, however,
364 are controlled by the local GS1 Member Organisation which restricts designated ranges for use
365 in a country, territory, company etc. RCNs might be used, for example, for identification of
366 money-off coupons in one country or retail products prepared to a particular customer order
367 (e.g., several slices of cheese).

368  **Important:** Restricted Circulation Numbers are not GS1 Identification Keys. However,
369 they can be used alongside GS1 Identification Keys without clashes as long as the goods
370 to which they are attached do not leave the Restricted Circulation Area.

371 1.4.1. Variable Measure Trade Items sold at Point-of-Sale

372 Variable Measure Trade Items that are sold at point-of-sale using a fixed price per unit of
373 measure or quantity sold (e.g., apples sold at a fixed price per kilogram).

374 These items are either marked in the store by the retailer or are marked at the source by the
375 supplier normally based upon national solutions using Restricted Circulation Numbers.

376 2. Supplementary data

377 2.1. Application Identifiers

378 *Normative References:*

- 379 ■ The [GS1 General Specifications](#)

380 *Abstract:*

381 All GS1 Identification Keys have an Application Identifier.

382 Supplementary data is generally associated with a GS1 Identification Key¹.

383 In the GS1 System the intention is that the minimum data is carried in physical data carriers
384 (GS1 bar codes or GS1 RFID tags) attached to the object being identified. Instead, the
385 identification keys are expected to find information about the identified object in a database.

386 Ideally, the supplementary data encoded in physical data carriers will only encode information
387 that cannot be looked up in a database by reference to the key. This could happen if data is
388 needed when connection to a database is not available or when the key identifies a class of
389 objects but the supplementary data relates to a batch or individual instance of the object. For
390 example, the SSCC provides a unique reference number that can be used as the key to access
391 all relevant information regarding the logistic unit in computer files. However, supplementary
392 data relating to the logistic unit (e.g., ship to information, logistic weights) are also available as
393 standardised supplementary data because access to this data might be needed when the goods
394 are in transit and connection to a network is impracticable.

395 The list of AIs representing summary data in Appendix A, while complete as of this writing, may
396 not be updated in tandem with the GS1 General Specifications.

397 *Dependencies:*

- 398 ■ The Physical Data Carriers capable of encoding Supplementary Data (GS1-128 bar
399 codes, GS1 DataMatrix bar codes, GS1 DataBar Expanded bar codes, GS1 DataBar
400 Expanded Stacked bar codes, GS1 Composite bar codes and GS1 RFID Tags)
- 401 ■ Supplementary data are dependent on the GS1 Identification Key to which they are
402 attributed.
- 403 ■ The GS1 System requires that only characters defined in the subset of ISO/IEC 646
404 International Reference Version of the GS1 General Specifications be used for
405 Application Identifier (AI) data.

406 2.2. Global Product Classification

407 *Normative References:*

- 408 ■ Product Classification (GPC) <http://www.gs1.org/gdsn/gpc>

409 *Abstract:*

410 To ensure products are classified correctly and uniformly, GS1 developed the Global Product
411 Classification (GPC) as a system that gives trading partners a common language for grouping
412 products in the same way, everywhere in the world.

¹In some special applications supplementary data is associated with another identifier or, in the case of AIs starting with '9', has meaning only internally or as previously agreed among trading partners.

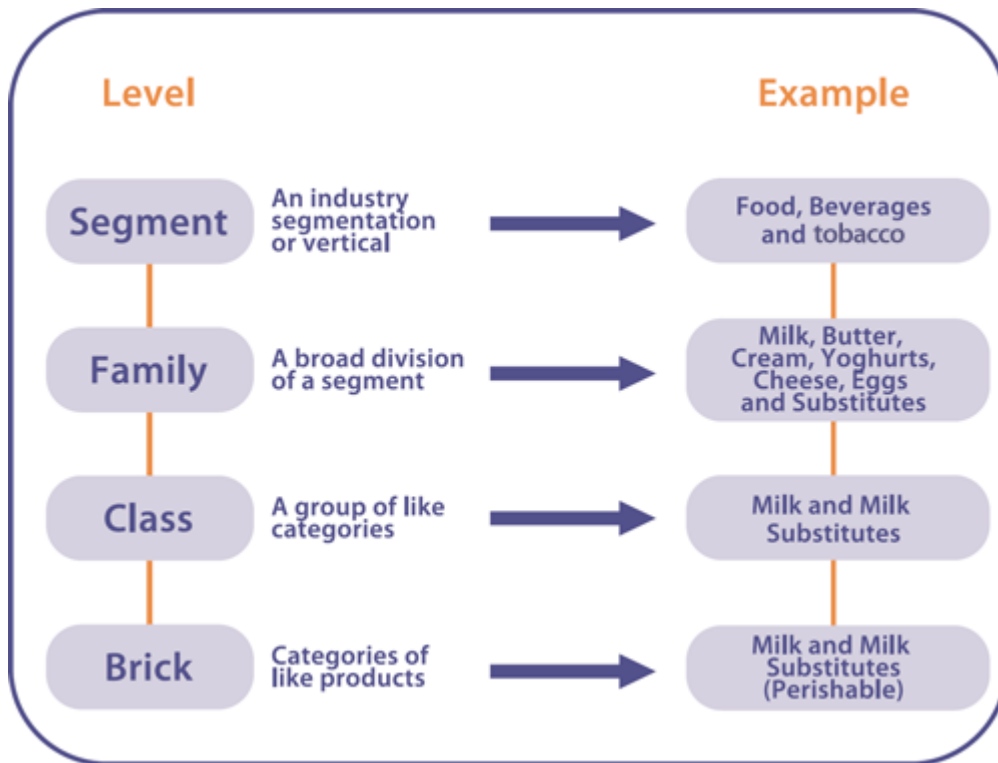
413 This improves accuracy and integrity of product master data, speeds up the supply chain's
 414 ability to react to consumer needs, and contributes to breaking down language barriers. It also
 415 facilitates the reporting process across product silos.

416 The foundation of GPC is called a "Brick;" GPC Bricks define categories of similar products.
 417 Using the GPC Brick for classification ensures the correct recognition of the product category
 418 across the extended supply chain, from seller to buyer. Bricks can be further characterised by
 419 Brick Attributes.

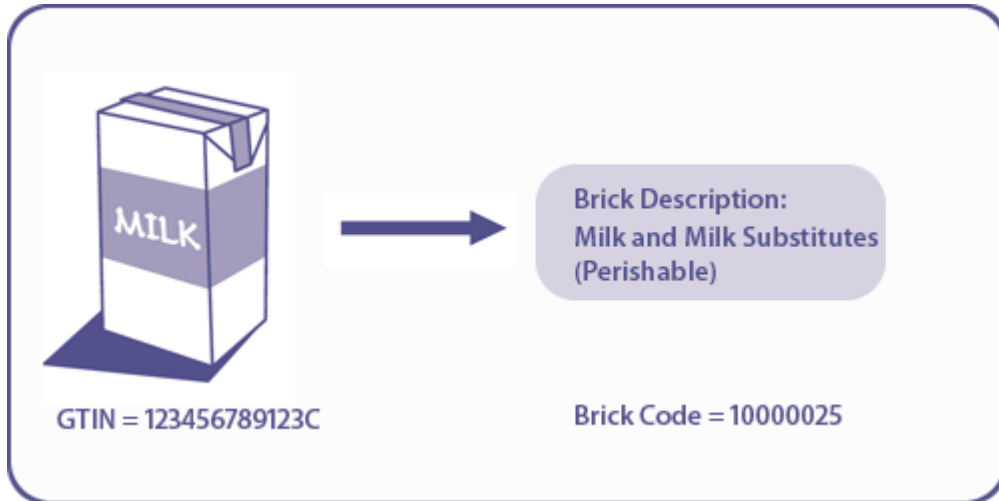
420 To simplify storage and retrieval and to support multiple human languages, all elements of GPC
 421 (Segments, Families, Classes, Bricks, Attributes, and Attribute Values) are numerically
 422 encoded.

423 **2.2.1. Structure**

424 The GPC structure is hierarchical, starting with an industry segment or vertical ("Segment"),
 425 then a broad division of a segment ("Family"), then a group of like categories ("Class"), and
 426 ending with a category of like products ("Brick"). See the diagram below.



427
 428 In the Global Data Synchronisation Network (GDSN), a Global Trade Item Number (GTIN) can
 429 be assigned only one Brick.

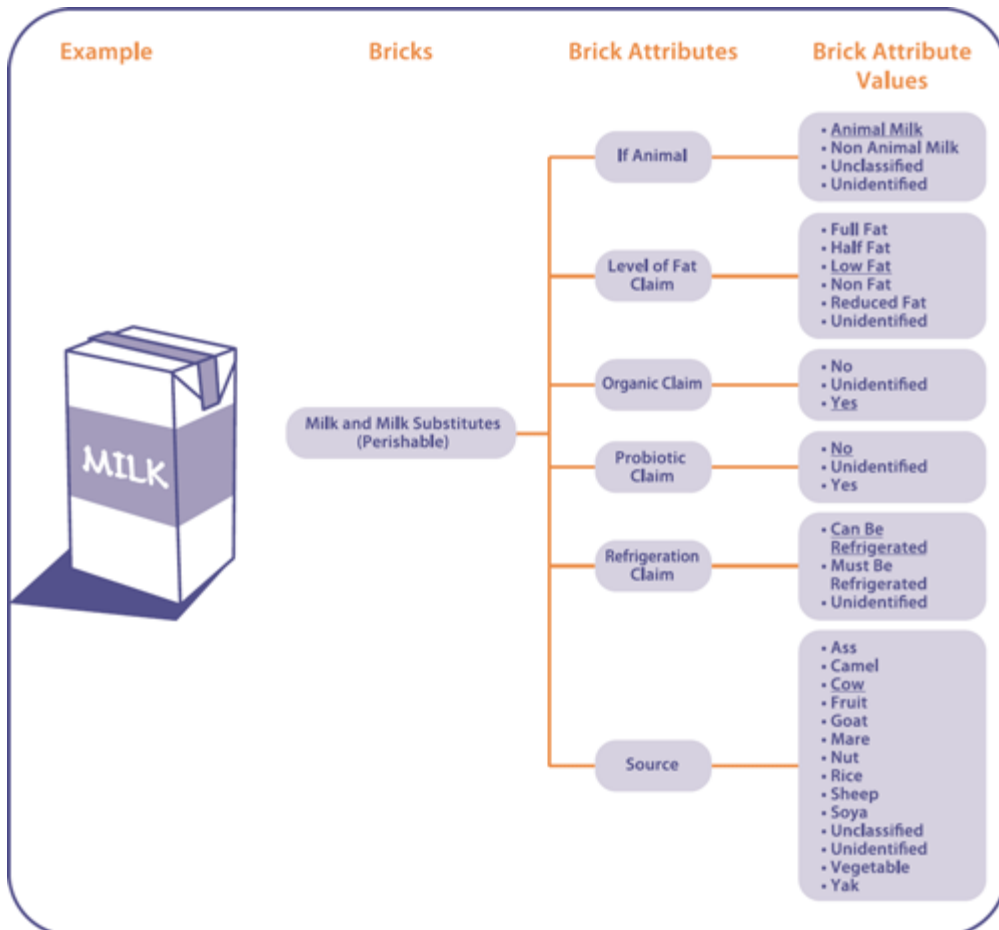


430

431 **2.2.2. Attributes**

432 Products can be further characterised using Attributes associated with the Bricks where
 433 required. Attributes are specific to a Brick, though multiple Bricks may define the same Attribute
 434 (e.g. “Organic Claim”).

435 Each Product belonging to a Brick may have different values for the Attributes defined by that
 436 Brick as a way of further refining the classification of the Product.



437

438 2.3. Rules

439 The GS1 set of standards contain rules intended for specific purposes.

440 2.3.1. Package measurement

441 *Normative References:*

- 442 ■ The [GDSN Package Measurement Rules](#).

443 *Abstract:*

444 The GDSN Package Measurement Rules contains rules for the global, unambiguous definition
445 of nominal measurement attributes of product packaging to facilitate communication of the
446 same for retail and non-retail products from the consumer unit to the case level and all
447 intermediate packaging levels in between.

448 The rules are intended to provide a consistent, repeatable process to determine measurements
449 within defined tolerances for a given product package. When a new GTIN is assigned to a trade
450 item, it is essential that the party allocating the number, normally the manufacturer, provide
451 detailed information to trading partners about the characteristics of the new trade item. This
452 information should be provided as soon as possible before the product is actually traded and
453 should include details such as brand name, height, width, depth, gross weight, and packaging
454 materials etc.

455 *Dependencies:*

- 456 ■ Information about trade items in which the package measurement rules are used is
457 specified in the GDSN Package Measurement Rules.
- 458 ■ The GTIN allocation rules specifies which changes that may be applied to a trade item
459 without allocating a new GTIN and which changes that require a new GTIN. Many of the
460 attributes to which these rules apply are defined in the Package Measurement Rules.
- 461 ■ The GDSN Validation Rules specifies any validations that are required to by the
462 different actors in the GDSN.

463 2.3.2. Cardinality

464 *Normative References:*

- 465 ■ None - Syntax (GS1 XML or EANCOM) dependent

466 *Abstract:*

467 Cardinality is used in eCom messages to describe rules relating to which data elements that
468 must be populated in an eCom message/document, which data elements that are optional, and
469 which data elements that must be populated depending on the population of other data
470 elements.

471 Depending on syntax (EANCOM or GS1 XML) cardinality is specified in different ways but
472 indicates whether the data is:

- 473 ■ Mandatory (e.g., order number in an order message)
- 474 ■ Optional (e.g., additional internal product code in an order message)
- 475 ■ Has a Dependency (e.g., if you do this, you must also do that)

476 *Dependencies:*

- 477 ■ GS1 XML standards
- 478 ■ EANCOM standards

479 2.3.3. Validation

480 *Normative References:*

481 The [GDSN Validation Rules](#)

482 *Abstract:*

483 Distributed global validation rules are required to support the Global Data Synchronisation
484 process. The validation rules lists the set of rules that actors in the GDSN must perform. The
485 GDSN Validation Rules are the foundation to ensure that Item data passed within the Global
486 Data Synchronisation Network conforms to a common structure and complies with global
487 standards.

488 The GDSN Validation Rules are used as a complement to the validations that are performed
489 based on the GDSN XML standard schemas. Whereas the schema validations perform syntax
490 and format checks, validation rules are applied to all other logic quality checks that are needed
491 to verify high quality Master Data.

492 *Dependencies:*

- 493 ■ The [GTIN Allocation Rules](#) specifies which changes may be applied to a trade item
494 without allocating a new GTIN and which changes require a new GTIN. Many of the
495 attributes to which these rules apply are defined in the Package Measurement Rules.
- 496 ■ The [GLN Allocation Rules](#) specify when a new GLN is required for a given business
497 application. These are relevant to the GDSN validation rules in terms of information
498 provider and production locations.
- 499 ■ Validation rules are to be contextualised so they apply to a context-based commercial
500 scenario, e.g. a specific target-market or regulatory restriction.

501 3. Data representation

502 3.1. Use of Syntax

503 A syntax is a set of rules that defines permissible sequences of characters and connections
504 between them so that a recognisable structure results. Then knowledge of the syntax rules
505 enables strings of characters to be separated and interpreted in the way intended. There are
506 many and various types of syntax.

507 To take a very simple example, the characters 121212 need something more to provide context:

- 508 ■ \$ 121,212
- 509 ■ Tel: 121212
- 510 ■ Best before 12-12-12

511 The conventions for representing the data in this example are a simple form of syntax. There is
512 a character or characters to denote the type of data and conventions for organising the data.

513 Different syntaxes are used in different parts of the GS1 System. Nonetheless the important
514 point is that the GS1 standards for data representation and syntax always make it possible to
515 extract the data from the carrier and convert it to an abstract form which can then be associated
516 with its business meaning by reference to the Global Data Dictionary.

517 This is especially important for the GS1 Identification Keys as they are always available for use
518 in all four carrier technologies specified in the GS1 System for conveying data (bar codes, EPC
519 RFID, GS1 XML and EANCOM) and the type of carrier employed must never alter the meaning
520 of the data (this is the principle of carrier independence).

521 There is currently no generally applied standard to represent the GS1 Identification Keys
522 abstracted from their carriers but the pure identity URI representation is specified in the EPC
523 standards (see Section 3.1.2).

524 3.1.1. Bar Code Syntax

525 The GS1 bar code types used to represent the data are in themselves a kind of syntax (see
526 Section 4.1). The data syntax in bar code in the GS1 standards uses GS1 Application Identifiers
527 (AIs) to denote the nature of the data. These are followed by the data itself. This is technically
528 known as a name/value pair with each AI (name) having its data (value) next to it in the
529 representation.

530 Most AIs are shown explicitly, but the AI (01) may be implied by the bar code type.

531 In some types of GS1 bar codes multiple data elements can be concatenated (linked together in
532 a chain) because they:

- 533 ■ either have a pre-defined length so that the start point, and therefore the AI of the next
534 element, appears in a position that can be determined
- 535 ■ or if a non-predefined length² string is followed by another element string, it must be
536 terminated by the specified separator character Function Code 1 (FNC1).

² Sometimes misleadingly referred to as 'variable length AIs'. However, the technically correct distinction is between pre-defined and non-predefined as some AIs starting with two digits not included in the predefined length table contain fixed length data fields (e.g., AI (402), GSIN has a fixed length data format of N17 but still requires the use of FNC1 if followed by another element string).

537 3.1.2. EPC URI Syntax

538 *Normative References:*

- 539 ■ The [EPC Tag Data Standard](#)

540 *Abstract:*

541 The EPC Tag Data Standard defines an Internet Uniform Resource Identifier (URI) syntax for
542 certain GS1 Identification Keys (or key extensions), namely those that identify a specific
543 instance of an entity as opposed to a class. A Uniform Resource Identifier is an Internet-
544 standard mechanism for identifying an abstract or physical resource, with general syntax
545 defined by the Internet standard RFC 3986. The most familiar form of URI is a Web page
546 address, which is a particular form or subset of URI called a Uniform Resource Locator (URL).
547 The form of URI defined in the EPC Tag Data Standard for representing GS1 Identification Keys
548 is not a URL, however, but rather is a Uniform Resource Name (URN). A URN is a persistent
549 name given to an Internet resource: the URN of the resource remains the same even though its
550 location and ownership may change. For this reason it is an appropriate type of URI for GS1
551 Identification Keys.

552 The URIs defined in the EPC Tag Data Standard to represent a GS1 Identification Key all share
553 a common structure, as follows:

554 `urn:epc:id:<scheme-name>:...`

555 where the *scheme-name* part is different depending on the GS1 Identification Key, and the
556 syntax of the remainder of the URI depends on which scheme is used.

557 The EPC URI syntax may be used in information systems that need the ability to refer to a
558 specific abstract or physical entity, without necessarily knowing in advance which GS1
559 Identification Key will be used. The EPC URI also has a structure that is more amenable for
560 routing network requests using the Object Name Service (ONS) standard than other syntaxes
561 for GS1 Identification Keys. The EPC URI is commonly used in the EPCIS, ONS, and
562 Discovery Services standards.

