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The application/green-commerce MIME Content-type

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Abstract

MIME [1] defines a format and general framework for the representation of a wide variety of data types in Internet mail. This document defines one particular type of MIME data, the application/green-commerce type, for "green" commerce on the Internet, according to the model defined in [6]. The application/green-commerce MIME type is intended to facilitate the interoperation of green commerce across a wide variety of hardware and software platforms.

1 The application/green-commerce MIME type

The Green Commerce model, as described in [6], facilitates "green commerce" transactions. Each transaction is represented as a MIME entity, and takes place via either electronic mail or an interactive protocol, SGCP (Simple Green Commerce Protocol, described in Appendix B). This document describes the data that are delivered via either of these mechanisms.

All transactions between a Green Commerce server and its clients take place using data in the "application/green-commerce" MIME type. A subtype of application is used to permit automated handling of this MIME type by specialized software. However, all Green Commerce transactions that are delivered to human users are also represented textually, using the MIME "multipart/alternative" mechanism, to permit text-based mail users to participate in the system. All examples in this document reflect the multipart/alternative usage where appropriate.

There are a varied set of different types of transactions that may be conducted between a Green Commerce server and its clients. Each of these is represented as the same MIME type, application/green-commerce, while the transaction type is specified by a content-type parameter, "transaction."

To further facilitate interoperation with non-MIME mail readers, and with MIME-aware mail readers that do not support the application/green-commerce Content-type, a Green Commerce server can provide mail server addresses where all incoming textual mail is treated as having a given variant of the application/green-commerce content-type. For example, text messages directed to the address "response@card.com" are treated as having a content-type of "application/green-commerce; transaction=transfer-response". Such special mailserver features are discussed in Appendix A.

Similarly, certain other features may be provided by a Green Commerce server for convenient use of SGCP protocol features in a non-email setting. These special SGCP-related usages are discussed in Appendix B.

It should be noted that authentication mechanisms are orthogonal to this format. In the future, particular interactions may achieve a higher level of security by requiring, for example, that buyer acknowledgements be signed and encrypted using the Internet standards for digital signature and encryption of MIME data. Aside from the "hook" left by the "Security-Requirements" attribute, such authentication mechanisms are entirely orthogonal to the format described in this memo.

2 Metasyntax

The format of the application/green-commerce data strongly resembles the basic format of Internet mail messages as defined by RFC 822. All data are represented in the form of headers with field names and field bodies, separated by CRLF. Thus

```
FOO: Bar
```

specifies an attribute named "FOO", the value of which is "Bar". Multiline values are permitted, as in RFC 822, with continuation lines beginning with SPACE or TAB characters. In such cases, CRLF and the leading white space of each continuation line are together interpreted as being equivalent to a single space. Thus

```
FOO: Bar
      Baz
```

specifies an attribute named "FOO", the value of which is "Bar Baz". Attribute names are simple case-insensitive words, while values can be arbitrary-length text.

A formal grammar, using the ABNF notation of RFC 822, for the application/green-commerce MIME entity is:

```
fventity = fields *(CRLF *details) ; Everything after
                                   ; first empty line
                                   ; is transaction details

details = *text
```

The above grammar, like other grammatical constructs in this specification, makes reference to several syntactical constructs from RFC 822, which are not reproduced here to avoid any possibility of transcription errors. Note that an entity with ONLY fields (no blank line followed by details) is explicitly permitted by this specification.

A special construct in this specification is the field named "#". Any field with this value is always ignored in application/green-commerce data. This allows the inclusion of comments in the form:

```
#: This is a comment
#: So is this
```

Important Notes:

(1) Green Commerce attribute names are used consistently across all transactions. Thus, for example, the attribute named CURRENCY appears in several transaction types, but always with the same meaning and syntax.

(2) Consistent with RFC 822, the specification of an attribute with no value is the same as the omission of that attribute. Thus an attribute of

```
FOO:
```

is equivalent to not specifying the FOO attribute at all.

2.1 Common Underlying Constructs

The Green Commerce transactions use a variety of attributes. In this section, we present the attributes which are used in various Green Commerce transactions and are therefore shared by several of the transaction types, as well as other underlying syntactic constructs that are used in the definition of multiple attributes.

2.1.1 Currency Values

Money is described by a combination of a numeric value to indicate the quantity of money, and a currency descriptor that names the currency in which the money is denominated. The grammar for currency descriptors is given by "currency-val", and is a coded three character alphabetic code abbreviation as defined by ISO 4217 [5], followed by a human-readable string giving the name of the currency. However, a particular Green Commerce server may not support all or even most currencies defined in ISO 4217. An attempt to use an unsupported currency will generate an error from a Green Commerce server. (A list of currently supported currency values, and other information, can be obtained using the CAPABILITIES-REQUEST transaction.)

```
currency-value = currency-code SPACE currency-name

currency-code = 3ALPHA  ; from ISO 4217

currency-name = 1*20text
```

Currency values are present in several attributes:

CURRENCY -- Specifies the currency in use.

```
currency-val = currency-value
```

PREFERRED-CURRENCY -- Specifies a buyer's preferred currency.

```
preferred-currency-val = currency-value
```

ORIGINAL-CURRENCY -- Specifies the currency in which a transaction originally took place, if currency translation has subsequently occurred.

```
original-currency-val = currency-value
```

2.1.2 Quantities of Money

The quanitity of money to be paid is represented as a floating point number, rounded as necessary for the relevant currency.

```
floatnum = 1*DIGIT ["." 1*DIGIT]
      ; Precision level not guaranteed,
      ; may be currency-dependent
```

Quantities of money are present in several attributes:

AMOUNT -- The amount of the current transaction.

```
amount-val = floatnum
```

ORIGINAL-AMOUNT -- The amount of the current transaction in its original currency, if currency translation has occurred.

```
original-amount-val = floatnum
```

SERVICE-CHARGE -- The amount of money, if any (in the currency specified in CURRENCY) charged by a Green Commerce server for the current transaction.

```
service-charge-val = floatnum
```

2.1.3 Account Identifiers and Names

Account identifiers consist of from 1 to 30 alphanumeric characters, and may contain spaces and punctuation characters which are not significant for comparison purposes. Further, account identifiers are case-insensitive for comparison purposes.

```
account-identifier = 1*30 (*IGN ALNUM) *IGN

ALNUM = ALPHA / DIGIT

IGN = <ASCII values 32-47, 58-64, 91-96, 123-127>
      ; Bascially printable ASCII excluding ALNUM and CTLs
```

Account identifiers are present in several attributes:

ACCOUNT-ID -- The identifier for a green commerce account.

```
account-id-val = account-identifier
```

BUYER -- The value specifies the account identifier for the paying party.

```
buyer-val = account-identifier
```

SELLER -- The value specifies the account identifier for the party to be paid.

```
seller-val = account-identifier
```

Sometimes users are referred to by their names rather than their account ID's:

FULL-NAME -- The full name of the account holder

```
full-name-val = 1*30text
```

BUYER-NAME -- The value specifies the name of the party to be paid, and is used in circumstances where the buyer's ID should not be revealed.

```
buyer-name-val = full-name-val
```

SELLER-NAME -- The value specifies the name of the party to be paid, and is used in circumstances where the seller's ID should not be revealed.

```
seller-name-val = full-name-val
```

2.1.4 Miscellaneous

PREFERRED-LANGUAGE -- A string specifying the natural (human) language in which the user wishes to correspond with the server. Such strings have a 2 letter code, from [3], followed by the English-language name of the language named by that code, e.g. "EN English". When no PREFERRED-LANGUAGE is specified, English will be used. Note also that attribute names and other aspects of the format that can be shielded from the end user's view are always represented in ASCII.

```
preferred-language-val = language-code SPACE language-name

language-code = 2ALPHA  ; from ISO 639

language-name = 1*20text
```

TRANSFER-ID -- The value is a unique identifier, enclosed in angle brackets, specified by the initiator of a transfer, in a TRANSFER-REQUEST, and passed on in subsequent TRANSFER-QUERY and TRANSFER-RESULT transactions. It is limited to 78 characters, but otherwise uses the syntax of Internet mail Message-ID values.

```
transfer-id-val =  <msg-id>   ; From RFC 822, but limited to
                              ; no more than 78 characters.
```

SERVER-ID -- The value is a unique identifier, with the same syntax as TRANSFER-ID, generated by the Green Commerce server, that may be used to correlate the different transactions (notably TRANSFER-QUERY, TRANSFER-RESPONSE, TRANSFER-RESULT, PAYIN-CHARGEBACK-NOTIFICATION, and PAYOUT-CHARGEBACK-NOTIFICATION) involved in a funds transfer.

```
server-id-val =  <msg-id>     ; From RFC 822, but limited to
                              ; no more than 78 characters.
```

BILLING-ID -- A unique identifier generated by the Green Commerce server for use in correlating payin or payout notifications with an external billing statement.

```
billing-id-val = 1*80text
```

SECURITY-REQUIREMENTS -- The value is a list of semicolon-separated strings indicating any extra security requirements that might be imposed on this transaction. The default value is "none", indicating no extra security requirements, and "none" is the only value defined by this memo. (The set of valid values for this attribute is expected to grow over time.) (A list of currently supported security requirements, and other information, can be obtained using the CAPABILITIES-REQUEST transaction.)

```
security-requirements-val = security-val *("; " security-val)

security-val = "none" / atom  ; extensions to be defined later
```

TRANSFER-TYPE -- The value is a case-insensitive string specifying the reason for a funds transfer. This attribute is not used by the Green Commerce server, but is present only to be passed on between the information buyer and seller. For information purchases, the TRANSFER-TYPE should be "info-sale". For charitable donations, the TRANSFER-TYPE should be "donation". If no TRANSFER-TYPE attribute is specified, "info-sale" is assumed.

```
ttype-val = "info-sale" / "donation" /
            "cost-recovery" / "usage-fee" /
            ALPHA *15 (ALPHA / "-")
```

2.1.5 Names in Examples

To understand this protocol, it is necessary to grasp the distinction between an ACCOUNT-ID and a FULL-NAME. The former, although not encrypted, is considered private information, and is used in as few locations as possible.

In the examples in this document, we will use two fictitious accounts. The fictitious buyer has a FULL-NAME of "Joe Internaut" and an ACCOUNT-ID of "Joe is a cool dude". The fictitious seller has a FULL-NAME of "Crazy Rupert's Discount Information Mart" and an ACCOUNT-ID of "CrazyRDIM".

3 The Green Commerce Transaction Types

Each application/green-commerce MIME entity contains exactly one Green Commerce transaction. The transaction type is specified by the "transaction" parameter in the content-type header field. The set of attributes that are included in the MIME entity will vary depending upon the value of the transaction parameter.

In this section, the initial set of Green Commerce transaction types will be listed. For each transaction type, a subsequent section will list the required and optional additional attributes for each transaction type. Although the list of transaction types given here is exhaustive as of the writing of this specification, a conforming implementation should recognize that future revisions to this specification may include new transaction types, and should behave gracefully upon encountering an unrecognized transaction type. (A list of currently supported transaction types, and other information, can be obtained using the CAPABILITIES-REQUEST transaction.)

Since all Green Commerce transactions which are delivered to end users are embedded in a multipart/alternative message with a plain text component, to allow human beings to operate upon their raw text form if necessary, this should be the default treatment of unrecognized transaction types in all programs that automatically process application/green-commerce data. (This will help ensure that specialized software does not make application/green-commerce data HARDER to use than it would be if viewed with a plain text mail tool.) Transaction type names are all to be interpreted in a case-insensitive manner.

3.1 Overview of Green Commerce Transaction Types

These are the different transaction types for application/green-commerce data and their intended uses and directionality:

3.1.1 Transactions relating to Movement of Funds

1. TRANSFER-REQUEST -- Initiates a fund transfer between two account holders. To be RECEIVED by a Green Commerce server.

2. TRANSFER-QUERY -- Query the paying party to verify a fund transfer requested by a TRANSFER-REQUEST transaction. To be SENT by a Green Commerce server.

3. TRANSFER-RESPONSE -- The paying party's response to a TRANSFER-QUERY transaction. To be RECEIVED by a Green Commerce server.

4. TRANSFER-RESULT -- The acknowledgement to the party receiving payment informing that party of the buyer's response. To be SENT by a Green Commerce server.

5. PAYIN-NOTIFICATION -- The notification to the paying party that an actual charge has been posted to the underlying payment engine. To be SENT by a Green Commerce server.

6. PAYOUT-NOTIFICATION -- The notification to an account holder that a credit has been posted to the underlying payment engine. To be SENT by a Green Commerce server.

7. PAYIN-CHARGEBACK-NOTIFICATION -- A report to the paying party in a previous transfer, indicating that a chargeback has been received from the underlying payment engine, and detailing its consequences. To be SENT by a Green Commerce server.

8. PAYOUT-CHARGEBACK-NOTIFICATION -- A report to the party receiving payment in a previous transfer, indicating that a chargeback has been received from the underlying payment engine, and detailing its consequences. To be SENT by a Green Commerce server.

9. PAYIN-FAILURE-NOTIFICATION -- A report to the paying party in a funds transfer, indicating that the underlying payment engine has declined to issue payment. To be SENT by a Green Commerce Server.

10. COLLECTION-FAILURE-NOTIFICATION -- A report to the party receiving payment in a funds transfer, indicating that the underlying payment engine has declined to issue payment. To be SENT by a Green Commerce Server.

3.1.2 Inquiries

1. INQUIRY-REQUEST -- An inquiry into whether or not a given account identifier is valid. To be RECEIVED by a Green Commerce server.

2. INQUIRY-RESULT -- A response to an INQUIRY-REQUEST transaction. To be SENT by a Green Commerce server.

3. HISTORY-REQUEST -- A requst from an accountholder for a digest of all recent transactions on his or her account. To be RECEIVED by a Green Commerce server.

