

TYANG Weather Monitoring Management Pack

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Feedback:

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Disclaimer:

- You are free to modify this management pack to suit your environments.
- This document is provided "as-is". Information and views expressed in this document, including URL and other Internet Web site references, may change without notice
- Even though this management pack has been fully tested, you may use it at your own risk. The Author does not hold any responsibility for any damages it may cause in your environments.

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1 Revision History

Revision Date	Version	Changes
October 2012	1.0.0.0	Initial Release
March 2012	1.0.1.0	Bug fixes: <ul style="list-style-type: none">• Incorrect temperature collected when the reading is below zero• Incorrect temperature collected when the reading contains decimal points• Script error when pressure reading is not within <pressure> tag (i.e. Vancouver, Canada uses <PressureTendency> tag). In this situation, pressure reading is not probed.• Fixed wind direction and speed probe when there are multiple <Wind> tags in the result.• Agent task not displaying wind speed in KM/H• Updated temperature related performance views to display negative temperature readings.

2 Introduction

TYANG Weather Monitoring Management Pack version 1.0.0.0 provides ability to monitor weather conditions and collect real time weather information for configured cities and locations. It utilise Windows PowerShell v2.0 to retrieve weather information from <http://www.webservice.net>

This management pack provides:

- Various 3-state threshold monitors for weather readings such as temperature Celsius, temperature Fahrenheit, wind speed km/h, wind speed mile/h, etc.
- Performance collection rules to collect temperature, wind speed, relative humidity %, air pressure, dew point as performance data for each configured location
- Collect weather summary report as event data
- Alert generating rule to generate information alert when your favourite weather condition has detected for configured locations.
- Weather summary report
- Ability to configure the weather probing node to use Metric or Imperial measuring units (or both) so only desired counters are collected for particular locations.

3 Pre-requisites and Limitations

3.1 Pre-requisites

- SCOM agent is installed on all computers acting as weather probe computers.
- PowerShell version 2.0 (or 3.0) on all weather probe computers.
- Appropriate PowerShell execution policy to allow script executions.
- Internet Connection that allows connection to <http://www.webservice.net>

3.2 Limitations

- The PowerShell scripts built into this management pack uses **New-WebServiceProxy** cmdlet to retrieve weather information from www.websvc.net. This PowerShell cmdlet does not support Internet proxy servers. I tried to use the System.Net.Webclient class to retrieve information from www.websvc.net via a Proxy server. However, I kept getting HTTP 500 error response in the only proxy environment that I have access to. I'm not sure if there is anything wrong with the code (even though works fine in a non-proxy environment) or the error is related to the environment. In the end, I switched back to the **New-WebServiceProxy** PowerShell cmdlet.

4 Objects Classes Created by the Management Pack

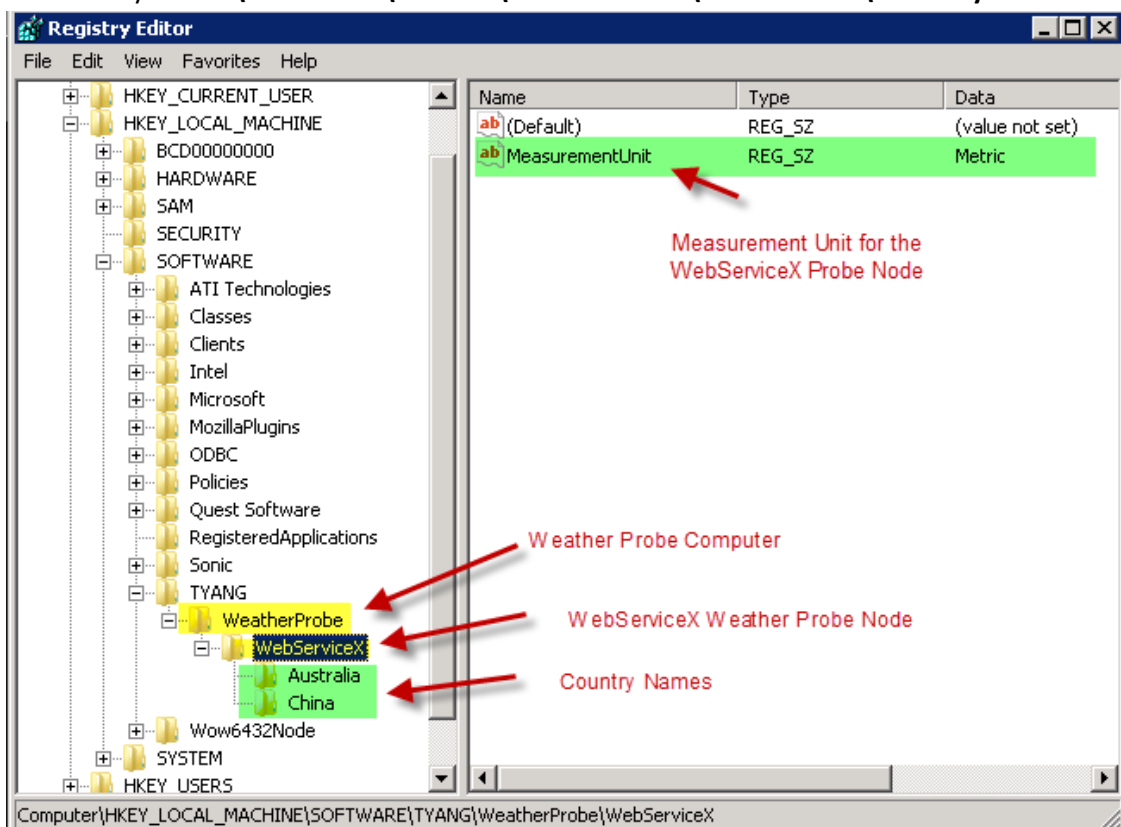
The following classes are defined and discovered by this management pack:

