ASPECT®

Nexus™ & Facility™

Hardware Installation Guide

AMERICAN AUTO-MATRIX®
A Cylon Energy Inc. Company

Aspect Nexus™ and Aspect Facility™ Hardware Installation Guide

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SECTION 1
HARDWARE INSTALLATION

The following provides mounting, wiring and installation of Aspect Nexus and Aspect Facility. Please read through this document carefully before beginning the installation procedure.

1.1 INTRODUCTION

Unpack your Aspect Nexus and Aspect Facility hardware and inspect the contents of the package for damaged or missing items. Included in this package, you should find the following items:

- Aspect Nexus and Aspect Facility Appliance
- Aspect Nexus and Aspect Facility QuickStart Guide

1.1.1 TOOLS REQUIRED

The following tools and supply may be required for installation:

- Slotted 2.5 mm precision screwdriver- for power and field-bus connectors
- 1/8" hex key- to fasten the cover
- Wire-strippers - for terminating EIA-485 connections and power connections

1.1.2 SAFETY PRECAUTIONS

NOTE

All equipment must be installed in accordance with NEC and local codes. For more information on local codes, please check state/local regulations in your area.

CAUTION

Ensure that this product is installed in an operating environment where the ambient temperature does not exceed the maximum rated ambient temperature of the unit.

WARNING

Ensure ALL Ethernet Network Interface Connections (i.e. RJ-45) are never attached to Public Telephone Server Provider Sources.

1.1.3 Static Discharge Precautions

WARNING

Follow the precautions provided specific to static discharge.

Static discharge can produce voltages high enough to damage electronic components. The microprocessor and associated circuitry within this product are sensitive to static discharge. Follow these precautions while working with the product in both installed and un-installed modes.

. Work in static free environments
. Discharge any static electricity you may have accumulated by touching a known, securely grounded object.

1.1.4 Miscellaneous Precautions

NOTE

Do not apply this product to aerospace systems, mainline communication systems, nuclear power control systems or medical equipment involved in life support that require high reliability and safety, as it is not intended for such use or application.

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, persuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radion communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTE

Batteries on the Aspect Nexus and Aspect Facility are not designed to be user replacable. Return the Nexus to American Auto-Matrix when in need of a replacement.

1.2 PRODUCT MOUNTING

This product ships with an approved enclosure consistent with most electrical standards and regulations. The product is intended for indoor applications only and should be installed in a location that is dry, and free from excessive dust, vibration, and electrical interference. Mount the product in a location that allows clearance for ease of wiring and service. Use the two keyhole-style screw holes located on the back of the enclosure for assistance with mounting.

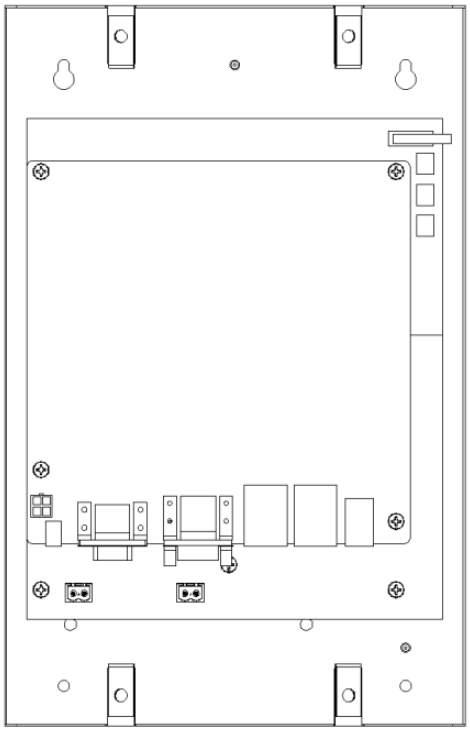

Figure 1-1 Aspect Nexus and Aspect Facility

1.2.1 ENCLOSURE COVER

The enclosure cover of the Nexus controller is designed to be removed for servicing the device. The cover is removed by unscrewing the 4 hex head screws in the cover then sliding the cover vertically before pulling it away from the base. Care should be taken when removing the cover on a mounted unit to prevent it from being dropped and damaging the cover or harming the user.

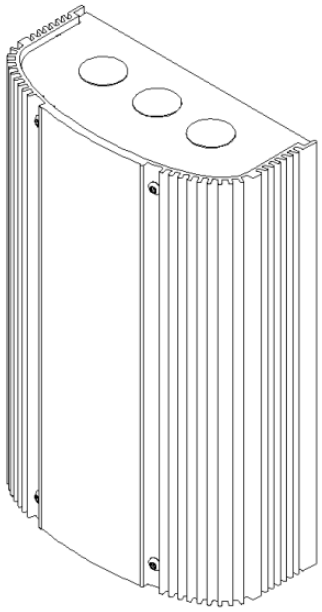

Figure 1-2 Aspect Nexus and Aspect Facility Cover

1.3 HARDWARE LAYOUT

Below is an illustration of the hardware layout of the Aspect Nexus and Aspect Facility. The device includes connection ports for main power, EIA-485 connectivity, and Ethernet connectivity.