4. STATUS-REQUEST -- A request for information about a transaction submitted in a previous TRANSFER-REQUEST. To be RECEIVED by a Green Commerce server.

5. STATUS-RESULT -- A response to a STATUS-REQUEST transaction. To be SENT by a Green Commerce server.

3.1.3 Account Creation and Maintenance

1. APPLICATION-REQUEST -- Requests an account application. To be RECEIVED by a Green Commerce server.

2. APPLICATION-RESULT -- Invites a user to open an account. To be SENT by a Green Commerce server.

3. NEWACCT-REQUEST -- An application to open an account. To be RECEIVED by a Green Commerce server.

4. NEWACCT-RESULT -- Informs the user of the status of his application to open an account. To be SENT by a Green Commerce server.

5. INITCHG-REQUEST -- Requests a form to be used in changing some aspect of an existing account. To be RECEIVED by a Green Commerce server.

6. INITCHG-RESULT -- Invites a user to change some aspect of an existing account. To be SENT by a Green Commerce server.

7. CHGACCT-REQUEST -- A request to change some aspect of an existing account. To be RECEIVED by a Green Commerce server.

8. CHGACCT-QUERY -- Query the accountholder to verify an account change requested by a CHGACCT-REQUEST transaction. To be SENT by a Green Commerce server.

9. CHGACCT-RESPONSE -- The accountholder's response to a CHGACCT-QUERY transaction. To be RECEIVED by a Green Commerce server.

10. CHGACCT-RESULT -- The acknowledgement to the accountholder informing him or her of the status of the requested changed. To be SENT by a Green Commerce server.

3.1.4 Miscellany

1. CAPABILITIES-REQUEST -- Request a list of current operational parameters from a Green Commerce server. To be RECEIVED by a Green Commerce server.

2. CAPABILITIES-RESULT -- Describe the current operational parameters of a Green Commerce server. To be SENT by a Green Commerce server.

3. ERROR-REPORT -- Describes an error in a Green Commerce transaction. To be SENT by a Green Commerce server.

The required and optional attributes for each of these transactions types are detailed in the subsequent sections.

3.2 Transactions relating to Movement of Funds

3.2.1 Transfer-request

A fund transfer between two accounts is initiated by a TRANSFER-REQUEST transaction, delivered (either via email or SGCP) as a MIME entity with a content-type of "application/green-commerce; transaction=transfer-request".

The following are the **required** attributes for TRANSFER-REQUEST transactions:

BUYER -- As previously specified.

SELLER -- As previously specified.

AMOUNT -- As previously specified.

CURRENCY -- As previously specified.

DESCRIPTION -- A textual explanation of the reason the transfer is taking place, to appear on billing notifications and other statements. The string is limited to 40 ASCII characters.

```
description-val = 1*40text
```

The following are the **optional** attributes for TRANSFER-REQUEST transactions:

TRANSFER-TYPE -- As previously specified.

TRANSFER-ID -- As previously specified. The identifier will be used in subsequent TRANSFER-QUERY and TRANSFER-RESULT transactions. If no TRANSFER-ID attribute is specified in the TRANSFER-REQUEST, none will be included in the subsequent TRANSFER-QUERY and TRANSFER-RESULT.

SECURITY-REQUIREMENTS -- As previously specified.

DELIVERY-STATUS -- A string that indicates whether or not the item being purchased has actually been delivered to the accountholder. Initially defined values are "delivered" and "pending". This attribute is not used by the Green Commerce server, but is present only to be passed on to the information buyer in the TRANSFER-QUERY transaction. If it is not present, a value of "delivered" is assumed by default.

```
delivery-status-val = "delivered" / "pending" / "not-applicable"
                        / ALPHA *15(ALPHA / "-")
```

NOTIFICATION-CC -- An Internet email address to which a carbon copy of the ultimate transfer-result corresponding to this request will be sent.

```
notification-cc-val = addr-spec ; from RFC 822, maximum 78 chars
```

PAYMENT-EXPECTED -- The case-insensitive string "yes" or "no", to indicate whether or not the SELLER expects that payment will be made. If this attribute is absent, "yes" is assumed. The "no" value may be used when the seller is explicitly sending out information on a "pay-if-you-like-it" basis, with no obligation implied. The only functional difference in this situation is that if the BUYER chooses not to pay, the Green Commerce server will not count this transaction against the BUYER's allotment of rejected transactions.

```
payment-expected-val = "YES" / "NO" ; case-insensitive
```

DAYS-TO-TIMEOUT -- The number of days to wait for an answer from the buyer before the transaction times out and is treated as a "no". By default, this is 20 days, but a smaller value may be specified.

```
days-to-timeout-val = 1*2DIGIT      ; must be in range 1-20
```

The **details** section of TRANSFER-REQUEST transactions, if present, should contain informative text that is to be shown to the user as part of the TRANSFER-QUERY.

For example, the following MIME entity describes a request to transfer $19.99 from the account of "Joe Internaut" to the account of "CrazyRDIM", the account-id for "Crazy Rupert's Discount Information Mart". This example uses the default value for TRANSFER-TYPE. Note that no special attention is given to human readability in this transaction, since TRANSFER-REQUEST transactions are not directed to human beings, but only to the Green Commerce server.

```
Content-type: application/green-commerce;
      transaction=transfer-request

BUYER: Joe Is a cool dude
SELLER: CrazyRDIM
AMOUNT: 19.99
CURRENCY: USD US Dollars
TRANSFER-ID: <CRDIM424242@somewhere.com>
SECURITY-REQUIREMENTS: None
DESCRIPTION: Purchase of slightly-used stock quotes

We gave you lots of useful stock quotes and tips that may
have helped you in your investments, and it isn’t our fault
if a grand jury is interested in you!
```

3.2.2 Transfer-query

When a Green Commerce server receives a TRANSFER-REQUEST transaction, the buyer must be asked to confirm that the charge is legitimate. This is accomplished by generating an email message to the buyer with a content-type of "application/green-commerce; transaction=transfer-query".

The following are the **required** attributes for TRANSFER-QUERY transactions:

BUYER-NAME -- As previously specified. The FULL-NAME attribute corresponding to the BUYER attribute in the corresponding transfer-request.

SELLER-NAME -- As previously specified. The FULL-NAME attribute corresponding to the SELLER attribute in the corresponding transfer-request.

AMOUNT -- As previously specified, translated into the buyer’s currency if necessary.

TRANSFER-TYPE -- As previously specified. The same value specified in the corresponding TRANSFER-REQUEST transaction. If none was specified, the value will be specified in the TRANSFER-QUERY transaction as "info-sale".

CURRENCY -- As previously specified. However, currency translation may have occurred. In the TRANSFER-QUERY transaction, the preferred currency of the buyer is always used.

SERVER-ID -- As previously specified, generated by the Green Commerce Server for this transaction.

DESCRIPTION -- As previously specified, the same value as given in the corresponding TRANSFER-REQUEST transaction.

NOTICE-NUMBER -- A numeric value specifying how many times the server has sent this particular TRANSFER-QUERY. (Thus, "Notice-Number: 3" is used for a third notice.)

```
notice-number-val = 1*DIGIT
```

The following are the **optional** attributes for TRANSFER-QUERY transactions:

TRANSFER-ID -- As previously specified. The same value specified in the corresponding TRANSFER-REQUEST transaction, if one was specified.

ORIGINAL-CURRENCY -- As previously specified.

ORIGINAL-AMOUNT -- As previously specified.

DELIVERY-STATUS -- As previously specified.

DAYS-TO-TIMEOUT -- As previously specified.

PAYMENT-EXPECTED -- As previously specified. If present and set to "No", this indicates that declining to pay will have no negative consequences for the buyer.

The **details** section of TRANSFER-QUERY transactions, if present, is simply text to be shown to the recipient with no automatic processing. Typically, this text is copied from the details section of the TRANSFER-REQUEST. In order to make it clear that this text does not come from the Green Commerce server, it is recommended to prefix it with a statement to that effect.

For example, the following MIME entity describes the payment query corresponding to the fund transfer initiated by the previous example. Note that special attention is given to human readability for users without specialized Green Commerce software.

```
Reply-to: response@card.com
Subject: <ABCDEFG1234567@card.com> -- Please Confirm
Content-type: multipart/alternative; boundary=fv42

--fv42

Transaction:  Purchase of slightly used stock quotes
Cost: US $19.99
SELLER-NAME: Crazy Rupert’s Discount Information Mart

Crazy Rupert’s Discount Information Mart has requested
that you (Joe  Internaut) should be charged $19.99 for
"Purchase of slightly used  stock quotes".  Please respond
to this message by using the reply command of your mail
system, making sure to preserve the special code in the
Subject field.  The body of your reply message needs to
contain only one word: "Yes" will authorize this fund
transfer, "No" will disallow this fund transfer according
to the terms of your agreement as our customer, and
```

```
"Fraud" will report that you did not initiate this
transaction and therefore suspect that someone is abusing
your account.  (Claiming fraud will freeze all use of your
account until further notice.)

Please ignore anything that appears below this line.
--fv42
Content-type: application/green-commerce;
      transaction=transfer-query

SERVER-ID: <ABCDEFG1234567@card.com>
BUYER-NAME: Joe Internaut
SELLER-NAME: Crazy Rupert's Discount Information Mart
AMOUNT: 19.99
TRANSFER-TYPE: info-sale
CURRENCY: USD US Dollars
DESCRIPTION: Purchase of slightly-used stock quotes

This message was provided by the transaction's originator:

We gave you lots of useful stock quotes and tips that may
have helped you in your investments, and it isn't our fault
if a grand jury is interested in you!

--fv42--
```

3.2.3 Transfer-response

In order for a fund transfer to be effected, the paying party must respond to the TRANSFER-QUERY transaction with a TRANSFER-RESPONSE transaction directed back to a Green Commerce server. Such a transaction should have a content-type of "application/green-commerce; transaction=transfer-response", deliverable either as email or via SGCP.

The following are the **required** attributes for TRANSFER-RESPONSE transactions:

SERVER-ID -- As previously specified. The same value specified in the corresponding TRANSFER-QUERY transaction.

AUTHORIZATION -- The value is an alphabetic string describing the paying party's response to the proposed fund transfer. The three valid (case-insensitive) values are "yes", which indicates that the buyer accepts responsibility for payment, "no", which means that the buyer does not wish to make payment, even though he or she may have initiated the transaction, and "fraud", which indicates that the transaction is unexpected by the buyer and may indicate fraudulent use of the account.

```
auth-val = "YES" / "NO" / "FRAUD" ; case-insensitive
```

There are no **optional** attributes for TRANSFER-RESPONSE transactions.

The **details** of TRANSFER-RESPONSE transactions are not used.

For example, the following MIME entity describes a positive response to Joe Internaut's information purchase in the earlier example:

```
Content-type: application/green-commerce;
      transaction=transfer-response

SERVER-ID: <ABCDEFG1234567@card.com>
AUTHORIZATION: Yes
```

3.2.4 Transfer-result

When a Green Commerce server has received a TRANSFER-RESPONSE transaction, the party named in that transaction as the seller will be informed of the buyer's response. This is accomplished by generating an email message to the seller with a content-type of "application/green-commerce; transaction=transfer-result".

The following are the **required** attributes for TRANSFER-RESULT transactions:

BUYER-NAME -- As previously specified.

SELLER-NAME -- As previously specified.

AMOUNT -- As previously specified.

TRANSFER-TYPE -- As previously specified.

CURRENCY -- As previously specified. Note that this is not necessarily the same currency as originally specified in the TRANSFER-REQUEST transaction. If they are different, then the ORIGINAL-CURRENCY and ORIGINAL-AMOUNT attributes are also required.

SERVER-ID -- As previously specified. The same value specified in the corresponding TRANSFER-QUERY transaction.

AUTHORIZATION-RESULT -- The same value specified as AUTHORIZATION in the corresponding TRANSFER-RESPONSE transaction. Note that if the AUTHORIZATION is "fraud", a Green Commerce server may choose not to issue a TRANSFER-RESULT transaction. If no TRANSFER-RESULT is received after sufficient time has passed, a TRANSFER-RESULT may be issued with an AUTHORIZATION-RESULT of "timeout". A timeout is effectively the same as a "No" authorization, but might be handled differently by certain sellers. Finally, if the Green Commerce server believes that the transfer-request is in fact a duplicate of another recent transfer-request, it will return an AUTHORIZATION-RESULT of "duplicate" without querying the BUYER.

```
auth-result-val = auth-val / "duplicate"
      / "timeout" ; case-insensitive
```

DESCRIPTION -- As previously specified, the same value as given in the corresponding TRANSFER-REQUEST transaction.

The following are the **optional** attributes for TRANSFER-RESULT transactions:

TRANSFER-ID -- As previously specified. The same value specified in the corresponding TRANSFER-REQUEST transaction.

ORIGINAL-CURRENCY -- As previously specified.

ORIGINAL-AMOUNT -- As previously specified.

The **details** section of TRANSFER-RESULT transactions is not used.

