Smartware Technologies

Network 8000 Conversion Service

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1. Overview of the Network 8000 Conversion Service

The *Network 8000 Conversion Service* is a powerful system that can analyze the controller logic in a GCM and the Monitor Screens in a Signal system and recreate the graphics and control logic into one or more Niagara R2 UNC and Enterprise Server stations.

Exactly What Does it Do?

The system really does two interrelated conversions:

- It takes the device and logic block information from a GCM and reproduces it in a UNC station.
- It takes the Monitor Screens from a Signal system and creates the background GIF file and GxPage in an Enterprise Server or UNC station.

A conversion project can include one or more GCMs and a Signal system, in which case the conversion process also links the points on the generated screens into the control logic in the generated UNC station. The Conversion Tool can also work on a GCM or Signal system without the other.

Some of the specific things that the Conversion Tool does include:

- Device blocks (ZONE2, PEM1, FLO2, MNFLO and SIM) in the GCM are converted to the corresponding shadow objects from the ibsAsd jar file in the UNC station.
- Schedule and Calendar information is extracted from OSS, WEEK and HOLI blocks and converted to Niagara Calendar and Schedule objects. If there is both a UNC and Enterprise Server station being generated, the Calendars and Schedules are created in both and linked as master/slave.
- A default GxPage for accessing the Calendars and Schedules is created.
- A list of Setpoints is generated from the APT and DPT blocks in the GCM. The setpoints are implement using two new custom blocks, one in the UNC and the other in the Enterprise Server, that essentially create a setpoint value that will not be lost during a loss of communication. It also provides an enhanced and commandable GxText object that allows for manual and timed overrides with visual feedback (changing colors and flashing "time remaining" counters).
- Most of the other logic blocks in the GCM are converted to a corresponding block from the Smartware R2 Jar File.

- SNET and RNET communications between GCMs are converted to direct links or subscription links between UNCs
- TREND blocks are created to link the input values and logs are created and configured to collect the data.
- Signal Screens are converted to a background GIF, incorporating all static text and shapes while preserving all font and color information, and a GxPage in the graphics station.
- Standard Signal Points are converted to *GxText* objects, with color, font, units, precision and Active/Inactive text preserved.
- Signal's *Analog Bitmap*, *Digital Bitmap* and *Graduated Fill* points are converted to Niagara *GxFloat*, *GxBoolean* and *GxBarGraph* objects.
- All screen points can be generated to automatically log their data and provide user access to the log data by clicking on the point on the screen.

Who Does the Conversion?

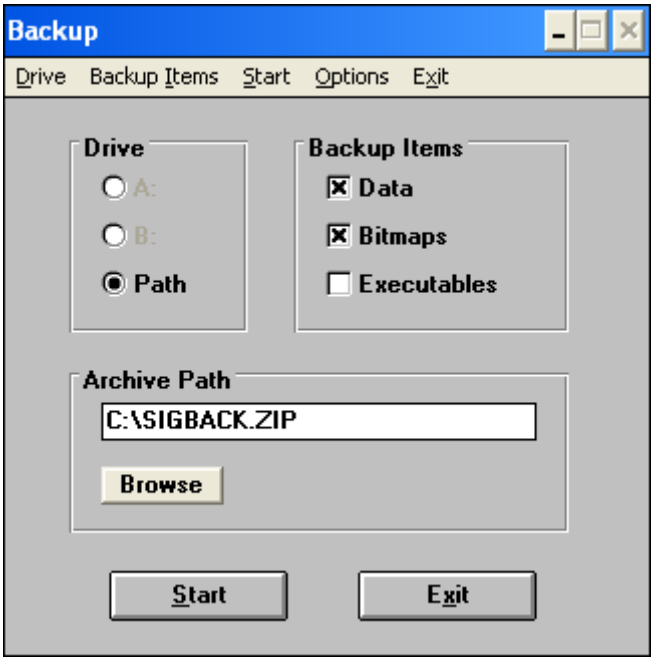
Smartware Technologies will do all the converting for you. You supply us with the required backup files and some additional information regarding how you want the conversion to be done (e.g., a single UNC or a UNC and Enterprise Server, etc.) and we return to you the converted stations in XML format ready to be installed onto the UNCs and/or Enterprise Servers.

What Files Do I Need?

