Table of Contents

About this document

The purpose of this document is to give an overview of the REST approach to retrieving and acknowledging events dispatched via the DR Hub system. PJM offers the command line interface (CLI), a Java based interface for sending requests and transferring files to and from PJM participants. The CLI provides one option for sending requests and receiving responses from DR Hub.

PJM provides this specification to aid PJM customers in building an external interface to PJM applications. PJM will assist customers seeking to understand or clarify details in these examples. However, due to the customizable nature of the external interface and the varied environments in which PJM customers will implement it, PJM is unable to provide application support for these customer-built external interfaces.

System Requirements

- A reliable internet connection

- Java Runtime Environment (JRE): Version 6 or higher is required. Java is available for Solaris, Linux, Mac OSX, AIX, and Windows. Java downloads are available at: http://www.oracle.com

- PJM provided Java CLI program: client side class to authenticate with PJM, download and transfer files. The current version is provided as a Java Archive (JAR) file.

Release History

Release	Date	Description
1.0.0	July 14, 2016	Initial Release.
2.0.0	November 8, 2016	November 17 Train Release. Added XML Examples for All Event Types
2.1.1	March 17, 2025	Added Event Types for Load Management Test and Test Responsive Demand

REST Examples for Load Management Events

Retrieve unacknowledged Load Management Events

This request returns a list of unacknowledged Load Management Events. The list of returned Events will include any Load Response Event not acknowledged within 60 minutes of the Event End Time.

https://servername.pjm.com/drhub/rest/secure/download/event/loadmanagement/acknowledgeable

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
  - <eventSummary>
        <id>10878</id>
    - <eventSummaryInfo>
        <eventDate>2016-07-08T10:00:00.000-04:00</eventDate>
        <eventType>Load Management Summary</eventType>
        <notifyTime>2016-07-08T10:10:58.000-04:00</notifyTime>
        <startTime>2016-07-08T10:55:58.000-04:00</startTime>
        <description>TEST</description>
        <status>Scheduled</status>
        <regProduct>Limited DR</regProduct>
        <regResource>Pre-Emergency</regResource>
        <regLeadTime>Short_60</regLeadTime>
        <zone>DOM</zone>
      </eventSummaryInfo>
    - <eventDetail>
      - <Event>
            <id>10879</id>
            <parentId>10878</parentId>
        - <eventRegistration>
            <registrationId>511</registrationId>
          - <CSP>
                <name>MYCSP</name>
            </CSP>
          </eventRegistration>
          <eventType>Load Management</eventType>
          <target>10</target>
        </Event>
      </eventDetail>
    </eventSummary>
</ns2:events>
```

Acknowledging Events

Acknowledgement requires one of two approaches. CSPs may use the complete response from the unacknowledged response or a modified version of the complete response that includes just the Load Management ids. Shown below is an example of each approach.

See the PJMCLI documentation for additional detail on uploading attachments.

https://servername.pjm.com/drhub/rest/secure/upload/event/loadmanagement/acknowledge/your_fil ename.xml

An event response result following acknowledgement.

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
  - <eventSummary>
        <id>10878</id>
    - <eventSummaryInfo>
          <eventDate>2016-07-08T10:00:00.000-04:00</eventDate>
          <eventType>Load Management Summary</eventType>
          <notifyTime>2016-07-08T10:10:58.000-04:00</notifyTime>
          <startTime>2016-07-08T10:55:58.000-04:00</startTime>
          <description>TEST</description>
          <status>Scheduled</status>
          <regProduct>Limited DR</regProduct>
          <regResource>Pre-Emergency</regResource>
          <regLeadTime>Short_60</regLeadTime>
          <zone>DOM</zone>
      </eventSummaryInfo>
    - <eventDetail>
      - <Event>
          <id>10879</id>
          <parentId>10878</parentId>
        - <eventRegistration>
            <registrationId>511</registrationId>
          - <CSP>
                <name>MYCSP</name>
            </CSP>
          </eventRegistration>
          <eventType>Load Management</eventType>
          <acknowledgeDate>2016-07-08T10:12:46.606-04:00</acknowledgeDate>
          <target>10</target>
        </Event>
      </eventDetail>
    </eventSummary>
</ns2:events>
```

The below example represents the minimum set of elements and information required to acknowledge events. This structure applies to all event types and thus be used interchangeably.

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
- <ns2:events xmlns:ns2="http://drhub.pjm.com/">
    - <eventSummary>
        - <eventDetail>
            - <event>
                <id>706727</id>
            </event>
        </eventDetail>
    </eventSummary>
</ns2:events>
```

Acknowledging multiple Events in the same upload follows the structure above appending the individual event ids.

Note: The ids to be included for acknowledgement are those within the eventDetail tag for each event.

Acknowledge Multiple Events Example

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
- <ns2:events xmlns:ns2="http://drhub.pjm.com/">
    - <eventSummary>
        - <eventDetail>
            - <event>
                <id>706727</id>
            </event>
            - <event>
                <id>706728</id>
            </event>
            - <event>
                <id>706729</id>
            </event>
        </eventDetail>
    </eventSummary>
</ns2:events>
```

Note: The Acknowledgement of Events follows the same pattern for all event types. For brevity, this example applies to each step.