For example, the following MIME entity informs Crazy Rupert that Joe Internaut has authorized the fund transfer. Note that special attention is given to human readability for users without specialized Green Commerce software.

```
Content-type: multipart/alternative; boundary=fv43
Subject: <ABCDEFG1234567@card.com> -- Purchase confirmed

--fv43

Transaction:  Purchase of slightly used stock quotes
Cost: US $19.99
BUYER-NAME: Joe Internaut

Joe Internaut has authorized the transfer of $19.99 to your
First Virtual account.

For Terms and Conditions of this account, please send
email to fineprint@fv.com.

Please ignore anything that appears below this line.
--fv43
Content-type: application/green-commerce; transaction=transfer-
result

TRANSFER-ID: <CRDIM424242@somewhere.com>
SERVER-ID: <ABCDEFG1234567@card.com>
AUTHORIZATION-RESULT: Yes
BUYER-NAME: Joe Internaut
SELLER-NAME: Crazy Rupert’s Discount Information Mart
AMOUNT: 19.99
TRANSFER-TYPE: info sale
```

```
CURRENCY: USD US Dollars
DESCRIPTION: Purchase of slightly-used stock quotes

--fv43--
```

3.2.5 Payin-notification

The translation of Green Commerce transactions into real world financial transactions is at the discretion of the Green Commerce service provider, and will not generally come in a one-to-one correspondence at the transaction level. When a Green Commerce server posts a charge into such an external payment vehicle, it will notify the paying party with a PAYIN-NOTIFICATION transaction. Such a transaction will have a content-type of "application/green-commerce; transaction=payin-notification", and will be delivered via email to the paying party.

The following are the **required** attributes for PAYIN-NOTIFICATION transactions:

BUYER-NAME -- As previously specified.

AMOUNT -- As previously specified. The amount of money charged to the external payment mechanism.

CURRENCY -- As previously specified. Indicates the currency in which the charge was generated.

BILLING-ID -- As previously specified.

TRANSACTION-DETAILS -- A data structure describing all previous transactions that are subsumed under this billing transaction.

```
transaction-details-val = transaction-record
                         *["," transaction-record]

transaction-record =    server-id-val
```

Note that software handling application/green-commerce data can only offer structured explanations of the transaction details if it has stored that information in its database when the transactions took place, to be retreived by the server-id-val. A "stateless" implementation might also show the textual explanation from the details section.

The following are the **optional** attributes for PAYIN-NOTIFICATION transactions:

SERVICE-CHARGE -- As previously specified. Indicates any service charge from the Green Commerce server for the external billing transaction.

The **details** section of PAYIN-NOTIFICATION transactions should include a human-readable textual description of the transactions subsumed under this billing transaction.

For example, the transaction in the previous examples might be included in a PAYIN-NOTIFICATION transaction such as:

```
Content-type: multipart/alternative; boundary=fv44
Subject: Information charged to your credit card

--fv44

This is to inform you that we have issued a charge of
$38.97 to the credit card account you have registered
for payment of your account.  This charge covers the
following transactions:

$19.99 -- Crazy Rupert’s Discount Information Mart
      "Purchase of slightly used stock quotes"
$3.99 -- Big Al’s Poetry Mart
      "Shall I compare thee to a pizza?" by A.Spire Ingpoet
$9.99 -- Voluptuous Valerie’s Virtual Vixens
      "A Customized Personal Email Experience"
$5.00 -- American Halitosis Foundation
      "Dedicated to curing bad breath in our lifetime"

This may be described via your billing mechanism as:
"Internet Information #XYZ123, $38.97"

Please ignore anything that appears below this line.
--fv44
Content-type: application/green-commerce;
      transaction=payin-notification

BUYER-NAME:Joe Internaut
AMOUNT: 38.97
CURRENCY: USD US Dollars
BILLING-ID: XYZ123
TRANSACTION-DETAILS: <ABCDEFG1234567@card.com>, <ADC42@foo.com>,
      <XYZ23ac@card.com>, <ACLKJ987@card.com>

$19.99 -- Crazy Rupert’s Discount Information Mart
      "Purchase of slightly used stock quotes"
$3.99 -- Big Al’s Poetry Mart
      "Shall I compare thee to a pizza?" by A.Spire Ingpoet
$9.99 -- Voluptuous Valerie’s Virtual Vixens
      "A Customized Personal Email Experience"
$5.00 -- American Halitosis Foundation
      "Dedicated to curing bad breath in our lifetime"
--fv44--
```

3.2.6 Payout-notification

When payment is received from a underlying payment mechanism on behalf of a buyer, a credit will be issued to the external payment mechanism associated with the seller’s account using a PAYOUT-NOTIFICATION transaction. Such a transaction will have a content-type of "application/green-commerce; transaction=payout-notification", and will be delivered via email to the party recieving the payment.

The following are the **required** attributes for PAYOUT-NOTIFICATION transactions:

SELLER-NAME -- As previously specified.

AMOUNT -- As previously specified. The total amount of money being paid via the external mechanism

CURRENCY -- As previously specified. Indicates the currency in which the charge was generated.

BILLING-ID -- As previously specified.

TRANSACTION-DETAILS -- As previously specified.

The following are the **optional** attributes for PAYOUT-NOTIFICATION transactions:

SERVICE-CHARGE -- As previously specified. Specifies the amount of money, if any (in the same currency specified in CURRENCY) charged by a Green Commerce server for the external transaction.

The **details** section of PAYOUT-NOTIFICATION transactions should include a human-readable textual description of the transactions subsumed under this billing transaction.

For example, in the earlier examples, Crazy Rupert would be happy to receive the following PAYOUT-NOTIFICATION:

```
Content-type: multipart/alternative; boundary=fv00

--fv00

This is to inform you that we have issued a payment of
US $84.96 to the bank account that you registered with
your account.  This reflects balances credit to your account
in previously-detailed transactions.

No service charge is being required for this fund transfer.

Please ignore anything that appears below this line.
-fv00
Content-type: application/green-commerce;
      transaction=payout-notification

SELLER-NAME: Crazy Rupert’s Discount Information Mart
AMOUNT: 84.96
```

```
CURRENCY: USD US Dollars
BILLING-ID: XYZ123@foo.edu
SERVICE-CHARGE: 0
TRANSACTION-DETAILS: <ABCDEFG1234567@card.com>, <ADC42@foo.com>,
      <XYZ23ac@card.com>, <ACLKJ987@card.com>

$19.99 -- Joe Internaut
      "Purchase of slightly used stock quotes"
$29.99 -- Jane Internaut
      "Purchase of slightly used stock quotes"
$19.99 -- Jeremy Internaut
      "Purchase of slightly used stock quotes"
$14.99 -- Julia Internaut
      "Purchase of slightly used stock quotes"

-fv00--
```

3.2.7 Payin-chargeback-notification

From time to time, the underlying payment engine may generate a chargeback, in which for one reason or another a charge has to be "undone". The Green Commerce server will "unwind" any such payments all the way back to both parties to the original transaction. The original paying party, who will be credited with the amount previously paid, is notified of this fact with a PAYIN-CHARGEBACK-NOTIFICATION transaction, delivered as an email message of type "application/green-commerce; transaction=payin-chargeback-notification".

Because of the exceptional nature of such events, most details of the chargeback and its consequences for the user’s account are provided textually. Software that automatically processes application/green-commerce MIME entities should take care to present all such textual information to the human reader.

The following are the **required** attributes for PAYIN-CHARGEBACK-NOTIFICATION transactions:

TRANSACTION-DETAILS -- As previously specified. The collected values specified in the corresponding TRANSFER-QUERY transactions.

AMOUNT -- As previously specified.

CURRENCY -- As previously specified. The currency in which the credit is computed.

NEGATIVE-CONSEQUENCES -- A binary value indicating whether or not the current chargeback will have negative consequences for the account in use.

```
negative-consequences = "yes" / "no"      ; case-insensitive
```

There are **no optional** attributes for PAYIN-CHARGEBACK-NOTIFICATION transactions.

The **details** section of PAYIN-CHARGEBACK-NOTIFICATION transactions describes the reason for the chargeback, its consequences for the accountholder, and what further steps the accountholder might wish to take.

For example, the following MIME entity describes the result of a credit card chargeback of Joe Internaut's information purchase in the earlier example:

```
Reply-to: deadbeats@card.com
Content-type: multipart/alternative; boundary=fv25

--fv25

$19.99 -- Crazy Rupert's Discount Information Mart
      "Purchase of slightly used stock quotes"

The above charge was authorized on your account, but then
refused upon receipt of your credit card bill. The account
transaction has been fully reversed, but your account has
been suspended until further notice.  If you believe that
there is a misunderstanding or error, please explain it in
email to "deadbeats@card.com".

Please ignore anything that appears below this line.
--fv25
Content-type: application/green-commerce;
      transaction=payin-chargeback-notification

TRANSACTION-DETAILS: <ABCDEFG1234567@card.com>
AMOUNT: 19.99
CURRENCY: USD US Dollars
NEGATIVE-CONSEQUENCES: Yes

$19.99 -- Crazy Rupert's Discount Information Mart
      "Purchase of slightly used stock quotes"

The above charge was authorized on your account, but then
refused upon receipt of your credit card bill. The
transaction has been fully reversed, but your account has
been suspended until further notice.  If you believe that
there is a misunderstanding or error, please explain it in
email to "deadbeats@card.com".
--fv25--
```

3.2.8 Payout-chargeback-notification

In a chargeback situation, both the buyer and seller must be notified. The party that received payment is informed that the payment is being "undone" via a PAYOUT-CHARGEBACK-NOTIFICATION transaction, delivered as an email message of type "application/green-commerce; transaction=payout-chargeback-notification". It is very similar in form to a PAYIN-CHARGEBACK-NOTIFICATION transaction.

The following are the **required** attributes for PAYOUT-CHARGEBACK-NOTIFICATION transactions:

SERVER-ID -- As previously specified. Note that one PAYOUT-CHARGEBACK-NOTIFICATION is generated for each transaction that was collected into the corresponding PAYIN-NOTIFICATION.

AMOUNT -- As previously specified. Note that this is only that portion of the original payment price that had actually already been credited to the seller's account.

CURRENCY -- The currency in which the charge is computed.

There are **no optional** attributes for PAYOUT-CHARGEBACK-NOTIFICATION transactions.

The **details** section of PAYOUT-CHARGEBACK-NOTIFICATION transactions describes the reason for the chargeback, and might include information on additional steps that the seller might take to try to obtain the funds.

For example, the following MIME entity tells the seller about the chargeback in the previous example:

```
Content-type: multipart/alternative; boundary=fv50

--fv50

$19.99 -- Joe Internaut
      "Purchase of slightly used stock quotes"

The above charge was authorized by the holder of the named
First Virtual  account, but payment was later refused or
retracted. Because $10.00 of the funds in question had
already been credited to your account, that amount must
now be debited from your account.

The accountholder in question has been taken into custody
by Interpol in Lichtenstein, and is now awaiting extradition.

Your account has been automatically registered as a
creditor in the legal proceedings against Joe Internaut.
If money is obtained through those proceedings, your
account will be credited automatically.

Please ignore anything that appears below this line.
--fv50
Content-type: application/green-commerce;
      transaction=payout-chargeback-notification

SERVER-ID: <ABCDEFG1234567@card.com>
```

```
AMOUNT: 19.99
CURRENCY: USD US Dollars

$19.99 -- Joe Internaut
      "Purchase of slightly used stock quotes"

The above charge was authorized by the holder of the named
First Virtual account, but payment was later refused or
retracted. Because $10.00 of the funds in question had
already been credited to your account, that amount must
now be debited from your account.

The accountholder in question has been taken into custody
by Interpol in Lichtenstein, and is now awaiting extradition.

Your account has been automatically registered as a
creditor in the legal proceedings against Joe Internaut.
If money is obtained through those proceedings, your
account will be credited automatically.
--fv50--
```

3.2.9 Payin-failure-notification

From time to time, the underlying payment engine may refuse to post a charge. In such a case, the buyer is notified of this fact with a PAYIN-FAILURE-NOTIFICATION transaction, delivered as an email message of type "application/green-commerce; transaction=payin-failure-notification".

The following are the **required** attributes for PAYIN-FAILURE-NOTIFICATION transactions:

TRANSACTION-DETAILS -- As previously specified. The collected values specified in the corresponding TRANSFER-QUERY transactions.

AMOUNT -- As previously specified.

CURRENCY -- As previously specified.

NEGATIVE-CONSEQUENCES -- As previously specified.

There are **no optional** attributes for PAYIN-FILAURE-NOTIFICATION transactions.

The **details** section of PAYIN-FAILURE-NOTIFICATION transactions describes the reason for the payment failure, its consequences for the accountholder, and what further steps the accountholder might wish to take.

For example, the following MIME entity describes the result of a credit card failure of Joe Internaut’s information purchase in the earlier example:

```
Reply-to: deadbeats@card.com
Content-type: multipart/alternative; boundary=fv25

--fv25

$19.99 -- Crazy Rupert's Discount Information Mart
      "Purchase of slightly used stock quotes"

The above charge was authorized on your account, but the
credit card that funds your account is over its credit
limit.  Your account has been suspended until further
notice.  If you believe that there is a misunderstanding
or error, please explain it in email to
"deadbeats@card.com".

Please ignore anything that appears below this line.
--fv25
Content-type: application/green-commerce;
      transaction=payin-failure-notification

TRANSACTION-DETAILS: <ABCDEFG1234567@card.com>
AMOUNT: 19.99
CURRENCY: USD US Dollars
NEGATIVE-CONSEQUENCES: Yes

$19.99 -- Crazy Rupert's Discount Information Mart
      "Purchase of slightly used stock quotes"

This charge was authorized on your account, but the
credit card that funds your account is over its credit
limit.  Your account has been suspended until further
notice.  If you believe that there is a misunderstanding
or error, please explain it in email to
"deadbeats@card.com".
--fv25--
```

3.2.10 Collection-failure-notification

In the event of a failure to collect from the buyer's underlying payment mechanism, both the buyer and seller must be notified. The party that was to receive payment is informed that the payment was never collected via a COLLECTION-FAILURE-NOTIFICATION transaction, delivered as an email message of type "application/green-commerce; transaction=collection-failure-notification". It is very similar in form to a PAYIN-FAILURE-NOTIFICATION transaction.

The following are the **required** attributes for COLLECTION-FAILURE-NOTIFICATION transactions:

SERVER-ID -- As previously specified. Note that one COLLECTION-FAILURE-NOTIFICATION is generated for each transaction that was collected into the corresponding PAYIN-NOTIFICATION.