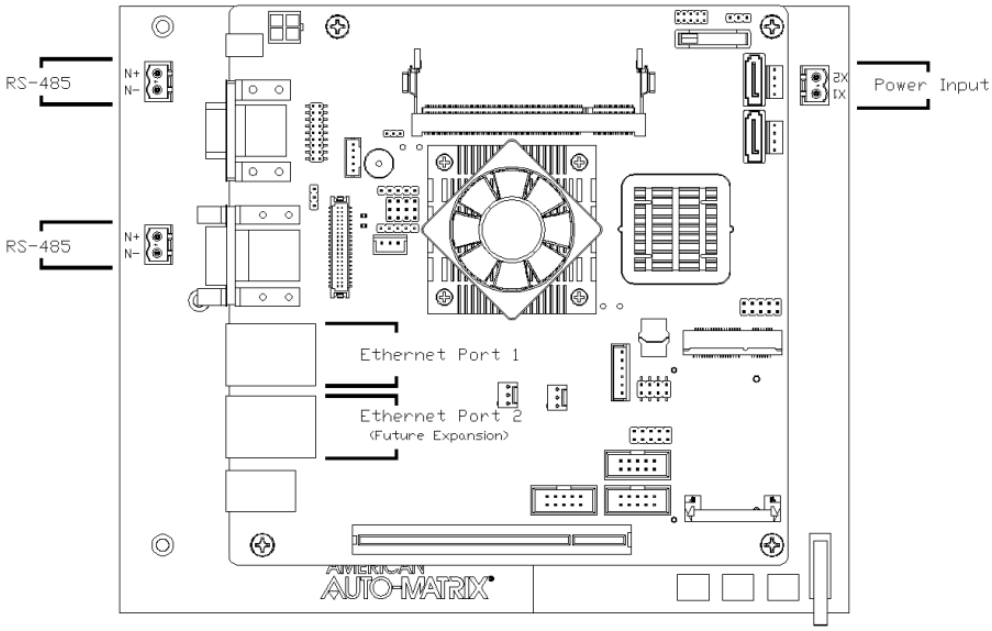

Figure 1-3 Hardware Layout

1.3.1 UNUSED PORTS

The motherboard of Aspect Nexus and Aspect Facility controller contains 3 RS-232 serial ports, 3.5mm audio ports, and a DC support port. These ports contain no field functionality, but are reserved for future functionality.

1.3.2 POWER REQUIREMENTS

This product requires a transformer capable of providing 24VAC power to the Aspect Nexus and Aspect Facility. Use a UL listed Class 2, 24VAC transformer.

To connect power to the product, use the supplied two-position terminal plug. The output leads from the transformer should be connected to the terminal plug. The terminal plug should then be connected into the socket on the board. American Auto-Matrix recommends using 18AWG cable for power wiring.

WARNING

Do not share the power source for the Aspect Nexus and Aspect Facility with other devices. Damage to the product as a result of improper power and wiring will void product warranty.

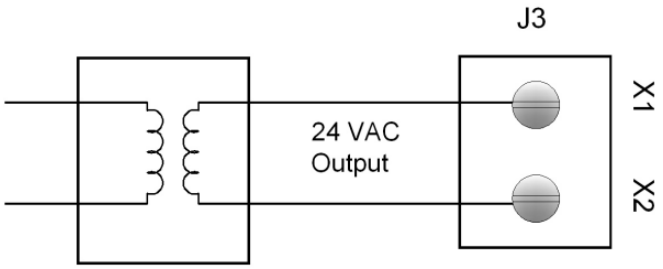

Figure 1-4 Power Connection

1.3.3 LED Indication

The PCB of the product includes diagnostic LEDs, providing user feedback when power has been connected to the device. When power is connected, the LEDs should be illuminated. The power diagnostic LEDs are located along the edge of the board.

1.4 Communication Connections

Communication connections made to device should be made with care. To avoid any possible conflict with existing network communications, it is recommended that communication port and network configuration of the device be performed prior to connecting the product to any associated field bus network.

1.4.1 Ethernet Network

Ethernet is a high-speed LAN widely used in commercial buildings. The main Ethernet network interface is located on the motherboard of the product directly next to the serial RS-232 ports. A second Ethernet connection, located next to the audio ports, is not active for use at this time.

The on-board Ethernet network interface supports 10Base-T (10Mbps), 100Base-T (100Mbps) and 1000Base-T(gigabit) Ethernet connections. The product will automatically switch to 100Base-T operations if other devices and cabling connected to the same subnetwork support this.

1.4.1.1 Cable Type and Length

Use an approved Category 5 (CAT5) Ethernet patch cable with RJ-45 plugs to connect the product to an Ethernet switch or hub. Use professionally manufactured cables to assure transmission rates and reliability between devices. Maximum length for Category 5 is typically limited to about 320 feet (100 meters).

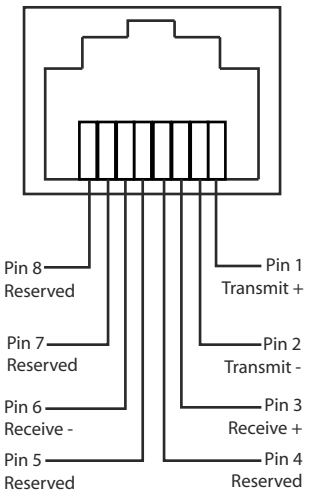

Figure 1-5 Standard Ethernet Connection Pinout

1.4.2 EIA-485 Networking

NOTE

EIA-485 networking capabilities are available on Aspect Nexus product variants. Aspect Facility does not support terminations to serial networks, nor can it be field upgraded to do so.

Aspect Nexus products support two EIA-485 network ports to accommodate connections to serial network protocols using two-wire, shielded-twisted pair cabling - such as BACnet MS/TP, American Auto-Matrix PUP, and Modbus RTU.

Terminals for EIA-485 network connections are located on the left side of the controller board and are labeled *PORT 1* and *PORT 2*. Each terminal has a connection for Network Positive (N+) and Network Negative (N-). Avoid network topologies where the network is “t-tapped” or “starred”.

1.4.2.1 Connecting EIA-485 networks

Connect the serial network to the determined EIA-485 port. Be sure to maintain network polarity at all times. Failure to do so can result in loss of network communications. For protection against ground loops or noise, connect the drain wire of the EIA-485 network wire to one of the supplied enclosure studs located within the enclosure panel.

1.4.2.2 Network Termination and Biasing

Adjacent to each EIA-485 port are two switches, which apply termination and biasing to your 485 network. To enable either termination (TERM) or biasing (BIAS), configure the respective switch towards the left position.

When applying termination, be certain that it is applied at both ends of your EIA-485 network at the two end devices. In termination applications, biasing should also be enabled to ensure proper idle state voltage.