Class	Inherited From
Weather Probe Computer	Microsoft.Windows.Computer
WebServiceX Probe Node	Microsoft.Windows.LocalApplication
WebServiceX Weather Probe Location	Microsoft.Windows.ApplicationComponent
WebServiceX Weather Probe Location Group - Imperial	Microsoft.SystemCenter.InstanceGroup
WebServiceX Weather Probe Location Group - Metric	Microsoft.SystemCenter.InstanceGroup

5 Configurations for Weather Probe Computers

To configure a Windows computer to become the weather probe computer, the following registry keys need to be created:

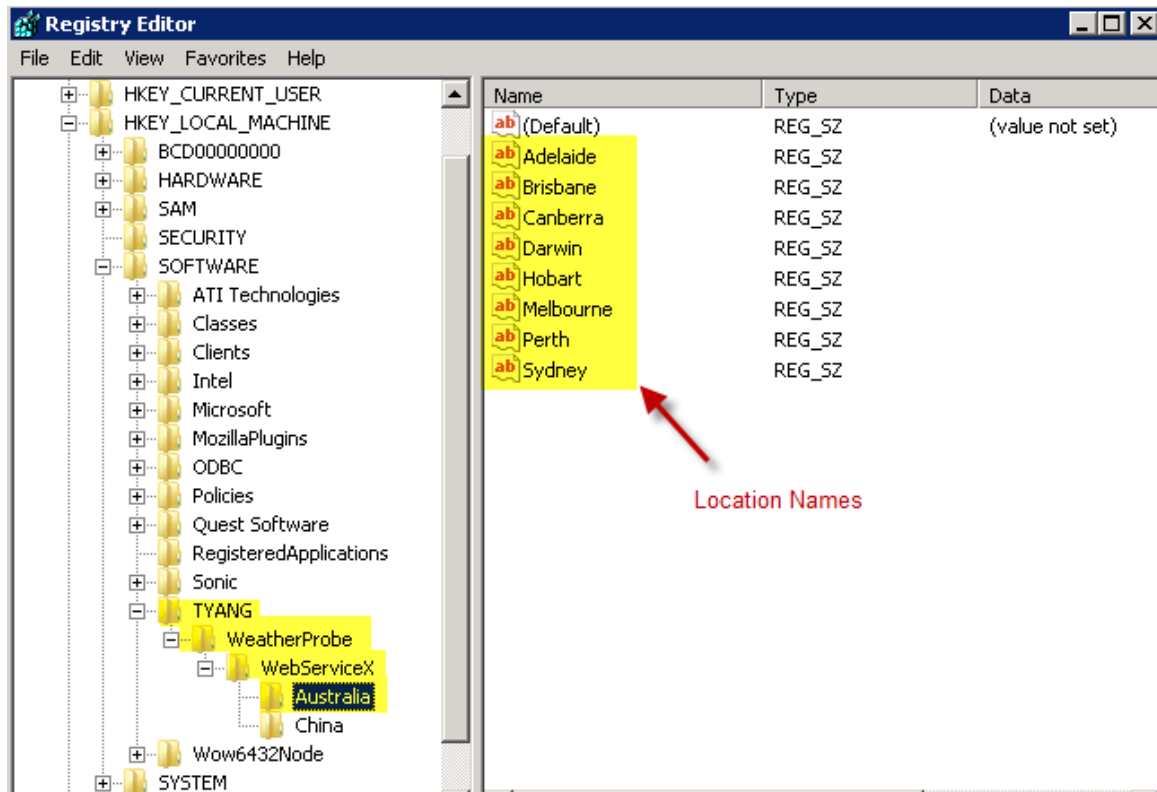
- Weather Probe Computer:
 - Key: **HKLM\SOFTWARE\TYANG\WeahterProbe**
- WebServiceX Weather Probe Node:
 - Key: **HKLM\SOFTWARE\TYANG\WeahterProbe\WebServiceX**
 - REG_SZ value:
HKLM\SOFTWARE\TYANG\WeahterProbe\WebServiceX\MeasurementUnit
 - MeasurementUnit possible value: Metric; Imperial or Both
- Country Name for each country to be probed:
 - Key: **HKLM\SOFTWARE\TYANG\WeahterProbe\WebServiceX\<CountryName>**



4. Location Names for each WebServiceX Probe Node under the country key

- REG_SZ value:

HKLM\SOFTWARE\TYANG\WeatherProbe\WebServiceX\<CountryName>\<LocationName>



Note:

1. For a full list of the locations included in a given country, please use the "GetCitiesByCountry" function at <http://www.webservicex.net/ws/WSDetails.aspx?CATID=12&WSID=56> to check:

GlobalWeather

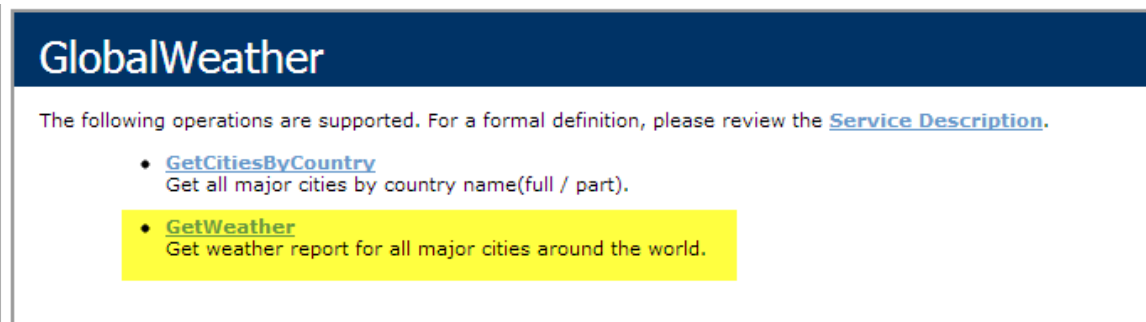
The following operations are supported. For a formal definition, please review the [Service De](#):

- **GetCitiesByCountry**
Get all major cities by country name(full / part).
- **GetWeather**
Get weather report for all major cities around the world.

2. Location names entered in the registry do not have to be exactly the same as what's shown from above result. i.e. When configured Melbourne, the location returned from the site is actually "Melbourne Airport".

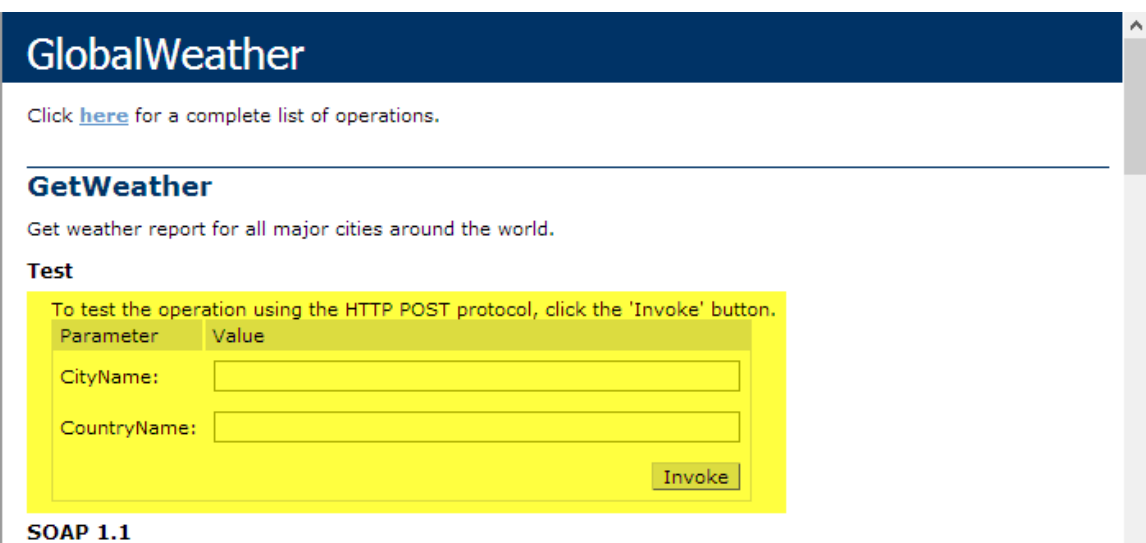
- i.e. London weather stations:

4. Before creating each probe location in registry, please validate the location name (CityName) and Country Name is via the “GetWeather” function on <http://www.webserviceX.net/ws/WSDetails.aspx?CATID=12&WSID=56>



The screenshot shows the 'GlobalWeather' service page. It has a dark blue header with the title 'GlobalWeather'. Below the header, it states: 'The following operations are supported. For a formal definition, please review the [Service Description](#).' There are two bullet points: 'GetCitiesByCountry' with the description 'Get all major cities by country name(full / part).', and 'GetWeather' with the description 'Get weather report for all major cities around the world.' The 'GetWeather' bullet point is highlighted with a yellow background.

And make sure the CityName & Countryname combination returns valid weather information from the GetWeather function.



The screenshot shows the 'GlobalWeather' service page with the 'GetWeather' operation selected. It has a dark blue header with the title 'GlobalWeather'. Below the header, it says: 'Click [here](#) for a complete list of operations.' The 'GetWeather' operation is listed with the description 'Get weather report for all major cities around the world.' Below this is a 'Test' section with a yellow background. It contains a table with two columns: 'Parameter' and 'Value'. There are two rows: 'CityName:' and 'CountryName:'. To the right of each row is an input field. Below the input fields is an 'Invoke' button. Below the test section, it says 'SOAP 1.1'.

Not all the cities returned by “GetCitiesByCountry” function contain valid weather data. For example, for Taiwan, less than half weather stations contain data!

