N1 Migration with the NIE Technical Bulletin

MS-NIE55xx-x, MS-NxE85SW-0 MS-NIE8500-x

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Refer to the QuickLIT website for the most up-to-date version of this document.

Johnson Controls

Document Introduction

This document describes the concepts and procedures used to perform an N1 Migration with a Network Integration Engine (NIE). An N1 Migration allows you to support N1 Networks in the Metasys® system.

This document contains three appendixes:

- Object Mapping Tables: This provides reference tables for how to map N1 object attributes, commands, and point features to the Metasys system. See *Appendix: Object Mapping Tables*.
- Metasys N1 Network to Metasys System Feature Comparison: This provides a comparison of features in Metasys N1 Networks and the Metasys system. See *Appendix: Metasys N1 Network to Metasys System Feature Comparison*.
- Command Priorities for NCM and NIE: This provides information on command priorities for the NIE and Network Communication Module (NCM) objects. See *Appendix: Command Priorities for NCM and NIE*.

Note: This document does not describe how to install, configure, or update an NIE.

Note: The NIE55 (but not the NIE85) can be configured as a validated device for Metasys for Validated Environments (MVE), allowing existing NCM/M Series validated sites to be migrated to Metasys system. See *Table 1* for related MVE documentation.

Related Documentation

See *Table 1* for information related to the migrating N1 Networks.

Table 1: Related Documentation

For Information On	Refer to	LIT or Part Number
Understanding Metasys System	*Metasys System Configuration Guide*	*LIT-1201832*
Using the System Configuration Tool (SCT)	*Metasys SCT Help*	*LIT-12011964*
Installing an NIE	*NAE55/NIE55 Installation Instructions*	*Part No. 24-10051-43*
Configuring an NIE55	*NAE Commissioning Guide*	*LIT-1201519*
Configuring an NIE85	*NxE85 Commissioning Guide*	*LIT-12011044*
Configuring an NIE55 as an MVE Engine	*Metasys for Validated Environments, Extended Architecture Technical Bulletin*	*LIT-12011327*
Verifying Hardware and Software Requirements for MVE	*Metasys System for Validated Environments (MVE) Platform Requirements Technical Bulletin*	*Part No.24-9693-193*
Installing and Upgrading MVE Software	*MVE Software* section of the *ADS, ADX, and SCT Installation and Upgrade Instructions Wizard Content*	*LIT-12011331*
Performing a Global Upload and a Network Controller (NC) Upload for All Network Control Modules (NCMs) in the Metasys Network	*Uploading and Downloading Databases* chapter of the *Operator Workstation User's Manual*	*LIT-120155*
Using UNDDL	*Decompiler* section of the *DDL Programmer's Manual*	*LIT-630050*
Backing Up the Metasys Network	*Saving and Restoring Databases* chapter in the *Operator Workstation User's Manual*	*LIT-120157*
Adding a Personal Computer Device to a Metasys Network	*Defining Devices* chapter in the *Operator Workstation User's Manual*	*LIT-120145*
Defining Report Destination in a Metasys Network	*Defining Report/Access Groups* chapter in the *Operator Workstation User's Manual*	*LIT-120151*
Using the Metasys System	*Metasys SMP Help*	*LIT-1201793*[1]
	Metasys SCT Help	*LIT-12011964*

Table 1: Related Documentation

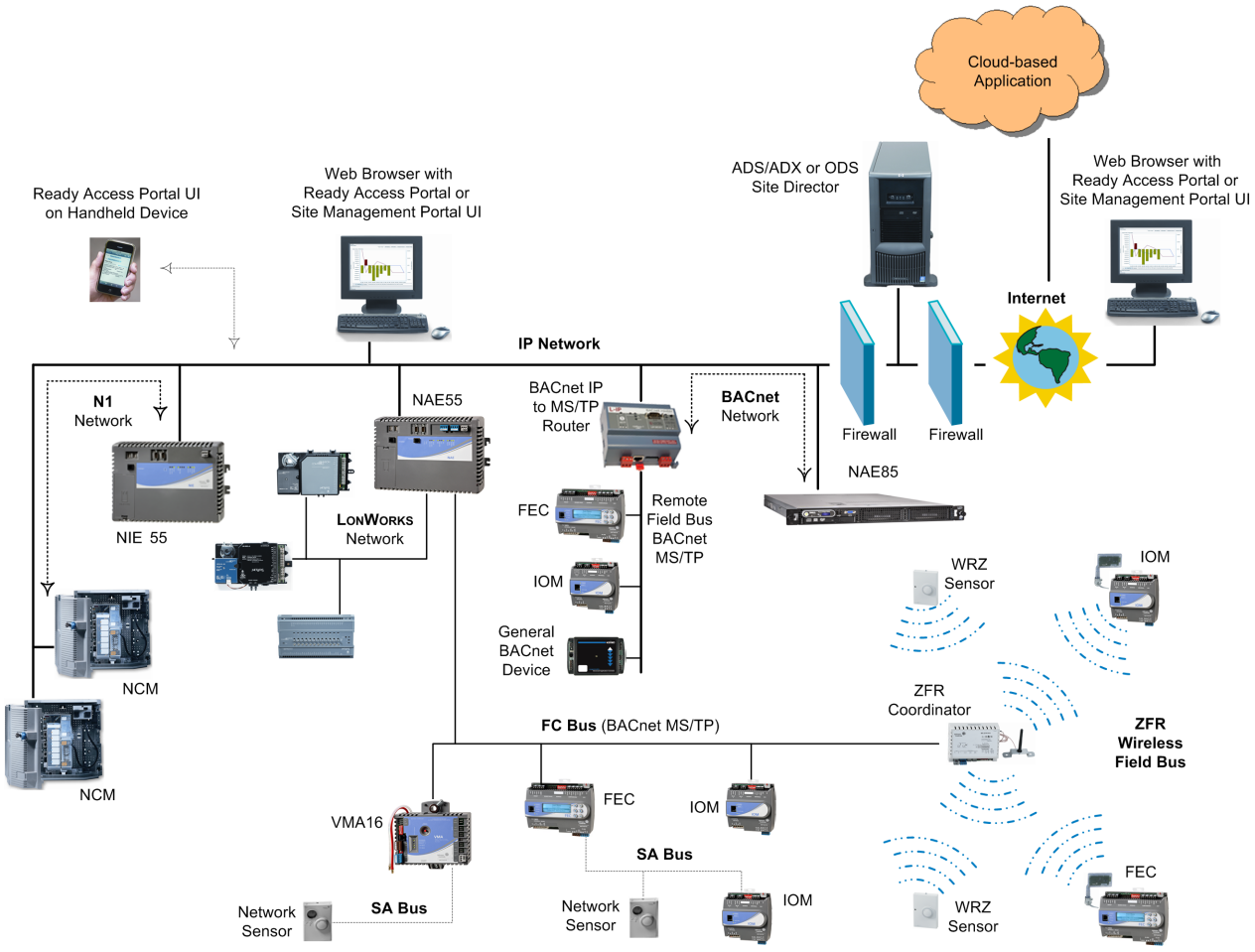
For Information On	Refer to	LIT or Part Number
Using the Network Map	*Using the Network Map* chapter in the *Operator Workstation User's Manual*	*LIT-120166*
Setting Security Features, Archiving NIE Configuration Files Adding Users and Roles to the System	*Security Administrator System Technical Bulletin*	*LIT-1201528*

1 This LIT number represents a print-friendly version of the Help.

N1 Migration Overview

The N1 Migration feature allows the Metasys system UI and applications to act on an N1 Network. Define each N1 Network as an N1 Migration object in the NIE. One or more NCMs in the N1 Network are defined as mapped devices under the N1 Migration object.

Figure 1: NIE in Metasys Network



Note: The NIE55 (but not the NIE85) can be configured as a validated device for MVE. Validated and non-validated devices can be combined on the same Metasys network. See *Table 1* for related MVE documentation.

N1 Migration Flowchart

The N1 Migration Flowchart (*Figure 2* and *Figure 3*) describes the sequence of steps necessary to successfully migrate an N1 Network into the Metasys system using an NIE. These steps allow you to configure and prepare the N1 Network, import the N1 objects either via Auto Discovery or using the N1 Migration Tool, and migrate the N1 Network features, including Schedules, Calendars, Alarm, Point, Trend, and Totalization configurations.

Figure 2: N1 Migration Flow Chart (Part 1 of 2)

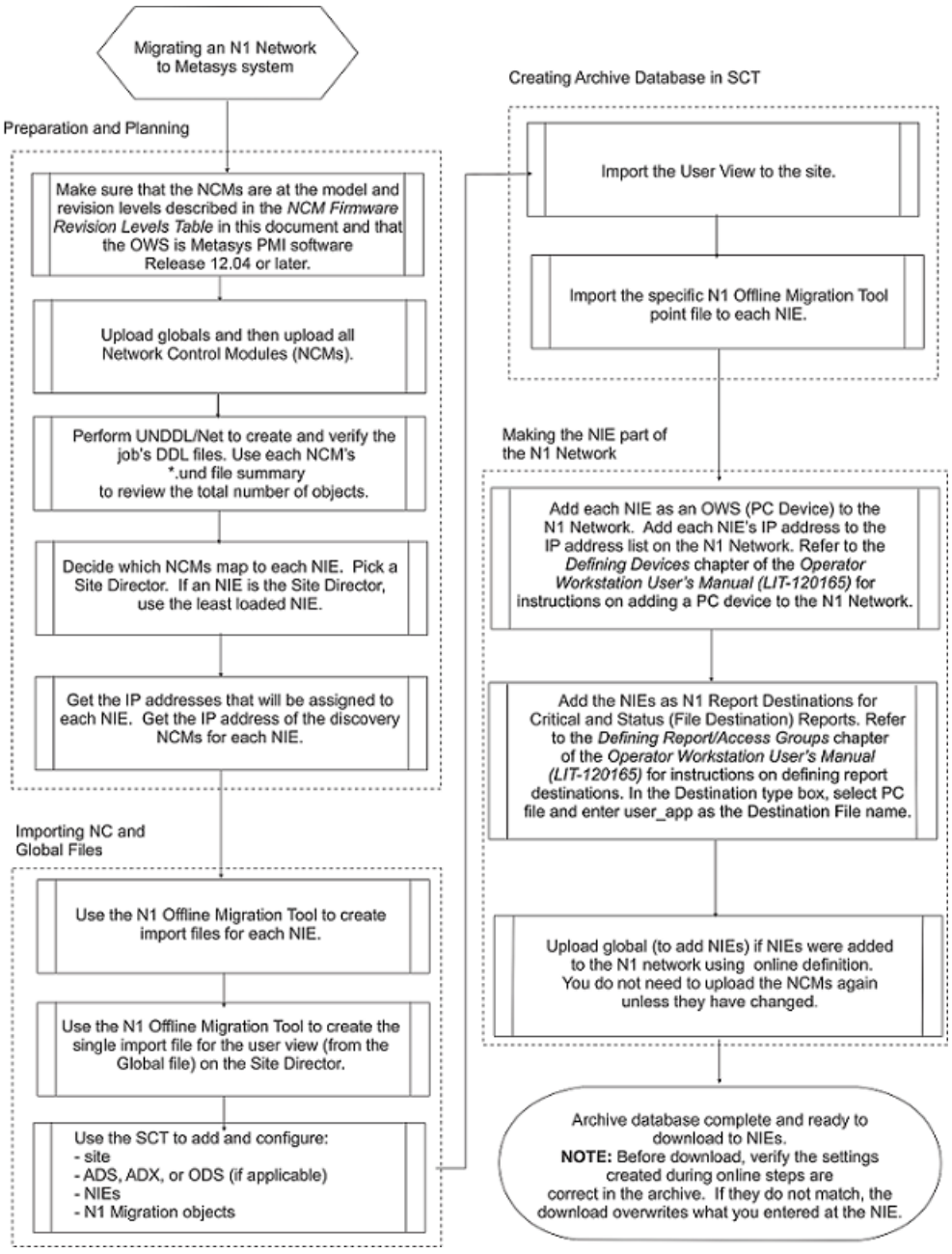
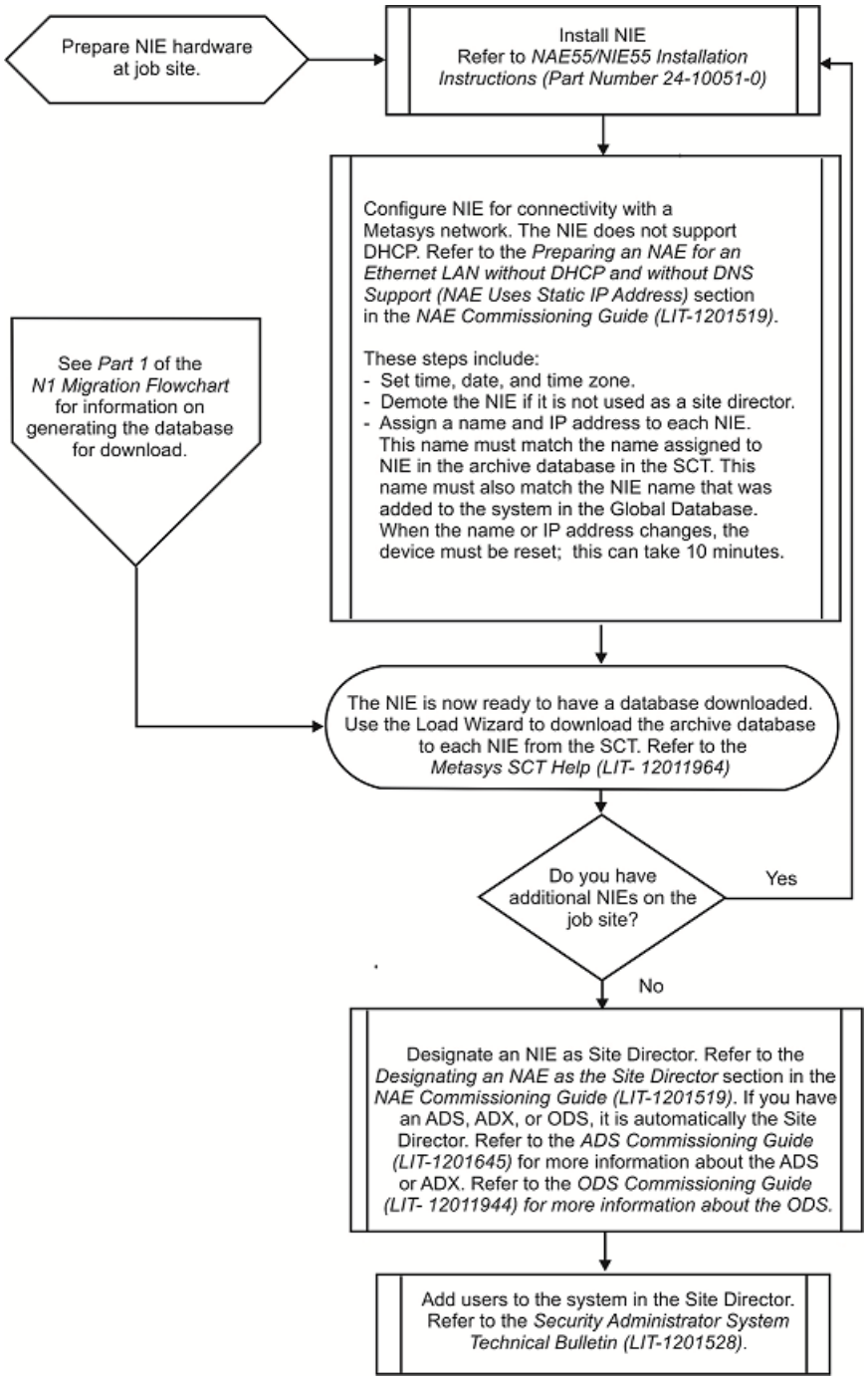


Figure 3: N1 Migration Flowchart (Part 2 of 2)



N1 Migration Flowchart for MVE

The N1 Migration Flowchart for MVE (*Figure 4* and *Figure 5*) describes the sequence of steps necessary to successfully migrate an N1 Network into the Metasys system using an NIE55 as a validated device. These steps allow you to configure and prepare the MVE parameters on the N1 Network, import the N1 objects either via Auto Discovery or using the N1 Migration Tool, and migrate the N1 Network features, including Schedules, Calendars, Alarm (including pre-alarm), Point, Trend, and Totalization configurations.

Figure 4: N1 Migration Flow Chart for MVE (Part 1 of 2)

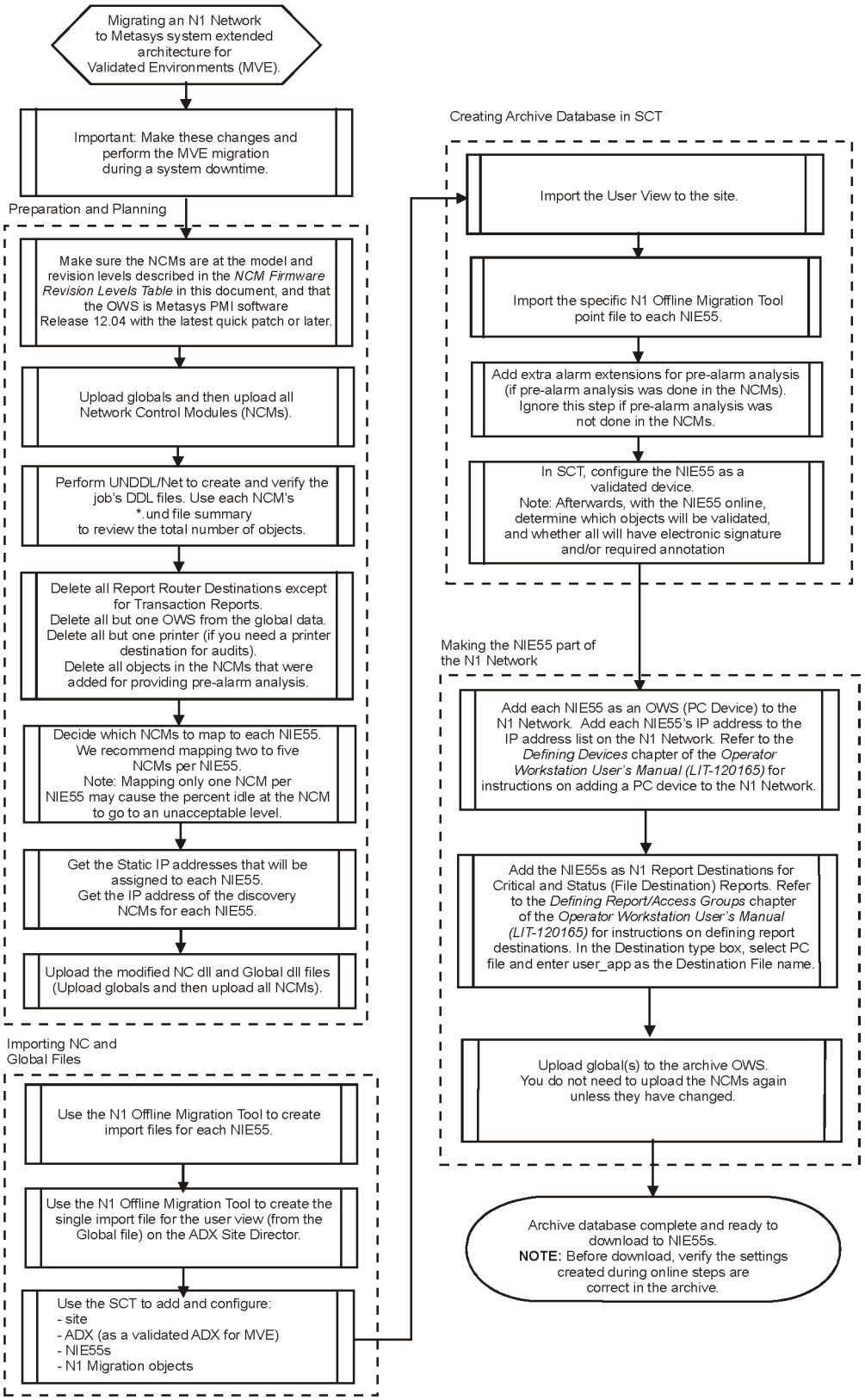
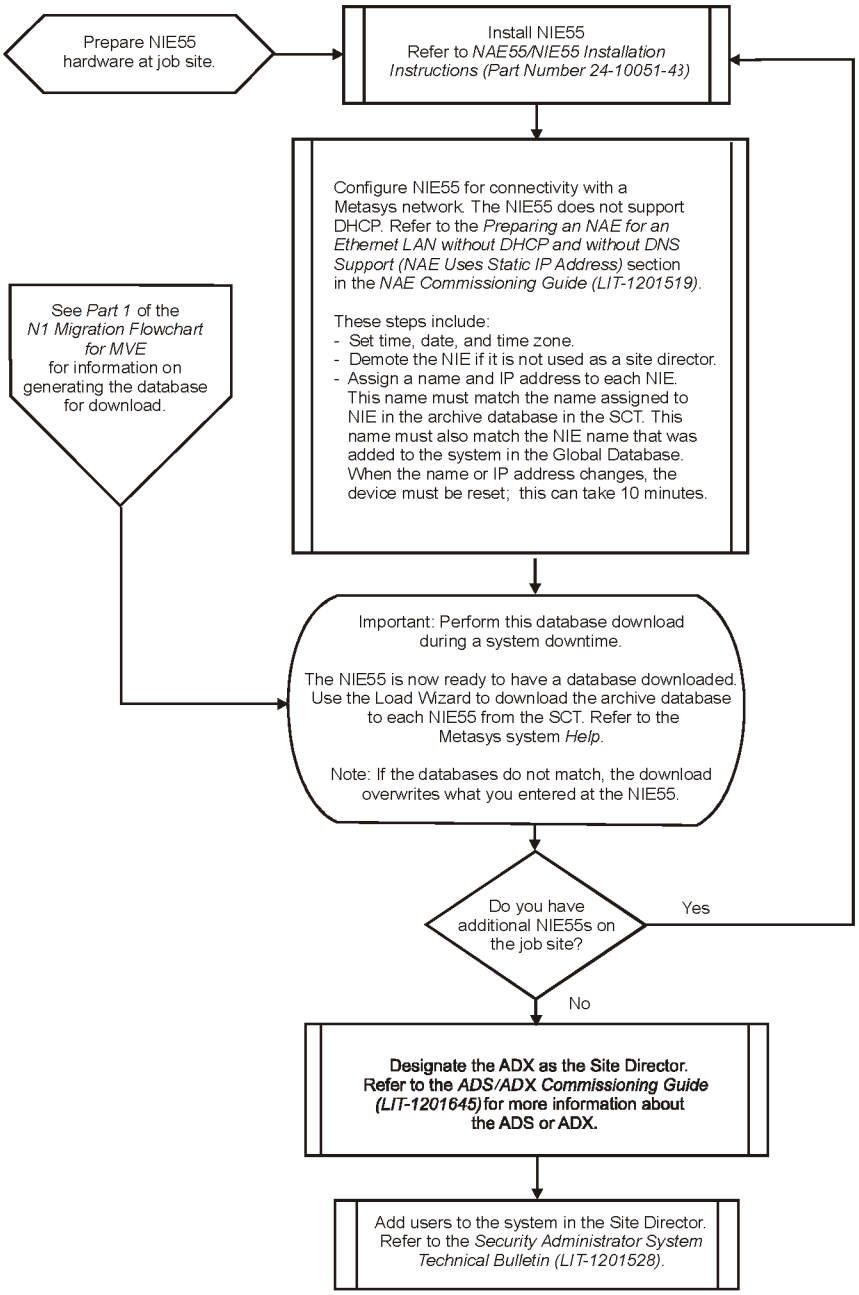


Figure 5: N1 Migration Flowchart for MVE (Part 2 of 2)



Note: The NAE45 is supported as a validated device at Release 6.0.

Related Concepts

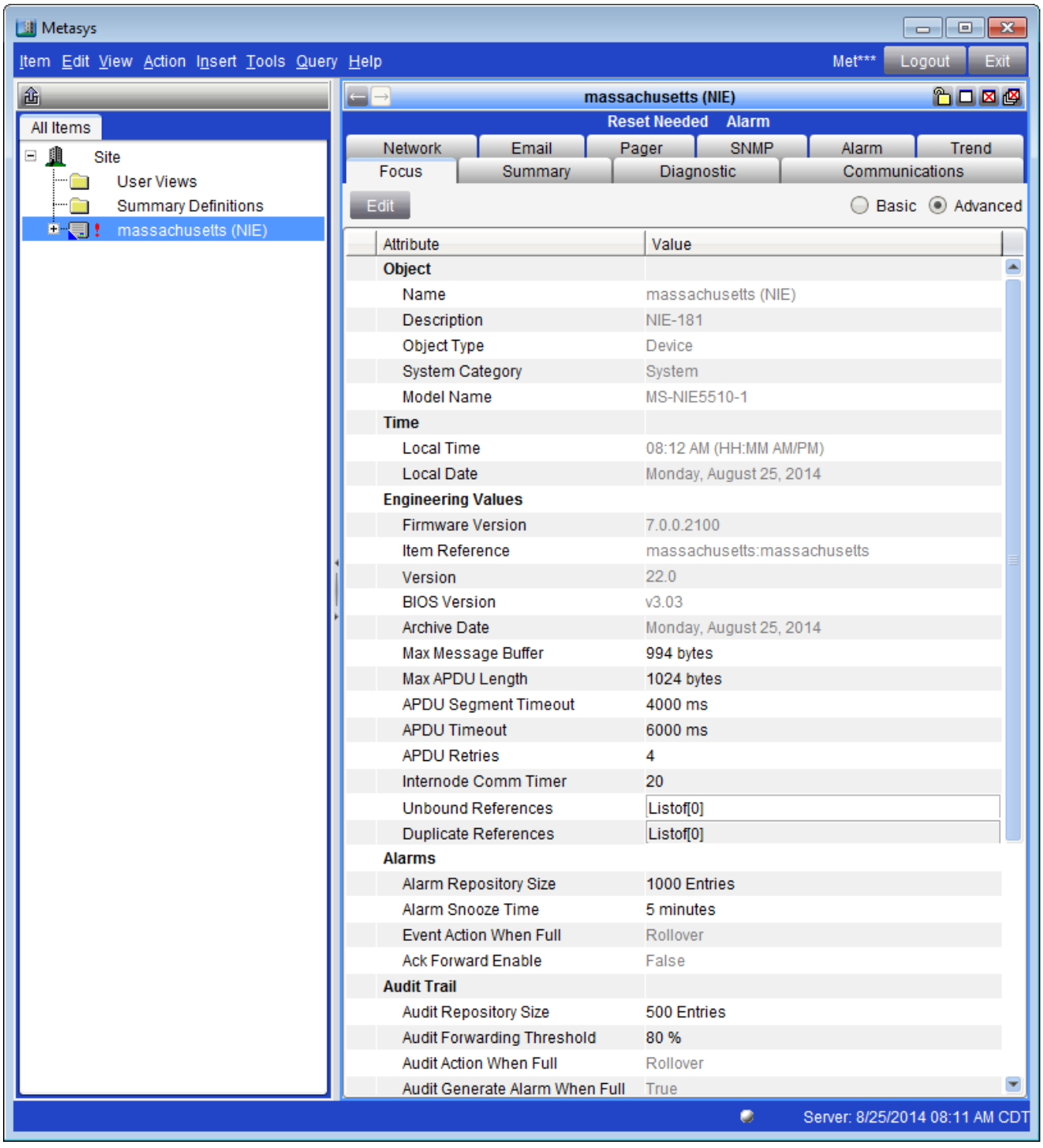
Metasys N1 Network

A Metasys N1 Network is a set of Network Control Modules (NCMs) and operator workstations (OWSs) configured to communicate as a single control system on a network. The N1 devices within one logical N1 Network cannot communicate with other logical N1 Networks.

Network Integration Engine (NIE)

The NIE is a web-enabled supervisory controller for integration of N1 Networks into the Metasys system. The NIE supports the same object set as the NAE; however, the NIE does not support field busses, specifically no N2 bus support, no BACnet® Master-Slave/Token-Passing (MS/TP) bus support, and no LonWorks® network integration. The NIE UI is similar to the NAE UI (*Figure 6*).

Figure 6: NIE User Interface in Focus View



Default NIE Configuration

Table 2 lists the NIE factory-default configuration.

Table 2: NIE Default Configuration

Field	Value
NIE55 Device Name	NIExxxxxxxxxxxx, where xxxxxxxxxxxx is the Ethernet MAC address of the device in hexadecimal. For example, if the Ethernet MAC address is 00-80-66-05-0f-fc, the device name is NIE008066050FFC.
DHCP Client	Enabled by default. However, Dynamic Host Configuration Protocol (DHCP) must be disabled for communicating to the N1 Network. N1 Networks do not support DHCP.
NIE55 Serial Port One	115,200 baud, 8 bits, no parity, 1 stop bit (115200,8,n,1), Direct Connect IP over Point-to-Point Protocol (PPP).
NIE55 Serial Port Two	8 bits, no parity, 1 stop bit (9600,8,n,1)
Site Director	The NIE is a Site Director by default. That is, it contains a Site Object. If it should not be a site director, it must be demoted and the host name or IP address of the Site Director specified.
Default NIE UI Login	MetasysSysAgent
Default NIE UI password. The NIE password is case sensitive.	[default password]

Network Automation Engine (NAE)

The NAE, an Ethernet-based supervisory controller, provides features including alarm and event management, trending, archiving, energy management, data exchange, scheduling, dial features, and password protection through the web browser user interface.