1.5 Product Specifications

1.5.1 Power Requirements

- Power Source**:** 19-29 VAC/VDC, 50/60Hz, 4.17A Max at nominal 24VAC voltage
- Connection**:** 2 position

1.5.2 Serial Port

- Each serial port is powered by 24VAC and independently protected
- Voltage: 24VAC, ±5V
- Frequency: 50/60Hz
- Over Current Protection: Resettable Fuse/PTC; 0.5A hold current
- Over Voltage Protection: 48VDC Bidirectional TVS

1.5.2.1 RS-485 (Aspect Nexus Only)

- Supported Baud Rates: 9.6kbps, 19.2kbps, 38.4kbps, 57.6kbps, 76.8kbps, 115.2kbp
- Data Isolation: GMR Data Isolated
- Termination: 249Ω, switch selectable
- Biasing: 3.32kΩ (on each line), switch selectable
- Receiver input resistance impedance: 96kΩ minimum, 160kΩ typical (1/8th unit load)
- Bus devices rating of transceiver: up to 256
- Protection: 12V TVS on each line

1.5.3 Ethernet Network

- Termination Count**:** 2 connection (2nd port for future use only)
- Connection Type**:** RJ-45, female
- Speed**:** 10/100/1000Mb auto-sensing

1.5.4 Product Setup and Configuration

- Software: Aspect Studio with USB Copy Protection Key and License File
- Browser**:** Windows Internet Explorer v7.0 or later, Mozilla Firefox v3.0 or later, Apple Safari v3.2 or later, Goggle Chrome v1.0 or later

1.5.5 Performance

- RAM and Storage: 2GB DDR2 SDRAM, 64GB Solid State Hard Drive
- CPU: Intel® Atom D510
- System Chipset and BIOS: Intel® ICH8M, Award SPI 16 Mbit BIOS

1.5.6 Operating Conditions

- Operating Temperature**:** 10°C to 40° (50°F to 104°F)
- Operating Humidity**:**0-80%, non-condensing

1.5.7 Dimensions, Weight, and Mounting

- **Approximate Dimensions:** 13” x 8.5” x 4”
- **Approximate Weight:** 7.5 lbs
- **Mounting:** Wall mount only

1.5.8 Agency Approvals

- CE Approved
- FCC Part 15, Subpart B, Class A
- UL Listed 916, Management Equipment, Energy (PAZX)

SECTION 2
SOFTWARE CONFIGURATION

The following provides instructions relative to the configuration settings of the Aspect Nexus and Aspect-Facility. Please read through this section carefully before beginning the installation procedure.

2.1 INTRODUCTION

The following provides details on the software configuration of the Aspect Nexus and Aspect Facility hardware. Please follow the steps contained within this document for proper setup and configuration.

2.1.1 TOOLS REQUIRED

The following tools will be required for proper configuration of the system:

- PC/Laptop
- Ethernet cross-over cable, or other network connection to your Aspect Nexus and Aspect Facility
- Standard web-browser such as Windows Internet Explorer, Mozilla Firefox, Apple Safari, or other.
- Aspect Nexus and Aspect Facility License file pre-installed
- 24VAC power source

2.2 Connecting to an Aspect Nexus and Aspect Facility

The Aspect Nexus and Aspect Facility is shipped with a default IP address and subnet mask. Please refer to the product sticker on the inside door panel of the Aspect Nexus and Aspect Facility for the default IP address (192.168.1.251) and subnet mask (255.255.255.0). Your computer's network card must be configured in a manner where it may access this IP network setting. Refer to your operating system documentation for details on how to configure your network card.

2.3 Log-In

To log-in to the AspectNexus and AspectFacility:

1. With your PC's network card configured, open any standard web browser.
2. Browse to the default IP address (192.168.1.251) of your Aspect Nexus and Aspect Facility.
3. If your connection is successful, you should be greeted with the main page of the Facility, requiring username and password entry.
4. Enter the case-sensitive default username (*aamuser*) and password (*default*) into the fields provided.
5. Click the *Log In* button.

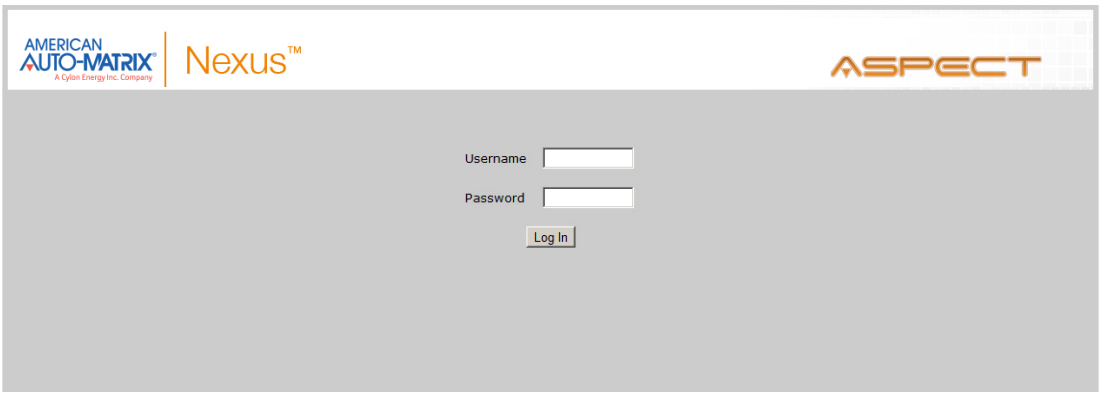

Figure 2-1 AspectNexus and AspectFacility Log-In

2.4 CONTROL PANEL

When you successfully log-in, you will be directed to the Control Panel. The Control Panel contains a navigation tree to the left of the web user interface; allowing users to select different configuration areas of the product.