AMOUNT -- As previously specified.

CURRENCY -- As previously specified.

There are **no optional** attributes for COLLECTION-FAILURE-NOTIFICATION transactions.

The **details** section of COLLECTION-FAILURE-NOTIFICATION transactions describes the reason for the collection failure, and might include information on additional steps that the seller might take to try to obtain the funds.

For example, the following MIME entity tells the seller about the collection failure in the previous example:

```
Content-type: multipart/alternative; boundary=fv50

--fv50

$19.99 -- Joe Internaut
      "Purchase of slightly used stock quotes"

The above charge was authorized by the holder of the named
First Virtual account, but the underlying payment
mechanism failed to deliver the funds required, so you
have not paid.

Please ignore anything that appears below this line.
--fv50
Content-type: application/green-commerce;
      transaction=collection-failure-notification

SERVER-ID: <ABCDEFG1234567@card.com>
AMOUNT: 19.99
CURRENCY: USD US Dollars

$19.99 -- Joe Internaut
      "Purchase of slightly used stock quotes"

This charge was authorized by the holder of the named
First Virtual account, but the underlying payment
mechanism failed to deliver the funds required, so you
have not been paid.
--fv50--
```

3.3 Inquiries

3.3.1 Inquiry-request

When an information vendor, a donor, or anyone else is presented with an account identifier, they may wish to query a Green Commerce server regarding the account’s status. A report on the account’s status does not guarantee payment, but does provide a defense against fraudulent use of non-existent or previously-compromised accounts. The query is made by generating mail to a Green Commerce server with a content-type of "application/green-commerce; transaction=inquiry-request", or by delivering a MIME entity of this type via SGCP.

The following are the **required** attributes for INQUIRY-REQUEST transactions:

ACCOUNT-ID -- The value specifies the account identifier being inquired about.

```
account-id = account-identifier
```

The following are the **optional** attributes for INQUIRY-REQUEST transactions:

PREFERRED-LANGUAGE -- As previously specified. Denotes the language to be used, if possible, for the subsequent INQUIRY-RESULT transaction.

The **details** section of INQUIRY-REQUEST transactions is not used.

For example, the following MIME entity describes an inquiry into the status of the account "Joe Internaut".

```
Content-type: application/green-commerce;
      transaction=inquiry-request

ACCOUNT-ID: Joe Internaut
```

Note that the above example is the form that might be generated by special software that is aware of the Green Commerce protocols. The following example shows a message that will have the equivalent effect if delivered to the"inquiry@card.com" address:

```
To: inquiry@card.com
Subject: Joe Internaut
```

3.3.2 Inquiry-result

When a Green Commerce server has received an INQUIRY-REQUEST transaction, a status report on that account will be provided to the party asking the question. (This will be done using the From or Reply-To headers in the case of email, or as a direct response using the SGCP protocol.) The report is presented as a MIME entity with a content-type of "application/green-commerce; transaction=inquiry-result".

The following are the **required** attributes for INQUIRY-RESULT transactions:

ACCOUNT-ID -- The same value specified in the corresponding INQUIRY-REQUEST transaction.

ACCOUNT-STATUS -- A string that reports the current status of the given account.

```
account-status = "active" / "invalid"
               / "suspended" / "seller-only"
```

The meaning of the ACCOUNT-STATUS attribute refers only to the current status of the account, and offers no guarantees of future payment. A status of "active" indicates that the account-id describes a currently-valid account. A status of "invalid" indicates that the specified account identifier is invalid, either because no such account exists or because the account's privileges have been revoked by a Green Commerce server. A status of "suspended" indicates an account that may be good, but is temporarily suspended by a Green Commerce server. Such a suspension does not necessarily indicate bad credit or other problems, but may happen if a accountholder is unresponsive for an extended period of time or number of transactions. Thus, for example, a perfectly good account may be suspended and unusable until the accountholder returns from an extended vacation and replies to the messages already pending. Finally, a status of "seller-only" indicates that the account is valid for sales but not for purchases.

The following are the **optional** attributes for INQUIRY-RESULT transactions:

LAST-CHANGE -- The date and time at which the account last changed in a significant way (demographic or financial information).

```
last-change-val = date-time ; from rfc 822
```

PREFERRED-CURRENCY -- As previously specified. Tells the inquiring party the preferred currency of the accountholder in question.

FULL-NAME -- As previously specified.

The **details** section of INQUIRY-RESULT transactions is not used.

For example, the following MIME entity reports on the status of Joe Internaut's account, indicating that it is a valid account. Note that special attention is given to human readability for users without specialized Green Commerce software.

```
Content-type: multipart/alternative; boundary=fv13

--fv13

You have inquired into the account named "Joe Internaut".
As of this writing, the account is active.

For Terms and Conditions of this account, please send
email to fineprint@fv.com.

Please ignore anything that appears below this line.
--fv13
Content-type: application/green-commerce; transaction=inquiry-
result
```

```
ACCOUNT-ID: Joe Internaut
ACCOUNT-STATUS: Active
PREFERRED-CURRENCY: USD US Dollars
--fv13--
```

3.3.3 History-request

When a Green Commerce account holder wishes to receive a history of all recent transactions on his account, he may send a HISTORY-REQUEST transaction to a Green Commerce server.

The following are the **required** attributes for HISTORY-REQUEST transactions:

ACCOUNT-ID -- As previously specified.

The following are the **optional** attributes for HISTORY-REQUEST transactions:

HISTORY-ID -- A unique identifier for this HISTORY-REQUEST transaction.

```
history-id-val = account-identifier
```

PREFERRED-LANGUAGE -- As previously specified.

The **details** section of HISTORY-REQUEST transactions is not used.

There is no corresponding history-response transaction. The reply is a collection of all relevant messages (-notification and -result messages) collected in a MIME multipart/digest or some other appropriate format and sent to the email-address associated with the account. (Note that the response is NOT sent to the originator of the request, for privacy reasons.)

3.3.4 Status-request

When a Green Commerce account holder wishes to receive a report on the status of a transaction submitted in a previous TRANSFER-REQUEST, he may send a STATUS-REQUEST transaction to a Green Commerce server. This is presented as a MIME entity with a content-type of "application/green-commerce; transaction=status-request".

The following are the **required** attributes for STATUS-REQUEST transactions:

TRANSFER-ID -- As previously specified.

The following are the **optional** attributes for STATUS-REQUEST transactions:

PREFERRED-LANGUAGE -- As previously specified.

The **details** section of STATUS-REQUEST transactions is not used.

3.3.5 Status-result

When a Green Commerce server has received a STATUS-REQUEST transaction, a status report on that transaction will be provided to the party asking the question. (This will be done using the From or Reply-To headers in the case of email, or as a direct response using the SGCP protocol.) The report is presented as a MIME entity with a content-type of "application/green-commerce; transaction=status-result".

The following are the **required** attributes for STATUS-RESULT transactions:

TRANSFER-ID -- As previously specified.

TRANSFER-STATUS -- A single word indicating the current statue of the transaction. If this is "transfer-query", it indicates that the server is still awaiting a response from a transfer-query. If it is "transfer-result", this indicates that the query has been answered and a transfer-result has already been issued.

```
transfer-status-val = "transfer-query" / "transfer-result"
```

There are no **optional** attributes for STATUS-RESULT transactions.

The **details** section of STATUS-RESULT transactions, if present, contains the entire MIME entity representing the appropriate TRANSFER-RESULT transaction.

Note that, for security reasons, the Green Commerce server will not disclose the server-id in a status-result when the status "transfer-query", nor will settlement events (payin or payout) ever be disclosed in this transaction.

3.4 Account Creation and Maintenance

3.4.1 Application-request

When anyone with the ability to send and receive Internet mail wishes to open a new account, he or she may do so by generating mail to a Green Commerce server with a content-type of "application/green-commerce; transaction=application-request", or by delivering a MIME entity of this type via SGCP.

The effect of a Green Commerce server’s receiving a APPLICATION-REQUEST transaction is the generation of a corresponding APPLICATION-RESULT transaction from a Green Commerce server to the applying party.

There are no **required** attributes for APPLICATION-REQUEST transactions.

The following are the **optional** attributes for APPLICATION-REQUEST transactions:

PREFERRED-LANGUAGE -- As previously specified. Denotes the language to be used, if possible, for the subsequent APPLICATION-RESULT transaction.

For example, the following MIME entity, however it is received by a Green Commerce server, will cause an application to be sent to Joe Internaut <Joe@mythical.com>:

```
From: Joe Internaut <Joe@mythical.com>
Content-type:  application/green-commerce;
      transaction=application-request

Preferred-language: EN English
```

3.4.2 Application-result

A user is invited to open an account by sending him an APPLICATION-RESULT transaction, a MIME entity of content-type "application/green-commerce; transaction=application-result", which is in essence an application form. The user's response to this (the filled-in application) will be a NEWACCT-REQUEST transaction.

There are no **required** or **optional** attributes for APPLICATION-RESULT transactions. The receipt of a transaction of this type should suffice to cause software implementing this protocol to solicit from the user the necessary information for constructing and sending a NEWACCT-REQUEST transaction. However, in APPLICATION-RESULT transactions, special attention is given to human readability for users without specialized Green Commerce software.

Thus, the following example shows an APPLICATION-RESULT transaction as it might actually be received by an end user:

```
Reply-to: newacct@card.com
Subject: account application form
Content-type: multipart/alternative; boundary=fv42

--fv42

You are invited to apply for a Green Commerce account,
the safe and simple way to purchase information via the Internet.

For Terms and Conditions of this account, please send
email to fineprint@fv.com.

To apply for the account, just reply to this message
(that is, send mail to "newacct@card.com") and simply
cut and paste everything between the two "---" lines into
your reply message.  Then, fill in all the information
```

```
as requested before sending the message.  Please keep
each of your answers on a single line.

That's all there is to it!

--------------------------------
#: This is your account application form.
#: On the next line, please enter your first and last name
#: after the colon.
Full-Name:
#: Next, please enter your Internet email address.
#: NOTE that this address may not exceed 78 characters,
#: INCLUDING the "@" sign.
Email-Address:
#: The next field is optional.  If you would like to, you
#: may designate an email address that will receive a CC
#: (carbon copy) of all "notification" messages, which
#: inform you of actual funds transfers.  For example, you
#: might send such copies to your accountant or your
#: accounting department.  If you are so inclined, fill in
#: such an email address below:
Notification-CC:
#: Next, please enter your phone number, in the form
#: +country-code area-code local-number
#: (The country code for the US and Canada is "1".)
#: Thus a North American phone number would be of the form
#:    +1 201 555 1212
Phone-Number:
#: Next, please enter your street address, on one or two lines.
Street-Address:
Street-Address-2:
#: Please enter the name of your city
City:
#: If applicable, please enter your state or province name
State/Province:
#: If applicable, please enter your postal code (zip code)
Postal-Code:
#: Next, please enter the name of your country:
Country:
#: Next please choose the currency you prefer to use for
#: your account.  To do so, simply uncomment
#: (that is, remove the "#:" at the beginning of the line)
#: whichever of the following is your preferred currency:
#:PREFERRED-CURRENCY: USD US Dollars
#:PREFERRED-CURRENCY: JPY Japanese Yen
#:PREFERRED-CURRENCY: DEM     Deutsche Mark
#: Next please choose the language in which you prefer to
#: have us communicate with you.  To do so, simply uncomment
#: (that is, remove the "#:" at the beginning of the line)
#: whichever of the following is your preferred language:
#:PREFERRED-LANGUAGE: EN English
```

```
#:PREFERRED-LANGUAGE: FR French
#: Finally, please give your choice of your preferred
#: account identifier.  Your account ID may
#: include up to 30 letters or numbers, plus spaces and
#: punctuation, which will be ignored, but won't hurt.)
#: Try to choose an ID that is not so easy to guess that
#: people can easily annoy you by using it.
ID-CHOICE:
#: On occasion, we make selected customers' email
#: addresses available to merchants whose products appear
#: to match the customers' interests.  If you do not wish
#: do have your email address redistributed in this manner,
#: just remove the "#:" from the beginning of the
#: following line.
#:ADDRESS-REDISTRIBUTION: No
#: That's it, you're done!  Just email this information to
#: "newacct@card.com" and we will begin processing
#: your application.  The application process will be
#: completed by mail and telephone.
#: At that time, you will need to provide a bank account
#: and/or credit card number to which your account will be
#: linked for purposes of payin and payout.

--------------------------------

For Terms and Conditions of this account, please send
email to fineprint@fv.com.

Thank you for applying!.
We look forward to doing business with you!

Please ignore anything that appears below this line.
--fv42
Content-type: application/green-commerce;
      transaction=application-result

--fv42--
```

Note that given the way MIME's multipart/alternative construct works, recipients with MIME-aware software that understands the application/green-commerce content-type will generally not see any of the above text, but will instead be offered a form-like interface for filling in the necessary data. However, users with pre-MIME mail systems or MIME mail systems with no knowledge about application/green-commerce will see the text that walks them through an application by hand.

3.4.3 Newacct-request

Applications for accounts are MIME entities of content-type "application/green-commerce; transaction=newacct-request". They may be delivered to a Green Commerce server via email or SGCP.

The following are the **required** attributes for NEWACCT-REQUEST transactions:

FULL-NAME -- As previously specified, the full name of the person opening the account.