There are **four** acknowledgable Event Types and four acknowledgeable URLs to acknowledge these event Types

Event Types

1. Load Management Event
2. Load Management Test Event
3. Real Time Dispatch Event

4. Synchronized Reserved Event
5. Zonal Emergency Energy Event
6. Test Responsive Demand Event

Acknowledgement URLs

https://servername.pjm.com/drhub/rest/secure/upload/event/loadmanagement/acknowledge/your_filename.xml

https://servername.pjm.com/drhub/rest/secure/upload/event/testloadmanagementevent/acknowledge/your_filename.xml

https://servername.pjm.com/drhub/rest/secure/upload/event/realtimedispatch/acknowledge/your_filename.xml

https://servername.pjm.com/drhub/rest/secure/upload/event/synchronizedreserve/acknowledge/yourfilename.xml

https://servername.pjm.com/drhub/rest/secure/upload/event/zonalemergencyenergy/acknowledge/yourfilename.xml

https://servername.pjm.com/drhub/rest/secure/upload/event/testpriceresponsivedemandevent/acknowledge/yourfilename.xml

Retrieve a Load Management Event by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/loadmanagement/10879

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
  - <eventSummary>
        <id>10878</id>
    - <eventSummaryInfo>
          <eventDate>2016-07-08T10:00:00.000-04:00</eventDate>
          <eventType>Load Management Summary</eventType>
          <notifyTime>2016-07-08T10:10:58.000-04:00</notifyTime>
          <startTime>2016-07-08T10:55:58.000-04:00</startTime>
          <description>TEST</description>
          <status>Scheduled</status>
          <regProduct>Limited DR</regProduct>
          <regResource>Pre-Emergency</regResource>
          <regLeadTime>Short_60</regLeadTime>
          <zone>DOM</zone>
      </eventSummaryInfo>
    - <eventDetail>
        - <Event>
            <id>10879</id>
            <parentId>10878</parentId>
          - <eventRegistration>
              <registrationId>511</registrationId>
            - <CSP>
                  <name>MYCSP</name>
              </CSP>
          </eventRegistration>
          <eventType>Load Management</eventType>
          <target>10</target>
        </Event>
      </eventDetail>
  </eventSummary>
</ns2:events>
```

Retrieve Load Management Events by Date Range using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/loadmanagement?startDate=05-01-2016&stopDate=06-30-2016

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
  - <eventSummary>
        <id>11895</id>
    - <eventSummaryInfo>
        <eventDate>2016-07-12T10:00:00.000-04:00</eventDate>
        <eventType>Load Management Summary</eventType>
        <notifyTime>2016-07-12T10:24:36.000-04:00</notifyTime>
        <startTime>2016-07-12T06:32:32.000-04:00</startTime>
        <description>TEST</description>
        <status>Scheduled</status>
        <regProduct>Annual DR</regProduct>
        <regResource>Pre-Emergency</regResource>
        <regLeadTime>Short_60</regLeadTime>
        <zone>DOM</zone>
      </eventSummaryInfo>
    - <eventDetail>
      - <Event>
            <id>11896</id>
            <parentId>11895</parentId>
          - <eventRegistration>
              <registrationId>511</registrationId>
            - <CSP>
                <name>MYCSP</name>
              </CSP>
          </eventRegistration>
          <eventType>Load Management</eventType>
          <acknowledgeDate>2016-07-12T10:34:51.000-04:00</acknowledgeDate>
          <target>10</target>
        </Event>
      </eventDetail>
  </eventSummary>
  - <eventSummary>
        <id>11569</id>
    - <eventSummaryInfo>
        <eventDate>2016-07-10T11:00:00.000-04:00</eventDate>
        <eventType>Load Management Summary</eventType>
        <notifyTime>2016-07-10T12:08:53.000-04:00</notifyTime>
        <startTime>2016-07-10T12:53:53.000-04:00</startTime>
        <description>TEST</description>
        <status>Scheduled</status>
        <regProduct>Limited DR</regProduct>
        <regResource>Pre-Emergency</regResource>
        <regLeadTime>Short_60</regLeadTime>
        <zone>DOM</zone>
      </eventSummaryInfo>
    - <eventDetail>
      - <Event>
            <id>11570</id>
            <parentId>11569</parentId>
```

Retrieve a Load Management Summary by Id using a REST request.

