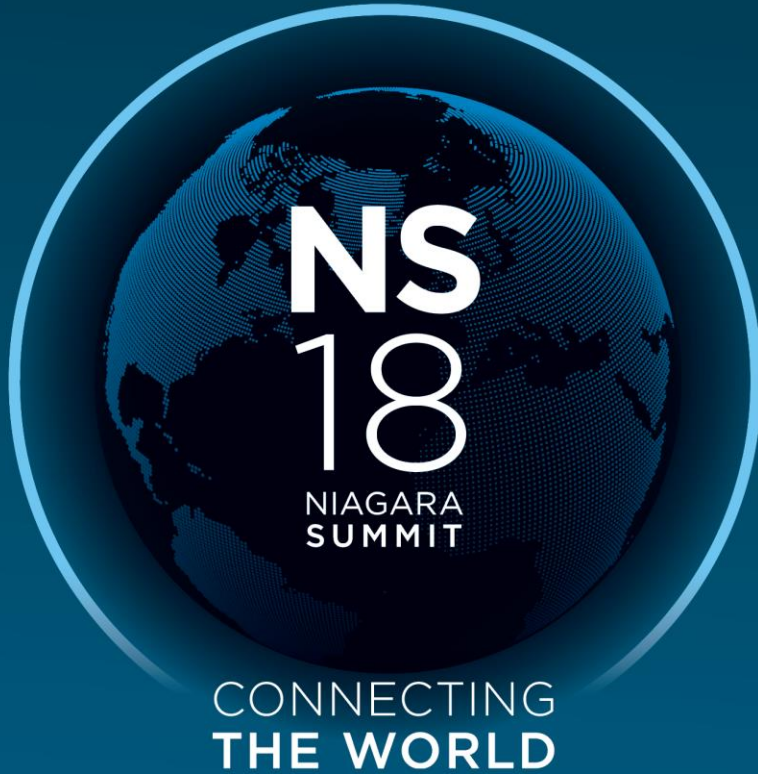




CONNECTING  
THE WORLD



# Niagara 4 TCP Advanced Training

*Damon Riddell*  
*Senior Training Engineer*

# Problem?

- Need to compare multiple data and give result report
- Need logic to be dynamic

# Solution!

- Series Transforms

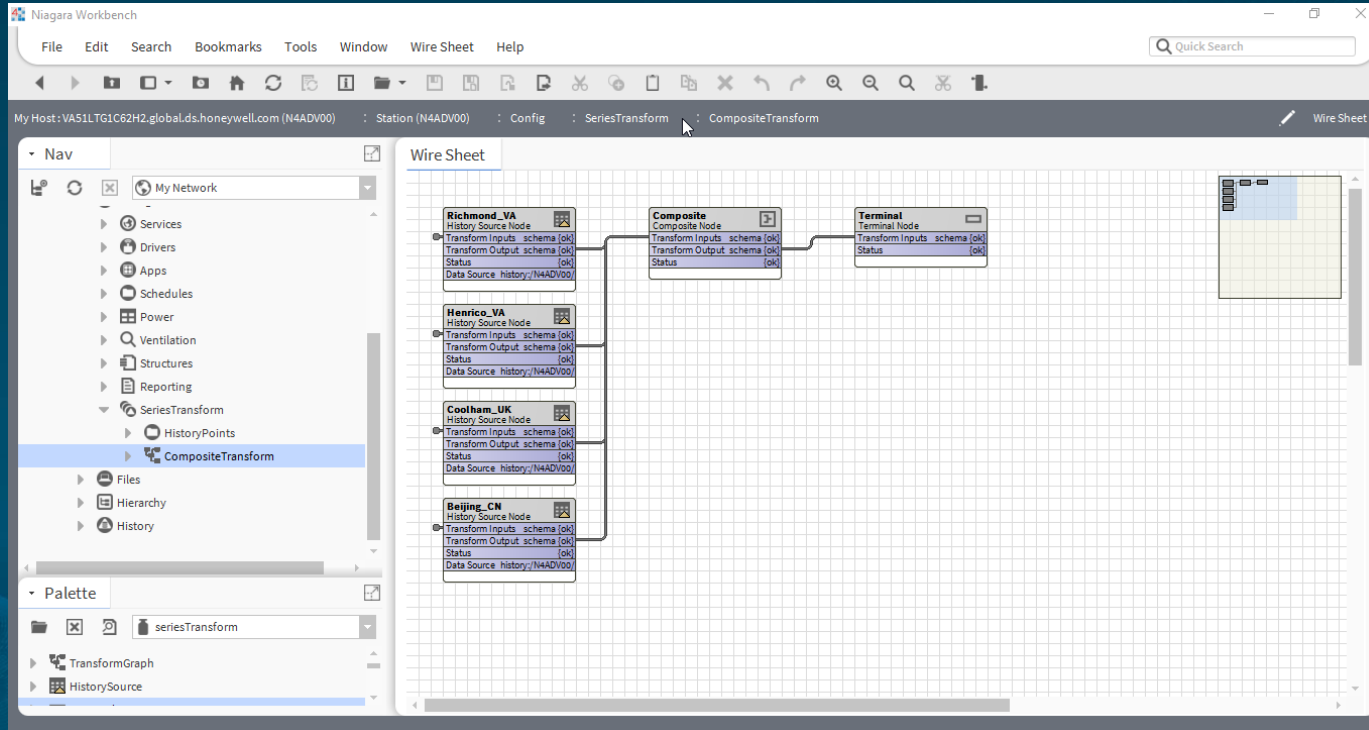
# Series Transforms

- Composite Node
- Aggregate Node
- Rollup Node
- TimeShift node

# Series Transforms

- Composite Node
- Aggregate Node
- Rollup Node
- TimeShift node

# Series Transform Composite Node





# Series Transform Composite Node

Niagara Workbench

File Edit Search Bookmarks Tools Window Help

My Host: VA51LTG1C62H2.global.ds.honeywell.com (N4ADV00) : Station (N4ADV00) : Config : CompositeTransform : transformslot:SeriesTransform/CompositeTransform Collection Table

Nav

- My Network
  - Services
  - Drivers
  - Apps
  - Schedules
  - Power
  - Ventilation
  - Structures
  - Reporting
  - SeriesTransform**
    - HistoryPoints
    - CompositeTransform
  - Files
  - Hierarchy
  - History

Palette

- TransformGraph
- HistorySource

166 rows

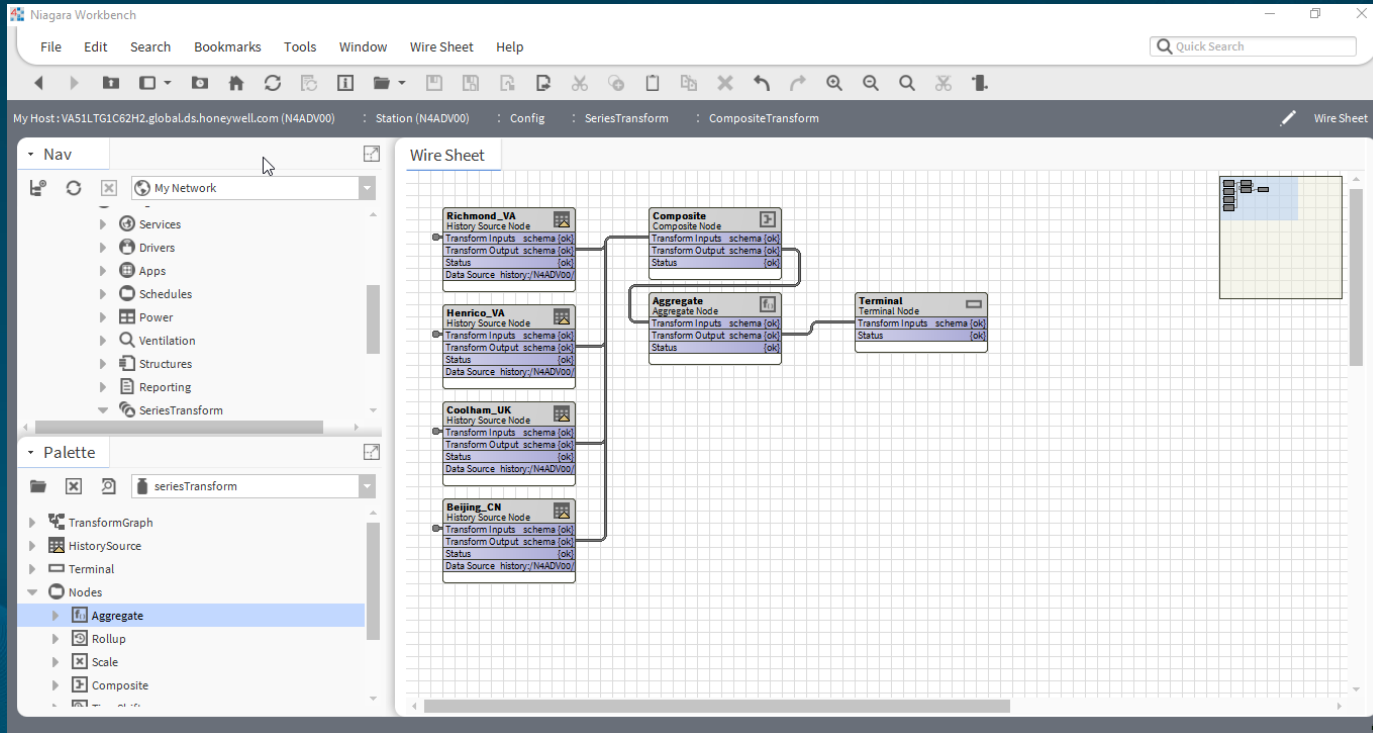
timestamp	Henrico_VA_value (kW)	Beijing_CN_value (kW)	Richmond_VA_value (kW)	Coolham_UK_value (kW)
08-Apr-18 10:28:00 AM EDT	1756.4 kW	1534.0 kW	1028.2 kW	1367.8 kW
08-Apr-18 10:42:59 AM EDT	1066.9 kW	1641.2 kW	1349.8 kW	1765.7 kW
08-Apr-18 10:57:58 AM EDT	1117.0 kW	1894.7 kW	1263.9 kW	1695.1 kW
08-Apr-18 11:12:57 AM EDT	1746.6 kW	1431.9 kW	1588.8 kW	1299.1 kW
08-Apr-18 11:27:56 AM EDT	1367.9 kW	1742.6 kW	1943.8 kW	1397.2 kW
08-Apr-18 11:42:55 AM EDT	1049.3 kW	1992.6 kW	1484.3 kW	1385.1 kW
08-Apr-18 11:57:54 AM EDT	1982.9 kW	1050.7 kW	1364.4 kW	1928.1 kW
08-Apr-18 12:12:53 PM EDT	1903.5 kW	1315.1 kW	1971.0 kW	1555.5 kW
08-Apr-18 12:27:52 PM EDT	1393.8 kW	1546.2 kW	1634.3 kW	1505.9 kW
08-Apr-18 12:42:51 PM EDT	1338.8 kW	1461.8 kW	1295.7 kW	1732.7 kW
08-Apr-18 12:57:50 PM EDT	1380.0 kW	1085.0 kW	1215.7 kW	1994.3 kW
08-Apr-18 1:12:49 PM EDT	1400.7 kW	1606.3 kW	1516.3 kW	1598.6 kW
08-Apr-18 1:27:48 PM EDT	1553.1 kW	1698.8 kW	1529.5 kW	1268.2 kW
08-Apr-18 1:42:47 PM EDT	1277.3 kW	1907.1 kW	1869.5 kW	1846.3 kW
08-Apr-18 1:57:46 PM EDT	1638.2 kW	1519.4 kW	1918.5 kW	1710.6 kW
08-Apr-18 2:12:45 PM EDT	1146.8 kW	1001.1 kW	1928.4 kW	1428.3 kW
08-Apr-18 2:27:44 PM EDT	1511.8 kW	1244.6 kW	1981.3 kW	1530.7 kW
08-Apr-18 2:42:43 PM EDT	1329.2 kW	1505.4 kW	1358.7 kW	1718.0 kW
08-Apr-18 2:57:42 PM EDT	1536.8 kW	1594.3 kW	1233.8 kW	1013.9 kW
08-Apr-18 3:12:41 PM EDT	1660.9 kW	1519.6 kW	1532.3 kW	1830.3 kW



