Experian Products and Services

Real Time Inquiry Events

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1. Real Time Events (RTE)

The Real Time Events service delivers notifications when updates happen to a consumer's profile. The events include:

- Inquiry Events.

Event Delivery

- Messages successfully delivered will not be resent.
- If there is a failure at the transactional level, the messages will be re-sent. Messages that failed on delivery will be stored up to **2 days**.
- There will be no sequencing for normal processing.
- Error messages will be delivered in the order in which they occurred.
- Existing NS Clients can continue to receive events in the batch system while also getting Real Time events. E.g. They could receive Risk Trade triggers in ONS and Inquiry Events in Real Time.
- The peak transaction rate could be as high as 80 events/second based on the monitored list volume.
- All Events for a program will be delivered to the same client URL.
- Events for multiple programs can be delivered to the same or different URLs.
- Company/Portfolio/Campaign ID will be a part of the event notification.

Billing

- Real Time Billing will be a part of existing Notification Services billing process.

1.1 History of Revisions

Ver #	Date	Author	Description of Change
1.0	03/06/2015	Shiva Ramanathan	Initial Draft
1.1	06/30/2017	Ayyappan Keddal Ramdoss	Client Listener Specifications.
1.2	10/14/2017	Shiva Ramanathan	Updated Company Id, Portfolio Id, Campaign Id to be CHAR elements. They will contain numeric values without leading zeroes.
1.3	03/02/2017	Ayyappan Keddal Ramdoss	Added information on connectivity
1.4	5/22/2023	Per Erik Berg	Phone, Score, and Attribute Append information: • Pg 11, Optional Information Available Upon Request • Pg 16-17, Phones and Models Arrays tables • Pg 19-20, Pohnes and Models Arrays examples

2. Client/Subscriber Setup for Real Time Events

2.1 Client / Subscriber Onboarding Flow

Subscribers will be onboarded in Real Time Events similar to Notification Services product.

- They will provide information on their monitored list and events of interest through sales support.
- The setup will be done by Client Support team.
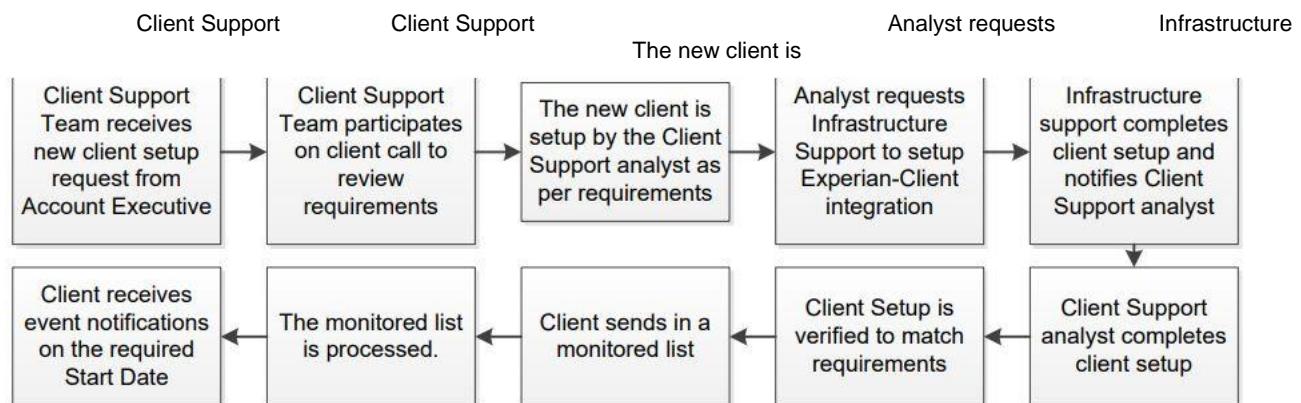
2.2 Client/Subscriber Information

Clients interested in Real Time Events will need to provide Experian the following information. Most of these elements are similar to what a client provides for Notification Services.