To run the conversion, you will need the following "source" files from your existing project:

Signal Backup (SIGBACK.ZIP)

If you are going to convert Signal screens, you will need a backup of the Signal System. This must be the single file version (not a multi-file version intended for floppy disks). It should include the DATA and BITMAPS, but does not need to include the EXECUTABLES:



Smartware Studio actually imports files from the following files and folders from SIGBACK.ZIP:

DS_LIST.DAT	Database list of Monitor Screens in File Manager
\BITMAPS	Background image files (*.BMP)
\DIGIBMP	Digital and Analog Bitmap image files (*.BMP)
\LINKBMP	Monitor Screen image files (*.BMP)
\MONITOR	Monitor Screens (*.SSF)
\PROJECT	Project Tree database files (*.DAT)

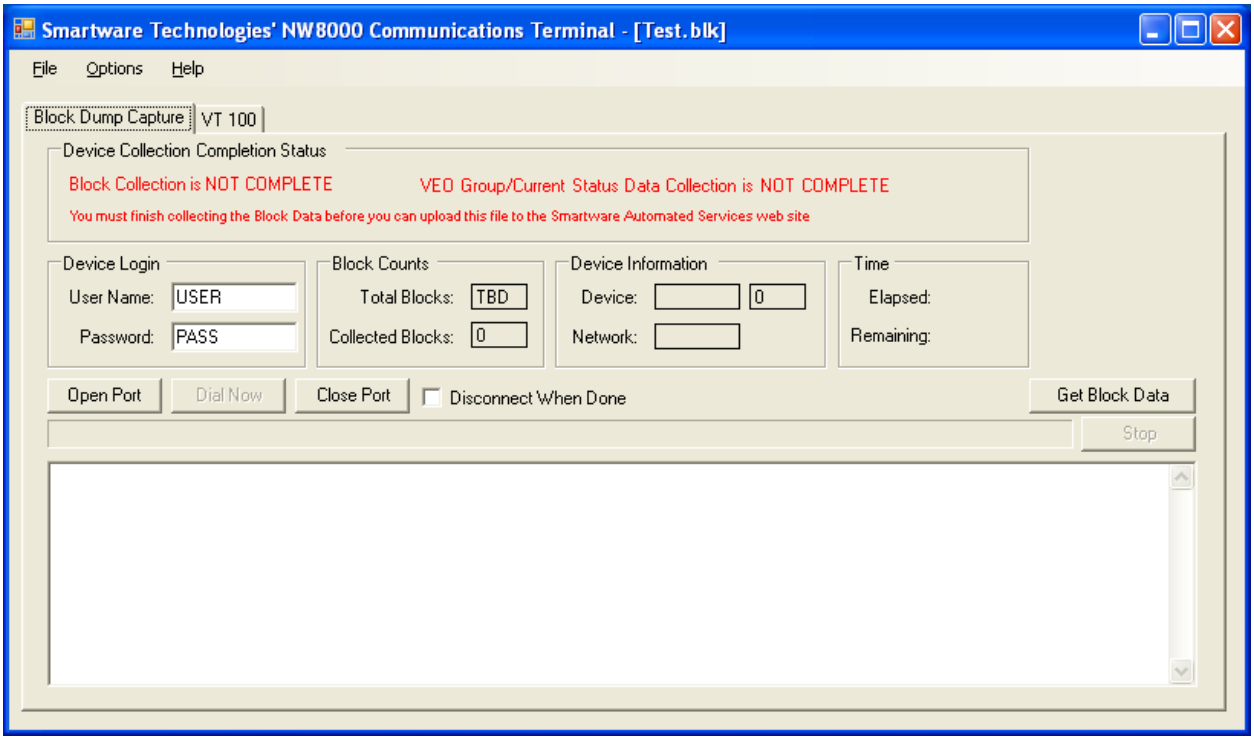
If for any reason the file is corrupted, you can rebuild this folder structure and create your own zip file.

- There are cases were SIGNAL may store Monitor Screen and Bitmap files in a subdirectory (usually named for the project). If this is the case, you will need to open the zip file and move the files from the subdirectory into the appropriate folder listed above.

GCM Block Database (.BLK Files)

For each GCM that you are going to convert, you will need to capture the block information from the GCM using our free *Smartware Network 8000 Communications Utility*.

- This utility can be downloaded from our web site.