Network Control Module (NCM)

The NCM coordinates and supervises the control activities for all objects and control loops connected to it via Network Expansion Units (NEUs) and Application Specific Controllers (ASCs).

Note: All NCM types are supported by the NIE. The minimum NCM firmware revision levels are listed in *Table 3*. All supported NCM models require Metasys person-machine interface (PMI) software Release 12.04 or later.

Note: The NIE55 supports NCM45 **10**-2s (N2) and NCM45 **20**-2s (LON), but the NIE55 as a validated device supports the NCM45 **10**-2s (N2) only.

Note: All NCM models must be networked to the NIE using Ethernet/IP protocols. ARCNET® based NCM models require use of Metasys Embedded Ethernet Router.

Table 3: NCM Firmware Revision Levels [1]

NCM Model	Firmware Revision Level
NCM 100	3.06
NCM 200	5.01
NCM 300	6.02
NCM 350	8.02
NCM 4500	Not applicable.

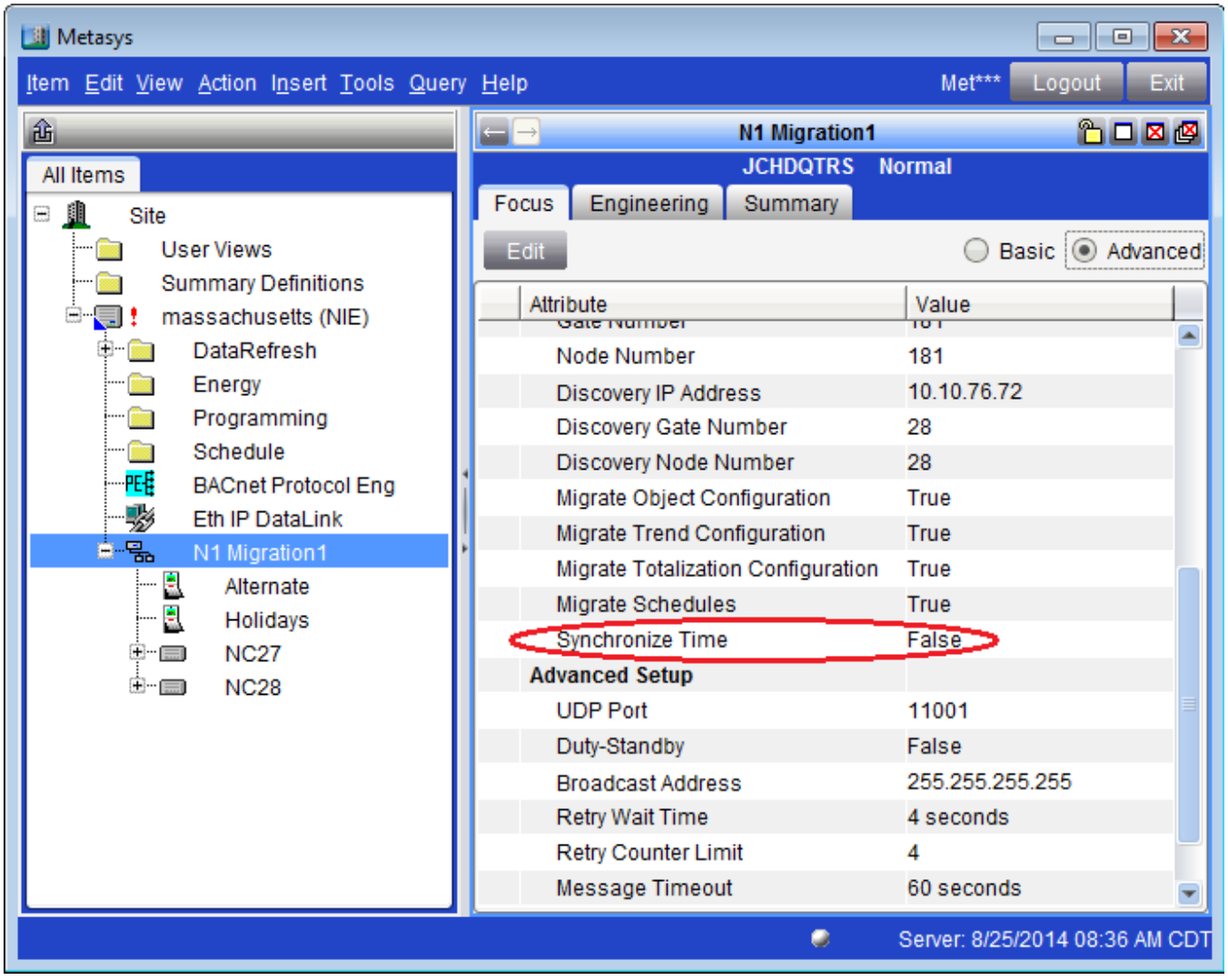
1 NCM upgrades are available through the Johnson Controls® Product Repair Center. To upgrade an NCM to the appropriate revision level, contact your local Johnson Controls branch office.

N1 Migration Object

The N1 Migration object (*Figure 7*) defines the N1 Network in the Metasys system. Use the Insert Integration Wizard in the Action menu to configure the N1 Migration object. The Synchronize Time attribute in the N1 Migration object allows you to define whether the NIE provides time synchronization to the integrated N1 Network.

Note: We recommend you leave the Synchronize Time attribute set to **False** (off) for all MVE installations.

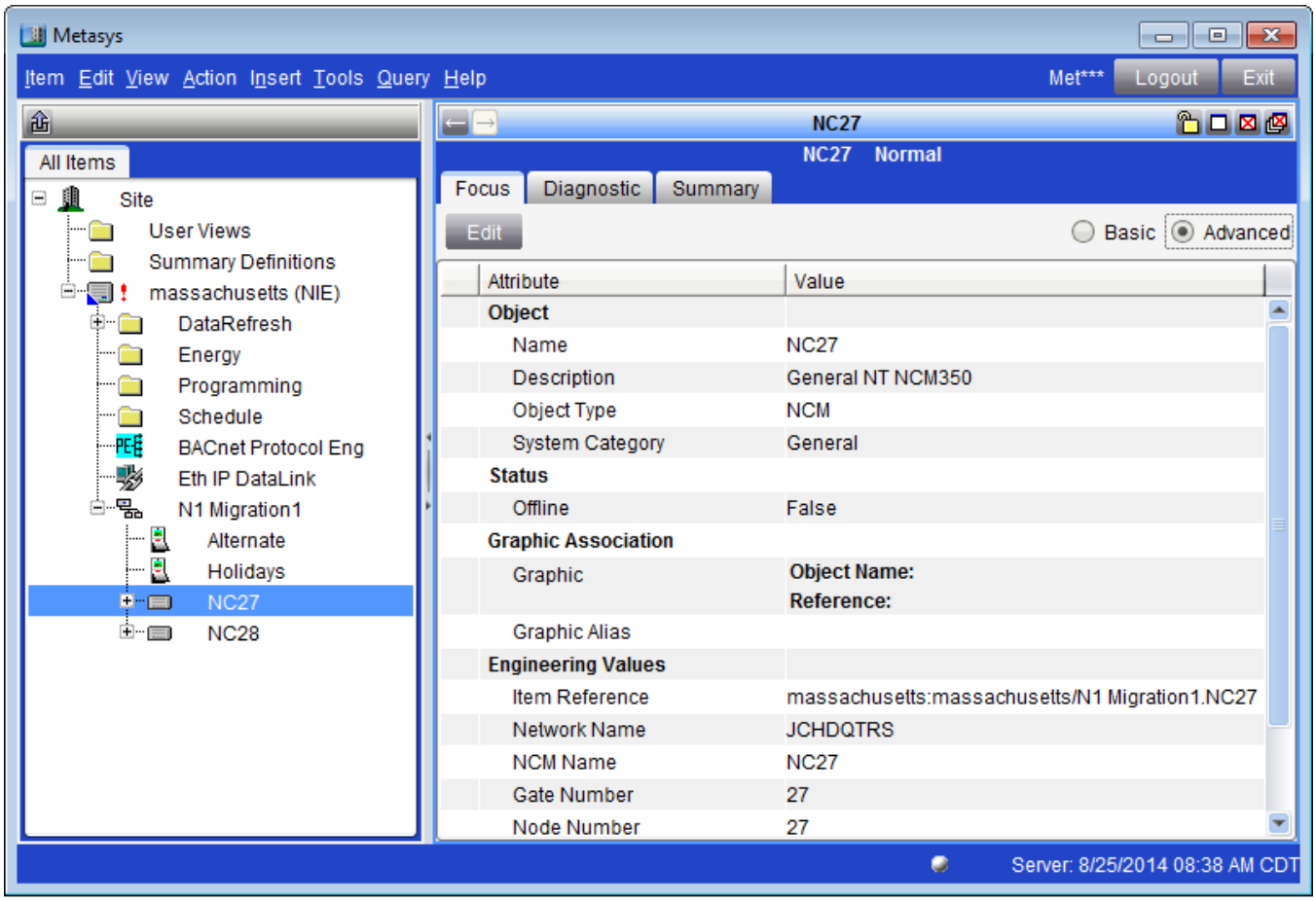
Figure 7: N1 Migration Object



NCM Object

The NCM object (*Figure 8*) represents one NCM in the Metasys system. All mapped objects within the NCM are under the NCM object. The NCM objects in the NIE are grouped underneath the N1 Migration object.

Figure 8: NCM Object



Auto Discovery

Auto Discovery, an online process, detects devices on a network or objects within a device on the network.

Note: Be aware that the Auto Discovery process degrades the performance of applications running at the NCM (such as Trend), as well as any client applications (such as an OWS), which are collecting data.

Applying the Auto Discovery process at the N1 Migration object allows the NIE to discover from the N1 Network. All objects within an NCM can also be discovered. Use the lists of discovered objects to insert Field Devices (NCM objects) and Field Points:

- accumulator (ACM)
- Active Interconnect (AI)
- analog output (AO)
- analog data (AD)
- binary input (BI)
- binary output (BO)
- binary data (BD)
- Metasys System Integrator (MSI)
- Multistate Output (MSO)

- message storage device (MSD)
- Control System (CS) Objects
- Multiple Command (MC) Objects
- PID Loop (PIDL)

The listed objects can then be mapped partially or completely into the NIE.

The discovered list populates the engineering view. Use Auto Discovery to refresh the discovered list of N1 devices and N1 objects at any time to ensure that the list is current.

Auto Discovery does not replicate N1 PC Groups seen in the PMI Network Map. Instead, objects appear in the order they are received by the NIE from the NCMs; therefore, running Auto Discovery twice can yield two different views for the same set of NCM data.

N1 Migration Tool

The N1 Migration Tool, a stand-alone utility, allows you to create a Metasys system point definition file from selected N1 data definition language (DDL) files. Use the Import Wizard to import the point definition file into the Metasys system.

The data imported by the N1 Migration Tool represents the state of the N1 Network at the time when the point definition file was created.

The N1 Migration Tool also allows you to create a Metasys user view file from the global DDL file. Broken references can occur if an NCM is assigned to the wrong NIE when the import file is generated. You must manually update references to the correct NIEs. See *Importing N1 Objects Using the N1 Migration Tool* and *Editing a User View to Show Points from NCMs Spanning Multiple NIEs* for more information.

File Parsing

The N1 Migration Tool parses global files and Network Controller (NC) DDL files from the N1 Network to import them into the Metasys system. File parsing breaks a file down into parts that a program can understand. In this case, the tool breaks down the global and NC DDL files into parts that the SCT can analyze and understand in terms of the Metasys system.

System Configuration Tool (SCT)

The SCT assists in all phases of engineering, installing, and commissioning of the Metasys system devices. The SCT, an offline tool, creates NIE and NAE archive databases that can be downloaded to the Metasys system devices. The SCT uses the same UI as the NAE/NIE and the Application and Data Server (ADS) or Extended Application and Data Server (ADX). Use the SCT offline to define the Site Director.

Note: An ADS or ADX is automatically added as a Site Director. When you add more than one ADS, the second is added as a child of the Site Director. Only one Site Director can exist on a site.

You can upload device databases modified in the Metasys system to the SCT for archiving or editing. The SCT includes features to enable the synchronization of the archived and online databases.

Browser Recommendations

Always open a new browser window to access the Metasys Site Management Portal UI. Do not use the Metasys UI browser window to navigate to any other website. If you access a website that requires a Java® plug-in, configuration and runtime problems may arise.

Launching the Windows® Internet Explorer® (version 8, 9, 10, or 11) or Apple® Safari® (version 6.0.5 or 7.0) web browser from a shortcut on the desktop or typing a URL in the address field of the taskbar may replace the Metasys system application if Internet Explorer is configured to reuse windows when launching shortcuts.

Note: Other browsers, such as Google® Chrome® and Mozilla® Firefox®, may also be used but are not fully supported.

Metasys System Help

The Metasys Help files provide shared system information and individualized mode-dependent information for the Metasys Site Management Portal (SMP) or the System Configuration Tool (SCT). The *Metasys SMP Help (LIT-1201973)* provides information about alarming, commanding, auditing live data values, and other online features. The *Metasys SCT Help (LIT-12011964)* provides information about offline operations such as managing archives, creating spaces, simulating systems, and establishing equipment and serving relationships.

In either SMP or SCT mode, the Metasys system Help menus provide Help files in PDF format. Refer to the QuickLIT website for the most up-to-date version of the Metasys Help files.

Data Definition Language (DDL)

DDL, a configuration language, defines the N1 Network and generates NCM databases. The N1 Migration Tool uses the global and Network Control (NC) DDL files to generate the files imported into the N1 Migration object.

Important: NIEs must reside at a higher node address on the N1 network than all NCMs and OWSs.

Global File

All NCMs and OWSs on a Metasys N1 Network share the global file. The global file includes data such as system names, access or report groups, and N1 nodes. The global file contains all the data necessary to generate the system map relationship defined in the PC Groups. Only one global file exists for each network defined in an OWS; therefore, when migrating an N1 Network to an NIE, only one global file may be imported per network.

If you are importing NCMs to multiple NIEs and want them to appear in a single user view, manually edit the references for all the NCMs that are not under the Site Director.

NC File

The NC file contains a database of hardware and software objects for a particular NCM. Each NCM device on the N1 Network has one NC file. You can import the DDL files for a particular N1 Network, or a subset of the NCMs on the N1 Network, down to the NCM level.

The NC file defines a unique NC database that resides in each NCM, corresponding to the archive database held in the OWS. To get the latest NC file, upload the NCM database to the archive OWS and perform the UNDDL process.

An archive OWS can hold multiple NCM databases; however, more than one archive OWS may be defined on the N1 Network. If more than one archive OWS exists, perform the UNDDL process on all archive OWSs.

Import Wizard

The Import Wizard guides you through the process to import a point definition file from a LonWorks network or a Metasys N1 Network. The Import Wizard creates points using the files created by the N1 Migration Tool and stores them in either an archive database (if you are offline in the SCT) or directly in an NIE's database (if you are online with an NIE). You can only import the user view online to an NIE or ADS/ADX that is a Site Director; however, you can import the point definition files generated by the N1 Migration Tool to any NIE.

Global Download or Upload

Global download or upload is the process of copying the global databases from the archive to the online database (download) or from the online database to the archive (upload) in an OWS.

Archive Database

An archive database is the offline copy of a database, usually preserved to allow recovery from a catastrophic failure of a network device or to allow database modification without disturbing a working system.

In a Metasys N1 Network, archive databases are stored at the OWS. In a Metasys system network, archive databases are SQL databases stored on the SCT Configuration Server.

Database Generation

The N1 Migration uses existing Metasys system Wizards to generate the N1 Mapped database. The three modes of N1 Migration are as follows:

- online with the NIE using Auto Discovery
- online with the NIE using the Import Wizard
- offline with the SCT using the Import Wizard

When generating the database from the NIE, the Object Creation Wizards (Insert-Integration, Insert-Field Device, and Insert-Field Point) are used in conjunction with Auto Discovery or the Import Wizard. When generating the database from the SCT, the Import Wizard creates the N1 mapped points directly into the NIE's archive database.

Online Database Generation

Online generation occurs at the NIE and operates against all the devices defined on the site. Add the N1 Migration, NCM, and mapped point objects under one or more NIEs. See *Generating an NIE Database Online Using Wizards*. The process is similar to the N2, BACnet®, and LonWorks integrations. Online generation uses the existing Metasys system Object Creation Wizards (Insert-Integration, Insert-Field Device, and Insert-Field Point) to create the database. You can also import the files that are generated by the N1 Migration Tool by right-clicking the N1 Migration object and selecting Import Integration from the menu that appears.

Offline Database Generation

Offline database generation occurs at the SCT and requires importing an XML file generated by the N1 Migration Tool. The XML files generated by the N1 Migration Tool have an .imp extension. The files for points are separate from the file for the user view. The .imp file is imported by the Metasys system Import Wizard in the SCT's UI. The Import Wizard reads the file and creates a new Metasys system point for every point definition found in the file. The newly created points are created in the active archive database on the SCT.

Mapped Objects

Mapped objects consist of mapped devices and mapped points. A mapped device shows an object exists in the NIE database that reflects an actual device in the N1 Network. The only devices mapped from the N1 Network are NCMs.

A number of N1 point objects are defined as Metasys mapped points under the NCM object. A mapped point reflects that an object exists in the NIE database that reflects the current state of the same point in an actual device on the N1 Network. *Table 4* describes the available point object mapping.

Table 4: N1 Object Mapping

N1 Network Point Object	Maps as the Following Metasys System Object
ACM	N1 PC
AI	AI
AO	AO
AD	AO
BI	BI
BO	BO

Table 4: N1 Object Mapping

N1 Network Point Object	Maps as the Following Metasys System Object
BD	BO
MSI	MI
MSO	MO
MSD	MO
CS	GIO
MC	MO
PIDL	N1 PID Loop

Important: To avoid a potential NIE crash when mapping CS objects as GIO objects using the Auto Discovery wizard on the NIE, wait 20 minutes before viewing the newly mapped GIO objects.

Mapped Names

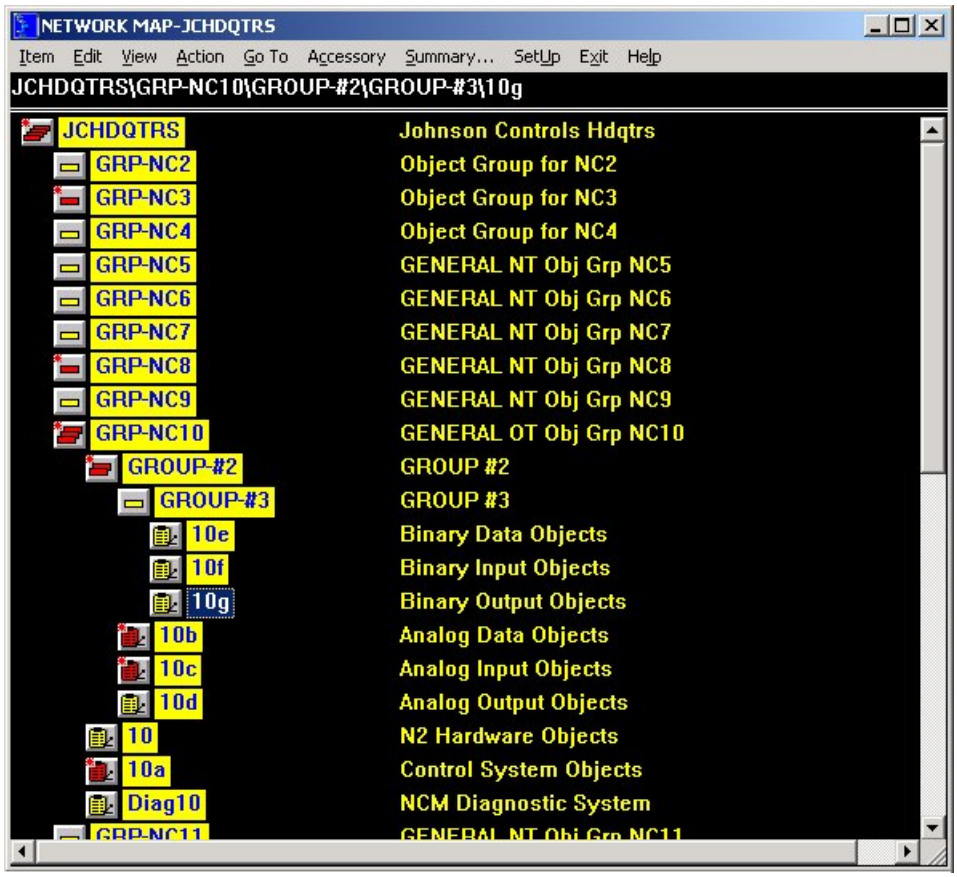
The mapped names are the names objects have in the Metasys N1 Network. The N1 integration software uses this value to locate and communicate with the Metasys N1 Network object. The Migration server rebinds to this name every time it restarts. If the name changes in the N1 Network, the Metasys system object goes offline. The mapped names are in the form **systemname.objectname**.

Network Map

A Metasys N1 Network consists of at least one NCM, all the devices connected to this NCM, and all the hardware and software objects associated with these devices. The Network Map (*Figure 9*) displays the organization of the most recently activated network. The Network Map:

- displays the network, PC group, system, device, and PC file
- provides quick access to summary information within facilities

Figure 9: N1 Network Map



Migrating N1 Features

When one of the objects in *Table 4* is added to a database, the N1 Migration server can optionally migrate the following features:

- Point Configuration
- Trend Configuration
- Totalization
- Point History
- Alarm Configuration
- Schedules
- Calendars

Table 5: Feature Migration Determination

N1 Migration Object Attribute	If Set to True, Results in
Migrate Trend Config	any trends and point history defined for points in the N1 Network are added as extensions to the corresponding objects in the Metasys system
Migrate Totalization Config	any totalizations defined for points in the N1 Network are added as extensions to the corresponding objects in the Metasys system
Migrate Object Config	if any Metasys N1 Network object is mapped to a Metasys system object, the basic object configuration from the Metasys N1 Network is used to write the basic Metasys system object configuration, such as the description and units. Also, when Migrate Object Config is set to True, any alarms defined for points in the N1 Network are added as extensions to the corresponding objects in the Metasys system.
Migrate Schedules	any schedules defined for points in the N1 Network are added as described in the *Schedule Migration* section in this document

Calendar Migration

The Metasys system reads the Metasys N1 Network calendar to generate two calendar objects.

The Metasys N1 Network calendar lists alternate and holiday dates for a year, starting with the current system month. For example, if the current month is September 2013, the calendar contains entries from September 1, 2013, until August 31, 2014.

The Metasys system calendars are created under the N1 Migration object and named **Alternate** and **Holidays**. These calendars contain the following:

- Alternate - Contains all days marked as Alternate days in the selected Metasys N1 Network calendar.
- Holiday - Contains all days marked as Holiday days in the selected Metasys N1 Network calendar.

When a change is made in a Metasys N1 Network calendar, the corresponding calendars in the Metasys system are updated. When a change is made in either of the Metasys system N1 calendars, the changes are written to the Metasys N1 Network calendar. If you delete either calendar, the Integration object adds it again. This feature ensures that the operator continues to have access to the Metasys N1 Network calendar. The Metasys N1 Calendar attributes are identical to the Johnson Controls Calendar object. You cannot enter dates more than one year beyond the current month.

Schedule Migration

N1 Network schedules defined in NCMs remain in the NCMs and are viewed in the NIE UI after migration. The Metasys N1 Network scheduling feature differs significantly from the Metasys system scheduling object. The major differences are:

- Metasys N1 Network schedules contain 14 days of schedules (seven regular and seven alternate), plus one holiday and infinite temporary (exception) calendar schedules. Metasys system schedules contain 7 days of schedules and 4 different mechanisms for exceptions.
- Metasys N1 Network schedules are on a single object basis. Metasys system schedules can have an infinite number of objects operated by a single schedule.

Using the previous differences, the following describes how a Metasys N1 Network schedule is migrated to a Metasys system schedule object.

Schedules are migrated only on AO objects, AD objects (mapped as a Metasys system AO), BO objects, BD objects (mapped as an Metasys system BO), MSO objects, and MSD objects (mapped as an Metasys system MSO objects). In all cases, only operational command schedules are migrated (start/stop/state0-4, adjust).

Note: The N1 exception schedule only supports the Date exception (for example, to schedule the same exception three days in a row using an N1 Exception schedule requires the use of three separate date exception entries). Date range, week day, and calendar reference exceptions are not supported.

A Metasys system schedule object is created if the Metasys N1 Network schedule contains weekly scheduling (days 1–7). It is named **weekly** and is created under the Metasys system object it is acting on; that is, the only object reference in the List of Object Property References attribute.

A Metasys system schedule object is created if the Metasys N1 Network schedule contains alternate scheduling (days 8–14). It is named **alternate** and is created under the Metasys system object on which it is acting (that is, the only object reference in the List of Object Property References attribute).

The **weekly** schedule object contains the following exceptions:

- an Alternate Calendar referenced exception with an empty timevalue/list (no operations on the exception days)
- a Holiday Calendar referenced exception with the schedules for the holiday read from the Metasys N1 Network schedule
- one or more date-based exceptions based on the temporary (calendar) schedules read from the Metasys N1 Network schedule

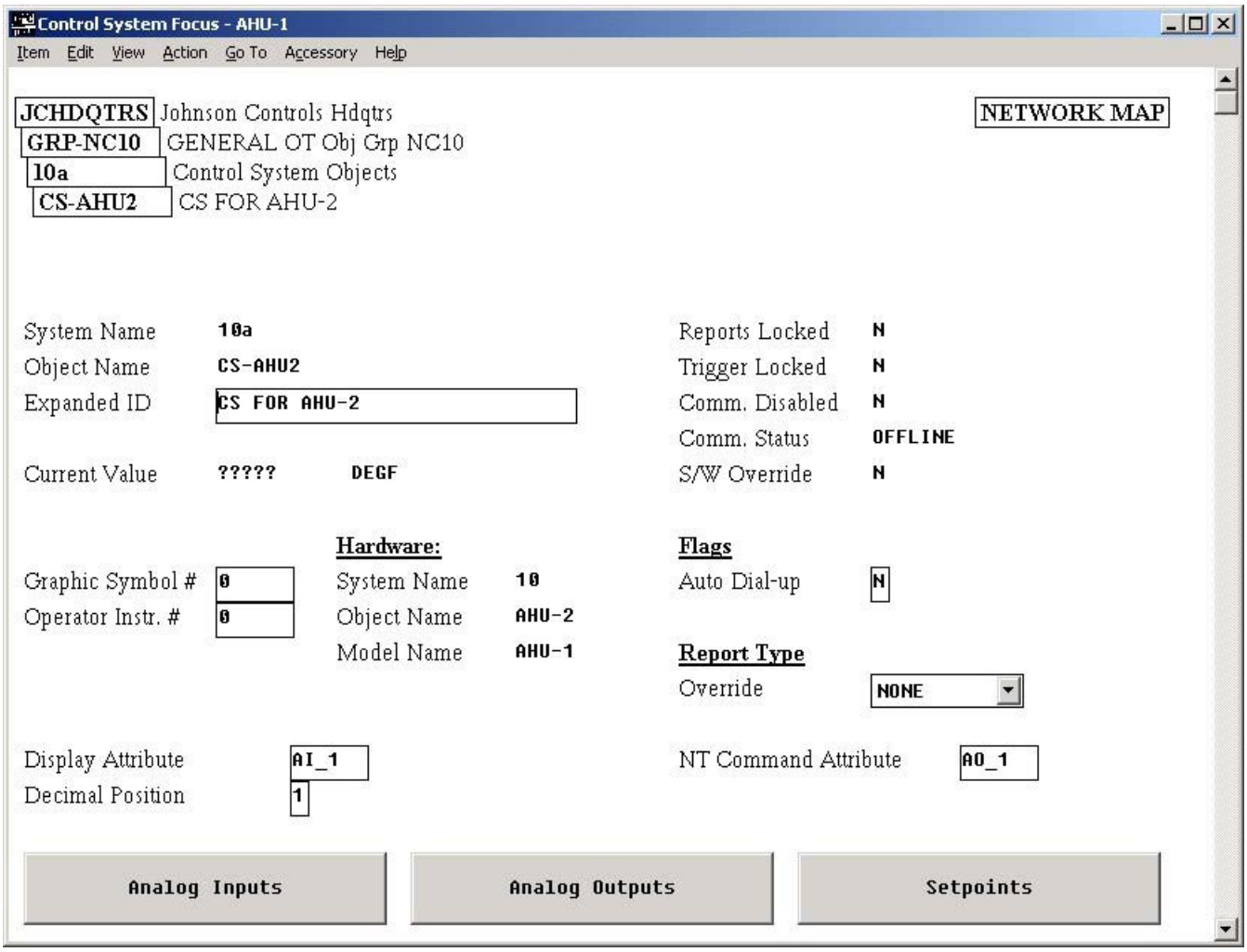
The alternate schedule object contains **no** exceptions.

The priority for writing attribute is undefined in this object because the schedule executes at the NCM.

Focus Window in N1 Network Map

Figure 10 shows an N1 Control System Focus View for comparison with the Focus View contained in the NIE.

Figure 10: N1 Control System Focus View Example



Note: The NIE uses the generic integration object (GIO) to map the N1 Control System (CS) Object. The GIO contains three categories (Input, Output, and Parameter) used to map all CS data types. Refer to the Metasys SMP Help *(LIT-1201793)* or Metasys SCT Help *(LIT-12011964)* for more information on the GIO.

N1 Migration Considerations

Consider the following when migrating to a Metasys system from a Metasys N1 Network:

General

An Ethernet connection is the only method for the NIE to connect to the N1 Network. If your N1 Network is an ARCNET® network, you must use an Ethernet router to connect the NIE.