1) **Monitored List**
   - Subscribers interested in Real Time Events will provide a list of consumers to monitor for activity.
   - Information about their file format (parsed, unparsed name & address) and transmission method (STS, Connect Direct).
   - Approximate size of the monitored list. The volume of events from RTE will depend on the size of the monitored list.
   - Guarantee permissible purpose by refreshing the monitored list frequently.

2) **Name and Type of the program**
   Information on how the events will be used. E.g. to notify consumers directly, for account management or prospecting.

3) **Inquiry Logging Information**
   Subcode to be used for logging an inquiry to the consumer's file after the events are posted to the client.

4) **Events to Monitor**
   A list of events the clients want.

5) **Optional Information on Output**
   Information like the consumer name, SSN or address that was supplied by client as a part of the input monitored list.

6) **Start Date**

7) **Connectivity for Posting Events**
   Additional information is provided below

8) **Product and Technical Contact(s).**

3. Connectivity

The topics contained in this section are intended to describe the connectivity information required for RTE to successfully send alerts to a Client.

RTE supports connections to two client environments. One is for testing and the second is for production.

3.1 Client connectivity using 2-way TLS

3.1.1 High Level Steps

1. Client & Experian Team exchange connectivity details.
2. Infrastructure changes (SSL cert install, IP whitelisting etc.) in Client & Experian environments
3. Application level changes in Client & Experian environments
4. QA Testing / Sign-off

3.1.2 Artifacts to be provided by Experian

➢ SSL certificates
➢ Public IP addresses to be whitelisted

3.1.3 Artifacts to be provided by Client

➢ SSL certificates
➢ Public IP addresses to be whitelisted
➢ URL Endpoint to send Events from Experian Infrastructure ○ Example: https://myRTEendpoint.com/app/v1/rte/event

3.2 Client connectivity using OAuth 2.0

3.2.1 High Level Steps

1. Client & Experian Team exchange connectivity details.
2. Infrastructure changes (IP whitelisting) in Client & Experian environments
3. Application level changes in Client & Experian environments.
4. QA Testing / Sign-off

3.2.2 Artifacts to be provided by Experian

➢ Public IP addresses to be whitelisted

3.2.3 Artifacts to be provided by Client

➢ Public IP addresses to be whitelisted
➢ URL Endpoint to send Events from Experian Infrastructure ➢ OAuth2
    client API samples (e.g. curl command output)
    Credentials (client id/client secret, user / password etc.)

3.2.4 Security Requirements to be met by OAuth2.0 Endpoints (provided by client):

➢ URLs must be hosted on a secure URL such as HTTPS that supports TLS 1.2.
➢ SHA-2 certificates with key length > 2048 bytes shall be used.
➢ Ciphers with a high work factor must be used, weaker ciphers shall not be permitted.

- TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384_P384
- TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256_P256
- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384_P256
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256_P256
- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA_P256
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA_P256
- TLS_RSA_WITH_AES_256_GCM_SHA384
- TLS_RSA_WITH_AES_128_GCM_SHA256
- TLS_RSA_WITH_AES_256_CBC_SHA256
- TLS_RSA_WITH_AES_128_CBC_SHA256
- TLS_RSA_WITH_AES_256_CBC_SHA
- TLS_RSA_WITH_AES_128_CBC_SHA
- TLS_RSA_WITH_3DES_EDE_CBC_SHA

➢ OAuth2 Grant Type has to be "Resource Owner Credentials". Refer the URL
    https://tools.ietf.org/html/rfc6749#section-1.3.3 for details.
➢ Access Tokens shall expire within 30 minutes.
➢ Refresh Tokens shall expire within 2 hours.

3.3 Retry.

Experian Tier 1 has a 120 second timeout parameter. Assuming the hop to CLIENT is 20ms, client server has 119 seconds to acknowledge the receipt of the message. If CLIENT doesn't respond within this timeframe,

- Experian will consider this a timeout error and retry the post up to **3** times before issuing an error code. This is configurable between 0 and 5 times.

