Electronic Commerce Modeling Language (ECML)
Version 2 Specification

Status of This Memo

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Abstract

Electronic commerce frequently requires a substantial exchange of information in order to complete a purchase or other transaction, especially the first time the parties communicate. A standard set of hierarchically-organized payment-related information field names in an XML syntax is defined so that this task can be more easily automated. This is the second version of an Electronic Commerce Modeling Language (ECML) and is intended to meet the requirements of RFC 3505.
1. Introduction

Numerous parties are conducting business on the Internet using ad hoc fields and forms. The data formats and structure can vary considerably from one party to another. Where forms are filled out manually, some users find the diversity confusing, and the process of manually filling in these forms can be tedious and error prone.

Software tools, including electronic wallets, can help this situation. Such tools can assist in conducting online transactions by storing billing, shipping, payment, preference, and similar information and using this information to complete the data sets required by interactions automatically. For example, software that fills out forms has been successfully built into browsers, as proxy servers, as helper applications to browsers, as stand-alone applications, as browser plug-ins, and as server-based applications. But the proliferation of more automated transaction software has been hampered by the lack of standards.

ECML (Electronic Commerce Modeling Language) provides a set of hierarchical payment-oriented data structures that will enable automated software, including electronic wallets from multiple vendors, to supply and query for needed data in a more uniform manner.
Version 2.0 extends ECML Versions 1.0 [RFC2706] and 1.1 [RFC3106] as described in the appendix to this document. These enhancements include support for additional payment mechanisms and transaction information and use of XML as the exemplar syntax.

ECML is designed to provide a simple baseline useful in a variety of contexts. Likely uses for ECML v2 are consumer payment information input and business-to-business transactions. At this time, the first is still likely to occur through HTML forms. The second is more likely to use XML documents.

1.2. History and Relationship to Other Standards

The ECML fields were initially derived from the W3C P3P base data schema [P3P.BASE] by the ECML Alliance as described in [RFC2706, RFC3106]. Technical development and change control of ECML was then transferred to the IETF. In version 2, ECML is extended by the fields in a W3C P3P Note related to eCommerce [P3P.ECOM], by [ISO8583], and other sources. Its primary exemplar form is now an XML syntax.

2. Field Definitions, DTD, and Schema

ECML v2 is the definition and naming of a hierarchically structured set of fields and the provision of an optional XML syntax for their transmission. These fields can be encoded in other syntaxes. Regardless of the encoding used, the fields can be transmitted via a variety of protocols.

Section 2.1 below lists and describes the fields, Section 2.2.1 provides an XML DTD for use with the fields, and Section 2.2.2 provides an XML schema.

To conform to this document, field names must be named and hierarchically structured as closely to the structure and naming listed below as is practical given the syntax and transaction protocol in use. (NOTE: This does not impose any restriction on human visible labeling of fields, just on their name or names and structure as used in on-the-wire communication.)

2.1. Field List and Descriptions

The fields are listed below, along with the minimum data entry size allowed. Implementations may accept larger data sizes, if doing so makes sense, and, for some applications, they will need to allow for larger data sizes.
Note that these fields are hierarchically organized as indicated in this table by the embedded underscore ("_") characters. Appropriate data transmission mechanisms may use this to request and send aggregates, such as Ecom_Payment_Card_ExpDate (to encompass all of a set of card expiry date components) or Ecom_ShipTo (to encompass all the ship-to address components that a consumer is willing to provide). The labeling, marshalling, and unmarshalling of the components of such aggregates depend on the data transfer protocol used. The suggested syntax is XML as specified in Section 2.2.

2.1.1. The Field List

The table below is the ECML v2 field list.

The NAME column gives the structured string name of each field as explained above. The MIN column below is the minimum data size that MUST be allowed for on data entry. It is NOT the minimum size for valid contents of the field, and merchant software should, in many cases, be prepared to receive a longer or shorter value. Merchants dealing with areas where, for example, the state/province name or phone number is longer than the MIN given below obviously must permit longer data entry. In some cases, however, there is a maximum size that makes sense, and where this is the case, it is usually documented in a Note for the field.

The following fields are typically used to communicate from the customer to the merchant:

<table>
<thead>
<tr>
<th>FIELD</th>
<th>NAME</th>
<th>MIN</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ship to title</td>
<td>Ecom_ShipTo_Postal_Name_Prefix</td>
<td>4</td>
<td>(1)</td>
</tr>
<tr>
<td>ship to first name</td>
<td>Ecom_ShipTo_Postal_Name_First</td>
<td>15</td>
<td>(54)</td>
</tr>
<tr>
<td>ship to middle name</td>
<td>Ecom_ShipTo_Postal_Name_Middle</td>
<td>15</td>
<td>(2)</td>
</tr>
<tr>
<td>ship to last name</td>
<td>Ecom_ShipTo_Postal_Name_Last</td>
<td>15</td>
<td>(54)</td>
</tr>
<tr>
<td>ship to name suffix</td>
<td>Ecom_ShipTo_Postal_Name_Suffix</td>
<td>4</td>
<td>(3)</td>
</tr>
<tr>
<td>ship to company name</td>
<td>Ecom_ShipTo_Postal_Company</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>ship to street line1</td>
<td>Ecom_ShipTo_Postal_Street_Line1</td>
<td>20</td>
<td>(4)</td>
</tr>
<tr>
<td>ship to street line2</td>
<td>Ecom_ShipTo_Postal_Street_Line2</td>
<td>20</td>
<td>(4)</td>
</tr>
<tr>
<td>ship to street line3</td>
<td>Ecom_ShipTo_Postal_Street_Line3</td>
<td>20</td>
<td>(4)</td>
</tr>
<tr>
<td>ship to city</td>
<td>Ecom_ShipTo_Postal_City</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>ship to state/province</td>
<td>Ecom_ShipTo_Postal_StateProv</td>
<td>2</td>
<td>(5)</td>
</tr>
<tr>
<td>ship to zip/postal code</td>
<td>Ecom_ShipTo_PostalPostalCode</td>
<td>14</td>
<td>(6)</td>
</tr>
<tr>
<td>ship to country</td>
<td>Ecom_ShipTo_PostalCountryCode</td>
<td>2</td>
<td>(7)</td>
</tr>
<tr>
<td>ship to phone</td>
<td>Ecom_ShipTo_Telecom_Phone_Number</td>
<td>10</td>
<td>(8)</td>
</tr>
<tr>
<td>ship to email</td>
<td>Ecom_ShipTo_Online_Email</td>
<td>40</td>
<td>(9)</td>
</tr>
</tbody>
</table>
bill to title            Ecom_BillTo_Postal_Name_Prefix      4  ( 1)
bill to first name      Ecom_BillTo_Postal_Name_First     15  (54)
bill to middle name     Ecom_BillTo_Postal_Name_Middle    15  ( 2)
bill to last name       Ecom_BillTo_Postal_Name_Last      15  (54)
bill to name suffix     Ecom_BillTo_Postal_Name_Suffix      4  ( 3)
bill to company name    Ecom_BillTo_Postal_Company        20
bill to street line1    Ecom_BillTo_Postal_Street_Line1    20  ( 4)
bill to street line2    Ecom_BillTo_Postal_Street_Line2    20  ( 4)
bill to street line3    Ecom_BillTo_Postal_Street_Line3    20  ( 4)
bill to city            Ecom_BillTo_Postal_City           22
bill to state/province  Ecom_BillTo_Postal_StateProv     2  ( 5)
bill to zip/postal code Ecom_BillTo_Postal_PostalCode   14  ( 6)
bill to country         Ecom_BillTo_Postal_CountryCode  2  ( 7)
bill to phone           Ecom_BillTo_Telecom_Phone_Number 10  ( 8)
bill to email           Ecom_BillTo_Online_Email         40  ( 9)