- The utility is essentially a beefed up VT100 terminal program. It automatically traverses the GCM menu structure to request a block list and then request each block one by one. If there is any communication problem during the capture, it will be detected immediately and the block will be retried. If there is a loss of communication during the capture, it can pick up where it left off.
- The utility can connect via a direct serial connection or a modem.
- The utility supports USB serial ports as well as hardware serial ports.

Unfortunately, we cannot read the block information from a backup created by Eclypse, ProBlock, Signal or TreeTech.

LCM Block Databases (.BLK Files)

The system can generate serial communications to and between LCM devices as part of the conversion. While you can download the blocks using the *Smartware Network 8000 Communications Utility*, it is not necessary for the conversion process. If you do collect the blocks, you can generate block diagrams with the Smartware Documenting Service.

LNC Devices

An LNC is a GCM that can communicate to Lon Devices through its SIM blocks. The conversion tool can handle this part of the conversion, but it needs some additional information about the Lon Device's profile and Network Variables (NVs) that isn't available in the LNC's block database.

For LNC devices, you must do the following:

- Collect the Block Database using the *Smartware Network 8000 Communications Utility*, just as you would with a regular GCM.
- Generate a temporary Niagara stations in WorkPlace Pro that includes shadow objects for the Lon Devices.

To generate the temporary station, follow this generate procedure:

- Disconnect the Lon bus from the LNC.
- Connect the Lon bus to a laptop running WorkPlace Pro.
- Use the *LonDeviceManager* in the *LonWorksService* to "learn" a station that contains a shadow object for all the Lon Devices. You must also learn all the Network Variables. Refer to the *Niagara LonWorks Integration Guide* for more information.
- Save the generated station as a config.xml file.

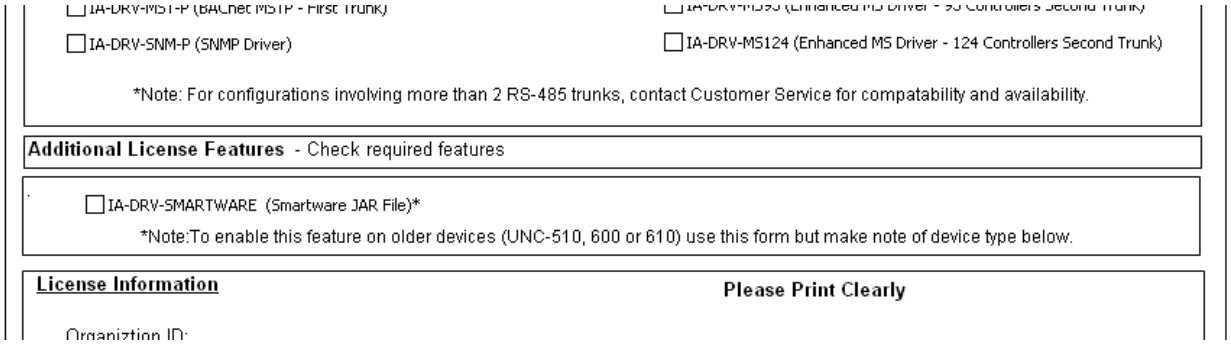
What is the Smartware R2 Jar File?

In order to make this conversion tool possible, it was necessary for us to create a set of R2 blocks that correspond to many of the GCM blocks. While some native R2 blocks were similar (e.g., MATH and LOGIC), there were still some differences. And some (EDL and SEQ, for example) had nothing even close in the native R2 system.

In order to avoid excessive use of Program Objects, which are highly discouraged by experienced Niagara R2 programmers and Tridium alike, we created our own compiled version of these blocks in a custom Jar File.

The jar file will be available for download from our web site, but it must be licensed by TAC through their normal procedures.

- If you order a new UNC or Enterprise Server license that will be running a station generated by the Conversion Tool, you should order the Smartware feature as well.
- If you have an existing UNC or Enterprise Server license, you will need to upgrade it to include the Smartware feature.
- The cost to include a license for the Smartware jar file in a Niagara license from TAC is about $300 (net). There is no cost to upgrade TIP copies of WorkPlace Pro to run the Smartware R2 Jar File for testing and development purposes.
- There is no cost to for TIP copies of WorkPlace Pro to run the Smartware R2 Jar File for testing and development purposes.
- The I/A License Forms have been updated (as of version 6.1) to include a place to order the Smartware Jar File (IA-DRV-SMARTWARE):



Pricing Structure

The cost for an unlimited one-year subscription to the Network 8000 Conversion Service is $2,795. Renewals are priced at 20% ($559) per year.