6 Management Pack Objects

6.1 Rules:

6.1.1 Performance Collection Rules

The following performance collection rules are created for Imperial measurement units:

- TYANG Weather WebServiceX Probe Dew.Point (Fahrenheit) Collection Rule
- TYANG Weather WebServiceX Probe Temperature (Fahrenheit) Collection Rule
- TYANG Weather WebServiceX Probe Wind Speed (Mph) Collection Rule

Note: These rules are disabled for the “TYANG WebServiceX Weather Probe Location Group – Metric” via overrides.

The following performance collection rules are created for Metric measurement units:

- TYANG Weather WebServiceX Probe Dew.Point (Celsius) Collection Rule
- TYANG Weather WebServiceX Probe Temperature (Celsius) Collection Rule
- TYANG Weather WebServiceX Probe Wind Speed (KMph) Collection Rule

Note: These rules are disabled for the “TYANG WebServiceX Weather Probe Location Group – Imperial” via overrides.


Other performance collection rules:

- TYANG Weather WebServiceX Probe % Relative Humidity Collection Rule
- TYANG Weather WebServiceX Probe Pressure (hPa) Collection Rule
- TYANG Weather WebServiceX Probe Pressure (In. Hg) Collection Rule

6.1.2 Event Collection Rules:

One event collection rule is created to collect weather summary report as event data:

- TYANG WebServiceX Probe Weather Summary Events Collection Rule

Details	
Date and Time: 22-Oct-12 9:29:18 PM	Description: UTC Date Time: 2012.10.22 0955
Log Name: TYANG Weather Report - San Diego/El Cajon, Gillespie Field Airport, CA, United States	Country: United States
Source: TYANG Weather Monitoring	Location: San Diego/El Cajon, Gillespie Field Airport, CA, United States
Generating Rule: TYANG WebServiceX Probe Weather Summary Events Collection Rule	Wind Direction: W
Event Number: 9998	Wind Speed(MPH): 5
Level:  Information	Wind Speed(KMPH): 8
Logging Computer: CLIENT05	Sky Conditions: overcast
User:	Temperature(C): 17
	Temperature(F): 62
	Dew Point(C): 14
	Dew Point(F): 57
	Relative Humidity: 82
	Pressure(In. Hg): 29.95
	Pressure(hPa): 1014
Event Data:	
Date and Time:	22-Oct-12 9:29:18 PM
Property Name	Property Value
Location	San Diego/El Cajon, Gillespie Field Airport, CA, United States
Country	United States
UTCDateTime	2012.10.22 0955
UTCDate	2012.10.22
UTCTime	0955
WindDirection	W
WindSpeedMPH	5
WindSpeedKMPH	8
SkyConditions	overcast
TempCelsius	17
TempFahrenheit	62
DewPointCelsius	14
DewPointFahrenheit	57
PercentRelativeHumidity	82
PressureInHg	29.95
PressurehPa	1014
WeatherReport	UTC Date Time: 2012.10.22 0955 Country: United States Location: San Diego/El Cajon, Gillespie Field Airport, CA, United States Wind Direction: W Wind Speed(MPH): 5 Wind Speed(KMPH): 8 Sky Conditions: overcast Temperature(C): 17 Temperature(F): 62 Dew Point(C): 14 Dew Point(F): 57 Relative Humidity: 82% Pressure(In. Hg): 29.95 Pressure(hPa): 1014

6.1.3 Alert Generating Rule

One alert generating rule was created to run once a day and it detects a desired weather condition (based on sky conditions, wind speed and temperature range). It generates an information alert when desired weather condition is detected:

- TYANG Weather WebServiceX Probe Good Weather Condition Detection Rule

Alert Details

TYANG WebserviceX Weather Probe Location - Good weather condition detected

Source:

WebServiceX Weather Probe - Brisbane, Australia

Path:

CLIENT02.corp.tyang.org\CLIENT02.corp.tyang.org\WebServiceX Weather Probe - Brisbane, Australia

Alert Rule:

TYANG Weather WebServiceX Probe Good Weather Condition Detection Rule

Created:

10/25/2012 1:32:00 PM

Alert Description

Good weather condition detected for Brisbane, Australia.

Current Weather Report:

UTC Date Time: 2012.10.25 0200
Country: Australia
Location: Brisbane Airport M. O, Australia
Wind Direction: NNE
Wind Speed(MPH): 13
Wind Speed(KMPH): 21
Sky Conditions: mostly clear
Temperature(C): 24
Temperature(F): 75
Dew Point(C): 11
Dew Point(F): 51
Relative Humidity: 43%
Pressure(In. Hg): 29.97
Pressure(hPa): 1015

Knowledge:

View additional knowledge...

Summary

Looks like today's weather is pretty good at this location!

[Hide knowledge](#)

The purpose of this rule is to demonstrate how to alert on certain weather conditions. It is configured to run daily at 7:00 am(RMS local time) for all probe locations. Even though it utilise Cook Down feature and the data source module only run once for all locations in one country, you may choose to disable it and only enable it for a subset of probe locations. You may also use this rule as an example to build your own workflow. The data source for this rule is made public so you can reference it from other MPs.