563 3.1.3. EPC Tag Data Syntax

564 *Normative References:*

- 565 ■ The [EPC Tag Data Standard](#)

566 *Abstract:*

567 The data syntax in GS1 RFID tags is indicated by the EPC binary encoding header which is an
568 extensible eight-bit field. For GS1 data this field denotes the principal key being represented
569 and the length of the data.

570 Additional keys and AI data may be carried in the tag's user memory. The EPC Tag Data
571 Standard defines an efficient compaction scheme called "packed objects" that provides for the
572 encoding of any combination of GS1 Application Identifiers (AIs), and also addresses data
573 access requirements including random access, tag selection by data content, modifying and
574 deleting data elements, and selective locking. The "packed objects" compaction scheme fits
575 within the general structure for RFID tag memory encoding specified in ISO/IEC 15962,
576 including the use of an 8-bit Data System Format Identifier (DSFID) header. In addition to its
577 publication with the EPC Tag Data Standard, the "packed objects" scheme is expected to be
578 published as an "access method" within the newest version of ISO/IEC 15962, expected in
579 2011.

580 3.1.4. EANCOM

581 *Normative References:*

- 582
- [GS1 EANCOM](#)
- 583
- UN/EDIFACT syntax rules (ISO 9735)

584 *Abstract:*

585 EANCOM is a set of semantic rules based on the UN/EDIFACT syntax rules (ISO 9735); they
586 are subsets of the United Nations Standard Messages (UNSM). Logically associated elements
587 of data are associated into segments. In this case it is these groupings of data elements that are
588 explicitly tagged and the individual values of data elements follow the segment tag in a known
589 sequence with separator characters between. Adjacent separator characters show missing
590 optional data and segments are explicitly terminated.

591 **3.1.5. XML**

592 *Normative References:*

- 593
- [W3C XML](#)

594 *Abstract:*

595 W3C XML syntax is used in GS1 Business Message Standards (BMS) and several EPC
596 standards (Reader Management, ALE, EPCIS). XML documents are constructed from
597 elements, each of which has a tag followed by a value, so that the name of the data element
598 which refers to a GS1 data definition is given explicitly. Each value is explicitly terminated by an
599 end tag. This is another manifestation of the name/value pair approach.

600 **3.2. Representation of Keys**

601 *Normative References:*

- 602
- The [GS1 General Specifications](#)

603 *Abstract:*

604 The following discusses the GS1 Identification Keys only as primary identifiers. Where a GS1
605 Identification Key is used as an attribute to another key (e.g. a ship-to location), the
606 representation is dependent on the data carrier and the context in which the attribute is used.
607 Below is a summary of the different GS1 Identification Keys in the approved GS1 Syntaxes.

Data Content	Application Identifier Syntax	EPC URI Syntax	GS1 XML Syntax	EANCOM Syntax
SSCC (Serial Shipping Container Code)	N2+N18	urn:epc:id:sscc:CompanyPrefix.ExtensionPlusSerialReference	<serialShippingContainerCode>SSCC expressed in 18-digit field with leading zero(s) if required</serialShippingContainerCode>	Dependent upon usage. The segment example below shows: Goods Identity Number, Serial Shipping Container Code, code value: BJ and the actual SSCC: GIN+BJ+35410738000001068'
Global Trade Item Number (GTIN)	N2+N14	urn:epc:id:sgtin:CompanyPrefix.IndicatorPlusItemReference.SerialReference	<gtin>GTIN expressed in 14-digit field with leading zero(s) if required</gtin>	Dependent upon usage. The segment example below shows: Line Item, the actual GTIN and GS1 as the agency controlling the party identifier: LIN+1++5712345001110:SRV
Global Document Type Identifier (GDTI)	N3+N13+N..17	urn:epc:id:gdti:CompanyPrefix.DocumentType.SerialComponent	Currently not used in GS1 XML.	Dependent upon usage. The segment example below shows: BGM+220+354123450014+9' Note: The use of GDTI is possible but cannot explicitly be qualified in EANCOM. A mutual agreement between trading partners is required.
Global Identification Number for Consignment (GINC)	N3+X..30	There is no EPC URI for the GINC	Currently not used in GS1 XML	Currently not used in EANCOM.
Global Shipment Identification Number (GSIN)	N3+N17	There is no EPC URI for the GSIN	Currently not used in GS1 XML	Currently not used in EANCOM.
Identification of a Physical Location - Global Location Number	N3+N13	urn:epc:id:sgln:CompanyPrefix.LocationReference.Extension	<gln>GLN expressed in 13-digit field with leading zero(s) if required</gln>	Dependent upon usage. The segment example below shows: Name and Address, Party: Buyer, the actual GLN and GS1 as the agency controlling the party identifier: NAD+BY+5412345000013::9'
Global Returnable Asset Identifier (GRAI)	N4+N14+X..16	urn:epc:id:sgtin:CompanyPrefix.AssetType.SerialNumber	Currently not used in GS1 XML	Dependent upon usage. The segment example below shows: GIN+RAG+354123450014'
Global Individual Asset Identifier (GIAI)	N4+X..30	urn:epc:id:giai:CompanyPrefix.IndividualAssetReference	Currently not used in GS1 XML	Dependent upon usage. The segment example below shows: GIN+CU+354123450000000014'

Data Content	Application Identifier Syntax	EPC URI Syntax	GS1 XML Syntax	EANCOM Syntax
Global Service Relation Number (GSRN)	N4+N18	urn:epc:id:gsm:CompanyPrefix.ServiceReference	Currently not used in GS1 XML.	Dependent upon usage. The segment example below shows: RFF+SNR:35412345001454857'

608

See also:

609

The GS1 Identification Keys are further explained in Section 1.1 in this document.

610 **3.3. Key extensions**

611 **3.3.1. Serialized GTIN**

612 See Section 1.2.1 – SGTIN (Serialized GTIN).

613 **3.3.2. Extended GLN**

614 See Section 1.2.2 – eGLN (Extended GLN).

615 4. Physical data carriers

616 A physical data carrier is a representation of data in a format that is designed to be machine-
 617 readable. There are two types of physical data carrier in the GS1 System: bar code and RFID
 618 tags and the GS1 standards for both are intended for carrying GS1 identification keys and GS1
 619 supplementary data. They are usually attached to the object or location that the key they carry
 620 identifies. Examples include a bar code on a box, an RFID tag on a pallet and a bar code at a
 621 delivery point location.

622 The purpose of physical data carriers in the GS1 System is to provide a reliable way to
 623 automatically capture a GS1 Identification Key and link to the data held on computer systems
 624 (e.g., price look up) globally. In a GS1 compliant application of physical data carriers, a GS1
 625 Identification Key must always be present. Many of the bar codes and RFID tags can also
 626 encode supplementary data which can be captured by the same scanner or reading system
 627 (e.g., batch number, weight, height, country of origin).

628 In line with the [GS1 Architecture Principles](#) the data standards are defined independently of
 629 physical data carrier. This means that the bar code or RFID tag never alters the meaning of the
 630 data.

631 4.1. Bar Code

632 A bar code is an optically readable symbol that encodes data into a machine readable pattern
 633 using dark and light areas. They come in two main types:

- 634 ■ Linear symbols
- 635 ■ Two-dimensional symbols

636 4.1.1. Symbologies

637 *Normative References:*

- 638 ■ ISO/IEC 15424: Information technology; automatic identification and data capture
 639 techniques; data carrier/symbology identifiers

640 *Abstract:*

641 In order to identify the symbology of a bar code, a symbology identifier is generated by the
 642 decoder after decoding and is transmitted as a preamble to the data message. The symbology
 643 identifiers used in the GS1 System are:

644

Symbology Identifier*	Symbology Format	Content
] E 0	EAN-13, UPC-A, or UPC-E	13 digits
] E 1	Two-digit Add-On Symbol	2 digits
] E 2	Five-digit Add-On Symbol	5 digits
] E 3	EAN-13, UPC-A, or UPC-E with Add-On Symbol**	15 or 18 digits
] E 4	EAN-8	8 digits
] I 1	ITF-14	14 digits
] C 1	GS1-128	Standard AI Element Strings

Symbology Identifier*	Symbology Format	Content
] e 0	GS1 DataBar	Standard AI Element Strings
] d 2	GS1 DataMatrix	Standard AI Element Strings

645

Notes:

646

- Symbology identifiers are case sensitive.

647

- Bar codes with Add-On Symbols may be considered either as two separate symbols, each of which is transmitted separately with its own symbology identifier, or as a single data packet. The system designer shall select one of these methods, but the method using symbology identifier]E3 is preferable for data security.

648

649

650

651

- For all the GS1 endorsed symbologies with the sole exception of ITF-14, the ISO Symbology Specifications have an explicit mechanism to indicate that GS1 data content is encoded.

652

653

654

Dependencies:

655

- The [GS1 General Specifications](#)

656

4.1.1.1. EAN/UPC

657

Normative References:

658

- ISO/IEC 15420: Information technology; automatic identification and data capture techniques; bar code symbology specifications; EAN/UPC

659

660

Abstract:

661

The EAN/UPC is a linear symbology that only encodes numbers. Its use is restricted to GS1 Applications. It has four main symbol types: EAN-13, UPC-A, EAN-8 and UPC-E.

662

663

EAN/UPC also has 2-digit and 5-digit add-on symbols whose use is restricted to a small number of specific areas.

664

665

Dependencies:

666

- The [GS1 General Specifications](#)

667

- Global Trade Item Number (GTIN)

668

- Restricted Circulation Numbers: a certain numbering capacity is set aside for closed-loop applications (e.g., Money off coupons)

669

670

4.1.1.2. ITF-14

671

Normative References:

672

- ISO/IEC 16390: Information technology; automatic identification and data capture techniques; bar code symbology specifications; ITF

673

674

Abstract:

675

The ITF-14 is a linear symbology that only encodes numbers. Within the GS1 System it is restricted to encoding the GTIN. Whatever type of GTIN is encoded, it must always be encoded as 14-digits in an ITF-14 symbol with leading zeros if required.

676

677

678

Dependencies:

679

- The [GS1 General Specifications](#)

- 680
- Global Trade Item Number (GTIN)

681 **4.1.1.3. GS1-128**

682 *Normative References:*

- 683
- ISO/IEC 15417: Information technology; automatic identification and data capture techniques; bar code symbology specifications; Code-128 Symbology specifications
- 684

685 *Abstract:*

686 Code-128 is a linear symbology that encodes all the numbers and letters and a number of
687 special characters.

688 GS1-128 is a subset of the more general Code-128. As per the ISO/IEC standard 15417 the
689 use of the Function 1 Symbol Character (FNC1) in Code 128 Symbols in the first symbol
690 character position following the Start Character has been reserved exclusively for encoding
691 GS1 Application Identifiers.

692 GS1-128 always uses GS1 Application Identifiers to encode information. It can encode all the
693 GS1 Identification Keys and any GS1 Application Identifier.

694 *Dependencies:*

- 695
- The [GS1 General Specifications](#)
 - All GS1 Identification Keys
 - All GS1 Application Identifiers
- 696
- 697

698 **4.1.1.4. GS1 DataBar**

699 *Normative References:*

- 700
- ISO/IEC 24724: Information technology; automatic identification and data capture techniques; Reduced Space Symbology (RSS) bar code symbology specification
- 701

702 *Abstract:*

703 GS1 DataBar is a family of linear symbologies used exclusively within the GS1 System. There
704 are three groups of GS1 DataBar symbols, two of which have a number of versions optimised
705 for different application requirements:

- 706
- The first group comprises GS1 DataBar Omnidirectional, GS1 DataBar Truncated, GS1 DataBar Stacked and GS1 DataBar Stacked Omnidirectional and only encodes GTINs
707 The second group is GS1 DataBar Limited which encodes GTINs in a linear symbol with
708 certain numbering restrictions.
 - The third group comprises GS1 DataBar Expanded and GS1 DataBar Expanded Stacked. They always use GS1 Application Identifiers to encode information and can
709 encode all the GS1 Identification Keys and any GS1 Application Identifier.
- 710
- 711
- 712

713 *Dependencies:*

- 714
- The [GS1 General Specifications](#)
 - All GS1 Identification Keys
 - All GS1 Application Identifiers
- 715
- 716

717 **4.1.1.5. GS1 DataMatrix**

718 *Normative References:*

- 719 ■ ISO/IEC 16022: Information technology; automatic identification and data capture
720 techniques; Data Matrix bar code symbology specification

721 *Abstract:*

722 Data Matrix ISO version ECC 200 is a standalone, two-dimensional matrix symbology that is
723 made up of square modules arranged within a perimeter finder pattern. It can encode all the
724 numbers and letters and a number of special characters and uses Reed-Solomon error
725 correction.

726 GS1 DataMatrix requires a leading FNC1 character at the start. This indicates that Application
727 Identifier (AI) data is encoded. GS1 DataMatrix therefore always uses GS1 Application
728 Identifiers to encode information and can encode all the GS1 Identification Keys and any GS1
729 Application Identifier.

730 *Dependencies:*

- 731 ■ The [GS1 General Specifications](#)
732 ■ All GS1 Identification Keys
733 ■ All GS1 Application Identifiers

734 4.1.1.6. GS1 Composite

735 *Normative References:*

- 736 ■ ISO/IEC 24723: Information technology; automatic identification and data capture
737 techniques; EAN.UCC Composite bar code symbology specification

738 *Abstract:*

739 The GS1 Composite Symbology integrates both a GS1 System linear symbol and a 2
740 Dimensional Composite Component as a single symbology. There are three types of Composite
741 Symbols A, B and C, each with different encoding rules. Properly defined encoders
742 automatically select the appropriate type and optimise.

743 The linear component always encodes the object's GS1 Identification Key and therefore the
744 primary identification is readable by most scanning technologies. The adjacent 2D Composite
745 Component encodes supplementary data.

746 The Composite Symbol only encodes information using GS1 Application Identifiers. It can
747 encode all the supplementary GS1 Application Identifier.

748 *Dependencies:*

- 749 ■ The composite component requires a GS1 System linear symbol encoding a GS1
750 Identification Key
751 ■ The [GS1 General Specifications](#)
752 ■ GS1 Application Identifiers for supplementary information

753 4.1.2. Symbol placement

754 *Normative References:*

- 755 ■ The [GS1 General Specifications](#)

756 *Abstract:*

757 Consistency of symbol placement is important to efficient scanning. With manual scanning,
758 variation of symbol placement makes it difficult for the scanning operator to predict where the

759 symbol is located, and this reduces efficiency. With automated scanning, the symbol must be
760 positioned so that it will pass through the field of vision of a fixed scanner as it travels past.

761 General principles exist such as number of symbols, scanning environment, orientation, printing
762 direction, curvature of surface and avoiding scanning obstacles (i.e. anything that will obscure
763 or damage a symbol and show through). In addition to these general principles guidelines are
764 provided for symbols in various scanning environments.

765 The general recommendations for symbol location are supplemented with additional
766 recommendations for the following areas:

- 767 ■ General Placement Guidelines for Point-of-Sale
- 768 ■ Placement Guidelines for Specific Packaging Types
- 769 ■ Placement Guidelines for Clothing and Fashion Accessories
- 770 ■ Placement for Plastics Packaged Products
- 771 ■ GS1 Logistics Label Design
- 772 ■ Placement Labels used in General Distribution
- 773 ■ Placement guidelines for Regulated Healthcare Trade Items
- 774 ■ Placement guideline Priority if both POS & General Distribution

775 4.2. RFID

776 Radio Frequency Identification (RFID) is a method of Automatic Identification and Data Capture
777 in which data is carried by an electronic device called an RFID Tag, which communicates via
778 radio frequency (RF) signals with a reading device called an RFID Interrogator (also called an
779 "RFID Reader," though most such devices are capable of "writing" as well as "reading"). RFID
780 Tags operate differently from bar codes in a number of ways, including the following:

- 781 ■ RFID Tags can be read even when there is not a direct optical line of sight from the
782 RFID Tag to the RFID Interrogator. On the other hand, the communication between
783 Tag and Interrogator may be subject to RF interference and absorption of RF signals by
784 electrically conductive materials.
- 785 ■ Certain types of RFID Tags may be read at very long distances.
- 786 ■ A single Interrogator may read many Tags simultaneously, without having to "aim" the
787 Interrogator at each Tag one at a time.
- 788 ■ The data on RFID Tags may be added to or changed at any time.
- 789 ■ Certain types of RFID Tags may provide additional functionality besides data storage
790 and retrieval; for example: encryption, authentication, access control, electronic
791 disabling, sensors, actuators, etc.

792 These different operating characteristics make RFID Tags a viable data carrier in applications
793 where the use of bar codes might be unsuitable or impractical. In some applications, RFID
794 Tags and bar codes are used simultaneously to obtain the benefits of both. These different
795 operating characteristics also lead to the need for RFID Software Standards that have no
796 counterpart for bar codes.

797 GS1 Standards for RFID include the following:

- 798 ■ *Air Interface Standards* are standards that define the capabilities of RFID Tags and how
799 RFID Tags communicate with RFID Interrogators. (The term "air interface" refers to the
800 fact that the interface between Tag and Interrogator occurs via radio signals, informally
801 "over the air.")

- 802 ■ *Tag Data Standards* define how data is encoded in the digital memory of RFID Tags,
803 and also provide definitions of data that is specific to RFID Tags and the process of
804 capturing information from RFID Tags.
- 805 ■ *RFID Software Standards* are standards governing network and software interfaces
806 between system components that interact with RFID Interrogators and capture data
807 from RFID Tags.

808 4.2.1. Air interfaces

809 An Air Interface standard defines the capabilities of a particular class of RFID Tag and specifies
810 how RFID Tags belonging to that class communicate with RFID Interrogators. GS1 Air
811 Interface standards can be classified along two dimensions:

- 812 ■ The frequency band in which the radio communication between Tag and Interrogator
813 takes place.
- 814 ■ The functions supported by the Tag.

815 The functions supported by the Tag are summarized by a “class” designation established by
816 GS1. The defined classes are as follows:

817 **Class-1: Identity Tags:** Passive-backscatter Tags with the following minimum features:.

- 818 ■ An Electronic Product Code (EPC) identifier, optionally writeable.
- 819 ■ A Tag Identifier (TID) that indicates the tag’s manufacturer identity and mask ID.
- 820 ■ A “kill” function that permanently disables the Tag. This feature may involve additional
821 data stored on the tag such as a kill password.
- 822 ■ Optional extended TID that may include a unique serial number and information
823 describing the capabilities of the tag.
- 824 ■ Optional recommissioning of the Tag
- 825 ■ Optional password-protected access control.
- 826 ■ Optional user memory (for application data apart from the EPC).

827 **Class-2: Higher-Functionality Tags:** Passive Tags with the following anticipated features
828 above and beyond those of Class-1 Tags:

- 829 ■ An extended Tag ID as described above (required in Class-2, as opposed to optional in
830 Class-1)
- 831 ■ Extended user memory
- 832 ■ Authenticated access control
- 833 ■ Additional features as will be defined in the Class-2 standard.