Request a Load Management Summary by ID (Summary Only)

https://servername.pjm.com/drhub/rest/secure/download/event/loadmanagementsummary/11204

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
  - <eventSummary>
        <id>11204</id>
    - <eventSummaryInfo>
          <eventDate>2016-07-09T00:00:00.000-04:00</eventDate>
          <eventType>Load Management Summary</eventType>
          <notifyTime>2016-07-09T09:30:00.000-04:00</notifyTime>
          <startTime>2016-07-09T09:30:00.000-04:00</startTime>
          <endTime>2016-07-11T07:49:57.000-04:00</endTime>
          <description>TEST</description>
          <status>Active</status>
          <regProduct>Limited DR</regProduct>
          <regResource>Pre-Emergency</regResource>
          <regLeadTime>Quick_30</regLeadTime>
          <zone>AECO</zone>
      </eventSummaryInfo>
  </eventSummary>
</ns2:events>
```

Retrieve Load Management Event Summaries by Date Range using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/loadmanagementsummary?startDate=06-01-2016&stopDate=07-31-2016

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
  - <eventSummary>
        <id>11204</id>
    - <eventSummaryInfo>
        <eventDate>2016-07-11T00:00:00.000-04:00</eventDate>
        <eventType>Load Management Summary</eventType>
        <notifyTime>2016-07-11T09:30:00.000-04:00</notifyTime>
        <startTime>2016-07-11T09:30:00.000-04:00</startTime>
        <endTime>2016-07-11T07:49:57.000-04:00</endTime>
        <description>TEST</description>
        <status>Active</status>
        <regProduct>Limited DR</regProduct>
        <regResource>Pre-Emergency</regResource>
        <regLeadTime>Quick_30</regLeadTime>
        <zone>AECO</zone>
    </eventSummaryInfo>
  </eventSummary>
  - <eventSummary>
        <id>11206</id>
    - <eventSummaryInfo>
        <eventDate>2016-07-09T00:00:00.000-04:00</eventDate>
        <eventType>Load Management Summary</eventType>
        <notifyTime>2016-07-09T09:30:00.000-04:00</notifyTime>
        <startTime>2016-07-09T09:30:00.000-04:00</startTime>
        <endTime>2016-07-09T07:49:57.000-04:00</endTime>
        <description>TEST</description>
        <status>Active</status>
        <regProduct>Limited DR</regProduct>
        <regResource>Pre-Emergency</regResource>
        <regLeadTime>Quick_30</regLeadTime>
        <zone>AEP</zone>
    </eventSummaryInfo>
  </eventSummary>
  - <eventSummary>
        <id>11636</id>
    - <eventSummaryInfo>
        <eventDate>2016-07-09T20:00:00.000-04:00</eventDate>
        <eventType>Load Management</eventType>
```

REST Examples for Day Ahead Energy Events

Retrieve a Day Ahead Energy Event by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/dayaheadenergy/5711

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
  <eventSummary>
    <eventSummaryInfo>
        <eventDate>2016-07-06T17:41:16.000-04:00</eventDate>
        <eventType>Day-Ahead Energy</eventType>
        <notifyTime>2016-07-06T17:41:16.000-04:00</notifyTime>
        <startTime>2016-07-06T17:41:16.000-04:00</startTime>
        <target>50.8</target>
        <status>New</status>
        <zone>BGE</zone>
    </eventSummaryInfo>
    <eventDetail>
      <Event>
          <id>5711</id>
        <eventRegistration>
            <registrationId>66</registrationId>
          <CSP>
              <name>PE</name>
          </CSP>
        </eventRegistration>
      </Event>
    </eventDetail>
  </eventSummary>
</ns2:events>
```

Retrieve Day Ahead Energy Events by Date Range using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/dayaheadenergy?startDate=06-01-2016&stopDate=07-30-2016

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
  - <eventSummary>
    - <eventSummaryInfo>
        <eventDate>2016-07-06T17:41:16.000-04:00</eventDate>
        <eventType>Day-Ahead Energy</eventType>
        <notifyTime>2016-07-06T17:41:16.000-04:00</notifyTime>
        <startTime>2016-07-06T17:41:16.000-04:00</startTime>
        <target>50.8</target>
        <status>New</status>
        <zone>BGE</zone>
      </eventSummaryInfo>
    - <eventDetail>
      - <Event>
          <id>5763</id>
        - <eventRegistration>
            <registrationId>66</registrationId>
          - <CSP>
              <name>PE</name>
            </CSP>
          </eventRegistration>
        </Event>
      </eventDetail>
  </eventSummary>
  - <eventSummary>
    - <eventSummaryInfo>
        <eventDate>2016-07-07T17:41:16.000-04:00</eventDate>
        <eventType>Day-Ahead Energy</eventType>
        <notifyTime>2016-07-07T17:41:16.000-04:00</notifyTime>
        <startTime>2016-07-07T17:41:16.000-04:00</startTime>
        <target>50.8</target>
        <status>New</status>
        <zone>BGE</zone>
      </eventSummaryInfo>
    - <eventDetail>
      - <Event>
          <id>4655</id>
        - <eventRegistration>
            <registrationId>66</registrationId>
          - <CSP>
              <name>PE</name>
            </CSP>
          </eventRegistration>
        </Event>
```

REST Examples for Real Time Dispatch Events

Special Notes on Real Time Event Searching

- Summary Event Searches do NOT include child event Registration detail.
- The Event Id displayed in the UI belongs to the summary event.
- To search individual RT events, retrieve events by date range first.
- Identify the event Id(s) in the Event Detail section to be used as arguments when searching individual events.
- Downloading individual or summary events by ID is best for historical reporting.

