OAG®

INTEGRATION GUIDE
FLIGHT STATUS API
for JSON and XML

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1. Introduction

OAG 's Flight Status API enables customers to integrate our robust, real-time flight information and flight tracking maps with their products and systems – some of which   include airport operations databases, travel and media websites, airport and hospitality displays, and scheduling and dispatching software for ground transportation and aviation   companies. This content enhances such products and systems to drive improved customer   service, increased website traffic, greater sales, and better operational efficiencies.

The data feed includes airline schedule verifications for the next 350 days, real-time flight status information published by airlines   and airports on an ongoing basis, radar-based air traffic data from the FAA and attractive maps showing flight paths and the aircrafts' current locations for in-air flights. This flight data covers all global commercial flights as well   as North American general aviation IFR (instrument flight restrictions).

The query interface is flexible, enabling users to enter simple queries, such as a single flight   by flight number or by route. Also, it supports more complex queries such as multiple flights by flight numbers or by departure/arrival airport. Finally, sample flights may be queried where a flight that is currently in the air will be returned.

The query results include a spectrum of valuable information about a flight. There is standard information concerning departure and arrival airports and times (scheduled, estimated, actual),   but also there is codeshare information, delay and cancellation status, diversion and recovery details, gate assignments, and current location for in-air flights (latitude/longitude) coordinates, altitude, heading, speed, and time remaining (for North America only).

This user guide describes how to use the Flight Status API to get real time flight status for commercial flights. Ask our sales team for a document describing North American general aviation flight status.

2.   OAG Flight Status API Servers

The OAG Flight Status API Servers support the data feed by receiving customer queries and sending back responses. Queries and responses are made via the Internet, using http(s) protocol.

The data servers are in a secure co-location facility with 24/7 support and >99% uptime. They are load-balanced to ensure fast responses to customer queries.

3.   Standard Use Cases

The flight information in the data feed answers a variety of questions, based on the   interests of a wide audience – the general public, online travel agencies, limousine dispatchers and drivers, corporate travel departments, airport employees, FBO operators, and pilots. The following is a list of sample questions, based on a fictitious airline called, FlightView Airways with airline code, FV.

Find a Single Commercial Flight Leg for a Flight Number on Target Date

For the general public checking flight information on a website or mobile site:

- I'm flying on flight FV123 from Detroit to Houston next week. When is it scheduled to depart and arrive that day?
- I'm flying on flight FV456, scheduled to leave Singapore in an hour. Is it still departing on-time or is it delayed?
- I'm flying on flight FV500 from London to Paris, scheduled to leave later today. The weather is very poor, and I'm worried the flight may be delayed or cancelled. What is its status?
- I just landed and have a ticket on a connecting flight, FV100, scheduled to leave for Toronto 10 minutes ago. Has it left yet, or can I catch it if I run to the gate? Also, what gate is it departing from?
- I'm picking someone up at the airport, arriving on flight FV200 from Tokyo in an hour. What is its estimated time of arrival now?
- My brother is arriving on a flight today and I want to know where along the curb I should expect him to appear based on his baggage claim. He is on flight FV234 – what is the baggage claim assigned to this flight?

For a dispatcher managing a fleet of limos:

- A customer just called and requested a ride next Monday from LaGuardia airport to downtown NYC. He said his flight number is FV123, arriving into LGA from Houston at 1:30pm. Can I verify this is the correct information for this flight next Monday?
- We have 24 clients arriving at London Heathrow today on different flights and I need to know if any of their flights are delayed along with updated estimated arrival times, so I can ensure our drivers' will arrive on time to the airport and not keep these clients waiting. Can you tell me when any of these flights – FV123 from Boston, FV100 from Dublin, FV134 from Frankfurt, FV22 from Atlanta, etc., is delayed and provide a new estimated arrival time?
- Are any of our clients' flights cancelled today so I can call them and confirm which new flight they have booked?
- What is the arrival terminal/gate assignment for flight FV123 from Madrid which a client is arriving on later today? Our driver needs to know where to pick him up and how long it will take him to walk to the curb.
- Our client's flight was diverted to another airport. Has the recovery flight taken off yet? If so, when is it expected to arrive?

For airport employees servicing aircrafts:

- When is flight FV123 from Detroit going to arrive? Do I have time to service a different aircraft first?
- Normally flight FV 234 parks at gate B22; however, it is not there today. What gate was it assigned to today?
- Flight FV100 was diverted to Cancun. Has the recovery flight taken off yet and when is it expected to arrive here in Tijuana?

Find All Commercial Flight Legs for a Flight Number on Target Date

For the general public checking flight information on a website or mobile site:

- A couple of colleagues from our office in NYC are meeting me here in Atlanta. One of them

emailed me the flight number, but I'm not sure which NY airport they departed. I need the status of their flight, FV144, which may have multiple legs but when I see a list of these legs I'll pick the one from a NY airport. That should be the right one.

- My in-laws are visiting from Mumbai and had a connection somewhere but I'm not sure where. I just know their flight number is FV144. What is the status of that flight arriving here in London?

For airport employees servicing air crafts:

- Flight FV123 is arriving from Dubai. Where is it departing to next and at what time so I can determine the window in which I have to service it?

Find All Commercial Flight Legs that fly a Route on Target Date

For the general public checking flight information on a website or mobile site:
- I'm picking someone up at the airport, but I don't remember the flight number. She is arriving here in Sydney at 1:20pm from Perth. What is the flight number and what is the status of the flight?
- I missed my connecting flight from Cape Town to Cairo. What other flights are scheduled for today between these two cities?

For a dispatcher managing a fleet of limos:

- A client's flight arriving from Las Vegas was cancelled today. What other flights are scheduled from Las Vegas today that she may have rebooked on?
- A client just called and requested a ride to the Seattle airport on Tuesday to catch a 7:40am flight to Portland. But the flight number appears to be invalid. What flights are scheduled from Seattle to Portland on Tuesday around 7:40am?

Find All Commercial Flight Legs that fly from an airport on Target Date

For hotel guests checking flight status for an airport:

- I'm checking out today. I would like to check the status of my flight that departs in three hours from Frankfurt airport. Is my Lufthansa flight on time and is the gate number assigned?

Find All Commercial Flight Legs for an airline on Target Date

For a travel agency customer looking for a flight on their favorite airline:

- I'm going on a vacation in a couple of weeks and would like to travel by Singapore Airlines from Hong Kong. Are there any flights on March 3 from Hong Kong to Tokyo?

Find All Commercial Flight Legs for a Tail Number

For someone working in aircraft servicing operations:

- When is aircraft with tail number N123 estimated to arrive? What other legs has it flown on today so I can get an idea of what services it will need when it arrives?

4. Query Format

Queries are submitted to the OAG data servers via the HTTP(S) protocol, with a request method set to a GET type. Queries contain *request* parameters. In addition, OAG maintains a set of **customer configuration parameters** which control certain aspects of the response.

A sample query, illustrating these different parameters is the following: http://xml.flightview.com/<fvCompanyName>/fvXML.exe?*'request parameters'*&*'response parameters'*

where 'fvCompanyName' is specific to each customer.

NOTE: While the examples in this guide refer to xml.flightview.com and fvXML.exe, the format of the response can be either XML or JSON-formatted data based on the customer's configuration.

The *request* parameters describe the flight(s) of interest (e.g. flight number, departure airport, etc.). The order in which the parameters are listed does not matter. In the next sections the complete list of request parameters are described, but as an introduction to them, a sample query is as follows:

http://xml.flightview.com/<fvCompanyName>/fvXML.exe?depap=bos&arrap=phx&al=aa&depdate=20190715

In this case the *request* parameters are:

Departure airport: depap=bos
Arrival airport: arrap=phx
Airline: al=aa
Departure date: depdate=20190715

The parameters are not case-sensitive, so you can write depap=bos or DEPAP=BOS.

This query is for all American Airlines flights from Boston to Phoenix on July 15, 2019. The response should have all date/time information expressed locally to the airport and should include all schedule dates/times for the flights, in addition to current status times (estimated, actual).

4.1 *Request Parameters*

The *request* parameters describe the flight(s) of interest. The following is a list of request parameters that may be used to specify a single flight of interest or a set of flights of interest. Different combinations of these request parameters will return a different list of flights.

	Request Parameter	Description	Format	Notes
1	ACID	Flight number of a commercial flight	aa(a)n(n)(n)(n)	aa(a) is an alphanumeric two letter IATA airline abbreviation (as shown on airline tickets). n(n)(n)(n) is 1 to 4 digit flight number (n is value between 0 and 9). **NOTE: Leading zeros are not permitted.**
2	DEPAP	Departure Airport	aaa	aaa is the three letter IATA airport code
3	ARRAP	Arrival Airport	aaa	aaa is the three letter IATA airport code
4	DEPDATE	Departure Date	yyyymmdd	Flight leg departure date
5	ARRDATE	Arrival Date	yyyymmdd	Flight leg arrival date
6	DEPHR*	Departure Hour (-1/+3 hours)	hhmm	hhmm is 24 hour time (default is local time to departure and arrival airports). Values range from 0000 to 2359
7	ARRHR*	Arrival Hour (-1/+3 hours)	hhmm	hhmm is 24 hour time (default is local time to departure and arrival airports). Values range from 0000 to 2359
8	AL	Airline	aa(a)	aa is an alphanumeric two letter IATA airline abbreviation (as shown on airline tickets); 3 letter FAA codes are acceptable as well
9	TAILNBR	Tail number	aaaaaa	Alphanumeric tail number or registration code
10	A	Username		Optional. Not all customer implementations require username or password
11	B	Password		Optional. Not all customer implementations require username or password

There are a number of acceptable combinations of request parameters that will return a flight or a set of flights. Depending on the desired use case or question to answer, certain combinations of request parameters are recommended. In the next section, the recommended combinations of parameters are specified for the standard use cases described in Section 3.

4.1.1   Request Parameters for Standard Use Cases

The following is a list of the use cases listed in Section 3 along with recommended request parameters.

Find a Single Commercial Flight Leg for a Flight Number on Target Date
Option 1: ACID & DEPAP & DEPDATE
Option 2: ACID & ARRAP & ARRDATE

For example:
http://xml.flightview.com/<fvYourCompanyNameXML>/fvXML.exe?acid=AA1&depap=jfk&depdate=20190715

Find All Commercial Flight Legs for a Flight Number on Target Date
Option 1: ACID & DEPDATE
Option 2: ACID & ARRDATE

For example:
http://xml.flightview.com/<fvYourCompanyNameXML>/fvXML.exe?acid=WN1&depdate=20190715

Find All Commercial Flight Legs by Route on Target Date
Option 1: DEPAP & ARRAP & DEPDATE Option 2:
DEPAP & ARRAP & ARRDATE

For example:
http://xml.flightview.com/<fvYourCompanyNameXML>/fvXML.exe?depap=jfk&arrap=lax&depdate=20190715

Find All Commercial Flight Legs departing/arriving at an Airport on Target Date and Hour
Option 1: DEPAP & DEPDATE & DEPHR
Option 2: ARRAP & ARRDATE & ARRHR

For example: http://xml.flightview.com/<fvYourCompanyNameXML>/fvXML.exe?depap=jfk&
depdate=20190715&dephr=1000

Find All Commercial Flight Legs for an airline on Target Date and Hour
Option 1: DEPDATE & DEPHR
Option 2: ARRDATE & ARRHR

For example:
http://xml.flightview.com/<fvYourCompanyNameXML>/fvXML.exe?al=G3&depdate=20190715&dephr=1000

NOTE: When using either the ARRHR or DEPHR parameters, by default, the application returns all qualifying flights in a four-hour window of time; up to one hour prior to, and three hours after, the time (hour) passed as the parameter.

