

Data Logging with XLReporter

Overview

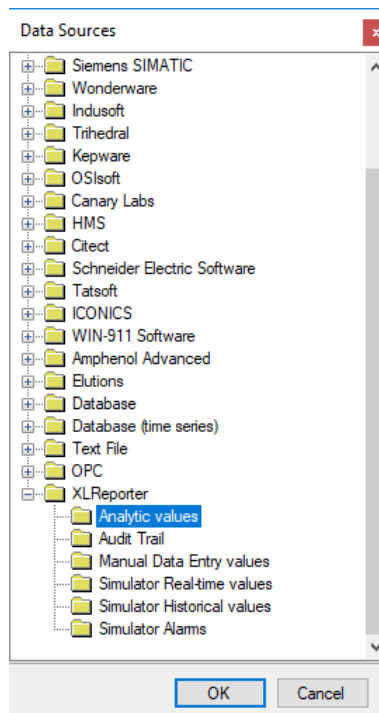
Logging process data to a centralized relational database can prove invaluable for creating descriptive and in-depth reports. XLReporter's solution for data logging are Data Snapshots, which are taken periodically or on event. There are other analytic types available in XLReporter to do everything from statistics like average, minimum, and maximum, to analytic types that can derive things like uptime and downtime of different machines in the plant. These are discussed in a separate document.

Project Setup

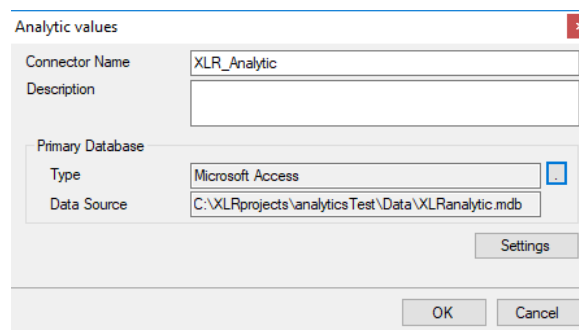
The following describes the setup for data logging with Data Snapshot Analytics.

Data Connector

In the **Project Explorer**, add a new data connector by navigating to the **Data** tab, selecting **Connectors**, and clicking **Add**.



For the **Data Source**, expand **XLReporter** and select **Analytic Values**. The following display is used to specify where the analytic values are stored.