Retrieve a Real Time Dispatch Event by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/realtimedispatch/11063

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>1257179</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Real-Time Dispatch</eventType>
            <notifyTime>2016-11-08T11:41:06.000-05:00</notifyTime>
            <startTime>2016-11-08T11:56:06.000-05:00</startTime>
            <endTime>2016-11-08T12:24:37.000-05:00</endTime>
            <target>0</target>
            <status>Completed</status>
            <zone>PENELEC</zone>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <id>1259525</id>
                <parentId>1257179</parentId>
                <eventRegistration>
                    <registrationId>123456</registrationId>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
                <eventType>Real-Time Dispatch</eventType>
                <notifyTime>2016-11-08T12:09:37.000-05:00</notifyTime>
                <startTime>2016-11-08T12:24:37.000-05:00</startTime>
                <endTime>2016-11-08T12:24:37.000-05:00</endTime>
             <acknowledgeDate>2016-11-08T12:10:10.172-05:00</acknowledgeDate>
                <target>0</target>
            </event>
        </eventDetail>
    </eventSummary>
</ns2:events>
```

Retrieve Real Time Dispatch Events by Date Range using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/realtimedispatch?startDate=11-01-2016&stopDate=11-30-2016

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>1257179</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Real-Time Dispatch</eventType>
            <notifyTime>2016-11-08T11:41:06.000-05:00</notifyTime>
            <startTime>2016-11-08T11:56:06.000-05:00</startTime>
            <endTime>2016-11-08T12:24:37.000-05:00</endTime>
            <target>0</target>
            <status>Completed</status>
            <zone>PENELEC</zone>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <id>1259525</id>
                <parentId>1257179</parentId>
                <eventRegistration>
                    <registrationId>123456</registrationId>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
                <eventType>Real-Time Dispatch</eventType>
                <notifyTime>2016-11-08T12:09:37.000-05:00</notifyTime>
                <startTime>2016-11-08T12:24:37.000-05:00</startTime>
                <endTime>2016-11-08T12:24:37.000-05:00</endTime>
             <acknowledgeDate>2016-11-08T12:10:10.172-05:00</acknowledgeDate>
                <target>0</target>
            </event>
        </eventDetail>
    </eventSummary>
    <eventSummary>
        <id>1257170</id>
        <eventSummaryInfo>
            <eventDate>2016-11-07T00:00:00.000-05:00</eventDate>
```

```xml
            <eventType>Real-Time Dispatch</eventType>
            <notifyTime>2016-11-07T11:41:06.000-05:00</notifyTime>
            <startTime>2016-11-07T11:56:06.000-05:00</startTime>
            <endTime>2016-11-07T12:24:37.000-05:00</endTime>
            <target>0</target>
            <status>Completed</status>
            <zone>PPL</zone>
        </eventSummaryInfo>
    Continuted…
</ns2:events>
```

Retrieve a Real Time Dispatch Summary by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/realtimedispatchsummary/4133

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>4133</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Real-Time Dispatch</eventType>
            <notifyTime>2016-11-08T11:41:06.000-05:00</notifyTime>
            <startTime>2016-11-08T11:56:06.000-05:00</startTime>
            <endTime>2016-11-08T12:24:37.000-05:00</endTime>
            <target>1700</target>
            <status>Completed</status>
        </eventSummaryInfo>
    </eventSummary>
</ns2:events>
```

Retrieve Real Time Dispatch Summaries by Date Range using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/realtimedispatchsummary?startDate
=06-01-2016&stopDate=07-30-2016

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>4133</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Real-Time Dispatch</eventType>
            <notifyTime>2016-11-08T11:41:06.000-05:00</notifyTime>
            <startTime>2016-11-08T11:56:06.000-05:00</startTime>
            <endTime>2016-11-08T12:24:37.000-05:00</endTime>
```

```
            <target>1700</target>
            <status>Completed</status>
        </eventSummaryInfo>
    </eventSummary>
    <eventSummary>
        <id>4132</id>
        <eventSummaryInfo>
            <eventDate>2016-11-07T00:00:00.000-05:00</eventDate>
            <eventType>Real-Time Dispatch</eventType>
            <notifyTime>2016-11-07T11:41:06.000-05:00</notifyTime>
            <startTime>2016-11-07T11:56:06.000-05:00</startTime>
            <endTime>2016-11-07T12:24:37.000-05:00</endTime>
            <target>1000</target>
            <status>Completed</status>
        </eventSummaryInfo>
    </eventSummary>
</ns2:events>
```

REST Examples for Synchronized Reserve Events

Special Notes on Synchronized Reserve Event Searching

- Summary Event Searches do NOT include child event Registration detail.
- The Event Id displayed in the UI belongs to the summary event.
- To search individual SR events, retrieve a events by date range first.
- Identify the event Id(s) in the Event Detail section to be used as arguments when searching individual events.
- Downloading individual or summary events by ID is best for historical reporting.