834 **Class-3: Battery-Assisted Passive Tags (also called Semi-Passive Tags):** Semi-passive
835 Tags with *one or more* of the following anticipated features above and beyond those of Class-2
836 Tags:

- 837 ■ A power source that may supply power to the Tag or to its sensors
- 838 ■ Sensors, with or without sensor data logging

839 Class-3 Tags still communicate passively, meaning that they (i) require an Interrogator to
840 initiate communications, and (ii) send information to an Interrogator using either backscatter or
841 load-modulation techniques

842 **Class-4: Active Tags:** Active Tags with the following anticipated features:

- 843 ■ An EPC identifier

- 844 ■ An extended Tag ID
- 845 ■ Authenticated access control
- 846 ■ A power source
- 847 ■ Communications via an autonomous transmitter
- 848 ■ Optional User memory
- 849 ■ Optional sensors, with or without sensor data logging.

850 Class-4 Tags have access to a transmitter and can typically initiate communications with an
851 Interrogator or with another Tag. Tag Protocols may limit this ability by requiring an Interrogator
852 to initiate or enable Tag communications. Because active tags have access to a transmitter, of
853 necessity they have access to a power source. Class-4 Tags shall not interfere with the
854 communications protocols used by Class-1/2/3 Tags.

855 At present, all GS1 Air Interface standards are for Class-1. Therefore, the definitions for tag
856 classifications beyond Class-1 should be considered as preliminary and subject to change.

857 **4.2.1.1. UHF Class 1 Gen 2**

858 *Normative References:*

- 859 ■ [EPC™ Radio-Frequency Identity Protocols Class-1 Generation-2 UHF RFID Protocol](#)
860 [for Communications at 860 MHz – 960 MHz](#)
- 861 ■ ISO/IEC 18000-6:2004 – “Information technology -- Radio frequency identification for
862 item management -- Part 6: Parameters for air interface communications at 860 MHz to
863 960 MHz”
- 864 ■ ISO/IEC 18000-6:2004/Amd 1:2006 – “Extension with Type C and update of Types A
865 and B”

866 *Abstract:*

867 The UHF Class 1 Gen 2 Air Interface (often referred to simply as “Gen 2”) specifies the air
868 interface for passive RFID Tags operating in the 860 MHz – 960 MHz radio frequency band,
869 with functionality as specified for “Class 1” tags in Section 4.2.1, above. This standard is
870 maintained in synchrony with ISO/IEC 18000-6C.

871 **4.2.1.2. HF Class 1 Gen 2**

872 *Normative References:*

- 873 ■ [currently under development]
- 874 ■ ISO/IEC 18000-3:2010 – “Information technology -- Radio frequency identification for
875 item management -- Part 3: Parameters for air interface communications at 13,56 MHz”

876 *Abstract:*

877 The HF Class 1 Gen 2 Air Interface is a standard currently under development. It is expected to
878 specify the air interface for passive RFID Tags operating in the 13.56MHz radio frequency band,
879 with functionality comparable to UHF Class 1 Gen 2 tags.

880 **4.2.2. Tag Data Standards**

881 Tag Data Standards define how data is encoded in the digital memory of RFID Tags, and also
882 provide definitions of data that is specific to RFID Tags and the process of capturing information
883 from RFID Tags. (In contrast, the definition of business data in the GS1 System is independent

884 of data carrier; the Tag Data Standards only specify the encoding of such data for RFID Tags
885 and not their semantics.)

886 4.2.2.1. EPC Tag Data Standard

887 *Normative references:*

888 ■ [EPC Tag Data Standard](#)

889 ■ ISO/IEC 15962, 2nd Edition. Appendixes I, J, K, and L of the EPCglobal Tag Data
890 Standard Version 1.5, which specify the encoding of the user memory bank of a Gen 2
891 RFID Tag, are reproduced in this ISO/IEC specification.

892 *Abstract:*

893 ■ Defines the overall structure of the Electronic Product Code, including the mechanism
894 for federating different coding schemes.

895 ■ Defines specific EPCglobal coding schemes.

896 ■ For each EPCglobal coding scheme, defines binary representations for use on RFID
897 tags, text URI representations (EPC Pure Identity URI described in Section 3.1.2 and
898 EPC Tag URI described in Section 4.2.2.4) for use within information systems (in
899 particular, at the ALE level and higher in the EPCglobal Architecture Framework,
900 including EPCIS and Discovery Services), and rules for converting between one
901 representation and another.

902 ■ For EPC codes that are in correspondence with GS1 codes, defines rules for traversing
903 this correspondence in both directions.

904 ■ Defines additional control information that is specific to RFID and the capture of data
905 from RFID Tags, including

906 □ Filter bits, which assist RFID Interrogators in isolating specific tag populations, in
907 order to improve performance

908 □ Attribute bits, which provide information regarding special handling of the object to
909 which the RFID Tag is affixed

910 ■ Defines the encoding of TID memory for Gen2 Tags, which encodes information about
911 the Tag itself as opposed to the object to which the Tag is affixed. This information may
912 include the capabilities of the Tag (such as how much memory it contains, whether it
913 implements optional features, etc). It also may include a globally unique serial number
914 assigned at Tag manufacture time.

915 ■ Defines the encoding of User Memory for Gen2 Tags, which may be used to store
916 additional data elements beyond the EPC.

917 *Dependencies:*

918 ■ UHF Class 1 Gen 2 Air Interface

919 ■ The [GS1 General Specifications](#)

920 ■ ISO/IEC 15961

921 4.2.2.2. Attributes values

922 Attribute values provide information regarding special handling of objects to which RFID Tags
923 are affixed. They are defined in the EPC Tag Data Standard (see Section 4.2.2.1).

924 4.2.2.3. Filter values

925 Filter values assist RFID Interrogators in isolating specific tag populations, in order to improve
926 performance. They are defined in the EPC Tag Data Standard (see Section 4.2.2.1).

927 4.2.2.4. EPC Tag URI

928 The EPC Tag URI is a Uniform Resource Identifier syntax for describing the complete contents
929 of the EPC Memory Bank of a Gen 2 RFID Tag. It is defined in the EPC Tag Data Standard
930 (see Section 4.2.2.1).

931 *See also:*

- 932 ■ Section 3.1.2 for information on EPC URI syntax.

933 4.2.2.5. EPC Binary Encoding

934 The EPC Binary Encoding is an efficient encoding of an EPC, together with Attribute Values,
935 Filter Values, and other control information, into a string of bits suitable for storage in the EPC
936 Memory Bank of a Gen 2 RFID Tag. It is defined in the EPC Tag Data Standard (see
937 Section 4.2.2.1).

938 4.2.2.6. Tag Data Translation

939 *Normative references:*

- 940 ■ [EPC Tag Data Translation](#)

941 *Abstract:*

- 942 ■ Provides in machine-readable form all of the rules that define how to translate between
943 EPC encodings defined by the EPC Tag Data Standard.

944 *Dependencies:*

- 945 ■ EPC Tag Data Standard

946 4.2.2.7. TID/XTID

947 The Tag Identification (TID) and Extended Tag Identification (XTID) encodes information about
948 an RFID Tag itself, as opposed to the object to which the Tag is affixed. It is defined in the EPC
949 Tag Data Standard (see Section 4.2.2.1).

950 4.2.2.8. User Memory Encoding (Packed Objects)

951 The User Memory Bank in a Gen 2 RFID Tag may be used to store additional data elements
952 beyond the EPC. The procedures for encoding user memory, including the “Packed Objects”
953 encoding method, are defined in the EPC Tag Data Standard (see Section 4.2.2.1).

954 4.2.3. RFID Software Interface Standards

955 GS1 RFID Software Interface Standards govern the network and software interfaces between
956 system components that interact with RFID Interrogators and capture data from RFID Tags.

957 4.2.3.1. Low-level Reader Protocol (LLRP)

958 *Normative references:*

- 959 ■ [EPC Low Level Reader Protocol \(LLRP\)](#)

- 960 *Abstract.*
- 961 ■ Provides means to command an RFID Interrogator to inventory tags (that is, to read the
- 962 EPC codes carried on tags), read tags (that is, to read other data on the tags apart from
- 963 the EPC code), write tags, manipulate tag user and tag identification data, and access
- 964 other features such as kill, lock, etc.
- 965 ■ May provide means to access RFID Interrogator management functions including
- 966 discovery, firmware/software configuration and updates, health monitoring, connectivity
- 967 monitoring, statistics gathering, antenna connectivity, transmit power level, and
- 968 managing reader power consumption.
- 969 ■ May provide means to control RF aspects of RFID Interrogator operation including
- 970 control of RF spectrum utilization, interference detection and measurement, modulation
- 971 format, data rates, etc.
- 972 ■ May provide means to control aspects of RFID Tag Air Interface operation, including
- 973 protocol parameters and singulation parameters.
- 974 ■ May provide access to processing features such as filtering of EPCs, aggregation of
- 975 reads, and so forth. For features that require converting between different
- 976 representations of EPCs, may use the Tag Data Translation Interface to obtain
- 977 machine-readable rules for doing so.
- 978 *Dependencies:*
- 979 ■ UHF Class 1 Gen 2 Air Interface Standard

980 **4.2.3.2. Application Level Events (ALE)**

981 *Normative references:*

- 982 ■ [EPC Application Level Events](#)

983 *Abstract (data functions):*

- 984 ■ Provides means for one or more client applications to request EPC data from one or
- 985 more Tag sources.
- 986 ■ Provides means for one or more client applications to request that a set of operations
- 987 be carried out on Tags accessible to one or more Tag sources. Such operations
- 988 including writing, locking, and killing.
- 989 ■ Insulates client applications from knowing how many readers/antennas, and what
- 990 makes and models of readers are deployed to constitute a single, logical Tag source.
- 991 ■ Provides declarative means for client applications to specify what processing to perform
- 992 on EPC data, including filtering, aggregation, grouping, counting, and differential
- 993 analysis.
- 994 ■ Provides a means for client applications to request data or operations on demand
- 995 (synchronous response) or as a standing request (asynchronous response).
- 996 ■ Provides means for multiple client applications to share data from the same reader or
- 997 readers, or to share readers' access to Tags for carrying out other operations, without
- 998 prior coordination between the applications.
- 999 ■ Provides a standardised representation for client requests for EPC data and operations,
- 1000 and a standardised representation for reporting filtered, collected EPC data and the
- 1001 results of completed operations.

1002 *Abstract (control functions):*

- 1003
1004
1005
- Provides a means for client applications to query and configure the mapping between logical reader names as used in read/write requests and underlying physical resources such as RFID Readers.
- 1006
1007
- Provides a means for client applications to configure symbolic names for Tag data fields.
- 1008
1009
- Provides a means for management applications to secure client access to the ALE interface.
- 1010
- Dependencies:*
- 1011
- UHF Class 1 Gen 2 Air Interface Standard
- 1012
- EPC Tag Data Standard

1013 **4.2.3.3. Reader Management (RM)**

- 1014
- Normative references:*
- 1015
- [EPC Reader Management](#)
- 1016
- Abstract:*
- 1017
- Provides means to query the configuration of an RFID Interrogator, such as its identity, number of antennas, and so forth.
- 1018
- 1019
- Provides means to monitor the operational status of an RFID Interrogator, such as the number of tags read, status of communication channels, health monitoring, antenna connectivity, transmit power levels, and so forth.
- 1020
- 1021
- 1022
- Provides means for an RFID Interrogator to notify management stations of potential operational problems.
- 1023
- 1024
- Provides means to control configuration of an RFID Interrogator, such as enabling/disabling specific antennas or features, and so forth.
- 1025
- 1026
- May provide means to access RFID Interrogator management functions including device discovery, identification and authentication, network connectivity management, firmware/software initialization, configuration and updates, and managing reader power consumption.
- 1027
- 1028
- 1029
- 1030
- Dependencies:*
- 1031
- UHF Class 1 Gen 2 Air Interface Standard

1032 **4.2.3.4. Discovery, Configuration, and Initialization (DCI)**

- 1033
- Normative references:*
- 1034
- [EPC Discovery, Configuration, and Initialization \(DCI\) for Reader Operations](#)
- 1035
- Abstract:*
- 1036
- Provide a means for an RFID Interrogator to discover one or more Access Controllers.
- 1037
- Provide a means for the Access Controller to discover one or more RFID Interrogator.
- 1038
- Provide a means for an RFID Interrogator to discover one or more Clients.
- 1039
- Provide a means for an RFID Interrogator and an Access Controller to exchange identity information and authenticate that identity information.
- 1040
- 1041
- Provide a means for a Client and Access Controller to authenticate their communications and operations.
- 1042

- 1043
1044
- Provide a means for an Access Controller to configure an RFID Interrogator, including a means to update the software and/or firmware on the Interrogator.
- 1045
1046
- Provide a means for the Access Controller to initialize an RFID Interrogator, providing parameters necessary for the Interrogator to begin operation.
- 1047
1048
- Provide a means for an RFID Interrogator and Access Controller to exchange vendor-specific information.
- 1049
- Dependencies:*
- 1050
1051
- “Control and Provisioning of Wireless Access Points (CAPWAP),” IETF RFC 5415, March 2009, <http://www.ietf.org/rfc/rfc5415.txt>.

1052 5. Business data

1053 5.1. Master data

1054 Master data provides the description and structure to define a Trade Item, a Catalogue Item, or
1055 a Party. The use, definition, and relevance of these attributes are the same for all users of GS1
1056 standards. The definition of these attributes must be the same for all industries.

1057 Master data defines the attributes of trade items that are used to establish a catalogue. It can
1058 establish the details about buyers and sellers as the 'parties' transacting business within the
1059 supply chain. It also sets up the details of locations within the supply chain that are necessary
1060 for invoicing, billing and logistics.

1061 5.1.1. Trade Item (Key = GTIN)

1062 Any item (product or service) upon which there is a need to retrieve pre-defined information and
1063 that may be priced, ordered, or invoiced at any point in any supply chain.

1064 *See Also:*

1065 1.1.1 GTIN

1066 *Definition*

1067 The Trade Item (identified by a GTIN) definition is provided at the *GS1 Standards Knowledge*
1068 *Centre within the GS1 website:*

1069 http://www.gs1.org/gsm/kc/ecom/xml/gdsn_grid

1070 *References*

- 1071 ■ GS1 EANCOM Product Information Messages (PRICAT)
- 1072 ■ Business Message Standard (BMS) Align/Trade Item (Data Definition)

1073

1074 5.1.2. Catalogue Item (Key = GTIN + GLN of Information Provider + Target 1075 Market)

1076 This is Trade Item information as it is usually stored in a catalogue or Data Pool, typically as
1077 implemented for use in the Global Data Synchronisation Network (GDSN). This combination of
1078 keys and attributes defines the uniqueness of a catalogue item in the GDSN. This allows for the
1079 ability to possibly vary the values of some of the attributes of a Trade Item, represented by a
1080 GTIN based on either the Party (GLN of Information Provider) as well as by the target market
1081 (the geographic location(s) in which the Trade Item is intended to be sold).

1082 *Definition*

1083 The Catalogue Item definition is contained within the GS1 Catalogue Item Synchronisation
1084 Business Message Standard, provided at the GS1 Standards Knowledge Centre within the GS1
1085 website:

1086 http://www.gs1.org/gsm/kc/ecom/xml/gdsn_grid

1087 *References*

- 1088 ■ GS1 EANCOM Product Information Messages (PRICAT)
- 1089 ■ GS1 EANCOM Product Data Messages (PRODAT)

- 1090 ■ Business Message Standard (BMS) Catalogue Item Synchronisation

1091 **5.1.3. Party (GLN)**

1092 *Abstract*

1093 The attributes of the Party ideally should be established as part of master data management
1094 using the GLN as the key to the information. The Party can be used to identify physical
1095 locations and legal entities where there is a need to retrieve pre-defined information to improve
1096 the efficiency of communication with the supply-chain. Parties are a prerequisite for GS1 eCom
1097 messages or for accessing information from the Global Data Synchronisation Network.

1098 The use of Global Location Numbers (GLNs) in these areas is driven by the exact party role
1099 within a given business process requirement. These GLNs identify parties to different business
1100 processes and transactions.

1101 *See also:*

- 1102 ■ 1.1.2 GLN

1103 *Definition*

1104 The Party (identified by a GLN) definition is provided at the GS1 Standards Knowledge Centre
1105 within the GS1 website:

1106 http://www.gs1.org/qsmp/kc/ecom/xml/gdsn_grid

1107 *References*

- 1108 ■ GS1 EANCOM Party Information Message (PARTIN)
1109 ■ Business Message Standard (BMS) Basic Party Synchronisation
1110 ■ Business Message Standard (BMS) Full Party Synchronisation

1111 **5.1.4. Price Synchronisation**

1112 Price Synchronisation is the capability for electronically communicating accurate pricing in-
1113 formation between trading partners using global standards that accommodates the different
1114 pricing business practices and facilitates an invoice amount equal to the expected payment
1115 amount equal to the actual payment. GS1 price synchronisation allows for pricing business
1116 practices ranging from simple pricing and transactional pricing to component based pricing.
1117 Component-based pricing includes components such as promotions, allowances, charges, and
1118 brackets.

1119 *See also:*

1120 1.1.1 GTIN

1121 *Definition*

1122 The Price Synchronisation definition is provided at the GS1 Standards Knowledge Centre within
1123 the GS1 website:

1124 http://www.gs1.org/qsmp/kc/ecom/xml/gdsn_grid

1125 *References*

- 1126 ■ GS1 EANCOM Business Transaction Messages (PRICAT)
1127 ■ Business Message Standard (BMS) Price Synchronisation

1128 **5.2. Business transactions**

1129 *Normative References:*

1130 ■ [EANCOM Message Implementation Guide](#)

1131 ■ [GS1 Business Message Standard \(BMS\)](#)

1132 *Abstract:*

1133 Standards for electronic supply chain transactions are provisioned by GS1 in EANCOM and
 1134 GS1 XML formats. The use of electronic business in the supply chain simplifies the processes
 1135 involved and reduces costs. They support business processes such as order to cash and
 1136 logistics.

1137 The technical formats used to exchange this information are found in Section 6.

1138 **5.2.1. Plan**

1139 The replenishment process in broad sense addresses the business practice to exchange data
 1140 between a buying party (e.g. buyer) and a supplying party (e.g. seller/supplier) related to the
 1141 future demand of finished or semi-finished products, ingredients, packaging and raw materials.

1142
 1143 Between retailer and manufacturer (the downstream supply chain) the data is based on future
 1144 demand based on finished products and time series but it can also be restricted to actual sales
 1145 data for a certain period of time. Feed-back from the manufacturer on his availability to deliver is
 1146 required, where available inventories (of both sides) are taken in account.

1147 Between manufacturer and material supplier (the upstream supply chain) the data is basically
 1148 based on material requirements for production and the timing for it, and also the feedback from
 1149 the material supplier on his availability to deliver and the schedule for delivery. Inventories (on
 1150 both sides) are taken into account for the actual delivery schedule.

