Appendix 4 Weather

Using weather data in your automation solution can have many benefits. Without weather data, your home automation happens regardless of environmental conditions. Some things you can use weather data for are:

- Don't run sprinkler systems when too hot or too windy
- Retract awnings when too windy
- When very hot or very cold adjust the thermostat setpoint to be a bit higher or a bit lower. In doing this you trade off a bit of comfort for what can be substantial energy savings
- Close remote control skylights when it's raining
- Adjust indoor lighting to make the house appear warmer when it's cold and cooler when it's hot. Your perception of the temperature varies with many environmental factors

This appendix describes how to work with weather data and covers these topics:

- What weather providers HCA supports
- Configuring HCA to use Weather Underground as a weather provider
- Configuring HCA to use the output of another program for current weather data.\
- Configuring HCA to use METAR observations
- Configuring HCA to add weather observation data to a database file. This database is used for tests of historical weather data like the max temperature in the last 4 hours
- The Visual Programmer weather test element
- Weather program triggers
- Additional support for Weather Underground

Weather Providers

HCA accepts weather data from three main types of sources. These are:

- HCA can retrieve weather data from the *Weather Underground* web site. You must first establish an account with them but once created, then you have access to not only current weather data temperature, humidity but also to forecasts and astronomical data.
- HCA reads a file that contains the weather data. These files are typically produced by another program. HCA can read these files in several formats. These are the formats produced by three programs that work with weather data: Virtual Weather Station, Weather Display, and the Davis WeatherLink program.
- HCA can retrieve weather data from the Internet using what are know as METAR reports. These are weather observations taken at airports across the county.

Once you have configured a weather provider, at periodic intervals weather data is retrieved. Each time this happens it is called an *Observation*. Contained in a weather observation are all the sensor data - temperature, barometer, wind speed, etc.

If you are new to working with weather data we recommend that you use the *Weather Underground* provider even if you own your own weather station. Your weather station can publish its data to Weather Underground – a feature of many weather programs - and then you can access that data from them. Working this way you also gain access to all that Weather Underground offers in addition to your own station data.

Weather Provider Setup

To setup a weather provider, press the *Weather Provider Setup* button in the ribbon *Interfaces* category. This weather provider dialog opens.

Weather Provider Properties	3
Provider Internet Schedule File Frequency Units Database	
The Visual Programmer Weather element and the _Weather functions of the Compute element operate on weather data (temperature, wind speed, rain amount) retrieved from a weather provider. HCA supports weather data read from files produced by other programs, and weather reports read from the internet.	
None	
🔘 Weather Display	
O Virtual Weather Station (VWS)	
WeatherLink HTML	
C METAR observation - NOAA web site	
O Weather Underground	
OK Cancel	

The setup options vary with the chosen weather provider. Refer to the next sections for setup of each weather provider.

In addition to choosing the weather provider and its setup options, there are three other items to configure:

- The units to use for the sensor data F or C, inches or mm, etc.
- How often a weather observation is taken
- The location of the database files that contain the historical weather data

These are covered in sections below.

Weather Underground

The Weather Underground web site (<u>http://www.wunderground.com/</u>) provides weather data to applications and that data can be accessed by HCA for your use.

Before you can use Weather Underground as a weather provider you need to sign up as a developer. What Weather Underground is doing is making weather data available to people creating applications, but since each of you are a "developer" of your own home design you should have your own key.

Signup for the key is here: http://www.wunderground.com/weather/api/

Complete the signup for the API Key and save the API Key they send in a safe place. During the signup process you may also want to do a quick review of the documentation that Weather Underground provides. This is important if you want to use Weather Underground beyond the standard weather data retrieval that HCA automatically performs.

Once you have your API Key, the next thing to do is to determine a location. Go here:

http://www.wunderground.com/weather/api/d/docs?d=data/index

Look at the section on "Query". There are lots of different ways to specify your location. The easiest is to use your zip-code. One you have a key and have determined a location you are ready to configure HCA.