- Client may have processed the first post after the 119 second limit in which scenario, they could get a duplicate message. Client will be responsible to dedupe messages sent because of retry parameters.
- If **5 of these error codes happen within 2 minutes**, application will be stopped and IT Services will be paged. They will then work with client technical team to resolve the issue.
- After issue is resolved, development will reprocess messages that failed the initial transmission and then resume normal posting of events.

The setup is depicted by following diagram.

Client Listener Applicaton

Experian ESB		Client
Client Internal Listener [Push Events]	DataPower	Client Listener Applicaiton
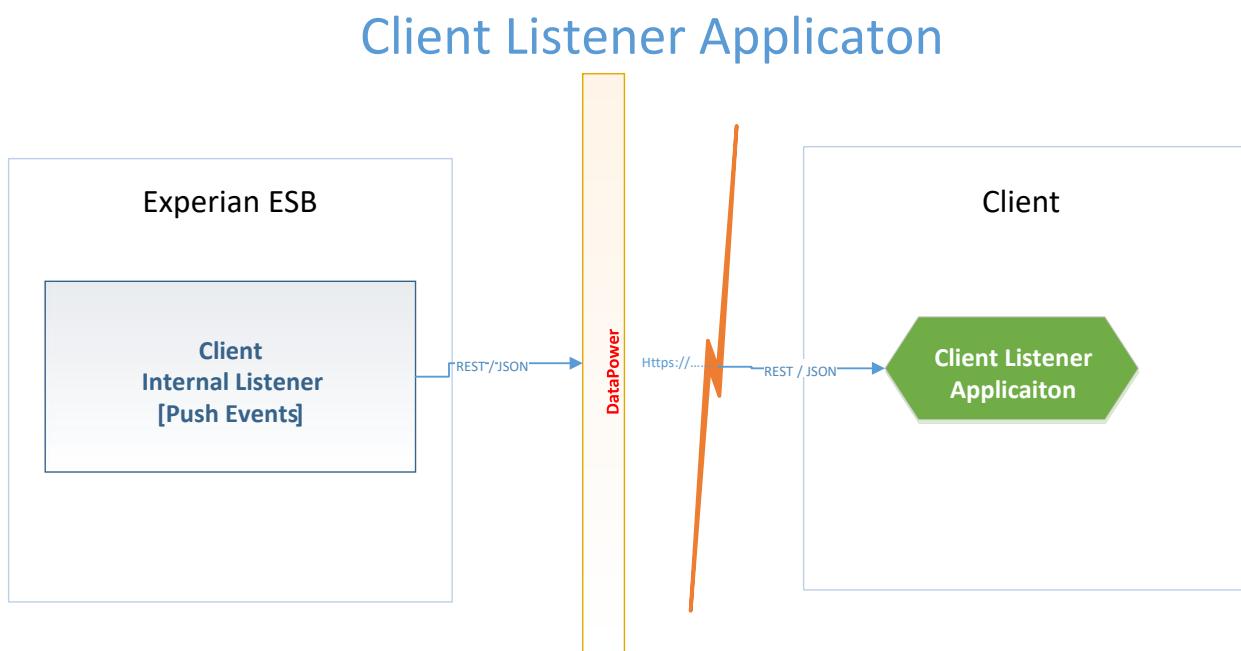
4. Event Types

Event Type	Event Description
I	Inquiry

5. Inquiry Events

```
AUTOI        Auto Loan Inquiry

BKCDI        Bank/Credit Card Inquiry

BUSLI        Business Loan Inquiry

HMEQI        Home Equity Loan Inquiry

INSTI        Installment Loan Inquiry

LEASI        Auto Lease Inquiry

MTGLI        Mortgage Loan Inquiry

RECRI        Recreational Merchandise Inquiry

RENTI        Rental Inquiry

RETLI        Retail Loan Inquiry

STUDI        Student Loan Inquiry
```

Inquiry Event Information:

1. Inquiring Subscriber KOB
2. Inquiry Date
3. Inquiry Purpose Type

Optional Information Available on Request:

1. File One Best Address
2. Phones append
   a. Array up to three phones
   b. Phones removed if included in the phone optout list
   c. Phone removed if not in the approved area code
   d. If selected, event can be dropped if no phones appended.
3. Score/Attribute append
   a. Append selected score models and attribute models.
   b. If selected, event can be dropped if outside score range.
   c. For attribute models, selected attributes will be included in the output.