1151



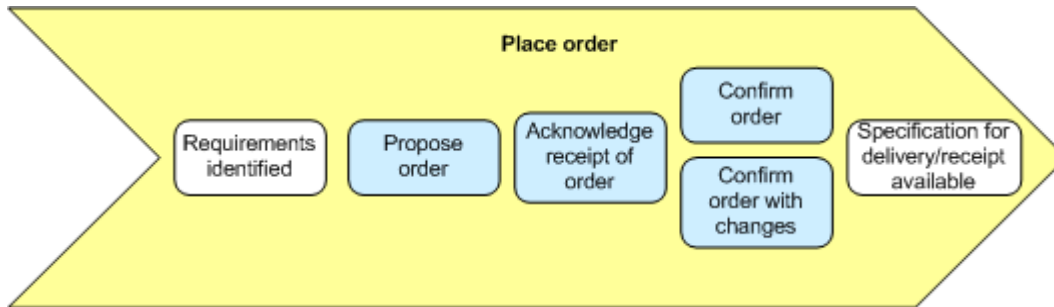
1152
 1153

1154 **Figure 1. Example of *Send sales data* process. The buyer's sales data is exchanged in the**
 1155 **document exchanges, shown blue in the diagram.**

1156 **5.2.2. Order**

1157 This process is used to order goods and services. The purpose is to transfer between the buyer
 1158 and supplier all information necessary to allow delivery to be made. This information is
 1159 exchanged in the document exchanges shown in blue in the following diagram.

1160



1161

1162

Figure 2 – Example of *Place order* process

1163

1164

The state *Requirements identified* starts the process and *Specification for delivery/receipt available* is the final state of the process.

1165

1166 **5.2.3. Deliver**

1167

This is the process of delivering goods that the buyer has ordered. It covers activities from the preparation of the shipment and its transport through to its receipt and the registration of information needed for traceability and invoice reconciliation.

1168

1169

1170

In addition to the physical transfer of goods from the supplier to the buyer, information about the shipment is transferred using a despatch advice message. Since this document should arrive before the goods, the recipient can plan for their arrival.

1171

1172

1173

Information is also exchanged with transporters and logistics service providers to manage the goods during transfer and intermediate storage.

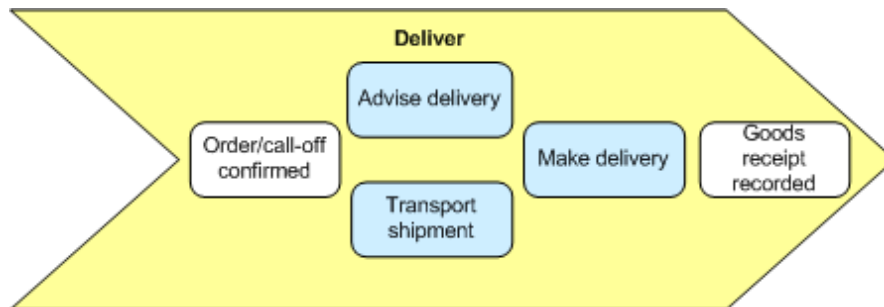
1174

1175

The transfer of the goods and related information is achieved with the document exchanges shown in blue in the following diagram.

1176

1177



1178

1179

Figure 3. Example of *Deliver* process.

1180

1181 **5.2.4. Pay**

1182

The Pay messages cover all financial information in the supply chain processes, such as invoice and remittance advice.

1183

1184

This process is used when a supplier issues an invoice demanding payment for goods or services delivered. The purpose is to ensure that the buyer has sufficient information to enable him to pay the debt and update his accounting system. Once the payment is carried out reporting messages may be exchanged, such as remittance advice and financial statement. Information is sent in the business document *Request payment*, shown in blue below.

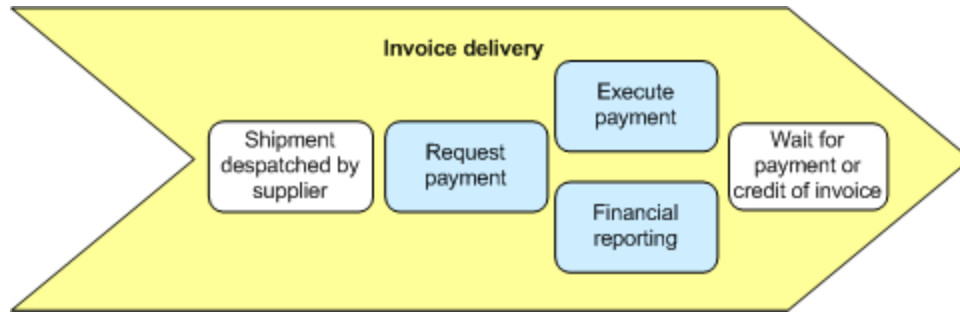
1185

1186

1187

1188

1189 The payment related information is achieved with the document exchanges shown in blue in the
 1190 following diagram.
 1191



1192
1193

1194 **Figure 1. Example of Pay process**

1195 **5.2.5. Other**

1196 Other messages cover general processes supporting the above processes, such as error
 1197 reporting and status updates.

1198 **5.3. Physical event data**

1199 The EPC Information Services (EPCIS) standard defines an abstract data model and concrete
 1200 XML syntax for physical event data, which is designed to provide visibility as to the whereabouts
 1201 and condition of physical assets. Physical event data is complementary to master data and
 1202 business transaction data defined earlier. Whereas the focus of master data standards is on
 1203 the description of business entities, and the focus of business transaction data standards is to
 1204 encode the information to support the creation or fulfilment of a contractual or monetary
 1205 obligation between parties, the focus of visibility data is on the physical status and condition of
 1206 assets.

1207 Physical event data as defined in EPCIS consists of a collection of events, where each event is
 1208 a record of something that happened to one or more physical objects. Each EPCIS event has
 1209 four information dimensions, conveniently remembered by the mnemonic *what, where, when,*
 1210 *and why:*

- 1211 ■ *What* The physical objects that are the subject of the event (indicated by their
 1212 respective EPC identifiers)
- 1213 ■ *When* The date and time at which the event took place
- 1214 ■ *Where* Location identifiers that indicate where the event took place, as well as where
 1215 the physical objects are expected to be following the event
- 1216 ■ *Why* Information that provides the business context for the event, including (a) an
 1217 indication of what step of a business process was taking place at the time of the event;
 1218 (b) the business state or condition of the physical objects subsequent to the event; and
 1219 (c) links to business transaction data or other business data that was part of the
 1220 business context in which the event took place.

1221 There are four different physical event structures defined in the EPCIS standard, as detailed in
 1222 the following sections. Each of these has the same four-dimensional information content as
 1223 defined above, but the details of the *what* dimension differ for each event type.

1224 5.3.1. Object Event

1225 The EPCIS Object Event is used to record an event that happened to one or more physical
1226 objects, where no particular relationship between the objects is implied apart from their having
1227 participated in the same event together. The *what* dimension for an Object Event simply
1228 enumerates each of the physical objects involved in the event.

1229 5.3.2. Aggregation Event

1230 The EPCIS Aggregation Event is used to record an event that happened to one or more
1231 physical objects, where there is a state of physical aggregation involved. Physical aggregation
1232 means that one or more “child” objects are physically associated to a “parent” object, such that
1233 the parent and all children must necessarily always exist at the same place at the same time.
1234 Examples of physical aggregation include: items packed into a carton; cartons stacked and
1235 shrink-wrapped onto a pallet skid; pallets packed into a shipping container, assembly of
1236 components into a computer; etc.

1237 The EPCIS Aggregation Event may be used to indicate the *creation* of or *addition* to an
1238 aggregation, the *removal* from or *dismantling* of an aggregation (i.e., “disaggregation”), or the
1239 observation of objects in a state of aggregation that is neither added to nor deleted from during
1240 the event.

1241 5.3.3. Quantity Event

1242 The EPCIS Quantity Event is used to record an event that happened to one or more instances
1243 of an object class, where the individual instances of that class do not have unique (serialized)
1244 identifiers. An example would be a physical handling event that happened to 100 instances of a
1245 product identified by a GTIN, but where the product instances do not carry serial numbers.

1246 5.3.4. Transaction Event

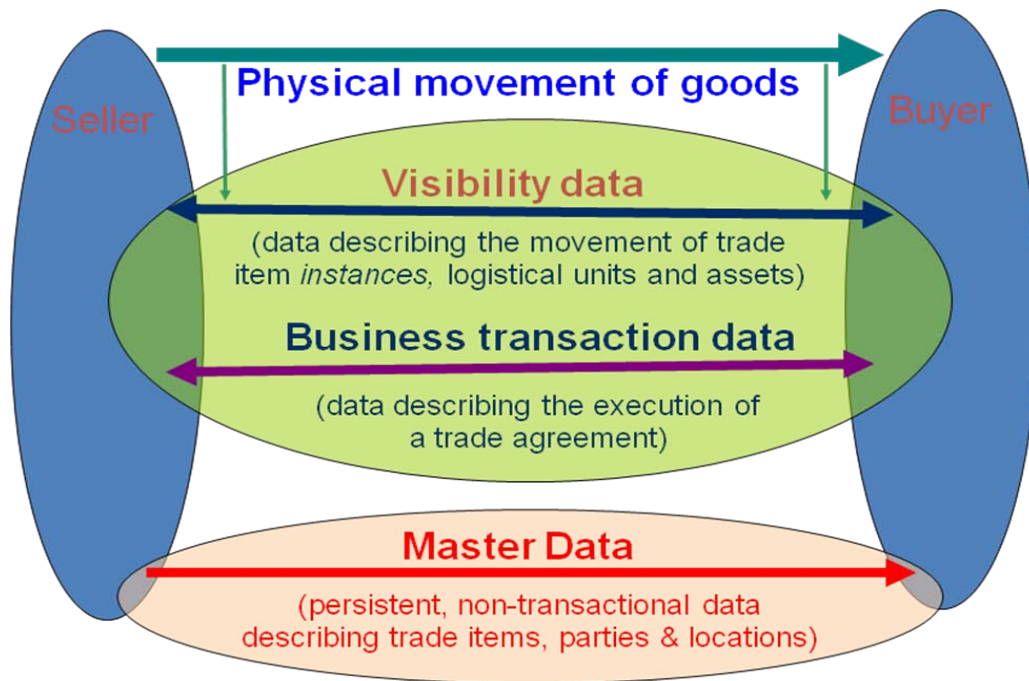
1247 The Transaction Event may be used to record the act of associating or disassociating a
1248 business transaction document to or from one or more physical objects. For example, a
1249 transaction event may record the decision to fill a specific purchase order with specific serial
1250 numbers of the product being ordered. Because the other three event types may also include
1251 links to business transactions, the Transaction Event is often not needed as a separate event.

1252 **6. Information distribution and discovery**

1253 **6.1. Data Exchange Categories**

1254 Looking across the GS1 standards, the data that is conveyed can be categorised into three
1255 types:

- 1256 ■ **Master data** that describes the trade items, parties and locations, all of which are
1257 identified by GS1 identification keys.
- 1258 ■ **Transaction data** that consist of trade transactions from order to final settlement, also
1259 making use of keys.
- 1260 ■ **Visibility data** provide details about physical activity in the supply chain of products
1261 and other assets, identified by keys, detailing where these objects are in time, and why;
1262 not just within one company's four walls, but throughout the supply chain.
1263



1264
1265 **Figure x: Main streams of goods and data exchange between Buyers and Sellers**

1266 **6.2. Data Exchange Methods**

1267 The communication methods may be broadly classified in two groups:

- 1268 ■ **“Push”** methods, where one party unilaterally transfers data to another in the absence
1269 of a prior request. Push methods may be further classified as:
 - 1270 □ Bilateral party-to-party push, where one party transfers data directly to another
1271 party. GS1 implementation: GS1 eCom (EANCOM and GS1 XML).
 - 1272 □ Publish/subscribe, where one party transfers data to a data pool, which in turn
1273 pushes the data to other parties who have previously expressed interest in that data
1274 by registering a subscription (“selective push”). GS1 implementation: GDSN.

- 1275
1276
- “**Pull**” or “query” methods, where one party makes a request for specific data to another party, who in turn responds with the desired data. GS1 implementation: EPCIS.

1277 6.3. Messaging Standards

1278 *Normative References:*

- 1279
- [EANCOM Message Implementation Guide](#)
 - [GS1 Business Message Standard \(BMS\)](#)

1280
1281 *Abstract:*

1282 Standards for electronic supply chain transactions are provisioned by GS1 in EANCOM and
1283 GS1 XML formats. Use of electronic business in the supply chain will enable simplification of
1284 the processes involved and reduce costs. They support business processes such as order to
1285 cash and logistics.

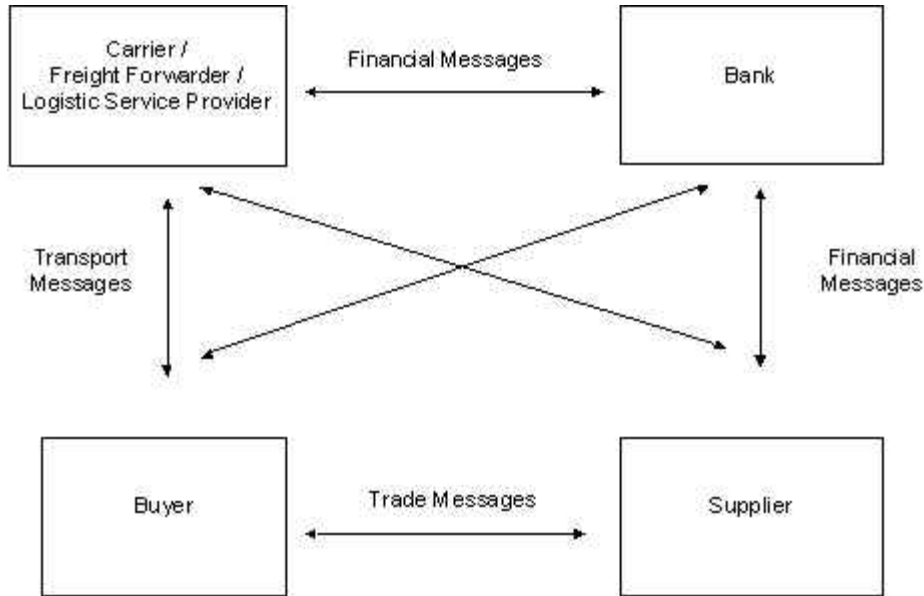
1286 EANCOM is a subset of the UN/EDIFACT standard and has a large installed user base globally.
1287 For new developments and new sectors GS1 XML is being used since it is better adapted for
1288 the Internet and allows for stronger validation of the business contents.

1289 6.3.1. EANCOM[®] MESSAGES

1290 6.3.1.1. EANCOM[®] Introduction

1291 The messages available in the EANCOM[®] standard cover the functions required to carry out a
1292 complete trade transaction: messages which enable the **trade** transaction to take place, (e.g.,
1293 price catalogue, purchase order, invoice, etc.); messages used to instruct **transport** services to
1294 move the goods; and messages used in settlement of the trade transactions through the
1295 **banking** system. The flows and trading partners catered for in EANCOM[®] can be represented
1296 as follows:

1297



1298

1299 **6.3.1.2. Categorisation**

1300 The EANCOM[®] messages can be categorised as follows:

1301 **Master data alignment**, messages used to exchange master data related to relevant parties
 1302 and products between trading partners. The master data is stored in computer systems for
 1303 reference in subsequent transactions or interchanges. Examples of messages: Price/Sales
 1304 Catalogue (PRICAT), Party Information (PARTIN).

1305 Note: Some EANCOM[®] messages, notably PRICAT, are used for data exchange between
 1306 companies and data pools connected to GDSN.

1307 **Transactions**, messages used to order goods or services, arrange for transport of the goods,
 1308 and realise payment for the goods or services supplied. Examples of messages: Purchase
 1309 Order (ORDERS), Despatch Advice (DESADV), Invoice (INVOIC), Transport Instruction
 1310 (IFTMIN).

1311 **Reporting and planning**, messages used to supply the trading partner with relevant
 1312 information or future requirements. The acknowledgement of receipt of an interchange and
 1313 experienced errors is also provided for. Examples of messages: Application Error and
 1314 Acknowledgement (APERAK), Delivery Schedule (DELFOR), Sales Data Report (SLSRPT).

1315 **Miscellaneous**, messages used for various purposes. They allow the exchange of general
 1316 application support information and the administration of the exchange of an external object.
 1317 Examples of messages: General Message (GENRAL), Drawing Administration (CONDRA).

1318 The full list of EANCOM messages can be found in Appendix A.

1319 **6.3.2. GS1 XML MESSAGES**

1320 **6.3.2.1. GS1 XML Introduction**

1321 XML is an acronym for "eXtensible Markup Language". XML is designed for information
 1322 exchange over the Internet. Within GS1 set of standards, GS1 XML is used for Electronic Data
 1323 Interchange - GS1 eCom and within the GDSN.

1324 The GS1 XML standards are based on and fully compliant with the World Wide Web
 1325 Consortium's XML and XML Schema specifications. It also uses the Core Components and
 1326 XML standards from UN/CEFACT wherever applicable.

1327 **6.3.2.2. Categorisation**

1328 The GS1 XML messages can be categorised as follows. These are detailed further in section
 1329 5.2.

1330 **GDSN**, messages used to exchange master data related to relevant parties and products
 1331 between trading partners. The master data is stored in computer systems for reference in
 1332 subsequent transactions or interchanges. Examples of messages: GDSN Catalogue Item
 1333 Notification, Item Authorisation, GDSN Trade Item Extension: Food & Beverage.

1334 **Plan**, messages used for collaborative planning and replenishment. This set of messages
 1335 supports the Collaborative Planning, Forecasting, and Replenishment (CPFR®) business
 1336 process. Examples of messages: Forecast, Product Activity, Replenishment Plan.

1337 **Order**, messages used to order goods or services. Examples of messages: Order, Configure to
 1338 Order.

1339 **Deliver**, messages used for transport of the goods. Examples of messages: Despatch Advice,
 1340 Transport Instruction, CrossDock Despatch Advice Extension.

1341 **Pay**, messages used to realise payment for the goods or services supplied. Examples of
 1342 messages: Invoice, Financial Institution Control Totals, EU Invoice Extension.