Weather Provider Properties	×
Provider Internet Schedule File Frequence The Visual Programmer Weather element a wind speed, rain amount) retrieved from a v programs, and weather reports read from th None None Weather Display Virtual Weather Station (VWS) WeatherLink HTML METAR observation - NOAA web site Weather Underground Weather Underground	y Units Database nd the _Weather functions of the Compute element operate on weather data (temperature, veather provider. HCA supports weather data read from files produced by other e internet. wunderground.com® API Key: Location: Note: See Weather Provider Technical Note for configuration help
	After each observation, run this program: None After each successful observation make an entry in the HCA log After each failed observation make a note in the HCA log Create a log file showing the progress of each observation retrieval OK Cancel

Enter your API key and location. No verification is done on either so enter them carefully.

Also in this tab are additional options. After each weather observation is taken a program can be started. You can also make entries in the HCA log (always the first of the three possible logs) after each observation.

If you choose to create a log file – last checkbox on this tab – it is located in the *Logs* folder and is called "WeatherLog.txt"

The *Internet Schedule* tab sets the schedule to be used to retrieve observations from Weather Underground. The *File Frequency* tab is used for file based providers and has no effect on Weather Underground.

Using the schedule you can set the times during the day that weather observations are taken.

ovider	Internet Schedule Fil	e Frequency	Units	Database		
í your w	veather provider retrieve	s its observatio	on from t	he internet - Weat	ner Undergrour	nd or METAR - you can specify a retrieval schedule.
for MET	TAR, the reports are gen ve it to the right list using	erally made ea the -> button	ach hour . To retr	r so retrieval more (rieve each hour us	often than once e the => buttor	e an hour is not useful. To add a retreival n.
or a W eterive	eather Underground ob up to the minute data if	servation, the that is needed	schedule	ed retrieval keeps t	he internal HC	A state up to date. You can use a program to
	Don't retrieve at this ti	me	F	Retrieve at this time		
	12:00 AM (Midnight) 01:00 AM 02:00 AM 03:00 AM 04:00 AM 05:00 AM 10:00 PM 11:00 PM		 	10:00 AM 11:00 AM 12:00 PM (Noon) 01:00 PM 02:00 PM 03:00 PM 04:00 PM 06:00 PM 06:00 PM 06:00 PM 06:00 PM 08:00 PM	E	Retrieve report from the internet
NOTE				09:00 PM	.	
The fil	e based weather provid	ers do not use	these s	ettings. Data is rei	ad from those p	roviders using the File Frequency settings.

As the text in this tab explains, HCA goes out to the internet at most once an hour to retrieve the current weather observation. There are items to configure in this dialog:

- When during the hour to read the data. This is given as the number of minutes past the hour. In this example, the weather data is retrieved at, for example, 9:15 or 11:15, etc.
- What hours of the day to retrieve the data. In the above example, the data is retrieved every hour except between 10pm and 6am.

The Units tab is where you specify the units of measurement the data from the provider are in, as well as the units that you want to work in your programs. For example, while the provider may report temperatures in Fahrenheit you may want to work in Centigrade. HCA translates the source units to the working units as needed.

Weather Provider Properties	X
Provider Internet Schedule File Frequency Units Database	
After each observation is taken, the units for each sensor can be converted into units more appropriate for yo observation wind speed is in knots and you may prefer miles per hour.	u. For example, the METAR
Source units	
Temperature Celsius	
Rain Inches Vind Knots	
HCA working units	
Temperature Fahrenheit	
Rain Inches Vind MPH V	
	OK Cancel

In the dialog above, the weather provider supplies temperature in degrees Fahrenheit, rain in inches, barometric pressure in inches and wind speed in knots. In this example, when working with weather data in the *Weather* element and weather triggers, temperature values are in degrees Fahrenheit, rain in inches, barometric pressure in millibars and wind speed in miles per hour.

When using Weather Underground, on the units tab make sure that the "source" units are configured as:

- Temperature: F
- Rain: Inches
- Barometer: Inches
- Wind: MPH

For other providers, you will have to determine the source unit choices based upon documentation or on examination of the data..

When the schedule tells HCA to take an observation – in this case retrieval of data from Weather Underground - an XML file containing the data is saved in the *Temp* folder in the HCA documents area.

After each observation is taken HCA extracts the data for these variables:

- Outside temperature
- Relative humidity
- Barometer (inches)
- Barometer Trend
- Wind speed (mph)
- Wind Dir (degrees)
- Wind Direction (string)
- Wind Chill
- Daily rain (precipitation today inches)
- Rain rate (1 hour Precipitation)
- Dewpoint
- Wind Gust (mph)
- WeatherCondition (string)

All these various values are extracted and are available to the *Weather* program element – described later in this appendix..You can also use the _Weather function –described in the *Expressions* chapter - to operate on these values.