6.2 Monitors

There are 6 performance based 3-state threshold monitors created in this management pack:

- TYANG WebServiceX Weather Probe High Temperature (Celsius) Monitor
- TYANG WebServiceX Weather Probe High Temperature (Fahrenheit) Monitor
- TYANG WebServiceX Weather Probe High Wind Speed (KMph) Monitor
- TYANG WebServiceX Weather Probe High Wind Speed (Mph) Monitor
- TYANG WebServiceX Weather Probe Low Temperature (Celsius) Monitor
- TYANG WebServiceX Weather Probe Low Temperature (Fahrenheit) Monitor

You may configure the warning and critical thresholds of each monitor via overrides.

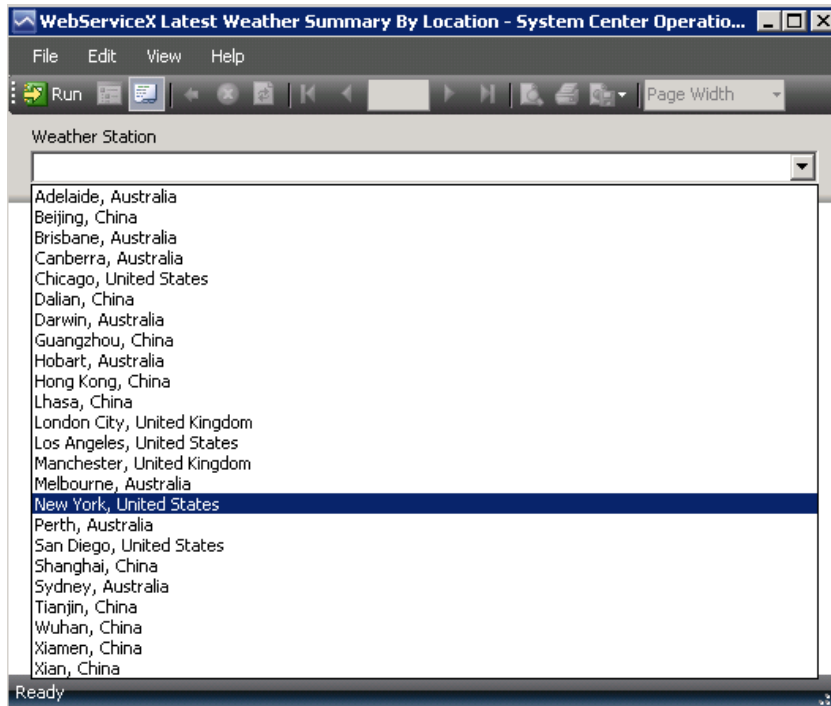
Reports

6.3 Reports

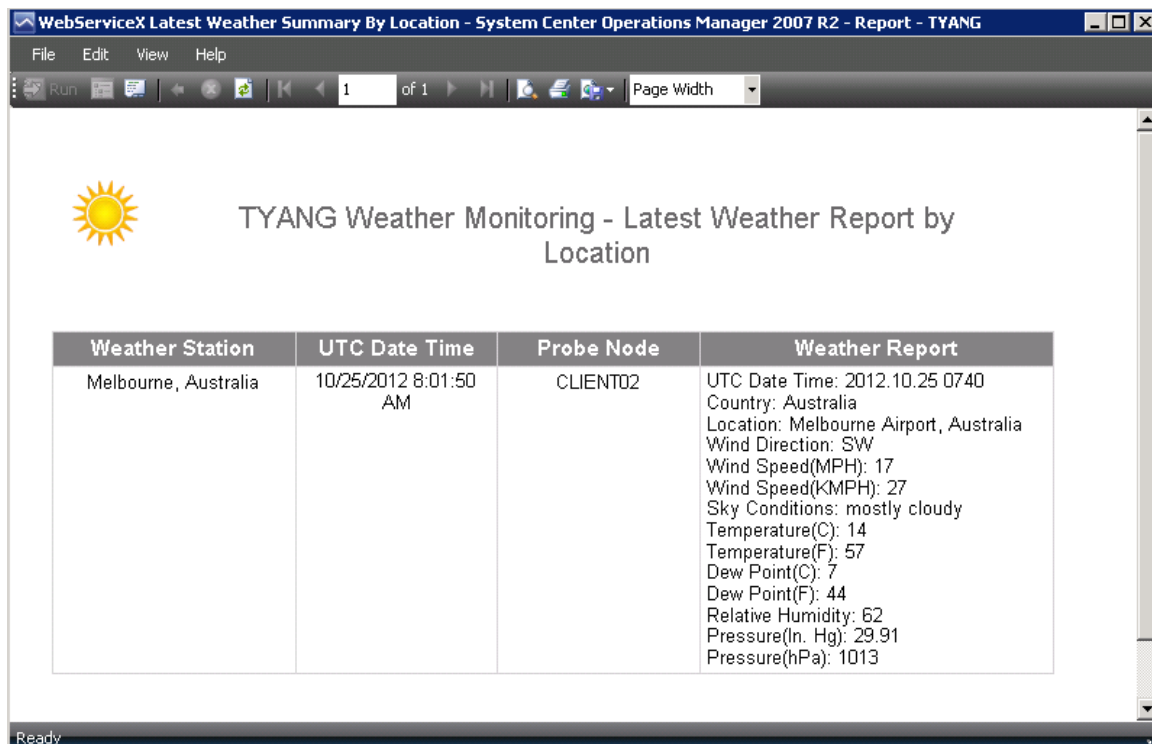
6.3.1 WebServiceX Latest Weather Summary By Location

This report displays the latest weather summary (collected by the event collection rule) for a selected probe location.