Each UNC or Enterprise Server station that runs a generated station will need to be licensed with the Smartware R2 Jar File. The cost for this license from TAC is about $300 net. There is no cost to for TIP copies of WorkPlace Pro to run the Smartware R2 Jar File for testing and development purposes.

Frequently Asked Questions (FAQ)

Q: Can the Conversion System be used on the Niagara AX/G3 Platform?

A: No. It can only generate stations for the Niagara R2 platform.

Q: Does the Conversion System handle LNCs?

A: Yes. LNCs can be the most time consuming part of a manual conversions because the inputs and outputs of the SIM blocks have to be mapped by hand from the DATA string to SNVTs, and then to one or more Niagara objects linked to the appropriate Lon Shadow object. We have programmed our system to do all that.

Q: Does the Conversion System handle LCMs

A: Yes, The tool adds the Lcm Service object, generates LCM device blocks for the available LCMS, creates Lcm Serial Integration objects to send and receive values handled by SGCM and RLCM blocks, and generates the appropriate objects for receiving and commanding individual block attribute values from a Signal Monitor screen point.

Q: Can the Conversion System convert graphics from a HOST system?

A: No. Unfortunately there were not enough HOST systems deployed to make this cost effective to develop.

Q: Can I convert 2 GCMs into 1 UNC, or split a GCM into 2 UNCs?

A: Yes. The tool will allow you to specify on a per-device basis the UNC into which the shadow object and associated logic will be created. You can effectively convert *N* number of GCMs into *M* number of UNCs in any configuration (within the limits of the UNC's resources, of course).

Q: Can I use GCM backup files from Eclypse, ProBlock, Signal or TreeTech?

A: No. Unfortunately those files are proprietary, so we cannot read the block information from a backup created by the other programs.

Q: Can I generate the Signal screens into a web-enabled UNC or do I have to use an Enterprise Server?

A: Either way. The graphics screens can be generated into a separate Enterprise Server station or into one of the generated UNC stations.

Q: Do I have to have a Signal system as part of my conversion project?

A: No. You can convert GCMs by themselves.

Q: Can I have more than one Signal system in my project?

A: No. The conversion assumes that there is only one (if any) Signal system and only one station that will contain the graphics. If you have a reason for a different scenario, please contact us to discuss.

Q: Do I need to set up Smartware Studio with a server to run this tool?

A: No. Smartware Studio with or without the Conversion Tool module works fine as a standalone program.

Q: Are there any other software requirements?

A: The tool generates a number of reports using Microsoft Excel, so you will want to have that installed to view these files. And of course you will need to have WorkPlace Pro installed to import and test the generated stations.

Q: Will the converted project be 100% complete?

A: Probably not, but it will likely be very close.

In any case, the tool generates very detailed reports of each GCM block, each GCM block attribute and each Signal screen point and notes exactly how they were handled and where there were exceptions.

Disclaimer and Limitation of Liability

The Smartware Network 8000 Conversion Service and its generated stations will be sold and used with a Disclaimer and Limitation of Liability that will not guarantee its success for any specific purpose or provide for any recourse for any damages or loss.

If you wish to review these legal notices before proceeding, please contact our office.

2. How to Analyze and Install the Results of the Conversion

This chapter will help you understand the results of the conversion and outline how to install the created stations in the field.

NOTE: Limitations of the Conversion

It is important to realize the following:

- The Conversion System will not fix existing mistakes. As much as possible we will note conditions that are clearly erroneous (e.g., an attempt to link a block to a non-existent block or output), but incorrect logic in the GCM will be reproduced in the UNC.
- The Conversion System cannot convert everything. Some things that are controllable in a GCM/Signal system just aren't possible in Niagara, and some things we haven't yet encountered and programmed the tool to handle. If you find something missing, please let us know about it.

Smartware Technologies accepts no responsibility whatsoever for any damages, monetary or otherwise, arising from the use of our generated stations, programs and data.