6. Event Message Format

Name	Data Elements	Req.	Data Definition	Data Description	Event Info
Id		Y	CHAR(50)	System ID (RTE for Real Time Events) Company ID (10 digit numeric with leading zeroes) Portfolio ID (4 digit numeric with leading zeroes) Campaign ID (10 digit numeric with leading zeroes) Date (YYYYMMDD) Time (HHMMSS) 9 byte identifier The transaction **id** is unique for a consumer and an event. For consumers with multiple monitored accounts, this will be the same across monitored accounts.	All Events
TransactionInfo		Y			All Events
	EventDeliveryDate	Y	MMDDYYYY	System Date	All Events
	EventDeliveryTime	Y	HHMMSS	System Time	All Events
	CompanyId	Y	CHAR(7)	COMPANY_ID of Real Time Program.	All Events
	PortfolioId	Y	CHAR(2)	PORTFOLIO_ID of Real Time Program.	All Events
	CampaignId	Y	CHAR(7)	CAMPAIGN_ID of Real Time Program.	All Events
	VersionNum	Y	CHAR(4)	Format Version Number. Default - 0001.	All Events
EventInfo				Generic Information that is available in ALL Events	All Events
	EventType	Y	CHAR(2)	Event Identifier: I for Inquiry	All Events
	ExperianConsumerIdentifier	N	CHAR(17)	1) Optional element that can be selected by clients for Events 2) Will always be present when the event is for a consumer with an onfile statement.	Optional for All Events
	EventDisplayCode	N	CHAR(10)	Optional Display Code that client can choose by providing additional definitions for events. E.g. BKCDI will mean Bankcard Inquiry.	Optional for All Events
	MonitoredAccount	Y	CHAR(40)	Monitored Account Number	All Events
	ConsumerStatementIndicator	N	CHAR(2)	BLANK	All Events

	FactaCode	N	CHAR(10)	BLANK	All Events
	FCRAAttr	N	CHAR(24)	FCRA Attributes for consumer.	All Events

Name	Data Elements	Req.	Data Definition	Data Description	Event Info
CustomerProgramName	CustomerSpecifiedName	N	CHAR(32)	Program Name specified by a client for a specific portfolio and campaign criteria. Available on request from client.	Optional for All Events
CustomerSuppliedName		N		Available on request client. Client will supply the consumer name, SSN and address as a part of the monitored list load. The Name only is output with this option.	Optional for All Events
Name	FirstName	N	CHAR(32)		Optional for All Events
	MiddleName	N	CHAR(32)		Optional for All Events
	Surname	N	CHAR(32)		Optional for All Events
	SecondSurname	N	CHAR(32)		Optional for All Events
	Gen	N	CHAR(1)	J = Junior S = Senior 2 = 2nd 3 = 3rd 4 = 4th	Optional for All Events
CustomerSuppliedSSN	SSN	N	CHAR(9)	Available on request. Client will supply the consumer name, SSN and address as a part of the monitored list load. The SSN only is output with this option.	Optional for All Events
CustomerSuppliedAddress		N		Available on request. Client will supply the consumer name, SSN and address as a part of the monitored list load. The Address only is output with this option.	Optional for All Events
AddressInformation	HouseNum	N	CHAR(7)		Optional for All Events
	StreetDir	N	CHAR(3)		Optional for All Events
	StreetNameAptNum	N	CHAR(28)		Optional for All Events

	AdditionalAddress	N	CHAR(28)		Optional for All Events
	City	N	CHAR(15)		Optional for All Events
	State	N	CHAR(2)		Optional for All Events
	Zip	N	CHAR(9)		Optional for All Events
CustomerSuppliedNameAddress		N		Available on request from CLIENT when they load the consumer name, SSN and address as a part of the data load. The full name, SSN and address are output with this option.	Optional for All Events