receipt to             (32)
receipt to title       Ecom_ReceiptTo_Postal_Name_Prefix    4  ( 1)
receipt to first name  Ecom_ReceiptTo_Postal_Name_First    15  (54)
receipt to middle name Ecom_ReceiptTo_Postal_Name_Middle    15  ( 2)
receipt to last name   Ecom_ReceiptTo_Postal_Name_Last      15  (54)
receipt to name suffix Ecom_ReceiptTo_Postal_Name_Suffix      4  ( 3)
receipt to company name Ecom_ReceiptTo_Postal_Company        20
receipt to street line1 Ecom_ReceiptTo_Postal_Street_Line1    20  ( 4)
receipt to street line2 Ecom_ReceiptTo_Postal_Street_Line2    20  ( 4)
receipt to street line3 Ecom_ReceiptTo_Postal_Street_Line3    20  ( 4)
receipt to city         Ecom_ReceiptTo_Postal_City           22
receipt to state/province Ecom_ReceiptTo_Postal_StateProv     2  ( 5)
receipt to postal code  Ecom_ReceiptTo_Postal_PostalCode   14  ( 6)
receipt to country      Ecom_ReceiptTo_Postal_CountryCode  2  ( 7)
receipt to phone        Ecom_ReceiptTo_Telecom_Phone_Number 10  ( 8)
receipt to email        Ecom_ReceiptTo_Online_Email         40  ( 9)

name on card            Ecom_Payment_Card_Name              30  (10)
card type               Ecom_Payment_Card_Type               4  (11)
card number             Ecom_Payment_Card_Number            19  (12)
card verification value Ecom_Payment_Card_Verification      4  (13)
card issuer number      Ecom_Payment_Card_IssueNumber        2  (53)
card expire date day    Ecom_Payment_Card_ExpDate_Day        2  (14)
card expire date month  Ecom_Payment_Card_ExpDate_Month      2  (15)
card expire date year   Ecom_Payment_Card_ExpDate_Year       4  (16)
card valid date day     Ecom_Payment_Card_ValidFrom_Day      2  (14)
card valid date month   Ecom_Payment_Card_ValidFrom_Month    2  (15)
card valid date year    Ecom_Payment_Card_ValidFrom_Year     4  (16)
card protocols  Ecom_Payment_Card_Protocol  20  (17)

loyalty card name  Ecom_Loyalty_Card_Name  30  (10)
loyalty card type  Ecom_Loyalty_Card_Type  20  (52)
loyalty card number  Ecom_Loyalty_Card_Number  40  (34)
loyalty card verification  Ecom_Loyalty_Card_Verification  4  (13)
loyalty card expire day  Ecom_Loyalty_Card_ExpDate_Day  2  (14)
loyalty card expire month  Ecom_Loyalty_Card_ExpDate_Month  2  (15)
loyalty card expire year  Ecom_Loyalty_Card_ExpDate_Year  2  (16)
loyalty card valid day  Ecom_Loyalty_Card_ValidFrom_Day  2  (14)
loyalty card valid month  Ecom_Loyalty_Card_ValidFrom_Month  2  (15)
loyalty card valid year  Ecom_Loyalty_Card_ValidFrom_Year  4  (16)

consumer order ID  Ecom_ConsumerOrderID  20  (18)
user ID  Ecom_User_ID  40  (19)
user password  Ecom_User_Password  20  (19)
user certificate  Ecom_User_Certificate_URL  128  (55)
user data country  Ecom_UserData_Country  2  ( 7)
user data language  Ecom_UserData_Language  30  (33)
user data gender  Ecom_UserData_Gender  1  (36)
user data birth day  Ecom_UserData_BirthDate_Day  2  (14)
user data birth month  Ecom_UserData_BirthDate_Month  2  (15)
user data birth year  Ecom_UserData_BirthDate_Year  4  (16)
user data preferences  Ecom_UserData_Preferences  60  (34)

schema version  Ecom_SchemaVersion  30  (20)

wallet id  Ecom_WalletID  40  (21)
wallet URL  Ecom_Wallet_Location  128  (35)

customer device ID  Ecom_Device_ID  20  (37)
customer device type  Ecom_Device_Type  20  (38)

end transaction flag  Ecom_TransactionComplete  -  (22)

The following fields are typically used to communicate from the merchant to the consumer:

<table>
<thead>
<tr>
<th>FIELD</th>
<th>NAME</th>
<th>Min</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>merchant home domain</td>
<td>Ecom_Merchant</td>
<td>128</td>
<td>(23)</td>
</tr>
<tr>
<td>processor home domain</td>
<td>Ecom_Processor</td>
<td>128</td>
<td>(24)</td>
</tr>
<tr>
<td>transaction identifier</td>
<td>Ecom_Transaction_ID</td>
<td>128</td>
<td>(25)</td>
</tr>
<tr>
<td>transaction URL inquiry</td>
<td>Ecom_Transaction_Inquiry</td>
<td>500</td>
<td>(26)</td>
</tr>
<tr>
<td>transaction amount</td>
<td>Ecom_Transaction_Amount</td>
<td>128</td>
<td>(27)</td>
</tr>
<tr>
<td>transaction currency</td>
<td>Ecom_Transaction_CurrencyCode</td>
<td>3</td>
<td>(28)</td>
</tr>
<tr>
<td>transaction date</td>
<td>Ecom_Transaction_Date</td>
<td>80</td>
<td>(29)</td>
</tr>
</tbody>
</table>
The following fields are used to communicate between the merchant and a processor acting for the merchant (such a processor is commonly called an acquirer and is frequently a bank):