Retrieve a Synchronized Reserve Event by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/synchronizedreserve/1257284

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>1257284</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Synchronized Reserve</eventType>
            <notifyTime>2016-11-08T11:41:42.000-05:00</notifyTime>
            <startTime>2016-11-08T11:41:42.000-05:00</startTime>
            <endTime>2016-11-08T12:04:41.000-05:00</endTime>
            <target>0</target>
            <status>Completed</status>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <id>1257346</id>
```

```xml
                <parentId>1257284</parentId>
                <eventRegistration>
                    <registrationId>123456</registrationId>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
                <eventType>Synchronized Reserve</eventType>
        <acknowledgeDate>2016-11-08T12:05:11.621-05:00</acknowledgeDate>
                <target>0</target>
            </event>
        </eventDetail>
    </eventSummary>
</ns2:events>
```

Retrieve Synchronized Reserve Events by Date Range using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/synchronizedreserve?startDate=11-01-2016&stopDate=11-10-2016

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>1257284</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Synchronized Reserve</eventType>
            <notifyTime>2016-11-08T11:41:42.000-05:00</notifyTime>
            <startTime>2016-11-08T11:41:42.000-05:00</startTime>
            <endTime>2016-11-08T12:04:41.000-05:00</endTime>
            <target>0</target>
            <status>Completed</status>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <id>1257346</id>
                <parentId>1257284</parentId>
                <eventRegistration>
                    <registrationId>123456</registrationId>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
                <eventType>Synchronized Reserve</eventType>
        <acknowledgeDate>2016-11-08T12:05:11.621-05:00</acknowledgeDate>
                <target>0</target>
            </event>
        </eventDetail>
    </eventSummary>
     <eventSummary>
        <id>1257274</id>
        <eventSummaryInfo>
```

```
            <eventDate>2016-11-06T00:00:00.000-05:00</eventDate>
            <eventType>Synchronized Reserve</eventType>
            <notifyTime>2016-11-06T11:41:42.000-05:00</notifyTime>
            <startTime>2016-11-06T11:41:42.000-05:00</startTime>
            <endTime>2016-11-06T12:04:41.000-05:00</endTime>
            <target>0</target>
            <status>Completed</status>
        </eventSummaryInfo>
```

Retrieve a Synchronized Reserve Summary by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/synchronizedreserve summary/114

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>114</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Synchronized Reserve</eventType>
            <notifyTime>2016-11-08T11:41:42.000-05:00</notifyTime>
            <startTime>2016-11-08T11:41:42.000-05:00</startTime>
            <endTime>2016-11-08T12:04:41.000-05:00</endTime>
            <status>Completed</status>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <id>116</id>
                <eventRegistration>
                    <registrationId>123456</registrationId>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
            </event>
        </eventDetail>
    </eventSummary>
</ns2:events>
```

Retrieve Synchronized Reserve Summaries by Date Range using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/synchronizedreservesummary?startDate=11-01-2016&stopDate=11-10-2016

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>1257285</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Synchronized Reserve</eventType>
            <notifyTime>2016-11-08T11:41:42.000-05:00</notifyTime>
            <startTime>2016-11-08T11:41:42.000-05:00</startTime>
            <endTime>2016-11-08T12:04:41.000-05:00</endTime>
            <status>Completed</status>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <id>1257285</id>
                <eventRegistration>
                    <registrationId>123456</registrationId>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
            </event>
        </eventDetail>
    </eventSummary>
        <eventSummary>
        <id>1257280</id>
        <eventSummaryInfo>
            <eventDate>2016-11-06T00:00:00.000-05:00</eventDate>
            <eventType>Synchronized Reserve</eventType>
            <notifyTime>2016-11-06T11:41:42.000-05:00</notifyTime>
            <startTime>2016-11-06T11:41:42.000-05:00</startTime>
            <endTime>2016-11-06T12:04:41.000-05:00</endTime>
            <status>Completed</status>
        ...
</ns2:events>
```

REST Examples for Zonal Emergency Events

Retrieve a Zonal Emergency Event by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/zonalemergencyenergy/**1259675**