EMAIL-ADDRESS -- The person's preferred Internet email address

```
email-val = addr-spec ; from RFC 822, maximum 78 chars
```

PHONE-NUMBER -- The person's telephone number, in international notation (+countrycode areacode localnumber). The Green Commerce server may enforce a maximum length for the phone number, although that length is not specified here.

```
phone-val = "+" countrycode " " [area] " " local

countrycode = *pdigit

area = *pdigit

local = *pdigit

pdigit = DIGIT / "-" / "(" / ")"    ; Punctuation ignored
```

STREET-ADDRESS -- The street/apartment portion of the person's mailing address

```
street-val = 1*30text
```

CITY -- The city part of the mailing address

```
city-val = 1*30text
```

COUNTRY -- The country of the mailing address, a 2 character code from [4]

```
country-val = 2ALPHA    ; from ISO 3166
```

ID-CHOICE -- A string giving the user's first choice for an account identifier.

```
id-choice-val = account-identifier
```

The following are the **optional** attributes for NEWACCT-REQUEST transactions.

STREET-ADDRESS-2 -- A continuation of the street/apartment specification, if necessary

```
street-val-2 = 1*30text
```

STATE -- The state or province of the mailing address

```
state-val = 1*30text
```

POSTAL-CODE -- The postal code (zip code in US) of the mailing address

```
postal-code-val = 1*9text
```

PREFERRED-LANGUAGE -- As previously specified. Denotes the language to be used, if possible, for subsequent TRANSFER-QUERY, TRANSFER-RESULT, or NEWACCT-RESULT transactions directed to this client.

PREFERRED-CURRENCY -- As previously specified.

NOTIFICATION-CC -- As previously specified. An Internet email address to which carbon copies of all "-notification" transactions for this account will be sent.

ADDRESS-REDISTRIBUTION -- A string indicating whether or not the user is willing to have his email address redistributed to third parties, e.g. for marketing purposes.

```
address-redistribution-val = "Yes" / "No" ; case-insensitive
```

ACTIVATION-CC -- An email address to which a copy of the corresponding NEWACCT-RESULT should be sent. This may be used by sellers to help mediate an account creation, and to submit a TRANSFER-QUERY after the account is activated.

```
activation-cc-val = addr-spec ; from RFC 822, maximum 78 chars
```

NEWACCT-ID -- The value is a unique identifier, with the same syntax as TRANSFER-ID, generated by the agent composing the NEWACCT-REQUEST. It may be used to correlate the request with the corresponding "pending" NEWACCT-RESULT transaction.

```
newacct-id-val =  <msg-id>    ; From RFC 822, but limited to
                              ; no more than 78 characters.
```

The **details** section of NEWACCT-REQUEST transactions is not used.

Thus a NEWACCT-REQUEST transaction generated by special software might look like this:

```
Content-type: application/green-commerce;
      transaction=newacct-request

Full-Name: Joe Internaut
Email-Address: Joe@anywhere.com
Notification-CC: accountant@somewhere.com
Phone-Number: +1 201 555 1212
Street-Address: 1600 Pennsylvania Avenue
```

```
City:Washington
State:DC
Country:US
ID-Choice: Joe Internaut
Address-Redistribution: No
Postal-Code: 07960
Preferred-Currency: USD US Dollars
Preferred-Language: EN English
```

while a NEWACCT-REQUEST generated by a human user who recieved an APPLICATION-RESULT transaction might look more like this:

```
Content-type: application/green-commerce;
      transaction=newacct-request

#: This is your account application form.
#: On the next line, please enter your first and last name
#: after the colon.
Full-Name: Joe Internaut
#: Next, please enter your Internet email address.
#: NOTE that this address may not exceed 78 characters,
#: INCLUDING the "@" sign.
Email-Address:
#: The next field is optional.  If you would like to, you
#: may designate an email address that will receive a CC
#: (carbon copy) of all "notification" messages, which
#: inform you of actual funds transfers.  For example, you
#: might send such copies to your accountant or your
#: accounting department.  If you are so inclined, fill in
#: such an email address below:
Notification-CC:accountant@somewhere.com
#: Next, please enter your phone number, in the form
#: +country-code area-code local-number
#: (The country code for US is "1".)  Thus an American
#: phone number would be of the form "+1 201 555 1212"
Phone-Number: +1 (201) 555-1212
#: Next, please enter your street address, all on one line.
Street-Address: 1600 Pennsylvania Avenue
#: Please enter the name of you city
City:Washington
#: If applicable, please enter your state or province name
State:DC
#: If applicable, please enter your postal code (zip code)
Postal-Code:
#: Next, please enter the name of your country:
Country:
#: Next please choose the currency you prefer to use for
#: your account.  To do so, simply uncomment
#: (that is, remove the "#:" at the beginning of the line)
#: whichever of the following is your preferred currency:
PREFERRED-CURRENCY: USD US Dollars
```

```
#:PREFERRED-CURRENCY: JPY Japanese Yen
#:PREFERRED-CURRENCY: DEM     Deutsche Mark
#: Next please choose the language in which you prefer to
#: have us communicate with you.  To do so, simply uncomment
#: (that is, remove the "#:" at the beginning of the line)
#: whichever of the following is your preferred language:
PREFERRED-LANGUAGE: EN English
#:PREFERRED-LANGUAGE: FR French
#: Finally, please give your choice of your preferred
#: account identifier.  Your account ID may
#: include up to 30 letters or numbers, plus spaces and
#: punctuation, which will be ignored, but won't hurt.)
#: Try to choose an ID that is not so easy to guess that
#: people can easily annoy you by using it.
ID-CHOICE:
#: On occasion, we make selected customers' email
#: addresses available to merchants whose products appear
#: to match the customers' interests.  If you do not wish
#: do have your email address redistributed in this manner,
#: just remove the "#:" from the beginning of the
#: following line.
#:ADDRESS-REDISTRIBUTION: No
#: That's it, you're done!  Just email this information to
#: "newacct@card.com" and we will begin processing
#: your application.  The application process will be
#: completed by mailand telephone.
#: At that time, you will need to provide a bank account
#: and/or credit card number to which your account will be
#: linked for purposes of payin and payout.
```

3.4.4 Newacct-result

A user who has applied to open an account is informed of the status of his application by sending him an NEWACCT-RESULT transaction, a MIME entity of content-type "application/green-commerce; transaction=newacct-result".

These are the **required** attributes for NEWACCT-RESULT transactions:

APPLICATION-STATUS -- A single case-insenstive word that gives the current status of the application.

```
application-status-val = "accepted" / "rejected" / "pending"
```

These are the **optional** attributes for NEWACCT-RESULT transactions:

ACCOUNT-ID -- The identifier that has been set up for this account, according to the grammar given previously. This attribute will only be present if the account application has been accepted.

ID-CHOICE -- As previously specified. This attribute will typically only be present when the APPLICATION-STATUS is "pending".

APPLICATION-NUMBER -- A numeric ID (up to 12 digits) that must be entered by touch tone, when completing the application, to identify the user.

```
application-number = 1*12DIGIT
```

NEWACCT-ID -- As previously specified. The same value given in the corresponding NEWACCT-REQUEST transaction. This will typically only appear on the "pending" NEWACCT-RESULT.

FULL-NAME -- As previously specified.

The **details** of NEWACCT-RESULT transactions specify a textual explanation of the reason for the current status of the user's application. If further action is required, the details explain what that action is.

Thus, the following example shows an NEWACCT-RESULT transaction as it might actually be received by an end user who had been accepted for an account:

```
Content-type: multipart/alternative; boundary=fv42

--fv42

Thank you for your application for an account.
We are happy to tell you that your account is
now completely operational.  Your account identifier is:
      Joe Internaut
You will receive a physical card in the mail, but may begin
using your account immediately.

Welcome to the Green Commerce community!
--fv42
Content-type: application/green-commerce;
      transaction=newacct-result

Account-ID: Joe Internaut
Application-Status: accepted

Welcome to the Green Commerce community!
--fv42--
```

The following example shows an NEWACCT-RESULT transaction as it might actually be received by an end user whose application was complete and whose acount was awaiting out-of-band information (via telephone or postal mail):

```
Content-type: multipart/alternative; boundary=fv42

--fv42

Thank you for your application for an account.

Your account is complete except for sensitive
information that is not to be entered via the Internet.

In the US, please call 1-800-VIR-TUAL, enter your
application number (666), and then provide the
necessary information in order to activate your account.

Outside the US, you will receive a physical form
in the mail which you will need to complete and
send back to us in order to activate your account.

We will get back to you when our information and
processing are complete.  Thank you for your patience.

Please ignore anything that appears after this line.
--fv42
Content-type: application/green-commerce;
      transaction=newacct-result

Application-status: pending
Application-number: 666

Your account is complete except for sensitive
information that is not to be entered via the Internet.

In the US, please call 1-800-VIR-TUAL, enter your
application number (666), and then provide the
necessary information in order to activate your account.

Outside the US, you will receive a physical form
in the mail which you will need to complete and
send back to us in order to activate your account.
--fv42--
```

The following example shows an NEWACCT-RESULT transaction as it might actually be received by an end user who had been rejected for an account:

```
Content-type: multipart/alternative; boundary=fv42

--fv42

Thank you for your application for an account.
We are sorry to tell you that your application
has been rejected.

The reason for rejection is that you are wanted by the police
```

```
in seven American states and also by Interpol, for numerous
felonies.

Thank you for your interest in Green Commerce on the Internet.

Please ignore anything that appears after this line.
--fv42
Content-type: application/green-commerce;
      transaction=newacct-result

Application-Status: rejected

The reason for rejection is that you are wanted by the police
in seven American states and also by Interpol, for numerous
felonies.
--fv42--
```

3.4.5 Initchg-request

When an accountholder wishes to change some aspect of the server's records related to his or her account, he or she may do so by generating mail to a Green Commerce server with a content-type of "application/green-commerce; transaction=initchg-request", or by delivering a MIME entity of this type via SGCP.

The effect of a Green Commerce server's receiving a INITCHG-REQUEST transaction is the generation of a corresponding INITCHG-RESULT transaction from a Green Commerce server to the applying party.

The following is the **required** for INITCHG-REQUEST transactions:

ACCOUNT-ID -- As previously specified.

The following are the **optional** attributes for INITCHG-REQUEST transactions:

PREFERRED-LANGUAGE -- As previously specified. Denotes the language to be used, if possible, for the subsequent INITCHG-RESULT transaction.

For example, the following MIME entity, however it is received by a Green Commerce server, will cause an application to be sent to the email address associated with the "Joe is a cool dude" account:

```
From: Joe Internaut <Joe@mythical.com>
Content-type:  application/green-commerce;
      transaction=initchg-request

Account-ID: Joe is a cool dude
Preferred-language: EN English
```

3.4.6 Initchg-result

A user is invited to change some aspects of an account's records by sending him an INITCHG-RESULT transaction, a MIME entity of content-type "application/green-commerce; transaction=initchg-result", which is in essence a modified account application form. The user's response to this will be a CHGACCT-REQUEST transaction.

The following is the **required** attribute for INITCHG-RESULT transactions:

ACCOUNT-ID -- As previously specified.

There are no **optional** attributes for INITCHG-RESULT transactions.

The receipt of a transaction of this type should suffice to cause software implementing this protocol to solicit from the user the necessary information for constructing and sending a CHGACCT-REQUEST transaction. However, in INITCHG-RESULT transactions, special attention is given to human readability for users without specialized Green Commerce software.

Thus, the following example shows an INITCHG-RESULT transaction as it might actually be received by an end user:

```
Reply-to: changes@card.com
Subject: account change form
Content-type: multipart/alternative; boundary=fv42

--fv42

We have been asked to help you change some aspects of
our records of your account.  To do this, please reply
to this message (send mail to "changes@card.com") and
simply cut and paste everything between the two

    ---cut here---

lines into your reply message.  Then, fill in any
information that you wish to change before you send the
message.  Please keep each of your answers on a single
line.

You should also send email to the address
"fineprint@fv.com" to receive the latest terms and
conditions governing your use of First Virtual's
Internet Payment System.

Thank you for your cooperation.

---cut here---
```

```
#: Do not change the following line.  You can not
#: change your account-id without getting a whole
#: new account.
Account-ID:  Joe is a cool dude
#:
#: If you want to CANCEL your account entirely, simply
#: fill in "Yes" at the end of the following line:
Cancel-Account:
#:
#: In what follows, please fill in (at the end of each
#: line) ONLY those aspects of your account records
#: which you want to change.
#:
#: Full Name -- Please enter your full name, by which
#: you will generally be described to other
#: FIRST VIRTUAL customers, e.g.,
#:
#:     Full-Name: Joe Internaut
#:
#: This may be a corporate identity, or even a
#: nickname, but it should be recognizable and
#: memorable.  It may be no more than 30 characters.
#:
Full-Name:
#:
#:
#: Email address -- Please enter your Internet email
#: address, e.g.,
#:
#:     Email-Address: joe@anywhere.com
#:
#: This address may not exceed 80 characters including
#: the "@" sign.
#:
#: PLEASE NOTE:  If you are connected to the Internet
#: via a broken gateway that rejects MIME messages,
#: such as the Lotus Notes gateway, you must convert
#: your mail address into a special form in order to
#: make the First Virtual system work for you in spite
#: of your gateway.  In particular, if your address is
#: "joe@foo.com", you should tell us instead that
#: your Email-Address is
#:    "joe%foo.com@lotus-notes.challenged.card.com"
#:
Email-Address:
#:
#:
#: If you like, whenever we send you email notifying
#: you about a funds transfer, we will send a copy to
#: an additional email address, such as your accountant
#: or your company's finance department.  Either enter
```

```
#: such an email address, or leave this field blank.
#:
#: Note that if you previously had a Notification-CC
#: value and you simply want to delete it, you may
#: enter "-" as the new value.
#:
Notification-CC:
#:
#:
#: Please enter your phone number using the
#: international format, i.e.,
#:
#:   +country-code area-code local-number
#:
#: The country code for Canada and the US is "1", so an
#: example might be
#:
#:   Phone-Number: +1 201 555 1212
#:
#: It is very important that you enter this number
#: correctly, since we may have to call you in order to
#: finish processing your application.
#:
Phone-Number:
#:
#:
#: Please enter your street address, including any
#: necessary apartment numbers, etc..  Do NOT include
#: town, state, country, or postal code, e.g.,
#:
#:     Street-Address: 1776 K Street, NW
#:
#: Note that this should be the same as the billing
#: address of the credit card which you will later link
#: to your First Virtual account.  This may be no more
#: than 30 characters per line.  Note that if you
#: previously had a Street-Address-2 value and you
#: simply want to delete it, you may enter "-" as the
#: new value.
Street-Address:
Street-Address-2:
#:
#:
#: Please enter the name of your city or locality, in
#: no more than 30 characters.
#:
#: e.g.,
#:
#:     City: Washington
#:
City:
```

```
#:
#:
#: Please enter your state, province, or other relevant
#: political subunit of your country, in no more than
#: 30 characters, e.g.,
#:
#:     State: DC
#:
State:
#:
#:
#: Please enter your postal code (ZIP code in the USA).
#:
#: e.g.,
#:
#:     Postal-Code: 20006
#:
Postal-Code:
#:
#:
#: Please enter the two-letter code for your country.
#: (If you don’t know the two-letter code, enter your
#: country’s name and we’ll try and figure it out).
#:
#: e.g.,
#:
#:     Country: US
#:
Country:
#:
#:
#: From time to time we make selected customers’ e-mail
#: addresses available to merchants whose products
#: appear to match thecustomers’ interests.  If you do
#: not wish us to redistribute your e-mail address for
#: this purpose, please enter "no" as the value for
#: this field.  Otherwise, please enter "yes".
#:
Address-Redistribution:
#:
#:
#: SENSITIVE FINANCIAL INFORMATION:  If you want to
#: change any of the sensitive financial information
#: associated with your account, such as your credit
#; card or bank account numbers, simply enter "Yes"
#: on the following line, and we will send you
#: appropriate instructions.  Do NOT enter the
#: sensitive information in this message.
#:
Financial-Changes:
---cut here---
```

```
Please ignore anything that appears after this line.

--fv42
Content-type: application/green-commerce;
      transaction=initchg-result

ACCOUNT-ID: Joe is a Cool Dude

--fv42--
```