Find All Commercial Flight Legs for a Tail Number

For example: http://xml.flightview.com/<fvYourCompanyNameXML>/fvXML.exe?TAILNBR=N203PM

4.2   Additional Customer Configurations

In addition to query parameters that may be used to specify the inclusion of certain data elements in the data response as well as specify the formatting of certain parameters, there are some customer-level configurations that may be activated by the OAG team for a given customer for similar purposes. These configurations enable the inclusion of content that is very valuable to some customers. These configuration parameters apply to the query results for all flights for a given customer.

	Configuration	Description	Possible	Default
1	Tracker Map for In-Air Flights	Include URL for a tracker map showing the aircraft's current location en-route	(Include URL, Exclude	Exclude URL
2	Format for time to arrival airport for In-Air Flights	Show time to arrival airport as 'remaining' or as 'elapsed'	(Remaining, Elapsed)	Remaining
3	Require username & password	Require username and password so request parameters in Section 4.1 are necessary	(True, False)	False

5. Response Format

The response sent by the OAG FVXML servers consists of three sections:
- Header
- Result Status
- Flight Elements

Each of these shall be discussed in detail. For an example of an XML response, see Appendix B and C.
For an example of a JSON response see Appendix D and E.

5.1   Header

The Header is in the following format
<?xml version=\"1.0\" encoding=\"UTF-8\"?\n>

5.2   Result Status

The result status specifies:
- OAG JSON/XML schema version information
- Query processing information, including the exact query submitted

Below is a sample of the result status:

```xml
<FlightViewResults xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="./FlightViewBase.xsd">
<QueryProcessingStamp    QueryProcessingStampId="2016-12-21|15:15:00|CAP|3992:296">
 <DateTime>
   <Date>2016-12-21</Date>
   <Time>15:15:00</Time>
   <UTC />
 </DateTime>
 <QueryServer>
   <Host>CAP</Host>
   <XMLGenerator>
    <Name>fvXML</Name>
    <Version>3.0.5.38</Version>
   </XMLGenerator>
 </QueryServer>
   <QueryRequest>ACID=DL1017&DEPAP=ATL&DEPDATE=20161221</
 QueryRequest>
 <Result>
    <ResultStatus>
    <OK />
    </ResultStatus>
    <ResultCode>0</ResultCode>
    <ResultMessage>1 flight found for this request</ResultMessage>
 </Result>
</QueryProcessingStamp>
```

5.3 Flight Elements and Schemas

The flight elements section contains zero or more flight elements that match the submitted   query.

For each flight data element, the following elements exist in the schema and may be   present:

FlightID
Aircraft
FlightStatus
ScheduleStatus
Departure
Arrival
SvcType
SchedInfoPresent
RelativeTime
TimeSinceLanding
Airborne
Route
Map
SeqNum
NumLegs
AircraftPreviousFlightLeg
UpLineInfo
DownLineInfo

This section uses tree diagrams to introduce the key sub-elements associated with each of these 15 elements.

- For the complete XML schema, please refer to the Flight Status API XML Schema
- For the JSON schema, please refer to Flight Status API JSON Schema

FlightID contains the following data elements:
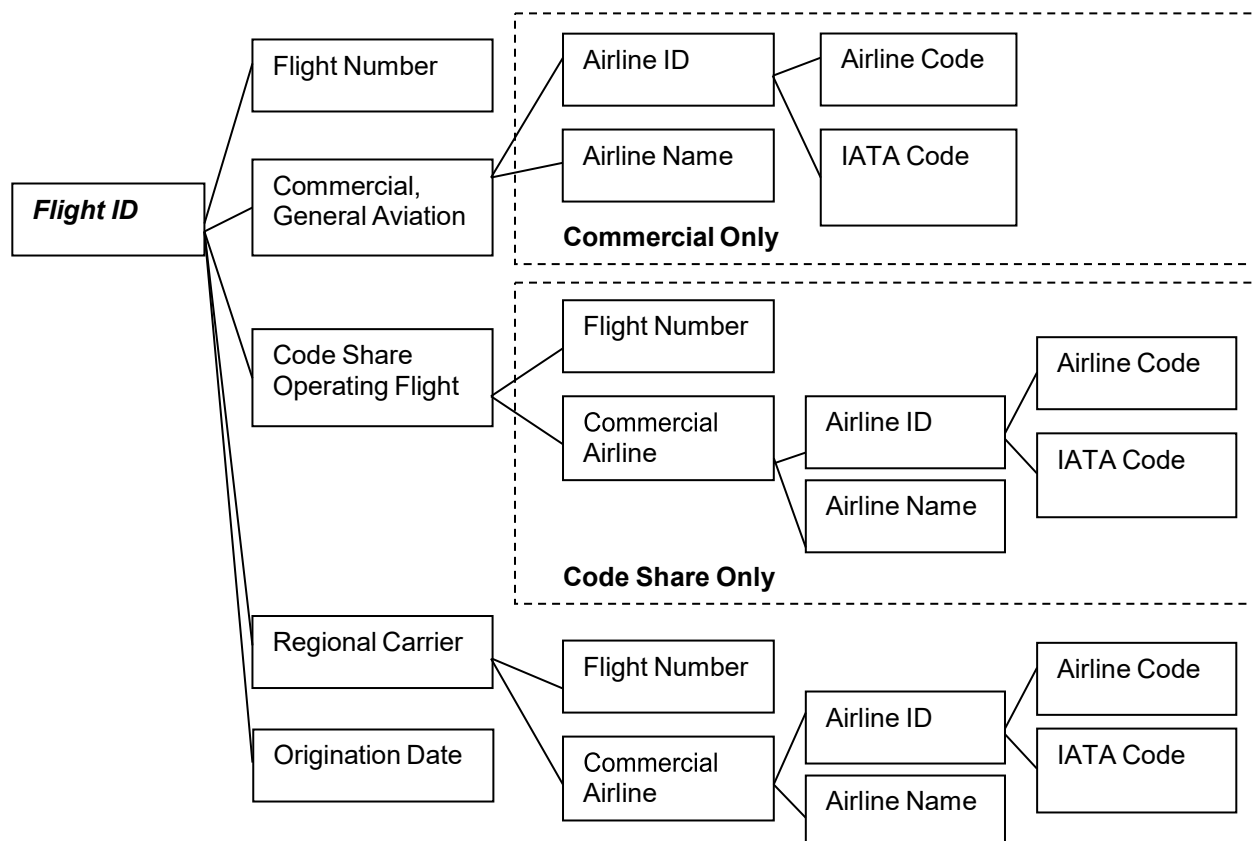
Note: By default, a 2-letter IATA airline code shall be provided. If a 2-letter IATA code is not available for a given airline, a 3-letter code may be provided.

Aircraft contains the following data elements:

```
                          ┌─────────────────────┐
                          │   Aircraft type     │
                          └─────────────────────┘
┌─────────────┐
│  Aircraft   │
└─────────────┘
                          ┌─────────────────────┐
                          │   Tail Number       │
                          └─────────────────────┘
```
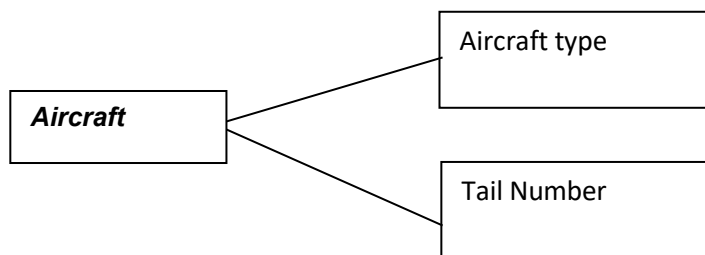
FlightStatus contains the following data elements:

```
                primary     ┌──────────────────────────────────────┐
                status      │ Scheduled, Proposed, InAir, Landed,   │
                            │ Cancelled, NoTakeoffInfo, Delayed,    │
┌─────────────┐             │ Unknown, Outgate, Ingate,             │
│ FlightStatus│             │ Expected, PastFlight                  │
└─────────────┘             └──────────────────────────────────────┘
                secondary   ┌──────────────────────────────────────┐
                status*     │ Original, Diverted, Recovery          │
                            │                                       │
                            └──────────────────────────────────────┘
```
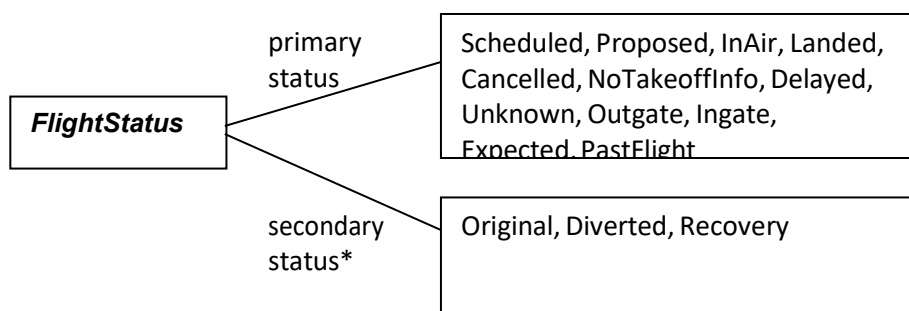
*Secondary status has the following meaning:
Original = primary status applies to the originally scheduled flight path Diverted =
primary status applies to a diverted flight path
Recovery = primary status applies to recovery flight path

ScheduleStatus contains the following data elements:

```
┌──────────────────┐         ┌────────────────────────────┐
│  ScheduleStatus  │         │ DO, DE, DD, AO, AE, AD**    │
└──────────────────┘         └────────────────────────────┘
```
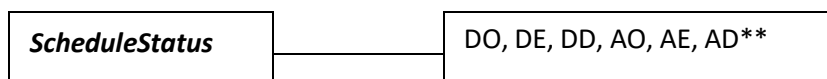
**Status relative to scheduled departure time and scheduled arrival time: DO = Departure
On-time
DE = Departure Early
DD = Departure Delayed AO = Arrival
On-time
AE = Arrival Early
AD = Arrival Delayed

Note: OAG recommends using the more granular Departure Schedule Status found in the Departure node
and Arrival Schedule Status found in the Arrival node.