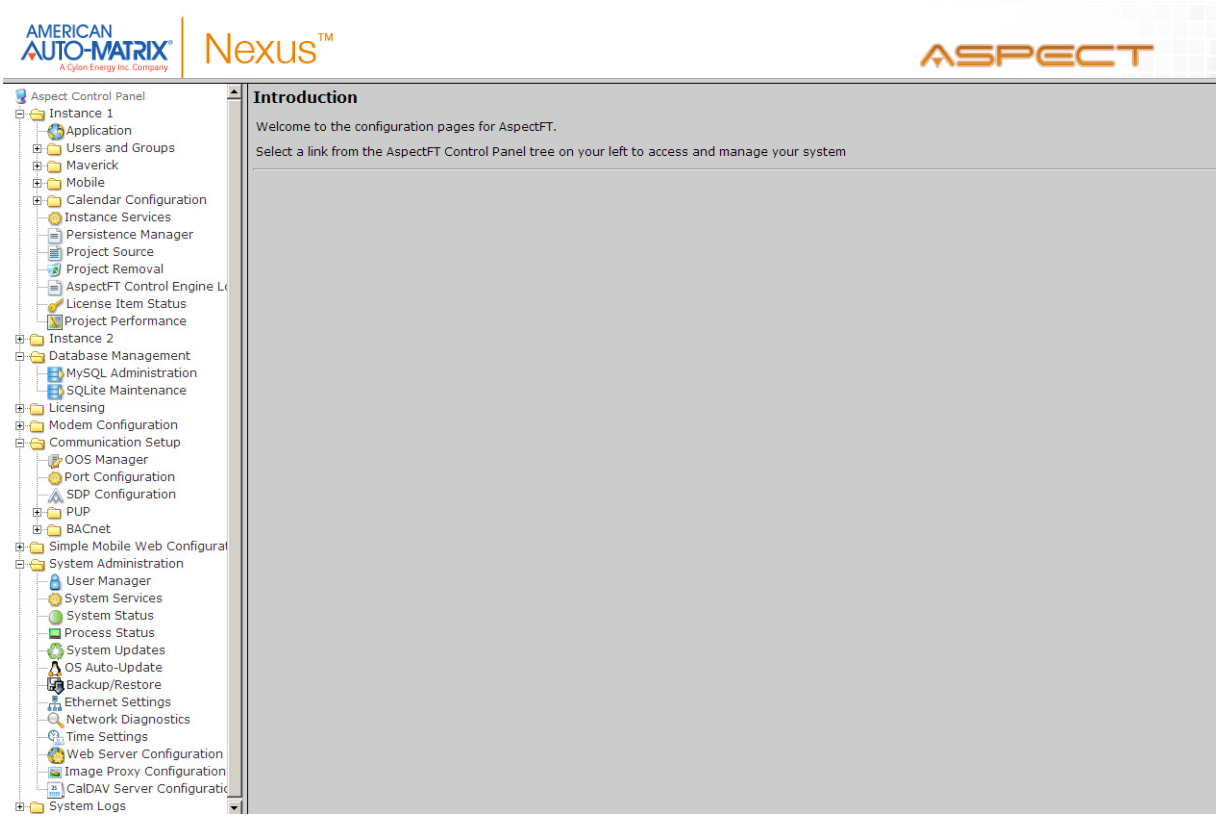

Figure 2-2 Control Panel Overview

2.5 PROJECT INSTANCES

Two instances are available within the Aspect Nexus and Aspect Facility. This provides the capability to host up to two projects within the target. Each instance runs its own Aspect Control Engine allowing service to be performed on sperate instances. Within Instance 1 and Instance 2, the same options exist for the following:

- Calendar Configuration
- Users and Groups
- Mobile
- Instance Services
- Project Source
- Project Removal
- AspectFT Control Engine Logs
- License Item Status
- Project Thread Status

2.5.1 CALENDAR CONFIGURATION

The Calendar Configuration area is used to configure iCalendar integration variables of the Aspect Nexus and Aspect Facility. Within this section there are two pages:

- Calendar File
- Calendar User

2.5.2 CALENDAR FILE

Calendar File can be used to browse and modify what calendars have been previously published to the instance, as well as allow users to manually upload iCalendar files (files with .ics extensions) to the device.

- To upload a saved calendar file, simply select the *Browse/Choose File* button and locate the iCalendar file on your computer. Once located, click the Upload button.
- To delete a previously published calendar, place a check mark next to the corresponding file and select the *Delete* button.

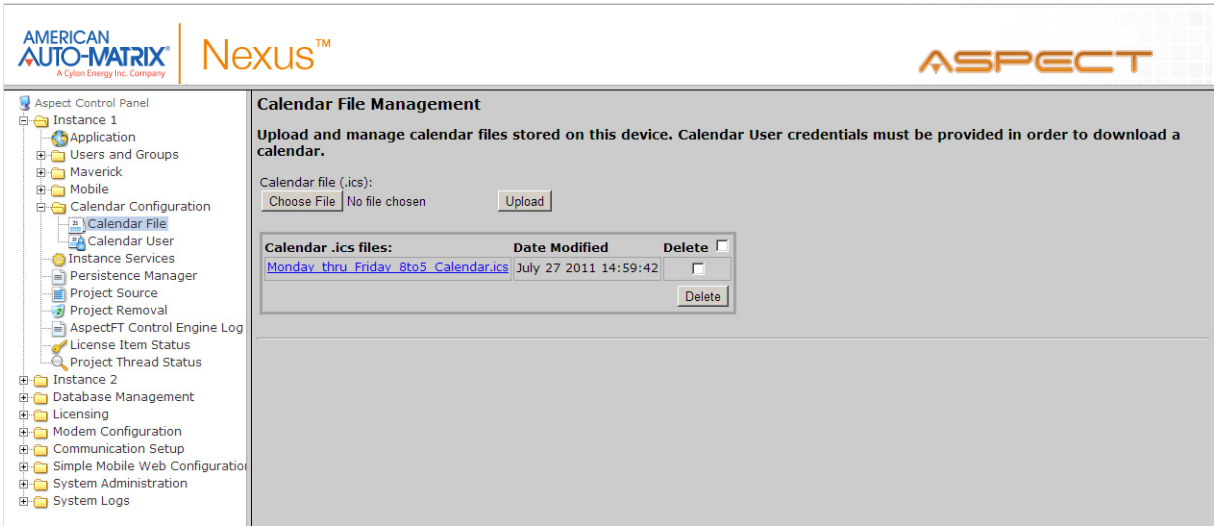

Figure 2-3 Calendar File Management

2.5.3 CALENDAR USER

Calendar User provides the ability to change the default username and password credentials that are required to allow iCalendar-based tools to publish data to the Aspect Nexus and Aspect Facility. By default, the username (*calendar*) and password (*user*) can be changed to any desired credential set. When referencing Calendars in Aspect Studio, these credentials must be specified in order to properly access the file.

