**Technical Note**

***Subject: How to Evaluate the Memory Size Growth of PecStar\_Data Database***

The PecStar iEMS database contains PecStar\_Config and PecStar\_Data.

The PecStar\_Data database mainly stores datalog (including meter datalog, virtual datalog, report datalog, energy datalog), SOE and waveform.

1. The formula to obtain the memory size growth of Report Data is as follows –

Growth (MB) =

136 x #of Device x #of Group x 60 x 24 x Running Days

Interval x (1024 x 1024)

Remarks:

1. Each recorder for one group of report data points requires 136 bytes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PD\_TB\_13\_YYYY\_MM\_StationID: Report Data** | | |  |  |
| Column Name | Data Type | Data Length (Byte) | Allow Nulls | Description |
| DaymeasStartID | int | 4 |  | The start ID of Report Data Point of the group |
| Logtime | smalldatetime | 4 |  | The Log time of Report Data Point of the group |
| val1 | float | 8 | Y | The Real-time value for the 1st Report Data Point in the group |
| val2 | float | 8 | Y | The Real-time value for the 2nd Report Data Point in the group |
| val3 | float | 8 | Y | The Real-time value for the 3rd Report Data Point in the group |
| val4 | float | 8 | Y | The Real-time value for the 4th Report Data Point in the group |
| val5 | float | 8 | Y | The Real-time value for the 5th Report Data Point in the group |
| val6 | float | 8 | Y | The Real-time value for the 6th Report Data Point in the group |
| val7 | float | 8 | Y | The Real-time value for the 7th Report Data Point in the group |
| val8 | float | 8 | Y | The Real-time value for the 8th Report Data Point in the group |
| val9 | float | 8 | Y | The Real-time value for the 9th Report Data Point in the group |
| val10 | float | 8 | Y | The Real-time value for the 10th Report Data Point in the group |
| val11 | float | 8 | Y | The Real-time value for the 11th Report Data Point in the group |
| val12 | float | 8 | Y | The Real-time value for the 12th Report Data Point in the group |
| val13 | float | 8 | Y | The Real-time value for the 13th Report Data Point in the group |
| val14 | float | 8 | Y | The Real-time value for the 14th Report Data Point in the group |
| val15 | float | 8 | Y | The Real-time value for the 15th Report Data Point in the group |
| val16 | float | 8 | Y | The Real-time value for the 16th Report Data Point in the group |
| **Total** |  | **136** |  |  |

1. #of Group = Ceiling (# of Report Data Points / 16). Each group consists of 16 report data points. For example, if there are 30 report data points, data point 1~16 will be in group 1, and data point 17~30 will be in group 2.
2. Interval is in minutes.
3. One report data stores for 365 days, at a 5-minute interval, will approximately consume 1MB size.
4. The formula to obtain the memory size growth of Meter/Virtual Datalog is as follows –

Growth (MB) =

143 x #of Device x #of Group x 60 x 24 x Running Days

Interval x (1024 x 1024)

Remarks:

1. Each group of meter/virtual datalog requires 143 bytes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PD\_TB\_01\_YYYY\_MM\_StationID: Datalog** | | |  |  |
| Column Name | Data Type | Data Length (Byte) | Allow Nulls | Description |
| SourceID | int | 4 |  | Data Recorder ID |
| LogTime | datetime | 8 |  | Data Recoder LogTime |
| Msec | int | 2 |  | Data Recoder LogTime（millisecond） |
| Data1 | float | 8 | Y | The 1st value of the Data Recorder |
| Data2 | float | 8 | Y | The 2nd value of the Data Recorder |
| Data3 | float | 8 | Y | The 3rd value of the Data Recorder |
| Data4 | float | 8 | Y | The 4th value of the Data Recorder |
| Data5 | float | 8 | Y | The 5th value of the Data Recorder |
| Data6 | float | 8 | Y | The 6th value of the Data Recorder |
| Data7 | float | 8 | Y | The 7th value of the Data Recorder |
| Data8 | float | 8 | Y | The 8th value of the Data Recorder |
| Data9 | float | 8 | Y | The 9th value of the Data Recorder |
| Data10 | float | 8 | Y | The 10th value of the Data Recorder |
| Data11 | float | 8 | Y | The 11th value of the Data Recorder |
| Data12 | float | 8 | Y | The 12th value of the Data Recorder |
| Data13 | float | 8 | Y | The 13th value of the Data Recorder |
| Data14 | float | 8 | Y | The 14th value of the Data Recorder |
| Data15 | float | 8 | Y | The 15th value of the Data Recorder |
| Data16 | float | 8 | Y | The 16th value of the Data Recorder |
| Status | tinyint | 1 |  | The Status of the Data Recorder: |
| 1：Normal |
| 2：Invalid |
| **Total** |  | **143** |  |  |

1. For meter datalog, # of Group = # of Data Recorder. The data recorders are pre-configured in the meter, the maximum of parameters for each data recorder is 16.