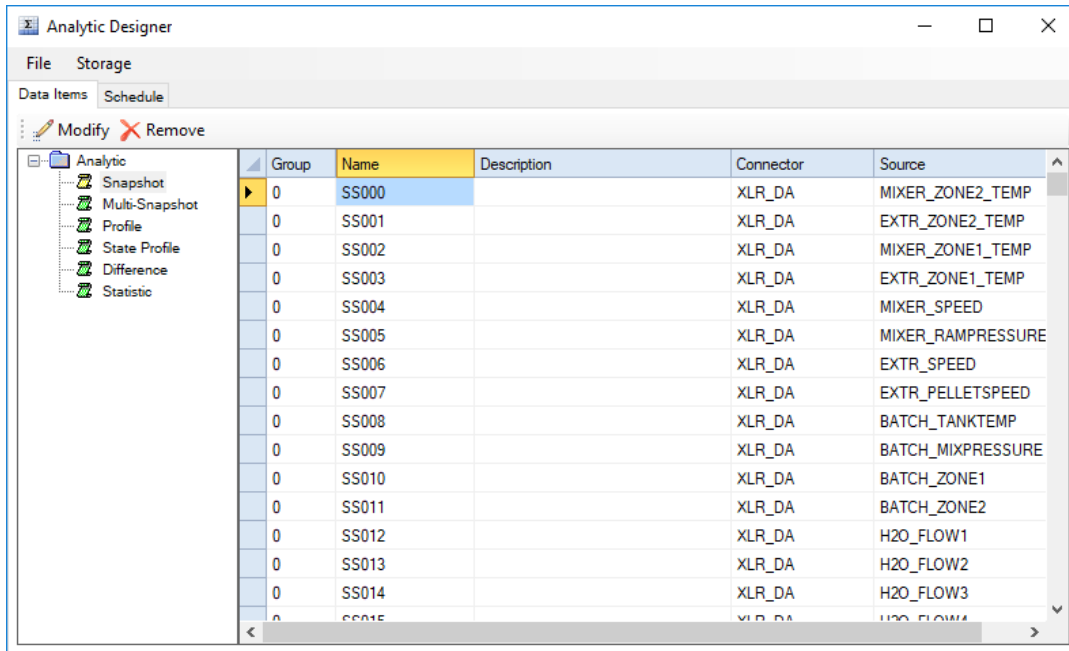


The **Primary Database** is where the data collection is be stored and is defined by clicking the browse pushbutton [...]. There are options to select Microsoft SQL Server and MySQL. A blank Microsoft Access database called *XLRanalytic.mdb* is provided in the *Data* folder of the project.

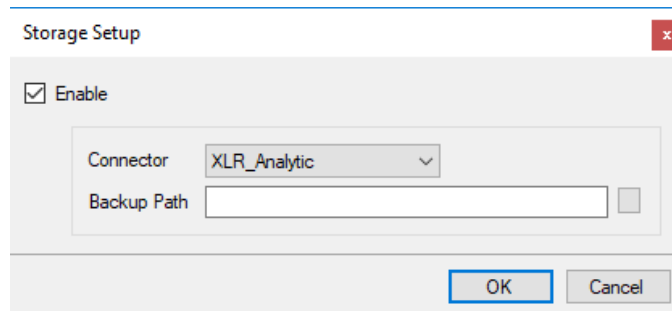
When selections are complete, click **OK** and a set of tables are created in the database to receive the logged data. In the next section, we will specify what will be logged.

Analytic Designer

From the **Project Explorer Data** tab, open the **Analytic Designer**.



By default, **Data Snapshots** do not get saved to the database and when used only the current value is available. To enable database storage, click the **Storage** menu at the top and then check the **Enable** checkbox.

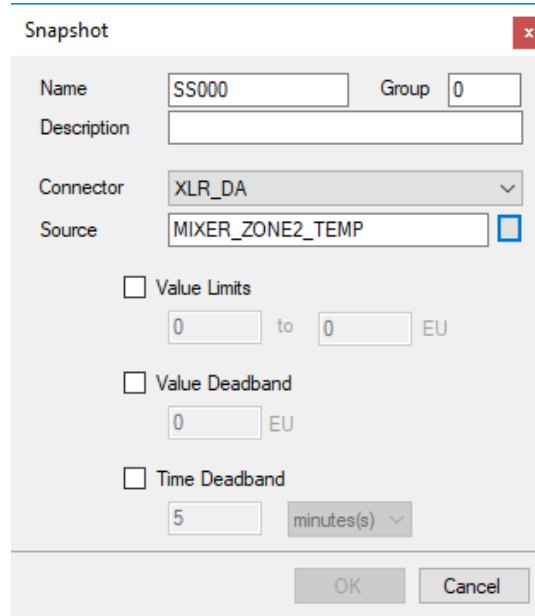


An optional **Backup Path** can be configured to cache process history in the event that communication to the database cannot be established. Once the link to the database is restored, the data in the backup is sent to the database.

Click **OK** to return to the main display.

Snapshot

To configure a **Snapshot**, either double-click a row in the grid or select a row **and** click **Modify**.



The screenshot shows a dialog box titled "Snapshot" with a close button (X) in the top right corner. The dialog contains the following fields and options:

- Name:** Text input field containing "SS000".
- Group:** Text input field containing "0".
- Description:** Empty text input field.
- Connector:** Dropdown menu showing "XLR_DA".
- Source:** Text input field containing "MIXER_ZONE2_TEMP" with a blue square icon to its right.
- Value Limits:** A checkbox that is unchecked. Below it are two text input fields, both containing "0", with "to" between them and "EU" to the right.
- Value Deadband:** A checkbox that is unchecked. Below it is a text input field containing "0" and "EU" to its right.
- Time Deadband:** A checkbox that is unchecked. Below it is a text input field containing "5" and a dropdown menu showing "minutes(s)".