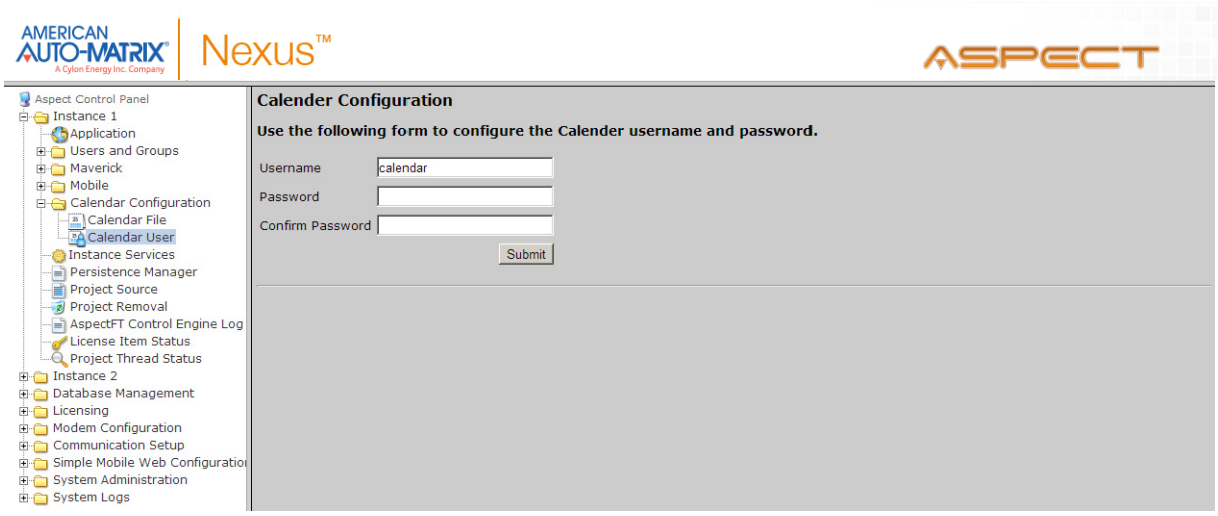

Figure 2-4 Calendar User Configuration

2.5.4 MOBILE

Administration of vSTAT users is accomplished through the Aspect Control Panel (WebUI) of an Aspect target. When logging in as an administrative user, a Mobile folder is present under each licensed instance of Aspect. The page provides the ability to download the current vSTAT configuration.

vSTAT configuration is downloaded as a .CSV file, which can be edited with any standard spreadsheet program such as Microsoft Excel, or even a text editor. To download the current configuration, click the download button and follow your browser's prompts to save the file locally to your PC.

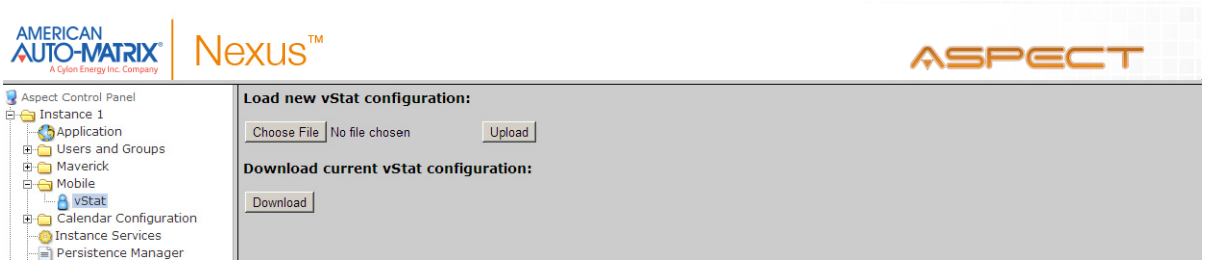

Figure 2-5 vSTAT Configuration

2.5.5 AUTOMAGIC

In order to access the AutoMagic HTML5 User Interface, navigate to the Aspect Control Panel (WebUI) of an Aspect target. When logging in as an administrative user, a Mobile folder is present under each licensed instance of Aspect. To open the AutoMagic UI, expand the Mobile group and select AutoMagic.

Click the “Click to open AutoMagic UI” link to open the AutoMagic UI.

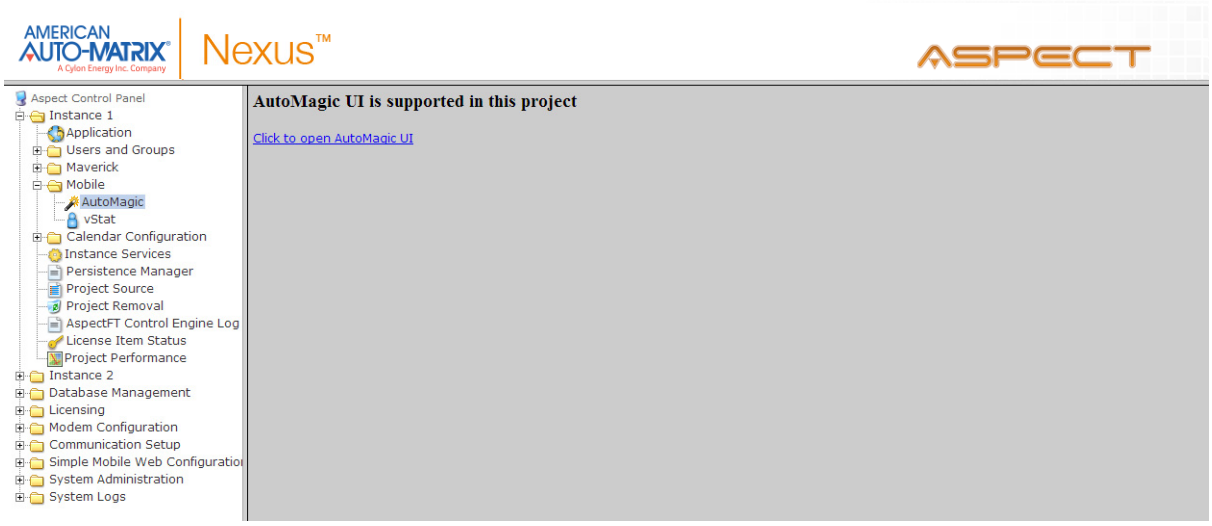

Figure 2-6 AutoMagic UI

2.5.6 Users and Groups

Users and Groups are included within each instance in the Aspect Nexus and Aspect Facility. This provides the ability to manage users in the Aspect control instance it serves.