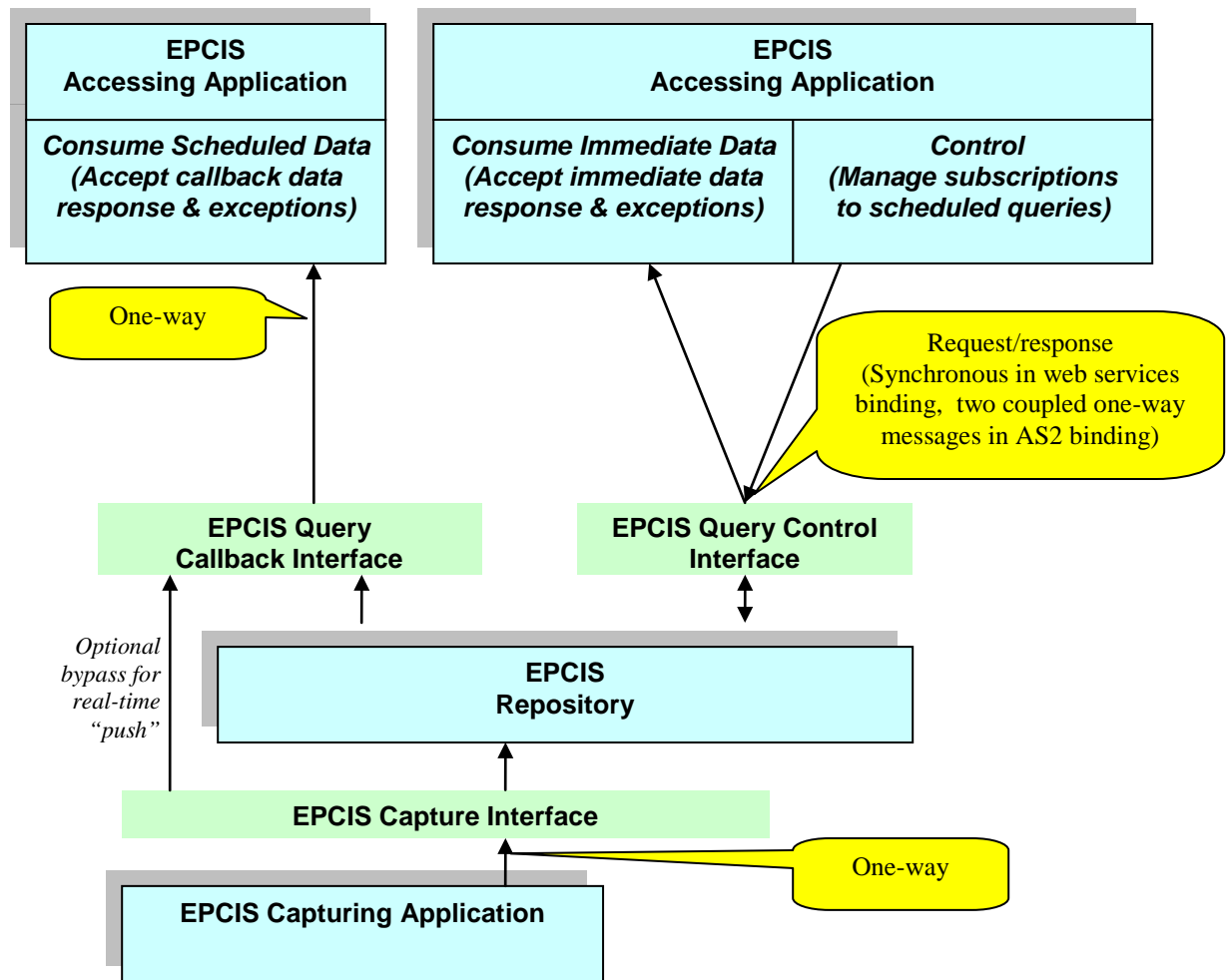
1343 **Other**, messages used for various purposes. They allow the exchange of general application
 1344 support information and the administration of the exchange of an external object. Examples of
 1345 messages: Standard Business Document Header (SBDH), Application Receipt
 1346 Acknowledgement

1347 The full list of GS1 XML messages can be found in Appendix A.

1348 **6.4. Physical event capture/query**

1349 The Electronic Product Code Information Services (EPCIS) standard specifies a data model and
 1350 XML representation for physical visibility events, and interfaces for capture and query of events
 1351 conforming to this data model and XML schema. The data model is described in Section 5.3.
 1352 This section describes the capture and query interfaces.

1353 The EPCIS standard specifies three interfaces: the EPCIS Capture Interface, the EPCIS Query
 1354 Control Interface, and the EPCIS Query Callback Interface. (The latter two interfaces are
 1355 referred to collectively as the EPCIS Query Interfaces.) The diagram below illustrates the
 1356 relationship between these interfaces:



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In this diagram, the green boxes denote the EPCIS interfaces as defined in the standard. The blue boxes are intended to illustrate typical system components that use or implement the standard interfaces. It must be stressed, however, that the EPCIS standard only defines the interfaces and not the system components. For example, there is no requirement that an end user system must include an “EPCIS Repository” component. In some end user systems, there is indeed a component whose role is to store and retrieve EPCIS events, and such a component is often referred to as an “EPCIS Repository.” On the other hand, an end user system might have some other system component that performs this function as well as many other functions, and so would not be identified as an “EPCIS Repository” at all. Still another end user system may lack this function altogether. By defining only interfaces, the EPCIS standard provides for the great variety of business information systems architectures that end users actually deploy.

1370
1371

The following subsections discuss the EPCIS Capture Interface and the EPCIS Query Interfaces in more detail.

1372 **6.4.1. EPCIS Capture Interface**

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1375
1376

The EPCIS Capture Interface specified in the EPCIS standard provides a standardised way for one system component to deliver an EPCIS event to another system component within an overall end user information system. Typically, the EPCIS Capture Interface is used to deliver EPCIS events from “edge” infrastructure responsible for operations in a factory, warehouse, or

1377 other facility where products and other objects are physically handled, to an information system
1378 that stores or performs business-level processing on the captured EPCIS events.

1379 The EPCIS Capture Interface simply specifies that EPCIS events are delivered using a standard
1380 XML schema defined in the EPCIS standard, and provides several different methods of
1381 transport for such an XML document. The two methods of transport specified in the EPCIS
1382 standard are:

- 1383 ■ Message queue
- 1384 ■ HTTP

1385 **6.4.2. EPCIS Query Interfaces**

1386 The EPCIS Query Interfaces specified in the EPCIS standard provides a way for one system
1387 component (the “query client”) to query another (the “query server”) for EPCIS events that
1388 match specified criteria, either between two components within the same end user environment
1389 or between two end users. There are two modes of operation provided:

- 1390 ■ On-demand (“pull”) The query client sends a query to the query server, which
1391 responds immediately with the events matching the specified criteria.
- 1392 ■ Standing query (“push”) The query client sends a standing query to the query server
1393 via the Query Control Interface, where the standing query includes the query criteria
1394 plus an execution schedule (e.g., “daily at 3:00am”). Periodically according to the
1395 schedule, the query server looks for events matching the query criteria that are new
1396 since the last time the query was executed, and delivers those to the query client via
1397 the Query Callback Interface. Once the standing query is set up, the query client does
1398 not make any further requests; the data is “pushed” by the server to the client
1399 asynchronously.

1400 In the standing query mode, the party establishing the standing query need not be the party that
1401 receives the results; e.g., it is common that Party A establishes its own schedule by which
1402 Party A pushes EPCIS events to Party B.

1403 The query language allows for matching EPCIS events using a variety of criteria, including all of
1404 the data fields defined in EPCIS events as well as extension fields.

1405 An EPCIS query server may wish to provide access to only a subset of information, depending
1406 on the identity of the requesting query client. This situation commonly arises in cross-enterprise
1407 scenarios where the requesting client belongs to a different organisation than the operator of an
1408 EPCIS query server, but may also arise in intra-enterprise scenarios. The EPCIS standard
1409 specifies a number of ways in which access to information may be restricted for security
1410 purposes.

1411 Several methods of transport are provided for each interface:

- 1412 ■ For the EPCIS Query Control Interface:
 - 1413 □ SOAP over HTTP (as described by a WSDL schema)
 - 1414 □ XML over AS2 (a separate request and response message, correlated using the
1415 Standard Business Document Header)
- 1416 ■ For the EPCIS Query Callback Interface:
 - 1417 □ XML over HTTP or HTTP+TLS (HTTPS)
 - 1418 □ XML over AS2

1419 6.5. Discovery

1420 6.5.1. Discovery Services

1421 *Normative References:*

- 1422 ■ [EPCglobal Discovery Services Standard \(in development\)](#)

1423 *Abstract:*

1424 At the time of writing, Discovery standards are still under technical development within
1425 EPCglobal and it is expected that the standard will not be ratified until late 2011. There are over
1426 sixty specific user requirements and fundamental principles for Discovery Services, organised in
1427 ten categories, covering Trust in the Network, Data Integrity & Confidentiality, Data Ownership
1428 & Management, Data in Discovery Services, Query Framework, Query Criteria, Identifiers and
1429 Pointers, End-to-end traceability and resilience, Scalability and Communication and Access
1430 Control.

1431 Discovery provides a means to locate EPCIS Services and other kinds of EPC related
1432 information resources in the most general situations arising from multi-party supply chains or
1433 product lifecycles, in which several different organisations may have relevant data about a
1434 specific EPC (or other EPC-related unique ID) but the identities of those organisations are not
1435 known in advance.

1436 A fundamental principle in the Data Discovery requirements is that end users should have a
1437 choice of Discovery Service providers and that there should be mechanisms to allow
1438 independent auditing of Discovery Service operators, as well as mechanisms to allow users to
1439 migrate their data and access control policies from one Discovery Service provider to another.

1440 The responsibilities of Discovery include the following:

- 1441 ■ Facilitate visibility by providing a lookup mechanism to help find multiple sources of
1442 information related to serial-level unique identifiers (i.e. EPCs or other EPC-related
1443 unique IDs), particularly when that information is provided by multiple parties, is
1444 commercially sensitive and/or not published in the public domain.
- 1445 ■ The results of a Discovery Service query will typically provide a set of one or more
1446 URLs, each accompanied by an indication of the type of service to which they
1447 correspond; such service types may indicate EPCIS interfaces, web pages, web
1448 services, additional Discovery Services as well as other kinds of services.
- 1449 ■ Provides a means to allow parties to mutually identify and authenticate each other.
- 1450 ■ Provides a means to share information necessary for authorising access to EPCIS
1451 service listings and EPCIS data. May provide a means to securely pass authorisation
1452 rules among parties.
- 1453 ■ May provide a cache for selected EPCIS data for the purposes of resilient traceability or
1454 avoiding unnecessary cascading of queries.

1455 6.5.2. Object Name Service

1456 *Normative References:*

- 1457 ■ [EPCglobal Object Name Service](#)

1458 *Abstract:*

1459 The Object Name Service is a special case of a Discovery Service. It is a DNS-based lookup
1460 service designed to locate services (e.g. EPCIS designated by the organisation that issued the
1461 EPC) for a class of objects. ONS does not address the issues of discovering the set of EPCIS
1462 data sources that may contain information about a particular EPC or set of EPCs nor does it

1463 address security or the interaction model with the target service. ONS and Discovery co-exist
1464 and serve different roles in the EPCglobal architecture.

1465 At the time of writing, requirements for a Federated ONS model, one that supports multiple peer
1466 roots rather than a single root (onsepc.com) have been approved and development is under
1467 way. Two additional requirements are also being developed: support for bar code identifiers
1468 and a framework for defining services.

1469 7. Communication

1470 GS1 Standards specify communication at three levels. At each level, different syntax is used
1471 for communication.

1472 At the level of peer-to-peer exchange of business data between trading partners, GS1
1473 standards use two different syntaxes:

- 1474 ■ EDIFACT
- 1475 ■ XML

1476 At the level of inter-communications between data capture components, GS1 standards mostly
1477 use XML syntax, but in certain instances use a custom binary syntax (as in LLRP) or something
1478 else (as in the SNMP binding for Reader Management).

1479 At the level of exchange between data carrier and reading device, GS1 standards use a syntax
1480 that is highly specific to the communication medium, via light waves for bar codes and radio
1481 waves for RFID.

1482 7.1. Syntax

1483 7.1.1. EDIFACT

1484 *Abstract*

1485 United Nations/Electronic Data Interchange For Administration, Commerce and Transport
1486 (UN/EDIFACT) is the international EDI standard developed under the United Nations. The work
1487 of maintenance and further development of this standard is done through the United Nations
1488 Centre for Trade Facilitation and Electronic Business (UN/CEFACT) under the UN Economic
1489 Commission for Europe, in the Finance Domain working group UN CEFACT TBG5. EDIFACT
1490 has been adopted by the International Organisation for Standardisation (ISO) as the ISO
1491 standard ISO 9735.

1492 The UN/EDIFACT standard provides

- 1493 ■ A set of syntax rules to structure data,
- 1494 ■ An interactive exchange protocol (I-EDI),
- 1495 ■ Standard messages which allow multi-country and multi-industry exchange.

1496 EANCOM is a GS1 EDI standard, fully based on UN/EDIFACT, which comprises a set of
1497 internationally agreed standards, directories and guidelines for the electronic interchange of
1498 data.

1499 As a subset of UN/EDIFACT, EANCOM provides the collection of only those message elements
1500 which are needed by the business applications and required by the syntax (mandatory
1501 elements). Optional elements covering very specific business requirements not relevant for GS1
1502 users are omitted from EANCOM.

1503 EANCOM incorporates the GS1 standards of physical identification of trade items, logistics units
1504 and the Global Location Numbers identifying the trading partners into the electronic messages.
1505 It allows integration of the physical flow of goods with related information sent by electronic
1506 means.

1507 *References*

- 1508 ■ EANCOM 2002, Edition 2008, based on D01B, EANCOM implementation guidelines for
1509 D01B messages.

- 1510
 - 1511
 - http://online.gs1.org/index.php/login/secure/docs/ecom/eancom/2002_2008/index.htm
 - 1512 ■ UN/CEFACT Directory 01B, UN/CEFACT EDIFACT Directory D01B
 - 1513
 - <http://www.unece.org/trade/untdid/download/d01b.zip>
 - 1514 ■ ISO9735 (1-10): Electronic data interchange for administration, commerce and transport (EDIFACT). Application level syntax rules.
 - 1515
 - 1516
 - http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_tc_browse.htm?command=53186
 - 1517

1518 **7.1.1.1. Syntax3**

- 1519 *Abstract*
- 1520 The EDIFACT syntax rules set the standards for structuring data into segments, segments into
- 1521 messages, and messages into an interchange.
- 1522 EANCOM 2002, Edition 2008, Syntax 3 is based on UN/EDIFACT directory D.01B, syntax
- 1523 version 3 which was released by UN/CEFACT in 2001.

1524 **7.1.1.2. Syntax4**

- 1525 *Abstract*
- 1526 The EDIFACT syntax rules set the standards for structuring data into segments, segments into
- 1527 messages, and messages into an interchange.
- 1528 EDIFACT syntax version 4 is as an enhancement of the EDIFACT syntax version 3. Syntax
- 1529 version 4 supports requirements such as digital signature, additional character sets, and more.
- 1530 EANCOM 2002, Edition 2008, Syntax 4 is based on UN/EDIFACT directory D.01B, syntax
- 1531 version 4 which was released by UN/CEFACT in 2001.

1532 **7.1.2. XML**

1533 **7.1.2.1. GS1 XML for eCom and GDSN**

- 1534 *Abstract*
- 1535 It is based on the W3C standard: XML – eXtensible Markup Language.
- 1536 GS1 XML refers to a design methodology for the use of XML in GS1 eCom and GDSN business
- 1537 message standards. This methodology provides a standardised and predictable structure for
- 1538 electronic business messages, enabling business partners to communicate business data
- 1539 rapidly, efficiently and accurately, irrespective of their internal hardware or software types.
- 1540 *References*
- 1541 ■ GS1 XML Business Message Standards (BMS)
 - 1542 □ http://www.gs1.org/gsm/kc/ecom/xml/xml_bms
 - 1543 ■ Technical guidelines
 - 1544 □ Technical specification to facilitate the implementation of GS1 XML messages.
 - 1545 □ <http://www.gs1.org/ecom/xml/implementation>
 - 1546 ■ W3C XML Standards

- 1547 □ XML Technologies including XML, XML Namespaces, XML Schema, XSLT, Efficient
1548 XML Interchange (EXI), and other related standards.
- 1549 □ <http://www.w3.org/standards/xml/>

1550 **7.1.2.2. XML in EPC Standards**

- 1551 It is based on the W3C standard: XML – eXtensible Markup Language.
- 1552 XML is used in the EPCIS, ALE, and Reader Management standards to define inter-
1553 communications between data capture components. XML used in these standards follows a
1554 design methodology similar to the GS1 XML methodology used in GS1 eCom and GDSN
1555 business message standards, but tailored to the requirements of inter-communications between
1556 data capture components.
- 1557 *References*
- 1558 ■ Technical guidelines
- 1559 □ EPCglobal XML Naming & Design Rules Analysis
- 1560 ■ W3C XML Standards
- 1561 □ XML Technologies including XML, XML Namespaces, XML Schema, XSLT, Efficient
1562 XML Interchange (EXI), and other related standards.
- 1563 □ <http://www.w3.org/standards/xml/>

1564 **7.1.2.3. Standard Business Document Header (SBDH)**

- 1565 *Abstract*
- 1566 The Standard Business Document Header (SBDH) is a component of GS1 XML business
1567 message standards and is also used within the EPCIS standard in certain circumstances.
- 1568 The Standard Business Document Header (SBDH) provides information about the routing and
1569 processing of the XML instance document. The SBDH is designed to be independent of the
1570 specific transport protocol used. The information contained in the SBDH can be used by
1571 communication applications to determine routing whether the transport protocol used is ebMS,
1572 AS2, or any other protocol.
- 1573 The SBDH can also optionally provide business scope and business service information.
- 1574 *References*
- 1575 ■ UN/CEFACT STANDARD BUSINESS DOCUMENT HEADER – Version 1.3
- 1576 □ This specification defines the ‘Standard Business Document Header’ (SBDH) which
1577 enables integration of documents between internal applications, enterprise
1578 applications, and business-to-business infrastructure by providing a consistent
1579 interface between applications. The standard header information enables any
1580 application to determine the logical routing requirements and/or the logical
1581 processing requirements of a document based on information contained in the
1582 standard header.
- 1583 □ http://www.gs1.org/docs/gsmp/xml/sbdh/CEFACT_SBDH_TS_version1.3.pdf
- 1584 ■ Standard Business Document Header (SBDH). Implementation guidelines. - Version 1.3
- 1585 □ The Standard Business Document Header Technical Implementation Guide is a
1586 supplement so that the implementer understands not only the technical details but
1587 also practical ways to use the SBDH and guidelines on its appropriate use.

- 1588 □ http://www.gs1.org/docs/gsmf/xml/sbdh/SBDH_v1.3_Technical_Implementation_Guide.pdf
1589

1590 **7.1.3. Other Data Capture Components Syntax**

1591 Many GS1 inter-communications standards use XML syntax as noted above in Section 7.1.2.2.
1592 Certain low-level data capture component standards use a different syntax that is tailored to
1593 specific requirements. This includes the following:

- 1594 ■ The Low-Level Reader Protocol (LLRP) standard uses an *ad hoc* binary format, in order
1595 to minimize message size and message processing time. This is necessary because
1596 LLRP typically operates in a real-time or near-real-time environment.
- 1597 ■ The Reader Management (RM) standard uses a syntax defined by the Simple Network
1598 Management Protocol (SNMP) Internet standard, which is a commonly accepted
1599 industry standard for management of network devices. (The RM standard also offers an
1600 XML alternative to SNMP.)
- 1601 ■ The Object Name Service (ONS) standard uses a syntax defined by the Domain Name
1602 System (DNS) Internet standard, upon which ONS is built.
- 1603 ■ The RFID Reader Discovery, Configuration, and Initialization (DCI) standard uses a
1604 syntax defined by the Control and Provisioning of Wireless Access Points (CAPWAP)
1605 Internet standard, upon which DCI is built.