At the bottom of the dialog are two buttons: "OK" and "Cancel".

Enter a **Name** or accept the default. When triggered on time or event from the **Scheduler**, the process value specified as **Source** is collected and sent to the database.

As part of the configuration, the following options can be configured to reduce the volume of data stored in the database:

- **Value Limits**

If enabled, the value is stored if it is within the limits specified.

- **Value Deadband**

If enabled, the value is stored when the difference from its previous value is greater than the deadband value.

- **Time Deadband**

If enabled, the value is stored if the amount of time elapsed since the last value was stored is greater than the time deadband.

Note that a **Group** can also be specified. This is used by the **Scheduler** to determine which **Snapshots** to process (see **Schedule** section).

Schedule

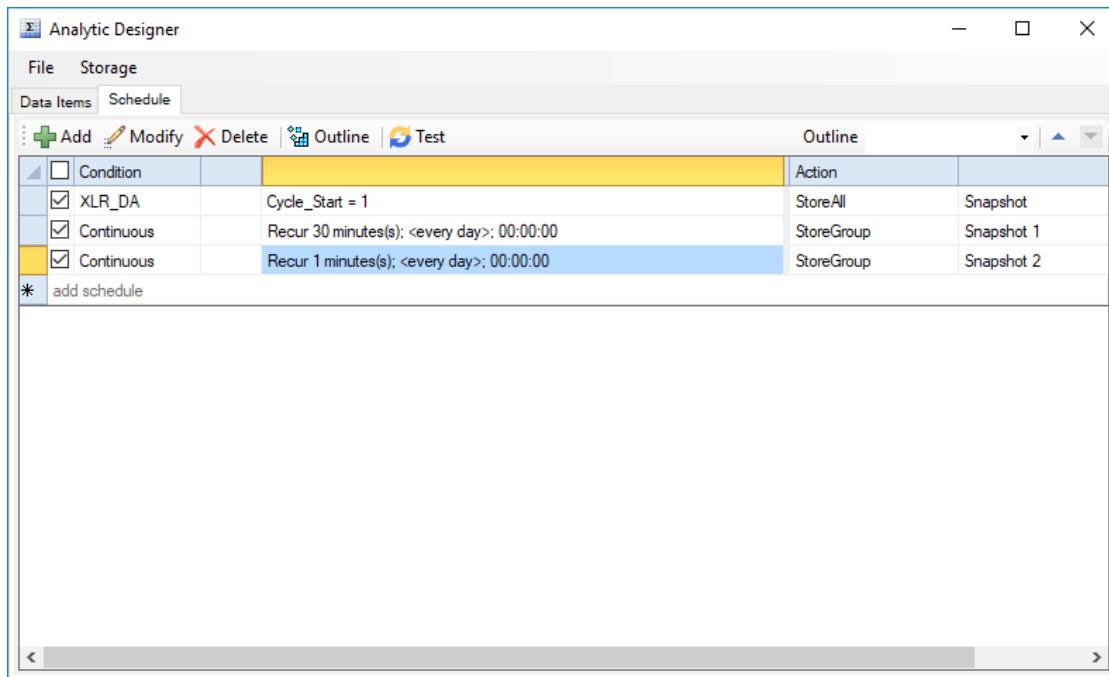
Store Actions

In the Scheduler, the **Store** action causes the **Snapshot** in the previous section to be logged either periodically or on event.

Groups

Each **Snapshot** is configured with a **Group** number which, by default, is set to 0. This can be set to a specific number so that only analytics in a specific group are stored. Group 0 is considered the global group, which means that any data point configured as 0 is stored regardless.