Departure contains the following data elements:

```
Departure ──┬── Airport ──────┬── Airport ID ──────────┬── Airport Code
            │                 │                        │
            │                 │                        └── IATA Code, FAA Code
            │                 ├── Airport Name
            │                 │
            │                 ├── Airport Location ─────┬── City Name
            │                 │                         ├── State ID
            │                 ├── Terminal              ├── State Name
            │                 │                         ├── Province ID
            │                 ├── Gate                  ├── Country ID
            │                 │                         └── Country Name
            │                 └── Baggage
            │
            ├── Date Time ────┬── Date
            │                 ├── Time
            │                 ├── UTC, Local
            │                 ├── Actual, Estimated, Scheduled
            │                 ├── Runway Time, Gate Time
            │                 └── Airline Data, Schedule Data, FlightView Data
            │
            ├── Original, Alternate
            │
            └── Departure Schedule Status ── DO, DE, DD***
```

***Status relative to scheduled departure time:
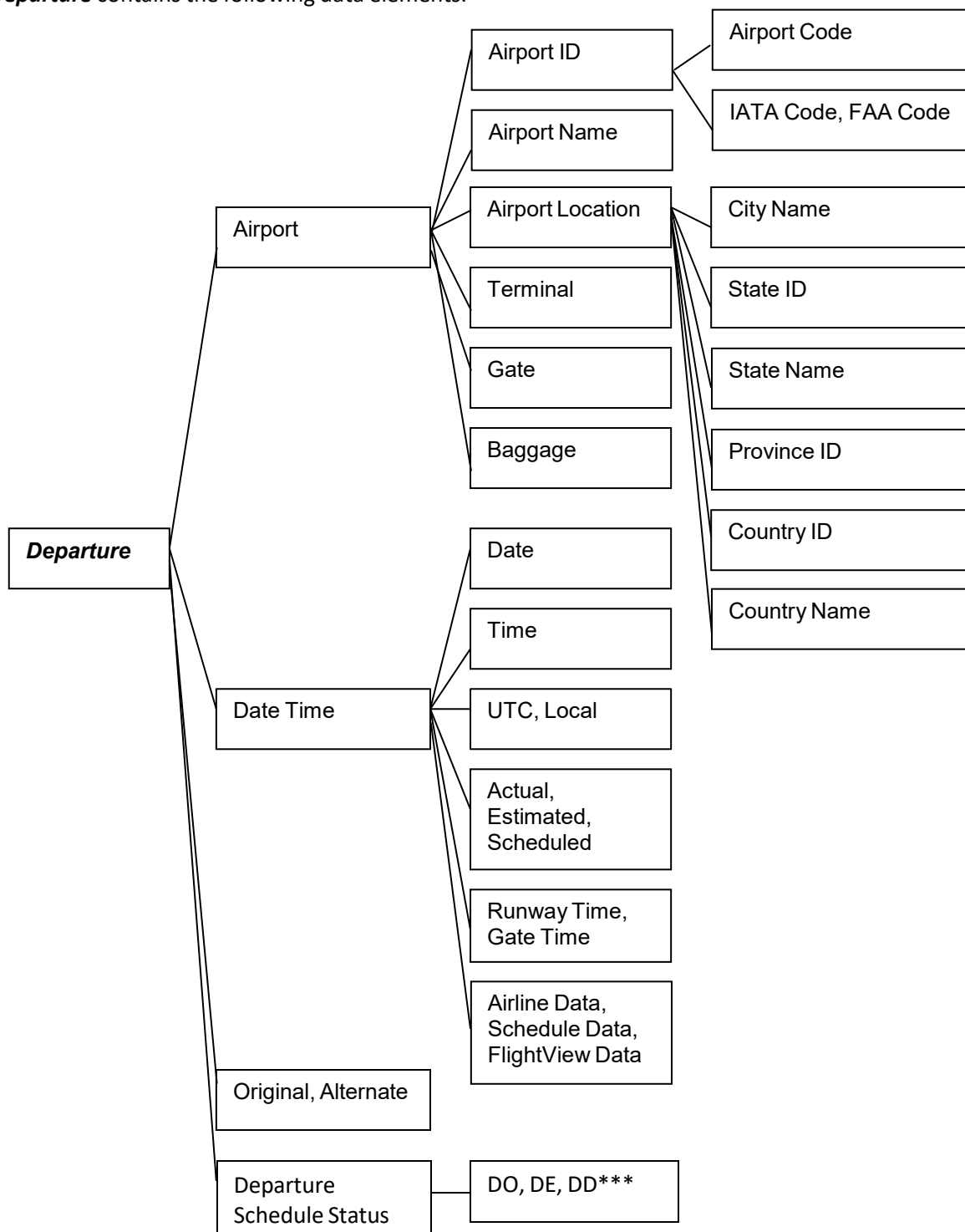DO = Departure On-time
DE = Departure Early
DD = Departure Delayed

Note: For the most part there will be one Departure element for each flight. However, if a flight has been diverted, there may be multiple departure elements depending on where the plane is currently located (alternate airport or final destination).

Arrival contains the following data elements:
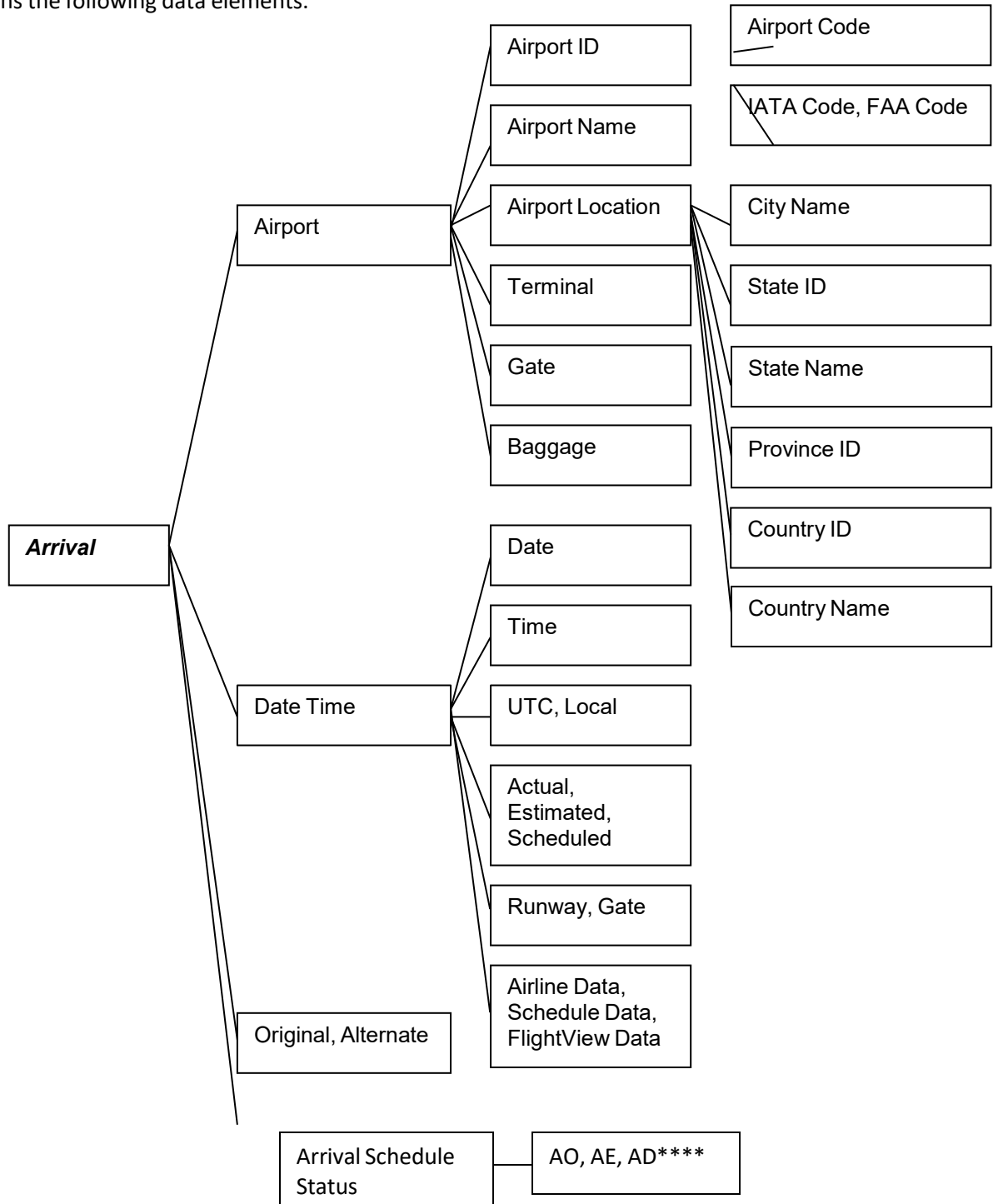

***Status relative to scheduled departure time: AO = Arrival On-time
AE = Arrival Early
AD = Arrival Delayed

Note: For the most part there will be one Arrival element for each flight. However, if a flight has been diverted, there may be multiple arrival elements depending on where the plane is currently located (alternate airport or final destination).

SvcType contains the following data elements:

SvcType	String
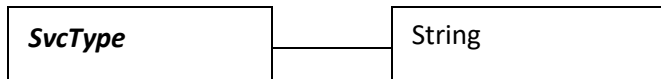
This is a single letter, specified by IATA, used to represent the type of service that the flight is providing. For example, J = scheduled passenger flight. Other codes indicate the flight is used for cargo, charter, etc. See Appendix D for list.

SchedInfoPresent contains the following data elements:

SchedInfoPresent	Y, N
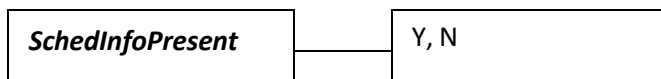
RelativeTime contains the following data elements:

Relative Time	Time
	Remaining, Elapsed
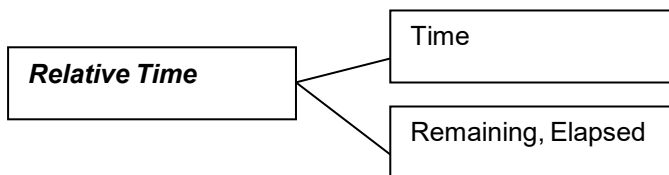
TimeSinceLanding contains the following data elements:

TimeSinceLanding	Duration

Map contains the following data elements:

Map	URL for proprietary graphical map
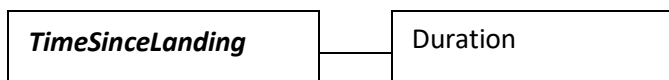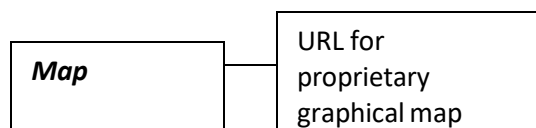
SeqNum contains the following data elements:

SeqNum	String
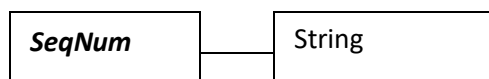
Sequence number for this leg in multi-leg flight.

NumLegs contains the following data elements:

NumLegs	String
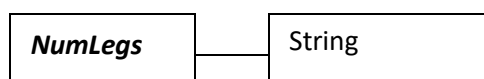
Total number of legs in multi-leg flight, for which this leg is a part of.