How to Proceed Once the Conversion has Been Generated

Once the conversion is complete, you will want to:

1. Review the generated files and reports. You will especially want to review the *GCM Block Report (Exceptions)* and the *Signal Point Exceptions.* Refer to the section *The Generated Reports and Files* later in this chapter for more information.
2. Install the Smartware R2 Jar File onto your technician's computer. Refer to the section *Installing and Licensing the Smartware Jar File* later in this chapter for more information.
3. Install the Smartware Jar file onto the UNC. The license for the UNC must have been updated by TAC to include the IA-DRV-SMARTWARE driver.
4. Copy the station files onto the technician's computer.
5. Convert the station from the generated XML to the SNS format.
6. Install the station (and any graphics files, if applicable) onto the UNC and Enterprise Server
7. Create Address Book entries in each station to point the Enterprise Server to and from each UNC, and possibly from UNC to UNC (if logic or devices from one GCM was generated into multiple UNCs)

The default name and password in the generated stations is usually *admin* and *password*.

Installing and Licensing the Smartware Jar File

The Smartware Jar File contains a number of custom, compiled objects used in the converted stations. It must be installed on any technician's computer that will be working with these stations (installing or servicing), and on any UNC or Enterprise Server running one of these station.

Obtaining the Smartware Jar File

The latest version of the Smartware Jar file can be obtained only from Smartware Technologies. To avoid confusion, TAC will not be distributing the jar file.

- If we converted a project for you, the Jar file will be included in the files we send you.
- The latest version of the Jar File is also available for download from our web site.

Licensing the Smartware Jar File

For a customer's UNC or Enterprise Server, you must include the IA-DRV-SMARTWARE driver feature in your license, either at the time it is ordered or by requesting an upgrade. TAC provides all Niagara licenses.

For a technician machine running a TIP copy of WorkPlace Pro, no explicit licensing should be required. However, this ability relies on how the license was first issued by TAC. If the Jar file does not function on a TIP license, or if you want to verify that it will, please e-mail us a copy of your license file (from WorkPlace Pro).

To generate the license file in WorkPlace Pro:

1. Open the Admin Tool
2. Select the INSTALLATION Tab
3. Click the VIEW LICENSE button.
4. From the FILE menu, select SAVE LOCAL

Versions of the Smartware Jar File

The name of the Smartware Jar File is:

Smartware-2.301.525.v00*xx*.jar

Where xx represents our revision number. The "2.301.525" in the name *does not* imply that it works only with that release of Niagara. In fact, the Smartware Jar File should work with Niagara release r2.01.514 and later.

From time to time we will release updated releases of the Smartware Jar File, which will differ only by the "v00xx" number. Please refer to the *Smartware Jar File Programmer's Guide* for Release Notes and other information about backward and forward compatibility between our releases.

Installing the Smartware Jar File into WorkPlace Pro

To install the Smartware Jar File, copy the file to the standard folders in WorkPlace Pro:

C:\Niagara\r2.301.5*xx*\emb
C:\Niagara\r2.301.5*xx*\nt
C:\Niagara\r2.301.5*xx*\nre\modules

Unlike some other jar files, there is only one file and it can be copied into all three folders.

Be sure there is only one version of the Smartware Jar File in a folder at any time.

The Generated Reports and Files

When you run a conversion project, there are a number of files that are generated to help you understand and verify exactly what the Conversion Tool did.

GCM Files

GcmName Asd Devices.xls

A listing of all the ASD Devices in the GCM. It also indicates which UNC the device is/was generated into, and the name of the device in the UNC (if different).

GcmName Schedules.xls

A listing of all the schedules created in the UNC (and linked master/slave to the Enterprise Server, if generated) based on OSS and WEEK blocks found in the GCM.

GcmName Calendars.xls

A listing of all the calendars created in the UNC (and linked master/slave to the Enterprise Server, if generated) based on HOLI blocks found in the GCM.

GcmName Setpoints - Apt.xls

A listing of all the APT blocks in the GCM with their current and default values and formatting information. If graphics pages are generated, SwAnalogSetpoint objects and Logs will be generated for these points.

GcmName Setpoints - Dpt.xls

A listing of all the DPT blocks in the GCM with their current and default values and formatting information. If graphics pages are generated, SwBinarySetpoint objects and Logs will be generated for these points.

GcmName Block Report (Full).xls

A listing of every block and attribute in the GCM and an indication of how it was converted into the UNC. Any exceptions will be noted here.