Reading data from a file

HCA can read data from three different file formats produced by three different programs that run on the same computer as HCA or on a different computer but create the file in a network location that HCA can access. You must configure these programs to produce the file that is read by HCA.

WeatherLink Program

The WeatherLink program from Davis Instruments can be configured to produce a file on a schedule you set. That file is read by HCA and the weather data values extracted.

In a very similar manner as the HCA *Status Export* feature, WeatherLink reads a template file and produces a result file while replacing placeholders with data read from the weather station data.

The list of placeholders available in WeatherLink template files is very large. There are over 250 possible placeholders.

HCA uses both the template and results file produced to extract the weather data.

To setup the WeatherLink HTML as the weather data provider, select WeatherLink HTML and the setup dialog shows those settings:

Weather Provider Properties	
Provider Internet Schedule File Frequence	y Units Database
The Visual Programmer Weather element a wind speed, rain amount) retrieved from a w programs, and weather reports read from th	nd the _Weather functions of the Compute element operate on weather data (temperature, reather provider. HCA supports weather data read from files produced by other e internet.
 None Weather Display Virtual Weather Station (VWS) WeatherLink HTML METAR observation - NOAA web site Weather Underground 	The WeatherLink program can be configured to periodically read a template file, substitute sensor data for placeholders in the file and create a result file. At each observation HCA reads both the template and result file to extract the weather data. Use the Browse button to locate both the template and results files Template file Browse Result file Browse
	After each observation, run this program: None After each successful observation make an entry in the HCA log After each failed observation make a note in the HCA log Create a log file showing the progress of each observation retrieval

The two setup parameters are the paths to the template file and the result files.

To configure WeatherLink to produce the HTML files and what the placeholder keys are, see the WeatherLink documentation. Look in the *Internet Settings* sections.

Optionally, after the file is read a program can be started. You can also make entries in the HCA log (always the first of the three possible logs) after each observation.

Tip: Extracting the data from the file produced by WeatherLink can be difficult. In the HCA installation is a Windows program called *WTest* that lets you enter the path to the two files and then performs and displays the decoded information. This can be a good way to check the extraction of the data.

Weather Provider Properties	X
Provider Internet Schedule File Frequency Units Database	
For file based observations, every few minutes HCA reads the data from the weather provider and makes it available for testing with the Visual Programmer Weather element.	
It depends upon the weather provider you are using when determining how often to have HCA read the observation file. Your don't want HCA to read the data more frequently than it is produced.	
The weather observation file is read every 5 minutes	
NOTE	
The internet weather providers do not use this setting. Data is read from those providers using the Internet Schedule settings.	
ОК Са	ncel

On the File Schedule tab is specified how often the data file is read.

How often the file is read should approximate how often the file is produced by the program creating it.

When working with the *WeatherLink* program you should also set the observation units and working units on the *Units* tab as described above in the Weather Underground section.

Weather Display Program

The Weather Display program periodically writes a file containing the current weather sensor data. When you select this option the setup dialog settings are:

Weather Provider Properties	×
Provider Internet Schedule File Frequence	y Units Database
The Visual Programmer Weather element a wind speed, rain amount) retrieved from a v programs, and weather reports read from th	nd the _Weather functions of the Compute element operate on weather data (temperature, veather provider. HCA supports weather data read from files produced by other e internet.
 None Weather Displayi Virtual Weather Station (VWS) WeatherLink HTML METAR observation - NOAA web site Weather Underground 	The Weather Display program can be configured to periodically produce a file called scriptlog.bd This file contains the weather data and is read by HCA at each observation. Use the Browse button to locate the data file: Browse
	After each observation, run this program: None After each successful observation make an entry in the HCA log After each failed observation make a note in the HCA log Create a log file showing the progress of each observation retrieval
	OK Cancel

All that is needed is the path to the file produced by Weather Display.

To configure *Weather Display* to produce the export file, it is all done from Weather Display menu selections. Select from the *Weather Display* menu:

```
Setup
Log file recording
Produce a 1 line log output for scripting (scriptlog.txt)
Yes
```

The exported file, scriptlog.txt, is placed in the Weather Display installation log files folder.