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>1259575</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Zonal Emergency Energy Summary</eventType>
            <startTime>2016-11-08T12:55:00.000-05:00</startTime>
            <endTime>2016-11-08T13:20:00.000-05:00</endTime>
            <target>0</target>
            <status>Completed</status>
            <zone>PPL</zone>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <id>1259675</id>
                <parentId>1259575</parentId>
                <eventRegistration>
                    <registrationId>123456</registrationId>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
                <eventType>Zonal Emergency Energy</eventType>
            <acknowledgeDate>2016-11-08T13:15:38.249-05:00</acknowledgeDate>
                <target>0</target>
            </event>
        </eventDetail>
    </eventSummary>
</ns2:events>
```

Retrieve Zonal Emergency Events by Date Range using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/zonalemergencyenergy?startDate=11-01-2016&stopDate=11-30-2016

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>1259575</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Zonal Emergency Energy Summary</eventType>
            <startTime>2016-11-08T12:55:00.000-05:00</startTime>
```

```xml
            <endTime>2016-11-08T13:20:00.000-05:00</endTime>
            <target>0</target>
            <status>Completed</status>
            <zone>PPL</zone>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <id>1259675</id>
                <parentId>1259575</parentId>
                <eventRegistration>
                    <registrationId>123456</registrationId>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
                <eventType>Zonal Emergency Energy</eventType>
            <acknowledgeDate>2016-11-08T13:15:38.249-05:00</acknowledgeDate>
                <target>0</target>
            </event>
        </eventDetail>
    </eventSummary>
        <eventSummary>
        <id>1259573</id>
        <eventSummaryInfo>
            <eventDate>2016-11-06T00:00:00.000-05:00</eventDate>
            <eventType>Zonal Emergency Energy Summary</eventType>
            <startTime>2016-11-06T12:55:00.000-05:00</startTime>
            <endTime>2016-11-05T13:20:00.000-05:00</endTime>
            <target>0</target>
            <status>Completed</status>
            <zone>DAY</zone>
        </eventSummaryInfo>
      Cont…
    </eventSummary>
</ns2:events>
```

Retrieve a Zonal Emergency Summary by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/zonalemergencyenergysummary/62

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>62</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Zonal Emergency Energy Summary</eventType>
            <startTime>2016-11-08T12:55:00.000-05:00</startTime>
            <endTime>2016-11-08T13:20:00.000-05:00</endTime>
            <status>Completed</status>
```

```
        <zone>PPL</zone>
    </eventSummaryInfo>
  </eventSummary>
</ns2:events>
```

Retrieve Zonal Emergency Summaries by Date Range using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/zonalemergencyenergysummary?startDate=06-01-2016&stopDate=07-30-2016

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>1259575</id>
        <eventSummaryInfo>
            <eventDate>2016-11-08T00:00:00.000-05:00</eventDate>
            <eventType>Zonal Emergency Energy Summary</eventType>
            <startTime>2016-11-08T12:55:00.000-05:00</startTime>
            <endTime>2016-11-08T13:20:00.000-05:00</endTime>
            <status>Completed</status>
            <zone>DAY</zone>
        </eventSummaryInfo>
    </eventSummary>
        <eventSummary>
        <id>1259573</id>
        <eventSummaryInfo>
            <eventDate>2016-11-07T00:00:00.000-05:00</eventDate>
            <eventType>Zonal Emergency Energy Summary</eventType>
            <startTime>2016-11-07T12:55:00.000-05:00</startTime>
            <endTime>2016-11-07T13:20:00.000-05:00</endTime>
            <status>Completed</status>
            <zone>PPL</zone>
        </eventSummaryInfo>
    </eventSummary>
        <eventSummary>
        <id>1259572</id>
        <eventSummaryInfo>
            <eventDate>2016-11-06T00:00:00.000-05:00</eventDate>
            <eventType>Zonal Emergency Energy Summary</eventType>
            <startTime>2016-11-06T12:55:00.000-05:00</startTime>
            <endTime>2016-11-06T13:20:00.000-05:00</endTime>
            <status>Completed</status>
            <zone>BG</zone>
        </eventSummaryInfo>
    </eventSummary>
</ns2:events>
```

REST Examples for Resource Outage Events

Retrieve a Resource Outage Event by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/resourceoutage/44

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <eventSummaryInfo>
            <eventDate>2016-09-21T00:00:00.000-04:00</eventDate>
            <eventType>Resource Outage</eventType>
            <startTime>2016-09-21T00:00:00.000-04:00</startTime>
            <endTime>2016-09-28T00:00:00.000-04:00</endTime>
            <description>test</description>
            <status>Active</status>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <id>1051924</id>
                <eventRegistration>
                    <registrationId>123456</registrationId>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
            </event>
        </eventDetail>
    </eventSummary>
</ns2:events>
```

Retrieve Resource Outage Events by Date Range using a rest request.

https://servername.pjm.com/drhub/rest/secure/download/event/resourceoutage?startDate=04-01-2012&stopDate=06-30-2012