# Series Transforms

- Composite Node
- **Aggregate Node**
- Rollup Node
- TimeShift node

# Series Transform Aggregate Node



# Series Transform Aggregate Node

Niagara Workbench

File Edit Search Bookmarks Tools Window Help

My Host: VA51LTG1C62H2.global.ds.honeywell.com (N4ADV00) : Station (N4ADV00) : Config : CompositeTransform : transformslot:SeriesTransform/CompositeTransform Collection Table

Nav

- My Network
  - Power
  - Ventilation
  - Structures
  - Reporting
  - SeriesTransform**
    - HistoryPoints
    - CompositeTransform
  - Files
  - Hierarchy
  - History

Palette

- TransformGraph
- HistorySource
- Terminal
- Nodes
  - Aggregate**
  - Rollup
  - ...

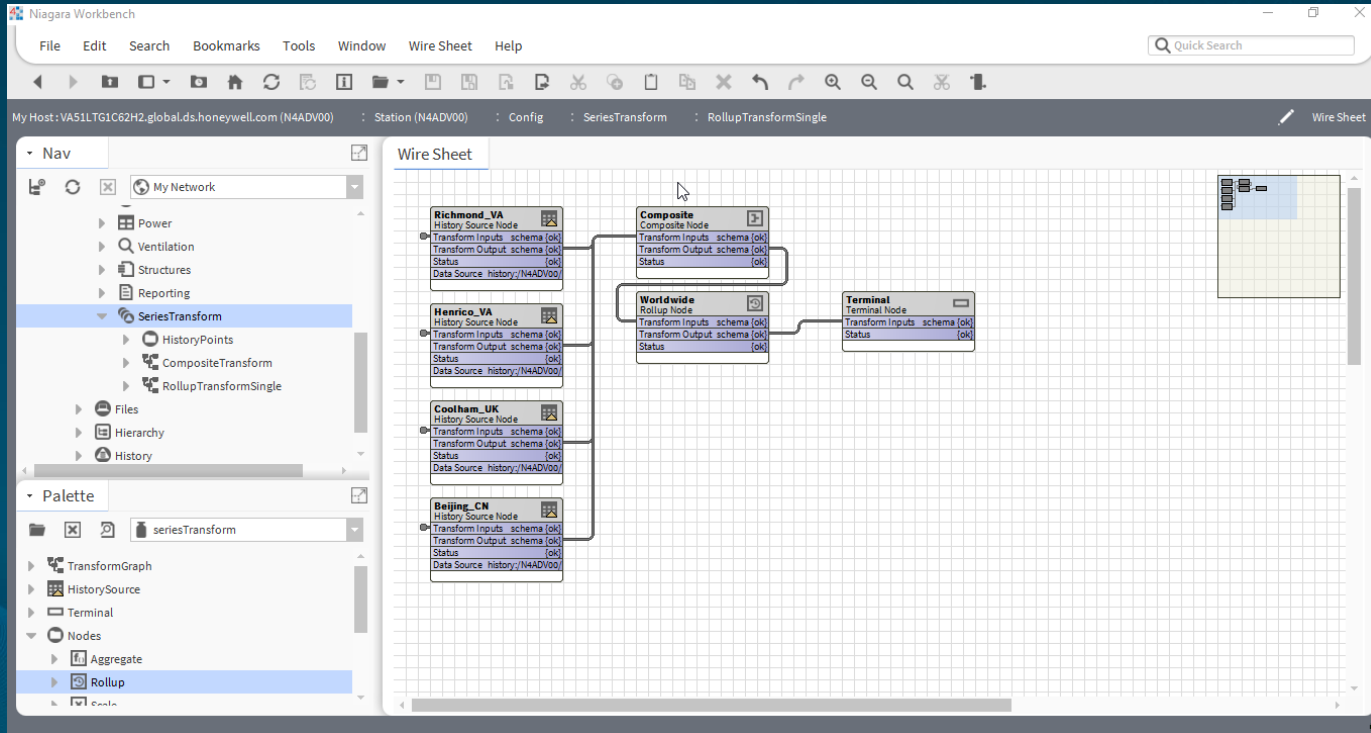
167 rows

timestamp	Henrico_VA_value (kW)	Beijing_CN_value (kW)	Richmond_VA_value (kW)	Coolham_UK_value (kW)	Max (kW)	Average (kW)	Min (kW)
08-Apr-18 10:28:00 AM EDT	1756.4 kW	1534.0 kW	1028.2 kW	1367.8 kW	1756.4 kW	1421.6 kW	1028.2 kW
08-Apr-18 10:42:59 AM EDT	1066.9 kW	1641.2 kW	1349.8 kW	1765.7 kW	1765.7 kW	1455.9 kW	1066.9 kW
08-Apr-18 10:57:58 AM EDT	1117.0 kW	1894.7 kW	1263.9 kW	1695.1 kW	1894.7 kW	1492.7 kW	1117.0 kW
08-Apr-18 11:12:57 AM EDT	1746.6 kW	1431.9 kW	1588.8 kW	1299.1 kW	1746.6 kW	1516.6 kW	1299.1 kW
08-Apr-18 11:27:56 AM EDT	1367.9 kW	1742.6 kW	1943.8 kW	1397.2 kW	1943.8 kW	1612.9 kW	1367.9 kW
08-Apr-18 11:42:55 AM EDT	1049.3 kW	1992.6 kW	1484.3 kW	1385.1 kW	1992.6 kW	1477.8 kW	1049.3 kW
08-Apr-18 11:57:54 AM EDT	1982.9 kW	1050.7 kW	1364.4 kW	1928.1 kW	1982.9 kW	1581.5 kW	1050.7 kW
08-Apr-18 12:12:53 PM EDT	1903.5 kW	1315.1 kW	1971.0 kW	1555.5 kW	1971.0 kW	1686.3 kW	1315.1 kW
08-Apr-18 12:27:52 PM EDT	1393.8 kW	1546.2 kW	1634.3 kW	1505.9 kW	1634.3 kW	1520.1 kW	1393.8 kW
08-Apr-18 12:42:51 PM EDT	1338.8 kW	1461.8 kW	1295.7 kW	1732.7 kW	1732.7 kW	1457.2 kW	1295.7 kW
08-Apr-18 12:57:50 PM EDT	1380.0 kW	1085.0 kW	1215.7 kW	1994.3 kW	1994.3 kW	1418.8 kW	1085.0 kW
08-Apr-18 1:12:49 PM EDT	1400.7 kW	1806.3 kW	1516.3 kW	1598.6 kW	1806.3 kW	1530.5 kW	1400.7 kW
08-Apr-18 1:27:48 PM EDT	1553.1 kW	1698.8 kW	1529.5 kW	1268.2 kW	1698.8 kW	1512.4 kW	1268.2 kW
08-Apr-18 1:42:47 PM EDT	1277.3 kW	1907.1 kW	1869.5 kW	1846.3 kW	1907.1 kW	1725.0 kW	1277.3 kW
08-Apr-18 1:57:46 PM EDT	1638.2 kW	1519.4 kW	1918.5 kW	1710.6 kW	1918.5 kW	1696.7 kW	1519.4 kW
08-Apr-18 2:12:45 PM EDT	1146.8 kW	1001.1 kW	1928.4 kW	1428.3 kW	1928.4 kW	1376.1 kW	1001.1 kW
08-Apr-18 2:27:44 PM EDT	1511.8 kW	1244.6 kW	1981.3 kW	1530.7 kW	1981.3 kW	1567.1 kW	1244.6 kW
08-Apr-18 2:42:43 PM EDT	1329.2 kW	1505.4 kW	1358.7 kW	1718.0 kW	1718.0 kW	1477.8 kW	1329.2 kW
08-Apr-18 2:57:42 PM EDT	1536.8 kW	1594.3 kW	1233.8 kW	1013.9 kW	1594.3 kW	1344.7 kW	1013.9 kW
08-Apr-18 3:12:41 PM EDT	1660.9 kW	1519.6 kW	1532.3 kW	1830.3 kW	1830.3 kW	1635.8 kW	1519.6 kW