1606 *References*

- 1607 ■ RFC5415 Control and Provisioning of Wireless Access Points (CAPWAP),
1608 <http://www.ietf.org/rfc/rfc5415.txt>
- 1609 ■ RFC1157 A Simple Network Management Protocol (SNMP),
1610 <http://www.ietf.org/rfc/rfc1157.txt>

1611 **7.2. Protocols**

1612 Information is exchanged and shared using the appropriate communication protocols. Protocols
1613 defined or recommended by GS1 are the following:

- 1614 ■ EDIINT AS1, AS2 and AS4
- 1615 ■ ebMS
- 1616 ■ Web services
- 1617 ■ Others: LLRP, AIP, ...

1618 *References*

- 1619 ■ See each chapter for the specific references.

1620 **7.2.1. EDIINT**

1621 *Abstract*

1622 The EDIINT project was initiated by IETF to define a protocol to enable Electronic Data
1623 Interchange (EDI) over the Internet whilst maintaining a service level equivalent to that found in
1624 the existing EDI exchanges over Value Added Networks (VAN).

1625 The EDIINT protocols define an envelope for information to be transmitted over the Internet (or
1626 TCP-IP based networks) using HTTP, which is the foundation for the World Wide Web (WWW),
1627 SMTP, which is the common Internet mail protocol or FTP, File Transfer Protocol.

- 1628 Rather than creating new solutions, EDIINT uses existing standards to ensure reliable and
1629 secure exchanges.
- 1630 Security, authentication, message integrity, and privacy are assured by the use of encryption
1631 and digital signatures.
- 1632 Another important feature, non-repudiation, makes it difficult under normal circumstances for the
1633 intended recipient of a message to deny having received it.
- 1634 EDIINT is designed to handle any type of document but in practice it is primarily adopted for the
1635 type of transactions normally linked to EDI and XML exchanges.
- 1636 EDIINT has developed AS1 and AS2 standards which are implementations over the SMTP and
1637 HTTP protocols respectively.
- 1638 *References*
- 1639 ■ “EDIINT AS1 and AS2 Transport Communication Guidelines - Issue 1, Feb-2006” by
1640 John Duker and Jin Chun
 - 1641 □ This document defines the EDIINT AS1 and AS2 Transport Communication
1642 Guidelines used by companies participating in e-Commerce using the GS1
1643 published XML, EANCOM, I/C, UCS, and VICS data format standards.
 - 1644 □ http://www.gs1.org/docs/gsmf/EDIINT_AS1_AS2_Transport_Comm_Guide_i1.pdf
 - 1645 ■ “EDIINT AS1 and AS2 User Guide – Version 1.1, 2006-08-01” by the GS1 Europe
1646 EDIINT Forum, a network of Western European Member Organisations of GS1
 - 1647 □ This document aims to provide both a functional overview and a technical
1648 framework for the implementation of the EDIINT protocols.
 - 1649 □ <http://www.gs1.eu/?page=&tudasbazis=60&lister=8>
 - 1650 ■ “GS1 Newcomers to AS2 Implementation Guide” by the GS1 GSMP eCom Technology
1651 Group
 - 1652 □ This guide is designed to be an informative source to GS1 community members and
1653 their trading partners who are new to AS2 based communications.
 - 1654 □ http://www.gs1.org/docs/gsmf/xml/sbdh/Newcomers_to_AS2_Implementation_Guide_i1.pdf
1655

1656 **7.2.1.1. AS1**

- 1657 *Abstract*
- 1658 Applicability Statement 1 – An Internet Request For Comment (RFC) defining how applications
1659 can securely transport EDI and XML over the Internet using SMTP. It specifies how to transport
1660 data files.
- 1661 The AS1 standard provides S/MIME (Secure Multi-Purpose Internet Mail Extensions) and uses
1662 Simple Mail Transfer Protocol (SMTP) to transmit data using e-mail.
- 1663 It was the first AS protocol developed and uses signing, encryption and MDN (Message
1664 Disposition Notification) conventions. The specification has been largely superseded by
1665 Applicability Statement 2 (AS2)
- 1666 An Internet connection capable of sending and receiving e-mail, an EDI transfer engine, and
1667 Digital Certificates are required for data exchange using AS1.
- 1668 *Normative References*
- 1669 ■ AS1 - “MIME-based Secure Peer-to-Peer Business Data Interchange Over the Internet”
1670 □ <http://www.ietf.org/rfc/rfc3335.txt>

1671 7.2.1.2. AS2

1672 *Abstract*

1673 Applicability Statement 2 – An Internet RFC defining how applications can securely transport
1674 EDI and XML over the Internet using HTTP. It specifies how to transport data files.

1675 The AS2 protocol is based on HTTP/S and SMIME. It was the second AS protocol developed
1676 and uses the same signing, encryption and MDN conventions used in the original AS1 protocol.

1677 AS2 provides a direct point-to-point message exchange between trading partners, compared
1678 with using an intermediate value added network (VAN) or service provider.

1679 The AS2 standard allows businesses to use a common, single communications solution. This
1680 eliminates the complications and costs involved when different businesses in a network use
1681 different transfer protocols. A Web server, an EDI transfer engine, and Digital Certificates are
1682 required for data exchange using AS2. Almost any type of data can be transmitted.

1683 AS2 is the preferred message transport protocol of choice for B2B messaging using GS1 XML
1684 standards. An AS2 message transport binding is also available for the EPCglobal EPCIS
1685 standard.

1686 *Normative References*

1687 ■ “MIME-Based Secure Peer-to-Peer Business Data Interchange Using HTTP,
1688 Applicability Statement 2 (AS2)”, RFC 4130

1689 □ <http://www.ietf.org/rfc/rfc4130.txt>

1690 7.2.1.3. AS4

1691 *Abstract*

1692 Applicability Statement 4 – An OASIS draft standard which maps AS2 functional requirements
1693 onto the Web Services stack using the ebMS version 3.0 specification.

1694 Allows small enterprises (without a 24x7 Internet connected server) to “pull” documents
1695 securely from an AS4 “hub” partner.

1696 Supports multiple document pull channels (priority, document type, etc.)

1697 Supports reliable messaging, payload compression, message-level security, and digitally signed
1698 receipts.

1699 7.2.2. ebMS

1700 *Abstract*

1701 ebXML Messaging Services (ebMS) is a standard under the E-Business XML umbrella which
1702 provides a secure and reliable SOAP / Web Services based transport protocol to the ebXML
1703 Architecture.

1704 The ebXML Message Service (ebMS) is defined as a set of layered extensions on the
1705 SOAP 1.1 and SOAP Messages with Attachments (SWA) specifications. The ebXML Message
1706 Service provides the necessary extensions for security and reliability that are not addressed
1707 directly by the SOAP 1.1 specification

1708 The ebXML Message Service specification defines a message structure and protocol that is
1709 independent of the underlying transport protocol, such as SMTP, File Transfer Protocol (FTP),
1710 HTTP or any other protocol capable of exchanging MIME data.

1711 Thus, businesses are free to choose the most suitable method for the actual transfer of
1712 messages with their partners, suppliers and customers while maintaining a standard message

1713 structure. This feature enables the messaging service to be integrated once with the enterprise
 1714 applications rather than once for each transport protocol. Transport protocol adapters can be
 1715 treated as "plug-ins" for the ebXML Message Service implementation.

1716 The ebXML Message Service is payload neutral, meaning that any kind of information can be
 1717 reliably routed. This information can include XML documents, binary data, or EDI messages.
 1718 This permits businesses to use the latest technology while also allowing them to leverage their
 1719 existing infrastructure.

1720 The ebXML Messaging Service provides many options for reliable messaging, security,
 1721 encryption, compression and non-repudiation of receipt.

1722 Currently, the ebXML Messaging Services committee is finalizing a new version, ebMS 3. This
 1723 is the specification of the Messaging Service and its associated processing rules using Web
 1724 Services standards.

1725 *Normative References*

1726 ■ "ebXML Message Service Specification 2.0, 1 April 2002" by OASIS ebXML Messaging
 1727 Services Technical Committee

1728 □ http://www.oasis-open.org/committees/ebxml-msg/documents/ebMS_v2_0.pdf

1729 ■ "OASIS ebXML Messaging Services Version 3.0: Part 1, Core Features, 12 July 2007"
 1730 by OASIS ebXML Messaging Technical Committee

1731 □ [http://www.oasis-open.org/committees/download.php/24618/ebms_core-3.0-spec-
 1732 cs-02.pdf](http://www.oasis-open.org/committees/download.php/24618/ebms_core-3.0-spec-cs-02.pdf)

1733 **7.2.3. Web Services**

1734 *Abstract*

1735 A web service is defined by the W3C as "a software system designed to support interoperable
 1736 machine-to-machine interaction over a network. The term Web services describes a
 1737 standardised way of integrating Web-based applications using the XML, SOAP, WSDL and
 1738 UDDI open standards over an Internet Protocol backbone.

1739 XML is used as the syntax for the data, SOAP provides an envelope and header structure,
 1740 WSDL is used for describing the service interfaces and UDDI is used for listing what services
 1741 are available.

1742 Used primarily as a means for businesses to communicate with each other and with clients,
 1743 Web services allow organisations to communicate data without intimate knowledge of each
 1744 other's IT systems behind the firewall.

1745 Web services are frequently just Internet Application Programming Interfaces (API) that can be
 1746 accessed over a network, such as the Internet, and executed on a remote system hosting the
 1747 requested services. Web services share business logic, data and processes expressed using
 1748 the web service's API and accessed across a network.

1749 In common usage the term refers to clients and servers that communicate over the public
 1750 Internet or enterprise networks using the HTTP protocol and XML syntax.

1751 Web services allow different applications from different sources to communicate with each other
 1752 without time-consuming custom coding, and because all communication is in XML, Web
 1753 services are not tied to any one operating system or programming language.

1754 The ALE and EPCIS standards, are examples where web service interfaces are provided.

1755 *References:*

1756 ■ The World Wide Web Consortium (W3C) is the main international standards
 1757 organisation for the World Wide Web (abbreviated WWW or W3). The W3C Web

- 1758 Services Activity is designing the infrastructure, defining the standards, architecture and
1759 creating the core technologies for Web services.
- 1760 □ <http://www.w3.org/2002/ws/>
- 1761 ■ The Web Services Interoperability Organisation (WS-I) is an open industry organisation
1762 chartered to establish Best Practices for Web services interoperability, for selected
1763 groups of Web services standards, across platforms, operating systems and
1764 programming languages.
- 1765 □ <http://www.ws-i.org/>

1766 7.3. Security

1767 All GS1 standards use security appropriate to their implementation. See the individual
1768 standards for details. An overview of security within the EPCglobal standards is provided in the
1769 EPCglobal Architecture Framework.

1770 *References*

- 1771 ■ [EPCglobal Architecture Framework](#)

1772 7.3.1. EANCOM digital signature

1773 *Abstract*

1774 Digital signatures are used in EANCOM to preserve the integrity of EDIFACT messages
1775 between the sender's and the receiver's EDI gateways.

1776 *References*

- 1777 ■ Digital Signatures for EANCOM messages.
- 1778 □ http://www.gs1.org/docs/ecom/eancom/eancom_Digital_Signature.pdf
- 1779 ■ Joint ISO/TC 154 – UN/CEFACT Syntax Working Group (JSWG), ISO 9735-5:2002
- 1780 □ http://www.iso.org/iso/catalogue_detail.htm?csnumber=35036
- 1781 □ http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=35037
- 1782
- 1783 ■ Joint ISO/TC 154 – UN/CEFACT Syntax Working Group (JSWG), ISO 9735-8:2002
- 1784 □ http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=35039
- 1785

1786 7.3.2. XML security

1787 *Abstract*

1788 GS1 has endorsed XMLDSIG for the implementation of XML Signatures within GS1 XML BMS.

1789 GS1 has provided a document 'Security for XML Messages' (XMLSEC) which provides detailed
1790 implementation guidelines for XML Signatures.

1791 *References*

- 1792 ■ XML Signature Syntax and Processing (Second Edition) - W3C Recommendation 10
1793 June 2008
- 1794 □ <http://www.w3.org/TR/xmlsig-core/>
- 1795 ■ Security for XML messages, Implementation guidelines

- 1796
1797
- http://www.gs1.org/1/productssolutions/ecom/xml/implementation/tmg_2_2_-_2_3/XML-Guidelines/Invoice2.2/docs/Security%20for%20XML%20Messages.pdf

1798 7.3.3. Digital Certificate Profile

1799 *Abstract*

1800 Digital Certificates bind an identity to a pair of electronic keys that can be used to encrypt and
1801 sign digital information. A Digital Certificate makes it possible to verify the identity of a party to a
1802 transaction (authentication), protect a document from unauthorized access (encryption), protect
1803 a document from alteration (integrity), and assert the provenance of a document (non-
1804 repudiation).

1805 Digital Certificates are the electronic counterparts to driver licenses, passports and membership
1806 cards. You can present a Digital Certificate electronically to prove your identity or your right to
1807 access information or services online.

1808 A Digital Certificate typically contains the:

- 1809
- Owner's public key
 - 1810 ■ Owner's name
 - 1811 ■ Expiration date of the public key
 - 1812 ■ Name of the issuer (the CA that issued the Digital Certificate
 - 1813 ■ Serial number of the Digital Certificate
 - 1814 ■ Digital signature of the issuer

1815 A Digital Certificate is issued by a Certification Authority (CA) and signed with the CA's private
1816 key.

1817 The most widely accepted format for Digital Certificates is defined by the CCITT X.509
1818 international standard; thus certificates can be read or written by any application complying with
1819 X.509.

1820 7.3.3.1. AS2

1821 *Abstract*

1822 EDINT AS1 and AS2 guidelines developed by GS1 make recommendations on a set of
1823 parameters linked to X.509 Digital Certificates.

1824 *References*

- 1825
- “EDIINT AS1 and AS2 Transport Communication Guidelines - Issue 1, Feb-2006” by
1826 John Duker and Jin Chun
 - This document defines the EDIINT AS1 and AS2 Transport Communication
1827 Guidelines used by companies participating in e-Commerce using the GS1
1828 published XML, EANCOM, I/C, UCS, and VICS data format standards.
 - http://www.gs1.org/docs/gsm/EDIINT_AS1_AS2_Transport_Comm_Guide_i1.pdf
- 1830

1831 A. Supplementary data AIs

1832

AI	Name	Attribute to which Key
02	GTIN of trade items contained in a logistic unit	SSCC: AI 00
10	Batch or lot number	GTIN: AI 01, 02, or 8006
11	Production date (YYMMDD)	GTIN: AI 01, 02, or 8006
12	Due date (YYMMDD)	GLN: AI 415 and 8020
13	Packaging date (YYMMDD)	GTIN: AI 01, 02, or 8006
15	Best before date (YYMMDD)	GTIN: AI 01, 02, or 8006
17	Expiration date (YYMMDD)	GTIN: AI 01, 02, or 8006
20	Product variant	GTIN: AI 01, 02, or 8006
21	Serial number	GTIN: AI 01
22	Secondary data for specific health industry products	
240	Additional product identification assigned by the manufacturer	GTIN: AI 01, 02, or 8006
241	Customer part number	GTIN: AI 01, 02, or 8006
242	Made-to-Order Variation Number	GTIN: AI 01 (9) or 02 (9)
250	Secondary serial number	GTIN: AI 01 and 21
251	Reference to source entity	GTIN: AI 01, 02, or 8006
254	GLN Extension component	GLN: AI 414
30	Variable count	GTIN: AI 01 (9) or 02 (9)
310*	Net weight, kilograms (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
311*	Length of first dimension, metres (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
312*	Width, diameter, or second dimension, metres (Variable Measure Trade Item)	GTIN: AI 01 (9)
313*	Depth, thickness, height, or third dimension, metres (Variable Measure Trade Item)	GTIN: AI 01 (9)

AI	Name	Attribute to which Key
314*	Area, square metres (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
315*	Net volume, litres (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
316*	Net volume, cubic metres (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
320*	Net weight, pounds (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
321*	Length or first dimension, inches (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
322*	Length or first dimension, feet (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
323*	Length or first dimension, yards (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
324*	Width, diameter, or second dimension, inches (Variable Measure Trade Item)	GTIN: AI 01 (9)
325*	Width, diameter, or second dimension, (Variable Measure Trade Item)	GTIN: AI 01 (9)
326*	Width, diameter, or second dimension, yards (Variable Measure Trade Item)	GTIN: AI 01 (9)
327*	Depth, thickness, height, or third dimension, inches (Variable Measure Trade Item)	GTIN: AI 01 (9)
328*	Depth, thickness, height, or third dimension, feet (Variable Measure Trade Item)	GTIN: AI 01 (9)
329*	Depth, thickness, height, or third dimension, yards (Variable Measure Trade Item)	GTIN: AI 01 (9)
330*	Logistic weight, kilograms	GTIN: AI 01 (9) or SSCC: AI 00
331*	Length or first dimension, metres	GTIN: AI 01 (9) or SSCC: AI 00
332*	Width, diameter, or second dimension, metres	GTIN: AI 01 (9) or SSCC: AI 00
333*	Depth, thickness, height, or third dimension, metres	GTIN: AI 01 (9) or SSCC: AI 00
334*	Area, square metres	GTIN: AI 01 (9) or SSCC: AI 00
335*	Logistic volume, litres	GTIN: AI 01 (9) or SSCC: AI 00
336*	Logistic volume, cubic metres	GTIN: AI 01 (9) or SSCC: AI 00
337*	Kilograms per square metre	GTIN: AI 01
340*	Logistic weight, pounds	GTIN: AI 01 (9) or SSCC: AI 00

AI	Name	Attribute to which Key
341*	Length or first dimension, inches	GTIN: AI 01 (9) or SSCC: AI 00
342*	Length or first dimension, feet	GTIN: AI 01 (9) or SSCC: AI 00
343*	Length or first dimension, yards	GTIN: AI 01 (9) or SSCC: AI 00
344*	Width, diameter, or second dimension	GTIN: AI 01 (9) or SSCC: AI 00
345*	Width, diameter, or second dimension	GTIN: AI 01 (9) or SSCC: AI 00
346*	Width, diameter, or second dimension	GTIN: AI 01 (9) or SSCC: AI 00
347*	Depth, thickness, height, or third dimension	GTIN: AI 01 (9) or SSCC: AI 00
348*	Depth, thickness, height, or third dimension	GTIN: AI 01 (9) or SSCC: AI 00
349*	Depth, thickness, height, or third dimension	GTIN: AI 01 (9) or SSCC: AI 00
350*	Area, square inches (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
351*	Area, square feet (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
352*	Area, square yards (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
353*	Area, square inches	GTIN: AI 01 (9) or SSCC: AI 00
354*	Area, square feet	GTIN: AI 01 (9) or SSCC: AI 00
355*	Area, square yards	GTIN: AI 01 (9) or SSCC: AI 00
356*	Net weight, troy ounces (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
357*	Net weight (or volume), ounces (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
360*	Net volume, quarts (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
361*	Net volume, gallons U.S. (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
362*	Logistic volume, quarts	GTIN: AI 01 (9) or SSCC: AI 00
363*	Logistic volume, gallons	GTIN: AI 01 (9) or SSCC: AI 00
364*	Net volume, cubic inches	GTIN: AI 01 (9) or 02 (9)