Note that given the way MIME's multipart/alternative construct works, recipients with MIME-aware software that understands the application/green-commerce content-type will generally not see any of the above text, but will instead be offered a form-like interface for filling in the necessary data. However, users with pre-MIME mail systems or MIME mail systems with no knowledge about application/green-commerce will see the text that walks them through an account change by hand.

3.4.7 Chgacct-request

Requests to change account status information are MIME entities of content-type "application/green-commerce; transaction=chgacct-request". They may be delivered to a Green Commerce server via email or SGCP.

The CHGACCT-REQUEST transaction is very similar to a NEWACCT-REQUEST transaction, except for the addition of two attributes (FINANCIAL-CHANGES and CANCEL-ACCOUNT) and the addition of a new bit of semantics for each value specified:

When "-" is the value specified for any of the optional attributes shared in common between CHGACCT-REQUEST and NEWACCT-REQUEST, this indicates that the old value should simply be deleted (replaced with the null or default value). This syntax is necessary because an empty attribute and an absent attribute are semantically equivalent. However, note also that at present only the STREET-ADDRESS-2 and NOTIFICATION-CC attributes qualify for this special value.

Thus, if a CHGACCT-REQUEST includes the line

```
STREET-ADDRESS-2:
```

this indicates that the value of STREET-ADDRESS-2 field is to be left unchanged, whereas

```
STREET-ADDRESS-2: -
```

indicates that the old value of STREET-ADDRESS-2 is to be deleted. Note that if this syntax is used for an attribute that is required for each account (i..e. that is required in NEWACCT-REQUEST), the server will generate an error.

The following is the **required** attributes for CHGACCT-REQUEST transactions:

ACCOUNT-ID -- As previously specified. Names an existing account.

The following are the **optional** attributes for CHGACCT-REQUEST transactions, each of which, if present, specifies an aspect of the account information that is to be changed:

FINANCIAL-CHANGES -- Specifies whether or not the accountholder wishes to change the payin or payout information associated with the account.

```
financial-changes-val = "Yes" / "No" ; case-insensitive
```

CANCEL-ACCOUNT -- Specifies whether or not the accountholder wishes to cancel the account entirely.

```
cancel-account-val = "Yes" / "No" ; case-insensitive
```

FULL-NAME -- As previously specified.

EMAIL-ADDRESS -- As previously specified.

PHONE-NUMBER -- As previously specified.

STREET-ADDRESS -- As previously specified.

STREET-ADDRESS-2 -- As previously specified.

CITY -- As previously specified.

STATE -- As previously specified.

COUNTRY -- As previously specified.

POSTAL-CODE -- As previously specified.

PREFERRED-LANGUAGE -- As previously specified.

PREFERRED-CURRENCY -- As previously specified.

NOTIFICATION-CC -- As previously specified.

ADDRESS-REDISTRIBUTION -- As previously specified.

The **details** section of CHGACCT-REQUEST transactions is not used.

Thus a CHGACCT-REQUEST transaction generated by special software, changing only the phone number, might look like this:

```
Content-type: application/green-commerce;
      transaction=chgacct-request

Account-ID: Joe is a cool dude
Phone-Number: +1 201 555 1212
```

while a CHGACCT-REQUEST with the same semantics, but generated by a human user who recieved an INITCHG-RESULT transaction might look more like this:

```
Content-type: application/green-commerce;
      transaction=chgacct-request

#: Do not change the following line.  You can not
#: change your account-id without getting a whole
#: new account.
Account-ID:  Joe is a cool dude
#:
#: If you want to CANCEL your account entirely, simply
#: fill in "Yes" at the end of the following line:
Cancel-Account:
#:
#: In what follows, please fill in (at the end of each
#: line) ONLY those aspects of your account records
#: which you want to change.
#:
#: Full Name -- Please enter your full name, by which
#: you will generally be described to other
#: FIRST VIRTUAL customers, e.g.,
#:
#:     Full-Name: Joe Internaut
#:
#: This may be a corporate identity, or even a
#: nickname, but it should be recognizable and
#: memorable.  It may be no more than 30 characters.
#:
Full-Name:
#:
#:
#: Email address -- Please enter your Internet email
#: address, e.g.,
#:
#:     Email-Address: joe@anywhere.com
#:
#: This address may not exceed 80 characters including
#: the "@" sign.
#:
#: PLEASE NOTE:  If you are connected to the Internet
```

```
#: via a broken gateway that rejects MIME messages,
#: such as the Lotus Notes gateway, you must convert
#: your mail address into a special form in order to
#: make the First Virtual system work for you in spite
#: of your gateway.  In particular, if your address is
#: "joe@foo.com", you should tell us instead that
#: your Email-Address is
#:    "joe%foo.com@lotus-notes.challenged.card.com"
#:
Email-Address:
#:
#:
#: If you like, whenever we send you email notifying
#: you about a funds transfer, we will send a copy to
#: an additional email address, such as your accountant
#: or your company's finance department.  Either enter
#: such an email address, or leave this field blank.
#:
#: Note that if you previously had a Notification-CC
#: value and you simply want to delete it, you may
#: enter "-" as the new value.
#:
Notification-CC:
#:
#:
#: Please enter your phone number using the
#: international format, i.e.,
#:
#:   +country-code area-code local-number
#:
#: The country code for Canada and the US is "1", so an
#: example might be
#:
#:   Phone-Number: +1 201 555 1212
#:
#: It is very important that you enter this number
#: correctly, since we may have to call you in order to
#: finish processing your application.
#:
Phone-Number: +1 201 555 1212
#:
#:
#: Please enter your street address, including any
#: necessary apartment numbers, etc..  Do NOT include
#: town, state, country, or postal code, e.g.,
#:
#:     Street-Address: 1776 K Street, NW
#:
#: Note that this should be the same as the billing
#: address of the credit card which you will later link
#: to your First Virtual account.  This may be no more
```

```
#: than 30 characters per line.  Note that if you
#: previously had a Street-Address-2 value and you
#: simply want to delete it, you may enter "-" as the
#: new value.
Street-Address:
Street-Address-2:
#:
#:
#: Please enter the name of your city or locality, in
#: no more than 30 characters.
#:
#: e.g.,
#:
#:     City: Washington
#:
City:
#:
#:
#: Please enter your state, province, or other relevant
#: political subunit of your country, in no more than
#: 30 characters, e.g.,
#:
#:     State: DC
#:
State:
#:
#:
#: Please enter your postal code (ZIP code in the USA).
#:
#: e.g.,
#:
#:     Postal-Code: 20006
#:
Postal-Code:
#:
#:
#: Please enter the two-letter code for your country.
#: (If you don’t know the two-letter code, enter your
#: country’s name and we’ll try and figure it out).
#:
#: e.g.,
#:
#:     Country: US
#:
Country:
#:
#:
#: From time to time we make selected customers’ e-mail
#: addresses available to merchants whose products
#: appear to match thecustomers’ interests.  If you do
#: not wish us to redistribute your e-mail address for
```

```
#: this purpose, please enter "no" as the value for
#: this field.  Otherwise, please enter "yes".
#:
Address-Redistribution:
#:
#:
#: SENSITIVE FINANCIAL INFORMATION:  If you want to
#: change any of the sensitive financial information
#: associated with your account, such as your credit
#; card or bank account numbers, simply enter "Yes"
#: on the following line, and we will send you
#: appropriate instructions.  Do NOT enter the
#: sensitive information in this message.
#:
Financial-Changes:
```

3.4.8 Chgacct-query

When a Green Commerce server receives a CHGACCT-REQUEST transaction, the accountholder must be asked to confirm that the change is legitimate. This is accomplished by generating an email message to the buyer with a content-type of "application/green-commerce; transaction=chgacct-query".

The following are the **required** attributes for CHGACCT-QUERY transactions:

SERVER-ID -- As previously specified.

OLD-FULL-NAME -- If the FULL-NAME has changed, the old value is given here.

```
old-full-name-val = 1*30text
```

NOTICE-NUMBER -- As previously specified.

The following are the **optional** attributes for CHGACCT-QUERY transactions. Each describes a change that has been proposed to the account information:

FULL-NAME -- As previously specified.

FINANCIAL-CHANGES -- As previously specified.

CANCEL-ACCOUNT -- As previously specified.

EMAIL-ADDRESS -- As previously specified.

PHONE-NUMBER -- As previously specified.

STREET-ADDRESS -- As previously specified.

STREET-ADDRESS-2 -- As previously specified.

CITY -- As previously specified.

STATE -- As previously specified.

COUNTRY -- As previously specified.

POSTAL-CODE -- As previously specified.

PREFERRED-LANGUAGE -- As previously specified.

PREFERRED-CURRENCY -- As previously specified.

NOTIFICATION-CC -- As previously specified.

ADDRESS-REDISTRIBUTION -- As previously specified.

The **details** section of CHGACCT-QUERY transactions, if present, is simply text to be shown to the recipient with no automatic processing. Typically, this text explains the changes to be made, particularly if either CANCEL-ACCOUNT or FINANCIAL-CHANGES are set to "Yes".

For example, the following MIME entity describes the change query corresponding to the previous example. Note that special attention is given to human readability for users without specialized Green Commerce software.

```
Reply-to: response@card.com
Subject: <ABCDEFG1234567@card.com> -- Please Confirm
Content-type: multipart/alternative; boundary=fv42

--fv42

This server has been asked to change some of the
information regarding your account, as follows:

Phone-Number: +1 201 555 1212

Please respond to this message by using the reply
command of your mail system, making sure to preserve
the special code in the Subject field.  The body of
your reply message needs to contain only one word:
"Yes" will authorize this account change, "No" will
disallow this change, and "Fraud" will report that
you did not initiate this change and therefore
suspect that someone is abusing your account.
(Claiming fraud will freeze all use of your account
```

```
until further notice.)

Please ignore anything that appears below this line.
--fv42
Content-type: application/green-commerce;
      transaction=chgacct-query

Server-ID: <ABCDEFG1234567@card.com>
Phone-Number: +1 201 555 1212


--fv42--
```

3.4.9 Chgacct-response

In order for an account change to be effected, the account holder must respond to the CHGACCT-QUERY transaction with a CHGACCT-RESPONSE transaction directed back to a Green Commerce server. Such a transaction should have a content-type of "application/green-commerce; transaction=chgacct-response", deliverable either as email or via SGCP.

The following are the **required** attributes for CHGACCT-RESPONSE transactions:

SERVER-ID -- As previously specified. The same value specified in the corresponding CHGACCT-QUERY transaction.

AUTHORIZATION -- As previously specified.

There are no **optional** attributes for CHGACCT-RESPONSE transactions.

The **details** of CHGACCT-RESPONSE transactions are not used.

For example, the following MIME entity describes a positive response to Joe Internaut's account change in the earlier example:

```
Content-type: application/green-commerce;
      transaction=chgacct-response

SERVER-ID: <SDFLKJB@SDFLK>
AUTHORIZATION: Yes
```

3.4.10 Chgacct-result

When a Green Commerce server has received a authorization to change some information related to an account (via a CHGACCT-RESPONSE transaction with an AUTHORIZATION of "Yes"), the account holder will be notified of the result with a content-type of "application/green-commerce; transaction=chgacct-result". (If no "Yes" authorization is received, no CHGACCT-RESULT is ever generated; however, in some cases an ERROR-REPORT might be generated.)

Note that a CHGACCT-RESULT is always sent to the OLD value of the EMAIL-ADDRESS. If the EMAIL-ADDRESS has changed, this will be the last time the server sends mail to that address. (A special warning to that effect is recommended for the textual part of the message.)