AircraftPreviousFlightLeg contains the following data elements:

```
┌──────────────────────────────┐          ┌──────────────────────┐
│                              │          │    Flight ID         │
│  AircraftPreviousFlightLeg   │──────────┤                      │
│                              │          └──────────────────────┘
└──────────────────────────────┘
                                          ┌───────────────┐    ┌──────────────┐
                                          │   Arrival     │────│  DateTime    │
                                          └───────────────┘    └──────────────┘
```
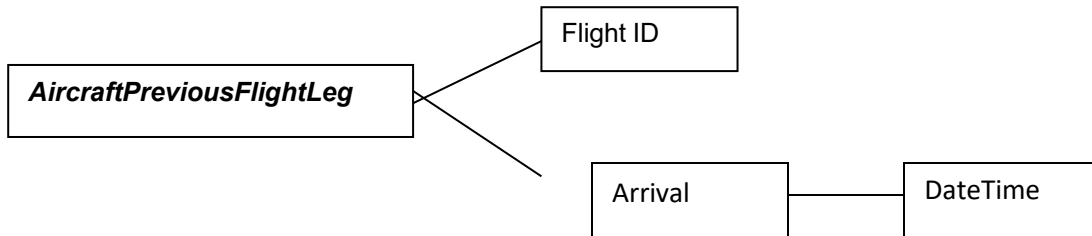
UpLIneInfo contains the following data elements:

```
                                                   ┌──────────────────────────┐
                                                   │  Departure (3 letter      │
                                                   │  airport code)            │
                               ┌───────────────┐   └──────────────────────────┘
┌──────────────────┐           │ FlightLeg     │
│                  │           │ (1 for each   │   ┌──────────────────────────┐
│   UpLIneInfo     │───────────│ upstream leg) │   │  DepContext              │
│                  │           │               │   │  (IATA, ICAO)            │
└──────────────────┘           └───────────────┘   └──────────────────────────┘

                                                   ┌──────────────────────────┐
                                                   │  Arrival (3 letter        │
                                                   │  airport code)            │
                                                   └──────────────────────────┘

                                                   ┌──────────────────────────┐
                                                   │  ArrContext               │
                                                   │  (IATA, ICAO)             │
                                                   └──────────────────────────┘
```
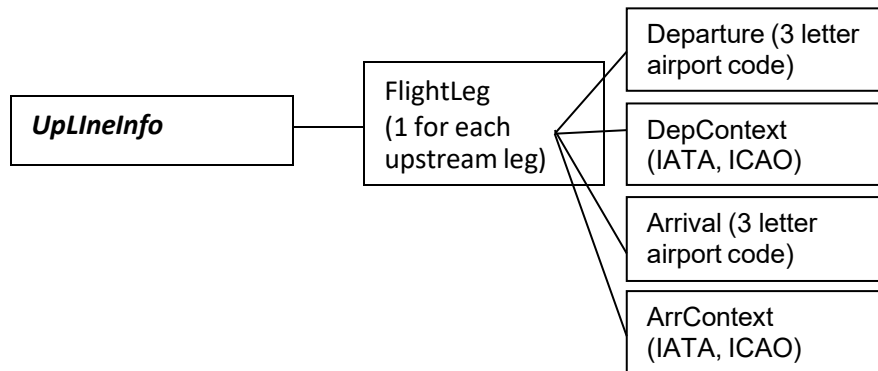
DownStreamInfo contains the following data elements:

```
                                                   ┌──────────────────────────┐
                                                   │  Departure (3 letter      │
                                                   │  airport code)            │
                               ┌───────────────┐   └──────────────────────────┘
┌──────────────────┐           │ FlightLeg     │
│                  │           │ (1 for each   │   ┌──────────────────────────┐
│  DownStreamInfo  │───────────│ downstream leg)│  │  DepContext              │
│                  │           │               │   │  (IATA, ICAO)            │
└──────────────────┘           └───────────────┘   └──────────────────────────┘

                                                   ┌──────────────────────────┐
                                                   │  Arrival (3 letter        │
                                                   │  airport code)            │
                                                   └──────────────────────────┘

                                                   ┌──────────────────────────┐
                                                   │  ArrContext               │
                                                   │  (IATA, ICAO)             │
                                                   └──────────────────────────┘
```
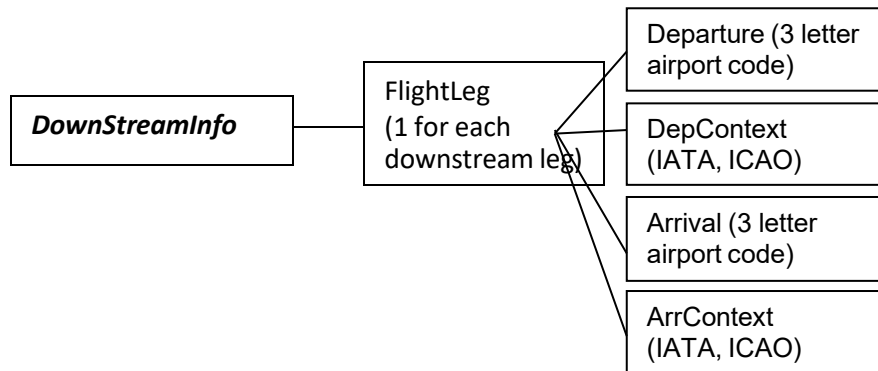
5.4   *Key Data Elements to Drive User Experience*

It is important to process the data elements correctly, particularly when there are schedule deviations. To help customers recognize key values that should drive the user experience in other applications, this section highlights such data values.

Note: In the next section, the flight status values are described and recommendations are provided for how they are displayed in a third party application.

Flight Tracker Map

The following data element provides a URL to a flight tracker map for flights that are currently in the air:

<Flight>
…
<Map>http://sample.flightview.com/fvXMLMaps/online.exe?qtype=XXX&acid=AA1&arrap=LAX& depap=JFK</Map>
        </Flight>

> This URL shows a geographical map of the departure and arrival cities and the flight path in between them. Also, there is a plane icon that illustrates where the flight current is located   along this flight path. Weather radar is overlaid on the map since weather has a significant impact on flight delays.

Flight Query Returns More Than 1 Flight Leg

> There may be cases where a query for a target flight leg yields a result with more than 1 flight leg (even if query includes ACID & DEPAP & DEPDATE). This often occurs when a flight leg is scheduled to fly on successive days. In some cases the airline changes the scheduled departure time for the flight leg on Day 1 by a few minutes so it ends up being scheduled on Day 2. For example, the flight leg is scheduled on Day 1 at 11:45pm and is then rescheduled to depart 30 minutes later, at 12:15am on Day 2. This scenario primarily occurs for queries that interpret depdate, dephr, arrdate, arrhr query parameters as UTC but in rare occasions can occur using local time parameters.

When this occurs, it is important to distinguish the flight legs from each other so the correct one can be presented to the user. To distinguish one flight leg from the other, focus on the scheduled date and time for each flight leg (each <Flight> element in the XML) by comparing the scheduled date and time in the data for the departure OR arrival with those in your system. That is, compare the following combined fields for each flight leg:

Airline Code
Flight Number
Departure Airport*
Scheduled Departure Date & Time*

*Note: Combined Arrival Airport & Scheduled Arrival Date & Time may be used in place of combined Departure Airport & Scheduled Departure Date & Time. To implement such a

comparison, the following algorithm may be used whenever a query is submitted to the API for a <u>single flight leg on a target date</u>. If you have clarifying questions about this algorithm, please reach out to the OAG team.

Algorithm: Find the best matching Flight Leg

The following algorithm can be used to match a single flight leg (<Flight> element in XML response) with a target flight leg in your system. First it tries to find an <u>exact match by scheduled departure date and time</u> (scheduled arrival date and time can be used instead). Since there may be cases where the schedule for a flight has changed, if it does not find an exact match, then it will look for a flight leg with the <u>closest scheduled date and time</u>. In almost all cases the algorithm will find a match; however, there may be a small number of cases where it does not – either because the airline code and flight number do not match any flight or because multiple flight legs fit the criteria for "close" or "loose" matches (see definitions of these below). It is important to define some logic for when this occurs.

    1) Let the variable "close_match_count" represent the number of <Flight> elements whose scheduled departure date and time is <u>within one hour</u> of the desired departure date and time.

    2) Let the variable "loose_match_count" represent the number of <Flight> elements whose scheduled departure date and time is <u>between one and four hours</u> of the desired departure date and time.

    3) Initialize both "close_match_count" and "loose_match_count" to zero.

    4) Iterate through each <Flight> element in the XML response. For each <Flight> element:

      a) If the airline code and flight number of the <Flight> element do not match the desired airline code and flight number,
        - This <Flight> element is definitely not a match. Go to the next <Flight> element.

      b) If the scheduled departure date and time of the <Flight> element exactly match the desired departure date and time,
        -This is the best matching <Flight> element, and stop. Use this <Flight> element.

      c) If the scheduled departure date and time of the <Flight> element is within one hour of the desired departure date and time,
        - Increment the variable "close_match_count" by one.
        - Let the <Flight> be the "close_match_candidate".

      d) If the scheduled departure date and time of the <Flight> element is between one and four hours of the desired departure date and time,
        - Increment the variable "loose_match_count" by one.
        - Let the <Flight> be the "loose_match_candidate".

    5) If "close_match_count" equals one,
     - "close_match_candidate" is the best matching <Flight> element and use it.

    6) If "close_match_count" equals zero and "loose_match_count" equals one,
     - "loose_match_count" is the best matching <Flight> element and use it.

7) Otherwise, there is no best matching <Flight> element.

Distinguishing between Gate Time and Runway Time

There are actually 3 departure times and 3 arrival times associated with a flight. These times include:

Departure:	Arrival:
Scheduled Departure Time	Scheduled Arrival Time
Departure Gate Time (out-gate or pushback) pullup) Departure Runway Time (takeoff) (touchdown)	Arrival Gate Time (in-gate or Arrival Runway Time

The Scheduled time will always be the same. Meanwhile the Gate and Runway times may be estimated or actual times depending on whether the events have occurred or not.

OAG allows for different configurations such that anywhere from 1 to all 3 of these times are associated with the Departure/Arrival nodes for each flight in the query result. By default, both the Gate Times and Runway Times are included (when available) as DateTime sub-elements.

When all three values are included, the following data elements and values shall be present for a Departure node:

```xml
<Departure>
        <Airport>
          …
        </Airport>
        <DateTi
          me>
            <Date></Date>
            <Time></Time>
            <Local/>
            <Scheduled />
            <GateTime/>
        </DateT
          ime>
        <DateTime>
            <Date></Date>
            <Time></Time>
            <Local/>
            <Estimated />
            <GateTime/>
        </DateTime>
        <Original
          />
</Departure>
```

Flight Delayed Prior to Takeoff

The following data elements and values indicate that a flight has been delayed prior to takeoff:

```
<FlightStatus>
  <Delay
    ed/>
 <Original
     />
</FlightStatus>
```

In some cases, estimated out-gate and estimated takeoff times will be available within the Departure node, as DateTime sub-elements. These values will be estimated departure times
associated with the delayed flight.

Flight Diverted to Alternate Airport

When flights are diverted, there is status information that indicates that the flight is either in the process of being diverted to an alternate (unscheduled arrival airport) or in the recovery process and en-route to the scheduled arrival airport. The following data elements and values indicate that a flight is being diverted to an alternate airport.