Select Probe Location:



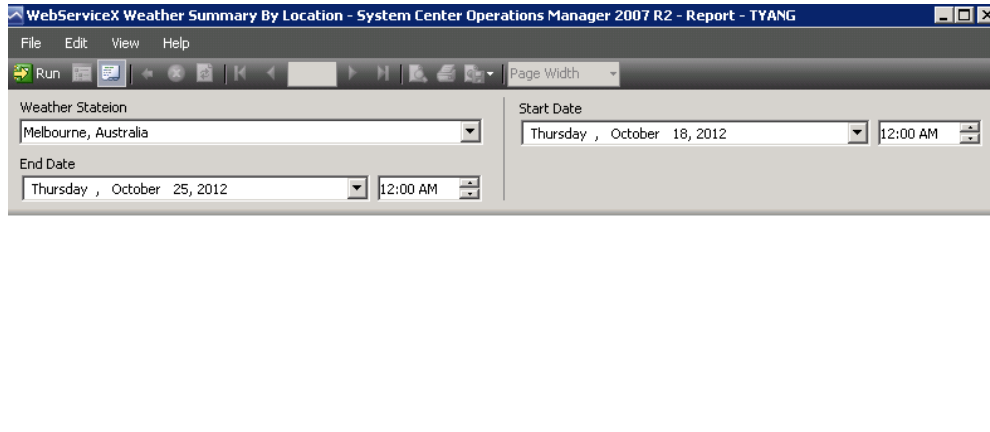
Report:



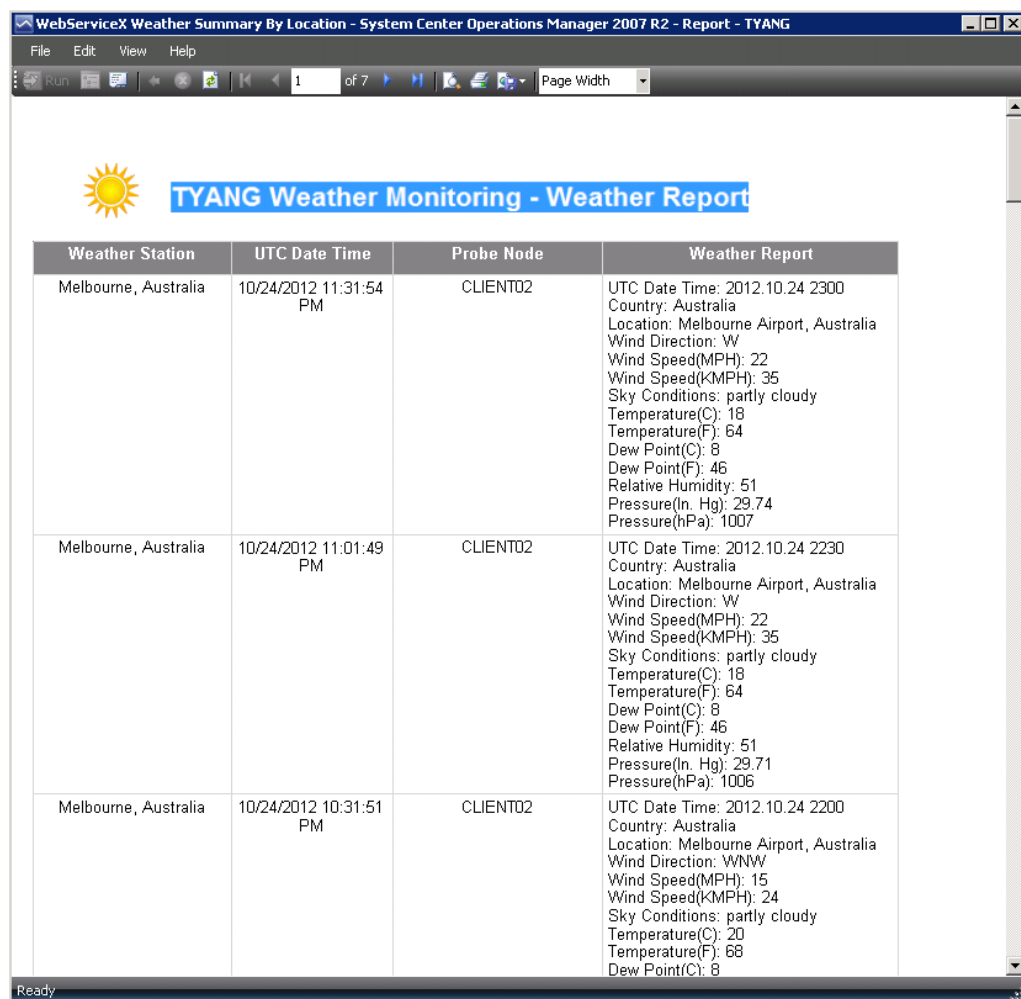
6.3.2 WebServiceX Weather Summary By Location

This report displays all Weather summary event collected for a selected probe location between selected time period:

Select Probe location and time window:



