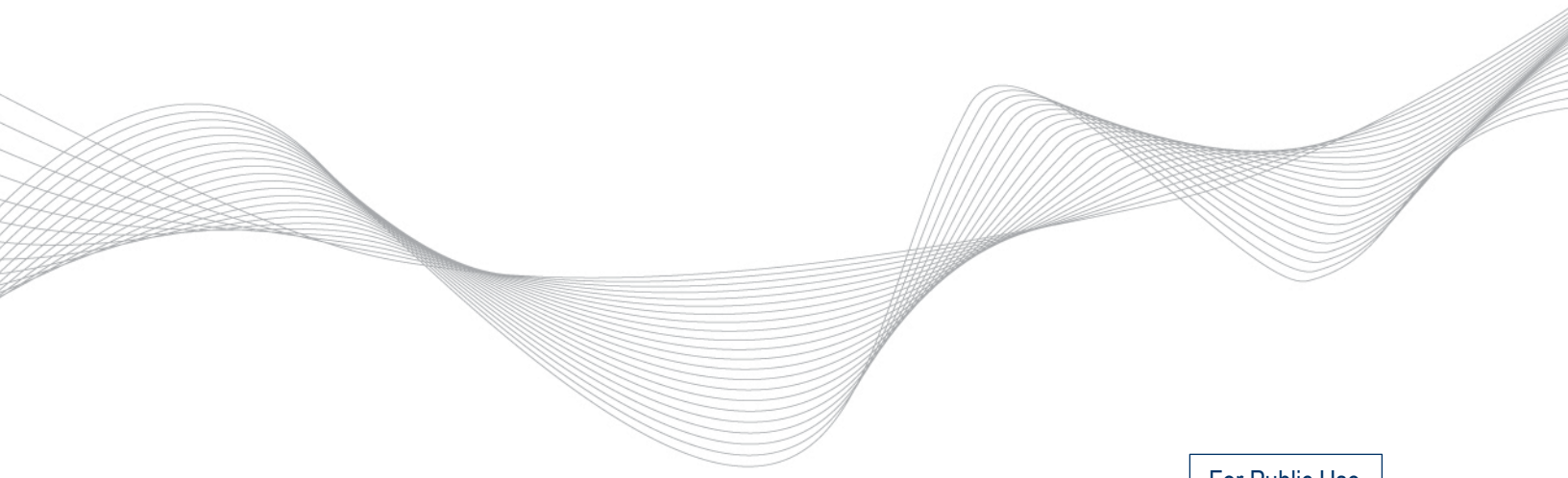
Data Miner 2 Guide for Historic Data Retrieval

PJM Interconnection



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I. Purpose

The purpose of this training guide is to provide assistance with historic data querying via the user interface and application programming interface (API) for PJM's Data Miner 2 tool. To enhance the performance of current data queries and to better handle the increasing volume of Five-Minute Real-Time LMP data, PJM has implemented an archiving solution for Data Miner 2. The archiving solution will move older data for specific feeds to a different area in order to preserve the speed and availability of more recent data. The archived data will still be available, but will have slightly less flexibility on querying parameters than the more recent data does. The details of the restrictions and expected results for several filter combinations are detailed in the following sections.

For example: The archive date for Real-Time Energy Market Hourly LMP data is 731 days. Users querying more recent data (data within the last two years) will be able to query that data as they do today. Users interested in querying older data will have slightly less flexibility in the data sets that can be retrieved. For example, this data could be queried by pnode type (i.e. requesting all aggregates), but not queried for a specific pnode.

II. Historic Data vs Standard Data

Historic Data is defined as data that is dated prior to the archived date. Standard data is defined as data that is more recent than the archived date. Archived date is specific to feed and is a rolling date. These dates are determined based on the UTC date fields.

III. Feeds that have archived solution implemented

Real-Time Hourly LMPs: This feed contains hourly Real-Time Energy Market locational marginal pricing (LMP) data for all bus locations, including aggregates. The archived date for this feed is current date is 731 days (approximately two years).

Day-Ahead Hourly LMPs: This feed contains hourly Day-Ahead Energy Market LMP data for all bus locations, including aggregates. The archived date for this feed is current date is 731 days (approximately two years).

Real-Time Five Minute LMPs: This feed contains five minute Real-Time Energy Market locational marginal pricing (LMP) data for all bus locations, including aggregates. The archived date for this feed is current date – 186 days (approximately six months).

IV. API and User Interface Impacts

A. Dates

i) Both Standard data and Historic data API queries will now require a date parameter. If API request is sent without either datetime_beginning_UTC or datetime_beginning_EPT, users will see the following error message as response:

```
{ "errors": [{ "field": "Filters", "message": "A datetime is missing.
Please input values for datetime_beginning_ept or datetime_beginning_utc",
"detail": ["datetime_filter"] }],
```

ii) If the date range in the request is spanning between archived date and standard date, users will see the following error message as response:

{ "errors": [{ "field": "Filters", "message": "Date range in the API request spans over archived and standard data. Please update the request. Refer to API Guide for more information." }],

iii) Current restriction on date range of 365 continuous days of data for standard data remains unchanged.