AI	Name	Attribute to which Key
365*	Net volume, cubic feet (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
366*	Net volume, cubic yards (Variable Measure Trade Item)	GTIN: AI 01 (9) or 02 (9)
367*	Logistic volume, cubic inches	GTIN: AI 01 (9) or SSCC: AI 00
368*	Logistic volume, cubic feet	GTIN: AI 01 (9) or SSCC: AI 00
369*	Logistic volume, cubic yards	GTIN: AI 01 (9) or SSCC: AI 00
37	Count of trade items contained in a logistic unit	GTIN: AI 02
390*	Amount payable – single monetary area	GLN: AI 415 and 8020
391*	Amount payable – with ISO currency code	GLN: AI 415 and 8020
392*	Amount payable for a Variable Measure Trade Item – single monetary unit	GTIN: AI 01 (9)
393*	Amount payable for a Variable Measure Trade Item – with ISO currency code	GTIN: AI 01 (9)
400	Customer's purchase order number	
403	Routing code	SSCC: AI 00
410	Ship to - deliver to Global Location Number	
411	Bill to - invoice to Global Location Number	
412	Purchased from Global Location Number	
413	Ship for - deliver for - forward to Global Location Number	
420	Ship to - deliver to postal code within a single postal authority	
421	Ship to - deliver to postal code with Three-Digit ISO country code	
422	Country of origin of a trade item	GTIN: AI 01 or AI 02
423	Country of initial processing	GTIN: AI 01 or AI 02
424	Country of processing	GTIN: AI 01 or AI 02
425	Country of disassembly	GTIN: AI 01 or AI 02
426	Country covering full process chain	GTIN: AI 01 or AI 02

AI	Name	Attribute to which Key
7001	NATO stock number	GTIN: AI 01 or AI 02
7002	UN/ECE meat carcasses and cuts classification	GTIN: AI 01 or AI 02
7003	Expiration Date and Time	GTIN: AI 01 or AI 02
7004	Active Potency	GTIN: AI 01 & AI 10
703s	Approval Number of Processor with ISO Country Code	GTIN: AI 01 or AI 02
8001	Roll products - width, length, core diameter, direction, and splices	GTIN: AI 01 (9)
8002	Electronic serial identifier for cellular mobile telephones	
8005	Price per unit of measure	GTIN: AI 01 (9) or AI 02 (9)
8006	Identification of the component of a trade item	
8007	International Bank Account Number	GLN: AI 415 & AI 8020
8008	Date and time of production	GTIN: AI 01 or AI 02
8020	Payment Slip Reference Number	GLN: AI 415
8100	GS1-128 Coupon Extended Code - NSC + Offer Code	
8101	GS1-128 Coupon Extended Code - NSC + Offer Code + end of offer code	
8102	GS1-128 Coupon Extended Code – NSC	
90	Information mutually agreed between trading partners (including FACT DIs)	
91-99	Company internal information	

1833

* Indicates the fourth digit of the Application Identifier

1834 **B. EANCOM[®] MESSAGES**

1835 **B.1. Master Data Alignment**

1836 **B.1.1. Party Information (PARTIN)**

1837 The Party Information message is used to provide location information and the related
1838 operational, administrative, commercial and financial data to the trading partner, (e.g., name
1839 and address, contact persons, financial accounts, etc.).

1840 **B.1.2. Product Inquiry (PROINQ)**

1841 The Product Inquiry message enables a buyer to inquire on a product or group of products from
1842 a master product catalogue according to criteria defined in the message.

1843 **B.1.3. Product Data (PRODAT)**

1844 The Product Data message is used to provide technical and functional data related to products,
1845 (e.g., the technical specifications of an electrical product, the ingredients of a cake, etc.), and
1846 does not include any commercial terms and conditions.

1847 **B.1.4. Price/Sales Catalogue (PRICAT)**

1848 The Price/Sales Catalogue message is used as a catalogue or list of all of the supplier's
1849 products or as an advanced warning to particular changes in the product line. The catalogue
1850 would include descriptive, logistical, and financial information about each product. However, the
1851 catalogue may also be used to provide technical and functional data related to products, (e.g.,
1852 the technical specifications of an electrical product, the ingredients of a cake, etc.) as done in
1853 the Product Data message.

1854 **B.2. Transactions**

1855 **B.2.1. Request for Quotation (REQOTE)**

1856 The Request for Quotation message is transmitted by the customer to his supplier to request a
1857 quotation for the supply of goods or services.

1858 **B.2.2. Quotation (QUOTES)**

1859 The Quotation message is transmitted by the supplier to his customer in response to a
1860 previously received request for quotation for the supply of goods or services. The quotation
1861 should provide details on all aspects previously requested by his customer.

1862 **B.2.3. Contractual Conditions (CNTCND)**

1863 The message provides the contractual conditions of a previously negotiated contract in order to
1864 enable the automatic validation of orders and the verification of invoices prior to payment.

1865 B.2.4. Purchase Order (ORDERS)

1866 The Purchase Order message is transmitted by the customer to his supplier to order goods or
1867 services and to specify the relevant quantities, dates and locations of delivery.

1868 B.2.5. Purchase Order Response (ORDRSP)

1869 The Purchase Order Response is sent by the supplier to his customer in relation to one or more
1870 goods items or services to acknowledge the receipt of the Purchase Order, to confirm its
1871 acceptance, to propose any amendments, or to notify non-acceptance of all or part of the
1872 Purchase Order.

1873 B.2.6. Purchase Order Change Request (ORDCHG)

1874 The Purchase Order Change Request is sent by the customer to the supplier to specify the
1875 details concerning modifications to a previously sent Purchase Order.

1876 B.2.7. Cargo/Goods Handling and Movement (HANMOV)

1877 The Cargo/Goods Handling and Movement message is sent by a party (e.g., buyer or supplier)
1878 to a logistics service provider identifying handling services on products held but not owned by
1879 the message recipient.

1880 B.2.8. Instruction to Despatch (INSDDES)

1881 The Instruction to Despatch is a message from a party (e.g., buyer or supplier) to a Logistics
1882 Service Provider who has control over ordered goods, providing instructions to despatch or
1883 collect a consignment according to conditions specified in the message.

1884 B.2.9. Firm Booking (IFTMBF)

1885 The Firm Booking is a message from a party booking forwarding and/or transport services for a
1886 consignment to the party providing those services, containing conditions under which the
1887 sender of the messages requires the services to take place.

1888 B.2.10. Booking Confirmation (IFTMBC)

1889 The Booking Confirmation message is sent from a carrier or forwarder to the consignor booking
1890 services, providing confirmation of a booking for a specified consignment.

1891 B.2.11. Transport Instruction (IFTMIN)

1892 The Transport Instruction is sent by a customer to his supplier of transport services requesting
1893 the transportation of a single consignment of goods to a specified delivery point or points.

1894 B.2.12. Forwarding and Consolidation Summary (IFCSUM)

1895 The Forwarding and Consolidation Summary message is a message from the party issuing
1896 either an instruction or a booking regarding transport services for multiple consignments under
1897 conditions agreed, to the party arranging the transport services.

1898 B.2.13. Transport Status (IFTSTA)

1899 The Transport Status message allows for the exchange of information regarding the status of
1900 the physical movement of consignments or goods at any point (in time or place) within the full
1901 transport chain.

1902 B.2.14. Arrival Notice (IFTMAN)

1903 The Arrival Notice message is sent from the party providing transport services to the party
1904 indicated in the contract (e.g., the consignor), giving notice and details of the arrival of a
1905 consignment. The message may also be used to provide proof of delivery information.

1906 B.2.15. Despatch Advice (DESADV)

1907 The Despatch Advice is a message specifying details for the goods despatched, advising the
1908 consignee of the detailed contents of a consignment. The message relates to a single despatch
1909 point and a single or multiple destination points.

1910 B.2.16. Receiving Advice (RECADV)

1911 The Receiving Advice is a message specifying details for the goods received, advising the
1912 consignor of the received contents of a consignment. The message relates to a single receiving
1913 point and a single despatch point.

1914 B.2.17. Invoice (INVOIC)

1915 The Invoice message is sent by the supplier to the customer claiming payment for goods or
1916 services supplied under conditions agreed by the seller and the buyer. This same message with
1917 correct data qualification also covers the functions of proforma invoice, debit and credit note.
1918 The seller may invoice for one or more transactions referring to goods and services related to
1919 one or more order, delivery instruction, call off, etc.

1920 B.2.18. Tax Control (TAXCON)

1921 The Tax Control message may be sent by the supplier to the customer summarising the tax
1922 related information for an invoice or batch of invoices. The message may also be sent by either
1923 party to third parties, auditors, and tax authorities in summary form to detail the tax information
1924 over a period of time.

1925 B.2.19. Remittance Advice (REMADV)

1926 The Remittance Advice is a communication between buyer and seller which provides detailed
1927 accounting information relative to a payment, or other form of financial settlement, on a
1928 specified date for the provision of goods and/or services as detailed in the advice. The message
1929 may be initiated by either the buyer or seller.

1930 B.2.20. Multiple Payment Order (PAYMUL)

1931 A Multiple Payment Order is sent by the Ordering Customer to its bank, to instruct the bank to
1932 debit one or more accounts it services for the Ordering Customer, and to arrange for the
1933 payment of specified amounts to several Beneficiaries.

1934 **B.2.21. Commercial Account Summary (COACSU)**

1935 The Commercial Account Summary message enables the transmission of data concerning
1936 payments made and outstanding items on an account over a period of time. The message may
1937 be exchanged by trading partners or may be sent by parties to their authorised agents (e.g.,
1938 accountants).

1939 **B.2.22. Commercial Dispute (COMDIS)**

1940 The Commercial Dispute message is a notice of commercial dispute against one or more
1941 INVOIC messages (e.g., incorrect price, incorrect product identification, no proof of delivery,
1942 etc.).

1943 **B.2.23. Order Status Enquiry (OSTENQ)**

1944 The Order Status Enquiry message may be sent from a buyer to a supplier to request
1945 information on the current status of a previously sent order(s).

1946 **B.2.24. Order Status Report (OSTRPT)**

1947 The Order Status Report message may be used by a supplier to report the status of an order.
1948 This message may be sent as a reply to an Order Status Enquiry sent by a buyer or buyer's
1949 agent or a report sent at regular intervals as agreed by the parties.

1950 **B.2.25. Announcement for Returns (RETANN)**

1951 The Announcement for Returns message is used by a party to announce to another party
1952 details of goods for return due to specified reasons (e.g. returns for repair, returns because of
1953 damage, etc.). The message may be used by the message sender to request credit for goods,
1954 or the replacement of goods.

1955 **B.2.26. Instructions for Returns (RETINS)**

1956 The Instructions for Returns message is the means by which a party informs another party
1957 whether and how goods shall be returned. The sender of the message will normally be
1958 informed by the recipient of the intention to return goods by means of the Announcement for
1959 Returns message.

1960 **B.3. Report and Planning Messages**

1961 **B.3.1. Delivery Schedule (DELFOR)**

1962 The Delivery Schedule is a message from a customer to his supplier providing product
1963 requirements for short term delivery instructions and/or long term product/service forecasts for
1964 planning purposes. The message can be used to authorise the commitment of labour and
1965 material resources. The message may also be sent by a supplier to a buyer in response to a
1966 previously transmitted delivery schedule.

1967 **B.3.2. Sales Data Report (SLSRPT)**

1968 The Sales Data Report message, sent from a seller to his supplier, headquarters, distribution
1969 centre or third party such as a marketing institute, transmitting sales data by location in terms of
1970 product(s) identification, quantity sold, price, and promotions applicable.

- 1971 **B.3.3. Sales Forecast Report (SLSFCT)**
- 1972 The Sales Forecast Report message, sent from a seller to his supplier, headquarters,
1973 distribution centre or third party, transmitting sales forecast data by location in terms of product
1974 identification, forecasted quantities and promotions applicable.
- 1975 **B.3.4. Inventory Report (INVRPT)**
- 1976 The Inventory Report is a message between interested parties, specifying information related to
1977 planned or targeted inventories. All goods, services and locations detailed in the inventory
1978 report will have been previously identified in the Party Information and Price/Sales Catalogue
1979 Messages.
- 1980 **B.3.5. Syntax and Service Report Message (CONTRL)**
- 1981 The Syntax and Service Report Message is used by the receiver of an EANCOM[®] message to
1982 acknowledge receipt of and/or detail any errors contained in an interchange. This message is
1983 used to report on the syntax level of a message and is not used to report on the business data
1984 contained.
- 1985 **B.3.6. Application Error and Acknowledgement (APERAK)**
- 1986 This message is sent from the party who received an original message, to the party who issued
1987 it, to acknowledge the receipt of the message by the recipient's application and to report errors
1988 made during the processing within the application.
- 1989 **B.3.7. Multiple Debit Advice (DEBMUL)**
- 1990 The Multiple Debit Advice message is sent by a Bank to its customer to report amounts which
1991 have been (or will be) debited from the customer's account in settlement of a referenced
1992 business transaction(s). A Multiple Debit Advice message may cover the financial settlement of
1993 one or more commercial trade transactions, such as invoices, credit notes, debit notes, etc.
- 1994 **B.3.8. Multiple Credit Advice (CREMUL)**
- 1995 The Multiple Credit Advice message is sent by a Bank to its customer to report amounts which
1996 have been (or will be) credited to the customer's account in settlement of a referenced business
1997 transaction(s). A Multiple Credit Advice message may cover the financial settlement of one or
1998 more commercial trade transactions, such as invoices, credit notes, debit notes etc.
- 1999 **B.3.9. Banking Status (BANSTA)**
- 2000 The Banking Status message is sent by a bank to its customer, providing status information
2001 regarding a previously sent financial message. The Banking Status message may cover the
2002 response given to any previously sent message, such as a commercial or payment instruction,
2003 a request for information, etc. This message provides a means to report on errors and
2004 inconsistencies found in the original message at application level.
- 2005 **B.3.10. Financial Cancellation (FINCAN)**
- 2006 A Financial Cancellation message is sent by the Ordering Customer to the Ordered Bank to
2007 request cancellation of a previously sent financial message(s). A Financial Cancellation
2008 message must always be responded to by a Banking Status message.

- 2009 **B.3.11. Financial Statement (FINSTA)**
- 2010 The Financial Statement message is sent by a financial institution to provide for a customer a
2011 statement of booked items confirming entries on the customer's account.
- 2012 **B.3.12. Direct Debit (DIRDEB)**
- 2013 A Direct Debit is sent by the Creditor to the Creditor's Bank instructing the latter to claim
2014 specified amount(s) from the Debtor(s) and to credit the amount(s) to an account.
- 2015 **B.3.13. Metered Services Consumption Report (MSCONS)**
- 2016 A Metered Services Consumption Report is a communication between trading parties, or their
2017 agents, providing consumption and where required associated technical information at a
2018 location(s) for a product(s) or service(s) where the supply is recorded using a meter(s).
- 2019 **B.3.14. Quality Test Report (QUALITY)**
- 2020 A message to enable the transmission of the results of tests performed to satisfy a specified
2021 product requirement. The content includes, but is not limited to, test data and measurements,
2022 statistical information, and the testing methods employed.
- 2023 **B.4. Miscellaneous**
- 2024 **B.4.1. Drawing Administration (CONDRA)**
- 2025 This message will be used for the administration of exchange of an external object. For
2026 example, an external object may be a photograph, a video, a film, a CAD file. The message will
2027 give additional information about the object and it will refer to the message, and if necessary to
2028 the line number to which it is related.
- 2029 **B.4.2. General Message (GENRAL)**
- 2030 The General Message may be used to send required data for which there is no specific
2031 standard message. It was designed primarily to facilitate early transmission testing between
2032 new EDI partners or to transmit text (preferably structured or coded) to supplement or further
2033 clarify previously transmitted EDI standard messages.

2034 C. GS1 XML MESSAGES

2035 C.1. GDSN

2036 C.1.1. Align Catalogue Item Synchronisation

2037 A standard outlining the choreography and messages for the synchronisation of Master Data
2038 from Source Data Pools to Recipient Data Pools within the GDSN supported by the GDSN
2039 Global Registry. Examples of documents within this standard are

- 2040 ■ **Catalogue Item Notification** – A business message used to transmit trade item
2041 information from a data source or a data pool to a data recipient with the Global Data
2042 Synchronisation Network
- 2043 ■ **Catalogue Item Confirmation** - This refers to electronic communication from the Data
2044 Recipient to the Data Source indicating what action has been taken on the item
- 2045 ■ **Catalogue Item Subscription** - A business message used to establish a request for
2046 the update of trade item information from an end recipient on a continuous basis.
- 2047 ■ **EANUCC Response** - A response message used to acknowledge that a business
2048 message has been successfully received and validated.
- 2049 ■ **GDSN Exception** - An error message sent by the recipient of a business message
2050 containing errors.

2051 C.1.2. Align Basic Party Synchronisation

2052 A set of messages used to populate the GS1 Global Registry with basic information about
2053 parties participating in the GDSN and report party information to data pools and their registered
2054 trading partners.

2055 C.1.3. Item Authorisation

2056 A set of messages used to authorise trading partners to sell or deliver an item at a specific
2057 location or group of locations. This standard is intended for Direct Store Delivery (DSD)
2058 business scenarios.

2059 C.1.4. GDSN Common Library

2060 A standard specifying common components that are used in multiple GDSN standards. This
2061 typically consists of classes of data elements and attributes.

2062 C.1.5. GDSN Price Synchronisation

2063 A standard outlining the choreography and messages needed for the process of synchronising
2064 prize information between trading partners.

2065 C.1.6. GDSN Trade Item

2066 A standard containing the core data model for the identification and description of all trade
2067 items. This information is exchanged between trading partners using the messaging and
2068 choreography of GDSN Catalogue Item Synchronisation.