For virtual datalog: #of Group = Ceiling (# of Virtual Data Points / 16). Each group consists of 16 data points. For example, if there are 30 parameters required to do virtual datalog, parameter 1~16 will be in group 1, and parameter 17~30 will be in group 2.

1. Interval is in minutes.
2. For meter/virtual datalog, one parameter stored for 365 days, at a 5-minute interval, will approximately consume 1MB size.
3. The formula to obtain the memory size growth of Energy Data is as follows –

Growth (MB) =

120 x #of Device x #of Energy Data Points x Running Days

(1024 x 1024)

Remarks:

1. Each energy data point requires 120 bytes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PD\_TB\_05\_YYYY: Energy Data** | |  |  |  |
| Column Name | Data Type | Data Length (Byte) | Allow Nulls | Description |
| StationID | int | 4 |  | Station ID |
| EngMeasID | int | 4 |  | The ID of Energy Data Point |
| LogTime | datetime | 8 |  | The Log time of Energy Data Point |
| RtlVal | bigint | 8 | Y | The Real-time value for the Energy Data Point |
| SegVal1 | bigint | 8 | Y | The Daily Consumption value of Tariff 1 for the Energy Data Point |
| SegVal2 | bigint | 8 | Y | The Daily Consumption value of Tariff 2 for the Energy Data Point |
| SegVal3 | bigint | 8 | Y | The Daily Consumption value of Tariff 3 for the Energy Data Point |
| SegVal4 | bigint | 8 | Y | The Daily Consumption value of Tariff 4 for the Energy Data Point |
| SegVal5 | bigint | 8 | Y | The Daily Consumption value of Tariff 5 for the Energy Data Point |
| SegVal6 | bigint | 8 | Y | The Daily Consumption value of Tariff 6 for the Energy Data Point |
| SegVal7 | bigint | 8 | Y | The Daily Consumption value of Tariff 7 for the Energy Data Point |
| SegVal8 | bigint | 8 | Y | The Daily Consumption value of Tariff 8 for the Energy Data Point |
| SegVal9 | bigint | 8 | Y | The Daily Consumption value of Tariff 9 for the Energy Data Point |
| SegVal10 | bigint | 8 | Y | The Daily Consumption value of Tariff 10 for the Energy Data Point |
| DayVal | bigint | 8 | Y | The Daily Consumption value for the Energy Data Point |
| Monval | bigint | 8 | Y | The Monthly Consumption value for the Energy Data Point |
| **Total** |  | **120** |  |  |

1. Each energy data point stores one record every day.
2. For energy data, one parameter stored for 1 day, will approximately consume 120-byte size.
3. The formula to obtain the memory size growth of SOE is as follows –

Growth (MB) =

1585 x #of Device x Occurrence

(1024 x 1024)

Remarks:

1. Each event requires 1585 bytes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PD\_TB\_06\_YYYY: SOE** | |  |  |  |
| Column Name | Data Type | Data Length (Byte) | Allow Nulls | Description |
| ID | int | 4 |  | Event ID |
| EventTime | datetime | 8 |  | Event Time |
| Msec | int | 4 |  | Event Time (millisecond) |
| StationID | int | 4 |  | Station ID |
| ChannelID | int | 4 |  | Channel ID |
| DeviceID | int | 4 |  | Station ID |
| StationFlag | tinyint | 1 |  | Station Flag: Main/Standby |
| EventType | int | 4 |  | Event Type |
| EventByte | int | 4 |  | Event Type Secondary Classification |
| EventClass | int | 4 |  | Event Class |
| Code1 | int | 4 | Y | Event Original Information 1 |
| Code2 | int | 4 | Y | Event Original Information 2 |
| EveStr1 | nvarchar(256) | 512 | Y | Event Original Information 3 |
| EveStr2 | nvarchar(256) | 512 | Y | Event Original Information 4 |
| Description | nvarchar(256) | 512 |  | Event Description |
| **Total** |  | **1585** |  |  |

1. One SOE will approximately consume 1KB size.
2. The formula to obtain the memory size growth of Waveform is as follows –

Growth (MB) =

(#of Channel x 2 + 8) x Samples/Cycle x Cycles x #of Device x Occurrence

(1024 x 1024)

Remarks:

1. Channel presents to V1, V2, V3, I1, I2, I3, …
2. One waveform for V1, V2 & V3 @256samples/cycle x 20cycles will approximately consume 32KB size.