As an example, consider the following:



In the above **Schedule**, there are three actions configured:

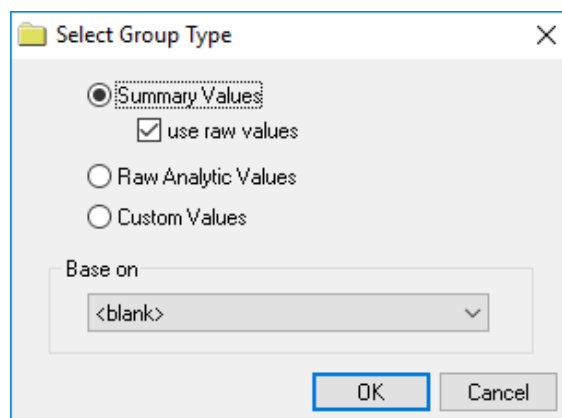
- A **StoreAll** action to run on the event *Cycle_Start = 1* to store all Snapshots.
- A **StoreGroup** to run *every 30 minutes* to store Snapshots assigned to group 1.
- A **StoreGroup** to run *every 1 minute* to store Snapshots assigned to group 2.

Each line of the schedule can be forced to run by selecting a row and clicking **Test**. The **Database Manager** tool from the **Project Explorer** can be used to verify that the values in the database.

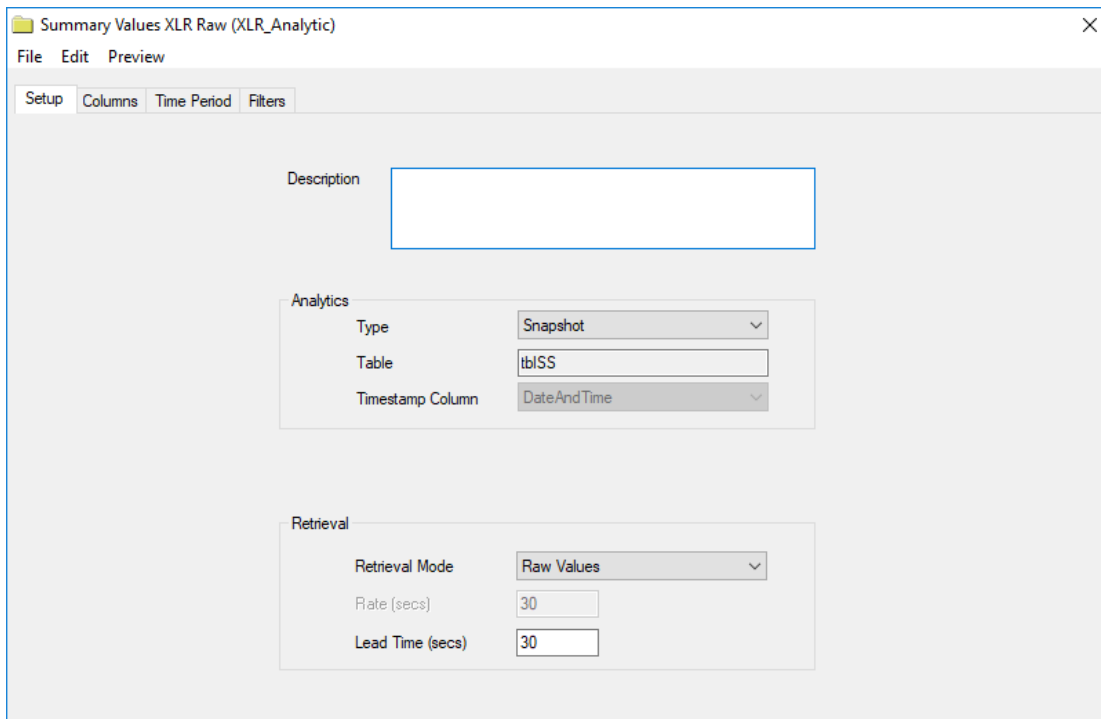
Data Group

The first step in getting the analytic **Snapshots** into a report is to design a **History Group**. This is usually done as part of template design. However, a quick method is to configure a data group directly.