If the aircraft is en-route to an alternate airport:

```
<FlightStatus>
              <InAir/>
          <Diverte
            d/>
</FlightStatus>
```

If the aircraft has landed at the alternate airport:

```
<FlightStatus>
        <Landed/>
        <Diverted/>
       </FlightStatus>
```

In addition to the flight status indicating there has been a diversion, there may be multiple Departure and Arrival elements for the flight. If the aircraft is en-route to the first alternate   airport, then there will be 1 Departure element (for departure from scheduled airport) and 2 Arrival elements (one for scheduled arrival and one for diverted arrival).

The following data elements and values indicate that a flight is in the recovery process to the scheduled arrival airport.

If the aircraft is en-route from an alternate airport to the scheduled arrival airport:

```
<FlightStatus>
  <InAir/>
<Recovery/>
</FlightStatus>
```

If the aircraft has diverted to an alternate airport, but has recovered and landed at the   scheduled arrival airport:

```
<FlightStatus>
<Landed/>
<Recovery/>
</FlightStatus>
```

In addition to the flight status indicating there has been a recovery, there will be *multiple Departure and Arrival elements for the flight*. If the aircraft is en-route to or landed at the   scheduled arrival airport (after being diverted to one or more alternate airports), then there will   be multiple Departure elements (one for departure from scheduled airport and more for as many alternate airports were visited) and multiple Arrival elements (one for scheduled arrival   and more for as many alternate airports were visited).

Flight Operated by Regional Carrier

There are cases where a marketed carrier has an agreement with a regional carrier to operate their local flights or own the aircrafts used for local flights. In these cases it is helpful for consumers to know that their flights are operated by the regional carrier for reference purposes; for example, when they arrive at the gate and see the regional carrier name/logo on the airplane they will not be concerned. Also, the Department of Transportation (DOT) requires marketing carriers to make this information available to their passengers.

The following data elements and values indicate that a flight is being operated by a regional carrier:

```
<FlightId>
            <FlightNumber>3888</FlightNumber>
            <CommercialAirline>
              <AirlineId>
                <AirlineCode>UA</AirlineCode>
             <IATACode />
              </AirlineId>
             <AirlineName>UnitedAirlines</AirlineName>
            </CommercialAirline>
            <RegionalCarrier>
              <FlightNumber>3888</FlightNumber>
              <CommercialAirline>
                <AirlineId>
                  <AirlineCode>9L</AirlineCode>
                <IATACode />
                </AirlineId>
                <AirlineName>Colgan  Air</AirlineName>
              </CommercialAirline>
            </RegionalCarrier>
            <OrigDate utc="2017-01-30">2017-01-30</OrigDate>
</FlightId>
```

Sequence Number & Number of Legs

The Sequence Number of the sequence position of this flight leg in a multi-leg flight. The Number of Legs is the total number of legs in the flight of which this leg is one of them. When a flight only has 1 leg, then Number of Legs = 1.

The following data elements and values illustrate these two fields:

```
<SeqNum>2</SeqNum>
<NumLegs>3</NumLegs>
```

Upstream & Downstream Flight Legs

In addition to knowing the Sequence Number and Number of Legs in a multi-leg flight (as described above), it is often helpful to reference the origin and destination for the other legs

because some passengers may board the flight at an upstream airport and some may disembark at a downstream airport. The UpLineInfo data element consists of pairs of departure and arrival airports for all the upstream legs relative to this flight leg, and the DownLineInfo data element consists of pairs of departure and arrival airports for all the downstream legs.

The airport pairs are listed in the XML response in the order in which they are scheduled to fly. That is, the first UpLine pair of airports listed (if any up line legs exist) is the first leg (SeqNum = 1). The last UpLine pair listed is the leg immediately prior to this flight leg. Meanwhile, the first DownLine pair of airports listed (if any downstream legs exist) is the first leg after this flight leg. The last DownLine pair of airports listed is the last leg of the flight.

The following data elements and values illustrate the upstream and downstream airport pairs for a flight leg from Atlanta (ATL) to Kansas City (MCI) that is the 2nd of 4 flight legs:

```xml
<UpLineInfo>
  <FlightLeg Departure="JAX" DepContext="IATA" Arrival="ATL"  ArrContext="IATA" />
</UpLineInfo>
<DownLineInfo>
  <FlightLeg Departure="MCI" DepContext="IATA" Arrival="IND"  ArrContext="IATA" />
  <FlightLeg Departure="IND" DepContext="IATA" Arrival="TPA"  ArrContext="IATA" />
</DownLineInfo>
```

Departure & Arrival Schedule Status

There is a schedule status associated with the departure node and one associated with the arrival node. The Departure Schedule Status is the status of the flight's departure from the departure airport as compared to the schedule. Similarly, the Arrival Schedule Status is the status of the flight's arrival at the arrival airport as compared to the schedule. The possible values for each are:

Departure Schedule Status: Arrival Schedule
Status: DE = Departed Early   AE = Arrived
Early
DO = Departed On-time   AO = Arrived On-time
DD = Departed Delayed   AD = Arrived

Delayed

The following data elements and values illustrate these fields:

<Departure>
            <Airport>
             …
            </Airport>
            <DateTime>
             …
            </DateTime>
            <DateTime>
             …
            </DateTime>
            <Original />
            <DepartureScheduleStatus>DO</DepartureScheduleStatus>
        </Departure>

5.5 *Flight Status Descriptions & Recommended Display Text*

The following table shows the recommended, consumer-friendly, display text for Flight Status to show in your customer-facing application(s). These values are mapped to the status values in the data feed. Also a description of each status is provided.

API Flight Status Value	Recommended Display Text for Flight Status	Description
Scheduled	Scheduled	The flight exists in airline schedule data. OAG has not received updated information on it from the FAA, airline or departure/arrival airport.
Proposed	Scheduled	This status is relevant to flights tracked by the FAA. It indicates that the pilot has filed a flight plan with the FAA prior to takeoff. This status is explicitly stated in the FVXML feed, however, often it is not relevant to the general public.
OutGate	Departed	OAG has received data indicating that the Flight has left the departure gate, but has not taken off in the air.
InAir	In Air	OAG has received a wheels up message from the FAA, airline, or departure/arrival airport for this flight, indicating it is in the air (for FAA tracked flights, takeoff notification is delayed 5 minutes in accordance with FAA regulations).
Landed	Landed	OAG has received touchdown information from the FAA, airline, or departure/arrival airport for this flight, indicating it has landed.
InGate	Arrived	OAG has received data indicating that the flight has arrived at the arrival gate.
Expected	Expected	OAG has received information from a data source that the flight is expected to land at the arrival airport soon. Often the source is the arrival airport, but not necessarily. In most cases there is an estimated arrival time.

NoTakeOffInfo	No Takeoff Info – Call Airline	It is approximately 30 minutes past the scheduled time of departure for this flight and there is no updated information on it. There is a possibility that updated information will become available, so the flight's status should continue to be monitored. Under these circumstances it is recommended that the airline is called to inquire about the flight's status.
Delayed	Delayed	OAG has received data indicating that the flight has been delayed.
Cancelled	Cancelled	OAG has received data indicating that the flight has been cancelled.
PastFlight	Past Flight	The operational time window for the flight has passed and OAG did not receive data concerning its actual landing or arrival.
Unknown	No Recent Info – Call Airline	It is more than 90 minutes past the scheduled time of departure or arrival for this flight and there is no updated information on it. There is a possibility that update information will become available, so the flight's status should continue to be monitored. Under these circumstances it is recommended that the airline is called to inquire about the flight's status.

Appendix A: Valid Combinations of Request Parameters

In Section 4.1.1 the recommended combinations of request parameters for standard use cases were defined. However, there are other valid combinations of request parameters that will return results from the OAG Flight Status API servers. In this appendix, all acceptable combinations of request parameters are listed in the table below.

The request parameters are listed in the headers of the columns. The cell entries in each row indicate whether the request parameter in that column should be included in the query to support the use case described in the left-most column. These cell entries are: Y = Mandatory, O = Optional, and X = Excluded. When a request parameters is optional instead of mandatory or excluded it will help filter the resulting list of flights.

Y = Mandatory, O = Optional, X = Excluded

Use Case	ACID	ACID includes AL	DEPAP	ARRAP	DEPDATE	DEPHR	ARRDATE	ARRHR	AL (as filter)
Target flight leg from departure airport	Y	YES	Y	X	O	X	X	X	X
Target flight leg from departure airport	Y	NO	Y	X	O	X	X	X	Y
Target flight leg from arrival airport	Y	YES	X	Y	X	X	O	X	X
Target flight leg from arrival airport	Y	NO	X	Y	X	X	O	X	Y
Target flight by departure day	Y	YES	X	X	Y	X	X	X	X
Target flight by departure day	Y	NO	X	X	Y	X	X	X	Y
Use Case	ACID	ACID includes AL	DEPAP	ARRAP	DEPDATE	DEPHR	ARRDATE	ARRHR	AL (as filter)

Target flight by arrival day	Y	YES	X	X	X	X	Y	X	X
Target flight by arrival day	Y	NO	X	X	X	X	Y	X	Y
Target flight all days	Y	YES	X	X	X	X	X	X	X
Target flight all days	Y	NO	X	X	X	X	X	X	Y
Target flight leg by city pair all days	Y	YES	Y	Y	X	X	X	X	X
Target flight leg by city pair all days	Y	NO	Y	Y	X	X	X	X	Y
All flights by city pair from departure	X	O	Y	Y	Y	O	X	X	O
All flights by city pair from arrival day	X	-	Y	Y	X	X	Y	O	O
All flights from departure	X	-	Y	X	Y	Y	X	X	O
All flights to arrival airport*	X	-	X	Y	X	X	Y	Y	O
Random flight data*	"RANDOM"		O	X	X	O	X	X	O

* - Extra feature: Query is not a standard feature - contact sales representative if interested.

Appendix B: Sample Query & Response in XML

In this appendix, a complete sample query and response for an in-air flight are provided. Note the status of each flight data element – they are highlighted in bold.