Name	Data Elements	Req.	Data Definition	Data Description	Event Info
Name	FirstName	N	CHAR(32)		Optional for All Events
	MiddleName	N	CHAR(32)		Optional for All Events
	Surname	N	CHAR(32)		Optional for All Events
	SecondSurname	N	CHAR(32)		Optional for All Events
	Gen	N	CHAR(1)	J = Junior S = Senior 2 = 2nd 3 = 3rd 4 = 4th	Optional for All Events
SSN		N	CHAR(9)		Optional for All Events
AddressInformation	HouseNum	N	CHAR(7)		Optional for All Events
	StreetDir	N	CHAR(3)		Optional for All Events
	StreetNameAptNum	N	CHAR(28)		Optional for All Events

Name	Data Elements	Req.	Data Definition	Data Description	Event Info
	AdditionalAddress	N	CHAR(28)		Optional for All Events
	City	N	CHAR(15)		Optional for All Events
	State	N	CHAR(2)		Optional for All Events
	Zip	N	CHAR(9)		Optional for All Events
BestAddressInformation		N			Optional for All Events
	PrimaryStreetId	N	CHAR(10)		Optional for All Events
	PreDirectional	N	CHAR(2)		Optional for All Events
	StreetName	N	CHAR(32)		Optional for All Events
	PostDirectional	N	CHAR(2)		Optional for All Events
	StreetSuffix	N	CHAR(4)		Optional for All Events
Name	**Data Elements**	**Req.**	**Data Definition**	**Data Description**	**Event Info**
	UnitType	N	CHAR(4)		Optional for All Events
	UnitID	N	CHAR(8)		Optional for All Events
	City	N	CHAR(32)		Optional for All Events
	State	N	CHAR(2)		Optional for All Events
	Zip	N	CHAR(9)		Optional for All Events
	NonStandardAddress	**N**	CHAR(60)		Optional for All Events

CustomerSuppliedData		N	CHAR(100)	Available on request from CLIENT when they load the 100 byte custom text as a part of the data load.	Optional for All Events
InquiryEventInformation		N		Information available for Inquiry Events (Event Type I)	Specific to Inquiry Events
	KOB	N	CHAR(2)		Specific to Inquiry Events
	PurposeType	N	CHAR(2)		Specific to Inquiry Events
	InquiryDate	N	MMDDYYYY		Specific to Inquiry Events

Name	Data Element	Req.	Data Definition	Data Description	Event Info
……					
Phones (Array)	Source	N	CHAR(1)	P = Published residential phone book U = Update tapes I = Inquiry D = Directory Assistance blank = unknown	All Events
	Type	N	CHAR(1)	R = Residence B = Business P = Pager F = Fax C = Cellular T = Pay Phone I = Institution blank = unknown	All Events
	Number	N	CHAR(10)	Consumers telephone number.	All Events

	FileDate	N	MMDDYYYY	Telephone Number To File Date	All Events
	UpdateDate	N	MMDDYYYY	Telephone Number Updated Date	All Events
	Indicator	N	CHAR(10)	"onFile"	All Events
Models (Array)	ModelId	N	CHAR(2)	Model Id	All Events
	ScoreValue	N	CHAR(10)	Score value for score models	All Events
	Attributes (Array)	N		Attribute array for attribute models	All Events
	Identifier	N	CHAR(10)	Attribute name	All Events
	Sign	N	CHAR(1)	Attribute value sign	All Events
	Value	N	CHAR(10)	Attribute value	All Events

7. Example - JSON Event Notification

The RTE service uses the JSON format for sending alerts to a CLIENT. The format of each section is shown below.