# Series Transforms

- Composite Node
- Aggregate Node
- **Rollup Node**
- TimeShift node

# Series Transform Rollup Node



# Series Transform Rollup Node

Niagara Workbench

File Edit Search Bookmarks Tools Window Help

My Host: VA51LTG1C62H2.global.ds.honeywell.com (N4ADV00) : Station (N4ADV00) : Config : RollupTransformSingle : transformslot:SeriesTransform/RollupTransformSingle

Collection Table

44 rows

timestamp	Henrico_VA_value (kW)	Beijing_CN_value (kW)	Richmond_VA_value (kW)	Coolham_UK_value (kW)	Max (kW)	Average (kW)	Min (kW)
08-Apr-18 10:00:00 AM EDT	1313.4 kW	1690.0 kW	1213.9 kW	1609.6 kW	1894.7 kW	1456.7 kW	1028.2 kW
08-Apr-18 11:00:00 AM EDT	1536.6 kW	1554.5 kW	1595.3 kW	1502.4 kW	1992.6 kW	1547.2 kW	1049.3 kW
08-Apr-18 12:00:00 PM EDT	1504.0 kW	1352.0 kW	1529.2 kW	1697.1 kW	1994.3 kW	1520.6 kW	1085.0 kW
08-Apr-18 1:00:00 PM EDT	1467.3 kW	1682.9 kW	1708.5 kW	1605.9 kW	1918.5 kW	1616.1 kW	1268.2 kW
08-Apr-18 2:00:00 PM EDT	1381.1 kW	1336.3 kW	1625.5 kW	1422.7 kW	1981.3 kW	1441.4 kW	1001.1 kW
08-Apr-18 3:00:00 PM EDT	1622.1 kW	1552.0 kW	1694.6 kW	1641.7 kW	1961.4 kW	1627.6 kW	1016.9 kW
08-Apr-18 4:00:00 PM EDT	1410.8 kW	1492.2 kW	1489.3 kW	1582.6 kW	1966.3 kW	1493.7 kW	1019.4 kW
08-Apr-18 5:00:00 PM EDT	1387.9 kW	1461.6 kW	1477.2 kW	1641.4 kW	1959.3 kW	1492.0 kW	1070.0 kW
08-Apr-18 6:00:00 PM EDT	1514.3 kW	1377.1 kW	1554.9 kW	1288.3 kW	1973.4 kW	1433.7 kW	1020.7 kW
08-Apr-18 7:00:00 PM EDT	1431.6 kW	1331.5 kW	1649.3 kW	1682.7 kW	1968.8 kW	1523.8 kW	1015.0 kW
08-Apr-18 8:00:00 PM EDT	1469.4 kW	1408.3 kW	1524.3 kW	1522.2 kW	1967.3 kW	1481.1 kW	1044.2 kW
08-Apr-18 9:00:00 PM EDT	1502.2 kW	1297.4 kW	1495.2 kW	1535.9 kW	1943.0 kW	1457.7 kW	1033.4 kW
08-Apr-18 10:00:00 PM EDT	1544.9 kW	1592.7 kW	1421.2 kW	1516.0 kW	1952.6 kW	1518.7 kW	1049.7 kW
09-Apr-18 8:00:00 AM EDT	1391.2 kW	1437.5 kW	1473.2 kW	1441.8 kW	1989.2 kW	1435.9 kW	1035.7 kW
09-Apr-18 9:00:00 AM EDT	1793.9 kW	1285.2 kW	1689.8 kW	1432.5 kW	1957.2 kW	1550.3 kW	1038.1 kW
09-Apr-18 10:00:00 AM EDT	1352.9 kW	1380.0 kW	1539.7 kW	1432.4 kW	1818.0 kW	1426.2 kW	1067.7 kW
09-Apr-18 11:00:00 AM EDT	1712.4 kW	1635.2 kW	1726.4 kW	1548.1 kW	1923.5 kW	1655.6 kW	1301.1 kW
09-Apr-18 1:00:00 PM EDT	1486.9 kW	1609.2 kW	1238.9 kW	1559.4 kW	1852.6 kW	1473.6 kW	1043.5 kW
09-Apr-18 2:00:00 PM EDT	1516.6 kW	1378.7 kW	1647.1 kW	1467.2 kW	1986.9 kW	1502.4 kW	1051.6 kW
09-Apr-18 3:00:00 PM EDT	1514.2 kW	1618.4 kW	1554.1 kW	1771.9 kW	1919.8 kW	1614.7 kW	1125.0 kW

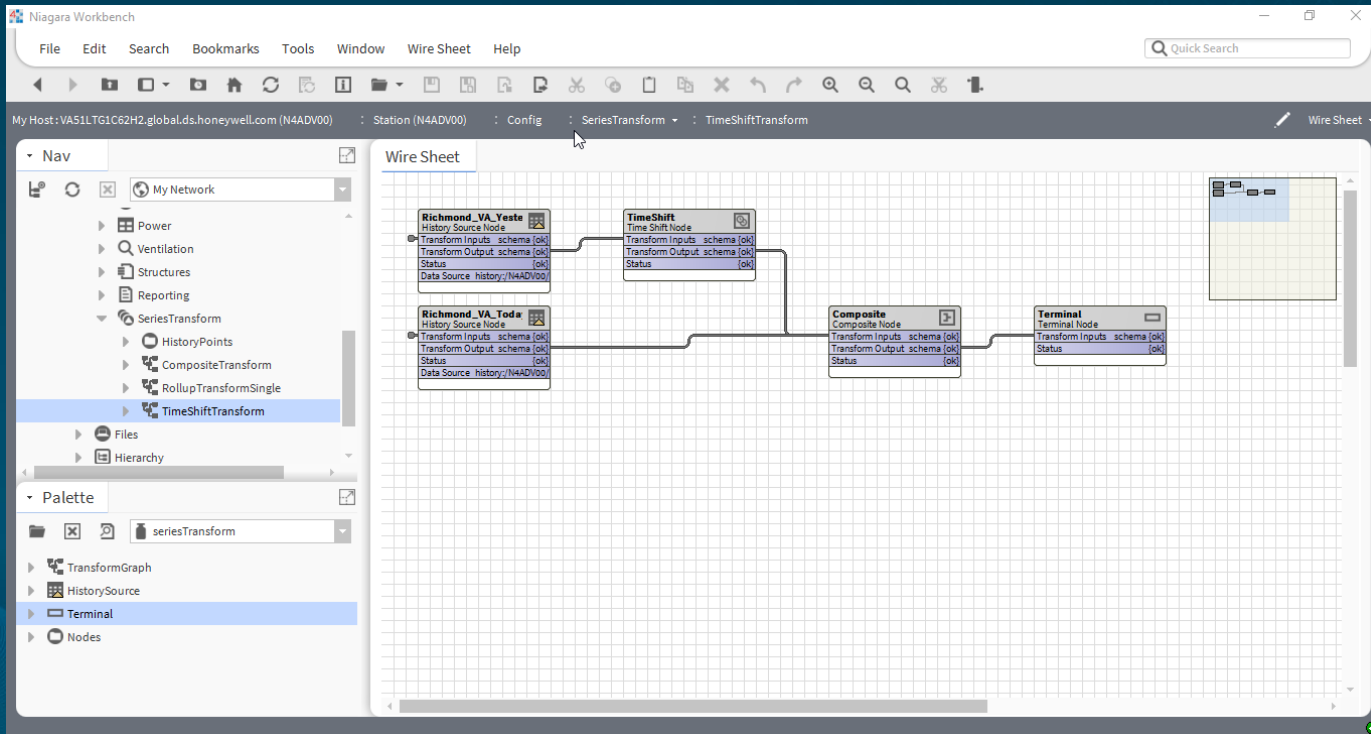
# Series Transforms

- Composite Node
- Aggregate Node
- Rollup Node
- TimeShift node



# Series Transform

# TimeShift Node



# Series Transform

# TimeShift Node

Niagara Workbench

File Edit Search Bookmarks Tools Window Help

My Host: VA51LTG1C62H2.global.ds.honeywell.com (N44DV00) : Station (N44DV00) : Config : TimeShiftTransform : transformslot:SeriesTransform/TimeShiftTransform Collection Table

62 rows

timestamp	Richmond_VA_Yesterday_value (kW)	Richmond_VA_Today_value (kW)
10-Apr-18 12:00:00 PM EDT	1127.9 kW	nan kW
10-Apr-18 12:00:00 PM EDT	1320.4 kW	nan kW
10-Apr-18 1:00:00 PM EDT	1495.4 kW	nan kW
10-Apr-18 1:00:00 PM EDT	1587.7 kW	nan kW
10-Apr-18 1:00:00 PM EDT	1653.1 kW	nan kW
11-Apr-18 7:00:00 AM EDT	nan kW	1020.4 kW
11-Apr-18 7:00:00 AM EDT	nan kW	1220.7 kW
11-Apr-18 7:00:00 AM EDT	nan kW	1645.5 kW
11-Apr-18 8:00:00 AM EDT	nan kW	1255.6 kW
11-Apr-18 8:00:00 AM EDT	nan kW	1279.7 kW
11-Apr-18 8:00:00 AM EDT	nan kW	1014.5 kW
11-Apr-18 8:00:00 AM EDT	nan kW	1810.2 kW
11-Apr-18 9:00:00 AM EDT	nan kW	1342.4 kW
11-Apr-18 9:00:00 AM EDT	nan kW	1330.6 kW
11-Apr-18 9:00:00 AM EDT	nan kW	1644.8 kW
11-Apr-18 9:00:00 AM EDT	nan kW	1983.9 kW
11-Apr-18 10:00:00 AM EDT	nan kW	1054.3 kW
11-Apr-18 10:00:00 AM EDT	nan kW	1039.8 kW
11-Apr-18 10:00:00 AM EDT	nan kW	1692.6 kW
11-Apr-18 10:00:00 AM EDT	nan kW	1304.2 kW

# Problem?

- Need to display results from Series Transforms
- Need to export results from Series Transforms
- Need to conveniently organize data as an array