Hint: The method for producing scriptlog.txt may have changed in the current version of Weather Display. Refer to the Weather *Display* documentation for current instructions.

When working with the *Weather Display* program you should also set the observation units and working units on the *Units* tab as described above in the Weather Underground section.

When working with the *Weather Display* program you should also set the observation frequency as described above in the WeatherLink section.

Virtual Weather Station Program

The *Virtual Weather Station* program periodically writes a file containing the current weather sensor data. When you select this option the setup options are:

Weather Provider Properties		×
Provider Internet Schedule File Frequence	y Units Database	
The Visual Programmer Weather element an wind speed, rain amount) retrieved from a w programs, and weather reports read from the	nd the _Weather functions of the Compute element operate on weather data (temperature, reather provider. HCA supports weather data read from files produced by other e internet.	
 None Weather Display (virtual Weather Station (VWS)) WeatherLink HTML METAR observation - NOAA web site Weather Underground 	The Virtual Weather Station program can be configured to periodically produce files called data csv and data2 csv. Data.csv contains data in the station native units and Data2 csv contains data in whatever units you select for export. This file contains the weather sensor data and is read by HCA at each observation. Use the Browse button to locate the file you want to use: Browse	
	After each observation, run this program: None After each successful observation make an entry in the HCA log After each failed observation make a note in the HCA log Create a log file showing the progress of each observation retrieval	
	ОК Са	ncel

All that is needed is the path to the file produced by VWS.

To configure VWS to periodically create the data.csv and data2.csv files, start VWS and select from the VWS menu: Settings then CSV Export. This dialog appears:

🔀 CSV File Export	<
Comma Separated Text File (Export Data)	
Create csv output file	
c:\wws\data	
Browse to Directory Location Browse	
File Update 🗧 120	
Close	

Make sure that you check the *Create csv output file* option and choose a folder for where the file is produced and how often. Don't use too short an update time or HCA will never get access to the file – VWS will always have it open. Then press *Close*.

Hint: The method for producing scriptlog.txt may have changed in later versions of *VWS*. Refer to the *VWS* documentation for current instructions.

When working with the *VWS* program you should also set the observation units and working units on the *Units* tab as described above in the Weather Underground section.

When working with the *VWS* program you should also set the observation frequency as described above in the WeatherLink section.

METAR weather data

METAR is a format for reporting weather information. A METAR weather report is predominantly used by pilots in fulfillment of a part of a pre-flight weather briefing, and by meteorologists, who use aggregated METAR information to assist in weather forecasting. HCA can also retrieve and decode METAR reports.

Before using METAR data, the first thing you need to do is to locate the nearest airport that has a weather reporting station. The best way to do this is to use an internet search to find such an airport. What you are looking for is the 4 character airport code.

When you choose the METAR option the setup dialog contains these configuration options:

Weather Provider Properties	
Provider Internet Schedule File Frequence	y Units Database
The Visual Programmer Weather element an wind speed, rain amount) retrieved from a w programs, and weather reports read from the	nd the _Weather functions of the Compute element operate on weather data (temperature, reather provider. HCA supports weather data read from files produced by other e internet.
None Weather Display Vitual Weather Station (VWS) WeatherLink HTML METAR observation - NOAA web stel Weather Underground	At airports all around the country - some international also - hourly weather observations are taken. Some of these are fully automated, some partly, and others made by real people. Choosing the airport location best for your use is made by looking at a map and taking note of its name - always four characters. Station Name: To control exactly when the internet is accessed and the weather data retrieved, set up a schedule on the Internet Schedule tab.
	After each observation, run this program: None After each successful observation make an entry in the HCA log After each failed observation make a note in the HCA log Create a log file showing the progress of each observation retrieval
	OK Cancel

When working with METAR data you should also set the observation units and working units on the *Units* tab as described above in the Weather Underground section.

When working with METAR data you should also set the observation frequency as described above in the Weather Underground section.

Hint: METAR observations seem to make it to the internet sometime between 50 minutes after and the top of the hour. A good time to retrieve data is 10 or 15 minutes after the hour.

Weather database

Based upon the configured schedule HCA take a weather observation and writes data to a file. This is necessary to support testing on weather data over time. For example, the database is used when testing to see if the average temperature in the last 24 hours has been above or below freezing.

To setup a weather database, choose the Database tab in the weather provider setup.

