UTC Date Time Stamp | XML to JSON Conversion SSIS Packages

Purpose: There is a PST/PDT date time stamp included within the XML file of meter readings. That date time stamp needs to be converted with the utmost certainty that it is correct. So, we’ve built a two staged approach to ensure proper conversion of the date time stamp to UTC.

Stage One: There is a SSIS package that works in conjunction with a SQL Insert Trigger. When a new XML record hits the database. The tuple is stamped with a NIST UTC timestamp.

The Insert Trigger executes the NIST UTC package. This package requests the dts from a list of four NIST servers. Incase a server is down or slow in responding the program jumps to the next server in the list. If all servers are inactive it will default to the System clocks Universal Time. That resulting UTC is stamped onto the incoming tuple.

Diagram

Description automatically generated

Stage Two: A second package handles the conversion of XML to JSON. During this conversion the PST/PDT dts is extracted and assessed. If the dts is outside a specific date time range, then the .Net conversion is applied to the dts and the JSON conversion is completed with a UTC dts.

If the dts falls within the date time of 1-2am on the 1st Sunday in November. Then the NIST dts stamped on the tuple is referenced to determine the correct UTC equivalent dts. Once converted, the dts in the JSON conversion is updated.

Usage: These packages can be redeployed into an existing Integration Services project via dtsx files. Then have different components updated to accommodate varying use cases.

Code Structure: The NIST UTC package is constructed with a SSIS Script Task and a Execute SQL Task. The script task contains C# code that works as follows. A list of hardcoded NIST servers is contained within a method GetNISTdtUTC that returns a dts string. A TCP connection is made between server and Task. The response from the server is parsed into a properly formatted dts.

If a server isn’t online or takes more than a quarter of a second to respond. Then the program moves to the next server in the list. If all servers are not responding. The Systems Universal Time will be used.

This dts string is returned from the Task to package variable. That variable is used by the Execute SQL Task to push the UTC dts into the inserted tuple.

The XML to JSON package uses a Script Task to convert the data. During this conversion, the PST/PDT dts is extracted from the XML to be assessed and converted to UTC. First a list of dates that are the 1st Sunday in November for the next ten years is created. If the extracted dts is contained within that list of dates a check is performed to see if the time is between 1 and 2 am. If it is then UTC dts created by the first packed is used for reference to determine the correct UTC value. That UTC is then pushed into the JSON data.

If the extracted dts doesn’t fall into the very specific date time frame. Then a normal .Net UTC conversion is performed. And that UTC is then pushed into the JSON data.

The remainder of the XML to JSON package is specific to moving the JSON data and other column data into a new table.