Note also that if a CHGACCT-RESULT with an APPLICATION-STATUS of "pending" is followed by one with an APPLICATION-STATUS of "accepted", the second will not necessarily include all of the optional attributes included in the first.

The following are the **required** attributes for CHGACCT-RESULT transactions:

FULL-NAME -- As previously specified.

APPLICATION-STATUS -- As previously specified.

The following are the **optional** attributes for CHGACCT-RESULT transactions:

OLD-FULL-NAME -- As previously specified.

SERVER-ID -- As previously specified.

APPLICATION-NUMBER -- As previously specified.

FINANCIAL-CHANGES -- As previously specified.

CANCEL-ACCOUNT -- As previously specified.

EMAIL-ADDRESS -- As previously specified.

PHONE-NUMBER -- As previously specified.

STREET-ADDRESS -- As previously specified.

STREET-ADDRESS-2 -- As previously specified.

CITY -- As previously specified.

STATE -- As previously specified.

COUNTRY -- As previously specified.

POSTAL-CODE -- As previously specified.

PREFERRED-LANGUAGE -- As previously specified.

PREFERRED-CURRENCY -- As previously specified.

NOTIFICATION-CC -- As previously specified.

ADDRESS-REDISTRIBUTION -- As previously specified.

The **details** section of CHGACCT-RESULT transactions, if present, contains human-readable text to be shown to the account holder. In particular, if FINANCIAL-CHANGES is yes, this text will instruct the account holder in how to change the relevant financial information.

For example, the following MIME entity informs Joe Internaut that his phone number has been changed as requested.

```
Content-type: multipart/alternative; boundary=fv43
Subject: Account change notification

--fv43

We have now changed your account to reflect the
following updated information:

Phone-Number: +1 201 555 1212

Please ignore anything that appears below this line.
--fv43
Content-type: application/green-commerce;
      transaction=chgacct-result

Phone-Number: +1 201 555 1212
Full-Name: Joe Internaut
Application-status: accepted

--fv43--
```

3.5 Miscellany

3.5.1 Capabilities-request

As previously mentioned in this specification, several aspects of the Green Commerce protocol are expected to be extended over time. This includes, but is not limited to, the list of transaction types and the list of supported currencies. To obtain a list of the current values of all such parameters from a Green Commerce server, anyone who wishes may generate a CAPABILITIES-REQUEST transaction by generating mail to a Green Commerce server with a content-type of "application/green-commerce; transaction=capabilities-request", or by delivering a MIME entity of this type via SGCP.

There are no **required** attributes for CAPABILITIES-REQUEST transactions.

The following are the **optional** attributes for CAPABILITIES-REQUEST transactions:

PREFERRED-LANGUAGE -- As previously specified. Denotes the language to be used, if possible, for the subsequent CAPABILITIES-RESULT transaction.

The **details** section of the CAPABILITIES-REQUEST transaction is not used.

For example, the following MIME entity, however it is received by a Green Commerce server, will cause a report to be sent to Joe Internaut <Joe@mythical.com>:

```
Content-type:  application/green-commerce;
transaction=capabilities-request
From: Joe Internaut <Joe@mythical.com>

<no body necessary>
```

3.5.2 Capabilities-result

The response to a CAPABILITIES-REQUEST transaction is a CAPABILITIES-RESULT transaction, which is delivered as a MIME entity of Content-type "application/green-commerce; transaction=capabilities-result". Although the kinds of information described in a CAPABILITIES-RESULT transaction may change over time, it is structured in such a way as to permit automated processes to use periodic CAPABILITIES-REQUEST/CAPABILITIES-RESULT transactions to monitor certain parameters and to alert software maintainers when new capabilities (such as a new transaction type) become available.

The following are the **required** attributes for CAPABILITIES-RESULT transactions:

TRANSACTION-TYPES -- A list of the currently known transaction types.

```
transaction-types-val = ttype *("; " ttype)

ttype = atom
```

CURRENCY-TYPES -- A list of the currently known currency codes and names.

```
currency-types-val = currency-value *("; " currency-value)
```

SECURITY-REQUIREMENTS -- As previously specified.

TRANSACTION-ATTRIBUTES -- A list of all the attribute names supported by any transaction on this Green Commerce server.

```
transaction-attributes-val = field-name *("; " field-name)
            ; Note that field-name is defined in RFC 822
```

TRANSFER-TYPES -- A list of the currently-known "transfer-type" values.

```
transfer-types-val = ttype-val *("; " ttype-val)
```

LANGUAGES -- A list of the currently-supported human languages for interaction with the server.

```
languages-val = preferred-language-val
                *("; " preferred-language-val)
```

There are **no optional** attributes for CAPABILITIES-RESULT transactions.

The **details** section of the CAPABILITIES-RESULT transaction is not used.

The following is an example of a CAPABILITIES-RESULT transaction:

```
Content-type:  application/green-commerce;
      transaction=capabilities-result

Transaction-types: APPLICATION-REQUEST;
    APPLICATION-RESULT; CAPABILITIES-REQUEST;
    CAPABILITIES-RESULT; CHGACCT-QUERY;
    CHGACCT-REQUEST; CHGACCT-RESPONSE; CHGACCT-RESULT;
    COLLECTION-FAILURE-NOTIFICATION; ERROR-REPORT;
    HISTORY-REQUEST; INITCHG-REQUEST; INITCHG-RESULT
    INQUIRY-REQUEST; INQUIRY-RESULT; NEWACCT-REQUEST;
    NEWACCT-RESULT; PAYIN-CHARGEBACK-NOTIFICATION;
    PAYIN-FAILURE-NOTIFICATION; PAYIN-NOTIFICATION;
    PAYOUT-CHARGEBACK-NOTIFICATION;
    PAYOUT-NOTIFICATION; STATUS-REQUEST;
    STATUS-RESULT; TRANSFER-QUERY;
    TRANSFER-REQUEST; TRANSFER-RESPONSE;
    TRANSFER-RESULT
Currency-types: USD US Dollars; JPY Japanese Yen;
      DEM Deutsche Mark
Security-Requirements: None
Transaction-Attributes:  ACCOUNT-ID; ACCOUNT-STATUS;
    ADDRESS-REDISTRIBUTION; AMOUNT;
    APPLICATION-NUMBER; APPLICATION-STATUS;
    AUTHORIZATION; AUTHORIZATION-RESULT;
    BAD-ATTRIBUTE; BILLING-ID; BUYER; BUYER-NAME;
    CANCEL-ACCOUNT; CITY;  COUNTRY;
    CURRENCY; CURRENCY-TYPES;  DELIVERY-STATUS;
    EMAIL-ADDRESS; ERROR-CODE; EXPLANATION;
    FINANCIAL-CHANGES;   FULL-NAME; HISTORY-ID;
    ID-CHOICE; NEGATIVE-CONSEQUENCES;
    OLD-FULL-NAME;   ORIGINAL-AMOUNT;
```

```
        ORIGINAL-CURRENCY; NOTICE-NUMBER;
        NOTIFICATION-CC; PAYMENT-EXPECTED; PHONE-NUMBER;
        POSTAL-CODE; PREFERRED-CURRENCY;
        PREFERRED-LANGUAGE; SECURITY-REQUIREMENTS; SELLER;
        SELLER-NAME;  SERVER-ID; SERVICE-CHARGE; STATE;
        STREET-ADDRESS; STREET-ADDRESS-2;
        TRANSACTION-ATTRIBUTES;  TRANSACTION-DETAILS;
        TRANSACTION-TYPES; TRANSFER-ID;  TRANSFER-TYPE;
        TRANSFER-TYPES
    Transfer-types:  INFO-SALE; DONATION
    Languages: EN English; FR French
```

Note that the CAPABILITIES-RESULT transaction is not particularly designed for human readability, as it is not intended for use by end users, but rather for use by application software developers and for automated system maintenance.

3.5.3 Error-report

A Green Commerce server may encounter a mal-formed transaction or may be unable to accomodate the actions requested in a well-formed transaction. In such cases, the Green Commerce server will respond by issuing an ERROR-REPORT transaction, structured as a MIME entity of Content-type "application/green-commerce; transaction=error-report".

The following are the **required** attributes for ERROR-REPORT transactions:

ERROR-CODE -- A string (analogous to the reply codes in SMTP) describing the error. The first three octets of the string are a three digit numeric error code, while the rest of the string is a textual description of the error type. An error code that starts with a "4" is a temporary failure, describing a transaction that might work at some later time, while an error code that starts with a "5" is a more permanent error.

```
    error-code-val = 3DIGIT [SPACE *text]
```

Error codes include, but are not limited to:

```
    421 <domain> Service not available
    450 Requested action not taken: database unavailable
    451 Requested action aborted: local error in processing
    452 Requested action not taken: insufficient system storage
    500 Syntax error, command unrecognized
    501 Syntax error in attributes or values
    502 Transaction not implemented
    504 Transaction attribute not implemented
    505 Required attribute not included
    506 Misdirected transaction received by server
    553 Requested action not allowed
    554 Transaction failed
    555 Requested action already taken
```

The following are the **optional** attributes for ERROR-REPORT transactions:

TRANSACTION-NAME -- The transaction-type of the failed transaction. (This is optional because its omission might have been the error.)

```
transaction-name-val = value  ; from RFC 1521
```

BAD-ATTRIBUTE -- A string naming an attribute that was missing or had an invalid value for the failed transaction.

```
bad-attribute-val = field-name            ; from RFC 822
```

EXPLANATION -- A one-line textual explanation of the reason for the transaction's failure.

TRANSFER-ID -- As previously specified.

The **details** section of the ERROR-REPORT transaction consists of the entire transaction that generated the error.

The following is an example of an ERROR-REPORT transaction. Note that it is designed for human readability as well as automatic processing.

```
Content-type: multipart/alternative; boundary=fv1

--fv1

We have recently received a transaction request
from you that could not be honored.  In this case, the payment
requested a fund transfer but failed to specify the party
providing the funds.  Each fund transfer requires both a
paying and a receiving party.
--fv1
Content-type:  application/green-commerce;
      transaction=error-report

Error-code: 505 Required attribute not included
Bad-attribute: BUYER
Explanation:  Every funds transfer requires a buyer.
Transaction-name: transfer-request
TRANSFER-ID: <A1B2C3@nowhere.edu>

Content-type: application/green-commerce;
      transaction=transfer-request

SELLER: CrazyRDIM
AMOUNT: 19.99
CURRENCY: USD US Dollars
```

```
TRANSFER-ID: <A1B2C3@nowhere.edu>
SECURITY-REQUIREMENTS: None
DESCRIPTION: Purchase of slightly-used stock quotes

--fv1--
```

4 Future Considerations

As mechanisms for authentication and encryption become standard on the Internet, this protocol should evolve to make use of them. This is the expected use of the SECURITY-REQUIREMENTS attribute, although additional mechanisms might also be necessary.

5 Security Considerations

Security issues are not discussed in this memo. See the Security Considerations in [6].

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8 References

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[7] Rose, M.T., and N.S. Borenstein, "The Simple MIME eXchange Protocol (SMXP)", First Virtual Holdings Incorporated, June, 1995.

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9 Appendix A -- Mailserver-specific functionality

In order to facilitate interaction between a Green Commerce server and a user without mail-handling software that automatically processes the application/green-commerce content-type, a mailbox exists for each transaction type that can be received by a Green Commerce server. Mail sent to these mailboxes is interpreted as being formatted according to the corresponding transaction type. In some cases, different special handling is applied to such data. These specialized addresses are specified in this appendix. Here, we assume that the Green Commerce server is operating with an Internet domain of "card.com" and describe the addresses in terms of that domain.

```
Mailserver address      Default transaction type assumed
------------------      ----------------------------
apply@card.com          APPLICATION-REQUEST
capabilities@card.com   CAPABILITIES-REQUEST
newacct@card.com        NEWACCT-REQUEST
transfer@card.com       TRANSFER-REQUEST
inquiry@card.com        INQUIRY-REQUEST
response@card.com       TRANSFER-RESPONSE
initchg@card.com        INITCHG-REQUEST
chgacct@card.com        CHGACCT-REQUEST
response@card.com       CHGACCT-RESPONSE
history@card.com        HISTORY-REQUEST
status@card.com         STATUS-REQUEST
```

Note that since no attributes are required for the APPLICATION-REQUEST or CAPABILITIES-REQUEST transactions, empty mail sent to the corresponding mailserver addresses will constitute complete transactions for those transaction types. The NEWACCT-REQUEST, CHGACCT-REQUEST, and TRANSFER-REQUEST transactions must include all the fields required for those transactions.

Special handling is applied to the mailserver addresses for the following transactions:

For HISTORY-REQUEST, INITCHG-REQUEST, and INQUIRY-REQUEST transactions received at the appropriate mailserver addresses, the entire Subject field is treated as the ACCOUNT-ID value. Because ACCOUNT-ID is the only required attribute for these three transaction types, no further information is needed, and the message body is ignored.

For STATUS-REQUEST transactions received at the appropriate mailserver address, the entire Subject field is treated as the TRANSFER-ID value. Because TRANSFER-ID is the only required attribute for this transaction type, no further information is needed, and the message body is ignored.

The TRANSFER-RESPONSE and CHGACCT-RESPONSE transactions require two attributes, the SERVER-ID and the AUTHORIZATION attributes. In the case of mail to the appropriate mailserver address, a special search is performed for a valid SERVER-ID field (enclosed in angle-brackets) in the "Subject" header field, and for a valid AUTHORIZATION field ("Yes", "No", or "Fraud") in the body of the message. Note that because TRANSFER-REQUEST and CHGACCT-REQUEST share a single mailserver address, they must also share a name space for SERVER-ID attributes.