- 2069 **C.1.7. GDSN Trade Item Extensions**
- 2070 The GDSN Trade Item standard contains trade item information that can be applied to any type
2071 of trade item in any industry and any process. To support requirements related to specific types
2072 of trade items, industries or processes without adding too many attributes and elements to the
2073 core trade item model, the concept of extensions has been developed. The use of extensions is
2074 optional. The extensions are:
- 2075 **C.1.7.1. Apparel & Home Fashion**
- 2076 Contains information specifically for clothing and home fashion.
- 2077 **C.1.7.2. Attribute Value Pair (AVP)**
- 2078 A generic extension designed to carry trade item information for which there is no suitable
2079 standard attribute. This is intended for “fast track” attributes (attributes that are approved for
2080 inclusion in a future version of core trade item or an extension) and “extended attributes” (non-
2081 standard attributes) that may be agreed between trading partners and data pools.
- 2082 **C.1.7.3. Audio Visual Photography**
- 2083 An extension containing attributes specifically relevant for Audio/Visual/Photography products.
- 2084 **C.1.7.4. BarCode Candidate Attributes**
- 2085 An extension carrying information that is needed in cases when the identification number in the
2086 barcode symbol physically on the trade item is a different number than the GTIN of the trade
2087 item.
- 2088 **C.1.7.5. Electronic Games**
- 2089 The specific purpose of this extension is to pass attributes describing within the product classes
2090 Computer/Video Game Gaming Software and Computer Software (Non Games).
- 2091 **C.1.7.6. FMCG**
- 2092 An extension containing attributes related to specific measurements, packaging marking and
2093 additional identification information specific to the FMCG industry.
- 2094 **C.1.7.7. Food & Beverage**
- 2095 An extension containing detailed information about foodstuffs, such as ingredient and nutrition
2096 information, allergen information, claims and preparation information end more.
- 2097 **C.1.7.8. Hardlines**
- 2098 An extension containing information about trade items specifically needed in the hardlines retail
2099 industry. This does not include detailed product descriptions.
- 2100 **C.1.7.9. Healthcare**
- 2101 The objective of this extension is to provide an initial set of attributes needed to communicate
2102 information relating to trade items within the healthcare sector.

- 2103 **C.1.7.10. Movie Publications**
2104 An extension containing information about movie publications.
- 2105 **C.1.7.11. Music Recordings**
2106 An extension containing information about music recordings.
- 2107 **C.1.7.12. Non-GTIN Logistic Units**
2108 An extension that supports the exchange of information about standard logistics units to which
2109 no GTIN has been assigned. The information is associated to the highest item level that has a
2110 GTIN assigned to it.
- 2111 **C.1.7.13. Office Supplies**
2112 An extension containing information about trade items specifically needed in the office supplies
2113 retail industry (similar to the Hardlines extension). This does not include detailed product
2114 descriptions.
- 2115 **C.1.7.14. Promotional Trade Item**
2116 An extension that details necessary information about promotional trade items. The extension
2117 provides information on these promotional trade items and to be able to link them to the
2118 standard trade items they replace or complement.
- 2119 **C.1.7.15. Regulatory Compliance**
2120 An extension enabling information relating to regulations to be exchanged between trading
2121 partners. Examples are permit numbers.
- 2122 **C.1.7.16. Specific Technical Characteristics**
2123 An extension that allows communications about technical properties of trade items.
- 2124 **C.1.7.17. US Hazmat**
2125 An extension containing attributes relating to the trade of hazardous goods, in support of the
2126 need for compliance with US Department of Transportation regulations for the transportation of
2127 hazardous goods.
- 2128 **C.2. Plan**
- 2129 **C.2.1. Bulk Forecast**
2130 A message containing descriptors that can be used to interpret one or more non-tagged files
2131 that contain forecast content record per line with comma, tab, or field-width delimiters (“bulk”
2132 messages). Each bulk data message is a uniform series of records of a single message type.
2133 Records criteria include width, order of fields and default values.

2134 **C.2.2. Bulk Product Activity**

2135 A message containing descriptors that can be used to interpret one or more non-tagged files
2136 that contain product activity content record per line with comma, tab, or field-width delimiters
2137 (“bulk” messages). Each bulk data message is a uniform series of records of a single message
2138 type. Records criteria include width, order of fields and default values.

2139 **C.2.3. Event**

2140 A message describing discrete events that affect supply or demand. For example, a sale on an
2141 item increases demand. Events are not restricted to promotions; they may include weather-
2142 related activity, or inventory policy changes.

2143 **C.2.4. Exception Criteria**

2144 The exception criteria is created during the development of the collaborative agreement and
2145 used as an input to revise forecasts. Exception criteria are rules that describe the thresholds for
2146 forecast variance, product activity, and performance history beyond which exceptions should be
2147 triggered.

2148 **C.2.5. Exception Notification**

2149 A message notifying a trading partner when a buyer or seller exception has been triggered.
2150 There are several types of exceptions, but all types describe a variance of a data item from an
2151 expected value during a particular time interval.

2152 **C.2.6. Forecast**

2153 Forecast can be either a sales forecast – reflecting consumer demand or manufacturing
2154 consumption – or an order forecast, indicating the supply needed to meet future consumption
2155 requirements. Each forecast data item within a forecast represents a quantity of demand or
2156 supply for a specific product that is expected between buyer and seller locations for a given time
2157 interval. An item may be for the total volume during the period, or a component (base/turn,
2158 promotional, or seasonal) of the total demand. Promotional forecast data items may also identify
2159 an associated promotion and the number of buyer locations that are participating.

2160 **C.2.7. Forecast Revision**

2161 Forecast items may be frozen, in which case they may not be adjusted. Otherwise, the
2162 receiving organisation has the option of revising the item and notifying an appropriate trading
2163 partner via a forecast revision.

2164 **C.2.8. Goods Requirements**

2165 A message allowing the buyer to communicate Goods Requirements to the seller, which is
2166 needed in several business scenarios. Sometimes it is needed in traditional order driven
2167 scenarios and is definitely needed in supplier managed scenarios. The Goods Requirements
2168 communicated by the buyer can be gross or net (=gross requirements -/- inventory).

2169 **C.2.9. Goods Requirements Response**

2170 The Goods Requirements Response message enables the responding party to communicate
2171 acceptance of the Goods Requirements transaction.

2172 C.2.10. Performance History

2173 Performance history captures key supply chain metrics. These metrics can include forecast
2174 accuracy, in-stock percentage, fill rate, days of supply, or on-time delivery percentage.

2175 C.2.11. Performance Measurement

2176 The Performance Measurement message allows trading partners to identify goals for the
2177 measures that they wish to share, as well as exchange the values for those measures. The
2178 scope of the message includes key measures of Sales, Operations, Supply Chain, and Data
2179 Accuracy performance.

2180 C.2.12. Product Activity

2181 Product activity reports are collections of product activity items that indicate the quantities of
2182 product movement during the specified time intervals. Types of product activity include sales
2183 (which may also be interpreted as manufacturing consumption or warehouse withdrawals,
2184 depending upon the type of buyer/seller relationship), orders, cancelled orders, emergency
2185 orders, receipts, shipments and on-hand inventory.

2186 C.2.13. Purchase Conditions

2187 Purchase Conditions expresses the official commitment between buyer and seller that certain
2188 quantities are to be delivered over a given period and at the stated price. In doing so it sets the
2189 contractual conditions for the ordering and delivering of the goods and so details specific terms
2190 and conditions that apply for a given period.

2191 C.2.14. Replenishment Proposal

2192 The replenishment process in broad sense addresses the business practice to exchange data
2193 between a buying party (e.g. buyer) and a supplying party (e.g. seller/supplier) related to the
2194 future demand of finished or semi-finished products, ingredients, packaging and raw materials.
2195 This message responds to the replenishment request by issuing a replenishment proposal.

2196 C.2.15. Replenishment Request

2197 The replenishment process in broader sense addresses the business practice to exchange data
2198 between a buying party (e.g. buyer) and a supplying party (e.g. seller/supplier) related to the
2199 future demand of finished or semi-finished products, ingredients, packaging and raw materials.
2200 This message allows the buyer to request the supplier to plan for future replenishment.

2201 C.2.16. Retail Event

2202 A message communicating information about retail events (such as promotions, product
2203 introductions, community or environmental events) that affect supply or demand.

2204 C.2.17. Trade Item Information Request

2205 A message sent by one trading partner to another to request forecast, product activity, or
2206 performance history for one or more products. A request of this type is needed if one party
2207 does not regularly send information to the other, but sends it only upon request.

2208 C.2.18. Trade Item Location Profile

2209 A message providing trading partners with a profile for trade items, their locations along with
2210 effective periods. The CPFR trade item attributes in this message are focused on replenishment
2211 policies. They enable a CPFR solution to generate an appropriate order forecast, given a
2212 particular sales forecast, and generate orders from the order forecast.

2213 C.3. Order**2214 C.3.1. Configure to Order**

2215 The Configure to Order provides support for configurable items on a purchase order. A
2216 configurable item is one that starts with a single structure, but to which a large variety of options
2217 may be added in a variety of combinations.

2218 C.3.2. Order

2219 The Order provides the ability for a buyer to order specified quantities of goods and services
2220 from a seller for a single shipment to or from a single location.

2221 C.3.3. Order Response

2222 The Order Response provides the ability for a supplier to respond to an order previously sent by
2223 the buyer. The Order Response allows the seller to inform about either the acceptance of the
2224 entire order as transmitted, or the acceptance of the order with modifications on items
2225 (substitutes), quantities, prices and/or dates, or the rejection of the entire order.

2226 C.3.4. Multi Shipment Order

2227 The Multi Ship to Order provides the ability for a buyer to order variable quantities of trade
2228 items/services shipped to multiple locations using one transmission.

2229 C.4. Deliver**2230 C.4.1. Transportation Rate Request Reply**

2231 Shippers will, at times, request spot rates from a carrier to support an immediate business need.
2232 In addition, Shippers will also work with a 3rd Party Logistics Provider or Payment Services
2233 Provider to rate a group of shipments for payment and/or freight auditing. The purpose of this
2234 message is to support the communication of transportation services provider rate requests and
2235 their corresponding responses.

2236 C.4.2. Consumption Report

2237 Allows the Buyer in consignment business scenarios to communicate the consumed materials
2238 or sold goods to the seller.

2239 C.4.3. Cross-Dock Despatch Advice Extension

2240 The message to advise the Receiver about the shipment of the goods in combination with AIDC
2241 applications, like bar code labels, to link in an efficient way the physical flow of goods with the
2242 flow of related information.

2243 C.4.4. Despatch Advice

2244 The Despatch Advice enables one Shipper to provide information about the content of a
2245 shipment to one Receiver. Specifically, the Despatch Advice serves as a link to a prior
2246 agreement between Shipper and Receiver and is applicable to one or many Receiver
2247 destination points from one Shipper launch point. Furthermore, the Despatch Advice may be
2248 used to indicate the despatch of goods being returned by the Receiver.

2249 C.4.5. ebMeat - Meat Item Containment Extension

2250 The objective of this extension is to describe the exchange of production history data of
2251 unprepared beef in order to support traceability and quality management.

2252 C.4.6. Full Truck Load Tender

2253 A message sent by a Shipper, Consignee or 3rd Party to the Carrier. It contains all relevant data
2254 regarding the goods to be picked up and transported from initial origin to final destination and all
2255 intermediate stops if applicable.

2256 C.4.7. Full Truck Load/Less-Than-Truckload Carrier Bill of Lading

2257 A message used by a Shipper to pass load information from a consignor to a less-than-
2258 truckload (LTL) or (FTL) motor carrier to a consignee. The use of an LTL carrier or (FTL) motor
2259 carrier Bill of Lading represents a shipment from a single origin to a single destination.

2260 C.4.8. Inventory Activity or Inventory Status

2261 A message used to communicate inventory levels from the place where goods are stored to the
2262 owner of goods.

2263 C.4.9. Inventory Status Advice

2264 A message used by the warehouse providing the inventory level information to the owner of
2265 goods.

2266 C.4.10. Motor Fuel Carrier Bill of Lading

2267 A message used by a Shipper to pass load information from a consignor to a motor fuel carrier
2268 to a consignee. The use of a Motor Carrier Bill of Lading can represent a shipment from a single
2269 origin to multiple destinations.

2270 C.4.11. Pickup Notification LTL

2271 A message used by the Shipper, Consignee or 3rd Party to notify the Carrier that a shipment is
2272 available for pick up.

2273 C.4.12. Receiving Advice

2274 The Receiving Advice provides the Receiver of the shipment the capability to inform the Shipper
2275 of actual goods received, compared to what was advised as being sent. It enables the link to the
2276 information that makes up a Despatch Advice or Shipping Document, providing detailed
2277 information about the content of a shipment of goods from the Shipper to the Receiver.

2278 C.4.13. Routing Guide

2279 A message passing transportation routing instructions, it consists of a buyer's carrier routing
2280 instructions and buyer's party cross reference (Store, Distribution Centre, Department) to the
2281 seller.

2282 C.4.14. Ship Status Inquiry Request FTL/LTL

2283 A message sent by a Supplier, Buyer or Third Party, requesting a shipping status from a
2284 Shipment Handler. The Shipment Handler is any party involved in the shipment of goods
2285 including a carrier or a Third Party Logistics provider.

2286 C.4.15. Ship Status Inquiry Request SPC

2287 A message addressing the requirements of having a core transport status inquiry for the Small
2288 Package Carriers (SPC) within the motor carrier industry.

2289 C.4.16. Small Package Pickup Manifest

2290 A message providing manifest information of all packages tendered to the carrier from the
2291 Shipper, Consignee or Third Party. It is used by the Shipper to communicate package level
2292 detail about a shipment ready for pickup by small package carrier.

2293 C.4.17. Warehouse Shipping Order

2294 A message passing order information from a supplier to ship goods from the warehouse.

2295 C.4.18. Transport Instruction

2296 The main objectives are to communicate/ share the arrangement of the transport of goods
2297 between all parties involved in the movement of the consignment(s) as well as providing the
2298 information necessary to perform that transport and delivery of the goods.

2299 C.4.19. Transport Instruction Confirmation

2300 The main objectives are to give the confirmation or modification of the arrangement of the
2301 transport of goods between all parties.

2302 C.4.20. Transport Status Request

2303 To request information regarding the status of the consignment.

2304 C.4.21. Transport Status Notification

2305 This transaction enables the transmission of status information by a freight forwarder or carrier,
2306 to a party requesting information concerning a consignment of goods for which a Transport
2307 Instruction was previously sent.

2308 C.4.22. Pick-up / Drop-off Request

2309 Request information for the pick-up of the goods, such as the time window and loading dock.

2310 **C.4.23. Pick-up / Drop-off Confirmation**

2311 To communicate the pick-up information to the Logistic Services Provider.

2312 **C.5. Pay**

2313 **C.5.1. Advanced Remittance Notification**

2314 The purpose of this message is to provide prior notification of payment in support the
2315 Collaborative Receipt Settlement (CRS), which is the process of rendering payment for goods
2316 received based upon quantity received and synchronised pricing records without having to
2317 exchange an invoice from a seller to a buyer.

2318 **C.5.2. Buyer Reconciliation of Request(s) for Payment**

2319 A message enabling a buyer to respond to Requests For Payment received from a seller. The
2320 document reports to the seller whether or not the buyer was able to schedule the requested
2321 payment through the accounts payable system.

2322 **C.5.3. Claims Notification**

2323 The purpose of this message is to provide notification of claims in support the Collaborative
2324 Receipt Settlement (CRS), which is the process of rendering payment for goods received based
2325 upon quantity received and synchronised pricing records without having to exchange an invoice
2326 from a seller to a buyer.

2327 **C.5.4. Confirmation of Settlement Instructions**

2328 A message handling the acknowledgment of payment orders, by transaction, from the financial
2329 institution to the payer. The payer submits payment requests to the financial institution.

2330 **C.5.5. Control Total - Buyer to Buyer**

2331 A message verifying payment requests submitted to the paying financial institution, as a part of
2332 the financial checks and balances employed within a company. It ensures that sufficient funds
2333 are available for payment by the financial institution, and removes the possibility of the
2334 submission of fraudulent payment transactions.

2335 **C.5.6. Debit Credit Advice**

2336 Provides advice to a trading partner that a monetary adjustment - debit or credit amount value -
2337 is being applied to the purchase of goods or services.

2338 **C.5.7. EU Invoice Extension**

2339 This Invoice extension meets the requirements of the European Union Directive 2001/115/EC of
2340 20 December 2001 amending Directive 77/388/EEC with a view to simplifying, modernising and
2341 harmonising the conditions laid down for invoicing in respect of value added tax.

2342 **C.5.8. Financial Institution Control Totals**

2343 A message allowing a financial institution to advise the payer (the submitter of one or more
2344 Settlement of Requests for Payment) of the total monetary value of Settlement messages
2345 processed for a particular day.

2346 **C.5.9. Invoice**

2347 The message requesting payment for goods or services under conditions agreed upon between
2348 the seller and the buyer. It contains the necessary information needed for payment consisting of
2349 parties, items, prices, amounts and quantities.

2350 **C.5.10. Invoice Response**

2351 The message enabling the responding party to communicate acceptance or rejection of the
2352 Invoice transaction. In some commercial transactions the requesting party requires a formal
2353 response by the responding party in order to ensure proper and timely processing.

2354 **C.5.11. Request for Payment**

2355 The Core Request for Payment Message is defined as requesting payment for goods or
2356 services under conditions agreed upon between the seller and the buyer. It contains only the
2357 necessary information needed for payment consisting of parties, items, and quantities.
2358 Extensions are available to add functionality and are categorised by business process. For
2359 example, the Core Request for Payment could be used with the Simple Invoice Extension for
2360 data relative to pricing and reference numbers.

2361 **C.5.12. Settlement**

2362 The Settlement message provides the ability is to send payment and remittance without
2363 adjustment, send remittance with adjustments and/or discounts, send payment and remittance
2364 with adjustment and/or discounts, send payment, send remittance without adjustments and/or
2365 discounts.

2366 **C.5.13. Simple Invoice**

2367 The Simple Invoice Extension to Core Request for Payment contains data relative to pricing and
2368 reference numbers. It can be used in conjunction with the Core Request for Payment message
2369 in a business-to-business exchange of Simple Invoice information between trading partners. As
2370 an extension, it cannot be used independently.

2371 **C.6. Other**

2372 **C.6.1. Application Receipt Acknowledgement**

2373 The Application Receipt Acknowledgement And Or Error Application Receipt Acknowledgement
2374 message sent as a response to any business message received. The Responder upon
2375 receiving the XML Instance Document acknowledges receipt (and optionally detects
2376 errors/warnings) at the SBDH, Transaction, Command and/or Document hierarchical levels and
2377 responds to the message Initiator.

2378 **C.6.2. Common Library**

2379 In design of each business document, some components defined in the common library are
2380 used. The common library contains all the files that may be used in more than one business
2381 document and more than one context.

2382 **C.6.3. Item Data Notification**

2383 Item Master Data is a set of data, which describes the specifications and structures of each item
2384 involved in Supply Chain Processes. Each set of data can uniquely be identified by a Global
2385 Trade Item Number (GTIN).

2386 **C.6.4. Standard Business Document Header (SBDH)**

2387 The SBDH standard provides a document header which identifies key data about a specific
2388 business document. Software vendors can develop functionality in their applications that rely on
2389 the existence and location of the essential data used to manage the routing of business
2390 documents and also systematically determine the documents processing requirements.