# Solution!

- Reports and Charts

# Reports


- Report Px View
- Component Grid
- Output Report to file


# Reports

- Report Px View
- Component Grid
- Output Report to file

# Reports

## Report Px View

 New Px View ✕


 **New Px View**  
Create a new view on the component using a px file

View Name


Report

View Icon


module://icons/x16/views/view.png





Target Media


 Workbench PxMedia

Source


 HxPx Media

 Mobile PxMedia

 Report PxMedia

 Workbench PxMedia

report.px



VelocityPxView

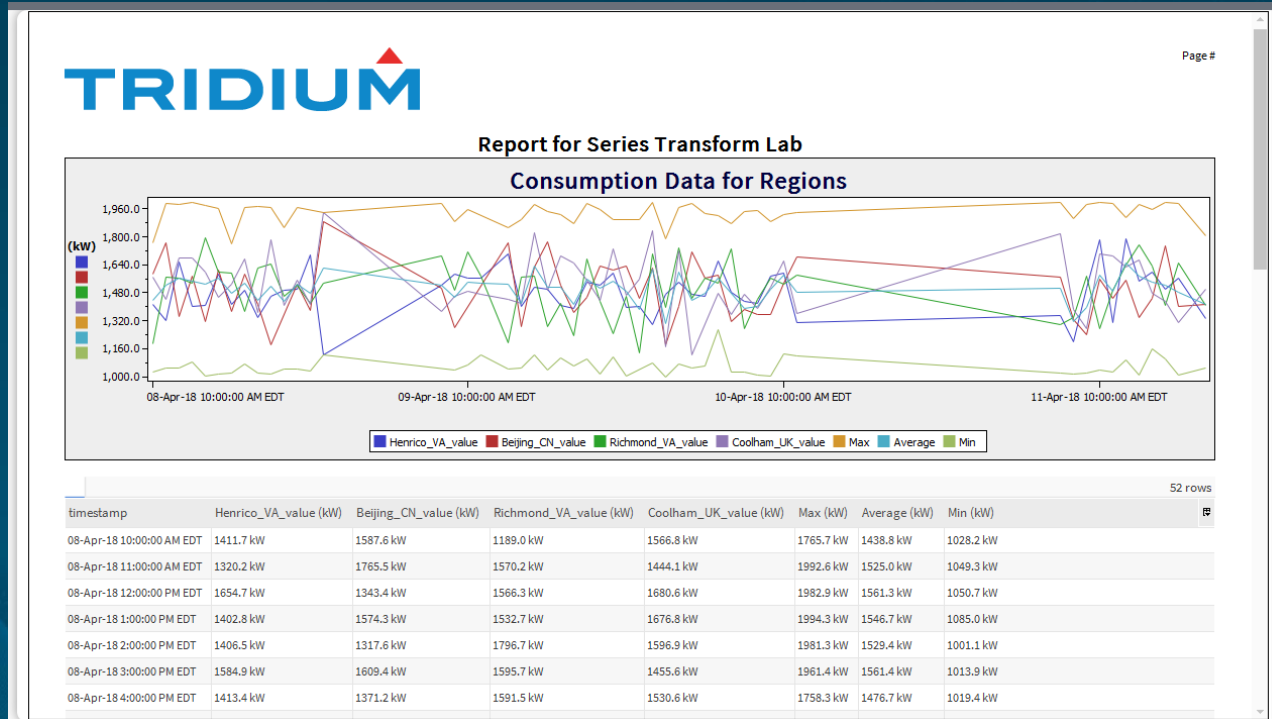
OK

Cancel



# Reports

## Report Px View



# Reports

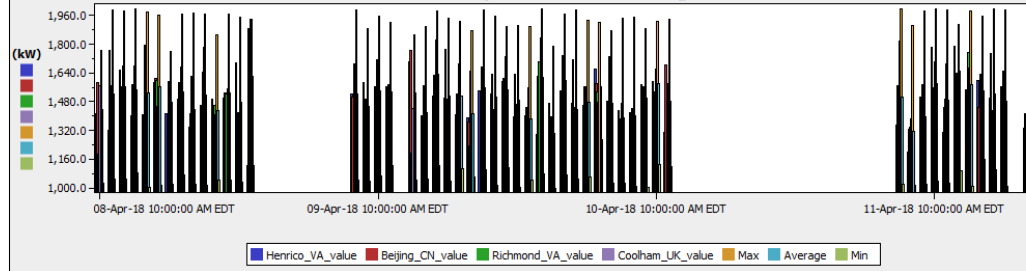
## Report Px View



Page #

### Report for Series Transform Lab

#### Consumption Data for Regions



52 rows

timestamp	Henrico_VA_value (kW)	Beijing_CN_value (kW)	Richmond_VA_value (kW)	Coolham_UK_value (kW)	Max (kW)	Average (kW)	Min (kW)
08-Apr-18 10:00:00 AM EDT	1411.7 kW	1587.6 kW	1189.0 kW	1566.8 kW	1765.7 kW	1438.8 kW	1028.2 kW
08-Apr-18 11:00:00 AM EDT	1320.2 kW	1765.5 kW	1570.2 kW	1444.1 kW	1992.6 kW	1525.0 kW	1049.3 kW
08-Apr-18 12:00:00 PM EDT	1654.7 kW	1343.4 kW	1566.3 kW	1680.6 kW	1982.9 kW	1561.3 kW	1050.7 kW
08-Apr-18 1:00:00 PM EDT	1402.8 kW	1574.3 kW	1532.7 kW	1676.8 kW	1994.3 kW	1546.7 kW	1085.0 kW
08-Apr-18 2:00:00 PM EDT	1406.5 kW	1317.6 kW	1796.7 kW	1596.9 kW	1981.3 kW	1529.4 kW	1001.1 kW
08-Apr-18 3:00:00 PM EDT	1584.9 kW	1609.4 kW	1595.7 kW	1455.6 kW	1961.4 kW	1561.4 kW	1013.9 kW
08-Apr-18 4:00:00 PM EDT	1413.4 kW	1371.2 kW	1591.5 kW	1530.6 kW	1758.3 kW	1476.7 kW	1019.4 kW

# Reports

- Report Px View
- **Component Grid**
- Output Report to file

# Reports

## Component Grid

The screenshot shows the Niagara Workbench application window. The title bar reads "Niagara Workbench". The menu bar includes "File", "Edit", "Search", "Bookmarks", "Tools", "Window", "Grid Editor", and "Help". A "Quick Search" bar is located on the right. The status bar at the bottom of the menu area shows "My Host: VA51LTG1C62H2-global.ds.honeywell.com (N4ADV00) : Station (N4ADV00) : Config : Reporting : Building1".

The left sidebar contains a "Nav" pane with a tree view. The tree structure is as follows:

- My Network
  - Ventilation
  - Structures
  - Reporting
    - Data
      - Zone1FanCmd
      - Zone2FanCmd**
      - Zone3FanCmd
      - Zone4FanCmd
      - Zone5FanCmd
      - Fan Schedules
      - Zone1Temp
      - Zone2Temp
      - Zone3Temp
      - Zone4Temp
      - Zone5Temp
- Building1

The main area displays a table with the following columns:

Name slot: %displayName%	Value slot: %out.value%	Status slot: %out.status%	Path slot: %slotPath%
station:slot/Reporting/Data			
Empty Query			
station:slot/Reporting/Data/Zone1FanCmd			
station:slot/Reporting/Data/Zone2FanCmd			
station:slot/Reporting/Data/Zone3FanCmd			
station:slot/Reporting/Data/Zone4FanCmd			
station:slot/Reporting/Data/Zone5FanCmd			
station:slot/Reporting/Data/Zone1Temp			
station:slot/Reporting/Data/Zone2Temp			
station:slot/Reporting/Data/Zone3Temp			
station:slot/Reporting/Data/Zone4Temp			
station:slot/Reporting/Data/Zone5Temp			

# Reports

## Component Grid

Niagara Workbench

File Edit Search Bookmarks Tools Window Help

My Host: VA51LTG1C62H2.global.ds.honeywell.com (N4ADV00) : Station (N4ADV00) : Config : Reporting : Building1

Nav

My Network

- Ventilation
- Structures
- Reporting
  - Data
    - Zone1FanCmd
    - Zone2FanCmd
    - Zone3FanCmd
    - Zone4FanCmd
    - Zone5FanCmd
    - FanSchedules
    - Zone1Temp
    - Zone2Temp
    - Zone3Temp
    - Zone4Temp
    - Zone5Temp
  - Building1

Name	Value	Status	Path
Zone1FanCmd	Off	{ok} @ 16	slot:Reporting/Data/Zone1FanCmd
Zone2FanCmd	Off	{ok} @ 16	slot:Reporting/Data/Zone2FanCmd
Zone3FanCmd	Off	{ok} @ 16	slot:Reporting/Data/Zone3FanCmd
Zone4FanCmd	Off	{ok} @ 16	slot:Reporting/Data/Zone4FanCmd
Zone5FanCmd	Off	{ok} @ 16	slot:Reporting/Data/Zone5FanCmd
Zone1Temp	68.4	{ok} @ 16	slot:Reporting/Data/Zone1Temp
Zone2Temp	68.4	{ok} @ 16	slot:Reporting/Data/Zone2Temp
Zone3Temp	68.4	{ok} @ 16	slot:Reporting/Data/Zone3Temp
Zone4Temp	68.4	{ok} @ 16	slot:Reporting/Data/Zone4Temp
Zone5Temp	68.4	{ok} @ 16	slot:Reporting/Data/Zone5Temp

# Component Grid in Px View

Page #

Building 1 Report

Name	Value	Status	Path	
Zone1FanCmd	Off	{ok} @ 16	slot/Reporting/Data/Zone1FanCmd	
Zone2FanCmd	Off	{ok} @ 16	slot/Reporting/Data/Zone2FanCmd	
Zone3FanCmd	Off	{ok} @ 16	slot/Reporting/Data/Zone3FanCmd	
Zone4FanCmd	Off	{ok} @ 16	slot/Reporting/Data/Zone4FanCmd	
Zone5FanCmd	Off	{ok} @ 16	slot/Reporting/Data/Zone5FanCmd	
Zone1Temp	76.0	{ok} @ 16	slot/Reporting/Data/Zone1Temp	
Zone2Temp	76.0	{ok} @ 16	slot/Reporting/Data/Zone2Temp	
Zone3Temp	76.0	{ok} @ 16	slot/Reporting/Data/Zone3Temp	
Zone4Temp	76.0	{ok} @ 16	slot/Reporting/Data/Zone4Temp	
Zone5Temp	76.0	{ok} @ 16	slot/Reporting/Data/Zone5Temp	