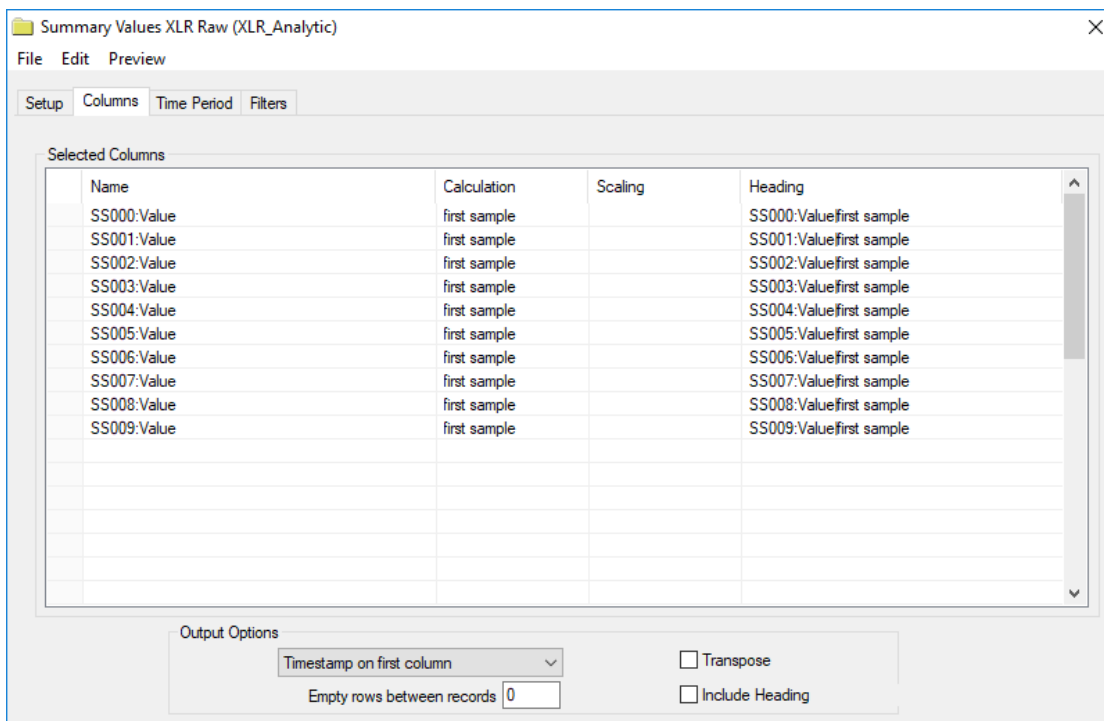
On the **Tools** tab of the **Project Explorer** open **Connector Groups**. Select the **XLR_Analytic** connector and click **Add**.