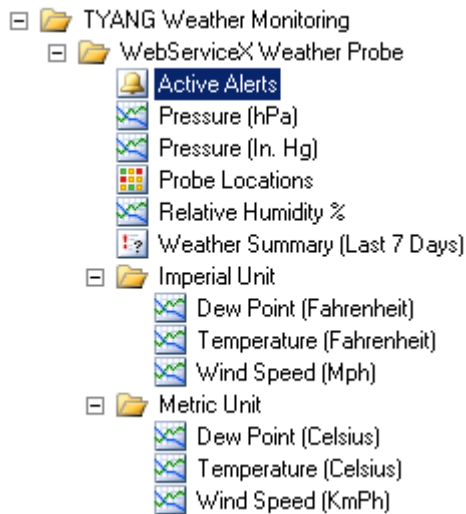
Report:



Weather Station	UTC Date Time	Probe Node	Weather Report
Melbourne, Australia	10/24/2012 11:31:54 PM	CLIENT02	UTC Date Time: 2012.10.24 2300 Country: Australia Location: Melbourne Airport, Australia Wind Direction: W Wind Speed(MPH): 22 Wind Speed(KMPH): 35 Sky Conditions: partly cloudy Temperature(C): 18 Temperature(F): 64 Dew Point(C): 8 Dew Point(F): 46 Relative Humidity: 51 Pressure(In. Hg): 29.74 Pressure(hPa): 1007
Melbourne, Australia	10/24/2012 11:01:49 PM	CLIENT02	UTC Date Time: 2012.10.24 2230 Country: Australia Location: Melbourne Airport, Australia Wind Direction: W Wind Speed(MPH): 22 Wind Speed(KMPH): 35 Sky Conditions: partly cloudy Temperature(C): 18 Temperature(F): 64 Dew Point(C): 8 Dew Point(F): 46 Relative Humidity: 51 Pressure(In. Hg): 29.71 Pressure(hPa): 1006
Melbourne, Australia	10/24/2012 10:31:51 PM	CLIENT02	UTC Date Time: 2012.10.24 2200 Country: Australia Location: Melbourne Airport, Australia Wind Direction: WNW Wind Speed(MPH): 15 Wind Speed(KMPH): 24 Sky Conditions: partly cloudy Temperature(C): 20 Temperature(F): 68 Dew Point(C): 8

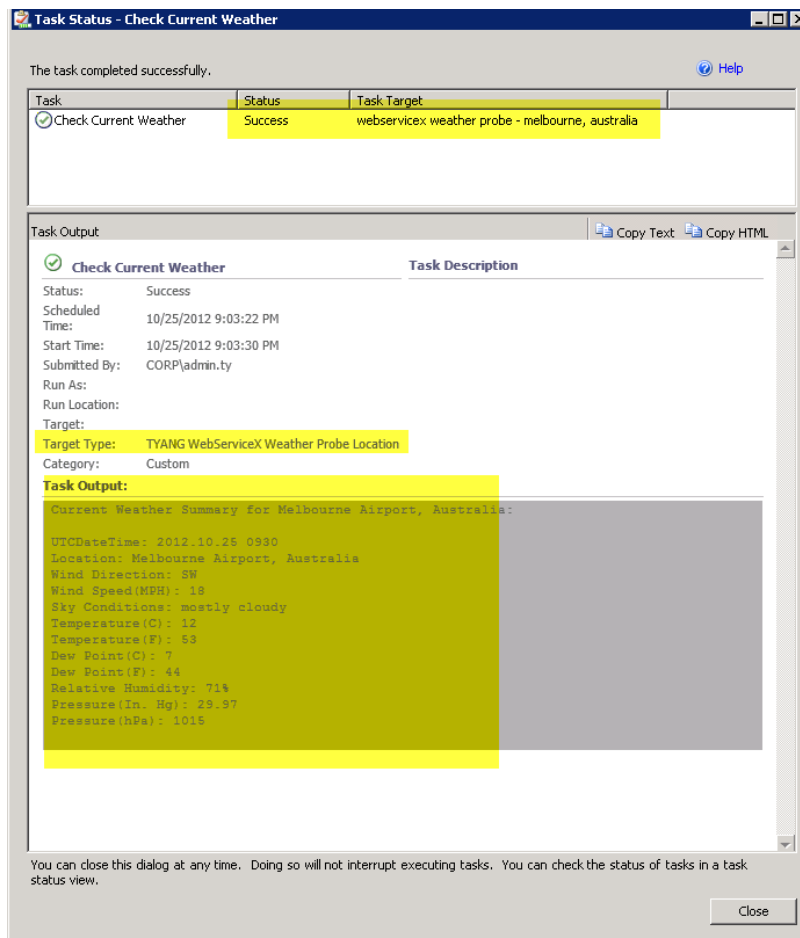
6.4 Views:

Several views are configured in the management pack:



6.5 Agent Task

An agent task called “Check Current Weather” is configured for WebServiceX Weather Probe Location class. You may run this manually to get the latest weather summary for a particular probe location:



7 Cook Down

I spent a lot of time to optimise workflows in this MP by fully utilise cook down. All the rules and monitors in this MP run on a schedule. They all use the same data source module. Except the alert generating rule mentioned in section 5.1.3 of this document, the PowerShell script inside the data source module only run once for each country in each probe node and feeds the data to all the performance collection rules, the event collection rule and all the monitors. When the data source runs, it creates a log entry in the Operations Manager log with **Event ID 10000**.

i.e. In my test environment, I have a computer configured as a probe node for 2 countries: Australia and China. Each country contains multiple cities.