11-Apr-18 7:04 PM EDT

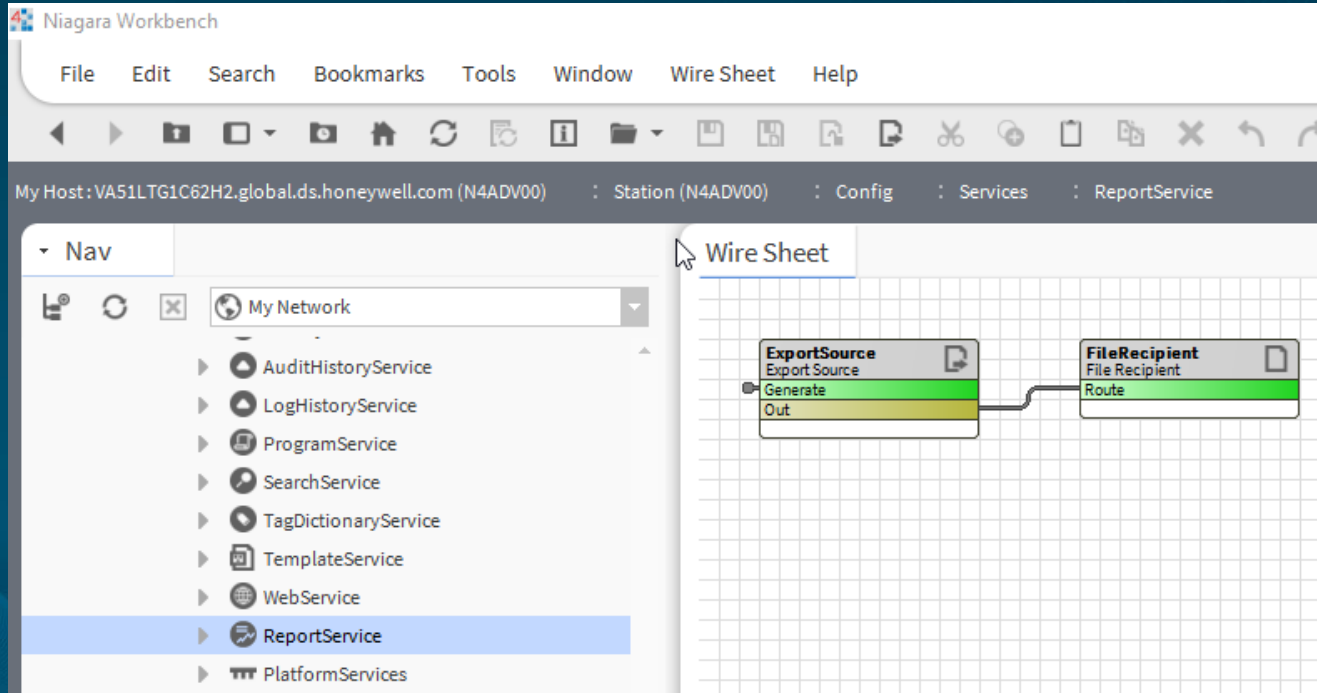
# Reports

- Report Px View
- Component Grid
- Output Report to file



# Reports

## Output Report to File



# Reports

## Output Report to File

Building1Report.pdf - Adobe Acrobat Reader DC

File Edit View Window Help

Home Tools Documenter

1 / 1

1

### Building 1 Report

Name	Value	Status	Path
Zone1FanCmd	Off	{ok} @ 16	slot:/Reporting/Data/Zone1FanCmd
Zone2FanCmd	Off	{ok} @ 16	slot:/Reporting/Data/Zone2FanCmd
Zone3FanCmd	Off	{ok} @ 16	slot:/Reporting/Data/Zone3FanCmd
Zone4FanCmd	Off	{ok} @ 16	slot:/Reporting/Data/Zone4FanCmd
Zone5FanCmd	Off	{ok} @ 16	slot:/Reporting/Data/Zone5FanCmd
Zone1Temp	75.6	{ok} @ 16	slot:/Reporting/Data/Zone1Temp
Zone2Temp	75.6	{ok} @ 16	slot:/Reporting/Data/Zone2Temp
Zone3Temp	75.6	{ok} @ 16	slot:/Reporting/Data/Zone3Temp
Zone4Temp	75.6	{ok} @ 16	slot:/Reporting/Data/Zone4Temp
Zone5Temp	75.6	{ok} @ 16	slot:/Reporting/Data/Zone5Temp

# Problem?

- Need to combine data and perform extensive analytics on results
- Need tool that is robust and can do more than basics of Series Transforms

# Solution!

- Niagara 4 Analytics

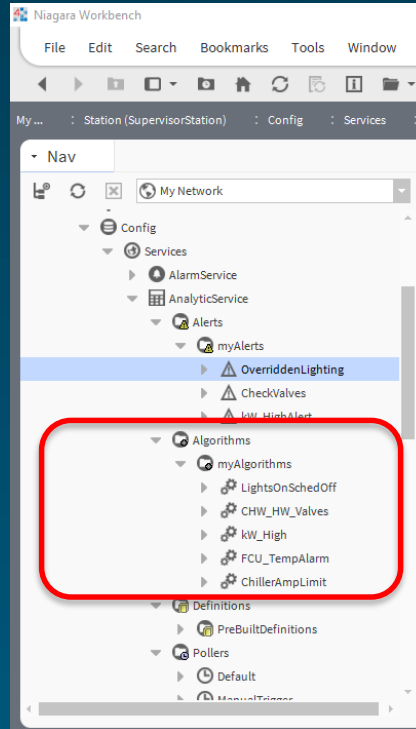
# Niagara 4 Analytics

- Algorithms
- Alerts
- Analytic Graphics

# Niagara 4 Analytics

- Algorithms
- Alerts
- Analytic Graphics

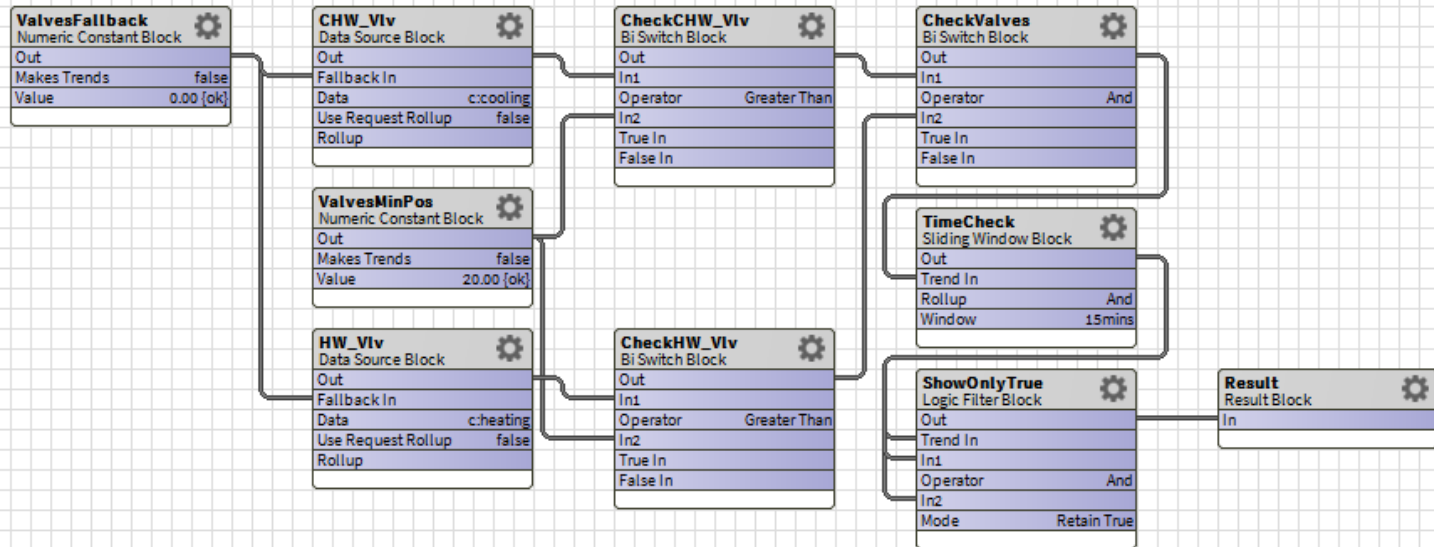
# Niagara 4 Analytics Algorithms





# Niagara 4 Analytics Algorithms

Wire Sheet



# Niagara 4 Analytics

- Algorithms
- Alerts
- Analytic Graphics

# Niagara 4 Analytics Alerts

The screenshot shows the Niagara Workbench interface with the 'AX Alarm Console' window open. The left sidebar contains a navigation tree with the following structure:

- Nav
  - Alarm
  - Config
    - Services
      - AlarmService
        - Default
        - Consol
        - Analyti
        - Analyti**
      - AnalyticSer

The main panel displays the 'AX Alarm Console' with a table of alarm data. The table has the following columns: Timestamp, Source State, Ack State, Source, Alarm Class, Priority, and Message Text. A single alarm entry is visible:

Timestamp	Source State	Ack State	Source	Alarm Class	Priority	Message Text
11-Apr-18 7:43:42 PM EDT	Fault	0 Aced / 4 Unacked	stationS3a57chS3a1b3a2_OverriddenLighting	AnalyticAlarmClass	255	%erralarm:AlarmRecord:errAlertEntry:node%

At the bottom of the console, there are buttons for Acknowledge, Hyperlink, Notes, Silence, Filter, and Review Video.