Thus while the following is the complete canonical form of a TRANSFER-RESPONSE transaction:

```
Content-type: application/green-commerce;
      transaction=transfer-response
To: sgcs@card.com

SERVER-ID: <ABCDEFG1234567@card.com>
AUTHORIZATION: Yes
```

The following message, when delivered to the mailserver address, will have the same effect:

```
To: response@card.com
Subject: Re: <ABCDEFG1234567@card.com> -- Please Confirm

Yes
```

Similarly, while the following is the complete canonical form of a CHGACCT-RESPONSE transaction:

```
Content-type: application/green-commerce;
      transaction=chgacct-response
To: sgcs@card.com

Server-ID: <lkjsdflksdjf@sdlkjf>
AUTHORIZATION: Yes
```

The following message, when delivered to the mailserver address, will have the same effect:

```
To: response@card.com
Subject: Re: <lkjsdflksdjf@sdlkjf> -- Please Confirm

Yes
```

10 Appendix B -- SGCP and SGCP-specific functionality

The interactive exchange of application/green-commerce protocols is performed using SMXP [7]. This appendix describes an application of SMXP called SGCP, the Simple Green Commerce Protocol.

SGCP is used to exchange application/green-commerce MIME entities. The server listens on TCP port 440. The SGCP server recognizes only application/green-commerce entities, and responds with an error code if presented with any other entities.

The parameter associated with a positive response depends on the transaction parameter associated with the EXCH command:

```
command parameter    positive response parameter
-----------------    ---------------------------
transfer-request     empty
transfer-response    empty
inquiry-request      inquiry-result
capabilities-request capabilities-result
application-request  application-result
newacct-request      newacct-result
initchg-request      initchg-result
chgacct-request      empty
chgacct-response     empty
history-request      empty
status-request       status-result
```

If the server issues a negative response, then the parameter always contains an error-report message.

A special mechanism is provided to short-circuit SGCP functionality for INQUIRY-REQUEST transactions: An INQUIRY-REQUEST transaction may be performed by using the finger protocol [8] to perform a lookup for a ACCOUNT-ID value on a Green

Commerce server. The server will return an INQUIRY-RESULT transaction in response. Account identifiers may be provided either with or without the characters that are ignored for comparison purposes. Thus if a client wishes to perform an INQUIRY-REQUEST transaction for an ACCOUNT-ID of "Joe is a Cool Dude", it could perform the equivalent of "finger Joeisacooldude@inquiry.card.com". The result would be a comple INQUIRY-RESULT transaction for the named accountholder.

11 Appendix C -- Collected Grammar

For the convenience of the reader, all syntactic entities defined in this document are collected below.

```
account-id-val = account-identifier

account-identifier = 1*30 (*IGN ALNUM) *IGN

account-status = "active" / "invalid"
                / "suspended" / "seller-only"

activation-cc-val = addr-spec ; from RFC 822, maximum 78 chars

address-redistribution-val = "Yes" / "No" ; case-insensitive

ALNUM = ALPHA / DIGIT

amount-pending-val = floatnum

amount-val = floatnum

application-number = 1*12DIGIT

application-status-val = "accepted" / "rejected" / "pending"

area = *pdigit

auth-val = "YES" / "NO" / "FRAUD" ; case-insensitive

auth-result-val = auth-val / "duplicate"
      / "timeout" ; case-insensitive

bad-attribute-val = field-name            ; from RFC 822

billing-id-val = 1*80text

buyer-name-val = full-name-val

buyer-val = account-identifier

cancel-account-val = "Yes" / "No" ; case-insensitive
```

```
chargeback-amt-val = floatnum

city-val = 1*30text

countrycode = *pdigit

country-val = *text

currency-code = 3ALPHA  ; from ISO 4217

currency-name = 1*20text

currency-types-val = currency-value *("; " currency-value)

currency-value = currency-code SPACE currency-name

currency-val = currency-value

days-to-timeout-val = 1*2DIGIT      ; must be in range 1-20

delivery-status-val = "delivered" / "pending" / "not-applicable"
                        / ALPHA *15(ALPHA / "-")

description-val = 1*40text

details = *text

email-val = addr-spec   ; from RFC 822, maximum 78 chars

error-code-val = 3DIGIT [SPACE *text]

financial-changes-val = "Yes" / "No" ; case-insensitive

floatnum = 1*DIGIT ["." 1*DIGIT]
      ; Precision level not guaranteed,
      ; may be currency-dependent

full-name-val = 1*30text

fventity = fields *(CRLF *details) ; Everything after
                                   ;  first empty line
                                   ;  is transaction details

history-id-val = account-identifier

id-choice-val = account-identifier

IGN = <ASCII values 32-47, 58-64, 91-96, 123-127>
      ; Bascially printable ASCII excluding ALNUM and CTLs

language-code = 2ALPHA  ; from ISO 639
```

```
language-name = 1*20text

languages-val = preferred-language-val
                *("; " preferred-language-val)

last-change-val = date-time ; from rfc 822

local = *pdigit

negative-consequences = "yes" / "no"      ; case-insensitive

newacct-id-val =  <msg-id>    ; From RFC 822, but limited to
                              ; no more than 78 characters.

notice-number-val = 1*DIGIT

notification-cc-val = addr-spec ; from RFC 822, maximum 78 chars

old-full-name-val = 1*30text

original-currency-val = currency-value

original-amount-val = floatnum

payment-expected-val = "YES" / "NO" ; case-insensitive

pdigit = DIGIT / "-" / "(" / ")"    ; Punctuation ignored

phone-val = "+" country " " [area] " " local

postal-code-val = 1*9text

preferred-currency-val = currency-value

preferred-language-val = language-code SPACE language-name

security-requirements-val = security-val *("; " security-val)

security-val = "none" / atom  ; extensions to be defined later

seller-name-val = full-name-val

seller-val = account-identifier

server-id-val =  <msg-id>     ; From RFC 822, but limited to
                              ; no more than 78 characters.

service-charge-val = floatnum

state-val = 1*30text

street-val = 1*30text
```

```
street-val-2 = 1*30text

transaction-attributes-val = field-name *("; " field-name)
            ; Note that field-name is defined in RFC 822

transaction-details-val = transaction-record
                        *["," transaction-record]

transaction-name-val = value  ; from RFC 1521

transaction-record =    server-id-val

transaction-types-val = ttype *("; " ttype)

transfer-id-val =  <msg-id>   ; From RFC 822, but limited to
                              ; no more than 78 characters.

transfer-status-val = "transfer-query" / "transfer-result"

transfer-types-val = ttype-val *("; " ttype-val)

ttype = atom

ttype-val = "info-sale" / "donation" /
            "cost-recovery" / "usage-fee" /
            ALNUM *15 (ALNUM / "-")
```

12 Appendix D -- Multi-currency Examples

The examples in the main body of this document all used a single currency, for the sake of simplicity. In this appendix, we consider the same basic example transactions, but in the multi-currency case. Here we assume that Crazy Rupert's Discount Information Mart denominates its sales in US Dollars, but that Joe Internaut's preferred currency is the Tongan Pa'anga. (For purposes of this example, we assume that the Green Commerce server in use supports transactions in Pa'anga, an assumption that should not be made about any real Green Commerce server without checking a CAPABILITIES-RESULT transaction.) In such an example, the initial TRANSFER-REQUEST is made in the seller's currency, US Dollars:

```
Content-type: application/green-commerce;
      transaction=transfer-request

BUYER: Joe is a cool dude
SELLER: CrazyRDIM
AMOUNT: 19.99
CURRENCY: USD US Dollars
TRANSFER-ID: <CRDIM424242@somewhere.com>
SECURITY-REQUIREMENTS: None
DESCRIPTION: Purchase of slightly-used stock quotes
```

Although the sale was initially denominated in US Dollars, it is translated into the buyer's currency and frozen in price in that currency at the time of the TRANSFER-QUERY transaction. If we assume that the exchange rate at that moment was 17 Pa'anga to the dollar, the TRANSFER-QUERY would look like this:

```
Reply-to: response@card.com
Subject: <ABCDEFG1234567> -- Please Confirm
Content-type: multipart/alternative; boundary=fv42

--fv42

Transaction:  Purchase of slightly used stock quotes
Cost: 339.83 Pa'anga (US $19.99)
Seller-Name: Crazy Rupert's Discount Information Mart

Crazy Rupert's Discount Information Mart has requested
that you (Joe  Internaut) should be charged 339.83 Pa'anga
for "Purchase of slightly used  stock quotes".  Please
respond to this message by using the reply  command of
your mail system, making sure to preserve the special code
in the Subject field.  The body of your reply message
needs to contain only one word: "Yes" will authorize this
fund transfer, "No" will disallow this fund transfer
according to the terms of your agreement as out customer,
and "Fraud" will report that you did not initiate this
transaction and therefore suspect that someone is abusing
your account.  (Claiming fraud will freeze all use of your
account until further notice.)

Please ignore anything that appears below this line.
--fv42
Content-type: application/green-commerce;
      transaction=transfer-query

SERVER-ID: <666@card.com>
BUYER-NAME: Joe Internaut
SELLER-NAME: Crazy Rupert's Discount Information Mart
TRANSFER-TYPE: info-sale
AMOUNT: 339.83
CURRENCY: TOP Tongan Pa'anga
ORIGINAL-AMOUNT: 19.99
ORIGINAL-CURRENCY: USD US Dollars
DESCRIPTION: Purchase of slightly-used stock quotes

--fv42--
```

If the buyer authorizes the transaction, the TRANSFER-RESULT received by the seller will look like something like this:

```
Content-type: multipart/alternative; boundary=fv43
```

```
Subject: <ABCDEFG1234567> -- Purchase confirmed

--fv43

Transaction:  Purchase of slightly used stock quotes
Cost: 339.83 Pa'anga (US $19.99)
BUYER-NAME: Joe Internaut

Joe Internaut has authorized the transfer of 339.83 Pa'anga
(approximately $19.99) to your First Virtual account.

For Terms and Conditions of this account, please send
email to fineprint@fv.com.

Please ignore anything that appears below this line.
--fv43
Content-type: application/green-commerce;
      transaction=transfer-result

SERVER-ID: <666@card.com>
AUTHORIZATION-RESULT: Yes
BUYER-NAME: Joe Internaut
SELLER-NAME: Crazy Rupert's Discount Information Mart
AMOUNT: 339.83
CURRENCY: TOP Tongan Pa'anga
ORIGINAL-AMOUNT: 19.99
ORIGINAL-CURRENCY: USD US Dollars
TRANSFER-TYPE: info sale
DESCRIPTION: Purchase of slightly-used stock quotes

--fv43--
```

Later, when an actual charge is made to Joe Internaut's credit card (which is presumably a Tongan credit card denominated in Pa'anga), he would receive a PAYIN-NOTIFICATION transaction that looked something like this:

```
Content-type: multipart/alternative; boundary=fv44
Subject: Information charged to your credit card

--fv44

This is to inform you that we have issued a charge of
407.66 Pa'anga to the credit card account you have
registered for payment of your account.  This charge covers
the following transactions:

339.83 -- Crazy Rupert's Discount Information Mart
      "Purchase of slightly used stock quotes"
67.83 -- Big Al's Poetry Mart
      "Shall I compare thee to a pizza?" by A.Spire Ingpoet

This may be described via your billing mechanism as:
```

```
"Internet Information #XYZ123, $38.97"

Please ignore anything that appears below this line.
--fv44
Content-type: application/green-commerce;
      transaction=payin-notification

BUYER-NAME:Joe Internaut
AMOUNT: 407.66
CURRENCY: TOP Tongan Pa'anga
SERVICE-CHARGE: 0
BILLING-ID: XYZ123@foo.edu
TRANSACTION-DETAILS: <ABCDEFG1234567@card.com>, <ADC42@foo.com>,
      <XYZ23ac@card.com>, <ACLKJ987@card.com>

339.83 -- Crazy Rupert's Discount Information Mart
      "Purchase of slightly used stock quotes"
67.83 -- Big Al's Poetry Mart
      "Shall I compare thee to a pizza?" by A.Spire Ingpoet
--fv44--
```

When payment is received, and the Green Commerce server has subtracted any appropriate service charges, the amount is converted back to the seller's currency and a PAYOUT-NOTIFICATION transaction is generated. In this example, for simplicity, it is assumed that the full payment was made to the seller immediately, though this will not always be the case. Here we assume that the Pa'anga has fallen in value, so there are now 18 Pa'anga to the dollar, so the seller gets somewhat less than his asking price. However, because the transaction is frozen in the buyer's currency, it is equally likely that a seller will get *more* than his asking price due to currency fluctuations.

```
Content-type: multipart/alternative; boundary=fv99
Subject: Funds credited to your account

--fv99

This is to inform you that we have issued a credit of
US $10.00 to your account.  This credit includes full
or partial payment for the following transaction:

Joe Internaut -- "Purchase of slightly used stock quotes"
      Amount of purchase: 339.83 Tongan Pa'anga ($18.87)
      Our fee:  $0.60
      Amount credited to your account: $18.27

Please ignore anything that appears below this line.
--fv99
Content-type: application/green-commerce;
      transaction=payout-notification

SELLER-NAME: Crazy Rupert's Discount Information Mart
```

```
AMOUNT: 18.27
CURRENCY: USD US Dollars
ORIGINAL-AMOUNT: 339.83
ORIGINAL-CURRENCY: TOP Tongan Pa'anga
SERVICE-CHARGE: 0.60
AMOUNT-PENDING: 0
TRANSACTION-DETAILS: <ABCDEFG1234567@card.com>

$18.87 -- Joe Internaut
      "Purchase of slightly used stock quotes"
-fv99--
```

Transaction values are always frozen in the buyer's currency at the time that the TRANSFER-QUERY transaction is generated by the Green Commerce server. Values are translated back into the seller's currency for reporting purposes and when fund transfers occur.

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