N1 Network Setup

To set up an N1 network:

1. Perform a global upload and an NC upload for all NCMs in the network.
2. Perform an UNDDL/Net and check and fix any errors.
3. Add the NIE as an OWS (PC device) to the N1 Network.

4. Configure the NIE at a fixed IP address. N1 Networks do not support Dynamic Host Configuration Protocol (DHCP).
5. Add the NIE to all the N1 Network access report groups as a file destination for critical reports and as a file destination for status reports. Be sure to verify that reporting is configured for each object. Enable status reporting for BI, BD, MCO and MSI objects by setting the report type for each NCM object since normal status changes do not usually report to the PMI. Adding the NIE to all the N1 Network access report groups makes updating values on mapped objects faster when the NIE receives a report. In all other cases, the values are updated as the NIE periodically polls the present value for all mapped objects or polls CSG attributes on a request basis. If reports are not sent to the migration device, values for point objects are updated more slowly.

Note: The only report that the NCM issues for a BO or MSO object triggered by a command is the report for overrides.

Additional N1 Network Setup for MVE

To set up an N1 Network for MVE, perform the steps in *N1 Network Setup*, and perform these additional steps:

1. Delete all report router destinations except for transaction reports.
2. Delete all but one OWS from the global data.
3. Delete all but one printer (if you need a printer destination for audits).
4. Delete all objects in NCMs that were added for providing pre-alarm analysis (pseudo or process objects added to report alarms at various delays with escalating priorities).
5. Deselect the General Alarm Delay setting in Nonvolatile RAM (NOVRAM) for every NCM.

Integrating Larger N1 Networks with an NIE85

An NIE85 is designed to provide supervisory level (Ethernet network) control of Metasys networks that include a large number of N1 devices. The NIE85 is a high-capacity engine providing a scalable solution that can take the place of multiple NIEs. An NIE85 supports up to 10,000 objects, and with an upgrade can support up to 25,000 objects. The NIE85 is available in a 1U rack mount configuration. The following items apply when implementing the NIE85:

- NIE85 cannot be upgraded using the NAE/NIE Update Tool.
- Dial-out to an ADS/ADX is not supported.
- Limited to ten simultaneous users.

Integrating Larger N1 Networks with Multiple NIEs

An NIE55 supports approximately 5,000 points from an N1 Network. If a system contains more points, consider using an NIE85, otherwise you may need to use multiple NIEs to migrate all the points to the Metasys system network. You can split the integration of several NCMs across multiple NIEs to provide scalability of the network. The following items apply when splitting an integration across multiple NIEs:

- Only one N1 Migration object can exist per NIE.
- Multiple NIEs can reference the same N1 Network.
- We recommend mapping objects from an NCM to only one NIE. Mapping objects to more than one NIE can cause degradation in the NCM idle time.
- We recommend mapping two to five NCMs to each validated NIE55. Mapping over five NCMs adversely affects the service times for each NCM mapped to the NIE.

Online versus Offline Capabilities

In the Metasys system, the term online refers to being directly logged in to an NIE with a web browser. When you are directly connected to a device, you can view and command objects on your network in real time. The term offline refers to working on an archive database in the System Configuration Tool (SCT). Working in an archive database allows you to see multiple sites in one archive, as well as copy and paste information between sites. User views are only converted using the N1 Migration Tool and importing the XML files to the NIE's archive database.

When using the offline method of importing objects, only the objects themselves are converted. On the first connection to the N1 Network, detailed items such as range, units (where applicable), description (expanded ID), Alarms, Trends, and Totalizations are migrated.

Do **not** make changes or add items such as range, units, description, Alarms, Trends, or Totalizations until after the first connection to the NCMs on the N1 Network. These features or attributes can be automatically overwritten the first time you connect to an NCM. Object names are migrated so those features such as the Logic Connector Tool (LCT) or the User Graphics Tool (UGT) can be used prior to an actual installation.

After Migration

After performing an N1 Migration, use the NIE UI (accessed through a web browser) as the primary interface for your Metasys N1 Network (rather than OWS).

Keep in mind that after migration, conventions of the Metasys system apply to objects in the NIE UI and the SCT. For example, the Metasys system uses BACnet compliant units, as opposed to earlier versions of Metasys software where units were text fields. During an N1 Migration, the system attempts to establish Units type matches where possible. Units not matched are included at the end of the Description field for the object.

Overridden AO or BO Points Migrated from an N1 Network

If you override an AO or BO point that was migrated from the N1 Network and then later release the override from the OWS, the NIE current status for that point still says Operator Override until a Release command is issued from the NIE; however, the value of the point in the NIE does change.

The NIE UI displays Operator Override when the object's priority in the Metasys system has the highest priority (Priority 8). The point shows Software Override (SWO) in the N1 Network whether it is overridden at the OWS or at the NIE. If the point is overridden at the NIE, and then an AUTO command is issued at the OWS, the Priority 8 is still present at the NIE, but the value reverts to the last user command given at the OWS. That is, it does not show SWO at the OWS, but still shows Operator Override at the NIE.

Also, if Priority 8 is not active in the NIE, but the point is overridden at the OWS, the NIE shows Overridden at the NIE, and SWO at the OWS. The hardware tab on the NIE UI shows the N1 Network override state in the Overridden attribute. This is the override status as it appears in the N1 Network regardless of the NIE priority values. See *Table 6* for more information.

Table 6: Behavior of Overridden Points [1]

Overridden Point	Commanded at Metasys OWS	Commanded at NIE	Overridden (Flag under Hardware Tab)
Point is not overridden at either NIE or OWS.			
Override at NIE	SWO	Operator Override	TRUE
Override at OWS	SWO	Overridden	TRUE
Point is overridden at either NIE or OWS.			
Override release at NIE	other	other	FALSE
Auto at OWS	other	Operator Override	FALSE
Point is overridden at OWS but not at NIE.			
Override release at NIE	other	other	FALSE
Auto at OWS	other	other	FALSE
Point is overridden at NIE but not at OWS.			

Table 6: Behavior of Overridden Points [1]

Overridden Point	Commanded at Metasys OWS	Commanded at NIE	Overridden (Flag under Hardware Tab)
Override release at NIE	other	other	FALSE
Auto at OWS	Error Message **command already executed**		

1 The value of a point at an NIE is always determined by the value at the NCM even if overridden to a value at the NIE.

Alarm Extensions

If an alarm extension has setpoints outside the warning limits, the alarm extension shows as unreliable. The status reverts to the correct value when the setpoints are put within the warning limits. If this is happening on your system, you see AI points that were migrated from the N1 Network showing Unreliable on the system summary view at the NIE, even though they show as reliable at the OWS. The NIE focus view for the point then shows Reliable for the Reliability Flag and Unreliable for the Alarm State Flag.

The alarm extension generates the status; that is, if it is unreliable, then the status of the object it is attached to is also unreliable (even if the AI object itself is reliable). The alarm extension can go unreliable if the setpoint value is not between the warning limits.

Considerations for Partial N1 Migrations

For the following applications, you may need to perform a partial migration of the N1 Network:

- Fire applications – Refer to the *Metasys System Extended Architecture Fire Integration Using the BACnet Protocol Application Note (LIT-1201993)*.
- Smoke applications – Refer to the *Metasys® System UL 864 9th Edition UUKL/ORD-C100-13 UUKLC Smoke Control System Technical Bulletin (LIT-12011252)*.
- Security applications – The NIE does not support the N1 Access Control System Objects (Access Controller and Card Reader object). If D600-J controllers are connected to the existing N1 Network, use the Engineering Workstation OWS (as shown in *Figure 1*) to monitor access-control-specific information. The NIE does not support an interface to the P2000 system. If a Pegasys system is connected via an M5 Workstation to the existing N1 Network, use the M5 Workstation to monitor access control specific information.
- Lighting applications – The NIE does not support the N1 Lighting Control objects (Lighting Control Device and Lighting Control Group objects). If Intelligent Lighting Controllers (ILCs) are connected to the existing N1 Network, monitor lighting control specific information with the OWS.
- Demand limiting/load rolling (DL/LR) applications – The NIE does not provide an interface to the N1 DL/LR feature. If an existing N1 Network uses the N1 DL/LR feature, monitor and engineer the N1 DL/LR feature with the OWS, or convert over to the Metasys system DL/LR feature.
- Do not map an ACM object to the DL/LR feature in a Metasys system; however, the ACM object at an NCM can be mapped to a Metasys system if used for monitoring only.

Detailed Procedures

See the N1 Migration flowcharts (*Figure 2* and *Figure 3*) for an overview of the workflow involved in migrating an N1 Network to the Metasys system.

Preparing the N1 Network for Migration

Use the following procedures to prepare an N1 Network for migration to Metasys system. Follow these preparatory steps whether migrating via Auto Discovery or migrating using the N1 Offline Migration Tool.

Preparing for an MVE Migration

If you are adding NIE55s as validated devices, keep only the OWS used for the archive online; remove all other OWSs from the system.

Updating the N1 Archive Device

When preparing the N1 Network for migration to a Metasys system, it is important to have a current N1 archive. To update the N1 archive device, perform the following steps from the Metasys N1 Network. Use the DDL files offline to set up the database prior to installing the NIEs.

1. Upload globals and all NCMs.
2. Perform an UNDDL/Net and make sure there are no errors.
3. Save the files in a secure location.

Adding an NIE Device as a PC Device to the N1 Network

To be a part of the N1 Network, the NIE must be defined in the N1 Network as a PC device. Refer to the *Defining Devices* chapter of the *Operator Workstation User's Manual (LIT-120165)* for instructions on adding a PC device to the N1 Network.

Defining All Necessary Report Destinations

The NIE, defined in the N1 Network as a PC device, should now be defined as a report destination. Refer to the *Defining Report/Access Groups* chapter of the *Operator Workstation User's Manual (LIT-120165)* for instructions on defining report destinations. Select the Destination Type PC file and enter **user_app** as the Destination File Name.

Generating an NIE Database Online Using Wizards

Generating an N1 Migration database is similar to generating a database in the NAE. To generate an NIE database online using Wizards:

1. Insert an N1 Integration Object (see *Inserting an N1 Integration Object*).
2. Insert an N1 Field Device (NCM) (see *Inserting an N1 Field Device*).
3. Insert field points to a field device (see *Adding Field Points to a Field Device*).

Table 7: Fields of the Insert Integration Wizard's Configure Screen

Section	Field	Definition
Engineering Values	Network Name	The Metasys N1 Network name.
	Device Name	Metasys system device (NIE) name defined in the Metasys N1 Network. Fill in this field so this NIE receives Metasys N1 Network reports or appears as online or offline by the Metasys N1 Network or devices.
	Gate Number	Metasys system device value as it is defined in the Metasys N1 Network.
	Node Number	Metasys system device value as it is defined in the Metasys N1 Network.
	Discovery IP Address	The NCM IP address as defined on the Metasys N1 Network to use for discovery of the Metasys N1 Network.
	Discovery Gate Number	The NCM Gate address as it is defined on the Metasys N1 Network. It is used for discovery of the Metasys N1 Network.
	Discovery Node Number	The NCM node address as it is defined on the Metasys N1 Network. It is used for discovery of the Metasys N1 Network.
	Migrate Object Configuration	If set to true, then when any Metasys N1 Network object is mapped to a Metasys system object, the basic object configuration from the Metasys N1 Network is used to write the basic Metasys system object configuration, such as the descriptor and units. When this is set to True, the alarm configuration from the Metasys N1 Network is used to create a Metasys system Alarm extension.
	Migrate Trend Configuration	If set to true, when any Metasys N1 Network object is mapped to a Metasys system network, the trend and point history configuration from the Metasys N1 Network is used to create a Metasys system Trend extension.
	Migrate Totalization Configuration	If set to true, when any Metasys N1 Network object is mapped to a Metasys system network, the totalization configuration from the Metasys N1 Network is used to create a Metasys system Totalization extension.
	Migrate Schedules	If set to true, when any Metasys N1 Network object is mapped to a Metasys system object, any attached Metasys N1 Network schedule is used to create a Metasys system schedule.
	Synchronize Time	If set to true, the NIE becomes the master time keeper for the Metasys N1 Network. Use only one NIE as a master time keeper, and only if there are no other master time keepers in the Metasys N1 Network. Time updates are sent to the Metasys N1 Network once daily and when the time changes. Time synchronization on the NCM is handled as documented in the *Network Control Module 300 Series Technical Bulletin (LIT-6360251)*.

Table 7: Fields of the Insert Integration Wizard's Configure Screen

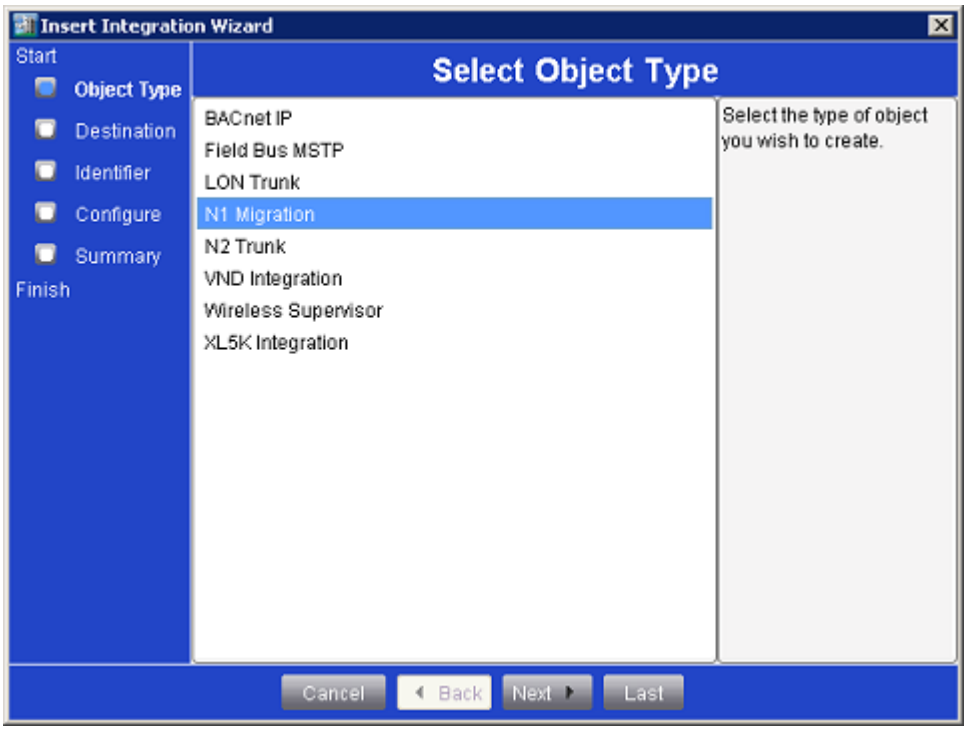
Section	Field	Definition
Advanced Setup	UDP Port	The User Datagram Protocol (UDP) Port as defined in the Metasys N1 Network.
	Duty Standby	Indicates whether the Metasys N1 Network is a Duty/Standby network.
	Broadcast Address	Modify to use directed broadcasts.
	RetryWaitTime	The amount of time to wait before retransmitting communications.
	RetryCounterLimit	The number of times an attempt is made to reestablish communications.
	Message Timeout	The time in seconds before communications time out. (Recommended setting, 63 seconds.)
	Poll Delay	The delay in milliseconds between requests to read all present values for all objects in a system. Additionally, at Release 5.2.11.20 or later, this is the delay between requests to read the value of all CSG points in one CSG object. **Note:** In addition to polling for present value, the NIE updates the present value for objects immediately when it receives a report from the NCM for an object.

Inserting an N1 Integration Object

To insert an N1 Integration object:

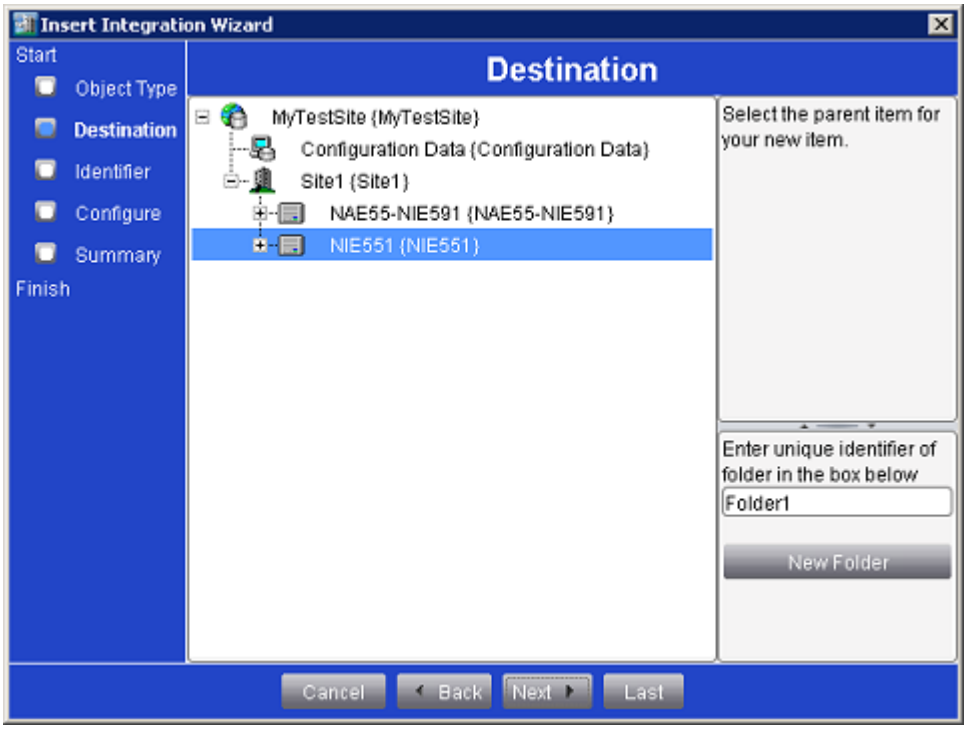
1. On the Insert Menu, select **Integration**. The Insert Integration Wizard Select Object Type screen appears (*Figure 11*).

Figure 11: Insert Integration Wizard - Select Object Type Screen



2. Select the N1 Migration object and click **Next**. The Insert Integration Wizard Destination screen appears (*Figure 12*).

Figure 12: Insert Integration Wizard - Destination Screen



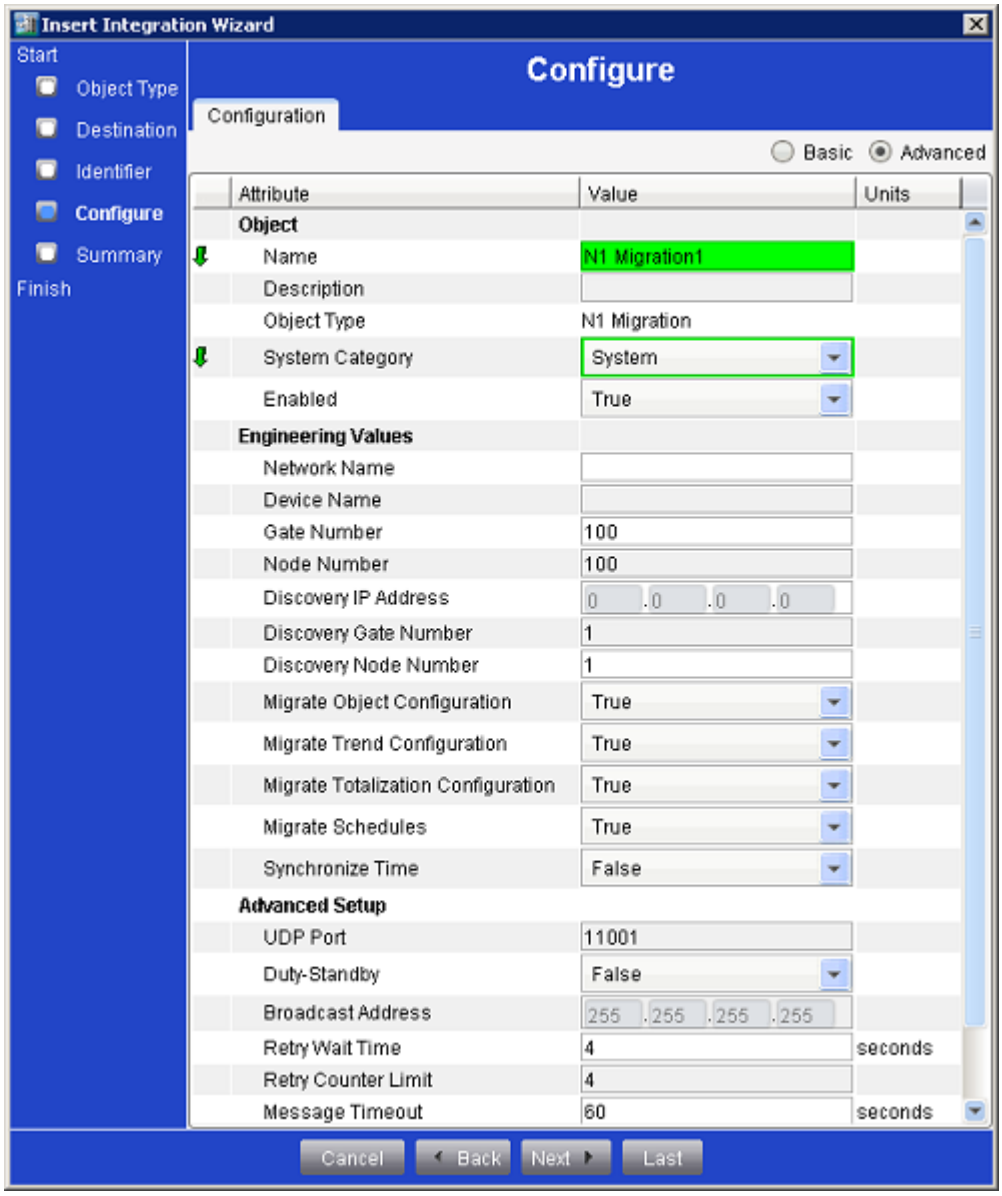
3. Select the NIE where you want to insert the N1 Integration object and click **Next**. The Insert Integration Wizard Identifier screen appears (*Figure 13*).

Figure 13: Insert Integration Wizard - Identifier Screen

4. Enter a unique name for the N1 Migration object and click **Next**. Do **not** click **Last**. The Insert Integration Wizard Configure screen appears (*Figure 14*).

   Note: Select an NCM that is not the node manager as the Discovery Node. Also, do not use a workstation as the Discovery Node.

Figure 14: Insert Integration Wizard - Configure Screen



5. Click the **Advanced** option to access the Engineering Values and Advanced Setup Parameters. Use *Figure 14* to determine the settings for the Configure screen.

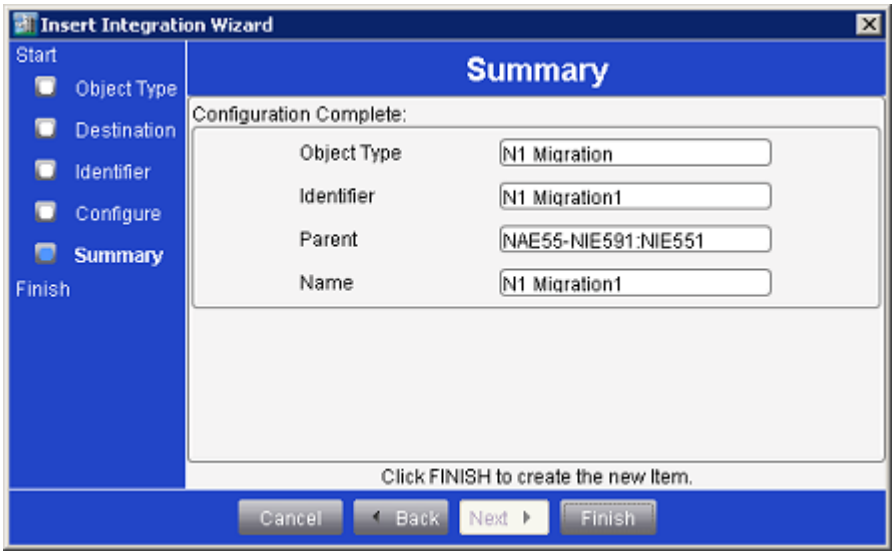
   Be sure to that you define the Network Name, Device Name, Gate Number, Node Number, Discovery Gate Number, and Discovery Node Number. These settings must match the N1 Network global data.

   Note: Some of these settings cannot be modified after submitting the settings. If you do not enter the settings correctly and you have to delete the N1 Migration object, you may cause the NIE to crash.

   Note: The Object Category drop-down menu on the Configure screen (not shown in *Figure 14*) allows you to select a category for any item except a Site object. A user's security level provides the basis for assigning (to users or roles) permission to view or act on different object categories.

6. Click **Next**. The Insert Integration Wizard Summary screen appears (*Figure 15*).

Figure 15: Insert Integration Wizard - Summary Screen



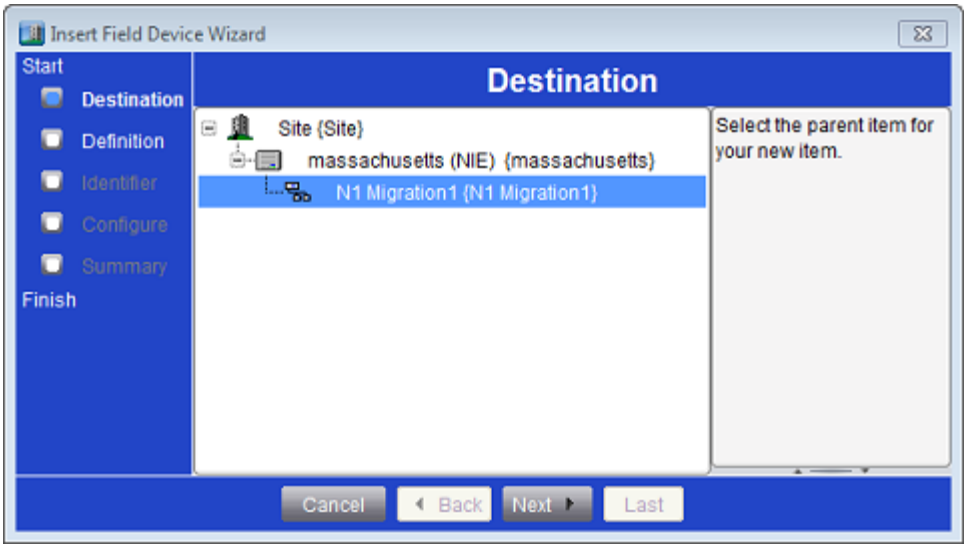
7. Review the Summary screen and click **Finish**. The Extensions Wizard starts, allowing you to add extensions. See *Adding Extensions to Objects* for more information.

Inserting an N1 Field Device

To insert an N1 Field Device:

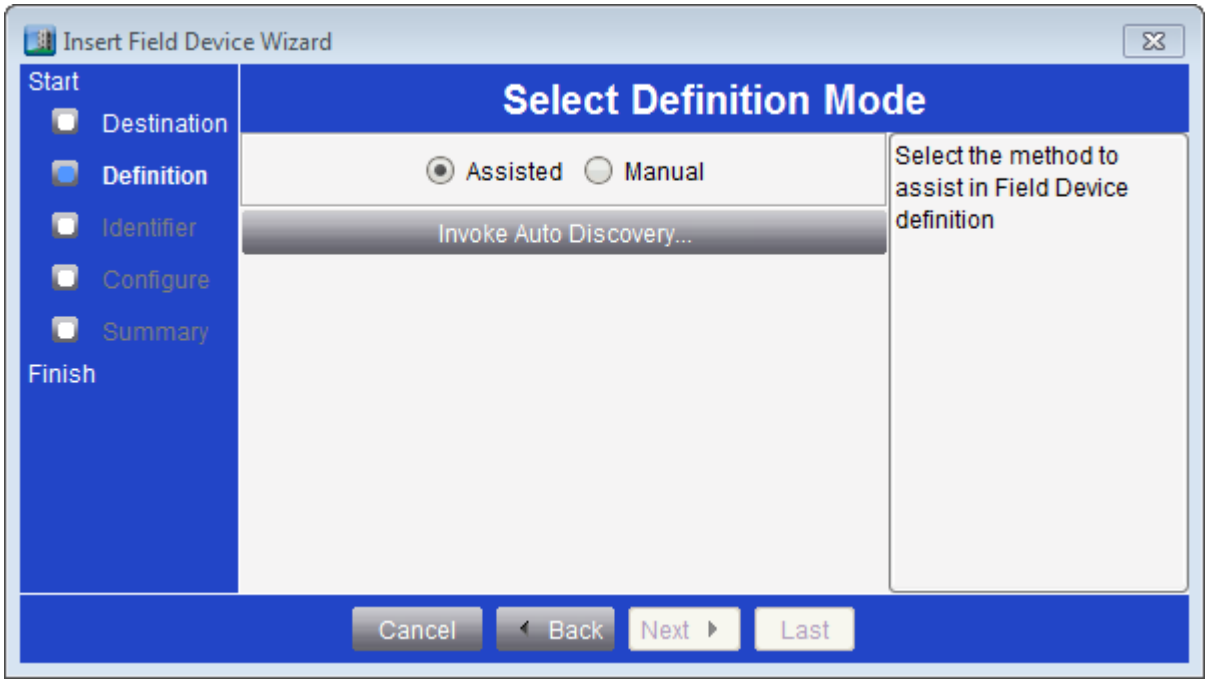
1. On the user view Insert menu, select **Field Device**. The Insert Field Device Wizard Destination screen appears.