# Niagara 4 Analytics

- Algorithms
- Alerts
- Analytic Graphics

# Niagara 4 Analytics

# Tables

## Understanding Aggregation

## Understanding Rollup

## Understanding Algorithms

Lights On Schedule Off			
Timestamp	Value	Status	
10-Apr-18 4:45:00 AM EDT	Overridden	{ok}	
10-Apr-18 6:00:00 PM EDT	Overridden	{ok}	
10-Apr-18 7:00:00 PM EDT	Overridden	{ok}	
10-Apr-18 8:45:00 PM EDT	Overridden	{ok}	
10-Apr-18 10:45:00 PM EDT	Overridden	{ok}	
CHW and HW Valves Open			
Timestamp	Value	Status	
kW High Limit			
Timestamp	Value	Status	
01-Apr-18 10:45:00 AM EDT	HighDemand	{ok}	
02-Apr-18 8:30:00 AM EDT	HighDemand	{ok}	
02-Apr-18 8:45:00 AM EDT	HighDemand	{ok}	
02-Apr-18 9:00:00 AM EDT	HighDemand	{ok}	
02-Apr-18 9:15:00 AM EDT	HighDemand	{ok}	
02-Apr-18 9:30:00 AM EDT	HighDemand	{ok}	
02-Apr-18 9:45:00 AM EDT	HighDemand	{ok}	
02-Apr-18 10:00:00 AM EDT	HighDemand	{ok}	
02-Apr-18 10:15:00 AM EDT	HighDemand	{ok}	
02-Apr-18 10:30:00 AM EDT	HighDemand	{ok}	
02-Apr-18 10:45:00 AM EDT	HighDemand	{ok}	
02-Apr-18 11:00:00 AM EDT	HighDemand	{ok}	
02-Apr-18 11:15:00 AM EDT	HighDemand	{ok}	

# Niagara 4 Analytics

## Charts

Understanding Analytic Charts and Graphs  
*Ranking Chart*

Understanding Analytic Charts and Graphs  
*Average Profile Chart*

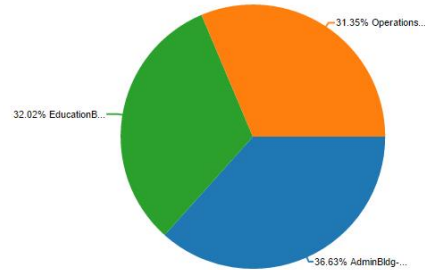
Spectrum Chart - Admin Bldg Spectrum Chart - Operations Bldg Spectrum Chart - Education Bldg

Understanding Analytic Charts and Graphs  
*Spectrum Chart*  
*Admin Building*

Understanding Analytic Charts and Graphs  
*Relative Contribution Chart*

Year to date

AdminBldg-energy OperationsBldg-energy EducationBldg-energy



# Problem?

- Need convenient way to navigate through station
- As project grows need custom navigation to dynamically update without additional work by programmer

# Solution!

- Hierarchies



# Hierarchies

- GroupLevelDef
- ListLevelDef/NamedGroupDef
- QueryLevelDef
- RelationLevelDef

# Hierarchies

- GroupLevelDef
- ListLevelDef/NamedGroupDef
- QueryLevelDef
- RelationLevelDef

# Hierarchies

## GroupLevelDef

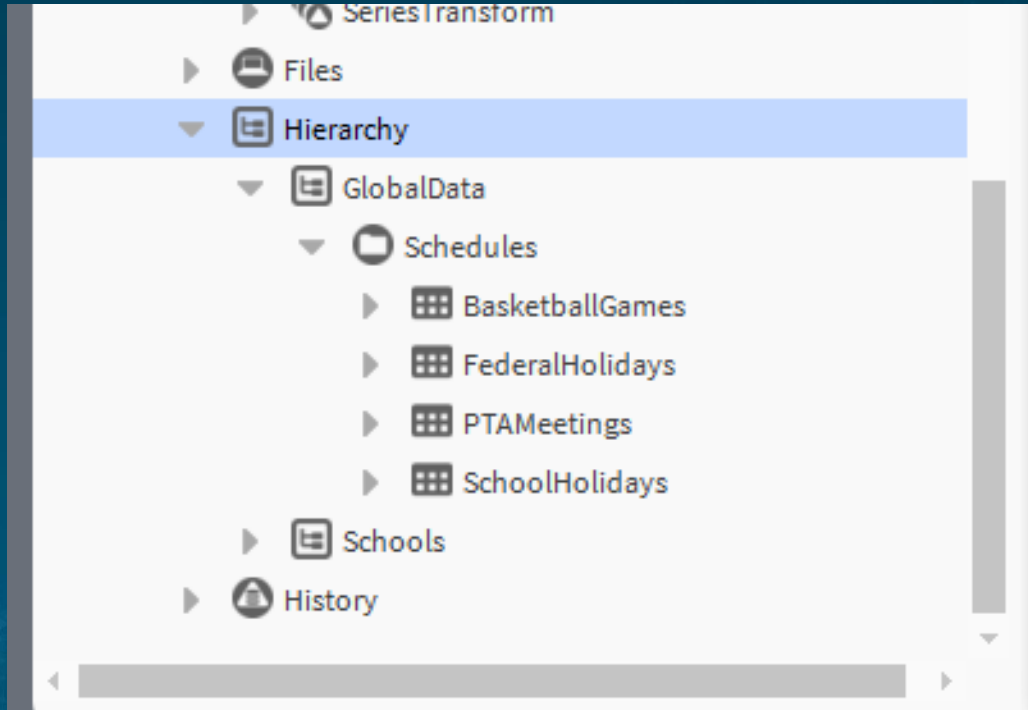
The screenshot displays the Niagara Workbench interface. On the left, the 'Nav' pane shows a tree structure under 'My Network' with various services listed. The 'GlobalData' service is expanded, showing 'Schedules' and 'Calendars'. The 'Property Sheet' on the right shows the configuration for 'GlobalData (Hierarchy)'. A red box highlights the 'Schedules' section, which is a 'Group Level Def' groupBy: abcmySchedu... The 'Schedules' section includes the following properties:

- Query Context: >> ⌚
- Group By: abc:mySchedules
- Sort: Ascending
- Tags: Hierarchy Tags

Below the 'Schedules' section, the 'Calendars' section is visible, with the property: Query Level Def: ntype like 'schedule:Ca...'. The 'Refresh' and 'Save' buttons are at the bottom right of the Property Sheet.

# Hierarchies

## GroupLevelDef



# Hierarchies

- GroupLevelDef
- ListLevelDef/NamedGroupDef
- QueryLevelDef
- RelationLevelDef

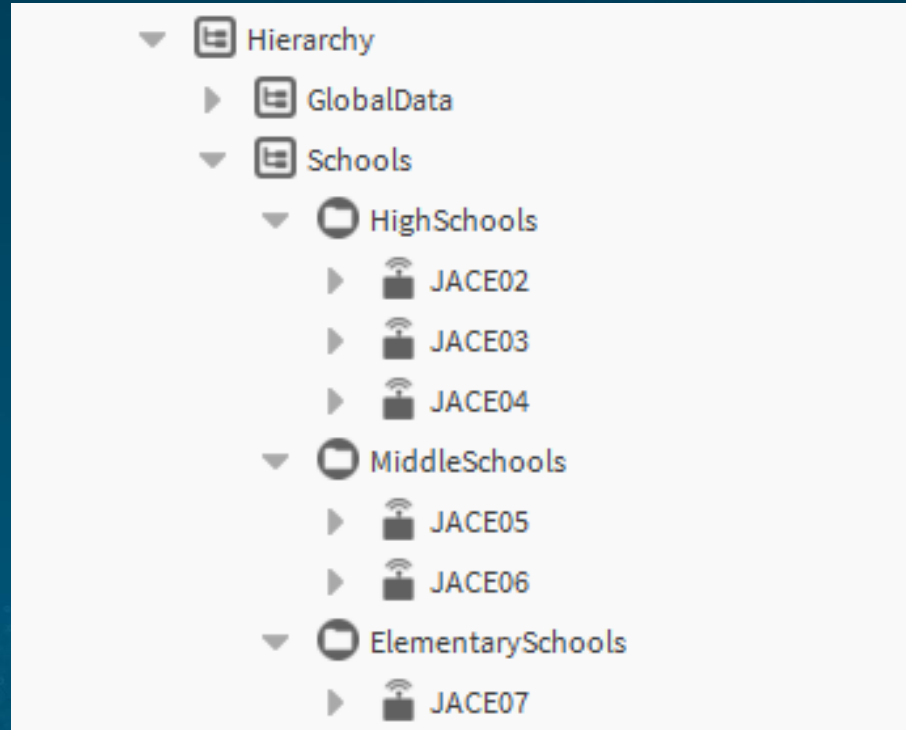
# ListLevelDef/NamedGroupDef

The screenshot displays the Niagara Workbench interface. The left sidebar shows a navigation tree with 'My Network' expanded, and 'Schools' selected under 'GlobalData'. The main area shows the 'Property Sheet' for the 'Schools' hierarchy. The 'Schools' property is highlighted with a red rounded rectangle. The 'Property Sheet' shows the following configuration:

- Status: {ok}
- Fault Cause: (empty)
- Scope: Hierarchy Scope Container
- Tags: Hierarchy Tags
- Cache Status: Not Cached
- Cache Creation Time: null
- Cache On Station Started: false
- Schools: List Level Def
  - Query Context: >> ⌚
  - Sort: None
  - Tags: Hierarchy Tags
  - HighSchools: Named Group Def: abcschool like '.\*High'
    - Query: abcschool like '.\*High'
    - Tags: Hierarchy Tags
  - MiddleSchools: Named Group Def: abcschool like '.\*Middle'
    - Query: abcschool like '.\*Middle'
    - Tags: Hierarchy Tags
  - ElementarySchools: Named Group Def: abcschool like '.\*Elementary'
    - Query: abcschool like '.\*Elementary'
    - Tags: Hierarchy Tags
  - GetSchools: Query Level Def: type = ' NiagaraDriver:!'...
  - ProxyPoints: Relation Level Def: out: nchildPoint

Buttons for 'Refresh' and 'Save' are visible at the bottom right of the 'Property Sheet'.