<table>
<thead>
<tr>
<th>FIELD</th>
<th>NAME</th>
<th>Min</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>merchant identifier</td>
<td>Ecom_Merchant_ID</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>merchant terminal</td>
<td>Ecom_Merchant_Terminal_ID</td>
<td>8</td>
<td>(39)</td>
</tr>
<tr>
<td>merchant terminal data</td>
<td>Ecom_Merchant_Terminal_Data</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>transaction process code</td>
<td>Ecom_Transaction_ProcessingCode</td>
<td>6</td>
<td>(40)</td>
</tr>
<tr>
<td>transaction reference</td>
<td>Ecom_Transaction_Reference_ID</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>transaction acquirer</td>
<td>Ecom_Transaction_Acquire_ID</td>
<td>13</td>
<td>(41)</td>
</tr>
<tr>
<td>transaction forward</td>
<td>Ecom_Transaction_Forward_ID</td>
<td>13</td>
<td>(42)</td>
</tr>
<tr>
<td>transaction trace</td>
<td>Ecom_Transaction_Trace_Audit</td>
<td>6</td>
<td>(43)</td>
</tr>
<tr>
<td>transaction effective date</td>
<td>Ecom_Transaction_Effective_Date</td>
<td>4</td>
<td>(44)</td>
</tr>
<tr>
<td>transaction CID</td>
<td>Ecom_Transaction_CID</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>transaction POS</td>
<td>Ecom_Transaction_POSCode</td>
<td>12</td>
<td>(45)</td>
</tr>
<tr>
<td>transaction private use</td>
<td>Ecom_Transaction_PrivateUseData</td>
<td>166</td>
<td></td>
</tr>
<tr>
<td>transaction response</td>
<td>Ecom_Transaction_ResponseData</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>transaction approval code</td>
<td>Ecom_Transaction_ApprovalCode</td>
<td>12</td>
<td>(46)</td>
</tr>
<tr>
<td>transaction retrieval code</td>
<td>Ecom_Transaction_RetrievalCode</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>transaction response action</td>
<td>Ecom_Transaction_ActionCode</td>
<td>13</td>
<td>(47)</td>
</tr>
<tr>
<td>transaction reason</td>
<td>Ecom_Transaction_ReasonCode</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>transaction AAV</td>
<td>Ecom_Transaction_AAV</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>transaction settlement date</td>
<td>Ecom_Transaction_Settle_Date</td>
<td>4</td>
<td>(48)</td>
</tr>
<tr>
<td>transaction capture date</td>
<td>Ecom_Transaction_Capture_Date</td>
<td>4</td>
<td>(49)</td>
</tr>
<tr>
<td>transaction Track 1</td>
<td>Ecom_Transaction_Track1</td>
<td>39</td>
<td>(50)</td>
</tr>
<tr>
<td>transaction Track 2</td>
<td>Ecom_Transaction_Track2</td>
<td>39</td>
<td>(51)</td>
</tr>
</tbody>
</table>

2.1.2. Field Footnotes

(1) For example: Mr., Mrs., Ms., Dr. This field is commonly omitted.

(2) May also be used for middle initial.

(3) For example: Ph.D., Jr. (Junior), 3rd, Esq. (Esquire). This field is commonly omitted.

(4) Address lines must be filled in the order line1, then line2, and last line3. Thus, for example, it is an error for line1 to be null if line2 or line3 is not.
(5) 2 characters are the minimum for the US and Canada; other countries may require longer fields. For the US, use 2-character US postal state abbreviation.

(6) Minimum field lengths for Postal Code will vary according to the international market served. Use 5-character postal code or 5+4 ZIP for the US and 6-character postal code for Canada. The size given, 14, is believed to be the maximum required anywhere in the world.

(7) Use [ISO3166] standard two letter country codes.

(8) 10 digits are the minimum for numbers within the North American Numbering Plan (<http://www.nanpa.com>): It includes the US, Canada and a number of Caribbean and smaller Pacific nations, but not Cuba). Other countries may require longer fields. Telephone numbers are complicated by differing international access codes, variant punctuation of area/city codes within countries, etc. Although it is desirable for telephone numbers to be in standard international format [E.164], it may be necessary to use heuristics or human examination based on the telephone number and addresses given to figure out how to call a customer, since people may enter local formatted numbers without area/access codes. It is recommend that an "x" be placed before extension numbers and that the "x" and extension number appear after all other parts of the number.

(9) For example: jsmith@example.com

(10) The name of the cardholder as it appears on the card.

(11) Case insensitive. Use up to the first 4 letters of the association name (see also Note 102):

  AMER  American Express
  BANK  Bankcard (Australia)
  DC  DC (Japan)
  DINE  Diners Club
  DISC  Discover
  JCB  JCB
  MAST  Mastercard
  NIKO  Nikos (Japan)
  SAIS  Saison (Japan)
  UC  UC (Japan)
  UCAR  UCard (Taiwan)
  VISA  Visa
(12) Includes the check digit at the end but no spaces or hyphens [ISO7812]. The min given, 19, is the longest number permitted under the ISO standard.

(13) An additional cardholder verification number printed on the card (but not embossed or recorded on the magnetic stripe) such as the American Express CIV, MasterCard CVC2, and Visa CVV2 values.

(14) The day of the month. Values: 1-31. A leading zero is ignored, so, for example, 07 is valid for the seventh day of the month.

(15) The month of the year. Jan - 1, Feb - 2, March - 3, etc.; Values: 1-12. A leading zero is ignored, so, for example, 07 is valid for July.

(16) The value in the wallet cell is always four digits; e.g., 1999, 2000, 2001.

(17) A space separated list of protocols available in connection with the specified card. The following is the initial list of case-insensitive tokens:

    none
    set
    setcert
    iotp
    echeck
    simcard
    phoneid

"Set" indicates that the card is usable with SET protocol (i.e., it is in a SET wallet) but that it does not have a SET certificate [SET]. "Setcert" indicates that the card is usable with SET and has a set certificate [SET]. "Iotp" indicates that the IOTP protocol [RFC2801] is supported at the customer. "Echeck" indicates that the eCheck protocol [eCheck] is supported at the customer. "Simcard" indicates an ability to use the transaction instrument built into a Cellphone subscriber for identification. "Phoneid" indicates use for the transaction of a billable phone number. "None" indicates that automatic field fill is operating but that there is no further information.