Figure 16: Insert Field Device Wizard - Destination Screen



2. Select the N1 Migration object as a parent for the field device and click **Next**. The Select Definition Mode screen appears.

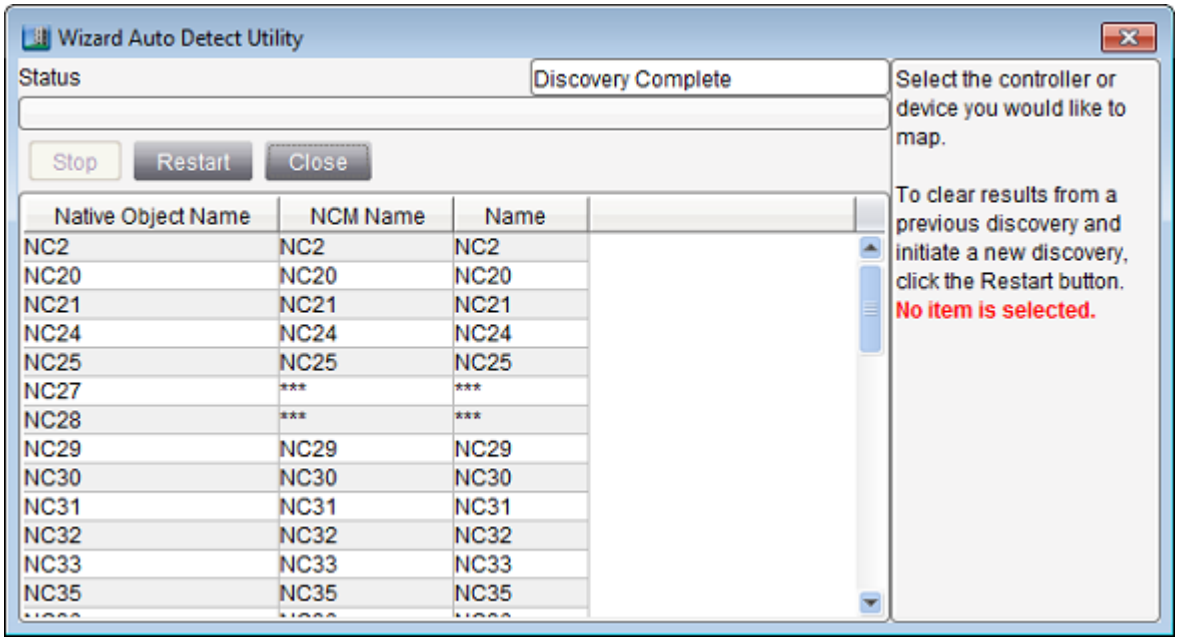
Figure 17: Insert Field Device Wizard - Select Definition Mode Screen



3. Click **Assisted** and click **Invoke Auto Discovery**. The Wizard Auto Detect Utility starts, discovering all NCMs on the N1 Network.

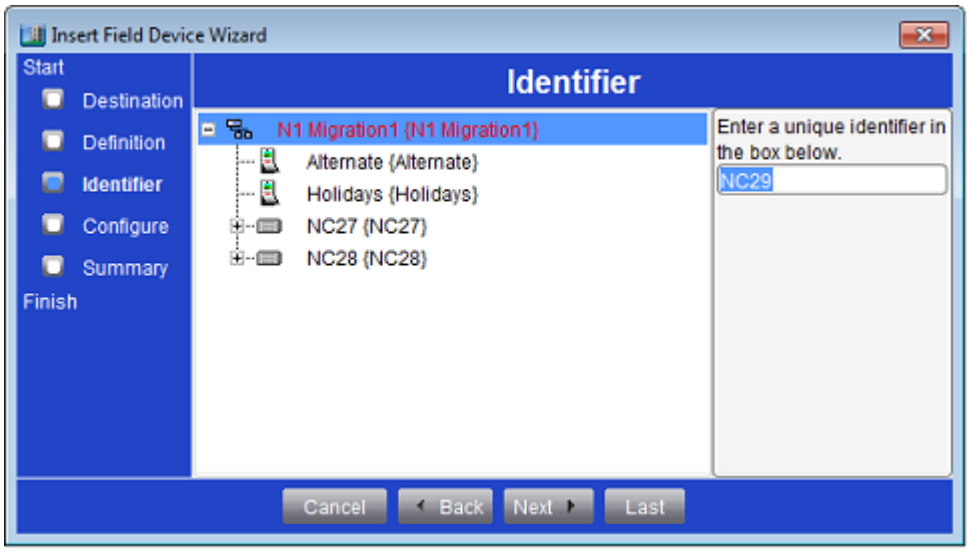
   Note: During Auto Discovery, the NCM becomes busier than normal. This situation passes when Auto Discovery is complete. Take appropriate precautions if the NCM idle time is lower than 70%. (Idle time does not apply to NCM4510s and NCM4520s.)

Figure 18: Wizard Auto Detect Utility



4. Select the NCM you are inserting. The Wizard Auto Detect Utility automatically closes, and the Insert Field Device Wizard Identifier screen appears.

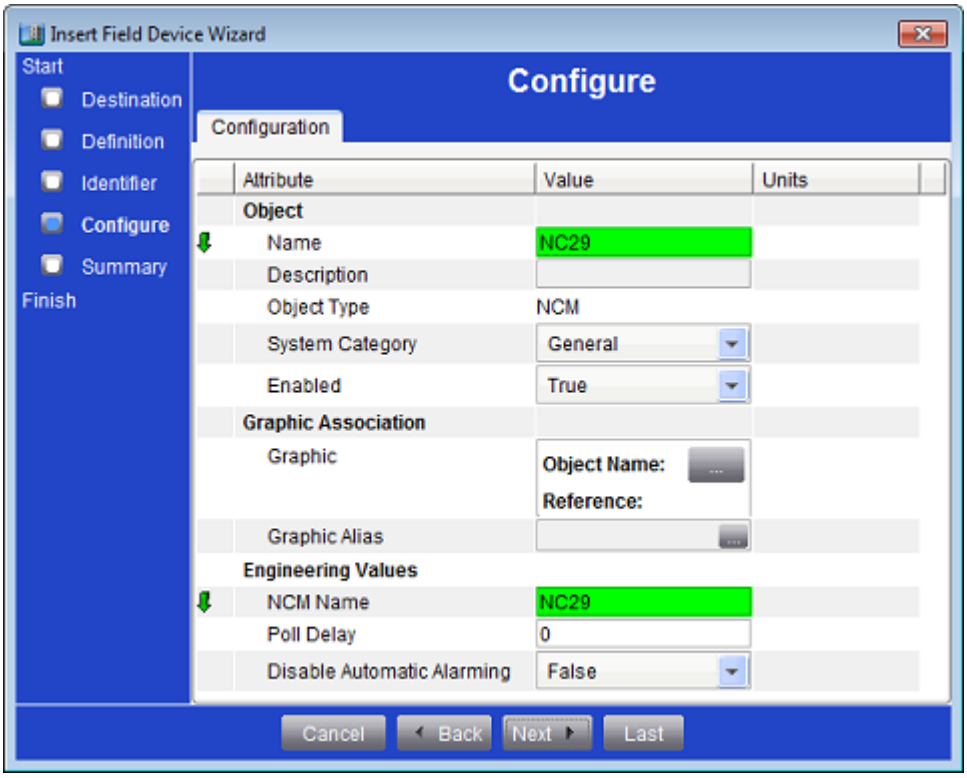
Figure 19: Insert Field Device Wizard - Identifier Screen



Note: The NCM you are inserting must have a unique name. We recommend leaving the default name, which is the name the NCM has on the N1 Network.

5. Click **Next**. The Insert Field Device Wizard Configure screen appears.

Figure 20: Insert Field Device Wizard - Configure Screen

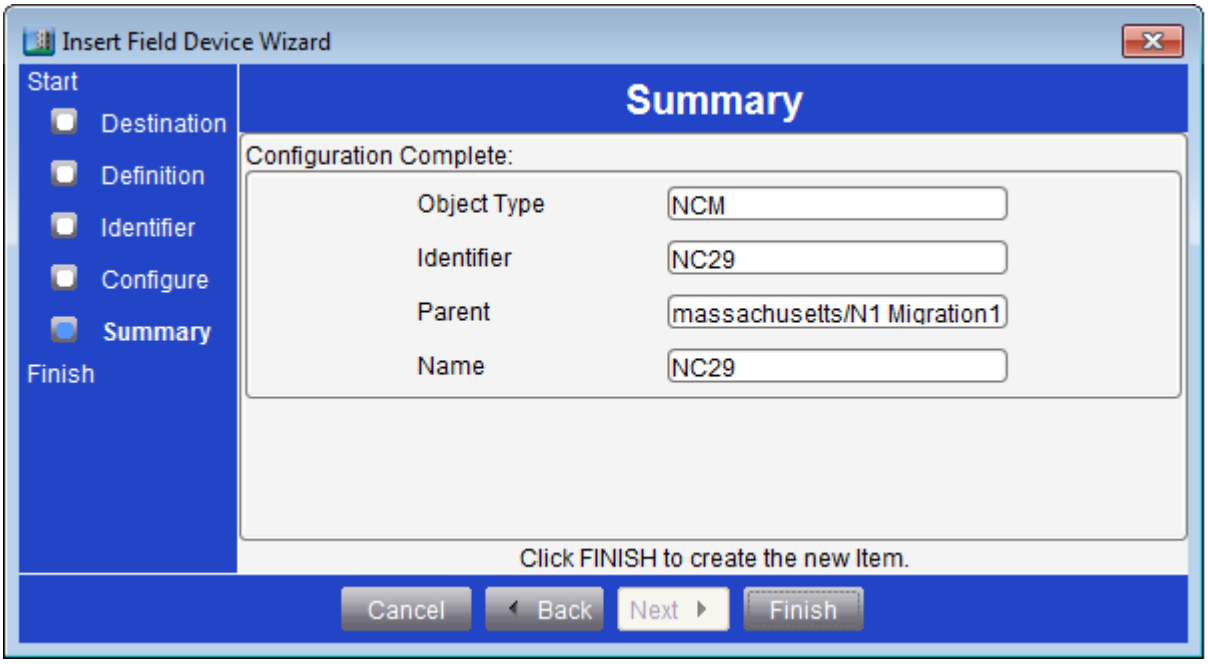


6. If the information on the Configure screen appears correct, click **Next**. The Insert Field Device Wizard Summary screen appears (*Figure 21*).

   Note: Do **not** change the NCM name in the Engineering Values field from the name the discovery finds. If you change this name, the NIE cannot communicate with the NCM.

   The Object Category menu on the Configure screen (not shown in *Figure 14*) allows you to select a category for any item except a Site object. Permission to view or act on different object categories is assigned to users or roles based on a user's security level.

Figure 21: Insert Field Device Wizard - Summary Screen



7. If the information on the Summary screen appears correct, click **Finish** to create the new object in your NIE database. With the new object created, the Extension Wizard starts. See *Adding Extensions to Objects*.

Adding Extensions to Objects

If you have set the Migrate Trend Configuration and Migrate Totalization Configuration fields to True when configuring your N1 Integration object, then any Trends or Totalizations attached to objects in the Metasys N1 Network are migrated as extensions to the corresponding Metasys system object. Otherwise, you can use the Extension wizard to add extensions manually.

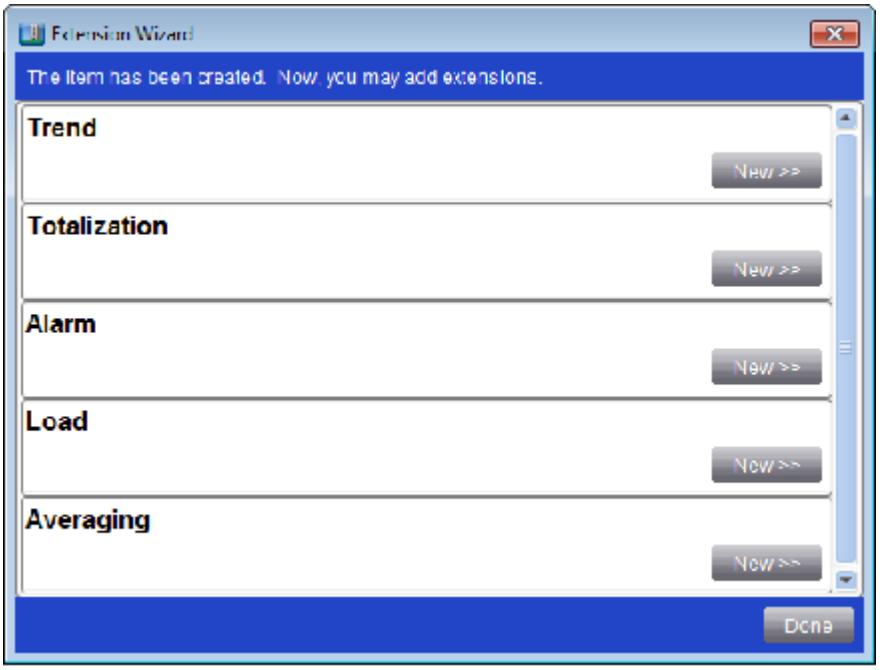
Note: If you want to mimic Point History using Trend extensions in the NIEs, be aware that each extension you add in the Metasys system counts as an object.

Note: Before adding Trend extensions for Point Histories, consider whether Point Histories are needed in the migrated Metasys system.

To add extensions to objects:

1. If the Extensions Wizard is not already open, navigate to and right-click the object or device to which you want to add an extension.
2. Select **Show Extensions**. The Extension wizard appears (*Figure 22*).

Figure 22: Extension Wizard



3. Click **New** next to an extension type and follow the prompts from the Extension Wizard. See *Adding Trend Extensions to Objects*, *Adding Totalization Extensions to Objects*, or *Adding Alarm Extensions to Objects* for information about each type of extension.

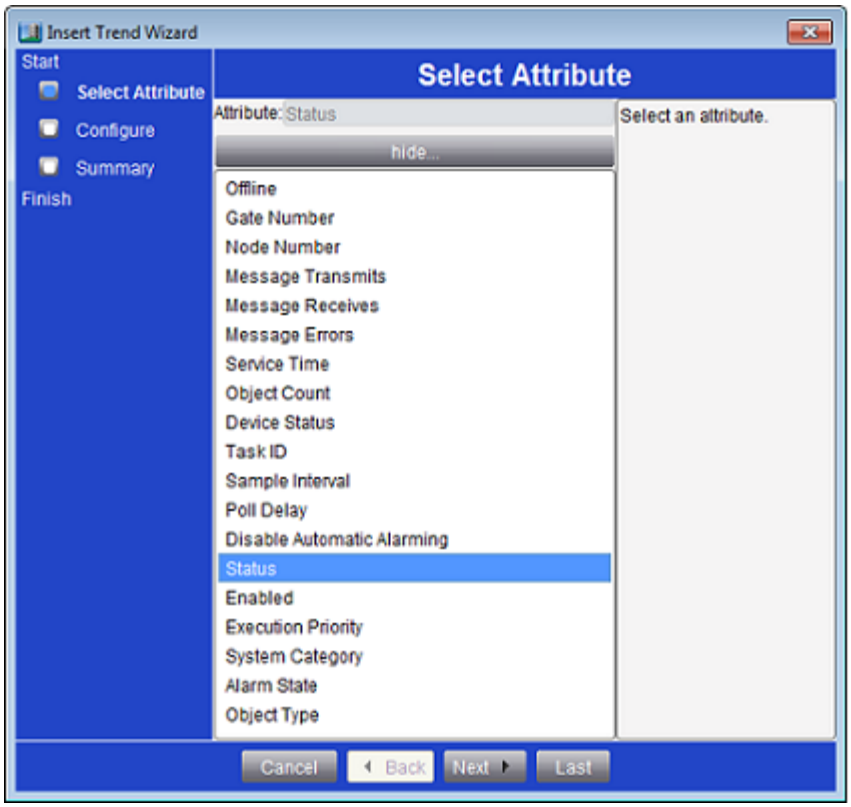
Adding Trend Extensions to Objects

Objects from the Metasys N1 Network that had Trends attached to them when they were imported to the Metasys system have Trend extensions corresponding to those trends. Only the attributes described in *Table 8* are migrated. Any other attribute in the NCM used as the source for Trends or Totalizations is not migrated to an NIE Trend or Totalization extension.

To add Trend extensions to objects:

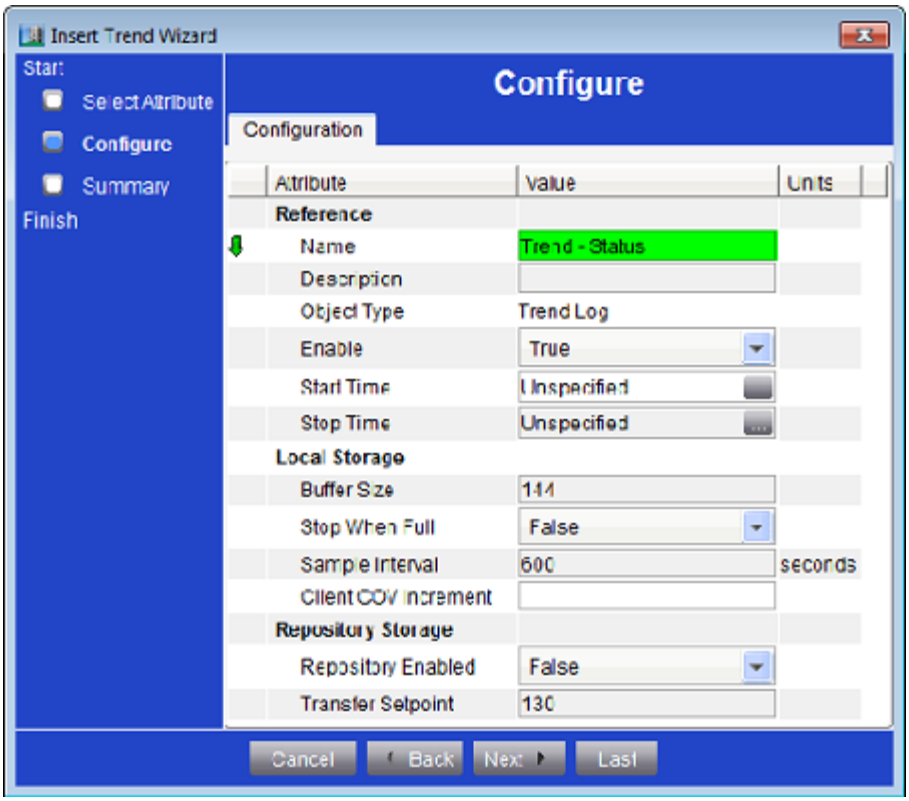
1. Click **New** in the Trend row. The Insert Trend Wizard **Select Attribute** screen appears.
2. Click **other** to show the list of attribute options.
3. Select the attribute to trend and click **Next**. The Insert Trend Wizard Configure screen appears.

Figure 23: Insert Trend Wizard - Select Attribute Screen



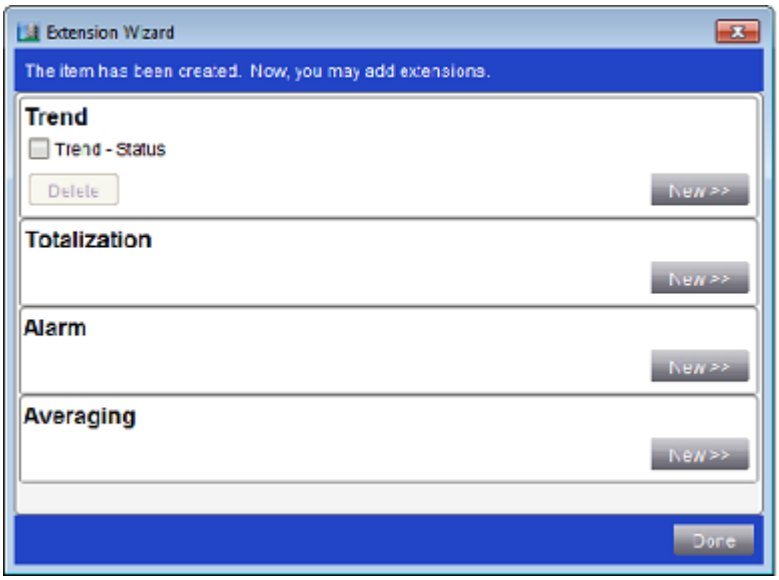
4. Configure and click **Next**. The Insert Trend Wizard Summary screen appears.

Figure 24: Insert Trend Wizard - Configure Screen



5. Review the Summary screen and click **Finish** to create the Trend extension. The Extension Wizard appears with a check box for the new Trend extension.

Figure 25: Extension Wizard with Status Trend Added



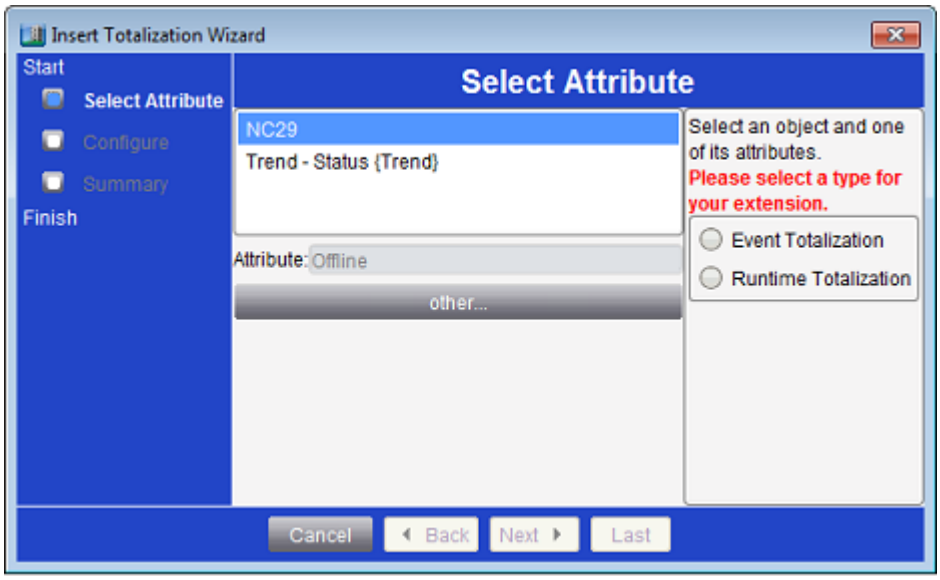
Adding Totalization Extensions to Objects

To add Totalization extensions to objects:

Note: Objects from the Metasys N1 Network with Totalizations attached to them when they were imported to the Metasys system have Totalization extensions corresponding to those Totalizations. Only the attributes described in *Table 8* are migrated. Any other attribute in the NCM used as the source for Trends or Totalizations is not migrated to an NIE Trend or Totalization extension.

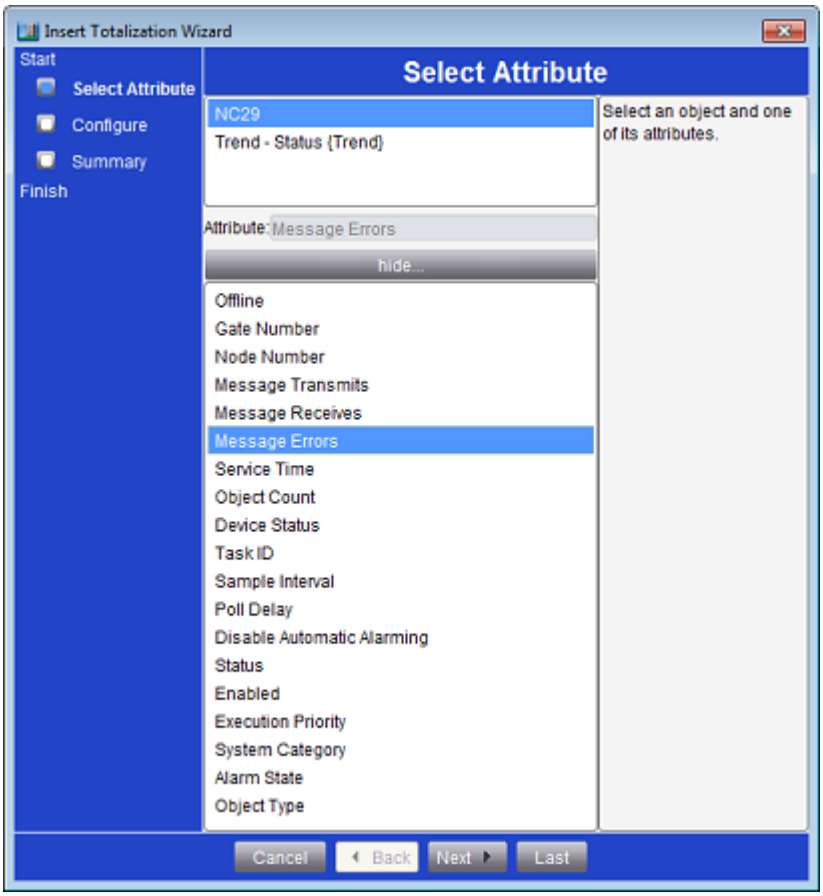
1. Click **New** in the Totalization row of the Extensions Wizard. The Insert Totalization Wizard Select Attribute screen appears (*Figure 26*).

Figure 26: Insert Totalization Wizard - Select Attribute



2. Select **Event Totalization** or **Runtime Totalization**.
3. Click **other** to display a list of attribute options.
4. Select an object in the top half of the screen and an attribute in the bottom half and click **Next**.

Figure 27: Insert Totalization Wizard - Select Attribute Screen



5. Follow the prompts in the wizard to complete the addition of a Totalization Extension.

Table 8: Migrated Trend and Totalization Attributes

NCM Attribute	NIE Attribute
VALUE	PRESENT_VALUE
STATUS	STATUS
OFFLINE	OFFLINE
TROUBLE	TROUBLE
OVERRIDE	OVERRIDDEN

Adding Alarm Extensions to Objects

If an object from the Metasys N1 Network has an alarm attached to the object when the object is imported to the Metasys system, then the object has a corresponding Alarm extension in Metasys system.

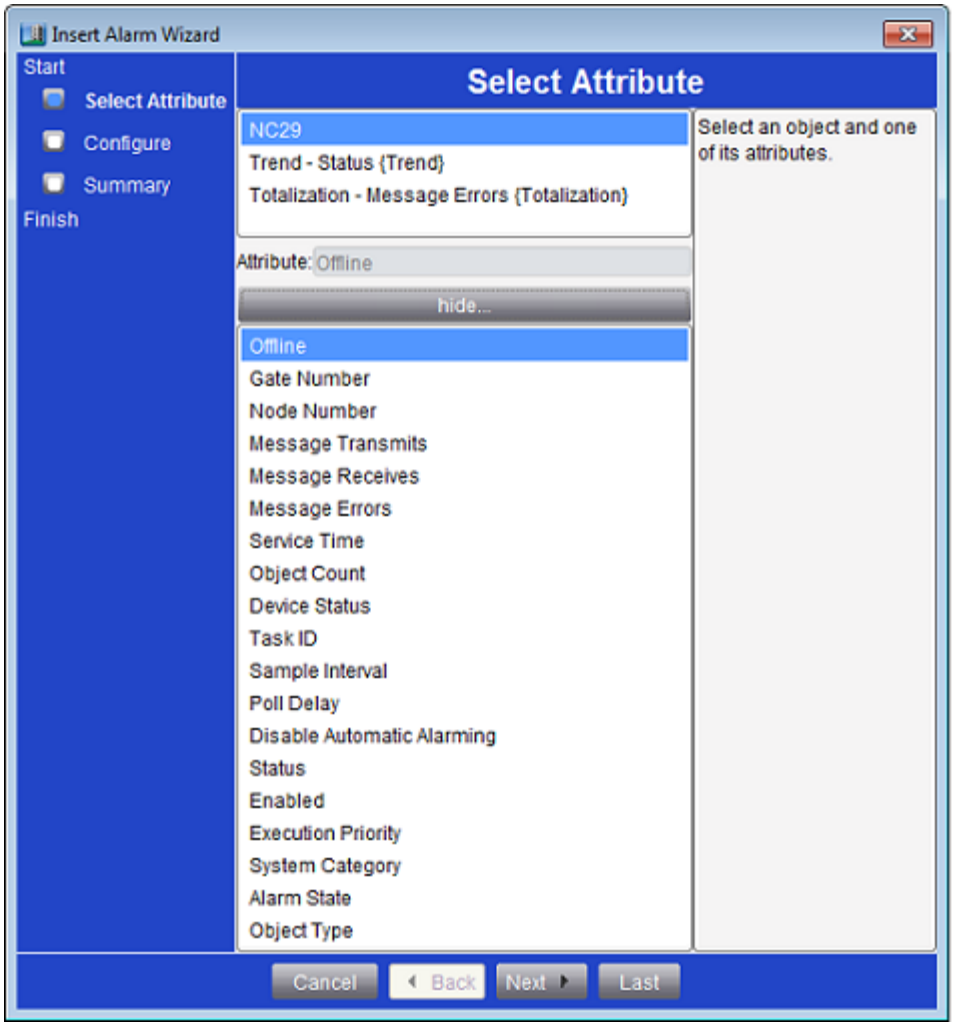
Note: You can configure pre-alarms for your MVE system by creating additional alarm extensions. Remove the extra alarm objects and any GPL processes you configured in the old NCM, and configure the Status attribute as a pre-alarm condition.

To add Alarm extensions to objects:

1. Click **New** in the Alarm row of the Extensions Wizard. The Insert Alarm Wizard Select Attribute screen appears.
2. Click **other** to show the list of attribute options.