```xml
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
- <ns2:events xmlns:ns2="http://drhub.pjm.com/">
  - <eventSummary>
    - <eventSummaryInfo>
        <eventDate>2012-04-05T20:00:00.000-04:00</eventDate>
        <eventType>Resource Outage</eventType>
        <startTime>2012-04-06T19:59:00.000-04:00</startTime>
        <endTime>2012-04-06T19:59:00.000-04:00</endTime>
        <status>Confirmed</status>
      </eventSummaryInfo>
    - <eventDetail>
      - <Event>
          <id>5726</id>
        - <eventRegistration>
            <registrationId>68</registrationId>
          - <CSP>
              <name>MYCSP</name>
            </CSP>
          </eventRegistration>
        </Event>
      </eventDetail>
    </eventSummary>
  - <eventSummary>
    - <eventSummaryInfo>
        <eventDate>2012-04-06T20:00:00.000-04:00</eventDate>
        <eventType>Resource Outage</eventType>
        <startTime>2012-04-07T19:59:00.000-04:00</startTime>
        <endTime>2012-04-07T19:59:00.000-04:00</endTime>
        <status>Confirmed</status>
      </eventSummaryInfo>
    - <eventDetail>
      - <Event>
          <id>5729</id>
        - <eventRegistration>
            <registrationId>68</registrationId>
          - <CSP>
              <name>MYCSP</name>
            </CSP>
          </eventRegistration>
        </Event>
      </eventDetail>
    </eventSummary>
  - <eventSummary>
    - <eventSummaryInfo>
        <eventDate>2012-04-04T20:00:00.000-04:00</eventDate>
        <eventType>Resource Outage</eventType>
        <startTime>2012-04-05T19:59:00.000-04:00</startTime>
        <endTime>2012-04-05T19:59:00.000-04:00</endTime>
        <status>Confirmed</status>
```

REST Examples for Creating and Updating Load Management Test Events

Create a Load Management Test Event using a REST request and the PJMCLI tool.

%CLIENT% -s %APP_URL% -a /rest/secure/upload/event/testloadmanagementsummary/create/ -file .\
CREATE_LOAD_MANAGEMENT_TEST_EVENT.xml

The below example uploaded to DR Hub will create a scheduled Load Management Test

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:testLoadManagementSummary xmlns:ns2="http://drhub.pjm.com/">
    <testLoadManagementEventInfo>
        <eventDate>2019-01-18T05:00:00</eventDate>
        <eventType>TEST_LOAD_MANAGEMENT_SUMMARY</eventType>
        <startTime>10:15:00</startTime>
        <regProduct>CAPACITY_PERFORMANCE_DR</regProduct>
        <zone>PSEG</zone>
        <!-- Status is Optional for Creation -->
        <status>SCHEDULED</status>
    </testLoadManagementEventInfo>
</ns2:testLoadManagementSummary>
```

Create a Load Management Re-Test Event using a REST request and the PJMCLI tool.

%CLIENT% -s %APP_URL% -a /rest/secure/upload/event/testloadmanagementsummary/create/ - file .\
CREATE_LOAD_MANAGEMENT_RETEST_EVENT.xml

The below example uploaded to DR Hub will create a scheduled Load Management Re-Test

```xml
<ns2:testLoadManagementSummary xmlns:ns2="http://drhub.pjm.com/">
    <testLoadManagementEventInfo>
        <eventDate>2019-01-14T00:00:00.000-05:00</eventDate>
        <eventType>RETEST_LOAD_MANAGEMENT_SUMMARY</eventType>
        <startTime>15:00:00</startTime>
        <regProduct>CAPACITY_PERFORMANCE_DR</regProduct>
        <zone>AECO</zone>
        <!-- Status is Optional for Creation. Scheduled is Default -->
        <status>SCHEDULED</status>
        <reTestRegistrations>
        <reTestRegistration>1528839</reTestRegistration>
        </reTestRegistrations>
    </testLoadManagementEventInfo>
</ns2:testLoadManagementSummary>
```

Retrieve a Load Management Test Event by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/testloadmanagementsummary/4101

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>1662559</id>
        <eventSummaryInfo>
            <eventDate>2019-04-26T00:00:00.000-04:00</eventDate>
            <eventType>TEST Load Management Summary</eventType>
            <startTime>2019-04-26T17:00:00.000-04:00</startTime>
            <status>SCHEDULED</status>
            <regProduct>CAPACITY_PERFORMANCE_DR</regProduct>
            <zone>AEP</zone>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <eventRegistration>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
            </event>
        </eventDetail>
    </eventSummary>
</ns2:events>
```

Retrieve a Load Management Re-Test Event by Id using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/testloadmanagementsummary/1102

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>
        <id>1662559</id>
        <eventSummaryInfo>
            <eventDate>2019-04-26T00:00:00.000-04:00</eventDate>
            <eventType>RE-TEST Load Management Summary</eventType>
            <startTime>2019-04-26T17:00:00.000-04:00</startTime>
            <status>SCHEDULED</status>
            <regProduct>CAPACITY_PERFORMANCE_DR</regProduct>
            <zone>AEP</zone>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <eventRegistration>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
            </event>
        </eventDetail>
    </eventSummary>
</ns2:events>
```

Retrieve Load Management Test Events by Date Range using a REST request.

https://servername.pjm.com/drhub/rest/secure/download/event/testloadmanagementsummary?startDate=04-01-2012&stopDate=06-30-2012

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:events xmlns:ns2="http://drhub.pjm.com/">
    <eventSummary>