(18) A unique order ID string generated by the consumer software.

(19) The user ID and password fields can be used if the user has a pre-established account with the merchant to which access is authenticated by such values. For that use, one would expect an
application to require exactly one user ID, and one password field be present.

(20) URI [RFC3986] indicating version of this set of fields. Equal to "urn:ietf:params:ecml:v2.0" for this version. See Section 5. (See also Note 101.)

(21) A string to identify the source and version of form fill software that is acting on behalf of a user. Should contain company and/or product name and version; for example, "Wallets Inc., SuperFill, v42.7". (See also Note 101.)

(22) A flag to indicate that this web-page/aggregate is the final one for this transaction. (See also Note 101.)

(23) The merchant domain name [RFC1034], such as www.merchant.example. (See also Note 101.)

(24) The domain name [RFC1034] of the gateway transaction processor that is actually accepting the payment on behalf of the merchant, such as www.processor.example. (See also Note 101.)

(25) A Transaction identification string whose format is specific to the processor.

(26) A URL [RFC3986] that can be invoked to inquire about the transaction. (See also Note 100.)

(27) The amount of the transaction in ISO currency format [ISO4217]. This is two integer numbers with a period in between but with no other currency mark (such as a "$" dollar sign).

(28) This is the three-letter ISO currency code [ISO4217]. For example, US dollars is USD.

(29) ISO Transaction date.

(30) The type of the transaction, if known. Currently a value from the following list:

```plaintext
debit
credit
```

(31) A digital signature, base64 encoded [RFC2045]. (See also Note 101.)
(32) The ReceiptTo fields are used when the BillTo entity, location, or address and the ReceiptTo entity, location, or address are different. For example, when using some forms of Corporate Purchasing Cards or Agent Purchasing Cards, the individual card holder would be in the ReceiptTo fields, and the corporate or other owner would be in the BillTo fields.

(33) An IETF Language Tag, as defined in [RFC3066].

(34) User preferences, as specified by the merchant. (See also Note 102.)

(35) The Uniform Resource Locator [RFC3986] for accessing the customer’s "wallet" software. (See also Note 100)

(36) A single capital letter: M=male, F=Female, U=Unknown [ISO5218].

(37) An immutable device identification or serial number. (See also Note 102)

(38) User understandable device brand name. (See also Note 102)

(39) [ISO8583] field "card acceptor terminal identification".

(40) [ISO8583] field "processing code".

(41) [ISO8583] field "acquiring institution identification code".

(42) [ISO8583] field "forwarding institution identification code".

(43) [ISO8583] field "system trace audit field".

(44) [ISO8583] field "date effective".

(45) [ISO8583] field "point of sale date code".

(46) [ISO8583] field "approval code".

(47) [ISO8583] field "action code".

(48) [ISO8583] field "date settlement".

(49) [ISO8583] field "date capture".

(50) [ISO8583] field "trace 1 data".

(51) [ISO8583] field "trace 2 data".
(52) User-recognizable loyalty card brand name. Values for this field are not controlled, and there is no IANA or other registry for them. (See also Note 102.)

(53) The card issuer number required by the UK-based Switch and Solo acquirers.

(54) The field names "first_name" and "last_name" have been retained for compatibility with earlier versions of ECML. However, "last_name" should be understood to refer to family or inherited names(s), whereas "first_name" is the first given or non-inherited name and "middle_name" is the subsequent given or non-inherited name or names, if any.

(55) The Uniform Resource Locator [RFC3986] for accessing the user’s X.509v3 certificate encoded as binary DER. (See also Note 100.)

Meta Notes (referenced by other notes)

(100) ECML, a basic field-naming and structuring convention, does not impose any particular requirements on these URLs. It is to be expected that most applications that make use of ECML will impose such limitations and perform checking to be sure that provided URLs conform to such limitations before attempting to invoke them.

(101) This is a field that, when presented in a web page, is usually hidden.

(102) An ASCII [ASCII] character string with no leading or trailing white space.

2.2. Exemplar XML Syntax

The following sections provide an XML DTD and an XML Schema that express the ECML fields with ECML v2 naming and ECML v2 hierarchical structure. In case of conflict between this DTD and Schema, the Schema should prevail. Note that the ECML v2 naming and structure may be used in non-XML syntaxes.

The ECML v2 XML syntax is deliberately liberal because it is assumed that specific applications making use of ECML will impose their own additional constraints.

For internationalization of ECML, use the general XML character-encoding provisions [XML] (which mandate support of UTF-8 and UTF-16 and permit support of other character sets) and the xml:lang attribute, which may be used to specify language information.
2.2.1. ECML v2 XML DTD

The following is an XML DTD for ECML v2.

<!-- Electronic Commerce Modeling Language v2 -->

<!ELEMENT Ecom ( #PCDATA | ShipTo | BillTo | ReceiptTo | Payment | Loyalty | User | Merchant | Transaction | TransactionComplete )* >

<!ATTLIST Ecom
  id        ID         #IMPLIED
  ConsumerOrderID CDATA #IMPLIED
  Merchant  CDATA      #IMPLIED
  Mode      (Query|Assert) #IMPLIED
  Processor CDATA      #IMPLIED
  SchemaVersion (urn:ietf:params:ecml:v2.0) #IMPLIED
  WalletID  CDATA      #IMPLIED
  WalletLocation CDATA #IMPLIED >

<!ELEMENT ShipTo ( #PCDATA | Postal | Telecom | Online )* >
<!ATTLIST ShipTo
  id        ID         #IMPLIED
  Mode      (Query|Assert) #IMPLIED >

<!ELEMENT BillTo ( #PCDATA | Postal | Telecom | Online )* >
<!ATTLIST BillTo
  id        ID         #IMPLIED
  Mode      (Query|Assert) #IMPLIED >

<!ELEMENT ReceiptTo ( #PCDATA | Postal | Telecom | Online )* >
<!ATTLIST ReceiptTo
  id        ID         #IMPLIED
  Mode      (Query|Assert) #IMPLIED >

<!ELEMENT Postal ( #PCDATA | Name | Company | Street | City | StateProv )* >
<!ATTLIST Postal
  id        ID         #IMPLIED
  PostalCode NM_TOKEN #IMPLIED
  Mode      (Query|Assert) #IMPLIED
  CountryCode NM_TOKEN #IMPLIED >