Weather Provider Properties	x
Provider Internet Schedule File Frequency Units Database	
Each time a weather observation is made, HCA appends the sensor data to a database file. This is done so tests can be made for conditions like the highest temperature in the last two hours HCA writes this file, a new file each month, in DBF format.	
Enter the name of the folder to use to store the weather database files:	
C:\Users\Kimberly\Documents\HCA\Logs Browse	
OK Canc	el

The only information to enter is the path to a folder that contains the monthly log files. What you enter here is the path to a folder and *not* the path to a file. Each monthly log file is given a name by HCA.

Tip: Not all weather data is saved in the weather database. On the HCA support web site is a technical note on Weather providers. The technical note describes exactly what parts of an observation are saved in the database and which can be tested with the historical weather tests.

Visual Programmer

To use weather data to make decisions in your HCA programs, the *Weather Test* element is used. This visual programmer element makes it possible to test both current weather data and historical weather data. When added to a program, the element properties are:

This element tests weather data and executes different elements based upon the outcome.
Sensor Barometer Dew point Humidity inside Humidity inside High value Low value Average value Temperature inside In last Image: Comparison of the set Wind chill Wind direction Step 2: Perform the test Wind speed THW Solar radiation UV Outside heat index [Data from step 1] Image: Step 2: Perform the test Daily rain Monthly rain Storn rain Rain Rate Daily ET Monthly ET Yearly ET
© Rain amount © ET amount OK Cancel

The parts of this dialog are:

- What data item to test. Not all weather providers support all data items.
- What to test. Either the current value taken from the last weather observation or a value determined from the weather database.
- The test. You can test the data to be <, <=, >, >=, =, <> to a value or within a range of values.

In the above example the test is to see if the low outside temperature over the last 24 hours is less than 32 degrees F.

Like other Test elements, execution continues following the path marked *Yes* if the test is true, otherwise execution follows the *No* path.

Weather Triggers

Weather data can be used to trigger a program when an observation is taken and the values of weather data meet certain criterion.

To create a weather trigger for a program, select the *Triggers* tab of the program's properties, select *Weather Condition Change* and press *Add*.

The trigger creation dialog shows these options.

Trigger					X	
Trigger Type: W	eather Conditio	on Change 🔻				
Start the program Current Outside	temperature <	= 32.0° F				
Sensor Barometer Dew point Humidty in Humidty o Temperatu Temperatu	iside utside ire inside ire outside	 Wind chill Wind direction Wind speed THW Solar radiation UV 	 Outside heat index Daily rain Monthly rain Yearly rain Storm rain Rain Rate 	 Daily ET Monthly ET Yearly ET Rain amount ET amount 		
Step 1: Select what to test © Current value High value High value In last ① ① ① ① ① ① ① ① ① ① ① ① ① ① ① ① D ① ① ① ① ① ① ① ① ① ① D ① ① ① ① ① <td< td=""></td<>						
Step 2: Perfor [Data fro [Data fro	Step 2: Perform the test Image: Step 1 in the ste					
		ОК	Cancel			

This dialog looks a lot like the properties for the visual programmer *weather* element described above. As described in the User Guide *Programs* chapter, HCA evaluates all weather triggers every minute and when the condition evaluates to Yes, the program starts. Before the program can start again, the weather condition must evaluate to No and then to Yes again. For more information on how these kinds of triggers are evaluated and programs started see the User Guide *Programs* chapter.

Weather Data and the Compute and Compute Test elements

In addition to examining weather data with the Visual Programmer *Weather* element and with weather triggers, there are also functions that can be used in expressions in the Compute, Compute Test, and in expression placeholders in elements that work with text strings. Refer to the User Guide expressions chapter for information on the _Weather functions.

Weather Underground

In addition to the *Weather Test* Visual Programmer element and *_Weather* function in expressions, an additional function has been added in support of Weather Underground. The function allows you to get deeper into all the data provided by Weather Underground.

The function is called *WUnderground* and it takes a minimum of 4 arguments and a max of 10. The format is:

```
_Wunderground ("feature", "location", "path1", "path2", ... "pathn", "tag")
```

The "feature" -1^{st} argument - is one of these on this list:

http://www.wunderground.com/weather/api/d/docs?d=data/index

The location -2^{nd} argument - is any acceptable location as described on that page in the "query" section. You can use "" for the feature and it defaults to "*conditions*". You can use "" for location and it defaults to whatever you entered as the location in the weather provider dialog setup for Weather Underground.