The data source runs twice every 30 minutes (one for each country):

The screenshot displays the Windows Event Viewer interface. The top pane shows a list of events with columns for Level, Date and Time, Source, Event ID, and Task Category. Several events from 'Health Service Script' are visible, with Event ID 10000 highlighted in yellow. The bottom pane shows the details for Event ID 10000, including a message box and a properties section.

Level	Date and Time	Source	Event ID	Task Category
Information	25-Oct-12 7:15:00 PM	Health Service Script	6022	None
Information	25-Oct-12 7:01:38 PM	Health Service Script	10000	None
Information	25-Oct-12 7:01:38 PM	Health Service Script	10000	None
Information	25-Oct-12 7:00:00 PM	Health Service Script	6022	None
Information	25-Oct-12 6:45:00 PM	Health Service Script	6022	None
Information	25-Oct-12 6:31:37 PM	Health Service Script	10000	None
Information	25-Oct-12 6:31:37 PM	Health Service Script	10000	None
Information	25-Oct-12 6:30:00 PM	Health Service Script	6022	None
Information	25-Oct-12 6:15:00 PM	Health Service Script	6022	None
Information	25-Oct-12 6:01:38 PM	Health Service Script	10000	None
Information	25-Oct-12 6:01:38 PM	Health Service Script	10000	None
Information	25-Oct-12 6:00:00 PM	Health Service Script	6022	None
Information	25-Oct-12 5:45:00 PM	Health Service Script	6022	None
Information	25-Oct-12 5:31:37 PM	Health Service Script	10000	None
Information	25-Oct-12 5:31:37 PM	Health Service Script	10000	None
Information	25-Oct-12 5:30:00 PM	Health Service Script	6022	None

Event 10000, Health Service Script

General | Details

WeatherByCountryProbe.PS1 : Checking weather details for country: Australia.

Log Name: Operations Manager
Source: Health Service Script
Event ID: 10000
Level: Information
User: N/A
OpCode:
More Information: [Event Log Online Help](#)

Logged: 25-Oct-12 7:01:38 PM
Task Category: None
Keywords: Classic
Computer: CLIENT02.corp.tyang.org

Therefore, if you wish to change the schedule (i.e. configure SyncTime or increase/decrease how frequent a workflow runs), I recommend you to change the schedule for ALL the rules and monitors to fully utilise cook down.

This shared data source module is called “TYANG Weather WebServiceX Probe Details by City and Country Data Source”, it has been made public and you can use this in other MPs.

Note: Even though the “WeatherStation” input parameter for this data source is different for each probe location, this data source contains another data source member module which retrieves

weather information for ALL configured weather locations of this country. The “WeatherStation” input parameter is used in a condition detection member module inside the data source to filter the data for this specific probe location.

8 Overrides

There are 12 overrides built-in to the MP. They are to disable Imperial measurement units related workflow for Metric probe nodes and vice versa. You may create an unsealed MP and create overrides on top of these built-in overrides again. Overrides in an unsealed MP always take precedents over the ones in a sealed MP.

9 Known Issues

- Incorrect Event Descriptions are displayed in the **Weather Summary (last 7 Days)** Event View:

Details

Date and Time:	25/10/2012 5:06:52 PM	Description:	UTC Date Time: 2012.10.25 0552
Log Name:	TYANG Weather Report - Brisbane Airport M. O, Australia	Country:	United States
Source:	TYANG Weather Monitoring	Location:	CHICAGO/WAUKEGAN REGIONAL, IL, United States
Generating Rule:	TYANG WebServiceX Probe Weather Summary Events Collection Rule	Wind Direction:	S
Event Number:	9998	Wind Speed(MPH):	13
Level:	Information	Wind Speed(KMPH):	21
Logging Computer:	INFRA01	Sky Conditions:	clear
User:		Temperature(C):	6
		Temperature(F):	1
		Dew Point(C):	7
		Dew Point(F):	1
		Relative Humidity:	78
		Pressure(In, Hg):	29.81
		Pressure(hPa):	1009

Incorrect Description

Event Data:

Property Name	Property Value
Date and Time:	25/10/2012 5:06:52 PM
Location	Brisbane Airport M. O, Australia
Country	Australia
UTCDateTime	2012.10.25 0530
UTCDate	2012.10.25
UTCTime	0530
WindDirection	NNE
WindSpeedMPH	14
WindSpeedKMPH	23
SkyConditions	mostly cloudy
TempCelsius	23
TempFahrenheit	73
DewPointCelsius	13
DewPointFahrenheit	55

[View Event Data](#)

Apparently this is a known issue (in both SCOM 2007 and 2012 Operations Console.) The data is stored correct in the data base. It's just they are displayed incorrectly in the console.

- As stated in Section 2.2 of this document, this management pack MAY not work when the probe node computers require to use Proxy server to get to the Internet as the PowerShell Cmdlet **New-WebServiceProxy** does not support using Proxy servers.