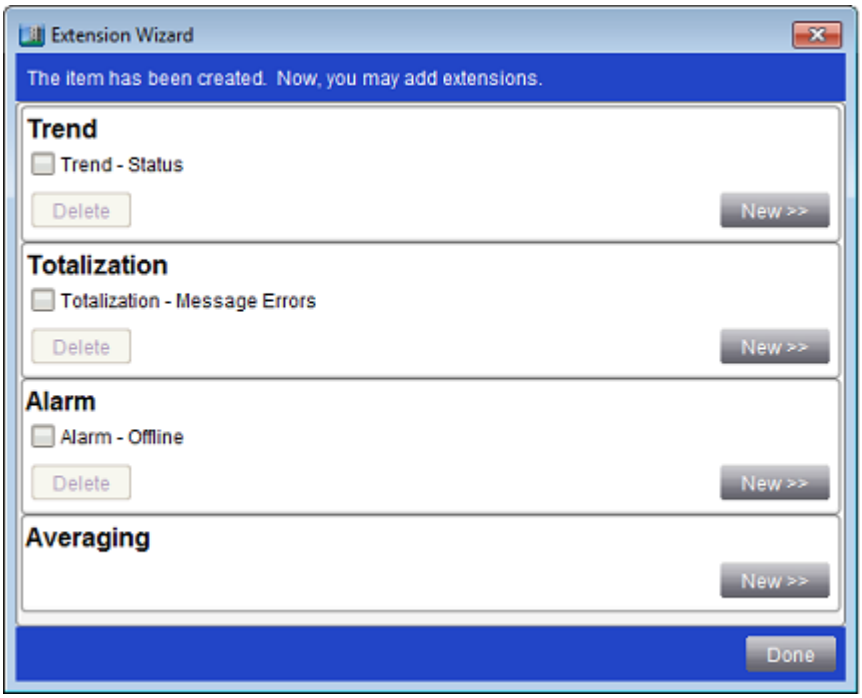
3. Select an object to which you want to add the Alarm extension (in the top half of the screen) and select an attribute (in the bottom half of the screen), then click **Next**.

Figure 28: Insert Alarm Wizard - Select Attribute Screen



4. Follow the prompts in the wizard to complete the addition of an Alarm Extension. When you are done adding extensions, they are listed on the Extension Wizard screen.

Figure 29: Extension Wizard with Extensions Added



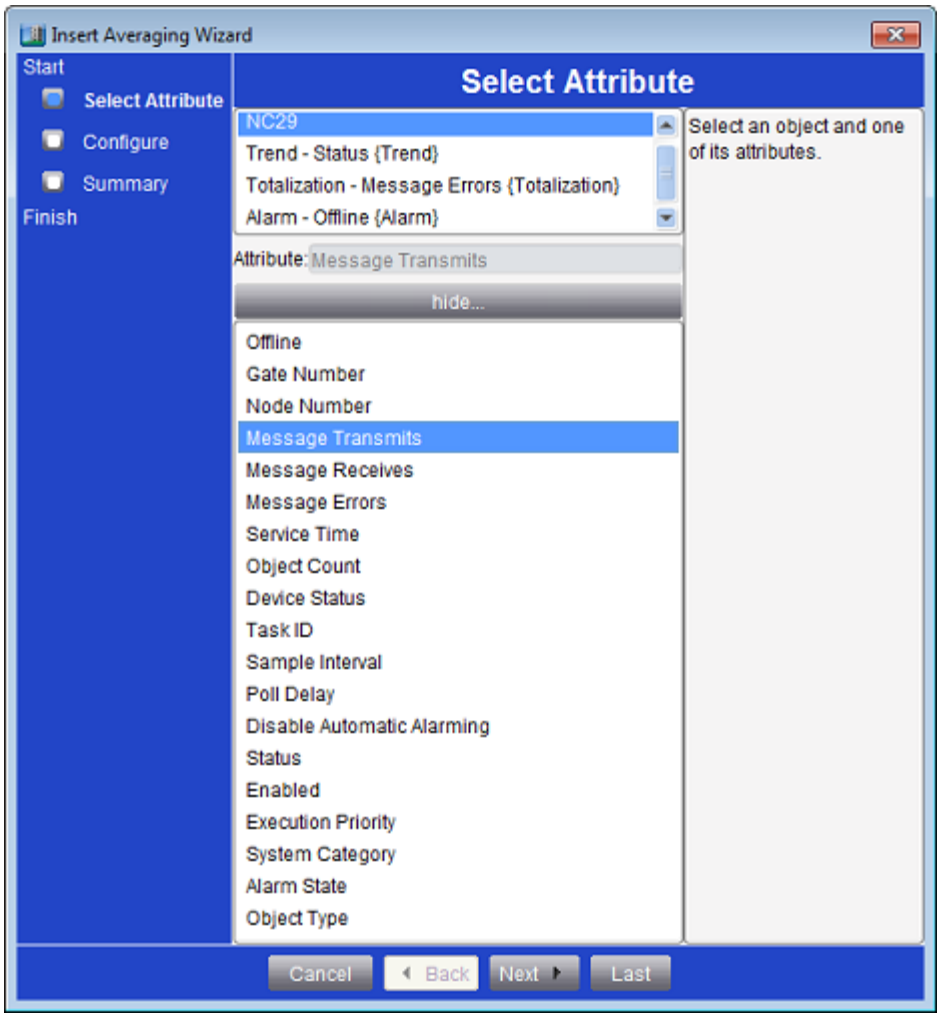
Adding Averaging Extensions to Objects

If an object from the Metasys N1 Network has an averaging attribute attached to the object when the object is imported to the Metasys system, then the object has a corresponding averaging extension in the Metasys system.

To add Averaging extensions to objects:

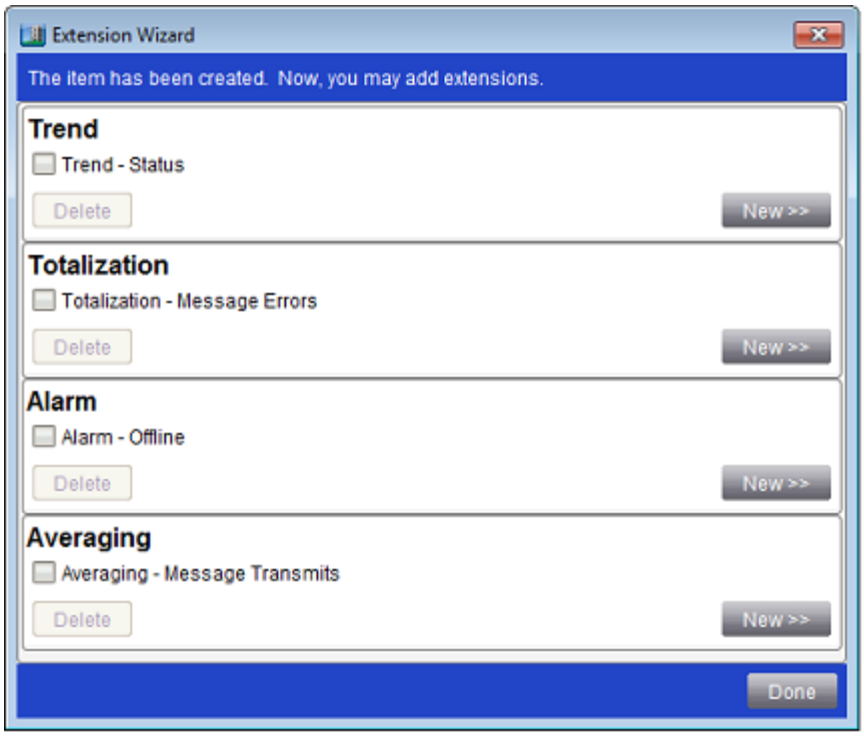
1. Click **New** in the Averaging row of the Extensions Wizard. The Insert Averaging Wizard Select Attribute screen appears.
2. Click **other** to show the list of attribute options.
3. Select an object to which you want to add the Alarm extension (in the top half of the screen) and select an attribute (in the bottom half of the screen), then click **Next**.

Figure 30: Insert Averaging Wizard - Select Attribute Screen



4. Follow the prompts in the wizard to complete the addition of an Alarm Extension. When you are done adding extensions, they are listed on the Extension Wizard screen.

Figure 31: Extension Wizard with Extensions Added



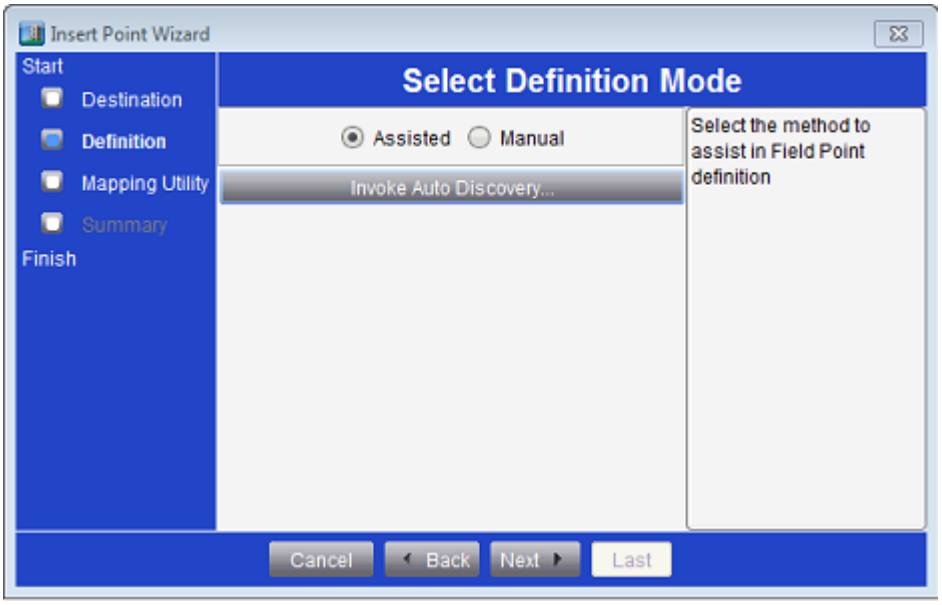
5. Click **Done** on the Extension Wizard screen when you are done adding your extensions. The Field Device Extension wizard screen appears. See *Adding Field Points to a Field Device*.

Adding Field Points to a Field Device

The Insert Point Wizard starts automatically when you complete the Extension Wizard prompts (See *Adding Extensions to Objects*). After the Insert Point Wizard starts, click **New** on the first screen to invoke the Select Definition Mode screen. Alternatively, you can add points to a field device manually from the user view. To manually add field points to a field device:

1. Navigate to and select a device from the user view.
2. On the Insert menu, select **Field Point**. The Destination screen of the Insert Point Wizard appears.
3. Select the device that you are adding field points to and click **Next**. The Select Definition Mode screen appears.

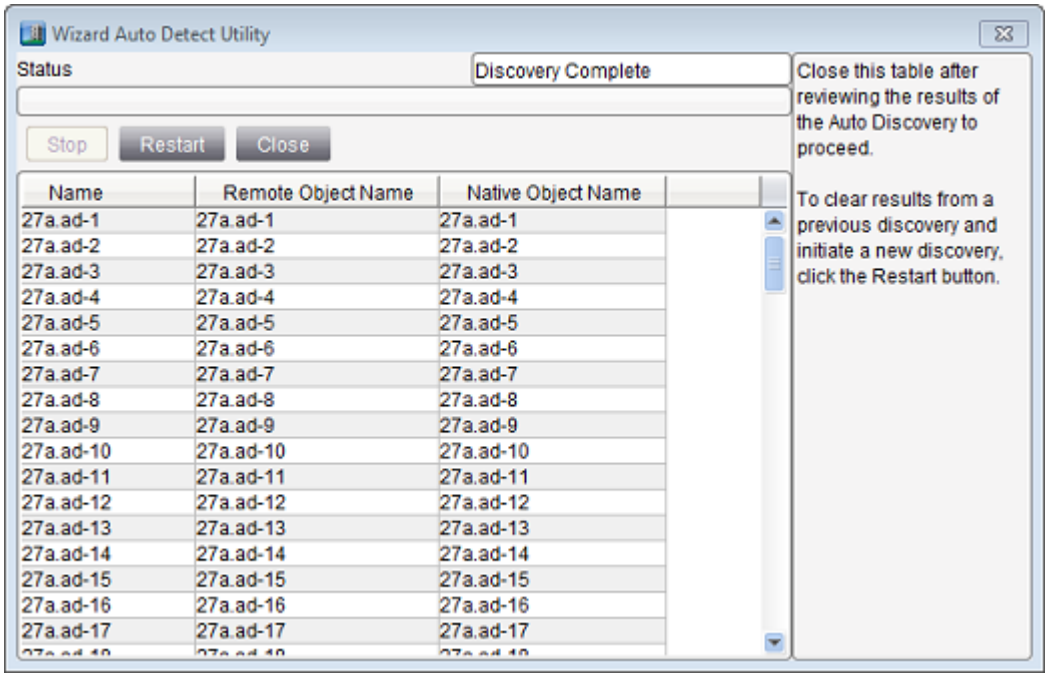
Figure 32: Insert Point Wizard - Select Definition Mode Screen



4. Leave **Assisted** selected and click **Invoke Auto Discovery**. The Wizard Auto Detect Utility starts (*Figure 33*).

   Note: Manual Point Definition is not supported.

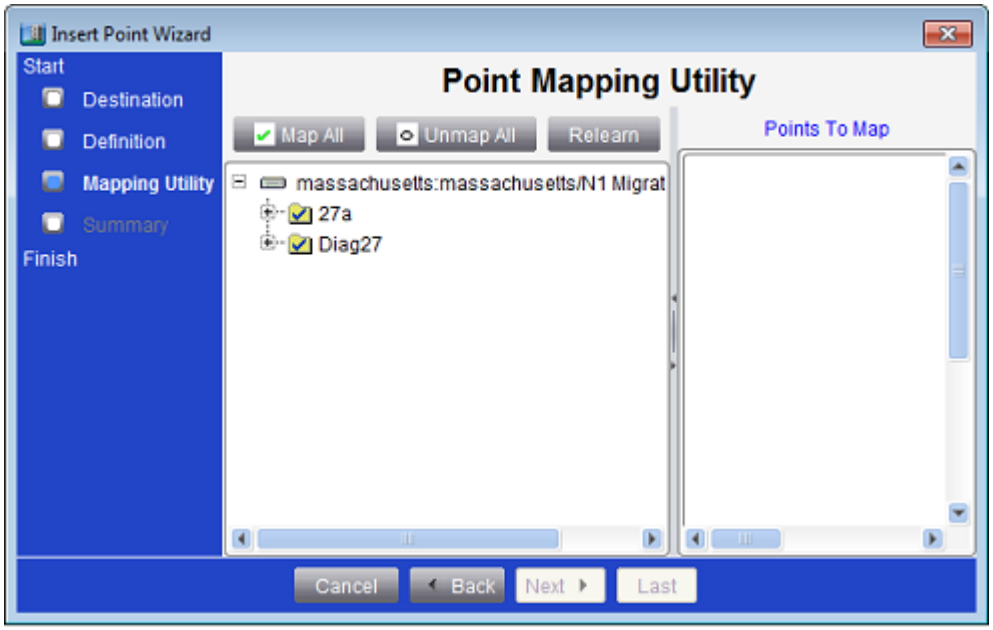
Figure 33: Wizard Auto Detect Utility



   Note: The Auto Detect Utility starts and finds all points.

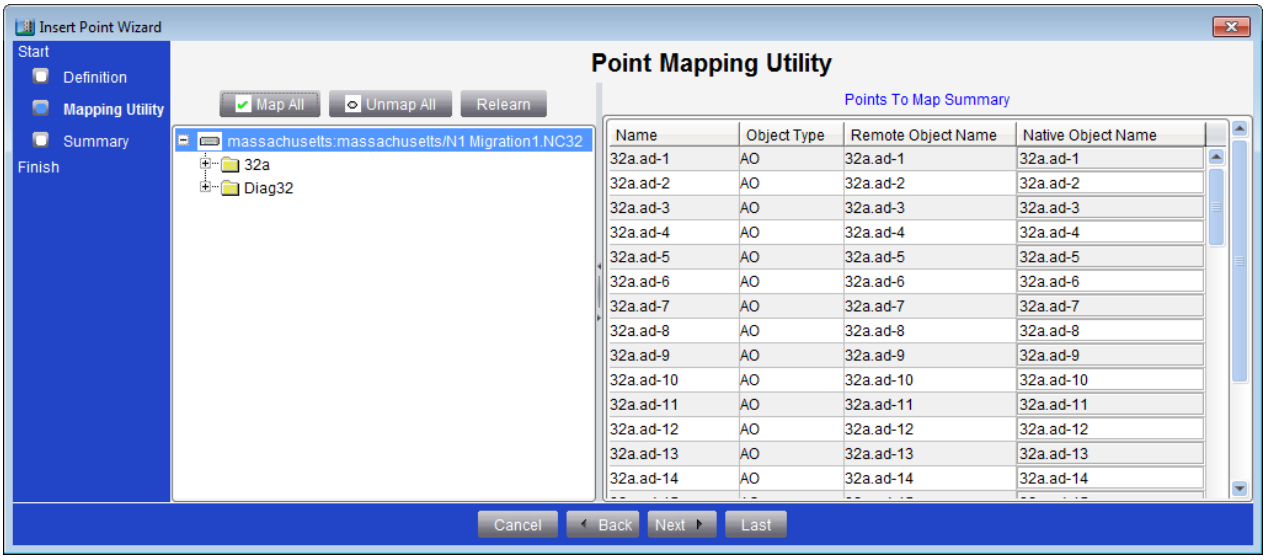
5. After reviewing the results of the Auto Discovery, click **Close**. The Point Mapping Utility screen appears.

Figure 34: Point Mapping Utility Screen



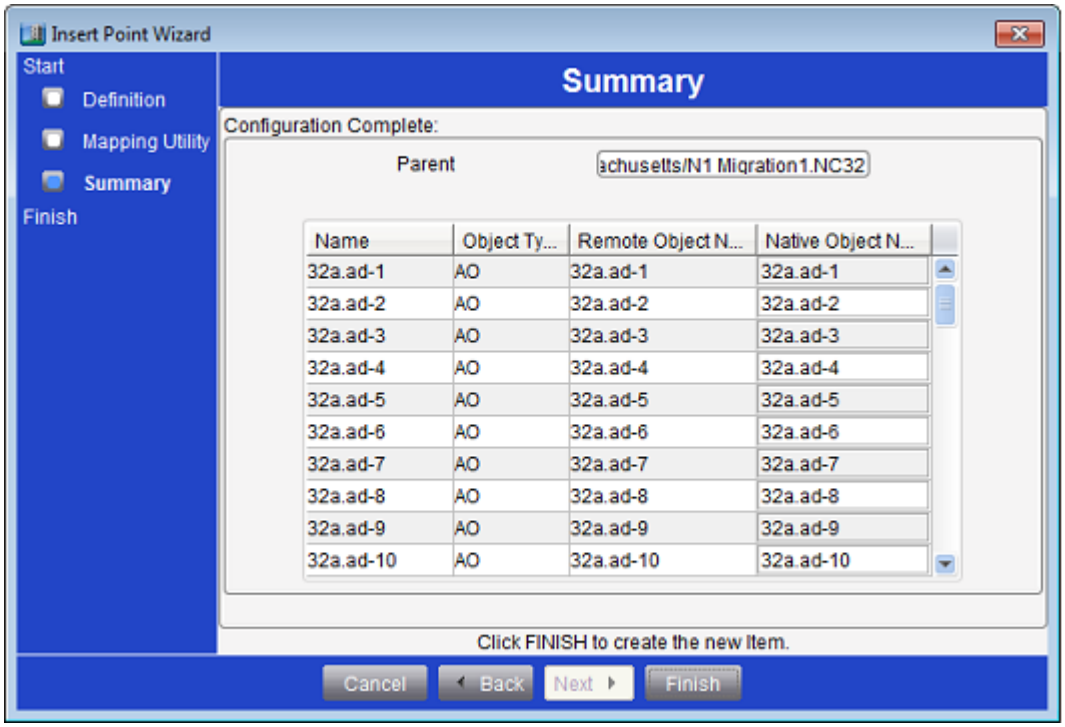
6. Expand objects by clicking the plus sign next to them and pick the points to map to your NIE database. You can also map or unmap all objects at once using **Map All** or **Unmap All**. The points that you map appear in the Points to Map Summary in the right panel of the screen.

Figure 35: Point Mapping Utility Screen with Points Mapped



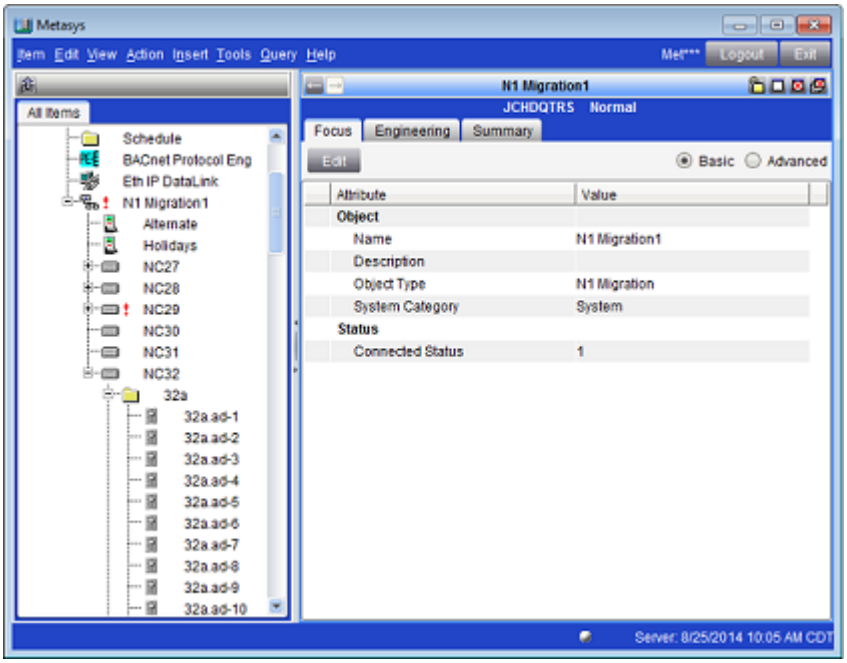
7. Click **Next**. The Insert Point Wizard Summary screen appears.

Figure 36: Insert Point Wizard - Summary Screen



8. When you are done, click **Finish**. The NIE UI shows the field points you have added.

Figure 37: NIE UI with Field Points Added



Importing N1 Objects Using the N1 Migration Tool

The N1 Migration Tool is a stand-alone tool available to Johnson Controls branch offices. Please contact your local Johnson Controls branch office for information about the N1 Migration Tool.

To import N1 Objects using the N1 Migration Tool:

1. Create the point import files. See *Creating the Import File Using the N1 Migration Tool*.
2. Create the user view. See *Creating a User View*.

   Note: The N1 Migration Tool imports the N1 PC group, the global file, as a user view. Broken references can occur if an NCM is assigned to the wrong NIE when the import file is generated. You must manually update references to the correct NIEs. See *Importing N1 Objects Using the N1 Migration Tool* and *Editing a User View to Show Points from NCMs Spanning Multiple NIEs* for more information.
3. Import the point files to the N1 Migration object in either an archive database in the SCT or directly in an NIE or ADS/ADX.

   Note: The import file for points can be imported offline with the SCT or online with an NIE or an ADS/ADX. However, the file generated to migrate user views can only be imported offline with the SCT or online to an NIE that is designated Site Director.
4. Import the user view to the Site Director NIE or ADS/ADX offline with the SCT.
5. Import the N1 point file into an NIE so it is available to the Metasys system.

   Do **not** make changes or add items such as range, units, description, Alarms, Trends, or Totalizations until after the first connection to the NCMs on the N1 Network. These features or attributes can be automatically overwritten the first time you connect to an NCM. Object names are migrated so that features, such as the LCT or the User Graphics Tool, can be used prior to an actual installation.

Creating the Import File Using the N1 Migration Tool

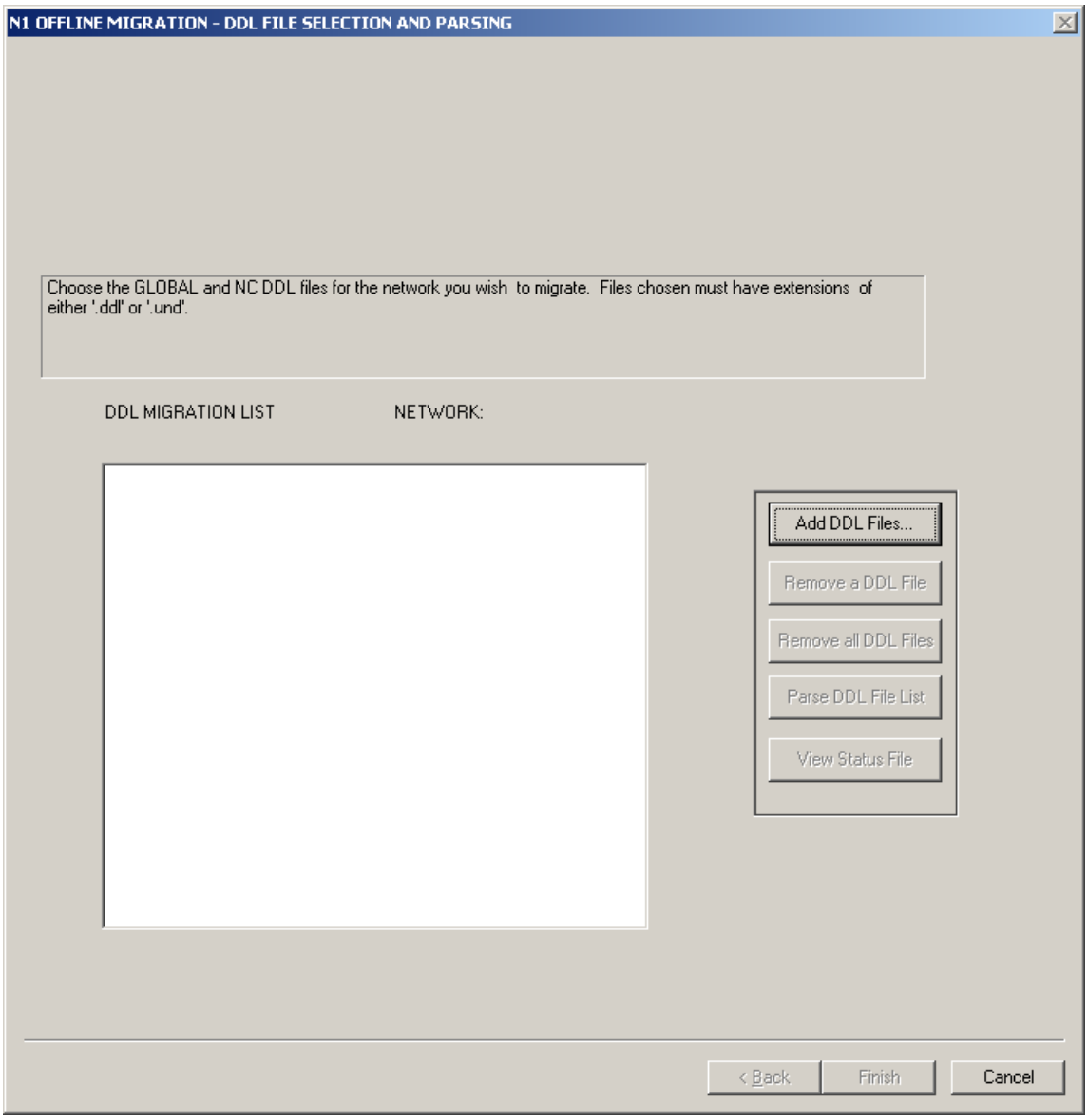
Prior to running the N1 Migration Tool, make sure to perform the steps listed in the *Preparing the N1 Network for Migration* section. Keep the following in mind when creating import files:

- You may only add one global DDL file per N1 Network.
- All DDL files must be from the same N1 Network.
- The process of selecting and adding DDL files can be repeated as often as necessary.
- If you are mapping points from your N1 network to multiple NIEs, you need to create a point import file for each NIE containing the points of all the NCMs to be integrated to that NIE.
- You can add one or several NC DDL files from an N1 network.
- If you separate the points of a particular NCM into more than one point import file, these files cannot be migrated to the same NIE.

To create the import file using the N1 Migration Tool:

1. Start the N1 Migration Tool. The install program for the N1 Migration Tool loads the program in the **C:\N1Migration** directory. To run the tool, navigate to this directory in Microsoft® Windows® Explorer and double-click the **Gen1DDLImport.exe** file. The N1 Migration DDL File Selection and Parsing screen appears (*Figure 38*).