<!ELEMENT Name EMPTY >
<!ATTLIST Name
  id        ID         #IMPLIED
  Mode      (Query|Assert) #IMPLIED
Prefix  NMTOKEN  #IMPLIED  
First    NMTOKEN  #IMPLIED  
Middle   NMTOKEN  #IMPLIED  
Last     NMTOKEN  #IMPLIED  
Suffix   NMTOKEN  #IMPLIED >  

<!ELEMENT Street EMPTY >  
<!ATTLIST Street  
id        ID         #IMPLIED  
Mode      (Query|Assert) #IMPLIED  
Line1     CDATA      #REQUIRED  
Line2     CDATA      #IMPLIED  
Line3     CDATA      #IMPLIED >  

<!ELEMENT Company (#PCDATA) >  
<!ATTLIST Company  
Mode      (Query|Assert) #IMPLIED >  

<!ELEMENT City (#PCDATA) >  
<!ATTLIST City  
Mode      (Query|Assert) #IMPLIED >  

<!ELEMENT StateProv (#PCDATA) >  
<!ATTLIST StateProv  
Mode      (Query|Assert) #IMPLIED >  

<!ELEMENT Telecom ( #PCDATA | Phone )* >  
<!ATTLIST Telecom  
Mode      (Query|Assert) #IMPLIED >  

<!ELEMENT Phone EMPTY >  
<!ATTLIST Phone  
id         ID        #IMPLIED  
Mode       (Query|Assert) #IMPLIED  
Number     CDATA     #REQUIRED >  

<!ELEMENT Online ( #PCDATA | Email )* >  
<!ATTLIST Online  
Mode      (Query|Assert) #IMPLIED >  

<!ELEMENT Email EMPTY >  
<!ATTLIST Email  
id         ID        #IMPLIED  
Mode       (Query|Assert) #IMPLIED  
Address    CDATA     #REQUIRED >  

<!ELEMENT Payment (Card) >  
<!ATTLIST Payment
<!ELEMENT Card (ExpDate, ValidDate?) >
<!ATTLIST Card
  id          ID        #IMPLIED
  Mode       (Query|Assert) #IMPLIED
  Name       CDATA     #IMPLIED
  Type       NMTOKEN   #IMPLIED
  Number     NMTOKEN   #REQUIRED
  Protocols  NMTOKENS  #IMPLIED
  Verification NMTOKEN  #IMPLIED
  Issuer     NMTOKEN   #IMPLIED >

<!ELEMENT Loyalty (ExpDate?, ValidDate?) >
<!ATTLIST Loyalty
  id          ID        #IMPLIED
  Mode        (Query|Assert) #IMPLIED
  Name        CDATA     #IMPLIED
  Type        NMTOKEN   #IMPLIED
  Number      NMTOKEN   #REQUIRED
  Verification NMTOKEN  #IMPLIED >

<!ELEMENT ExpDate EMPTY >
<!ATTLIST ExpDate
  id          ID        #IMPLIED
  Mode        (Query|Assert) #IMPLIED
  Day         NMTOKEN   #IMPLIED
  Month       NMTOKEN   #IMPLIED
  Year        NMTOKEN   #IMPLIED >

<!ELEMENT ValidDate EMPTY >
<!ATTLIST ValidDate
  id          ID        #IMPLIED
  Mode        (Query|Assert) #IMPLIED
  Day         NMTOKEN   #IMPLIED
  Month       NMTOKEN   #IMPLIED
  Year        NMTOKEN   #IMPLIED >

<!ELEMENT User ( #PCDATA | UserID | Password )* >
<!ATTLIST User
  id          ID        #IMPLIED
  Mode        (Query|Assert) #IMPLIED
  CertificateURL CDATA  #IMPLIED
  DataCountry NMTOKEN #IMPLIED
  DataLanguage CDATA  #IMPLIED >

<!ELEMENT UserID (#PCDATA) >
<!ATTLIST UserID
  id          ID        #IMPLIED
  CertificateURL CDATA  #IMPLIED
  DataCountry NMTOKEN #IMPLIED
  DataLanguage CDATA  #IMPLIED >
<!ELEMENT Effective EMPTY >
<!ATTLIST Effective
  id          ID        #IMPLIED
  Mode        (Query|Assert) #IMPLIED
  Day         NMTOKEN   #REQUIRED
  Month       NMTOKEN   #REQUIRED
  Year        NMTOKEN   #REQUIRED >

<!ELEMENT Settle EMPTY >
<!ATTLIST Settle
  id          ID        #IMPLIED
  Mode        (Query|Assert) #IMPLIED
  Day         NMTOKEN   #REQUIRED
  Month       NMTOKEN   #REQUIRED
  Year        NMTOKEN   #REQUIRED >

<!ELEMENT Capture EMPTY >
<!ATTLIST Capture
  id          ID        #IMPLIED
  Mode        (Query|Assert) #IMPLIED
  Day         NMTOKEN   #REQUIRED
  Month       NMTOKEN   #REQUIRED
  Year        NMTOKEN   #REQUIRED >

<!ELEMENT Data (#PCDATA | Trace | PrivateUse | Response | AAV | Track1 | Track2 )* >
<!ATTLIST Data
  Mode      (Query|Assert) #IMPLIED >

<!ELEMENT Trace (#PCDATA) >
<!ATTLIST Trade
  id        ID         #IMPLIED
  Mode      (Query|Assert) #IMPLIED >

<!ELEMENT PrivateUse (#PCDATA) >
<!ATTLIST PrivateUse
  id        ID         #IMPLIED
  Mode      (Query|Assert) #IMPLIED >

<!ELEMENT Response (#PCDATA) >
<!ATTLIST Response
  id        ID         #IMPLIED
  Mode      (Query|Assert) #IMPLIED >

<!ELEMENT AAV (#PCDATA) >
<!ATTLIST AAV
  id        ID         #IMPLIED
  Mode      (Query|Assert) #IMPLIED >
2.2.2. ECML v2 XML Schema