Example 1: Sample In-Air Flight

First, here is the sample query to the OAG FVXML Server:

http://xml.flightview.com/<fvCompanyName>/fvXML.exe?acid=BA103&depdate=20170322

Here is the response:

Response Header	```xml
	<?xml version="1.0" encoding="UTF-8"?>
	<FlightViewResults xsi:noNamespaceSchemaLocation="./FlightViewBase.xsd"
	  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
	    <QueryProcessingStamp QueryProcessingStampId="2017-03-
	22|20:08:03|DECKER|1126:124">
	``

Results Status	```xml
	      <DateTime>
	        <Date>2017-03-22</Date>
	        <Time>20:08:03</Time>
	        <UTC/>
	      </DateTime>
	      <QueryServer>
	        <Host>DECKER</Host>
	        <XMLGenerator>
	          <Name>fvXML</Name>
	          <Version>3.0.5.38</Version>
	        </XMLGenerator>
	      </QueryServer>
	      <QueryRequest>ACID=BA103&DEPDATE=20170322</QueryRequest>
	      <Result>
	        <ResultStatus>
	          <OK/>
	        </ResultStatus>
	        <ResultCode>0</ResultCode>
	        <ResultMessage>1 flight(s) found for this request</ResultMessage>
	      </Result>
	    </QueryProcessingStamp>
	``

Flight ID	```xml
	    <Flight FlightId="BA103:LHR:2017-03-22:1535">
	      <FlightId>
	        <FlightNumber>103</FlightNumber>
	        <CommercialAirline>
	          <AirlineId>
	            <AirlineCode>BA</AirlineCode>
	            <IATACode/>
	          </AirlineId>
	          <AirlineName>British Airways</AirlineName>
	        </CommercialAirline>
	        <OrigDate utc="2017-03-22">2017-03-22</OrigDate>
	``

```
Code share        <OperatingFlight/>
                  <CodeShare>
                    <FlightNumber>6225</FlightNumber>
                    <CommercialAirline>
                      <AirlineId>
                        <AirlineCode>AA</AirlineCode>
                        <IATACode/>
                      </AirlineId>
                      <AirlineName>American Airlines</AirlineName>
                    </CommercialAirline>
                  </CodeShare>
                  <CodeShare>
                    <FlightNumber>5990</FlightNumber>
                    <CommercialAirline>
                      <AirlineId>
                        <AirlineCode>AY</AirlineCode>
                        <IATACode/>
                      </AirlineId>
                      <AirlineName>Finnair</AirlineName>
                    </CommercialAirline>
                  </CodeShare>
                  <CodeShare>
                    <FlightNumber>8803</FlightNumber>
                    <CommercialAirline>
                      <AirlineId>
                        <AirlineCode>EI</AirlineCode>
                        <IATACode/>
                      </AirlineId>
                      <AirlineName>Aer Lingus</AirlineName>
                    </CommercialAirline>
                  </CodeShare>
                  <CodeShare>
                    <FlightNumber>4609</FlightNumber>
                    <CommercialAirline>
                      <AirlineId>
                        <AirlineCode>IB</AirlineCode>
                        <IATACode/>
                      </AirlineId>
                      <AirlineName>Iberia Airlines</AirlineName>
                    </CommercialAirline>
                  </CodeShare>
                </FlightId>
Aircraft        <Aircraft>
                  <AircraftType>788</AircraftType>
                  <TailNumber>GZBJA</TailNumber>
                </Aircraft>
Flight Status   <FlightStatus>
                  <InAir/>
                  <Original/>
                </FlightStatus>
                <ScheduleStatus>AE</ScheduleStatus>
```

| Departure Airport | ```xml
<Departure>
  <Airport>
    <AirportId>
      <AirportCode>LHR</AirportCode>
      <IATACode/>
    </AirportId>
    <AirportName>HEATHROW</AirportName>
    <AirportLocation>
      <CityName>LONDON</CityName>
      <CountryId>GB</CountryId>
    </AirportLocation>
    <Terminal>5</Terminal>
  </Airport>
``` |
| Departure *Scheduled Gate* Date/Time | ```xml
  <DateTime>
    <Date utc="2017-03-22">2017-03-22</Date>
    <Time utc="15:35:00">15:35:00</Time>
    <Local/>
    <Scheduled/>
    <GateTime/>
    <ScheduleData/>
  </DateTime>
``` |
| Departure *Actual Gate* Date /Time | ```xml
  <DateTime>
    <Date utc="2017-03-22">2017-03-22</Date>
    <Time utc="15:42:00">15:42:00</Time>
    <Local/>
    <Actual/>
    <GateTime/>
    <AirlineData/>
  </DateTime>
``` |
| Departure *Actual Runway* Date /Time | ```xml
  <DateTime>
    <Date utc="2017-03-22">2017-03-22</Date>
    <Time utc="16:11:00">16:11:00</Time>
    <Local/>
    <Actual/>
    <RunwayTime/>
    <AirlineData/>
  </DateTime>
``` |
| "Original" = scheduled airport | ```xml
  <Original/>
``` |
| | ```xml

</Departure>
<Arrival>
``` |
| Arrival Airport | ```xml
  <Airport>
    <AirportId>
      <AirportCode>YYC</AirportCode>
      <IATACode/>
    </AirportId>
    <AirportName>CALGARYINTL</AirportName>
    <AirportLocation>
      <CityName>CALGARY</CityName>
      <ProvinceId>AB</ProvinceId>
``` |

	`<CountryId>CA</CountryId>`
	`</AirportLocation>`
	`</Airport>`
	`<DateTime>`
	`<Date utc="2017-03-23">2017-03-22</Date>`
Arrival *scheduled* **Gate** Date /Time	`<Time utc="00:55:00">18:55:00</Time>`
	`<Local/>`
	`<Scheduled/>`
	`<GateTime/>`
	`<ScheduleData/>`
	`</DateTime>`
	`<DateTime>`
	`<Date utc="2017-03-23">2017-03-22</Date>`
Arrival *Estd* **Gate** Date /Time	`<Time utc="00:51:00">18:51:00</Time>`
	`<Local/>`
	`<Estimated/>`
	`<GateTime/>`
	`<AirlineData/>`
	`</DateTime>`
	`<Original/>`
	`</Arrival>`
	`<SvcType>J</SvcType>`
	`<SchedInfoPresent>Y</SchedInfoPresent>`
URL for Tracker Map for In-Air Flights only	`<Map>http://tracker.flightview.com/fvXMLDemoMapEstPos/flightviewCGI.exe?qtype=GIF&acid=BA103&arrap=YYC&depap=LHR</Map>`
Seq Num Num of Legs	`<SeqNum>1</SeqNum>`
	`<NumLegs>1</NumLegs>`
Aircraft previous flight	`<AircraftPreviousFlightLeg>`
	`<FlightId>`
	`<FlightNumber>276</FlightNumber>`
	`<CommercialAirline>`
	`<AirlineId>`
	`<AirlineCode>BA</AirlineCode>`
	`<IATACode/>`
	`</AirlineId>`
	`<AirlineName>British Airways</AirlineName>`
	`</CommercialAirline>`
	`</FlightId>`
	`<Arrival>`
	`<DateTime>`
	`<Date utc="2017-03-22">2017-03-22</Date>`
	`<Time utc="12:40:00">12:40:00</Time>`
	`<Local/>`
	`<Scheduled/>`
	`<GateTime/>`
	`<ScheduleData/>`
	`</DateTime>`
	`</Arrival>`
	`</AircraftPreviousFlightLeg>`

```
   </Flight>
</FlightViewResults>
```

Appendix C: Sample Query & Response for Diversion in XML

In this appendix, a complete sample query and response are provided. This is for a flight that has been diverted to an alternative airport and is waiting to take off on a recovery leg to its originally scheduled destination. The diverted flight leg appears in the response as one flight data element and the recovered flight leg appears as a separate flight data element. Note the status of each flight data element – they are highlighted in bold.

First, here is the sample query to the OAG FVXML Server:

http://xml.flightview.com/<fvCompanyName>/fvXML.exe?acid=SQ7297&Depdate=20170412&depap=MEL

Here is the response:

Response Header	```<?xml version="1.0" encoding="UTF-8"?>```
	```<FlightViewResults xsi:noNamespaceSchemaLocation="./FlightViewBase.xsd"```
	``` xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">```

Results Status	``` <QueryProcessingStamp QueryProcessingStampId="2017-04-13|14:26:39|SAREK|13831:91">```
	``` <DateTime>```
	``` <Date>2017-04-13</Date>```
	``` <Time>14:26:39</Time>```
	``` <UTC/>```
	``` </DateTime>```
	``` <QueryServer>```
	``` <Host>SAREK</Host>```
	``` <XMLGenerator>```
	``` <Name>fvXML</Name>```
	``` <Version>3.0.5.38</Version>```
	``` </XMLGenerator>```
	``` </QueryServer>```
	``` <QueryRequest>ACID=SQ7297&DEPDATE=20170412&DEPAP=MEL</QueryRequest>```
	``` <Result>```
	``` <ResultStatus>```
	``` <OK/>```
	``` </ResultStatus>```
	``` <ResultCode>0</ResultCode>```
	``` <ResultMessage>2 flight(s) found for this request</ResultMessage>```
	``` </Result>```
	``` </QueryProcessingStamp>```

Flight ID	``` <Flight FlightId="SQ7297:MEL:2017-04-12:1135">```
	``` <FlightId>```
	``` <FlightNumber>7297</FlightNumber>```
	``` <CommercialAirline>```
	``` <AirlineId>```
	``` <AirlineCode>SQ</AirlineCode>```
	``` <IATACode/>```
	``` </AirlineId>```
	``` <AirlineName>Singapore Airlines</AirlineName>```

	`</CommercialAirline>`
	`<OrigDate utc="2017-04-12">2017-04-12</OrigDate>`
	`</FlightId>`
Aircraft	`<Aircraft>`
	`<AircraftType>74Y</AircraftType>`
	`<TailNumber>9VSFP</TailNumber>`
	`</Aircraft>`
Flight Status	`<FlightStatus>`
	`<InGate/>`
	`<Diverted/>`
	`</FlightStatus>`
Departure Airport	`<Departure>`
	`<Airport>`
	`<AirportId>`
	`<AirportCode>MEL</AirportCode>`
	`<IATACode/>`
	`</AirportId>`
	`<AirportName>MELBOURNE INTL</AirportName>`
	`<AirportLocation>`
	`<CityName>MELBOURNE</CityName>`
	`<CountryId>AU</CountryId>`
	`</AirportLocation>`
	`</Airport>`
Departure *Scheduled Gate* Date/Time	`<DateTime>`
	`<Date utc="2017-04-12">2017-04-12</Date>`
	`<Time utc="11:35:00">21:35:00</Time>`
	`<Local/>`
	`<Scheduled/>`
	`<GateTime/>`
	`<ScheduleData/>`
	`</DateTime>`
Departure *Actual Gate* Date/Time	`<DateTime>`
	`<Date utc="2017-04-12">2017-04-12</Date>`
	`<Time utc="11:11:00">21:11:00</Time>`
	`<Local/>`
	`<Actual/>`
	`<GateTime/>`
	`<AirlineData/>`
	`</DateTime>`
Departure *Actual Runway* Date /Time	`<DateTime>`
	`<Date utc="2017-04-12">2017-04-12</Date>`
	`<Time utc="11:37:00">21:37:00</Time>`
	`<Local/>`
	`<Actual/>`
	`<RunwayTime/>`
	`<AirlineData/>`
	`</DateTime>`
"Original" = scheduled airport	`<Original/>`
	`</Departure>`
	`<Arrival>`
	`<Airport>`