Using the _Wunderground function you can get to **anything** that weather underground provides. For an example, enter this into a browser:

http://api.wunderground.com/api/<your api key>/forecast/q/<your zipcode>.xml

Substitute your API key and location into this URL. This is similar to what you will see:

```
v<response>
   <version>0.1</version>
 v<termsofService>
    http://www.wunderground.com/weather/api/d/terms.html
   </termsofService>
 v<features>
    <feature>forecast</feature>
   </features>
  v<forecast>
   v<txt_forecast>
      <date>7:00 AM PST</date>
     v<forecastdays>
      v<forecastday>
         <period>0</period>
         <icon>rain</icon>
         <icon_url>http://icons-ak.wxug.com/i/c/k/rain.gif</icon_url> <title>Wednesday</title>
        v<fcttext>
          ▼<![CDATA]
            Overcast with rain. High of 45F. Breezy. Winds from the South at 15 to 20 mph. Chance of rain 90%.
           11>
         </fcttext>
        v<fcttext metric>
          ▼<![CDATA[
            Overcast with rain. High of 7C. Windy. Winds from the South at 25 to 30 km/h. Chance of rain 90%.
           11>
         </fcttext metric>
         <pop>90</pop>
        </forecastday>
      <forecastday>...</forecastday>
```

As you can see this is forecast data for your location. To extract the forecast string for today the path though this XML is:

Response - forecast - txt_forecast - forecastdays - forecastday - fcttext

To make it easier to see, this image has that path highlighted.

```
v<response>
  <version>0.1</version>
 ▼<termsofService>
    http://www.wunderground.com/weather/api/d/terms.html
  </termsofService>
 v<features>
    <feature>forecast</feature>
  </features>
 <forecast>
  ▼<txt forecast>
      <date>7:00 AM PST</date>
     <forecastdays>
      v<forecastday>
         <period>0</period>
         <icon>rain</icon>
         <icon url>http://icons-ak.wxug.com/i/c/k/rain.gif</icon url>
         <title>Wednesday</title>
        v<fcttext>
         ▼<![CDATA[
            Overcast with rain. High of 45F. Breezy. Winds from the South at
          11>
         </fcttext>
        v<fcttext metric>
         ▼<! [CDATA [
            Overcast with rain. High of 7C. Windy. Winds from the South at 2:
          11>
         </fcttext metric>
         <pop>90</pop>
       </forecastday>
      <forecastday>...</forecastday>
```

Extracting the forecast string using the _Wunderground function uses these arguments:

The first argument to _wunderground is the *feature*. In this case "forecast". The second argument is the location. Since it is set to "" the location as set in the weather provider setup is used. The remaining arguments are the path to the data using the highlighted names shown above.

Given the above XML, and the function with those arguments, it evaluates to this string:

"Overcast with rain. High of 45F. Breezy. Wind from the South at 15 to 20 mph. Chance of rain 90%."

Instead of the forecast, if you wanted to get the "icon" the path would be:

Response - forecast - txt forecast - forecastdays - forecastday - icon

In addition to weather data, Weather Underground offers lots of other data as well. For example, to get the current moon phase percent use:

Moon = wunderground ("astronomy", "", "moon phase", "percentIlluminated")

There is one complication with some keys: In this example XML below there are multiple "forecastDay" branches:

As an example, to get data for a specific day, include a qualifier in the name of the tag – note the ":3" which requests the 3^{rd} forecastday.

This retrieves the 3rd forecast day. To get the first forecast day use "forecastday:1". To find the second use "forecastday:2", etc. If you leave off the qualifier it defaults to 1.

A good suggestion is to try out the various retrievals in your browser first then look at the data and figure out the path you need to get at that data in HCA. Pay close attention to any paths that will need qualifiers.

Two more important points when using Weather Underground data

To prevent multiple queries to Weather Underground each time a *_wunderground* function is evaluated, the file is retrieved, parsed, and saved internally along with the date/time that it was retrieved. Subsequent *_wunderground* functions don't retrieve the data again from the internet if the XML for that feature was retrieved less than 15 minutes ago. This way you can extract lots of data and do it quickly since only one internet action is needed.

And finally, the interactions with the Weather Underground site are done using HTTP so there should be no firewall issues.