The following is an XML Schema for ECML v2.

```xml
<?xml version="1.0" encoding="utf-8"?>
<!-- Electronic Commerce Modeling Language v2 -->
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified">
  <xs:attribute name="Mode">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="Query"/>
        <xs:enumeration value="Assert"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
  <xs:attribute name="id" type="xs:ID"/>
  <xs:complexType name="EcomSimpleText">
    <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute ref="Mode" use="optional"/>
        <xs:attribute ref="id" use="optional"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:schema>
```
<xs:element name="Ecom">
  <xs:complexType mixed="true">
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element ref="ShipTo"/>
      <xs:element ref="BillTo"/>
      <xs:element ref="ReceiptTo"/>
      <xs:element ref="Payment"/>
      <xs:element ref="Loyalty"/>
      <xs:element ref="User"/>
      <xs:element ref="Merchant"/>
      <xs:element ref="Transaction"/>
      <xs:element ref="TransactionComplete"/>
    </xs:choice>
    <xs:attribute ref="Mode" use="optional"/>
    <xs:attribute ref="id" use="optional"/>
    <xs:attribute name="ConsumerOrderID" use="optional"/>
    <xs:attribute name="Merchant" use="optional"/>
    <xs:attribute name="Processor" use="optional"/>
    <xs:attribute name="SchemaVersion" type="xs:string" fixed="urn:ietf:params:ecml:v2.0"/>
    <xs:attribute name="WalletID" use="optional"/>
    <xs:attribute name="WalletLocation" type="xs:anyURI" use="optional"/>
  </xs:complexType>
</xs:element>

<xs:element name="ShipTo">
  <xs:complexType mixed="true">
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element ref="Postal"/>
      <xs:element ref="Telecom"/>
      <xs:element ref="Online"/>
    </xs:choice>
    <xs:attribute ref="Mode" use="optional"/>
    <xs:attribute ref="id" use="optional"/>
  </xs:complexType>
</xs:element>

<xs:element name="BillTo">
  <xs:complexType mixed="true">
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element ref="Postal"/>
      <xs:element ref="Telecom"/>
      <xs:element ref="Online"/>
    </xs:choice>
    <xs:attribute ref="Mode" use="optional"/>
    <xs:attribute ref="id" use="optional"/>
  </xs:complexType>
</xs:element>
<xs:element name="ReceiptTo">
  <xs:complexType mixed="true">
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element ref="Postal"/>
      <xs:element ref="Telecom"/>
      <xs:element ref="Online"/>
    </xs:choice>
    <xs:attribute ref="Mode" use="optional"/>
    <xs:attribute ref="id" use="optional"/>
  </xs:complexType>
</xs:element>

<xs:element name="Postal">
  <xs:complexType mixed="true">
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element ref="Name"/>
      <xs:element ref="Company"/>
      <xs:element ref="Street"/>
      <xs:element ref="City"/>
      <xs:element ref="StateProv"/>
    </xs:choice>
    <xs:attribute ref="Mode" use="optional"/>
    <xs:attribute ref="id" use="optional"/>
    <xs:attribute name="PostalCode" type="xs:NMTOKEN" use="optional"/>
    <xs:attribute name="CountryCode" type="xs:NMTOKEN" use="optional"/>
  </xs:complexType>
</xs:element>

<xs:element name="Telecom">
  <xs:complexType mixed="true">
    <xs:sequence maxOccurs="unbounded">
      <xs:element name="Phone">
        <xs:complexType>
          <xs:attribute ref="Mode" use="optional"/>
          <xs:attribute ref="id" use="optional"/>
          <xs:attribute name="Number"/>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
    <xs:attribute ref="Mode" use="optional"/>
    <xs:attribute ref="id" use="optional"/>
  </xs:complexType>
</xs:element>

<xs:element name="Online">
  <xs:complexType mixed="true">
    <xs:sequence maxOccurs="unbounded">
      <xs:element name="Email">
        <xs:complexType>
          <xs:attribute ref="Mode" use="optional"/>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
    <xs:attribute ref="Mode" use="optional"/>
  </xs:complexType>
</xs:element>
<xs:attribute ref="Mode" use="optional"/>
<xs:attribute ref="id" use="optional"/>
<xs:attribute name="Address"/>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute ref="Mode" use="optional"/>
</xs:complexType>
</xs:element>
<xs:element name="Payment">
<xs:complexType>
<xs:sequence>
<xs:element name="Card">
<xs:complexType>
<xs:sequence>
<xs:element ref="ExpDate"/>
<xs:element ref="ValidDate" minOccurs="0"/>
</xs:sequence>
<xs:attribute ref="Mode" use="optional"/>
<xs:attribute ref="id" use="optional"/>
<xs:attribute name="Name" use="optional"/>
<xs:attribute name="Type" type="xs:NMTOKEN" use="optional"/>
<xs:attribute name="Number" type="xs:decimal"/>
<xs:attribute name="Protocols" type="xs:NMTOKENS" use="optional"/>
<xs:attribute name="Verification" type="xs:NMTOKEN" use="optional"/>
<xs:attribute name="Issuer" type="xs:NMTOKEN" use="optional"/>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute ref="Mode" use="optional"/>
</xs:complexType>
</xs:element>
<xs:element name="Loyalty">
<xs:complexType>
<xs:sequence>
<xs:element ref="ExpDate"/>
<xs:element ref="ValidDate" minOccurs="0"/>
</xs:sequence>
<xs:attribute ref="Mode" use="optional"/>
<xs:attribute ref="id" use="optional"/>
<xs:attribute name="Name" use="optional"/>
<xs:attribute name="Type" type="xs:NMTOKEN" use="optional"/>
<xs:attribute name="Number" type="xs:NMTOKEN"/>
<xs:attribute name="Verification" type="xs:NMTOKEN" use="optional"/>
</xs:complexType>
</xs:element>
<xs:element name="ExpDate">
  <xs:complexType>
    <xs:attribute ref="Mode" use="optional"/>
    <xs:attribute ref="id" use="optional"/>
    <xs:attribute name="Day" type="xs:positiveInteger"/>
    <xs:attribute name="Month" type="xs:positiveInteger"/>
    <xs:attribute name="Year" type="xs:positiveInteger"/>
  </xs:complexType>
</xs:element>
<xs:element name="ValidDate">
  <xs:complexType>
    <xs:attribute ref="Mode" use="optional"/>
    <xs:attribute ref="id" use="optional"/>
    <xs:attribute name="Day" type="xs:positiveInteger"/>
    <xs:attribute name="Month" type="xs:positiveInteger"/>
    <xs:attribute name="Year" type="xs:positiveInteger"/>
  </xs:complexType>
</xs:element>
<xs:element name="User">
  <xs:complexType mixed="true">
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element ref="UserID"/>
      <xs:element ref="Password"/>
    </xs:choice>
    <xs:attribute ref="Mode" use="optional"/>
    <xs:attribute ref="id" use="optional"/>
    <xs:attribute name="CertificateURL" type="xs:anyURI" use="optional"/>
    <xs:attribute name="DataCountry" type="xs:NMTOKEN" use="optional"/>
    <xs:attribute name="DataLanguage" type="xs:language" use="optional"/>
  </xs:complexType>
</xs:element>
<xs:element name="Transaction">
  <xs:complexType mixed="true">
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element ref="Id"/>
      <xs:element ref="Code"/>
      <xs:element ref="Date"/>
      <xs:element ref="Data"/>
      <xs:element ref="Inquiry"/>
      <xs:element ref="Signature"/>
    </xs:choice>
  </xs:complexType>
</xs:element>
<xs:attribute ref="Mode" use="optional"/>
<xs:attribute name="Currency" type="xs:NMTOKEN" use="optional"/>
<xs:attribute name="Type" type="xs:NMTOKEN" use="optional"/>
</xs:complexType>
</xs:element>