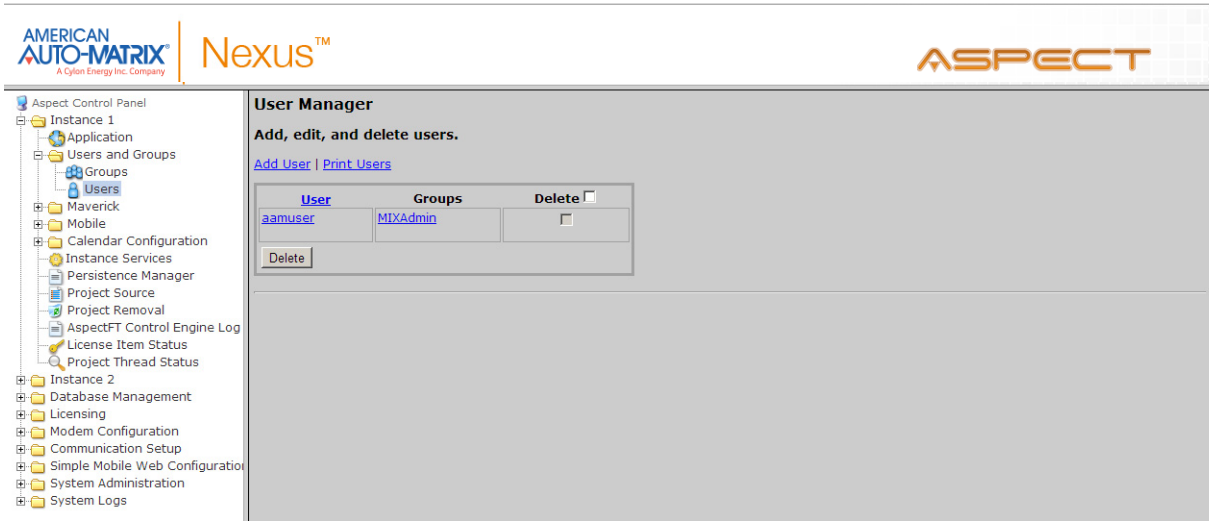

Figure 2-7 Instance Based Users and Groups

2.5.7 Instance Services

The Instance Services provides users with the ability to restart the Aspect Control Engine for the instance they are working with. Only one option is available in the Instance Services drop-down which will allow the instance to be reset.

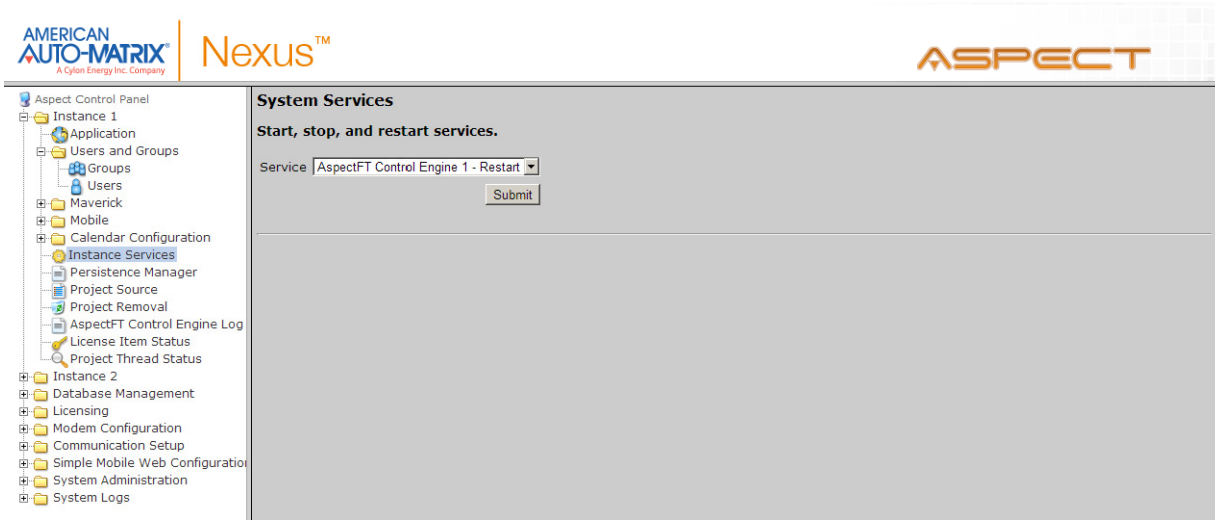

Figure 2-8 Instance Services

2.5.8 PERSISTENCE MANAGER

The Persistence Manager area is used to manage and delete Persisted data. Persisted data is localized data stored from Persisted Elements that may be present in an AspectFT project, as well as data persisted by vSTAT elements when such functionality is implemented in a delivered solution.

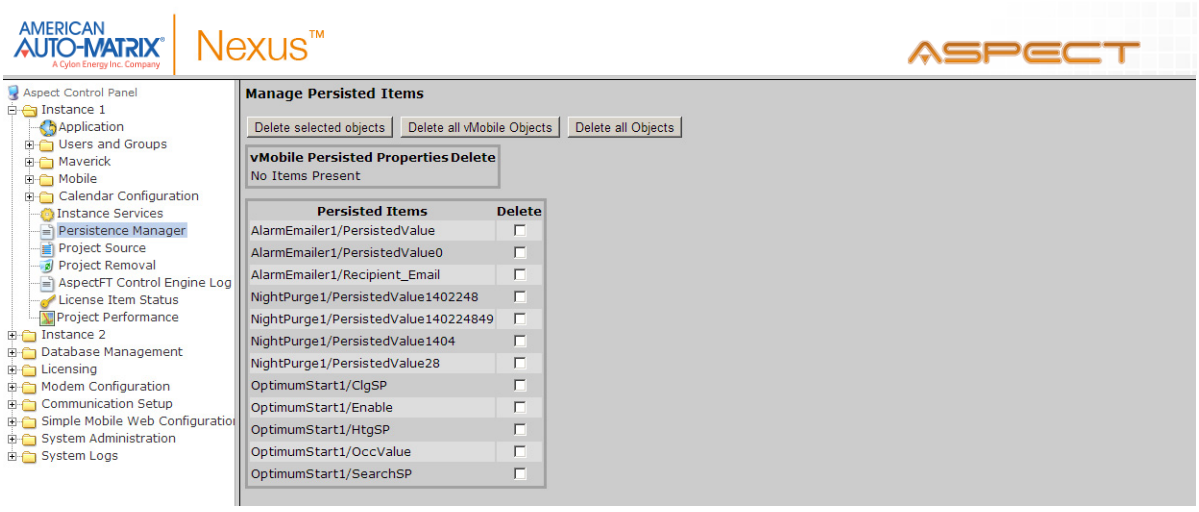

Figure 2-9 Persistence Manager

2.5.9 PROJECT SOURCE

The Project Source page provides administrators with the ability to download a password protected copy of the Aspect project deployed to the Instance. When selecting this in the Control Panel, you will be prompted to re-enter your credentials in order to download a copy of the project.