        <id>1616066</id>
        <eventSummaryInfo>
            <eventDate>2019-03-01T00:00:00.000-05:00</eventDate>
            <eventType>TEST Load Management Summary</eventType>
            <startTime>2019-03-01T16:00:00.000-05:00</startTime>
            <endTime>2019-03-01T17:00:00.000-05:00</endTime>
            <status>COMPLETED</status>
            <regProduct>CAPACITY_PERFORMANCE_DR</regProduct>
            <zone>AECO</zone>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <eventRegistration>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
            </event>
        </eventDetail>
    </eventSummary>
    <eventSummary>
        <id>1616067</id>
        <eventSummaryInfo>
            <eventDate>2019-03-02T00:00:00.000-05:00</eventDate>
            <eventType>TEST Load Management Summary</eventType>
            <startTime>2019-03-02T10:00:00.000-05:00</startTime>
            <endTime>2019-03-02T11:00:00.000-05:00</endTime>
            <status>COMPLETED</status>
            <regProduct>CAPACITY_PERFORMANCE_DR</regProduct>
            <zone>AECO</zone>
        </eventSummaryInfo>
        <eventDetail>
            <event>
                <eventRegistration>
                    <CSP>
                        <name>MYCSP</name>
                    </CSP>
                </eventRegistration>
            </event>
        </eventDetail>
    </eventSummary>
</ns2:events>
```

Modify an existing Load Management Test / Re-Test Event using a REST request and the PJMCLI tool.

%CLIENT% -s %APP_URL% -a /rest/secure/upload/event/testloadmanagementsummary/123
/ -file .\ UPDATE_LOAD_MANAGEMENT_TEST_EVENT.xml

or

%CLIENT% -s %APP_URL% -a /rest/secure/upload/event/testloadmanagementsummary/123
/ -file .\ UPDATE_LOAD_MANAGEMENT_RETEST_EVENT.xml

Important: Don't forget to update the Event ID in the URL string before sending the update Request. Failure to do so will create a New Test Event using the updated information.

The below example(s) uploaded to DR Hub will create / modify a scheduled Load Management Test or Re-Test

Note: Modifications to Test Events must be made within 48 Hours of the Scheduled Event Time

XML Markup used to Create the Load Management Test

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:testLoadManagementSummary xmlns:ns2="http://drhub.pjm.com/">
    <testLoadManagementEventInfo>
        <eventDate>2019-04-22T05:00:00</eventDate>
        <eventType>TEST_LOAD_MANAGEMENT_SUMMARY</eventType>
        <startTime>10:00:00</startTime>
        <regProduct>CAPACITY_PERFORMANCE_DR</regProduct>
        <zone>AEP</zone>
        <status>SCHEDULED</status>
    </testLoadManagementEventInfo>
</ns2:testLoadManagementSummary>
```

If the Create Request is accepted, the response will mimic the below.

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:testLoadManagementSummary xmlns:ns2="http://drhub.pjm.com/">
    <testLoadManagementEventInfo>
        <eventId>1662559</eventId>
        <eventDate>2019-04-26T00:00:00.000-04:00</eventDate>
        <eventType>TEST_LOAD_MANAGEMENT_SUMMARY</eventType>
        <startTime>17:00:00</startTime>
        <regProduct>CAPACITY_PERFORMANCE_DR</regProduct>
        <zone>AEP</zone>
        <status>SCHEDULED</status>
    </testLoadManagementEventInfo>
</ns2:testLoadManagementSummary>
```

XML Markup to Modify the Load Management Test is the same payload received in the response when the Event was created. In the below, the startTime is modified to demonstrate the change.

Changes to Test or Re-Test Events are limited to the Date, Time and Registration Product Type and Zone to be tested. Always check to verify there are <u>Confirmed</u> Resources for the Registration type combination provided.

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:testLoadManagementSummary xmlns:ns2="http://drhub.pjm.com/">
    <testLoadManagementEventInfo>
        <eventId>1662559</eventId>
        <eventDate>2019-04-26T00:00:00.000-04:00</eventDate>
        <eventType>TEST_LOAD_MANAGEMENT_SUMMARY</eventType>
        <startTime>15:00:00</startTime>
        <regProduct>CAPACITY_PERFORMANCE_DR</regProduct>
        <zone>AEP</zone>
        <status>SCHEDULED</status>
    </testLoadManagementEventInfo>
</ns2:testLoadManagementSummary>
```

If the Modify Request is accepted, the updated response will mimic the below.

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:testLoadManagementSummary xmlns:ns2="http://drhub.pjm.com/">
    <testLoadManagementEventInfo>
        <eventId>1662559</eventId>
        <eventDate>2019-04-26T00:00:00.000-04:00</eventDate>
        <eventType>TEST_LOAD_MANAGEMENT_SUMMARY</eventType>
        <startTime>15:00:00</startTime>
        <regProduct>CAPACITY_PERFORMANCE_DR</regProduct>
        <zone>AEP</zone>
        <status>SCHEDULED</status>
    </testLoadManagementEventInfo>
</ns2:testLoadManagementSummary>
```

The Load Management Re-Test Pattern is similar for the Load Management Test Event creation and update. <u>Required:</u> The user must change the eventType to RETEST_LOAD_MANAGEMENT_SUMMARY and include the specific registration information to be re-tested. It is OK to "stack" the multiple reTestRegistration entries.

In Conclusion:

<u>The DR Hub Event pattern repeats itself for all Event types and many other data entities. Field names and types may vary for individual Event Types</u>