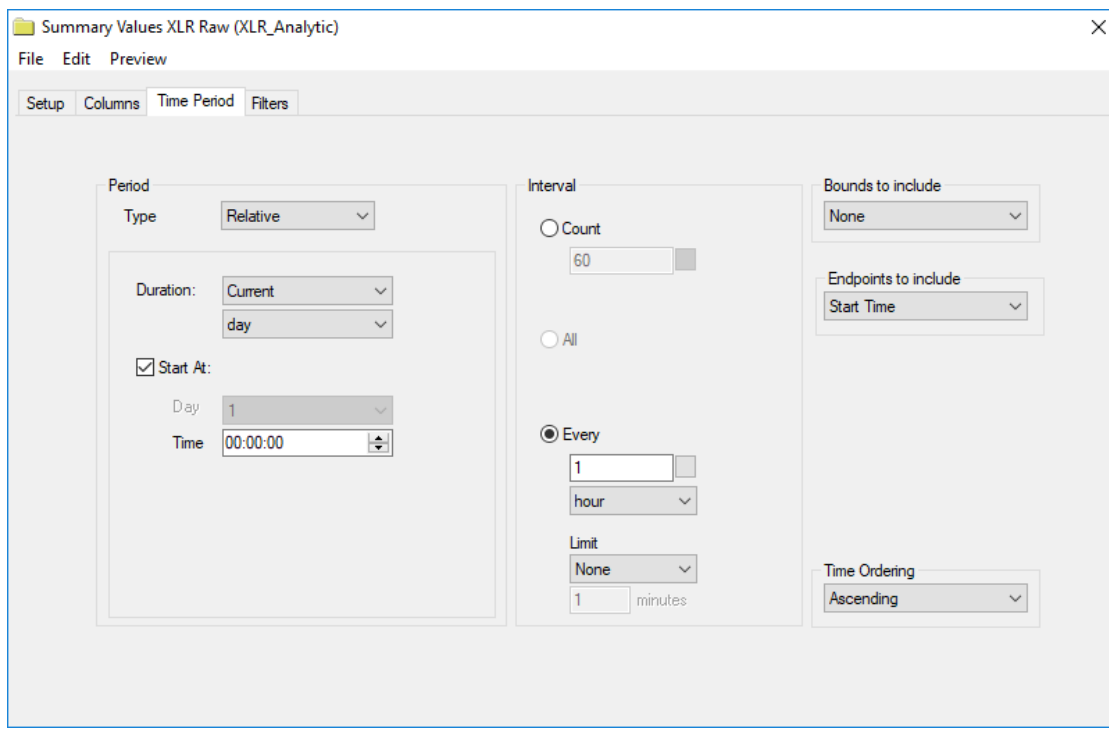
In the **Select Group Type** dialog, make a selection.



Under the **Setup** tab, set the **Type** to *Snapshot* and **Table** to *tblSS*



Under the **Columns** tab, Select the tags from the **Tag Browser** using the [...].



Under the **Time Period** tab, set the **Period** and **Interval**.

Click the **Preview** button.

Set the **Start Date** and click **Refresh**.