The required credentials will be the same as the ones used to originally deploy the project.

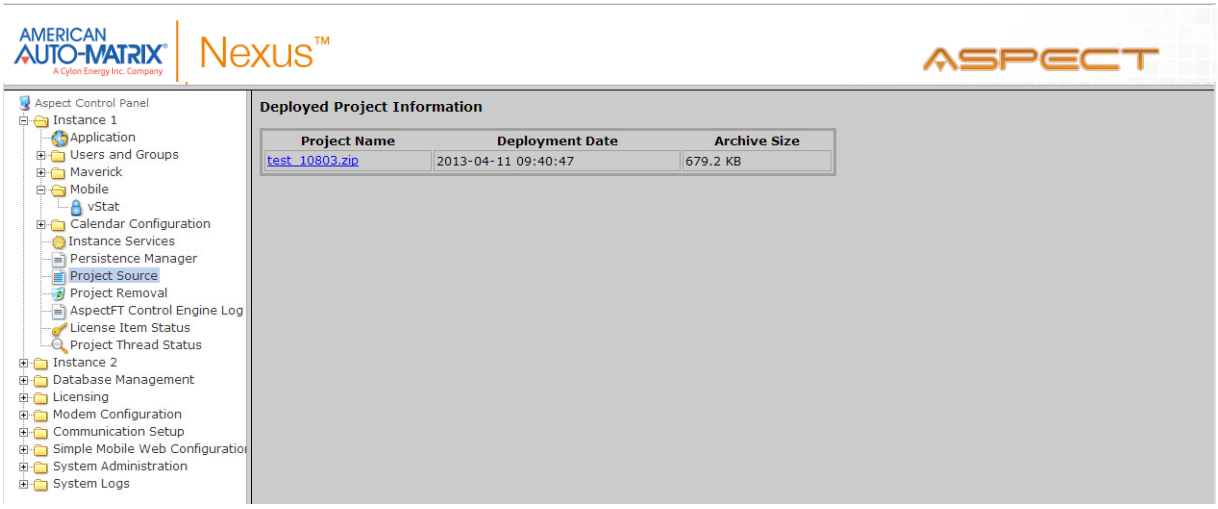

Figure 2-10 Project Source

2.5.10 Project Removal

The project removal page provides administrators the ability to remove a currently deployed project from an Aspect instance.

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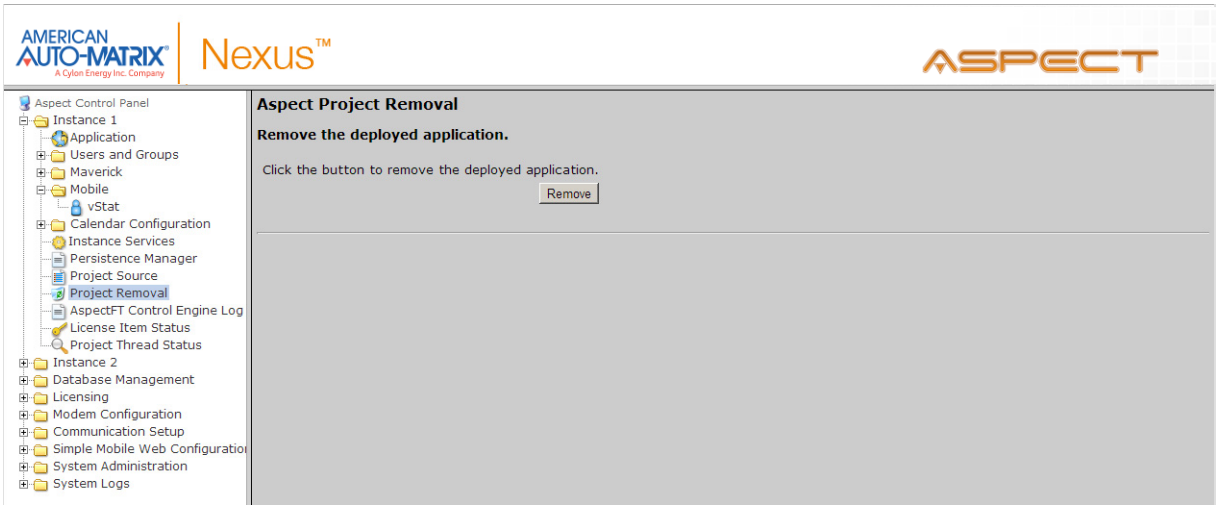

Figure 2-11 Project Removal

2.5.11 Aspect Control Engine Log

The Aspect Control Engine log provides administrators and technicians the ability to view project status and debugging information relating to the health of the deployed Aspect project. Up to 10 pages of Aspect logs are contained and individual logs can be downloaded.