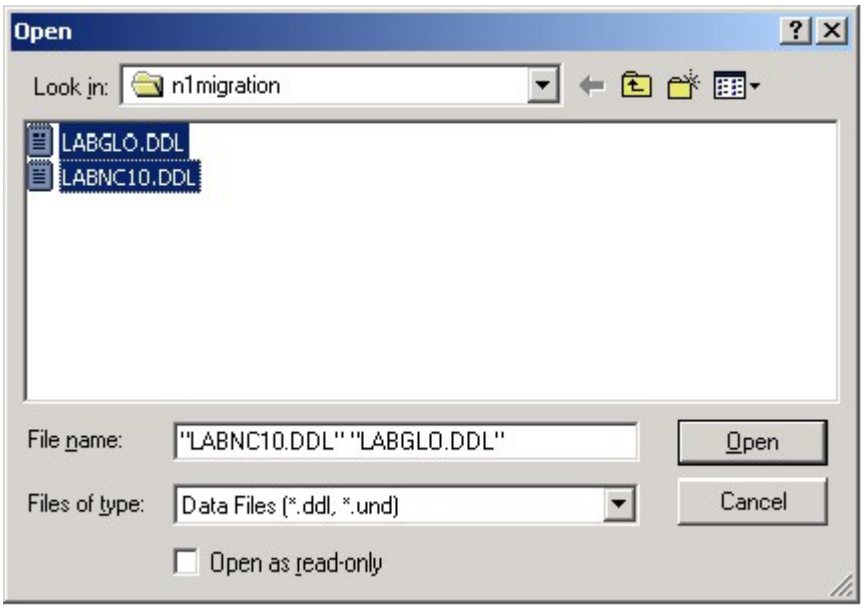
Figure 38: N1 Migration - DDL File Selection and Parsing Screen



Note: The Parse DDL File List button is unavailable until the global file and at least one NCM are selected.

2. Click **Add DDL Files**. The Open files screen appears (*Figure 39*). After you select the files you want to add, the other buttons on the DDL File Selection and Parsing Screen become enabled.

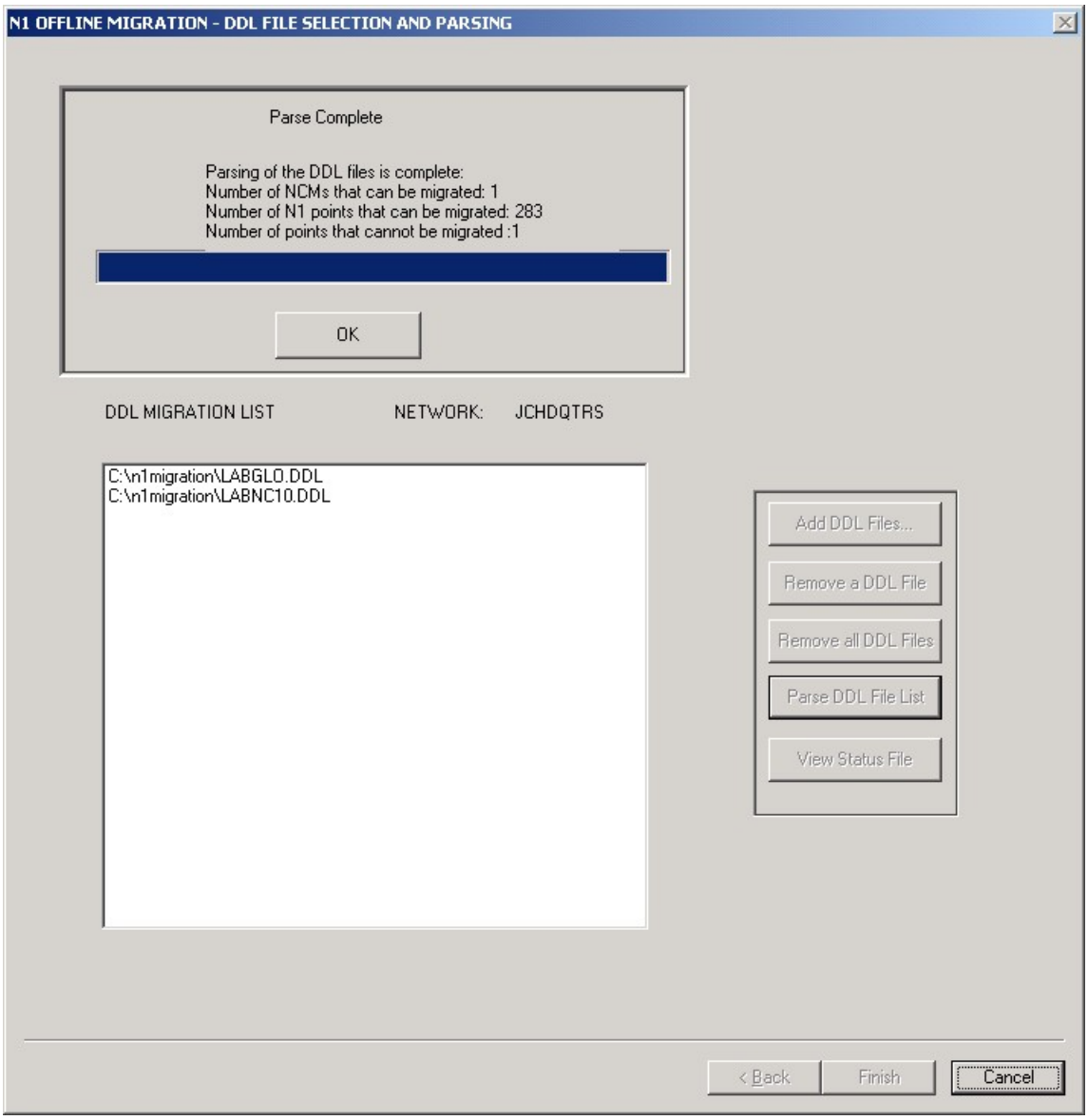
Figure 39: Open Files Screen



3. After adding all the DDL files to import to a particular NIE, click **Parse DDL File List**. The files you added are parsed, and a description of the results of the parse is displayed (*Figure 40*).

   Note: The name of the N1 Network you are migrating should now appear in between the Parse complete description and the list of files to import. In *Figure 40*, the network name shows as Network: JCHDQTRS.

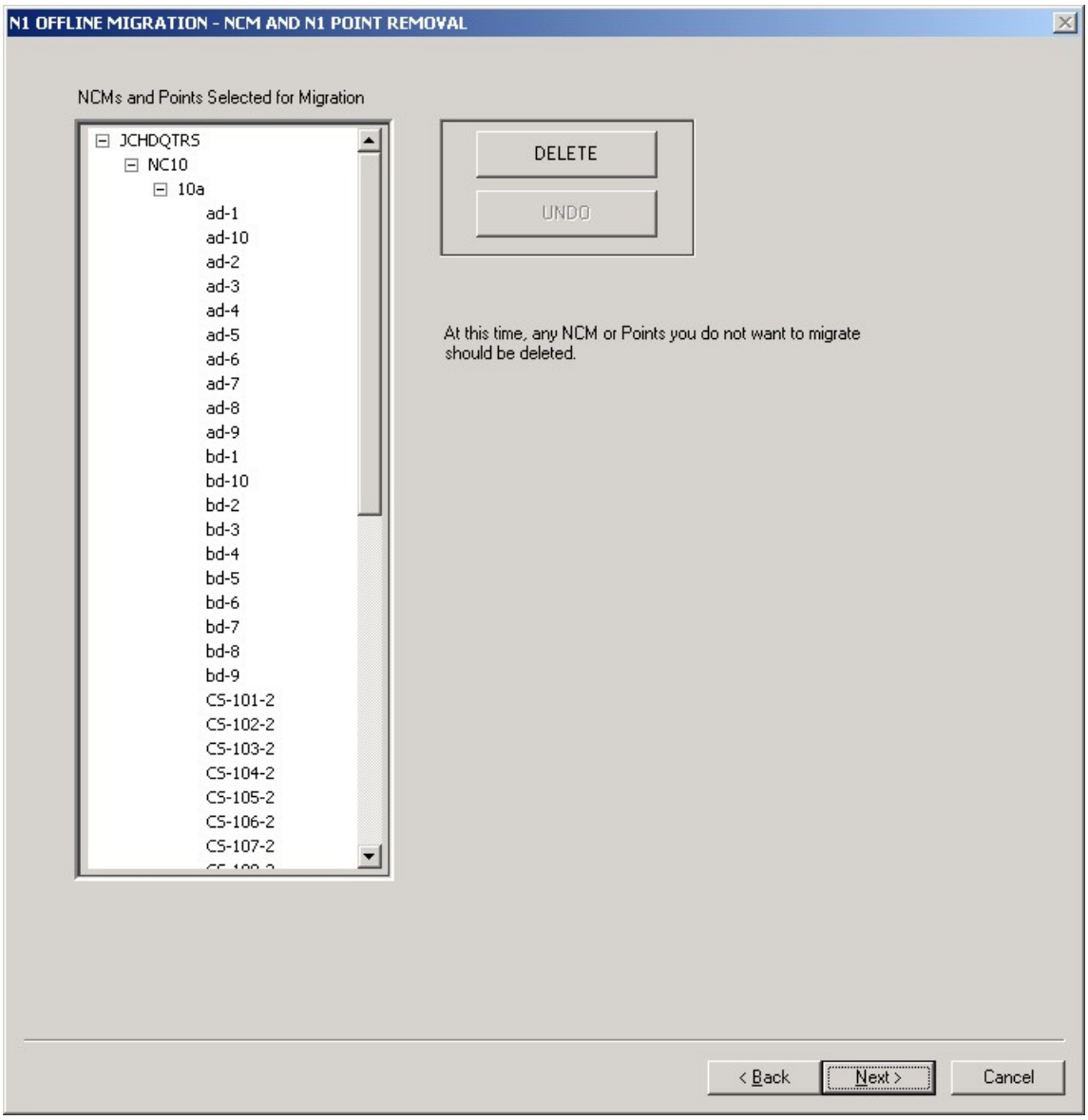
Figure 40: N1 Migration - Parse Complete Screen



4. When parsing is complete, click **OK**. View Status File is enabled. You can view the status file and save it for reference, or add more NC DDL files. You overwrite the status file each time you click Parse. To save a status file, you need to copy and save the file under a different name. The name of the status file is N1MigrationStatus.txt, and the file is located in the C:\N1Migration directory.

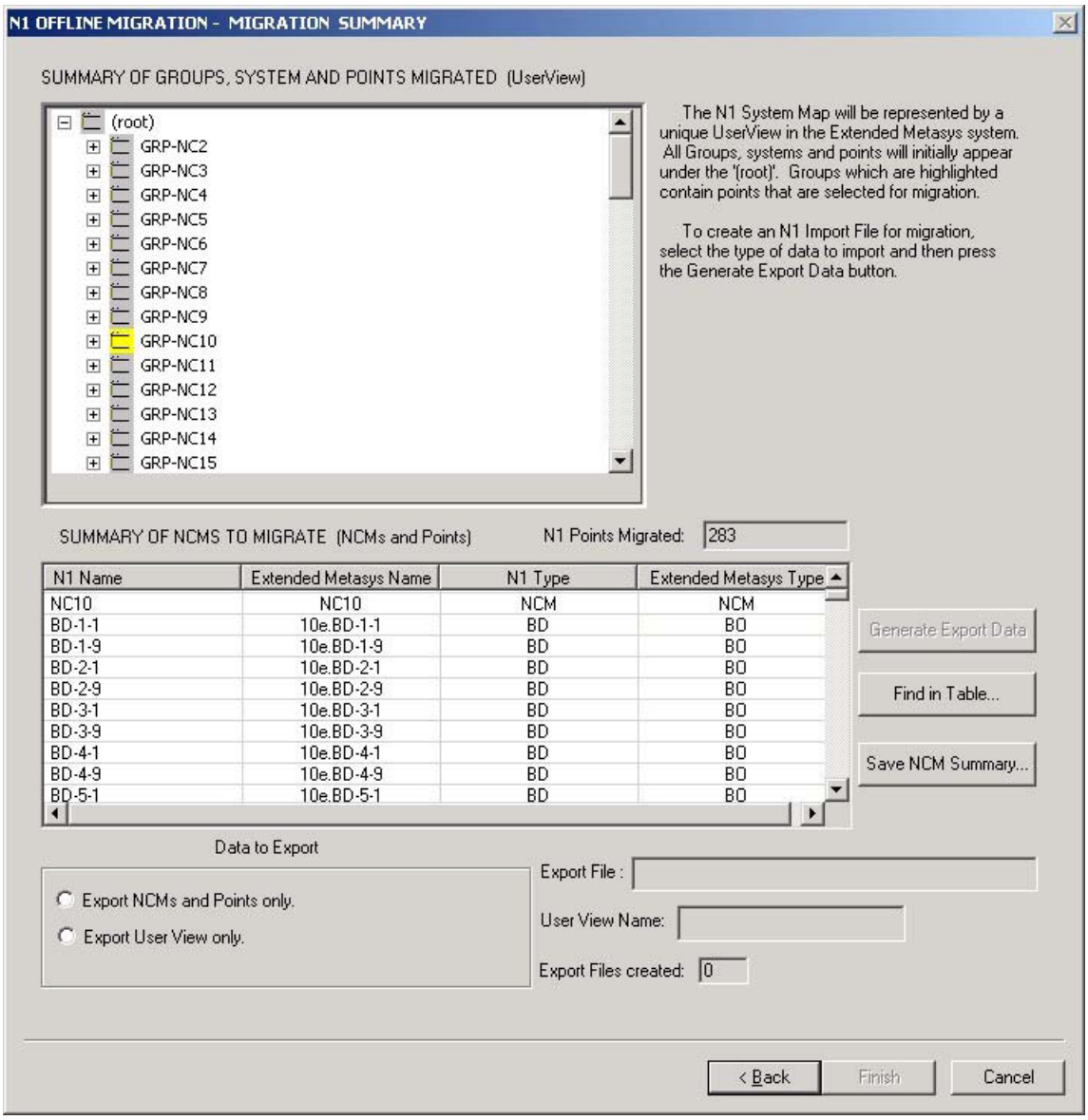
   Note: Importing files that already exist into the Metasys system (for example, if you have already performed a partial migration) causes an error when the files are imported into the Metasys system. If you inadvertently add duplicate files, you must delete duplicate files prior to importing into Metasys system.

Figure 41: N1 Migration - NCM and N1 Point Removal Screen



5. When you have all your NC DDL files and your global file added and parsed, click **Next**. The N1 Migration - NCM and N1 Point Removal screen appears (*Figure 41*).
6. Expand lists of points, systems, and NCMs by clicking **+** signs in the tree. Select the points, systems, and NCMs you do not want to migrate and click **Delete**. There is one level of Undo; you can only undo your most recent action. When you remove a system from this screen, all points beneath it disappear, but the system remains in the user view that this tool generates. Click **Next**. The N1 Offline Migration - Migration Summary screen appears (*Figure 42*).

Figure 42: N1 Migration - Migration Summary Screen



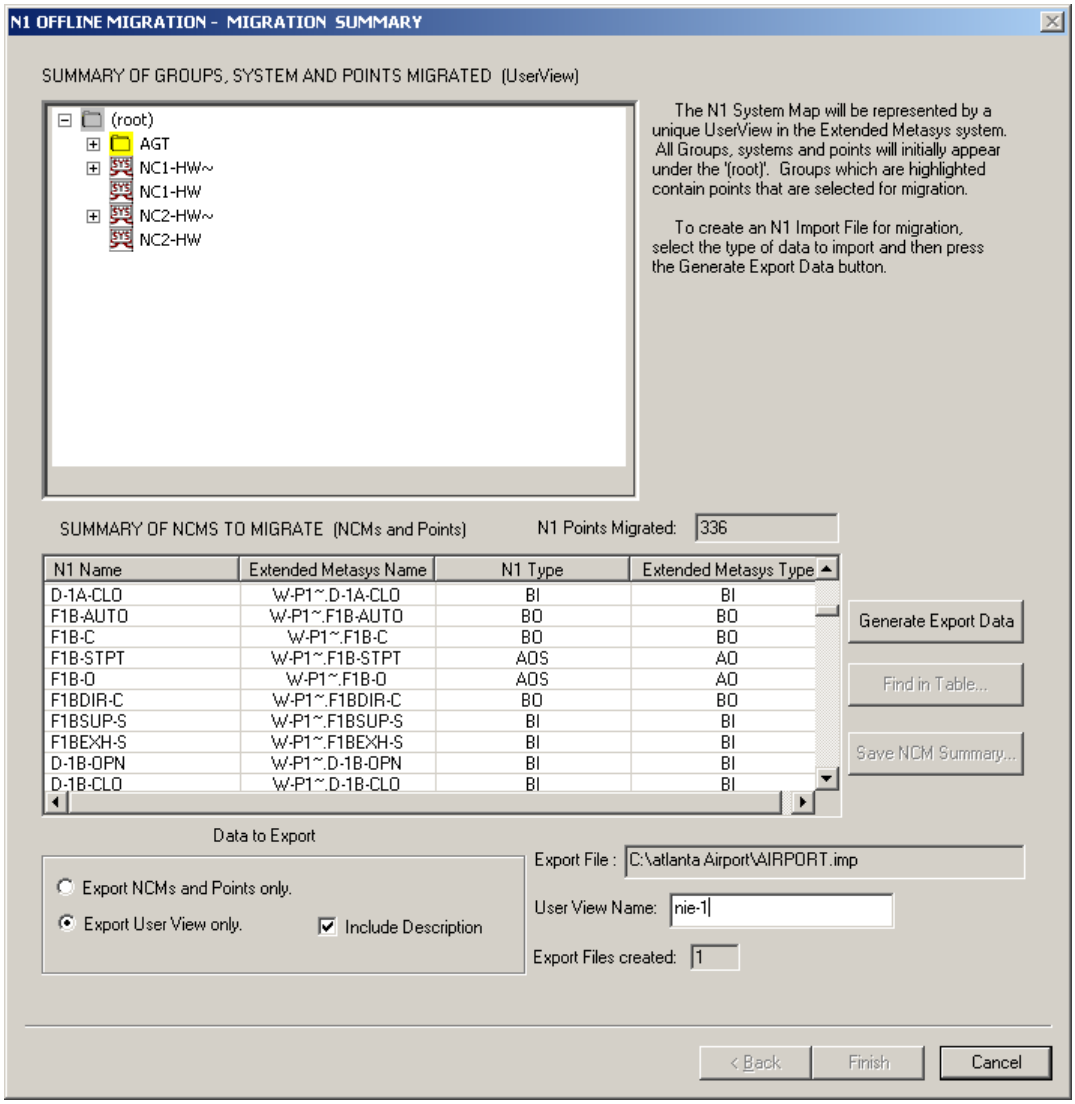
7. Use **Find in Table** to quickly go to a specific NCM or point to verify its existence in the list of NCMs and points to migrate.

   Note: If there are points in a group, the group's folder icon is colored yellow in the Summary of Groups, System, and Point Migrated box at the top of the Migration Summary Screen (*Figure 42*).

8. Select **Export NCMs and Points only** and then click the **Generate Export Data** button. A Save As dialog box appears. Enter the name and location for the point import file.
9. To create a record of the export process, click **Save Summary to File**.

Note: Clicking Cancel exits the N1 Migration Tool. If you Cancel the N1 Migration Tool prior to finishing, all files created during this process are deleted. If you wish to keep the Summary file for planning purposes, you must save a copy before canceling this process.

Figure 43: N1 Migration - Migration Summary Screen



10. Click **Back** to import a different set of DDL files. You need a different point import file for each NIE into which you are mapping NCM points. Each time a new point import file is created, the count of Import files goes up by one. When you click **Finish**, all the files are saved.
11. Remain on the Migration Summary screen and Create a user view using the instructions for the system configuration that you are setting up. See *Creating a User View*.

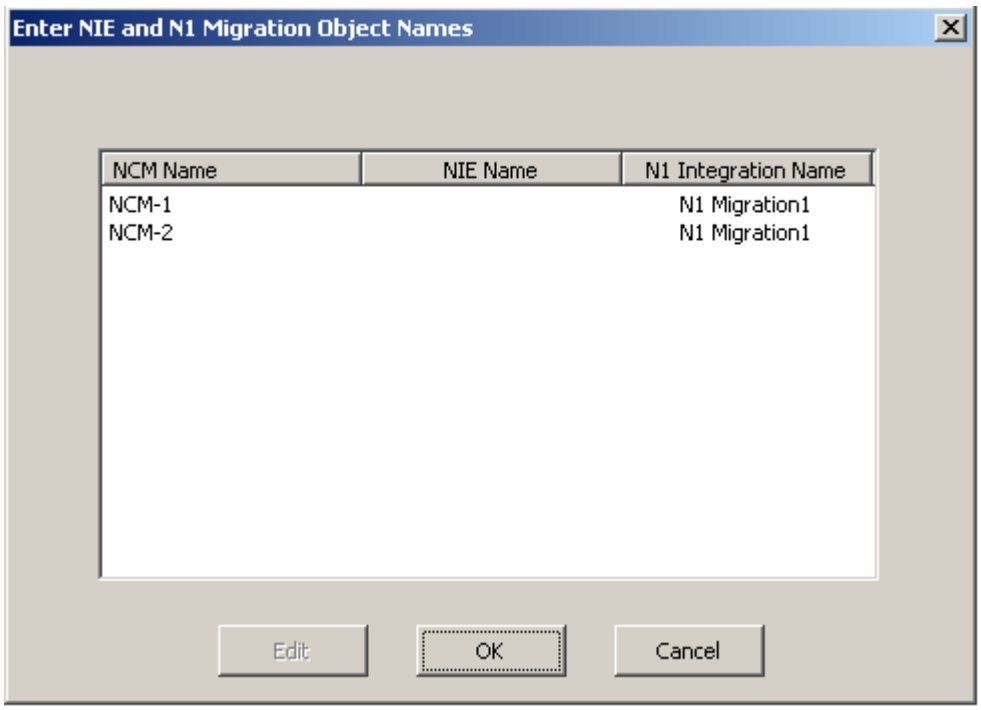
Creating a User View

Generate the point import files prior to creating the user view. See *Creating the Import File Using the N1 Migration Tool*.

1. Select **Export User View only**.
2. Enter a name for the user view.
3. Click the **Generate Export Data** button.

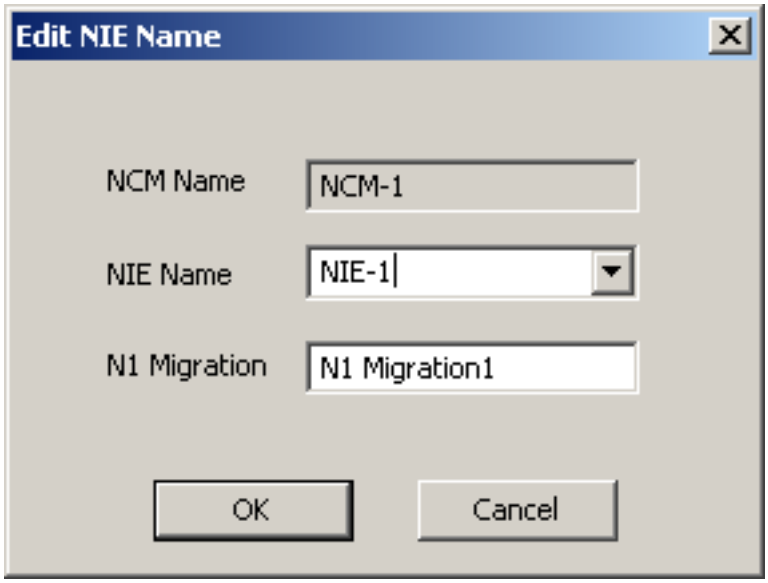
The NIE and N1 Migration Object Names Screen appears. See *Figure 44*. This screen enables the user to assign NCMs to the NIEs before mapping the NCMs to those NIEs.

Figure 44: NIE and N1 Migration Object Names Screen



4. Highlight an NCM and click **Edit**. Enter the name of the NCM to which the NIE is mapped. The Edit NIE Name screen appears. See *Figure 45*.

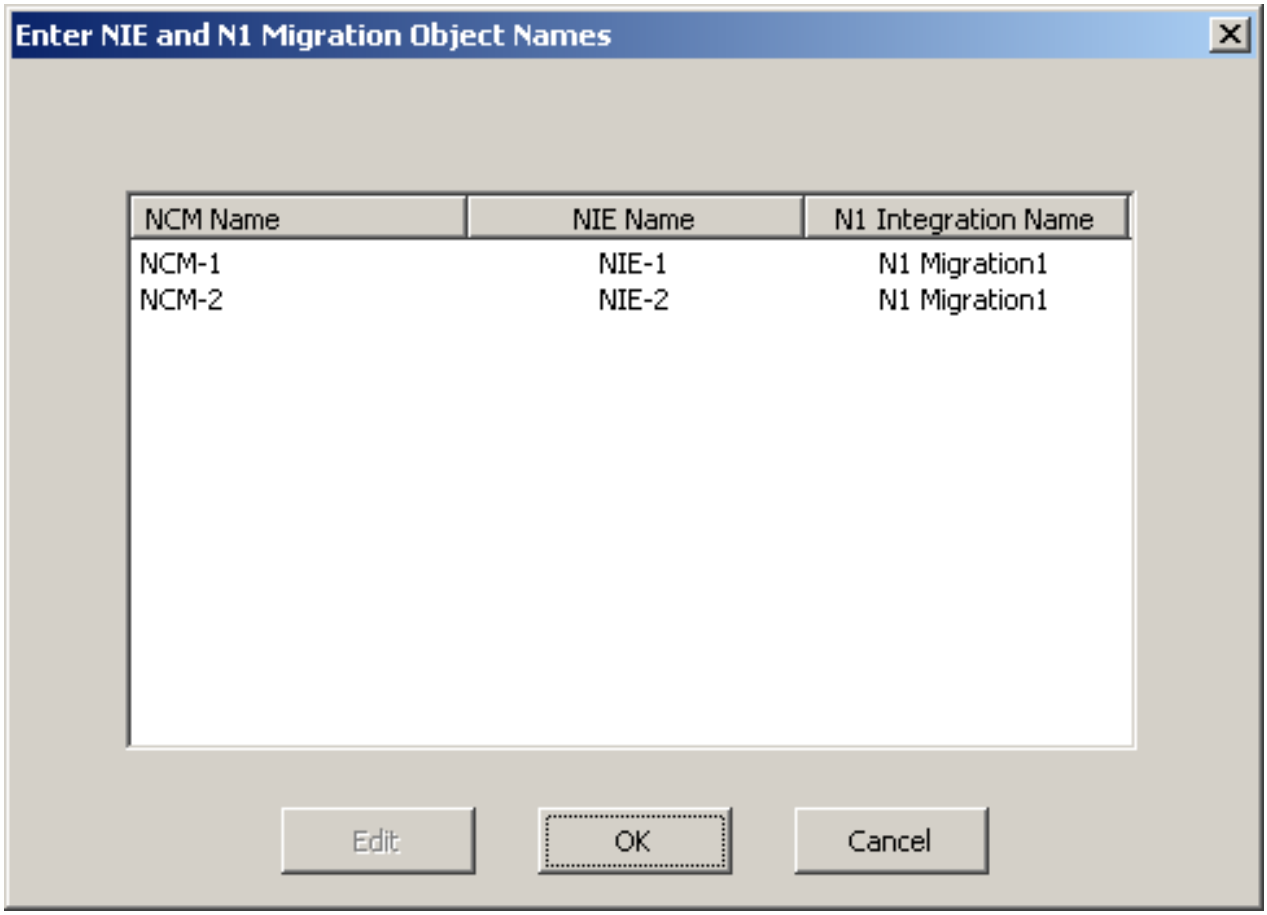
Figure 45: Edit NIE Name Screen



5. Enter the name of the NIE. Click **OK**.

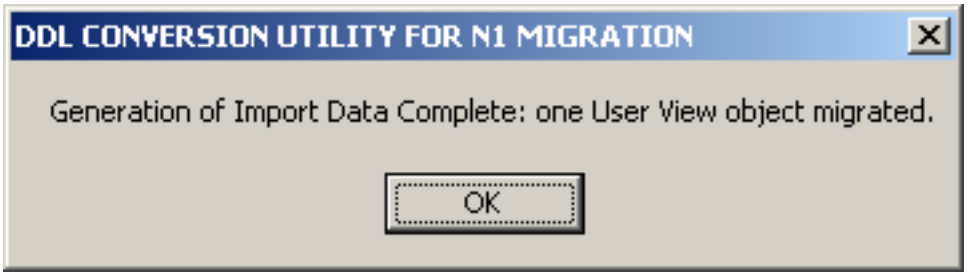
   The NIE and N1 Migration Object Names screen reappears with updated information. See *Figure 46*.