# ListLevelDef/NamedGroupDef



# Hierarchies

- GroupLevelDef
- ListLevelDef/NamedGroupDef
- QueryLevelDef
- RelationLevelDef



# Hierarchies

## QueryLevelDef

The screenshot displays the Niagara Workbench interface. On the left is a navigation pane with a tree view showing the project structure: My Modules, My Tools, Platform, Station (N4ADV00), Alarm, Config, Files, Hierarchy, GlobalData, and Schools. The 'Schools' folder is expanded, showing sub-folders like HighSchools, MiddleSchools, and ElementarySchools, each containing JACE nodes. The main area on the right is the 'Property Sheet' for the 'Schools (Hierarchy)' object. It lists various properties such as Query Context, Status, Fault Cause, Scope, Tags, Cache Status, Cache Creation Time, Cache On Station Started, Schools, GetSchools, ProxyPoints, and Sort. The 'GetSchools' property is expanded, showing its 'Query Level Def' with a red box highlighting the 'Query' property, which is set to 'n:type = \'niagaraDriver:NiagaraStation\''. Other properties in the 'GetSchools' section include 'Include Grouping Queries' (set to true) and 'Sort' (set to Ascending). The bottom of the interface has 'Refresh' and 'Save' buttons.

Property Sheet

Schools (Hierarchy)

- Query Context
- Status: {ok}
- Fault Cause
- Scope: Hierarchy Scope Container
- Tags: Hierarchy Tags
- Cache Status: Not Cached
- Cache Creation Time: null
- Cache On Station Started: false
- Schools: List Level Def
- GetSchools: Query Level Def: n:type = 'niagaraDriver:?'
  - Query Context
  - Query: n:type = 'niagaraDriver:NiagaraStation'
  - Include Grouping Queries: true
  - Sort: Ascending
- ProxyPoints: Relation Level Def: out: nchildPoint

Refresh Save

# Hierarchies

- GroupLevelDef
- ListLevelDef/NamedGroupDef
- QueryLevelDef
- RelationLevelDef

# Hierarchies

## RelationLevelDef

The screenshot displays the Niagara Workbench interface. On the left, the 'Nav' pane shows a tree structure with 'Schools' selected. The main area shows the 'Property Sheet' for 'Schools (Hierarchy)'. The 'ProxyPoints' section is highlighted with a red box, showing the following properties:

- Query Context: [icon]
- Inbound Relation Ids: [text field]
- Outbound Relation Ids: `n:childPoint`
- Filter Expression: [text field]
- Repeat Relation: ☐ false
- Caching Repeat Limit:  [1 - max]
- Sort:

The 'Relation Level Def' for 'ProxyPoints' is set to 'n:childPoint'.

# Problem?

- Need to reduce time to upgrade small job to large job
- Do not want to spend time 're-doing' work that was done previously

# Solution!

- Exports Tags

# Export Tags

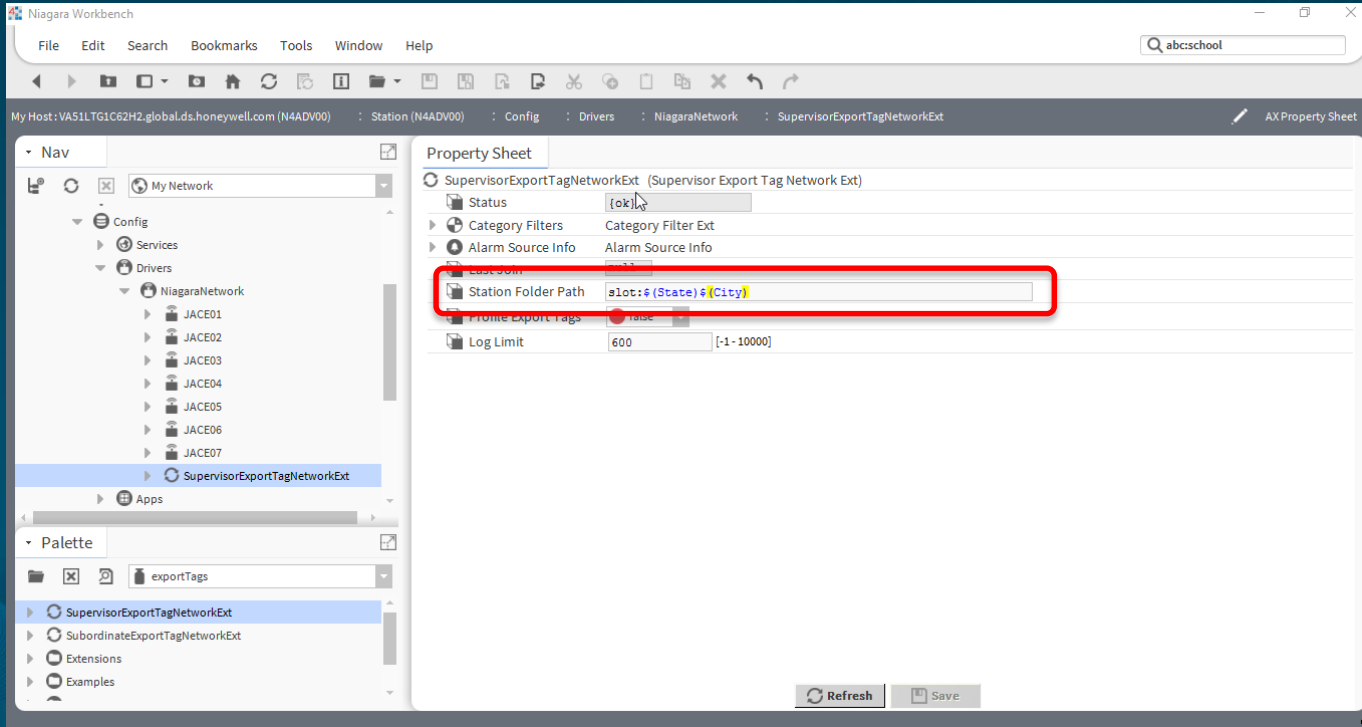
- Prepare Supervisor Station
- Prepare JACE Station
- Merge Stations