GcmName Block Report (Exceptions).xls

A listing of every block and in the GCM and any attributes that generated an exception.

Gcm Exception Report(Aggregate).xls

A listing of every block attribute amongst all the GCMs that generated an exception.

Signal Files

Proof Sheets.pdf

Contains images of the screens with the block numbers for points indicated. Use this as a cross reference with the generated Signal Block and Point Exception reports..

Signal Monitor Screens Report.xls

A listing of all the Signal Monitor Screens that were generated as GxPages in the conversion.

Signal Gcm Input Override Setpoints.xls

A listing of all the Signal points that are linked to an Input Attribute of a GCM block, and therefore create an overridable setpoint on the screen and in the UNC.

Signal Gcm Parameter Setpoints.xls

A listing of all the Signal points that are linked to a Parameter of a GCM block, and therefore create an overridable setpoint on the screen and in the UNC.

Signal Gcm Output Overrides Setpoints.xls

A listing of all the Signal points that were explicitly marked as an overridable output value, and therefore creates an overridable setpoint on the screen and in the UNC.

Signal LCM Point Report.xls

A listing of all the Signal points that are linked to LCM points, which are created in the UNC station as LCM Serial Integration objects.

Signal Block Report (Full).xls, Signal Block Report (Exceptions).xls

A listing of all the Signal blocks (including, but not limited to points) that were found on the Monitor Screens, along with details about how they were generated and if there were exceptions.

Signal Point Report (Full).xls, Signal Point Report (Exceptions).xls

A listing of all the Signal points that were found on the Monitor Screens, along with details about how they were generated and if there were exceptions.

Differences between the Original and Generated Systems

There are some intentional differences between the original GCM and Signal systems and the generated UNC and Enterprise Server stations.

Naming Conventions

The names of the generated objects in Niagara (e.g., Device Shadow Objects, logic blocks, schedules, etc.) are usually related to the GCM or Signal block to which they are related. However, the GCM systems allowed special characters (such as dash, slash and pound sign) and lets block names begin with a number, whereas Niagara allows only letters, numbers and an underscore, and must begin with a letter.

Therefore, you will may see names such as

131-VAV

Converted to

X_131_VAV

OSS Blocks

For the moment, OSS blocks in a GCM are converted to an OSSX block in the UNC. The OSSX block has the same inputs and outputs as an OSS, but does not implement any optimizing algorithm for starting and stopping. Instead, it is linked to a Niagara schedule object and all the outputs go on and off in conjunction with the scheduled times. The Force Value (FOVAL) inputs are also functional.

A true OSS block is available but has not been fully tested.

TREND Blocks

A TREND block is created to gather the values that feed the trends, but the actual logs that collect the records are created in a separate container (in the UNC station), configured according to the TREND block parameters and then linked to the TREND block.

The four column report for the TREND block is not available directly, but would need to be recreated from the individual logs.

You can optionally disable the creation of the TREND blocks and logs.

Common Exceptions

There are some exceptions that are more common than others. The exceptions are noted in the Gcm and Signal Exception Report spreadsheets. Here are some examples:

Common GCM Exceptions

Invalid Data Type

There may be block attributes that couldn't be linked because "The destination attribute doesn't exist". The note will usually include a reason why the pointer was bad, such as:

- It’s a pointer to "ZONE2:MZ5:UIDV3" but "ZONE2:MZ5 has TYUI3 = ANALOG"
- It’s a pointer to "RLCM:EMERG:DV" but "RLCM:EMERG has DATYP = ANALOG VALUE"

Common Signal Exceptions

Links to Calendar Date and Time Parameters

There may be screens that included links to the day/time parameters of the scheduling blocks (OSS, CALEN, WEEK, HOLI, etc.). Since the schedule features of these blocks were replaced by links to actual Niagara schedules and calendars, in general these screens should be removed or restructured and replaced by links to the schedule objects so the user can user the Niagara Schedule Editor directly.

Execute Program Links

There may be screens that used "Execute Program" links to run Windows programs, such as "write.exe" (used to display a document or text file). These actions were not implemented.

Invalid Point or Missing Point Descriptor

There may be Signal Points that weren't linked for various reasons (bad attribute, attribute without a Niagara equivalent, point descriptor wasn't found, etc.).