Arrival Airport	`<AirportId>`
	`<AirportCode>`SIN`</AirportCode>`
	`<IATACode/>`
	`</AirportId>`
	`<AirportName>`CHANGI AIRPORT`</AirportName>`
	`<AirportLocation>`
	`<CityName>`SINGAPORE`</CityName>`
	`<CountryId>`SG`</CountryId>`
	`</AirportLocation>`
	`</Airport>`
	`<DateTime>`
Arrival scheduled *Gate* Date /Time	`<Date utc="2017-04-12">`2017-04-13`</Date>`
	`<Time utc="19:35:00">`03:35:00`</Time>`
	`<Local/>`
	`<Scheduled/>`
	`<GateTime/>`
	`<ScheduleData/>`
	`</DateTime>`
"Original" = scheduled airport	`<Original/>`
	`</Arrival>`
	`<Arrival>`
	`<Airport>`
Alternate Arrival Airport	`<AirportId>`
	`<AirportCode>`BNE`</AirportCode>`
	`<IATACode/>`
	`</AirportId>`
	`<AirportName>`BRISBANE INTL`</AirportName>`
	`<AirportLocation>`
	`<CityName>`BRISBANE`</CityName>`
	`<CountryId>`AU`</CountryId>`
	`</AirportLocation>`
	`</Airport>`
	`<DateTime>`
Alternate Airport Arrival *Actual Gate* Date /Time	`<Date utc="2017-04-12">`2017-04-12`</Date>`
	`<Time utc="13:27:00">`23:27:00`</Time>`
	`<Local/>`
	`<Actual/>`
	`<GateTime/>`
	`<AirlineData/>`
	`</DateTime>`
	`<Alternate/>`
Alternate airport	`</Arrival>`
	`<SvcType>`F`</SvcType>`
	`<SchedInfoPresent>`Y`</SchedInfoPresent>`
Service Type	`<RelativeTime>`
	`<Remaining/>`
	`</RelativeTime>`
Sequence and number of legs	`<SeqNum>`2`</SeqNum>`
	`<NumLegs>`2`</NumLegs>`
	`<AircraftPreviousFlightLeg>`
	`<FlightId>`

Aircraft previous flight

```xml
    <FlightNumber>7297</FlightNumber>
    <CommercialAirline>
      <AirlineId>
        <AirlineCode>SQ</AirlineCode>
        <IATACode/>
      </AirlineId>
      <AirlineName>Singapore Airlines</AirlineName>
    </CommercialAirline>
  </FlightId>
  <Arrival>
    <DateTime>
      <Date utc="2017-04-12">2017-04-12</Date>
      <Time utc="09:20:00">19:20:00</Time>
      <Local/>
      <Scheduled/>
      <GateTime/>
      <ScheduleData/>
    </DateTime>
  </Arrival>
</AircraftPreviousFlightLeg>
<UpLineInfo>
  <FlightLeg ArrContext="IATA" Arrival="MEL" DepContext="IATA" Departure="AKL"/>
</UpLineInfo>
</Flight>
<Flight FlightId="SQ7297:BNE:2017-04-12:1513">
<FlightId>
  <FlightNumber>7297</FlightNumber>
  <CommercialAirline>
    <AirlineId>
      <AirlineCode>SQ</AirlineCode>
      <IATACode/>
    </AirlineId>
    <AirlineName>Singapore Airlines</AirlineName>
  </CommercialAirline>
</FlightId>
<Aircraft>
  <TailNumber>9VSFP</TailNumber>
</Aircraft>
<FlightStatus>
  <InGate/>
  <Recovery/>
</FlightStatus>
<Departure>
  <Airport>
    <AirportId>
      <AirportCode>MEL</AirportCode>
      <IATACode/>
    </AirportId>
    <AirportName>MELBOURNE INTL</AirportName>
    <AirportLocation>
```

Arrival date time

Upline info

Flight Id

Flight Status

Departure Airport Of original second leg

```
                        <CityName>MELBOURNE</CityName>
                        <CountryId>AU</CountryId>
                      </AirportLocation>
                    </Airport>
                    <DateTime>
                      <Date utc="2017-04-12">2017-04-12</Date>
                      <Time utc="11:35:00">21:35:00</Time>
                      <Local/>
                      <Scheduled/>
                      <GateTime/>
                      <ScheduleData/>
                    </DateTime>
                    <Original/>
                  </Departure>
                  <Departure>
                    <Airport>
                      <AirportId>
                        <AirportCode>BNE</AirportCode>
                        <IATACode/>
                      </AirportId>
                      <AirportName>BRISBANE INTL</AirportName>
                      <AirportLocation>
                        <CityName>BRISBANE</CityName>
                        <CountryId>AU</CountryId>
                      </AirportLocation>
                    </Airport>
                    <DateTime>
                      <Date utc="2017-04-12">2017-04-13</Date>
                      <Time utc="15:13:00">01:13:00</Time>
                      <Local/>
                      <Actual/>
                      <GateTime/>
                      <AirlineData/>
                    </DateTime>
                    <Alternate/>
                  </Departure>
                  <Arrival>
                    <Airport>
                      <AirportId>
                        <AirportCode>SIN</AirportCode>
                        <IATACode/>
                      </AirportId>
                      <AirportName>CHANGI AIRPORT</AirportName>
                      <AirportLocation>
                        <CityName>SINGAPORE</CityName>
                        <CountryId>SG</CountryId>
                      </AirportLocation>
                    </Airport>
                    <DateTime>
                      <Date utc="2017-04-12">2017-04-13</Date>
                      <Time utc="19:35:00">03:35:00</Time>
```

Departure scheduled gate time

Original departure airport

Alternate departure airport

Date/time for recovery leg

Original arrival airport

Scheduled date/time for recovery leg	`<Local/>`
	`<Scheduled/>`
	`<GateTime/>`
	`<ScheduleData/>`
	`</DateTime>`
	`<DateTime>`
	`<Date utc="2017-04-12">2017-04-13</Date>`
	`<Time utc="22:59:00">06:59:00</Time>`

Actual arrival date/time	`<Local/>`
	`<Actual/>`
	`<GateTime/>`
	`<AirlineData/>`
	`</DateTime>`
	`<DateTime>`
	`<Date utc="2017-04-12">2017-04-13</Date>`
	`<Time utc="22:49:00">06:49:00</Time>`

Actual runway date/time	`<Local/>`
	`<Actual/>`
	`<RunwayTime/>`
	`<AirlineData/>`
	`</DateTime>`
	`<Original/>`
	`</Arrival>`
	`<SvcType>F</SvcType>`
	`<SchedInfoPresent>N</SchedInfoPresent>`

Service type	`<RelativeTime>`
	`<Remaining/>`
	`</RelativeTime>`
	`<SeqNum>1</SeqNum>`
	`<NumLegs>1</NumLegs>`

Sequence number and number of legs	`</Flight>` `</FlightViewResults>`

Appendix D: Sample Query and Response in JSON

In this appendix, a complete sample query and response for a landed flight is provided.

For the first leg of BA1 from LCY to SNN, here is the sample query to the OAG Flight Status API Server:

/fvxml.exe?ACID=BA1&DEPDATE=20190724&DEPAP=LCY

Here is the data in raw JSON format:

```
{"Result":{"ProcessingTimeUtc":"2019-07-
24T19:29:36","Version":"3.0.5.61","Code":"0","Message":"1 flight(s) found
for this
request","Flights":1},"Flights":[{"FlightGuid":"B780BFC2348A4DA9963733CFC
9B464F2","Acid":{"Airline":{"Code":"B6","CodeNamespace":"Iata","Name":"Je
tBlue
Airways"},"FlightNumber":"400"},"DepartureAirport":{"Code":"MSY","CodeNam
espace":"Iata","Name":"LOUIS ARMSTRONG NEW ORLEANS
INTL","Location":{"CityName":"NEW
ORLEANS","StateId":"LA","CountryId":"US"}},"ArrivalAirport":{"Code":"BOS"
,"CodeNamespace":"Iata","Name":"GENERAL EDWARD LAWRENCE LOGAN
IN","Location":{"CityName":"BOSTON","StateId":"MA","CountryId":"US"}},"Or
iginationDate":{"Utc":"2019-07-24","Local":"2019-07-
24"},"ScheduledDeparture":{"Utc":"2019-07-24T18:12Z","Local":"2019-07-
24T13:12"},"ScheduledArrival":{"Utc":"2019-07-24T21:40Z","Local":"2019-
07-
24T17:40"},"Scheduled":true,"GeneralAviation":false,"Status":"InAir","Dep
artureScheduleStatus":null,"ArrivalScheduleStatus":null,"DiversionStatus"
:null,"DepDelayReason":[{"Code":6,"Subcode":"
"}],"ArrDelayReason":[{"Code":6,"Subcode":"
"}],"FaaId":{"Code":"JBU","CodeNamespace":"Icao","FlightId":"400"},"Codes
hares":[{"Airline":{"Code":"EI","CodeNamespace":"Iata","Name":"Aer
Lingus"},"FlightNumber":"5179"},{"Airline":{"Code":"EK","CodeNamespace":"
Iata","Name":"Emirates
Airline"},"FlightNumber":"6348"},{"Airline":{"Code":"QR","CodeNamespace":
"Iata","Name":"Qatar
Airways"},"FlightNumber":"4117"}],"OutGate":{"Accuracy":"Actual","DateTim
eUtc":"2019-07-24T18:09Z","DateTimeLocal":"2019-07-
24T13:09","SourceType":"AirlineData"},"InAir":{"Accuracy":"Actual","DateT
imeUtc":"2019-07-24T18:22Z","DateTimeLocal":"2019-07-
24T13:22","SourceType":"AirlineData"},"Landed":{"Accuracy":"Estimated","D
ateTimeUtc":"2019-07-24T20:55Z","DateTimeLocal":"2019-07-
24T16:55","SourceType":"FlightViewData"},"InGate":{"Accuracy":"Estimated"
,"DateTimeUtc":"2019-07-24T21:13Z","DateTimeLocal":"2019-07-
24T17:13","SourceType":"AirlineData"},"DepartureTerminal":null,"Departure
Gate":"C5","CheckinCounter":null,"ArrivalTerminal":"C","ArrivalGate":"C25
","Baggage":"8","ServiceType":"J","LegSequenceNumber":1,"NumLegs":1,"Airc
raft":{"Code":"A320","CodeNamespace":"Icao","OptionalEquipment":null,"Wei
ghtClass":"L","TailNumber":"N554JB"},"AlternateDepartureAirport":null,"Al
ternateArrivalAirport":null,"UplineInfo":null,"DownlineInfo":null,"Aircra
ftPreviousFlightLeg":{"FlightId":{"Airline":{"Code":"B6","CodeNamespace":
"Iata","Name":"JetBlue
Airways"},"FlightNumber":"401"},"ScheduledArrival":{"Utc":"2019-07-
24T17:27Z","Local":"2019-07-
24T12:27"}},"RemainingTime":"01:43:24","ElapsedTime":"01:20:36","Schedule
dDuration":"03:28:00","Map":null,"Position":{"Altitude":"35000","Speed":"
542","Heading":"54"},"Route":null}]}
```

Here is the result transformed into an easier-to-read format by the Chrome plug-JSONView.