Figure 46: Enter NIE and N1 Migration Object Names



6. Click **OK**.
7. The DDL Conversion Utility for N1 Migration screen appears. See *Figure 47*.

Figure 47: DDL Conversion Utility for N1 Migration Screen



8. Click **OK**.

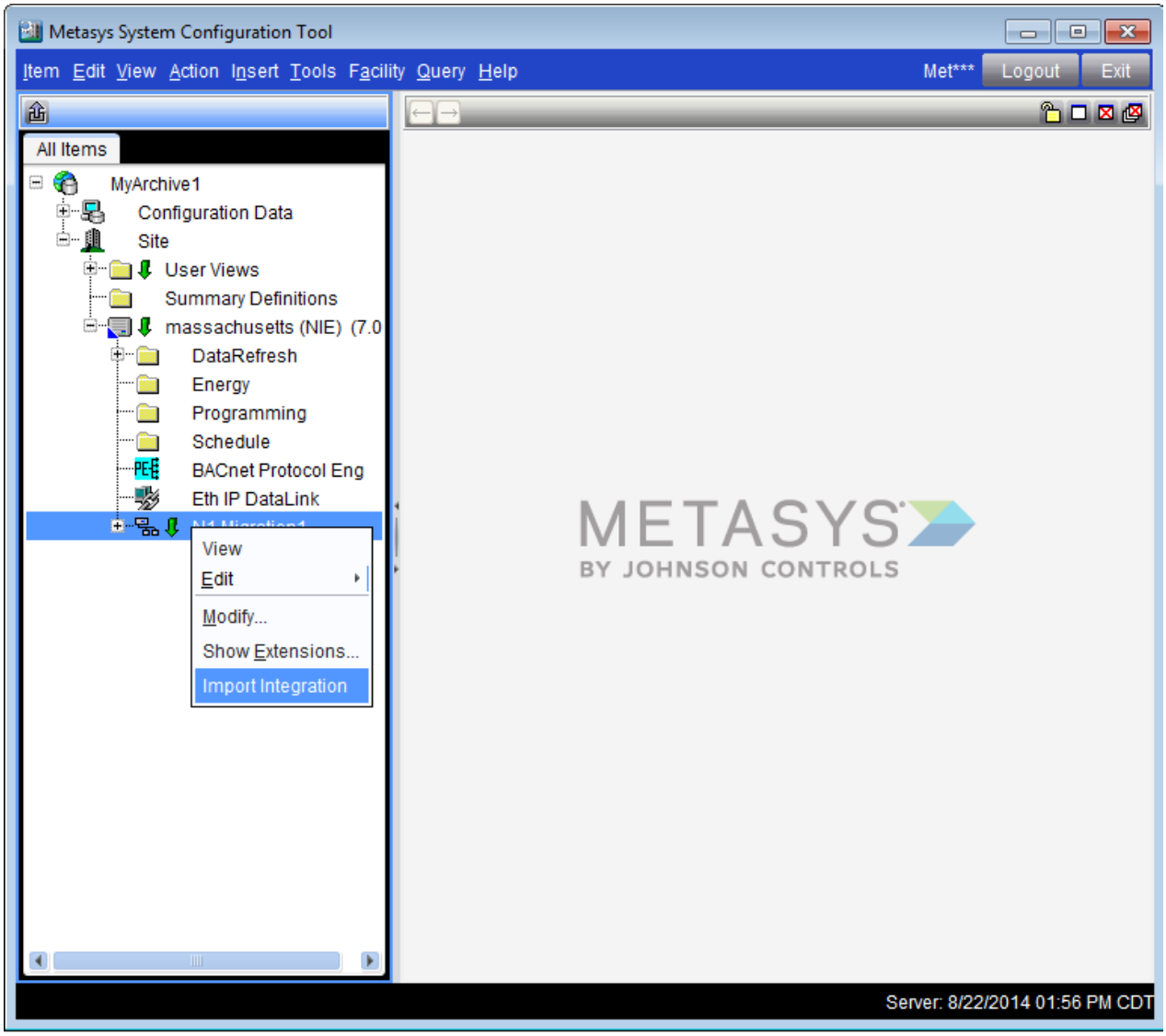
   Repeat this process for each NCM and NIE to be migrated.

Importing the N1 Import File to an NIE Offline in an Archive Database

To import the N1 Import File to an NIE in an archive database:

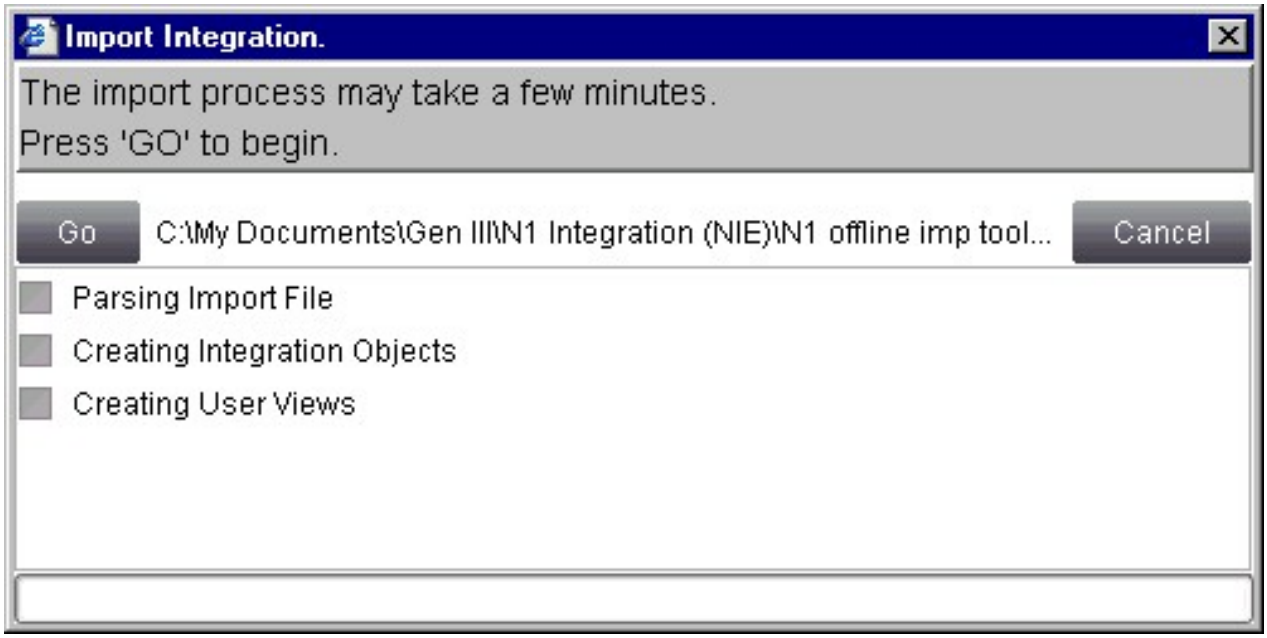
1. In the archive database, select the NIE to which you want to import the N1 import file and right-click the N1 Migration object (*Figure 48*).

Figure 48: Right-Click Menu on N1 Migration Object



2. Select **Import Integration**. The Open file dialog box appears.
3. Navigate to the file you want to import and select **Open**. The Import Integration utility starts (*Figure 49*).

Figure 49: Import Integration Utility



4. Click **Go**. When the Utility finishes importing the file, an Import Completed Successfully message appears. Click **OK**.

   Note: This process should be completed for both the N1 objects import file and the user view import file.

Importing the N1 Point File to an NIE Online

The user view file can only be imported to an NIE that is designated as a Site Director or to an SCT.

To import the N1 file to the NIE:

1. Log in to the NIE UI through a web browser.
2. Navigate to and right-click the N1 Migration object.
3. Select **Import Integration** from the menu that appears. The Open file dialog box appears.

   Note: You can also start the Import Utility integration by selecting Import Integration from the Action menu when the N1 Migration object is selected.
4. Navigate to and select the file you want to import and select **Open**. The Import Integration utility starts (*Figure 49*).
5. Click **Go**. When the utility finishes importing the file, an Import Completed Successfully message appears. Click OK.
6. Complete this process for both the point object files and the user view import file.

Archiving NIE Configuration Files

Use the SCT to archive NIE configuration files.

Troubleshooting

Be sure to configure the Network Name attribute of the N1 Migration. Once you insert the N1 Migration, you cannot edit the Network Name attribute. The workaround is to delete the existing N1 Migration and insert a new N1 Migration ensuring you enter the desired Network Name before completing the Insert Integration Wizard.

Note: Be aware that the Auto Discovery process degrades the performance of applications running at the NCM (such as Trend), as well as any client applications (such as an OWS), which is collecting data.

Fixing Broken References in Imported User View

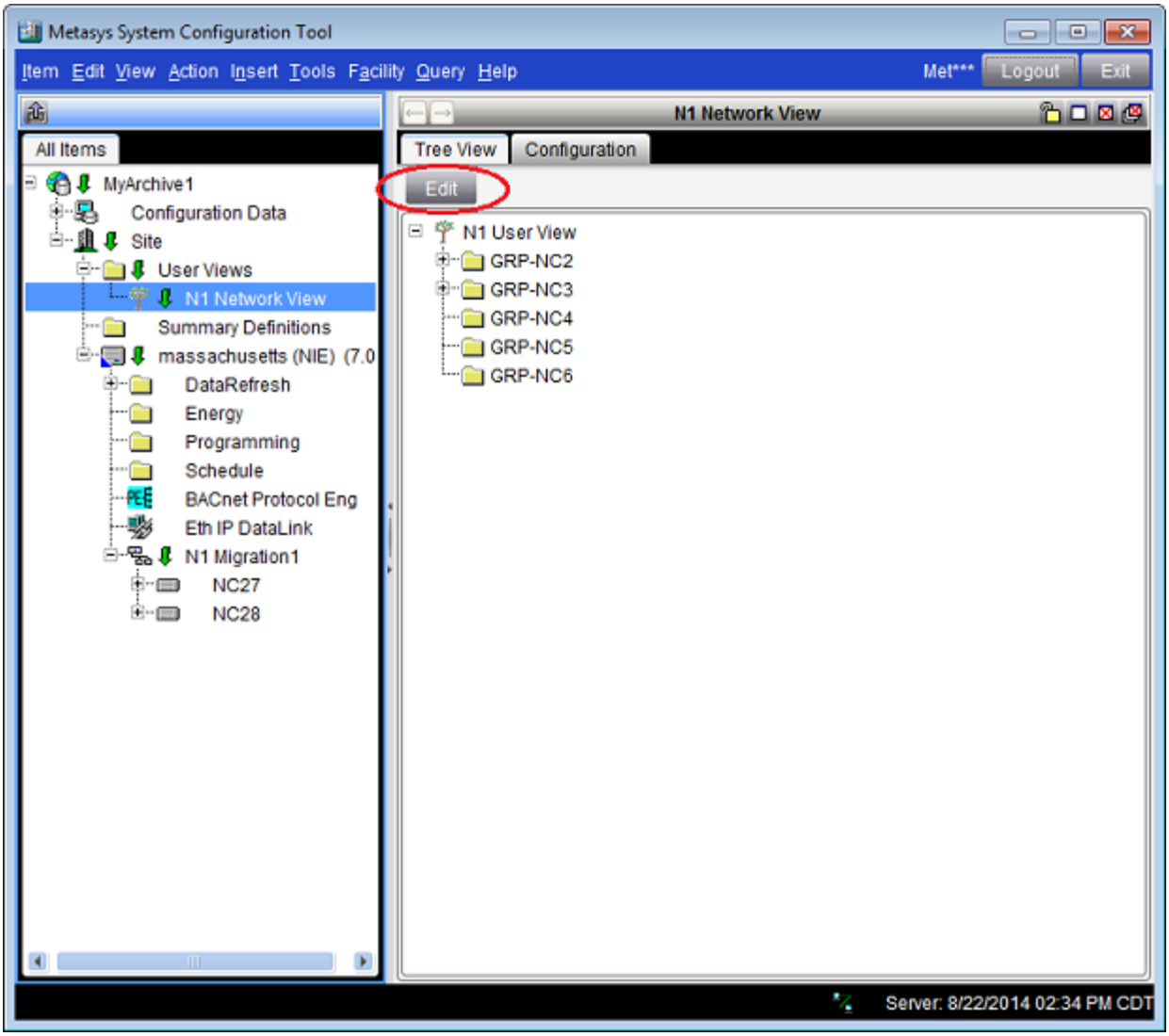
If references are broken in a user view, the points that have bad references produce an **Item not found** error message in the SCT. Broken references can occur if an NCM was assigned to the wrong NIE when the import file was generated.

You can fix these references in the Site Director or on the archive database in the SCT.

To fix broken references in an imported user view:

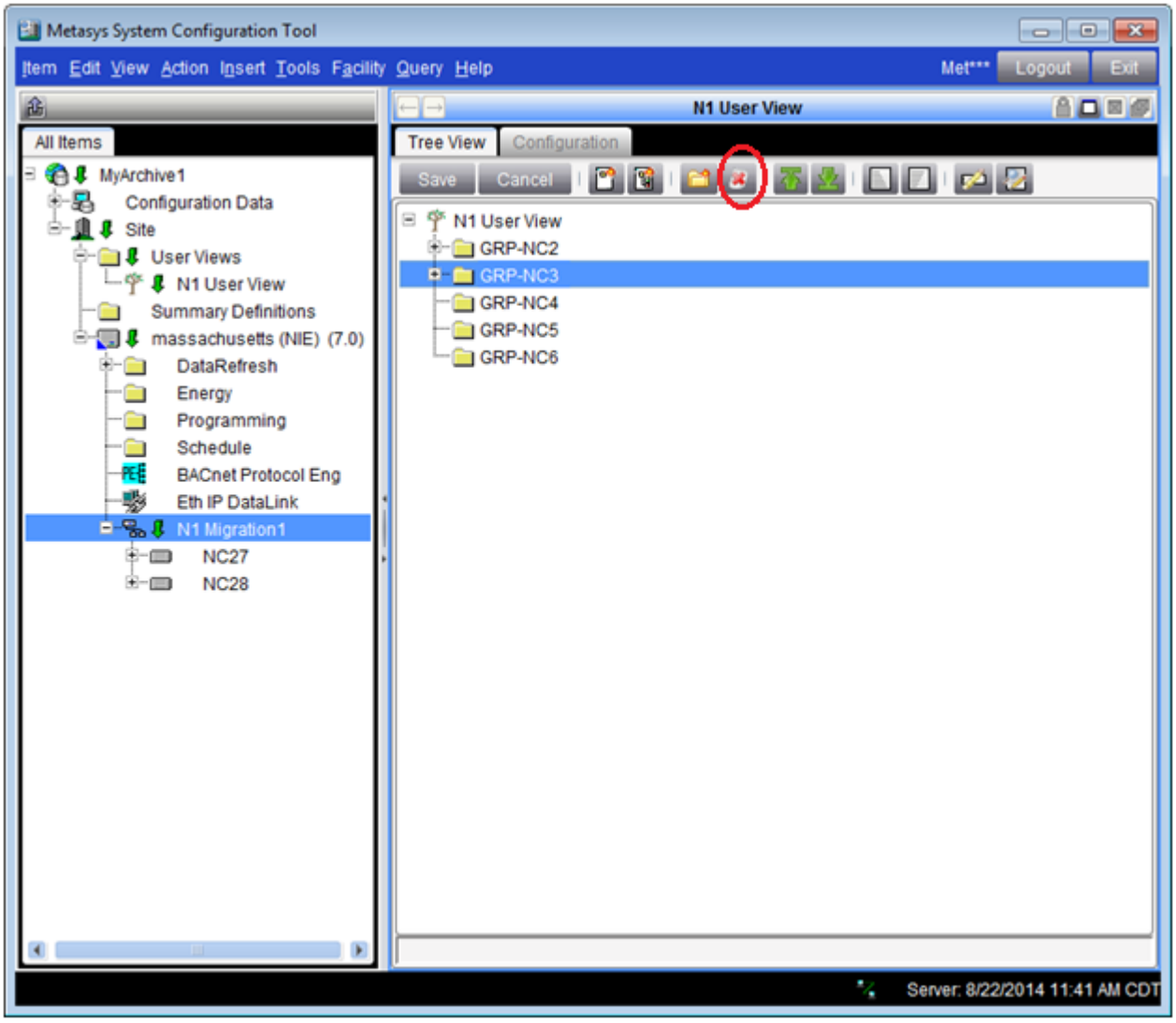
1. Double-click or drag your user view to the right panel of the NIE UI. The tree view of your user view appears.
2. Click **Edit** at the top of the Tree View panel.

Figure 50: User View in SCT with Edit Selection



3. Navigate to a group containing an incorrect reference and select the point.
4. Click the **Remove** icon at the top of the Tree View panel. You can also remove a point by selecting it then pressing **Delete** on your keyboard.

Figure 51: Remove Incorrect Points in User View



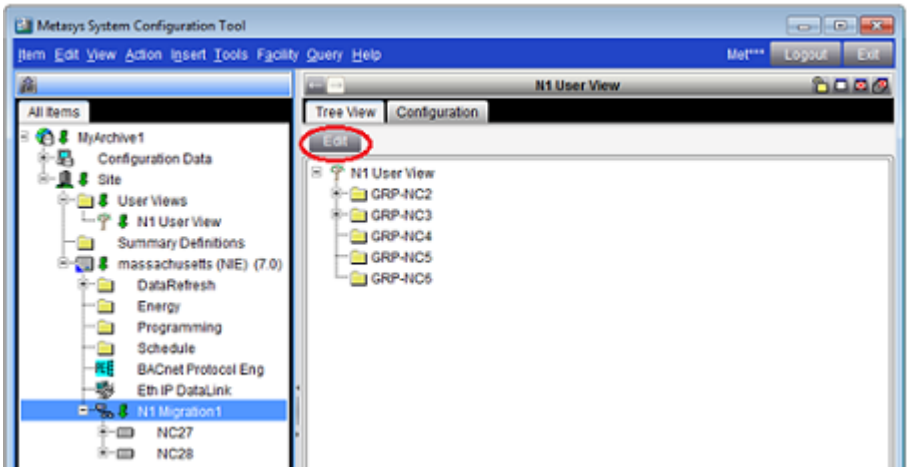
5. When you finish removing references, click **Save** at the top of the Tree View panel.
6. Add correct references using the procedure in the *Editing a User View to Show Points from NCMs Spanning Multiple NIEs* section in this document.

Editing a User View to Show Points from NCMs Spanning Multiple NIEs

To edit a user view to show points from NCMs spanning multiple NIEs:

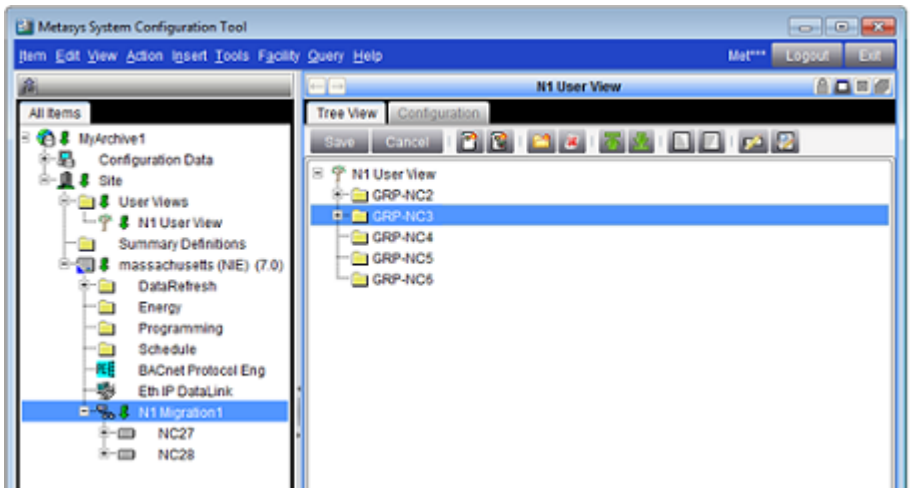
1. In the archive database, navigate to and double-click the user view you want to edit. The tree view appears in the right panel of the screen.
2. Click **Edit** at the top of the Tree View panel.

Figure 52: User View in SCT



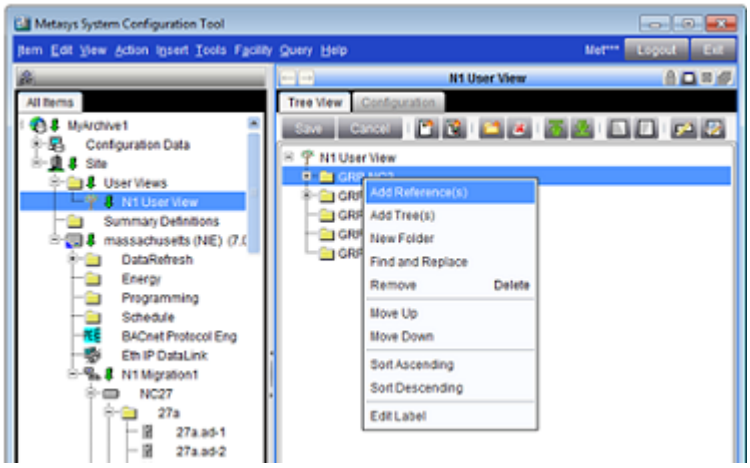
3. Select the NC group that needs reference points from a NIE.

Figure 53: Group Selected in Edit Mode



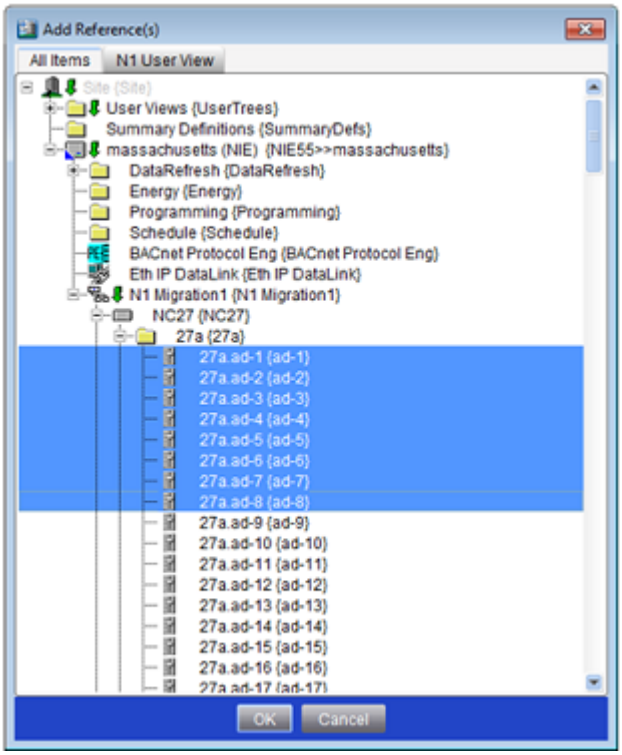
4. Right-click the NC group and click **Add Reference(s)**. Alternatively, you can select the NC group, then select the Add Reference(s) icon at the top of the Tree View panel.

Figure 54: Right-Click Menu Selection



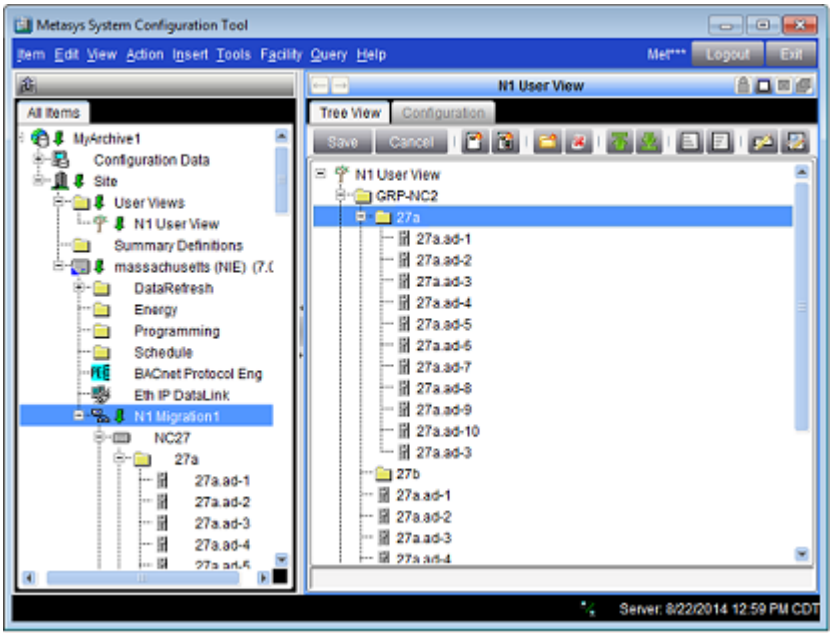
5. The Add Reference(s) window appears. In the Add Reference(s) window, navigate to the correct NIE (stay in the All Items view). Use the **+** and **–** signs to expand and contract groups with points you want to add to the user view.
6. Select the points you want to display in the Tree View panel. You can select multiple points sequentially by using the Shift key, or individually, by using the Ctrl key.

Figure 55: Add Reference(s) Screen with Points Showing in a Group



7. Click OK. You are returned to the user view with the new references added to the group.

Figure 56: User View Screen with Corrected References



8. Right-click your next NC group and continue adding references as needed.
9. When you finish adding references, click **Save** at the top of the Tree View panel.

Note: If you have only edited one or two NCMs, click **Synchronize** to correct the references in the NIE. Otherwise, it is faster to perform a full download to the NIE. Refer to the Metasys SMP Help *(LIT-1201793)* or Metasys SCT Help *(LIT-12011964)* for instructions on using the Load Wizard.

Enabling the Fast Polling Feature

When enabled (set to True), this attribute causes the integration in the NIE to place a system being viewed into a fast polling table. This attribute also places a system into a fast polling table on an object's Focus view. This scenario provides faster updates to objects being viewed in any Metasys system UI. When viewing points from several systems, the Service Time for the NCM increases. Enabling this fast polling feature also affects the NIE service time.

Note: To prevent delays in event reporting due to the fast polling operation, follow the existing report routing guidelines.

Note: The NIE caches data read from each NCM at the rate monitored by the service time. Since applications use the cached values, do not enable the Fast Polling attribute if you are using any applications that require data to be updated within 2 minutes, or twice the normal service time, such as trend.

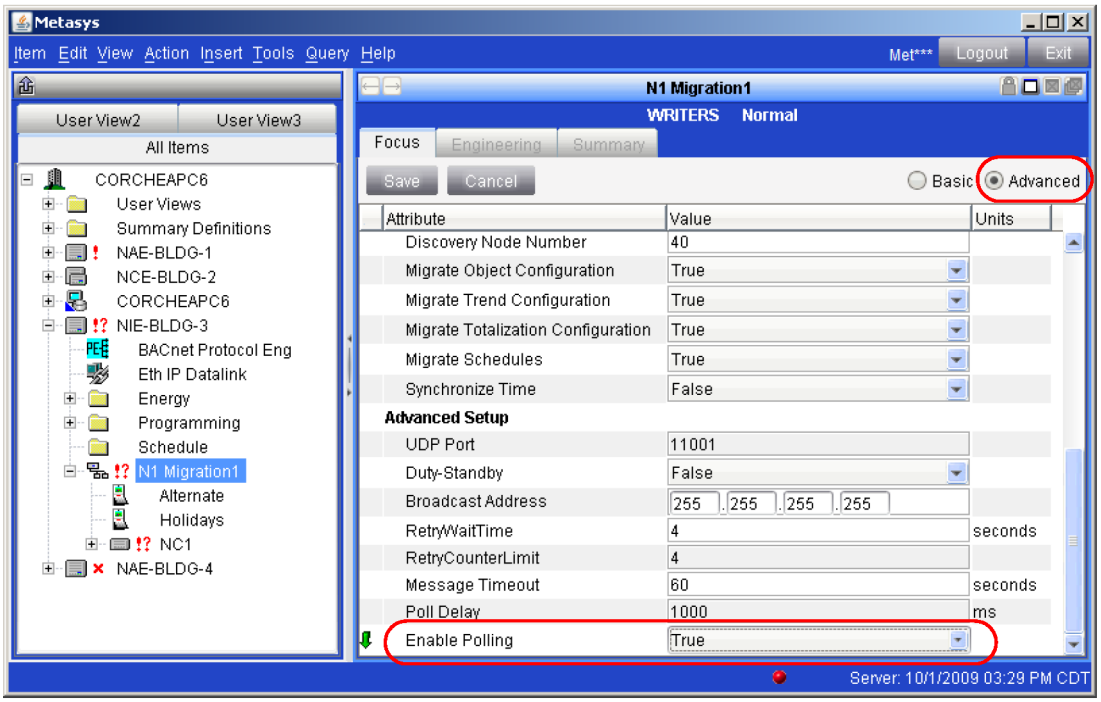
Note: If you have Metasys system applications using polled values (such as Energy Essentials), do **not** enable this fast polling feature.

To enable or disable the fast polling feature:

1. Drag the N1 Migration object from the navigation tree to the display panel.
2. Select **Advanced** to view all the object attributes.
3. Click **Edit** to enter edit mode.

4. Scroll down to Enable Polling, and from the drop-down list select:
   - **True** (to enable fast polling)
   - **False** (to disable fast polling)
5. Click **Save**. Fast polling is now enabled or disabled.

Figure 57: Enable Polling Feature in the Focus View



Resolving No Updates to Input Values

Table 9: Input Values Do Not Update

Symptom	Cause	Solution
Input values do not immediately update when a change of value occurs.	Report Groups are not configured to route reports to the NIE user_app file destination.	Configure the report group set for the object's system to route Critical and Status reports to the NIE user apps destination.
	BI, BD, and MSD objects are not configured with a normal state or with a status or alarm report type.	Configure objects to route status and alarm report types as either STATUS or a CRIT1, CRIT2, CRIT3, or CRIT4 type.
	BO and MSO objects do not route reports to the NIE when commanded from processes at the NCM or from a PMI workstation.	Consider using a feedback point to monitor critical BO operation.

Improving Slow, Stalled, or Failed Auto Discovery

Use the information in *Table 10* to assist in diagnosing and solving Auto Discovery problems.

Table 10: Troubleshooting a Slow, Stalled, or Failed Auto Discovery Process

Symptom	Cause	Solution
The Auto Discovery process is slow, stalled, or has failed.	N1 Migration Message Timeouts are slowing the Auto Discovery process.	Increase the N1 Migration Message Timeout attribute value to 63 seconds on all person-machine interface (PMI) workstations and NIEs.
	Out of sequence message handling is slowing the Auto Discovery process.	For improved performance, we strongly recommend you upgrade all NCMs to the latest version of software available.
	Multiple NIE Auto Discoveries are running at the same time.	Run only one NIE Auto Discovery at a time. Wait for the current NIE Auto Discovery to finish completely before starting a new Auto Discovery.
	The Import File for points does not match the database in the NCM (missing point[s]).	Create an Import File of the current NCM database.
	M-Series workstations are online while an Auto Discovery is in progress. • Graphics with a large file size can cause long upload times. • System is busy polling many objects configured with many trends or points.	Ensure that all M-Series workstations are offline while an Auto Discovery is in progress. • Reduce the file size of the graphics. Always reduce graphics to the smallest file size possible. • Perform the Auto Discovery during off-peak times, and non-critical times.
The NCM4500 continuously restarts during the startup procedure.	Too many VMA devices are configured on one NCM4500 (over 63 devices).	Install the NCM45x0 Quick Patch 12.04k. After installing the Quick Patch, increase the amount of acquired memory as documented in the Change Verification Report (CVR) for this Quick Patch. This issue is reported in *Flash Sheet: NCM45x0 Quick Patch 12.04k Now Available (LIT-2008F26).*
The NIE crashes shortly after discovering and mapping points.	A GIO object has been viewed by a user before the object has been initalized.	• Upgrade to Release 5.2.11 or later. or • Wait at least 20 minutes prior to viewing newly discovered GIO objects and archive your NIE prior to discovering another NCM.