<xs:element name="Date">
<xs:complexType>
<xs:sequence>
  <xs:element ref="Effective" minOccurs="0"/>
  <xs:element ref="Settle" minOccurs="0"/>
  <xs:element ref="Capture" minOccurs="0"/>
</xs:sequence>
<xs:attribute ref="Mode" use="optional"/>
<xs:attribute ref="id" use="optional"/>
</xs:complexType>
</xs:element>

<xs:element name="Data">
<xs:complexType mixed="true">
<xs:choice minOccurs="0" maxOccurs="unbounded">
  <xs:element ref="Trace"/>
  <xs:element ref="PrivateUse"/>
  <xs:element ref="Response"/>
  <xs:element ref="AAV"/>
  <xs:element ref="Track1"/>
  <xs:element ref="Track2"/>
</xs:choice>
<xs:attribute ref="Mode" use="optional"/>
</xs:complexType>
</xs:element>

<xs:element name="Merchant">
<xs:complexType>
<xs:sequence>
  <xs:element name="Terminal">
    <xs:complexType>
      <xs:attribute ref="Mode" use="optional"/>
      <xs:attribute ref="id" use="optional"/>
      <xs:attribute name="Data" use="optional"/>
    </xs:complexType>
  </xs:element>
</xs:sequence>
<xs:attribute ref="Mode" use="optional"/>
<xs:attribute ref="id" use="optional"/>
</xs:complexType>
</xs:element>

<xs:element name="AAV" type="EcomSimpleText"/>
<xs:element name="Capture">
    <xs:complexType>
        <xs:attribute ref="Mode" use="optional"/>
        <xs:attribute ref="id" use="optional"/>
        <xs:attribute name="Day" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="Month" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="Year" type="xs:NMTOKEN" use="optional"/>
    </xs:complexType>
</xs:element>

<xs:element name="City" type="EcomSimpleText"/>
<xs:element name="Code">
    <xs:complexType>
        <xs:attribute ref="Mode" use="optional"/>
        <xs:attribute name="Processing" use="optional"/>
        <xs:attribute name="Approval" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="Retrieval" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="Action" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="Reason" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="POS" type="xs:NMTOKEN" use="optional"/>
    </xs:complexType>
</xs:element>

<xs:element name="Company" type="EcomSimpleText"/>
<xs:element name="Effective">
    <xs:complexType>
        <xs:attribute ref="Mode" use="optional"/>
        <xs:attribute ref="id" use="optional"/>
        <xs:attribute name="Day" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="Month" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="Year" type="xs:NMTOKEN" use="optional"/>
    </xs:complexType>
</xs:element>

<xs:element name="Id">
    <xs:complexType>
        <xs:attribute ref="Mode" use="optional"/>
        <xs:attribute ref="id" use="optional"/>
        <xs:attribute name="CID" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="Reference" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="Acquire" type="xs:NMTOKEN" use="optional"/>
        <xs:attribute name="Forward" type="xs:NMTOKEN" use="optional"/>
    </xs:complexType>
</xs:element>
<xs:complexType>
  <xs:element name="Inquiry">
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:anyURI">
          <xs:attribute ref="Mode" use="optional"/>
          <xs:attribute ref="id" use="optional"/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
  <xs:element name="Name">
    <xs:complexType>
      <xs:attribute ref="Mode" use="optional"/>
      <xs:attribute ref="id" use="optional"/>
      <xs:attribute name="Prefix" type="xs:NMTOKEN" use="optional"/>
      <xs:attribute name="First" type="xs:NMTOKEN" use="optional"/>
      <xs:attribute name="Middle" type="xs:NMTOKEN" use="optional"/>
      <xs:attribute name="Last" type="xs:NMTOKEN" use="optional"/>
      <xs:attribute name="Suffix" type="xs:NMTOKEN" use="optional"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="Password" type="EcomSimpleText"/>
  <xs:element name="PrivateUse" type="EcomSimpleText"/>
  <xs:element name="Response" type="EcomSimpleText"/>
  <xs:element name="Settle">
    <xs:complexType>
      <xs:attribute ref="Mode" use="optional"/>
      <xs:attribute ref="id" use="optional"/>
      <xs:attribute name="Day" type="xs:NMTOKEN"/>
      <xs:attribute name="Month" type="xs:NMTOKEN"/>
      <xs:attribute name="Year" type="xs:NMTOKEN"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="Signature">
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:string">
          <xs:attribute ref="Mode" use="optional"/>
          <xs:attribute ref="id" use="optional"/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
</xs:complexType>
<xs:complexType>
  <xs:element name="StateProv" type="EcomSimpleText"/>
  <xs:element name="Street">
    <xs:complexType>
      <xs:attribute ref="Mode" use="optional"/>
      <xs:attribute ref="id" use="optional"/>
      <xs:attribute name="Line1"/>
      <xs:attribute name="Line2" use="optional"/>
      <xs:attribute name="Line3" use="optional"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="Trace" type="EcomSimpleText"/>
  <xs:element name="Track1" type="EcomSimpleText"/>
  <xs:element name="Track2" type="EcomSimpleText"/>
  <xs:element name="TransactionComplete">
    <xs:complexType/>
  </xs:element>
  <xs:element>
    <xs:element name="UserID" type="EcomSimpleText"/>
  </xs:element>
</xs:schema>

3. Usage Notes for ECML v2

This section provides a general usage guide for ECML v2.

3.1. Presentation of the Fields

ECML v2 merely names fields and specifies their content and hierarchical organization. It does not constrain the order or completeness of communication of or query for these fields.

Some parties may wish to provide or ask for more information, and some for less by omitting fields. Some may ask for the information they want in one interaction or web page, and others may ask for parts of the information at different times in multiple interactions or different web pages. For example, it is common to ask for "ship to" information earlier so that the shipping cost can be computed before the payment method information. Some parties may require that all the information they request be provided whereas others may make much of the information optional. Other variations are likely.