This is an image of all the JSON elements condensed in JSONView:

```
{
  - Result: {
        ProcessingTimeUtc: "2019-07-24T15:47:18",
        Version: "3.0.5.61",
        Code: "0",
        Message: "1 flight(s) found for this request",
        Flights: 1
  },
  - Flights: [
    - {
          FlightGuid: "CC727B92BC754DC883018CB55BF1AB60",
        + Acid: {…},
        + DepartureAirport: {…},
        + ArrivalAirport: {…},
        + OriginationDate: {…},
        + ScheduledDeparture: {…},
        + ScheduledArrival: {…},
          Scheduled: true,
          GeneralAviation: false,
          Status: "InGate",
          DepartureScheduleStatus: null,
          ArrivalScheduleStatus: null,
          DiversionStatus: null,
        + DepDelayReason: […],
        + ArrDelayReason: […],
          FaaId: null,
        + Codeshares: […],
        + OutGate: {…},
        + InAir: {…},
        + Landed: {…},
        + InGate: {…},
          DepartureTerminal: null,
          DepartureGate: "21",
          CheckinCounter: null,
          ArrivalTerminal: null,
          ArrivalGate: null,
          Baggage: null,
          ServiceType: "J",
          LegSequenceNumber: 1,
          NumLegs: 2,
        + Aircraft: {…},
          AlternateDepartureAirport: null,
          AlternateArrivalAirport: null,
          UplineInfo: null,
        + DownlineInfo: […],
        + AircraftPreviousFlightLeg: {…},
          RemainingTime: null,
          ElapsedTime: null,
          ScheduledDuration: "01:20:00",
          Map: null,
          Position: null,
          Route: null
    }
  ]
}
{
```

The flight details look like this when uncompressed:

```
Result:{

    ProcessingTimeUtc:"2019-07-24T15:47:18",
    Version:"3.0.5.61",
    Code:"0",
    Message: "1 flight(s) found for this request",
    Flights: 1

},
```

```
Flights:[

    {

        FlightGuid: "CC727B92BC754DC883018CB55BF1AB60",
        Acid:{

            Airline:{

                Code:"BA",
                CodeNamespace:"Iata",
                Name:"British Airways"

                },

            FlightNumber:"1"

            },

        DepartureAirport:{

            Code:"LCY",
            CodeNamespace:"Iata",
            Name:"LONDONCITY",
            Location:{

                CityName:"LONDON",
                StateId:"UK",
                CountryId: "GB"

                }

            },

        ArrivalAirport:{

            Code:"SNN",
            CodeNamespace:"Iata",
            Name:"SHANNON",
            Location:{

                CityName:"SHANNON",
                StateId:"IE",
                CountryId:"IE"

                }

            },

        OriginationDate:{
```

```
    Utc:"2019-07-24",
    Local:"2019-07-24"

  },

ScheduledDeparture:{

   Utc:"2019-07-24T08:40Z",
   Local:"2019-07-24T09:40"

  },

ScheduledArrival:{

   Utc:"2019-07-24T10:00Z",
   Local:"2019-07-24T11:00"

  },

Scheduled:true,
GeneralAviation:false,
Status:"InGate",
DepartureScheduleStatus:null,
ArrivalScheduleStatus:null,
DiversionStatus:null,
DepDelayReason:[

   {

       Code:6,
       Subcode:" "

     }

  ],

ArrDelayReason:[

   {

       Code:6,
       Subcode:" "

     }

  ],

FaaId:null,
Codeshares:[

   {
```

```
            Airline:{

                Code:"AA",
                CodeNamespace:"Iata",
                Name:"American Airlines"

            },

        FlightNumber:"6229"

        },

    {

        Airline:{

            Code:"AY",
            CodeNamespace: "Iata",
            Name:"Finnair"

            },

        FlightNumber:"5401"

        },

        {

                Airline:{

                        Code:"IB",
                        CodeNamespace:"Iata",
                        Name:"Iberia Airlines"

                },

                FlightNumber:"7300"

        }

    ],

OutGate:{

    Accuracy:"Actual",
    DateTimeUtc:"2019-07-24T08:42Z",
    DateTimeLocal:"2019-07-24T09:42",
    SourceType:"AirlineData"

    },

InAir:{
```

```
        Accuracy:"Actual",
        DateTimeUtc:"2019-07-24T08:51Z",
        DateTimeLocal:"2019-07-24T09:51",
        SourceType:"AirlineData"

    },

Landed:{

        Accuracy:"Actual",
        DateTimeUtc:"2019-07-24T09:59Z",
        DateTimeLocal:"2019-07-24T10:59",
        SourceType:"AirlineData"

    },

InGate:{

        Accuracy:"Actual",
        DateTimeUtc:"2019-07-24T10:03Z",
        DateTimeLocal:"2019-07-24T11:03",
        SourceType: "AirlineData"

    },

DepartureTerminal:null,
DepartureGate:"21",
CheckinCounter:null,
ArrivalTerminal:null,
ArrivalGate:null,
Baggage:null,
ServiceType:"J",
LegSequenceNumber:1,
NumLegs:2,
Aircraft:{

        Code:"318",
        CodeNamespace:"Iata",
        OptionalEquipment:null,
        WeightClass:null,
        TailNumber:"GEUNA"

    },

AlternateDepartureAirport:null,
AlternateArrivalAirport:null,
UplineInfo:null,
DownlineInfo:[

    {

        DepAirportCode:"SNN",
        DepCodeNS:"Iata",
```

```
                    ArrAirportCode:"JFK",
                    ArrCodeNS:"Iata"


                }

        ],

    AircraftPreviousFlightLeg:{

        FlightId:{

            Airline:{

                Code:"BA",
                CodeNamespace:"Iata",
                Name:"British Airways"

            },

            FlightNumber:"2"

        },

        ScheduledArrival:{

            Utc:"2019-07-24T05:50Z",
            Local:"2019-07-24T06:50"

        }

    },

    RemainingTime:null,
    ElapsedTime:null,
    ScheduledDuration:"01:20:00",
    Map:null,
    Position:null,
    Route:null

        }

    ]

}
```

Appendix E: Sample Query and Response for In-Air Flight in JSON

Here is the sample query for B6400 MSY to BOS, executed while the flight is in-air:

/fvxml.exe?ACID=B6400&DEPDATE=20190724

Here is the result, represented as JSON-formatted data then transformed by the Chrome plug-in JSONView:

```
{

 Result:{

    ProcessingTimeUtc: "2019-07-24T18:38:42",
    Version: "3.0.5.61",
    Code: "0",
    Message: "1 flight(s) found for this request",
    Flights: 1

    },

 Flights:[

    {

        FlightGuid: "B780BFC2348A4DA9963733CFC9B464F2",

        Acid:{

           Airline:{

               Code: "B6",
               CodeNamespace: "Iata",
               Name: "JetBlue Airways"},

           FlightNumber: "400"

           },

        DepartureAirport:{

           Code: "MSY",
           CodeNamespace: "Iata",
           Name: "LOUIS ARMSTRONG NEW ORLEANS INTL",
           Location:{

               CityName: "NEW ORLEANS",
               StateId: "LA",
               CountryId: "US"

               }
```

```
        },

ArrivalAirport:{

    Code: "BOS",
    CodeNamespace: "Iata",
    Name: "GENERAL EDWARD LAWRENCE LOGAN IN",

    Location:{

        CityName: "BOSTON",
        StateId: "MA",
        CountryId: "US"


    }

},

OriginationDate:{

    Utc: "2019-07-24",
    Local: "2019-07-24"

},

ScheduledDeparture:{

    Utc: "2019-07-24T18:12Z",
    Local: "2019-07-24T13:12"

},

ScheduledArrival:{

    Utc: "2019-07-24T21:40Z",
    Local: "2019-07-24T17:40"

},

Scheduled: true,
GeneralAviation: false,
Status: "InAir",
DepartureScheduleStatus: null,

ArrivalScheduleStatus: null,
DiversionStatus: null,
DepDelayReason:[

    {

        Code: 6,
        Subcode: " "
```

```
            }

        ],

    ArrDelayReason:[

        {

            Code: 6,
            Subcode: " "

        }

    ],

FaaId: {

    Code: "JBU",
    CodeNamespace: "Icao",
    FlightId: "400"

    },
```

Codeshares data has been removed from this example.

```
OutGate: {

    Accuracy: "Actual",
    DateTimeUtc: "2019-07-24T18:09Z",
    DateTimeLocal: "2019-07-24T13:09",
    SourceType: "AirlineData"

    },

InAir: {

    Accuracy: "Actual",
    DateTimeUtc: "2019-07-24T18:22Z",
    DateTimeLocal: "2019-07-24T13:22",
    SourceType: "AirlineData"

    },
```

```
Landed:{

        ▪  Accuracy: "Estimated",
        ▪  DateTimeUtc: "2019-07-24T20:58Z",
        ▪  DateTimeLocal: "2019-07-24T16:58",
        ▪  SourceType: "FlightViewData"

    },

▪  InGate:{
        ▪  Accuracy: "Estimated",
        ▪  DateTimeUtc: "2019-07-24T21:06Z",
        ▪  DateTimeLocal: "2019-07-24T17:06",
        ▪  SourceType: "AirlineData"

    },

▪  DepartureTerminal: null,
▪  DepartureGate: "C5",
▪  CheckinCounter: null,
▪  ArrivalTerminal: "C",
▪  ArrivalGate: "C25",
▪  Baggage: "8",
▪  ServiceType: "J",
▪  LegSequenceNumber: 1,
▪  NumLegs: 1,
▪  Aircraft:{
        ▪  Code: "A320",
        ▪  CodeNamespace: "Icao",
        ▪  OptionalEquipment: null,
        ▪  WeightClass: "L",
        ▪  TailNumber: "N554JB"

    },

▪  AlternateDepartureAirport: null,
▪  AlternateArrivalAirport: null,
▪  UplineInfo: null,
▪  DownlineInfo: null,
▪  AircraftPreviousFlightLeg:{

    FlightId: {

        Airline:{

            Code: "B6",
            CodeNamespace: "Iata",
            Name: "JetBlue Airways"

        },

    FlightNumber: "401"
```

```
            },

        ScheduledArrival: {

            Utc: "2019-07-24T17:27Z",
            Local: "2019-07-24T12:27"


        }

    },

    RemainingTime: "02:27:18",
    ElapsedTime: "00:29:42",
    ScheduledDuration: "03:28:00",
    Map: null,
    Position: {

        Altitude: "24400",
        Speed: "437",
        Heading: "62"

    },

    Route: null

    }

]

}
```

Service Type	Description
J	Scheduled: Passenger Normal Service
S	Scheduled: Passenger Shuttle Mode
U	Scheduled: Passenger Service operated by surface vehicle
F	Cargo/Mail: loose loaded cargo and/or preloaded devices
V	Cargo/Mail: service operated by surface vehicle
M	Cargo/Mail: Mail only
Q	Passenger/Cargo: in cabin
G	Additional Flights: Passenger Normal Service
B	Additional Flights: Passenger Shuttle Mode
A	Additional Flights: Cargo/Mail
R	Additional Flights: Passenger/Cargo in cabin
C	Charter: Passenger only
O	Charter: requiring special handling
H	Charter: Cargo and/or Mail
L	Charter: Passenger and Cargo and/or Mail
P	Other: Non-revenue (Positioning/Ferry/Delivery/Demo)
T	Other: Technical Test
K	Other: Training (School/Crew check)
D	Other: General Aviation
E	Other: Special (FAA/Government)
W	Other: Military
X	Other: Technical Stop