Preview

	0	SS000:Value	SS001:Value	SS002:Value	SS003:Value	SS004:Value	SS005:Value	SS006:Value	SS007:Value	SS008:Value	SS009:Value
	Date	first sample	first sample	first sample	first sample	first sample	first sample	first sample	first sample	first sample	first sample
	Start	17 Sep 2020									
	End	18 Sep 2020									
9/17/2020		76.0037460327148	76.0037460327148	31.0037422180176	90.767822265625	55.9937438964844	76.0037460327148	71.0037460327148	81.0037460327148	55.9937438964844	114.41955664063
9/17/2020 1:00:00 AM		77.9161834716797	77.0083618164063	38.7391319274902	89.5472183227539	56.398365020752	77.0083618164063	82.739143371582	87.286376953125	56.398365020752	111.368057250977
9/17/2020 2:00:00 AM		46	82.1043090820313	45.5073699951172	83.2448577880859	55.8060836791992	82.1043090820313	75.0856628417969	83.2800598144531	57.8060836791992	95.6121444702148
9/17/2020 3:00:00 AM		77.6549758911133	81.9631652832031	45.7643737792969	74.0623245239258	58.395076751709	81.9631652832031	75.3426361083984	84.4635009765625	57.0649566650391	72.6558151245117
9/17/2020 4:00:00 AM		78.2271118164063	65	50.3950843811035	65.2073516845703	57.2774314880371	77.735466003418	79.9733428955078	69	56.7883834838867	50.518383026123
9/17/2020 5:00:00 AM		75.6990432739258	78.3638000488281	63.8195152282715	59.7732315063477	58.985842590332	80.0436248779297	79.3104553222656	37	58.4965362548828	36.9330825905664
9/17/2020 6:00:00 AM		77.6809387207031	79.902702331543	60.9093818664551	59.658260345459	56.7985687255859	83.7354583740234	76.4003295898438	82.8470077514648	58.5074348449707	36.6456489562988
9/17/2020 7:00:00 AM		46	75.4353103637695	60.899845123291	64.9025955200195	57.5451622009277	79.26806640625	76.3907852172852	82.9726943969727	58.3992233276367	49.7564926147461
9/17/2020 8:00:00 AM		75.850715637207	79.0334320068359	48.5095252990723	73.6742477416992	58.3743057250977	80.6971817016602	71.6874160766602	85.9814224243164	57.350643157959	71.6856231689453
9/17/2020 9:00:00 AM		77.8348846435547	78.3759841918945	49.3849411010742	82.9090194702148	56.146556854248	81.3976135253906	72.5628356933594	80.5897598266602	49	94.7725601196289
9/17/2020 10:00:00 AM		76.9254837036133	79.8847351074219	53.0889434814453	89.3809509277344	57.0552978515625	82.906364440918	76.266845703125	84.3551559448242	58.4065971374512	110.952369689941
9/17/2020 11:00:00 AM		77.758430480957	80.6124649047852	42.3071441650391	90.8291931152344	59.382080078125	83.6340942382813	73.4063949584961	81.4223175048828	56.6159362792969	114.572982788086
9/17/2020 12:00:00 PM		78.6410903930664	79.3693923950195	42.8257827758789	86.7478485107422	59.300724029541	82.3910217285156	73.9250335693359	81.6172103881836	54.7728729248047	104.369621276855
9/17/2020 1:00:00 PM		76.2477645874023	77.9020385742188	42.4303092956543	78.5626373291016	56.1095199584961	78.0751800537109	73.5295867919922	80.7988739013672	57.6602592468262	83.9066009521484
9/17/2020 2:00:00 PM		76.2538604736328	75.4281539916992	50.3524017333984	69.1329040527344	56.5240173339844	75.6012954711914	81.4516754150391	85	54.5863990783691	60.3322525024414
9/17/2020 3:00:00 PM		77.6068954467773	77.4648132324219	50.8709983825684	61.7527084350586	57.960666564941	77.6379547119141	81.9702987670898	37	57.6774024963379	41.8817672729492
9/17/2020 4:00:00 PM		78.0690078735352	77.5559844970703	49.5143508911133	59.000171661377	58.653881072998	82.5226898193359	80.613639831543	83.0640640258789	58.3984298706055	35.0004348754883
9/17/2020 5:00:00 PM		74.9252624511719	79.0385208129883	38.9220733642578	61.836841583252	59.5364074707031	84.0052261352539	70.0213165283203	81.4268417358398	59.2809562683105	42.092098236084
9/17/2020 6:00:00 PM		28	88.9875411987305	39.8495063781738	69.2717742919922	55.946891784668	77.5601043701172	77.2373657226563	61	56.5238838195801	60.6794395446777
9/17/2020 7:00:00 PM		76.634162902832	92.5627517700195	37.4186706542969	78.7077484130859	58.9220962524414	81.1353149414063	74.8065032958984	83.3035583496094	59.4990882873535	84.2693634033203
9/17/2020 8:00:00 PM		77.9736404418945	89.4606781005859	38.3731880187988	86.8484954833984	59.1553268432617	84.1656799316406	75.7610321044922	84.2580871582031	56.9260864257813	104.621231079102
9/17/2020 9:00:00 PM		80.72900390625	91.747184753418	36.5806045532227	90.8502197265625	45	86.4521865844727	73.9684371948242	61	17	114.625556945801
9/17/2020 10:00:00 PM		76.9942626953125	90.9952774047852	41.5867385864258	89.3150100708008	54.3376693725586	85.7002792358398	78.9745712280273	53	57.7827415466309	110.787528991699
9/17/2020 11:00:00 PM		78.1735382080078	61	35.9065933227539	82.7791595458984	60.3019599914551	77.4826354980469	73.29443359375	81.012565612793	49	94.4478912335316