Every element may be flagged as a query or assertion by including, when XML syntax is in use, the optional Mode attribute with the value "Query" or "Assert" respectively. The Mode attribute effects all descendant elements until overridden by a lower level element with a Mode attribute. Thus it is easy to indicate that all of the elements in an ECML v2 structure are present as queries or assertions.
Query elements may have data content. Such content SHOULD be interpreted as a default value to be returned if no better value is known.

There is no way with Version 2.0 of ECML to indicate what query fields a party considers mandatory to be answered. From this point of view, all fields queried are optional to complete. However, a party may give an error or re-present a request for information if some field it requires is not completed, just as it may if a field is completed in a manner that it considers erroneous.

3.2. Methods and Flow of Setting the Fields

A variety of methods of communication is possible between the parties by which each can indicate what fields it wants the other to provide. Probably the easiest method for currently deployed mass software is through fields in an [HTML] form. Other possibilities include using an [XML] exchange, the IOTP Authenticate transaction [RFC2801], or proprietary protocols.

So that browser software can tell what version it is dealing with, it is REQUIRED that the Ecom_SchemaVersion field be included in every transaction when ECML is being used on the web. Ecom_SchemaVersion SHOULD appear on every web page that has any Ecom fields. It is usually a hidden field in HTML Forms.

User action or the appearance of the Ecom_SchemaVersion field are examples of triggers that can be used to initiate a facility capable of providing information in response to an ECML-based query or of using information from ECML assertions. Because some web software may require user activation, it is RECOMMENDED that there be at least one user-visible Ecom field on every web page with any Ecom fields present when ECML is used via the web.

Under some circumstances, communications can proceed very slowly, so it may not be clear to an automated processing function when it is finished receiving ECML fields on a web page or the like. For this reason, it is RECOMMENDED that the Ecom_SchemaVersion field be the last Ecom field on a web page.

Transfer or requests for information can extend over several interactions or web pages. Without further provision, a facility could either require re-starting on each page or possibly violate or appear to violate privacy by continuing to provide personal data beyond the end of the transaction with a particular business. For this reason, the Ecom_TransactionComplete field, which is normally hidden when it is part of an HTML Form, is provided. It is RECOMMENDED that it appear on the last interaction or web page.
involved in a transaction, just before an Ecom_SchemaVersion field, so that multi-interaction automated logic receives a hint as to when to stop if it chooses to check for this field.

4. Security and Privacy Considerations

The information called for by many of these fields is sensitive. It should be protected from unauthorized modification and kept confidential if it is stored in a location or transmitted over a channel where it might otherwise be observed. In addition, the authenticity of the information will be a concern in many systems.

Mechanisms for such protection and authentication are not specified herein but might, depending on circumstances, include object security protocols (such as XMLDSIG [RFC3275], XML encryption [XMLENC], or CMS [RFC3852]), or channel security (such as TLS [RFC2246] or IPSec [RFC2411]). Systems in which an ECML field or fields are stored and later forwarded will likely find object security the most appropriate.

When information is being requested from a user, the user’s control over the release of such information is needed to protect the user’s privacy.

Software that is installed on shared or public terminals should be configurable so that memory of any sensitive or individual identity information is fully disabled. This is vital to protect the privacy of library patrons, students, and customers using public terminals, and of children who might, for example, use a form on a public terminal without realizing that their information is being stored.

When sensitive or individual identification information is stored, the operator or user should have an option to protect the information; for example, with a password without which the information will be unavailable, even to someone who has access to the file(s) in which it is being stored.

Any multi-page/screen or other multi-aggregate field fill-in or data provision mechanism SHOULD check for the Ecom_TransactionComplete field and cease automated fill when it is encountered until fill is further authorized.

It should be remembered that default, hidden, and other values transferred to another party may be maliciously modified before being returned.
5. IANA Considerations

The sections below provide for:

1. registration of the ECML v2 XML schema contained in this document,

2. a version URN for ECML versions,

3. the subsidiary registration of particular ECML versions and the specific registration of Version 2.0, and

4. three additional IANA registries for elements appearing in three ECML v2 fields.

5.1. ECML v2 Schema Template

The ECML v2 schema given in Section 2.2.2 above is registered as follows:

URI: urn:ietf:params:xml:schema:ECMLv2

Registrant Contact: The IESG <iesg@ietf.org>

XML: The XML Schema in Section 2.2.2 above.

5.2. ECML v2 URN Template

As specified by the template below from [RFC3553], urn:ietf:params:ecml is permanently registered with sub-registration via RFC publication.

Registry name: urn:ietf:params:ecml

Specification: RFC 4112

Repository: RFC 4112

Index value: Values subordinate to urn:ietf:params:ecml are registered by RFC publication. As provided in [RFC3553], once such a value is registered, it may never change.
5.2.1. Sub-registration of v2.0

The subordinate value "v2.0" is hereby permanently registered so that the URN

    urn:ietf:params:ecml:v2.0

is used to indicate an ECML field or fields that conform to this specification. Although it is not anticipated that deeper values subordinate to this URN will need to be registered, if necessary, they are registered by IESG approval.

5.3. IANA Registries

There are three fields described in Section 2.1.2 that require the establishment of IANA registries as described below:

Ecom_Payment_Card_Type
A registry of case-insensitive alphanumeric ASCII [ASCII] card-type designations from one to four characters in length with no white space. See Section 2.1.2, Note 11, for the initial 12 designations. Designations are added based on expert approval. Applicants for registration will normally be required already to have an ISO Issuer Identification Number (IIN) or set of IINs.

Ecom_Payment_Card_Protocol
This field holds a space-separated list of protocols designated by case-insensitive alphanumeric ASCII [ASCII] tokens from this registry or holds the token "none". See Section 2.1.2, note 17, for the initial seven registered tokens (including "none") and further information. Tokens are added to the registry based on expert approval.

Ecom_Transaction_Type
A case-insensitive alphabetic ASCII [ASCII] value indicating the type of transaction. See Section 2.1.2, note 30, for the initial two registered values. Values are added based on expert approval.

6. Acknowledgements

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A. Appendix: Changes from v1.1 to v2

Substantial rewording of text to change the emphasis from HTML Form Fields to XML Syntax.

Addition of the merchant -> processor fields.


Addition of the "Mode" attribute.

Addition of the ECom_Payment_Card_IssueNumber, Loyalty Card fields, Device ID, Valid From, and User Data fields.

Addition of an XML schema.

Some minor fixes related to telephone numbers.

Addition of IANA Considerations section.

Updating of RFC references for obsoleted RFCs.

Normative References


Informative References

[eCheck]  <http://www.echeck.org>


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