Request Header

```
POST /client-endpoint HTTP/1.1
Date: Wed, 12 May 2017 09:27:15 GMT
Content-Length: xxxx
Content-Type: application/JSON
{
JSON data
   }
```

START OF REAL TIME EVENT NOTIFICATION (ALWAYS PRESENT)

```
{
"Id": "RTE00009999900090000009999201705120927 15P70098501",
```

COMPANY INFORMATION (ALWAYS PRESENT)

```
"TransactionInfo":{
                "EventDeliveryDate":"05122017",
                "EventDeliveryTime":"092715",
                "CompanyId":"999999",
                "PortfolioId":"99",
                "CampaignId":"9999",
                "VersionNum":"001"
},
```

GENERIC INFORMATION FOR ALL EVENTS (ALWAYS PRESENT)

```
"EventInfo":{
          "EventType":"I",
          "ExperianConsumerIdentifier":"OJDWM0661784629G8",
          "EventDisplayCode":"BKCDI",
          "MonitoredAccount":"MONITOREDACCOUNTNUMBER",
          "ConsumerStatementIndicator":"",
          "FactaCode":"",
          "FCRAAttr":"00YYYY05    00"
},
```

CUSTOMER SUPPLIED NAME (ON CLIENT REQUEST)

```
"CustomerSuppliedName":{
                    "Name":{
                        "FirstName":"JONATHAN",
                        "MiddleName":"QUINCY",
                        "Surname":"CONSUMER",
                        "SecondSurname":"TESTCASE",
                        "Gen":"J"
                        }
},
```

FILE ONE BEST ADDRESS (ON CLIENT REQUEST)

```
"BestAddressInformation":{
                    "PrimaryStreetId":"303",
                    "PreDirectional":"E",
                    "StreetName":"FUN AVENUE",
                    "PostDirectional":"W",
                    "StreetSuffix":"ST",
                    "UnitType":"APT",
                    "UnitID":"3J",
                    "City":"NEW YORK",
                    "State":"NY",
                    "Zip":"100283415",
                    "NonStandardAddress":null
},
```

FILE ONE PHONES (ON CLIENT REQUEST)

```
"Phones":[{
                    "Source":"P",
                    "Type":"R",
                    "Number":"1234567890",
                    "FileDate": "08072015",
                    "UpdateDate": "01262016",
                    "Indicator":"onFile"},

                    {"Source":"D",
                    "Type":"C",
                    "Number":"1234567891",
                    "FileDate": "10262022",
                    "UpdateDate":"04042023",
                    "Indicator":"onFile"},
```

```
{"Source":"I",
"Type":"C",
"Number":"1234567892",
"FileDate": "02092010",
"UpdateDate": "02092010",
"Indicator":"onFile"}]
```

EXPERIAN GENERIC MODELS (ON CLIENT REQUEST)

```
"Models":[{
       "ModelId":"CS",
                 "Attributes":[{
                      "Identifier":"P13_ALL0302",
                      "Sign":"+",
                      "Value":"10"},
                      {"Identifier":"P13_ALL0303",
                      "Sign":"+",
                      "Value":"00"},
                      {"Identifier":"P13_ALL0305",
                      "Sign":"+",
                      "Value":"99"},
                      {"Identifier":"P14_ALL0309",
                      "Sign":"+",
                      "Value":"00"}]},
       {"ModelId":"V4",
                 "ScoreValue":"0661"}]}
```

CUSTOMER SUPPLIED DATA (ON CLIENT REQUEST)

```
"CustomerSuppliedData":"CLIENT SUPPLIED 100 BYTE DATA",
```

INQUIRY EVENT INFORMATION (PRESENT for EventType = I)

```
"InquiryEventInformation":{
                     "KOB":"BB",
                     "PurposeType":"18",
                     "InquiryDate":05112017"
},

}
```

8. Available Optional Data Elements

CUSTOMER PROGRAM NAME (DESCRIPTION OF THE MONITORING PROGRAM FOR CLIENTS WITH MULTIPLE PORTFOLIOS AND CAMPAIGNS, AVAILABLE ON CLIENT REQUEST)

```
"CustomerProgramName":"REAL TIME PROGRAM - CALIFORNIA",
```