Improving NIE Performance When Migrating S2 NC Objects

Use the information in *Table 11* to help improve NIE performance when migrating S2 NC objects.

Table 11: Improving NIE Performance When Migrating S2 NC Objects

Symptom	Cause	Solution
The Analog Output (AO) values are not immediately updated at the Site Management Portal after a command is issued. Instead, the value is updated within the NIE service time.	The NCM waits for the command response from the S2 device prior to updating the current value of the AOS object.	Send the command a second time to force an immediate second read.
		Decrease the NIE service time by decreasing the poll delay while ensuring that the S2 NCM percent idle does not fall below 60%.

Improving NIE Performance When Monitoring GIO Point Attributes

Table 12: Improving NIE Performance When Monitoring GIO Point Attributes

Symptom	Cause	Solution
The NIE service time for every NCM increases when monitoring GIO objects.	Polling for GIO Point Attributes interrupts the polling for object values. There is no way to tune the polling rate for these objects.	Upgrade your NIE to Release 5.2.11.200 or later. Once your NIE is upgraded, overall service time improves. You can further improve performance by tuning the CSG poll rate, which is accomplished by increasing the value of the N1 integration object's poll delay. For each NCM device with a poll delay set to zero, set the NCM device poll delay to match the N1 integration object poll delay. Then increase the N1 Integration poll delay by 1,000 milliseconds at a time, until the average service time is acceptable while ensuring that the collection time for the CSG points is also acceptable. To estimate the time to poll for CSG object data, multiply the total number of CSG objects being polled by the NIE times the N1 intergration object's poll delay and round up 2 to 5 seconds per N2 device. **Note:** If this is not acceptable to the site, consider migrating these devices to an NAE.

Appendix: Object Mapping Tables

Object Mapping

Table 13 shows how objects from a Metasys N1 Network are mapped to a Metasys system network.

Table 13: Object Mapping

N1 Network Object	Maps to Metasys System (NIE) as:
ACM	N1 PC
AI	AI
AO	AO
AD	AO
BI	BI
BO	BO
BD	BO
MSI	MI
MSO	MO
MSD	MO
CS	GIO
MC	MO
PIDL	N1 PID Loop

Important: To avoid a potential NIE crash when mapping CS objects as GIO objects using the Auto Discovery wizard on the NIE, wait 20 minutes before viewing the newly mapped GIO objects.

Object Configuration

When migrating an object configuration, the attributes are read from the object in the Metasys N1 Network and written to the corresponding Metasys system object as described in *Table 14*.

Table 14: Configuration Migration

Metasys System Object Configuration Attribute Name/Type	Metasys N1 Network Attribute Variable/Type	Notes
DESCRIPTION_ATTR	NAME_ATTR	
Note 1 and 4	UNITS_ATTR	Metasys N1 Network analog
Note 2 and 3 and 4	UNIT_0_ATTR	Metasys N1 Network binary or multistate
Note 2 and 3 and 4	UNIT_1_ATTR	Metasys N1 Network binary or multistate
Note 3 and 4	UNIT_2_ATTR	Metasys N1 Network multistate
Note 3 and 4	UNIT_3_ATTR	Metasys N1 Network multistate
NUMBER_OF_STATES_ATTR	STATES_ATTR	Metasys N1 Network multistate

Table 14: Configuration Migration

Metasys System Object Configuration Attribute Name/Type	Metasys N1 Network Attribute Variable/Type	Notes
DISPLAY_PRECISION_ATTR	FORMAT_ATTR	Metasys N1 Network analog
REFERENCE_ATTR	HW_SYSTM_ATTR and HW_OBJCT_ATTR	Metasys N1 Network hardware system object

1 The N1 Migration attempts to match the analog unit read from the Metasys N1 Network system (including the PIDL object) with a unit enumeration number from the UNIT_ENUM_SET.
2 The N1 Migration attempts to match the units with a unit enumeration number from the TWOSTATE_ENUM_SET for binary objects.
3 The N1 Migration attempts to match the units with a unit enumeration number from the MULTISTATE_ENUM_SET for binary objects.
4 If a match with the enum set is not possible, the retrieved units are appended to the DESCRIPTION_ATTR of the Metasys system object, and the units are defaulted (binaries - OFFON_ENUM_SET, analogs - NO_UNITS, multistates - STATES_ENUM_SET).

Alarm Configuration Analogs

When migrating an Analog object configuration, the alarm configuration attributes are read from the Metasys N1 Network system, and a Metasys system analog alarm extension object is created as described in *Table 15*.

Table 15: Alarm Configuration Migration for Analog Objects

Metasys System Object Configuration Attribute Name/Type	Metasys N1 Network Attribute Variable/Type	Notes
LOW_ALARM_LIMIT_ATTR	LO_LIMIT_ATTR	
HIGH_ALARM_LIMIT_ATTR	HI_LIMIT_ATTR	
WARNING_REFERENCE_ATTR	SETPOINT_ATTR	
LOW_WARNING_OFFSET_ATTRHIGH_WARNING_OFFSET_ATTR	NORMBAND_ATTR	Low and high are written as one-half of normal band.
DIFFERENTIAL_ATTR	DIFF_ATTR	
REPORT_DELAY_ATTR	DELAY_ATTR	
NORM_ACK_REQUIRED_ATTR	NOR_RPT_ATTR	If Crit1, 2, 3, or 4, set Metasys system attribute to True.
OFFNORM_ACK_REQUIRED_ATTR	WARN_RPT_ATTR	If Crit1, 2, 3, or 4, set Metasys system attribute to True.
FAULT_ACK_REQUIRED_ATTR	ALR_RPT_ATTR	If Crit1, 2, 3, or 4, set Metasys system attribute to True.
ALARM_MESSAGE_TEXT_ATTR	ALR_MSG_ATTR	Read Metasys N1 Network text from the number.

Alarm Configuration Binaries/Multistates

When migrating a Binary/Multistate object configuration, the alarm configuration attributes are read from the Metasys N1 Network system, and a Metasys system multistate alarm extension object is created as described in *Table 16*.

Table 16: Alarm Configuration for Binary and Multistate Objects

Metasys System Object Configuration Attribute Name/Type	Metasys N1 Network Attribute Variable/Type	Notes
NORMAL_STATE_ATTR	NOR_COND_ATTR	
REPORT_DELAY_ATTR	DELAY_ATTR	
NORM_ACK_REQUIRED_ATTR	NOR_RPT_ATTR	If Crit1, 2, 3, or 4, set Metasys system attribute to **True**.
OFFNORM_ACK_REQUIRED_ATTR	WARN_RPT_ATTR	If Crit1, 2, 3, or 4, set Metasys system attribute to **True**.
FAULT_ACK_REQUIRED_ATTR	ALR_RPT_ATTR	If Crit1, 2, 3, or 4, set Metasys system attribute to **True**.
ALARM_MESSAGE_TEXT_ATTR	ALR_MSG_ATTR	Read Metasys N1 Network text from the number.
NUMBER_OF_STATES_ATTR	STATES_ATTR	Number of states set to **2** for Metasys N1 Network binaries.

Trend

Table 17 shows the configuration of a Trend extension. The trend is **not deleted in the NCM** and continues to run. If the trend is modified in either the Metasys N1 Network system or the Metasys system, the changes are **not reflected** in the other system. The migration occurs **only** at the Metasys system object addition. The Trend enable or disable default is determined by the Metasys N1 Network system default.

Table 17: Trend Migration

Metasys System Trend Object Configuration Attribute Name/Type	Metasys N1 Network Trend Configuration Variable/Type	Notes
Buffer_Size/Unsigned16	nc_samples/Unsigned 8	Number of samples both 1 – 5000
Log_Interval/Unsigned32	sample_int/Unsigned 16	NCM times are in minutes; Network Control Engine (NCE) values are in seconds.
Input_Reference/Structure	ATT_NUMBER	Convert to reference (match as best you can the attribute number).

Point History

Note: If you want to mimic Point History using Trend extensions in the NIEs, be aware that each extension you add in the Metasys system counts as an object.

Note: Before adding Trend extensions for Point Histories, consider whether Point Histories are needed in the migrated Metasys system.

If the Metasys N1 Network object's HISTORY_ATTR is true, a Metasys system Trend configured as follows is created. Point History is migrated as a Metasys system event trend, similar to Trend Migration, with fixed parameters as listed in *Table 18*.

Table 18: Point History Migration

Metasys System Trend Object Configuration Attribute Name/Type	Metasys N1 Network Point History Configuration Variable/Type	Notes
Buffer_Size/Unsigned16	48 or 10	NCM has 48 samples for AI, ACM, and AD; 10 for all others.
Log_Interval/Unsigned32	0 for binaries/multistates1800 seconds for analogs	Set the trend to be Change of Value (COV)-based for binaries/multistates. Set the trend to be sampled every 30 minutes for analogs.
Input_Reference/Structure	/system object name. PRESENT_VALUE_ATTR	Convert to reference (match as best you can the attribute number).

Totalizations

Table 19, *Table 20*, *Table 21*, and *Table 22* describe Totalization Migration. The totalization is **not deleted in the NCM** and continues to run. If the totalization is modified in either the Metasys N1 Network system or Metasys system system, the changes are **not reflected** in the other system. The migration occurs **only** on Metasys system object addition.

Table 19 depicts the migration of an Analog Totalization. *Table 20* depicts the migration of an Event Totalization. *Table 21* depicts the migration of a Pulse Totalization, and *Table 22* depicts the migration of a Runtime Totalization.

Table 19: Analog Totalization Migration

Metasys System Analog Totalization Object Configuration Attribute Name/Type	Metasys N1 Network Analog Totalization Configuration Variable/Type	Notes
Input_Reference/Structure	\system\object\attr_name/char[ ]	Convert to reference (match as best you can the attribute number).
Rollover Limit/Double	limit/Float	
Units/Enumeration	display_units/char[7]	Match the Metasys N1 Network unit as best you can.
Low_Cutoff_Value/Float	low_cutoff/Float	
TimeBase/Enumeration	time_scale/Float	
ScaleFactor/Float	display_scale/Float	
RollOver/Boolean	TRUE	
Present Value		Read current Totalization value from Metasys N1 Network and set.
Add Analog Alarm object	Report type	Is Crit1-4 or status
FAULT_ACK_REQUIRED_ATTR	Report type	If Crit1, 2, 3, or 4, set Metasys system attribute to True in analog alarm object.
Alarm Message text	ALARM_MSG_#	Read Metasys N1 Network text from the number and save in alarm object.

Note: The Metasys N1 Network period parameter is not mappable to Metasys system totalization.

Table 20: Event Totalization Migration

Metasys System Event Totalization Object Configuration Attribute Name/Type	Metasys N1 Network Event Totalization Configuration Variable/Type	Notes
Input_Reference/Structure	\system\object\attr_name/char[ ]	Convert to reference (match as best you can the attribute number).
Rollover Limit/Double	limit/Float	
Units/Enumeration	display_units/char[7]	Match the Metasys N1 Network unit as best you can.
Reference/Enum	total_state/int	
Value_Per_Pulse/Float	1	
Scale_Factor/Float	1	
Transitions/Enumeration	0	
RollOver/Boolean	TRUE	
Present Value		Read current Totalization value from Metasys N1 Network and set.
Add Analog Alarm object	Report type	Is Crit1-4 or status
FAULT_ACK_REQUIRED_ATTR	Report type	If Crit1, 2, 3, or 4, set Metasys system attribute to True in analog alarm object.
Alarm Message text	ALARM_MSG_#	Read Metasys N1 Network text from the number and save in alarm object.

Note: The Metasys N1 Network period parameter is not mappable to Metasys system totalization.

Table 21: Pulse Totalization

Metasys System Event Totalization Object Configuration AttributeName/Type	Metasys N1 Network Pulse Totalization ConfigurationVariable/Type	Notes
Executing/Enumeration	started/BYTE	
Input_Reference/Structure	\system\object\attr_name/char[ ]	Convert to reference (match as best you can the attribute number).
Totalize Limit/Double	limit/Float	
Units/Enumeration	display_units/char[7]	Match the Metasys N1 Network unit as best you can.
Reference/Enum	total_state/int	
Value_Per_Pulse/Float	pulse_constant/Float	
Scale_Factor/Float	display_scale/Float	
Transitions/Enumeration	1	
RollOver/Boolean	TRUE	
Present Value		Read current Totalization value from Metasys N1 Network and set.
Add Analog Alarm object	Report type	Is Crit1-4 or status
FAULT_ACK_REQUIRED_ATTR	Report type	If Crit1, 2, 3, or 4, set Metasys system attribute to True in analog alarm object.
Alarm Message text	ALARM_MSG_#	Read Metasys N1 Network text from the number and save in alarm object.

Note: The Metasys N1 Network period parameter is not mappable to Metasys system totalization.

Table 22: Runtime Totalization Migration

Metasys System Event Totalization Object Configuration Attribute Name/Type	Metasys N1 Network Runtime Totalization Configuration Variable/Type	Notes
Input_Reference/Structure	\system\object\attr_name/char[ ]	Convert to reference (match as best you can the attribute number).
Rollover Limit/Double	limit/Float	
Units/Enumeration	boolean_units/char[7]	Match the Metasys N1 Network unit as best you can.
Reference/Enum	total_state/int	
Scale_Factor/Float	1	
RollOver/Boolean	TRUE	
Present Value		Read current Totalization value from Metasys N1 Network and set.
Add Analog Alarm object	Report type	Is Crit1-4 or status
FAULT_ACK_REQUIRED_ATTR	Report type	If Crit1, 2, 3, or 4, set Metasys system attribute to True in analog alarm object.
Alarm Message text	ALARM_MSG_#	Read Metasys N1 Network text from the number and save in alarm object.

Note: The Metasys N1 Network period parameter is not mappable to Metasys system totalization.

Appendix: Metasys N1 Network to Metasys System Feature Comparison

Table 23 compares features from the N1 Network Metasys System to the Metasys system features and provides some tips on performing certain tasks in the new system. Additional details on feature migration are contained in this appendix when indicated.

Table 23: Metasys System to Metasys System Feature Comparison

N1 Network Features	Metasys System Support on N1 Network System	Notes
Commands	Through Mapped Objects as listed in *Object Mapping*.	
Summaries	Through Basic Monitoring and Commanding for Mapped Objects, and an equivalent to the Metasys N1 Network standard summary though the engineering view natively	
Report Router	Alarm and Event on Mapped Objects	See *Adding Alarm Extensions to Objects*.
Calendar/Holiday		See *Calendar Migration*.
Command Scheduling		See *Schedule Migration*.
Summary Scheduling	Future release of Metasys system	
Global Alarm Indicator	Global Status indicator	
PC Groups	User Views (Import of global DDL to automatically generate these views)	
Password	System Security	
Totalization	Migrated as described in *Appendix: Object Mapping Tables*.	
Point History	Migrated as described in *Appendix: Object Mapping Tables*.	
Trend	Migrated as described in *Appendix: Object Mapping Tables*.	
Online Database Generation	None	OWS required
NC Upload/Download	None	OWS required
DDL/UNDDL	None	OWS required
JC-BASIC	None	OWS required
Online Diagnostics	Statistical data through Migration and NCM objects	
Direct-Connect PC	None	OWS functionality
Dial-Up PC	None	OWS functionality
Fast Trend	None	
N1 Trend Collector	None	
GPL	None	OWS required
Demand Limiting, Load Rolling	DLLR	The ACM object at an NCM cannot be used with Metasys system.
Objects	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	
Multistate	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	
DSC8500 Snapshot	None	
Database Save/Restore	None	OWS required

Table 23: Metasys System to Metasys System Feature Comparison

N1 Network Features	Metasys System Support on N1 Network System	Notes
Maintenance Management	None	
BASIC Digital Control Module (DCM)	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	
PIDL Algorithm in the DCM	None	Used for PIDL on Metasys system. Attributes in NIE55/85s are Setpoint, Feedback, and Value.
Lighting Controller	None	
Alarm Messages	Alarm and Event, on Mapped Objects	
Node Manager	None	
Network Terminal (NT)	None	
JC/85 Gateway	None	
Access Control System	None	
Fire System	None	
Transaction Log	Audit Trails	
Operator Terminal (OT)	None	
Ethernet Router	Supported as access point to ARCNET NCMs	
System 9100	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	
Network Port	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	
N2 Dialer Module (NDM)	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	NDMs can be commanded to connect and disconnect via Control System (CS) objects in the NCM that are mapped as GIO objects within the NIE. Refer to *Appendix C: Using Metasys CS Objects with an NDM* in the *N2 Dialer Module (NDM) Technical Bulletin (LIT-6363065)* for information on using the CS object to command the NDM.
N2E Trunk	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	
LonWorks Network Devices	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	
LonWorks Network Trunk	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	
Duty/Standby NCM	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	

Table 23: Metasys System to Metasys System Feature Comparison

N1 Network Features	Metasys System Support on N1 Network System	Notes
BASIC Expansion Point Module (XM)	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	
L2 Interface	None	
BASIC ASC	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	
Metalink	None	OWS required
Metasys Telephone Interface	None	OWS required
Custom Summaries	None	
MetaPage® Software	Metasys system pager destinations in alarm and event feature	OWS required
Metasys Remote Server	None	OWS required
NCM-VMA Interface	Support is limited to the mappable objects that are listed in *Object Mapping*, and in the associated engineering views for those objects.	for VMA 1400s/1600s, N2, and MS/TP

Appendix: Command Priorities for NCM and NIE

Table 24 through *Table 37* contain the command priorities for the NCM and NIE objects. For more information on NCM objects, refer to the appropriate object technical bulletin. For more information on NIE objects, refer to the *Object Help* section of the *Metasys SMP Help (LIT-1201793)* or *Metasys SCT Help (LIT-12011964)*.

Table 24: Analog Input (N1-AI)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			OVERRIDE	N/A	N/A
In Service			AUTO	N/A	N/A
Write Attribute of "Present Value"		1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	N/A	N/A	N/A
Release "Present Value"		1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	N/A	N/A	N/A

Table 25: Analog Output (N1-AOD)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			N/A	N/A	N/A
In Service			N/A	N/A	N/A
Operator Override		8	OVERRIDE	1	GATEWAY
Release Operator Override		8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	1, 2, 3, 4, 5, 6, 7, 8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	9, 10, 11, 12, 13, 14, 15	RELEASE	2	Reverts to previous value
Release All			N/A	N/A	N/A
Adjust		16	SET_AOD	2	GATEWAY
Write Attribute of "Present Value"		1, 2, 3, 4, 5, 6, 7, 8	OVERRIDE	1	GATEWAY
Write Attribute of "Present Value"		9, 10, 11, 12, 13, 14, 15	SET_AOD	2	GATEWAY

Table 26: Analog Output (N1-AOS)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			N/A	N/A	N/A
In Service			N/A	N/A	N/A
Operator Override		8	OVERRIDE	1	GATEWAY
Release Operator Override		8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	1, 2, 3, 4, 5, 6, 7, 8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	9, 10, 11, 12	RELEASE	2	Reverts to previous value
Release "Present Value"	Release	13, 14, 15	RELEASE3	3	Reverts to previous value
Release All			REL_ALL	3	Reverts to previous value
Adjust		16	SET_AOS	3	GATEWAY
Write Attribute of "Present Value"		1, 2, 3, 4, 5, 6, 7, 8	OVERRIDE	1	GATEWAY

Table 26: Analog Output (N1-AOS)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Write Attribute of "Present Value"		9, 10, 11, 12	SET_AOS	2	GATEWAY
Write Attribute of "Present Value"		13, 14, 15, 16	SET_AOS	3	GATEWAY

Table 27: Analog Output (N1-AD)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			N/A	N/A	N/A
In Service			N/A	N/A	N/A
Operator Override		8	OVERRIDE	1	GATEWAY
Release Operator Override		8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	1, 2, 3, 4, 5, 6, 7, 8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	9, 10, 11, 12	RELEASE	2	Reverts to previous value
Release "Present Value"	Release	13, 14, 15, 16	N/A	N/A	N/A
Release All			N/A	N/A	N/A
Adjust		16	SET_AD	3	GATEWAY
Write Attribute of "Present Value"		1, 2, 3, 4, 5, 6, 7, 8	OVERRIDE	1	GATEWAY
Write Attribute of "Present Value"		9, 10, 11, 12	SET_AD	2	GATEWAY
Write Attribute of "Present Value"		13, 14, 15, 16	SET_AD	3	GATEWAY

Table 28: Binary Input (N1-B1)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			OVERRIDE	N/A	N/A
In Service			AUTO	N/A	N/A
Release "Present Value"		1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	N/A	N/A	N/A
Write Attribute of "Present Value"		1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	N/A	N/A	N/A

Table 29: Binary Output (N1-BO)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			N/A	N/A	N/A
In Service			N/A	N/A	N/A
Operator Override		8	OVERRIDE	3	GATEWAY
Release Operator Override		8	AUTO	3	Reverts to previous value
Release "Present Value"	Release	1	REL_PRI	1	Reverts to previous value
Release "Present Value"	Release	2	REL_PRI	2	Reverts to previous value

Table 29: Binary Output (N1-BO)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Release "Present Value"	Release	3, 4, 5, 6, 7, 8	AUTO	3	Reverts to previous value
Release "Present Value"	Release	9, 10	REL_PRI	4	Reverts to previous value
Release "Present Value"	Release	11, 12	REL_PRI	5	Reverts to previous value
Release "Present Value"	Release	13	REL_PRI	6	Reverts to previous value
Release "Present Value"	Release	14, 15	REL_PRI	7	Reverts to previous value
Release All			REL_ALL	8	N/A
State 0 or State 1		16	MAN_STRT or MAN_STOP	8	GATEWAY
Write Attribute of "Present Value"		1	START or STOP	1	GATEWAY
Write Attribute of "Present Value"		2	START or STOP	2	GATEWAY
Write Attribute of "Present Value"		3, 4, 5, 6, 7, 8	OVERRIDE	3	GATEWAY
Write Attribute of "Present Value"		9, 10	START or STOP	4	GATEWAY
Write Attribute of "Present Value"		11, 12	START or STOP	5	GATEWAY
Write Attribute of "Present Value"		13	START or STOP	6	GATEWAY
Write Attribute of "Present Value"		14, 15	START or STOP	7	GATEWAY
Write Attribute of "Present Value"		16	MAN_STRT or MAN_STOP	8	GATEWAY

Table 30: Binary Output (N1-BD)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			N/A	N/A	N/A
In Service			N/A	N/A	N/A
Operator Override		8	OVERRIDE	1	GATEWAY
Release Operator Override		8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	1, 2, 3, 4, 5, 6, 7, 8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	9, 10, 11, 12, 13	RELEASE	2	Reverts to previous value
Release "Present Value"	Release	14, 15, 16	N/A	N/A	N/A
Release All			N/A	N/A	N/A
State 1 or State 2		16	SET_BD	3	GATEWAY
Write Attribute of "Present Value"		1, 2, 3, 4, 5, 6, 7, 8	OVERRIDE	1	GATEWAY
Write Attribute of "Present Value"		9, 10, 11, 12, 13	SET_BD	2	GATEWAY
Write Attribute of "Present Value"		14, 15, 16	SET_BD	3	GATEWAY

Table 31: Generic Input/Output (N1-CS)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Operator Override		8	OVERRIDE	1	GATEWAY
Release Operator Override		8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	1, 2, 3, 4, 5,6, 7, 10, 11, 12, 13, 14, 15	N/A	N/A	N/A
Release "Present Value"	Release	8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	9, 16	Release	3	Reverts to previous value
Release All			N/A	N/A	N/A
Adjust/Set state		9, 16	STCSMS_CMD STCSAN_CMD STCSBN_CMD	3	OPERATOR
Write Attribute of "Present Value"		8	OVERRIDE	1	GATEWAY
Write Attribute of "Present Value"		1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	N/A	N/A	N/A
Write Attribute of "Present Value"	9, 16	9, 16	STCSMS_CMD STCSAN_CMD STCBN_CMD	3	GATEWAY

Table 32: Multistate Input (N1-MSI)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			OVERRIDE	N/A	N/A
In Service			AUTO	N/A	N/A
Release "Present Value"		1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	N/A	N/A	N/A
Write Attribute of "Present Value"		1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	N/A	N/A	N/A

Table 33: Multistate Output (N1-MSO)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			N/A	N/A	N/A
In Service			N/A	N/A	N/A
Operator Override		8	OVERRIDE	3	GATEWAY
Release Operator Override		8	AUTO	3	Reverts to previous value
Release "Present Value"	Release	1	REL_PRI	1	Reverts to previous value
Release "Present Value"	Release	2	REL_PRI	2	Reverts to previous value
Release "Present Value"	Release	3, 4, 5, 6, 7, 8	AUTO	3	Reverts to previous value
Release "Present Value"	Release	9, 10	REL_PRI	4	Reverts to previous value
Release "Present Value"	Release	11, 12	REL_PRI	5	Reverts to previous value

Table 33: Multistate Output (N1-MSO)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Release "Present Value"	Release	13	REL_PRI	6	Reverts to previous value
Release "Present Value"	Release	14, 15	REL_PRI	7	Reverts to previous value
Release All			REL_ALL	8	N/A
State 0, 1, 2, 3		16	SET_MSO	8	GATEWAY
Write Attribute of "Present Value"		1	SET_MSO	1	GATEWAY
Write Attribute of "Present Value"		2	SET_MSO	2	GATEWAY
Write Attribute of "Present Value"		3, 4, 5, 6, 7, 8	OVERRIDE	3	GATEWAY
Write Attribute of "Present Value"		9, 10	SET_MSO	4	GATEWAY
Write Attribute of "Present Value"		11, 12	SET_MSO	5	GATEWAY
Write Attribute of "Present Value"		13	SET_MSO	6	GATEWAY
Write Attribute of "Present Value"		14, 15	SET_MSO	7	GATEWAY
Write Attribute of "Present Value"		16	SET_MSO	8	GATEWAY

Table 34: Multistate Output (N1-MSD)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			N/A	N/A	N/A
In Service			N/A	N/A	N/A
Operator Override		8	OVERRIDE	1	GATEWAY
Release Operator Override		1, 2, 3, 4, 5, 6, 7, 8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	9, 10, 11, 12, 13	RELEASE	2	Reverts to previous value
Release "Present Value"	Release	14, 15, 16	N/A	N/A	N/A
Release All			N/A	N/A	N/A
State 0, 1, 2, 3		16	SET_MSD	3	GATEWAY
Write Attribute of "Present Value"		1, 2, 3, 4, 5, 6, 7, 8	OVERRIDE	1	GATEWAY
Write Attribute of "Present Value"		9, 10, 11, 12, 13	SET_MSD	2	GATEWAY
Write Attribute of "Present Value"		14, 15, 16	SET_MSD	3	GATEWAY

Table 35: Pulse Counter (N1-ACM)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Preset Counter			N/A	N/A	N/A

Table 36: Multiple Command (N1-MC)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			N/A	N/A	N/A
In Service			N/A	N/A	N/A
Operator Override		8	OVERRIDE	1	GATEWAY
Release Operator Override		8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	1, 2, 3, 4, 5, 6, 7, 8	AUTO	1	Reverts to previous value
Release "Present Value"	Release	9, 10, 11, 12, 13, 14, 15, 16	RELEASE	2	N/A
Release All			RELEASE	2	N/A
State 0, 1, 2, 3		16	SET_MC	3	GATEWAY
Write Attribute of "Present Value"		1, 2, 3, 4, 5, 6, 7, 8	OVERRIDE	1	GATEWAY
Write Attribute of "Present Value"		9, 10, 11, 12, 13	SET_MC	2	GATEWAY
Write Attribute of "Present Value"		14, 15, 16	SET_MC	3	GATEWAY

Table 37: PID Loop (N1-PIDL)

Migration Object Command	NIE Command	NIE Priority	NCM Command	NCM Priority	N1 Feature ID
Out of Service			N/A	N/A	N/A
In Service			N/A	N/A	N/A
Operator Override		8	OVERRIDE	1	GATEWAY
Release Operator Override		8	AUTO	1	Reverts to previous value
Release "Setpoint"	Release	1, 2, 3, 4, 5, 6, 7, 8	AUTO	1	Reverts to previous value
Release "Setpoint"	Release	9, 10, 11, 12, 13	RELEASE	2	Reverts to previous value
Release "Setpoint"	Release	14, 15, 16	N/A	N/A	N/A
Release All			N/A	N/A	N/A
Adjust		16	SET_PIDL	3	GATEWAY
Write Attribute of "Setpoint"		1, 2, 3, 4, 5, 6, 7, 8	OVERRIDE	1	GATEWAY
Write Attribute of "Setpoint"		9, 10, 11, 12, 13	SET_PIDL	2	GATEWAY
Write Attribute of "Setpoint"		14, 15, 16	SET_PIDL	3	GATEWAY

Note: Refer to the *PID Loop Objects Technical Bulletin (Order No. 636-100)* for information on implementing the Value attribute of the PIDL object.