# Export Tags

- Prepare Supervisor Station
- Prepare JACE Station
- Merge Stations

# Export Tags

## Prepare Supervisor Station



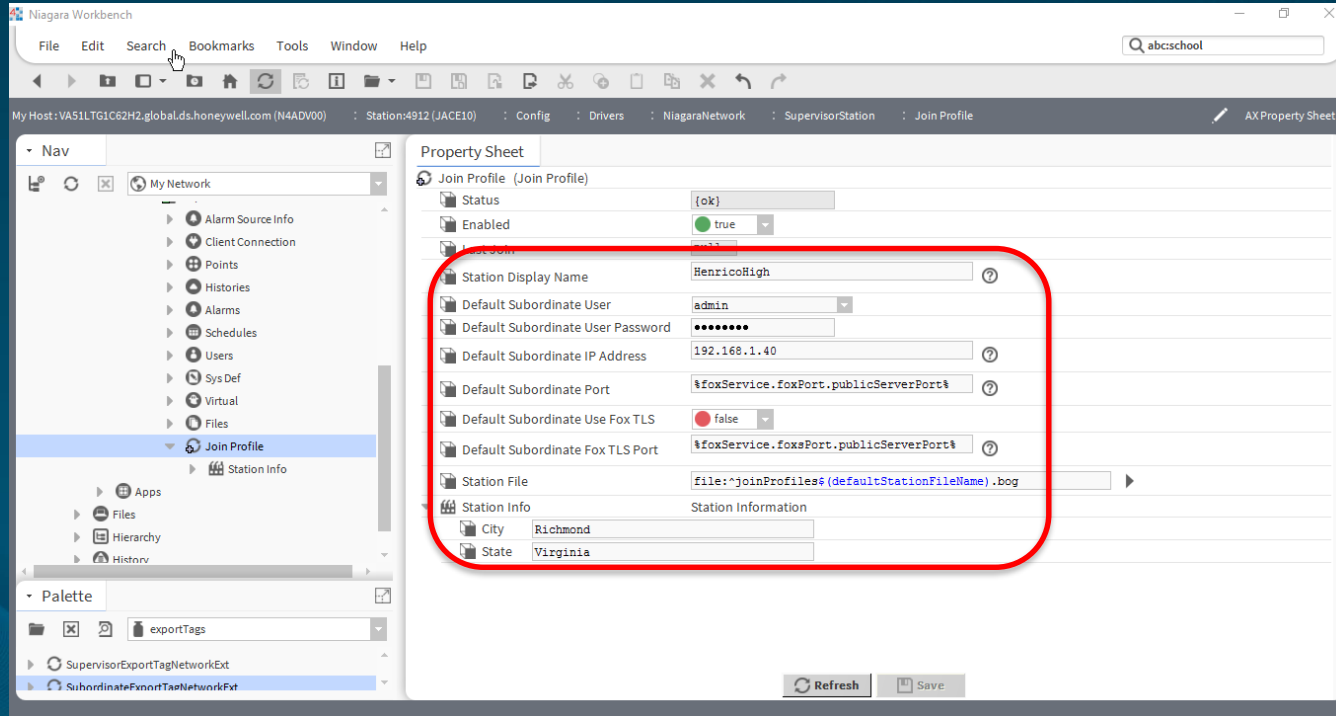


# Export Tags

- Prepare Supervisor Station
- Prepare JACE Station
- Merge Stations

# Export Tags

## Prepare JACE Station

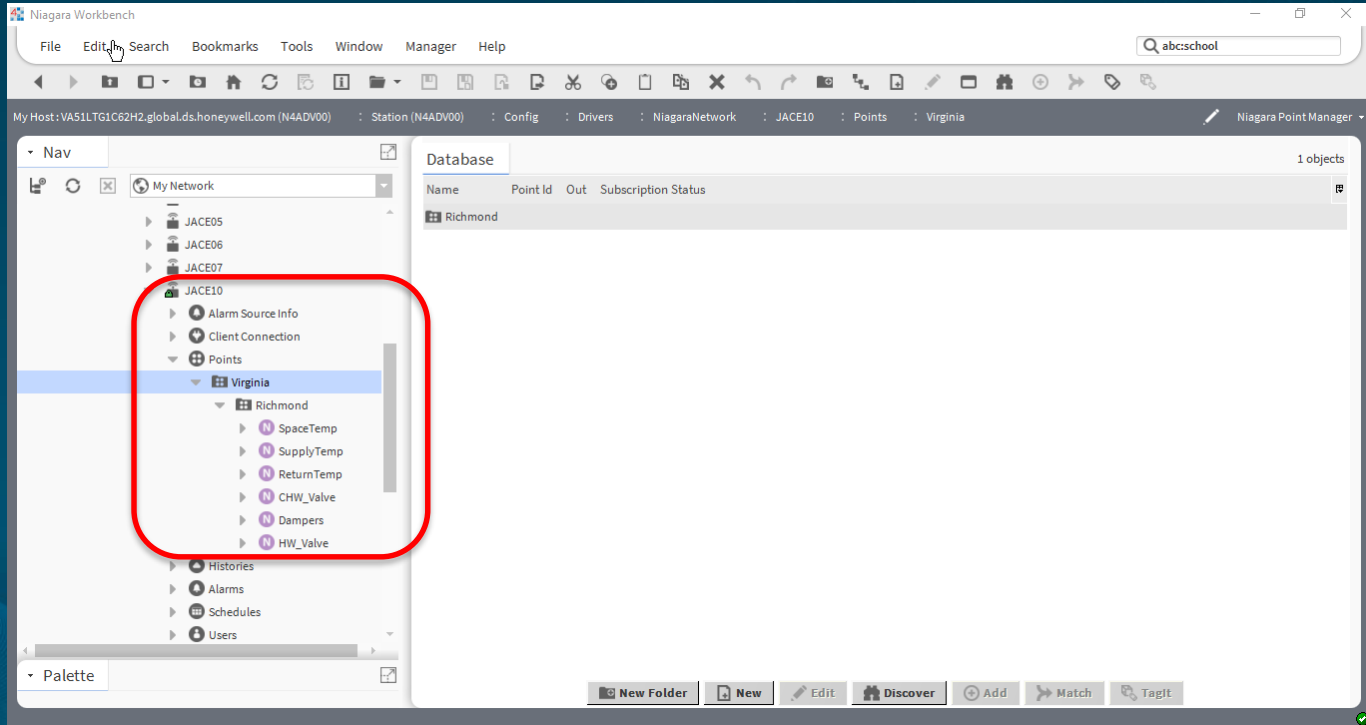


# Export Tags

- Prepare Supervisor Station
- Prepare JACE Station
- Merge Stations

# Export Tags

## Merge Stations



# Problem?

- Need to efficiently backup stations on a large site
- Need to efficiently update modules on a large site
- Need to efficiently manage a large site

# Solution!

- Provisioning Niagara

# Provisioning Niagara

- Backup Stations
- Updates Stations

# Provisioning Niagara

- Backup Stations
- Update Stations



# Provisioning Niagara Backup Stations

The screenshot displays the Niagara Workbench application. The left sidebar shows a tree view of the project structure, with 'NiagaraNetwork' selected. The main area shows a calendar view for the month of April 2018, with the 12th highlighted. Below the calendar, a table lists the backup schedule details. A red box highlights the 'MonthlyBackup' entry, which has a summary of 'Week And Day: Mon Week 1 Every Month'. The right sidebar shows the 'AXTriggerScheduler' configuration, including a time range from 12:00 AM to 11:59 PM, a range interval of +000001h 00m, and buttons for 'Add' and 'Remove'.

My Host: VAS1LTG1C62H2.global.ds.honeywell.com (N4ADV00) : Station:4912 (JACE10) : Config : Drivers : NiagaraNetwork : TriggerSchedule

AXTriggerScheduler

Nav

- My Network
  - Station (N4ADV00)
    - Station:4912 (JACE10)
      - Alarm
      - Config
      - Services
      - Drivers
        - NiagaraNetwork
          - SubordinateExportTagNetworkExt
          - ProvisioningNwExt
          - NiagaraNetworkJobPrototype
          - TriggerSchedule
          - JACE01
        - Apps
        - Files
        - Hierarchy
        - History

Prev Page Prev Month Today Next Month Next Page

Apr 2018 May 2018 Jun 2018 Jul 2018

s	m	t	w	t	f	s
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

s	m	t	w	t	f	s
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

s	m	t	w	t	f	s
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

s	m	t	w	t	f	s
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Name	Summary
MonthlyBackup	Week And Day: Mon Week 1 Every Month

01h : 00m

12:00 AM

☒ Range

Range End 11:59 PM

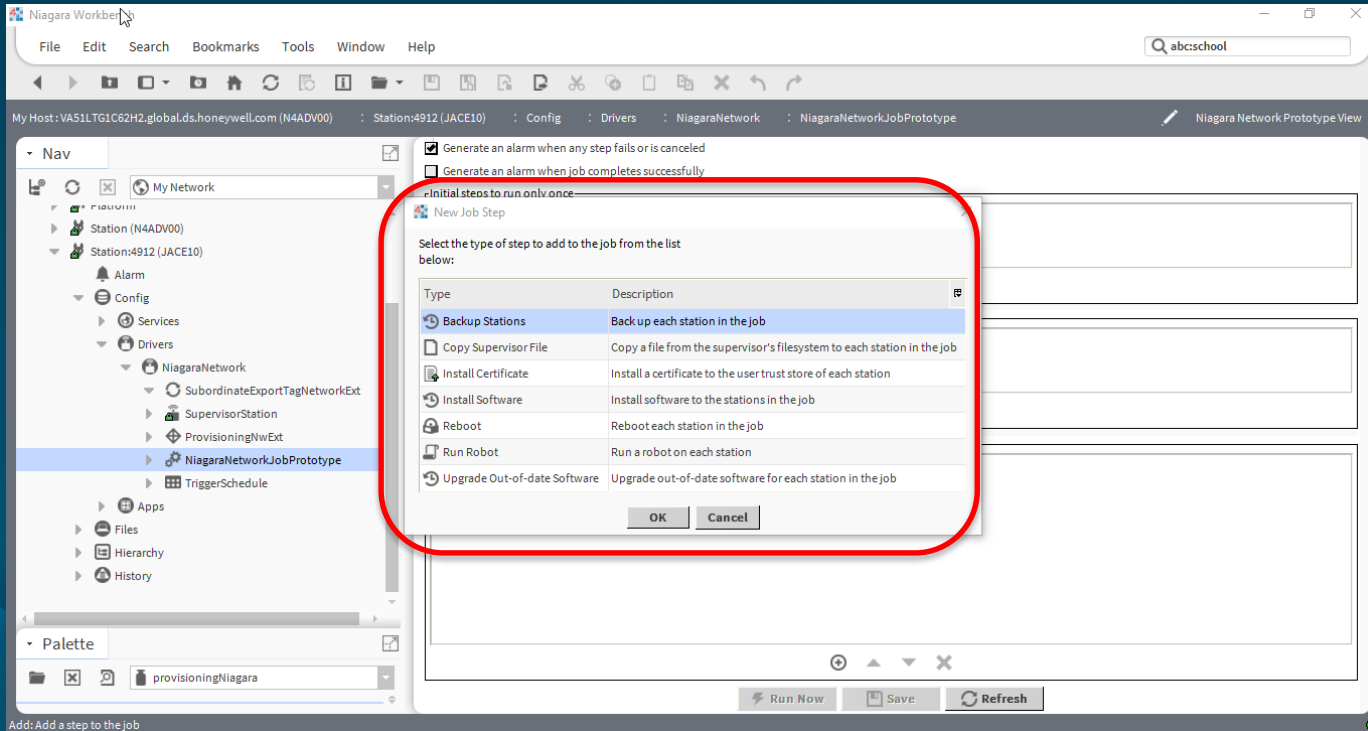
Range Interval +000001h 00m

Add Remove

Add Edit Priority Priority Rename Delete

Save Refresh

# Provisioning Niagara Update Stations



# Examples

# Summary

Don't be part of the 'Bucket Brigade'





# Summary

Take advantage of the new features in Niagara 4



# How?

## Niagara 4 Advanced Technical Certification Program (TCP) (AMER)

STATUS: Enrolled | KEYWORDS: ilt english amer | LANGUAGE: English | TYPE: Event



Educates students to an Advanced level of technical expertise to effectively and efficiently design, engineer, and program "cyber-secure", enterprise-wide, supervisor projects using the Niagara 4 Framework and demonstrate how to migrate existing Niagara AX stations to the N4 model. | Prerequisites: Niagara 4 certification | Audience: Systems Integrators, OEMs, distributors, and other business partners | Certification: Niagara 4 Advanced TCP | 5-day, Instructor Led Training, Part #: TRN-CRS-N4-ADV, Price: \$2890 USD

Material	Description	Instructions	Downloads
Agenda N4 Advanced TCP (5.15.17)	Brief class agenda.	Download PDF and review.	[ Niagara 4 Advanced Training Agenda (5.15.17).pdf ]
Training Locations (10.24.16)	List of recommended accommodations and travel instructions.	Don't book travel until you have received enrollment confirmation.	[ Training Locations AMER 10-24-16.pdf ]



*Thanks*

# Niagara 4 Advanced TCP (Tridium)

- May 7 - 11, 2018      Stanford University – Palo Alto, CA
- May 14 - 18, 2018      Tridium HQ – Richmond, VA
- Jul 30 - Aug 3, 2018      Tridium EMEA HQ – Coolham, UK
- May 28 - Jun 1, 2018      Padova, Italy
- Jun 11 - 15, 2018      Monza, Italy
- Jun 18 - 22, 2018      Kuala Lumpur, Malaysia
- Jun 25 - 29, 2018      Adelaide, Australia



# Cochrane Technical Service

- Jun 4 - 8, 2018      Madison Heights, MI
- Jun 18 - 22, 2018    Cleveland OH

# Honeywell

- |                     |                  |                  |
|---------------------|------------------|------------------|
| • Apr 23 - 27, 2018 | Minvalco         | Minneapolis, MN  |
| • May 7 - 11, 2018  | Control Depot    | Omaha, NE        |
| • Jun 4 - 8, 2018   | G&O Thermal      | Chicago, IL      |
| • Oct 22 - 26, 2018 | Jackson Controls | Indianapolis, IN |
| • Nov 5 - 9, 2018   | USG              | Cedar Knolls, NJ |

# Vardell Technical Training

- Apr 23 - 27, 2018      Green Bay, WI
- Jun 4 - 8, 2018      Philadelphia, PA
- Jul 30 – Aug 3, 2018      Lake Forest, CA

# MOV Training

- Jul 30 - Aug 4, 2018
- Aug 27 - 31, 2018
- Sep 17 - 21, 2018
- Dec 10 - 14, 2018
- Jan 14 - 18, 2019

Minneapolis, MN

Wisconsin (exact location pending)

Chicago, IL

Houston, TX

Dallas, TX



*Thanks Again*