CUSTOMER SUPPLIED NAME AND ADDRESS - AVAILABLE ON CLIENT REQUEST IF PARTIAL CUSTOMER SUPPLIED INFORMATION IS NOT REQUESTED

```
"CustomerSuppliedNameAddress":{
                "Name":{
                        "FirstName":"JONATHAN",
                        "MiddleName":"QUINCY",
                        "Surname":"CONSUMER",
                        "SecondSurname":"TESTCASE",
                        "Gen":"J"
                        },
                "SSN":999999990",
                "AddressInformation":{
                        "HouseNum":"10655",
                        "StreetDir":"N",
                        "StreetNameAptNum":"BIRCH STREET",
                        "AdditionalAddress":"SE",
                        "City":"BURBANK",
                        "State":"CA",
                        "Zip":"91502"
                        }
},
```

CUSTOMER SUPPLIED SSN (RTCSS) - AVAILABLE ON CLIENT REQUEST

```
"CustomerSuppliedSSN":{
                "SSN":"999999990" },
```

CUSTOMER SUPPLIED ADDRESS - AVAILABLE ON CLIENT REQUEST

```
"CustomerSuppliedAddress":{
               "AddressInformation":{
                              HouseNum":"10655",
                              "StreetDir":"N",
                              "StreetNameAptNum":"BIRCH STREET",
                              "AdditionalAddress":"SE",
                              "City":"BURBANK",
                              "State":"CA",
                              "Zip":"91502"
                              }
},
```

9. Response Message

The CLIENT shall return a response message for every message sent from the RTE service. The format of that response shall depend on whether or not the CLIENT has successfully received and consumed the message. For those that are successfully received, the response message shall contain a 200 HTTP status code along with an informative message. If the message is not successfully received, the response message shall just contain a HTTP status code other than 200.

JSON Response Header:

The following is a sample response header for a HTTP status code 200:

```
HTTP/1.1 200 OK
Server: ASP.NET Development Server/10.0.0.0
Date: Wed, 09 Jan 2017 22:52:23 GMT
X-AspNet-Version: 4.0.30319
Content-Length: 344
Cache-Control: private
Content-Type: application/json; charset=utf-8
Connection: Close
```

The following is a sample response header for a non-200 HTTP status code:

```
HTTP/1.1 500 Internal Server Error
Server: ASP.NET Development Server/10.0.0.0
Date: Wed, 04 Dec 2013 15:59:13 GMT
X-AspNet-Version: 4.0.30319
Content-Length: 246
Cache-Control: private
Content-Type: application/json; charset=utf-8 Connection:
Close
```

Response Message Format

The applicable name/value pairs for the response message are listed below.

- The Req column indicates whether or not the name is required.
- The Data Type column indicates the type of data that can be entered for that particular value. And the maximum length of the value.

Parent Name	Child Name	REQ.	Data Type	Data Description
Id		Y	CHAR(50)	Unique Real Time Event Transaction ID System ID sent in the event
	statusCode	Y	CHAR(10)	
	statusMessage	Y	CHAR(32)	

Example Response Message:

```
{
"transaction": {
"id": " RTE00009999990099000000099992020170512092715P70098501"
},
"statusCode": "0001",
"statusMessage": "Success"
}
```

REAL TIME EVENTS WILL CONSIDER 200 AS A SUCCESS.

HTTP Status Code	Sample Status Message	Description
200	Success	Success status
Non-200	Error	Real Time Events will retry 3 times before writing out an alert to support.

10. Client Listener Application

Experian can provide a prototype client listener application to receive the events. This application can be a good reference point for the client development team to receive the events. This application is built on Java programming language as a web service application.

It has following key functionalities.

Client Listener (Rest Service HTTPS/JSON) Application

| HTTP/S Receiver Receive Event | → | Parse & Validate Payload | → | Log the output | → | End |

1. Receive the events through Https/json REST Service. It is a one way receiving application
2. Perform the validation of input data by checking the key values such as Event Type. 3. Log the message

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