B. *Filters, Order, Sort*

i) Current filtering, ordering and sorting capabilities for standard data remains unchanged.

ii) Historic data API requests will require to have the start and end dates within the same calendar year following the UTC timezone. If these API requests have date range outside same calendar year, uses will see the following error message as response:

{ "errors": [{ "field": "Filters", "message": "Archived data date range must be within same calendar year. Please enter valid dates" }],

iii) Historic data API requests will have no sorting and order capabilities. Data returned will be sorted by datetime_beginning_utc in ascending order. If these API requests have sort and/or order, users will see the following error message as response:

{ "errors": [{ "field": "Order", "message": "Custom Order is not an available option on archived data. Please remove order from the request" }],
{ "errors": [{ "field": "Sort", "message": "Custom Sort is not an available option on archived data. Please remove sort from the request", "detail": ["datetime_beginning_utc"] },

iv) Historic data API requests will have limited filtering capabilities. Filters can be applied only on following attributes – dates, type, row_is_current, version_nbr. If these API requests have filters other than the ones specified below, users will see the following error message as response:

{ "errors": [{ "field": "Filters", "message": "The API request contains invalid attribute(s) for archived data - Pnode_Id. Please update the request and retry.", "detail": ["pnode_id"] }],

Please note that type is not an allowed filter for both standard and archived data for Real-Time Five-Minute LMPs.

C. *Metadata API*

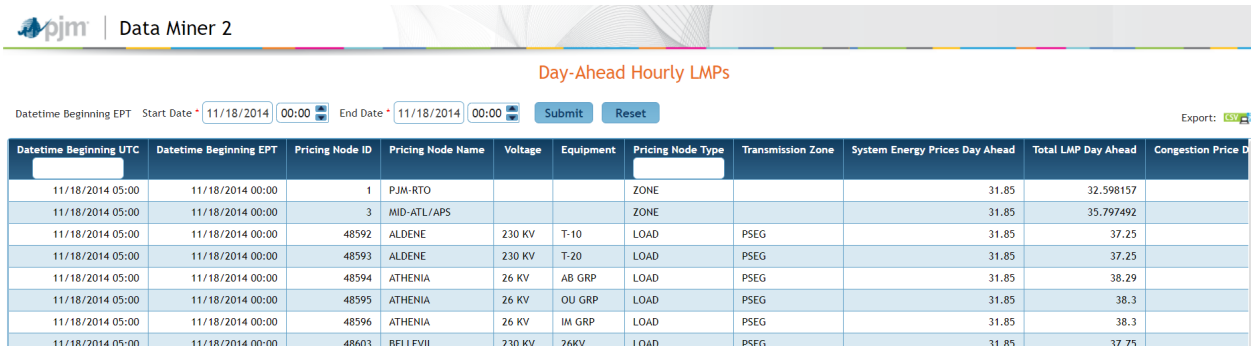
Metadata API response for these three feeds will include these new fields – EnableArchiving, ArchiveCutoffDays, EnableArchiveFiltering

Response will look like:

"enableArchiving": true, "archiveCutoffDays": 731, "enableArchiveFiltering": "True",

D. *User Interface*

When user inputs archived dates for the above mentioned feeds, the data presented back will look like the screenshot below with the sort and filter capabilities disabled.



Data Miner 2

Day-Ahead Hourly LMPs

Datetime Beginning EPT Start Date * 11/18/2014 00:00 End Date * 11/18/2014 00:00 Submit Reset Export:

Datetime Beginning UTC	Datetime Beginning EPT	Pricing Node ID	Pricing Node Name	Voltage	Equipment	Pricing Node Type	Transmission Zone	System Energy Prices Day Ahead	Total LMP Day Ahead	Congestion Price D
11/18/2014 05:00	11/18/2014 00:00	1	PJM-RTO			ZONE		31.85	32.598157	
11/18/2014 05:00	11/18/2014 00:00	3	MID-ATL/APS			ZONE		31.85	35.797492	
11/18/2014 05:00	11/18/2014 00:00	48592	ALDENE	230 KV	T-10	LOAD	PSEG	31.85	37.25	
11/18/2014 05:00	11/18/2014 00:00	48593	ALDENE	230 KV	T-20	LOAD	PSEG	31.85	37.25	
11/18/2014 05:00	11/18/2014 00:00	48594	ATHENIA	26 KV	AB GRP	LOAD	PSEG	31.85	38.29	
11/18/2014 05:00	11/18/2014 00:00	48595	ATHENIA	26 KV	OU GRP	LOAD	PSEG	31.85	38.3	
11/18/2014 05:00	11/18/2014 00:00	48596	ATHENIA	26 KV	IM GRP	LOAD	PSEG	31.85	38.3	
11/18/2014 05:00	11/18/2014 00:00	48603	BELLEVIL	230 KV	26KV	LOAD	PSEG	31.85	37.75	