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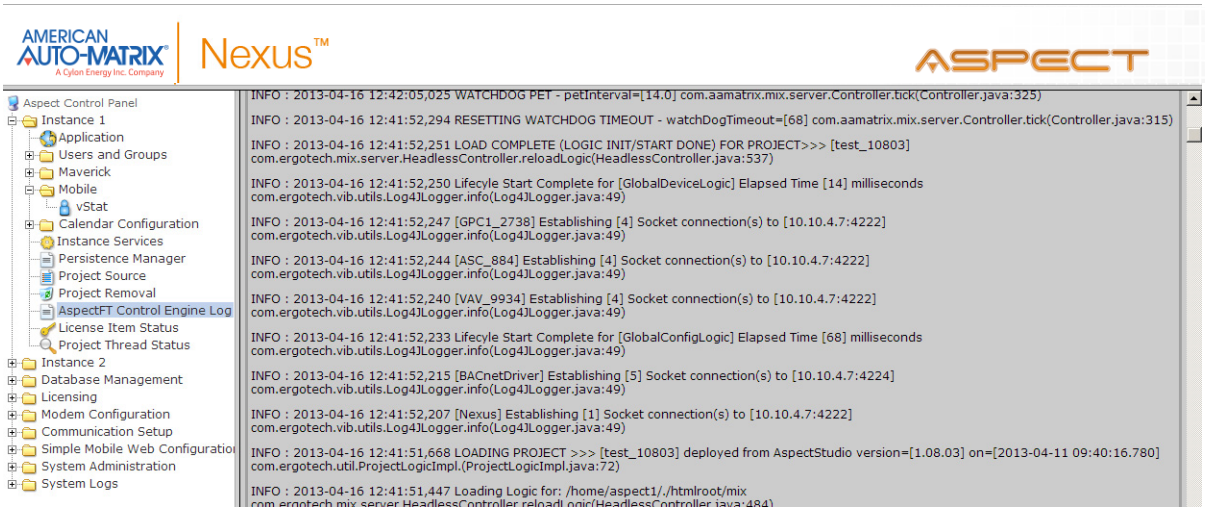

Figure 2-12 AspectFT Control Engine Logs

2.5.12 License Item Status

The License Item Status area provides the ability to view how many current license items a project may be using, as well as the maximum amount of licenses available for a particular feature or function.

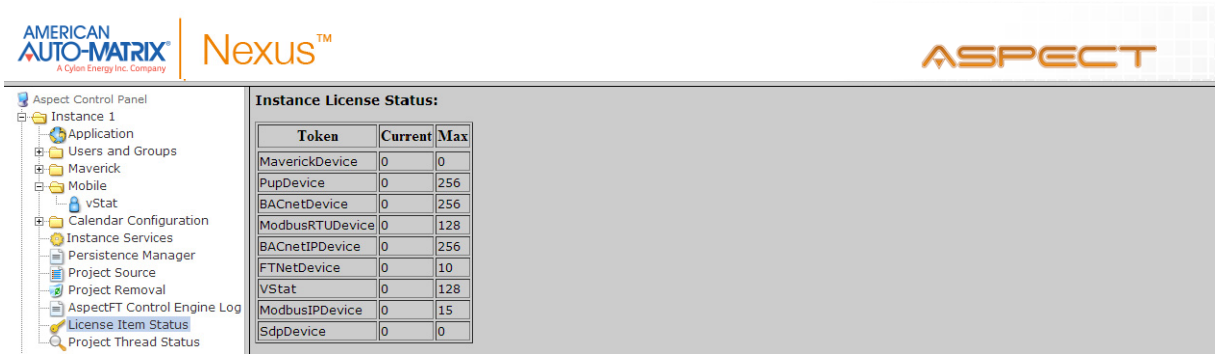

Figure 2-13License Item Status

2.5.13 Project Performance

The Project Performance area provides the ability to dynamically view and monitor the status of Threads, Maps, and Ports being used by the Aspect project loaded into the target.

By default, the all Tabs will update information every 15 seconds. You may adjust this update timer by choosing the Settings tab, and changing the Global Settings Update time.

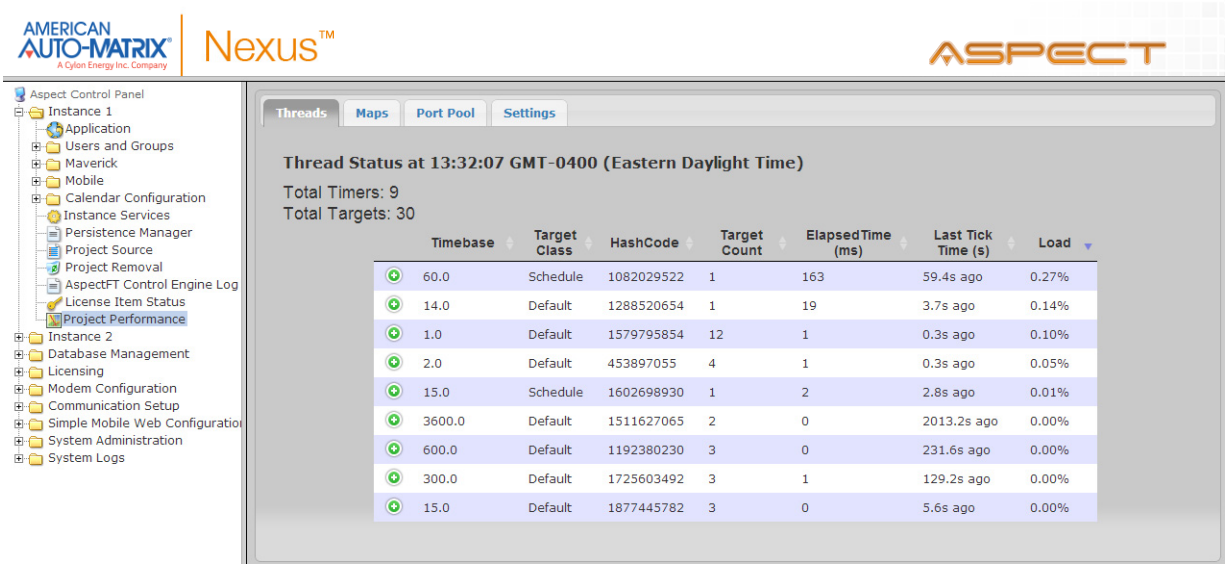

Figure 2-14 Project Performance Threads

2.6 DATABASE MANAGEMENT

Database Management is the centralized location for all database storage and contains paths to MySQL Administration and SQLite Maintenance.

2.6.1 MYSQL ADMINISTRATION

The MySQL Administration page provides users with a link to access the phpMyAdmin side of the Aspect server target and contains the MySQL Database Server. Once accessed, users will be challenged with login credentials. The default, case sensitive, credentials are:

. Username - ***matrixac1***
. Password - ***aam***

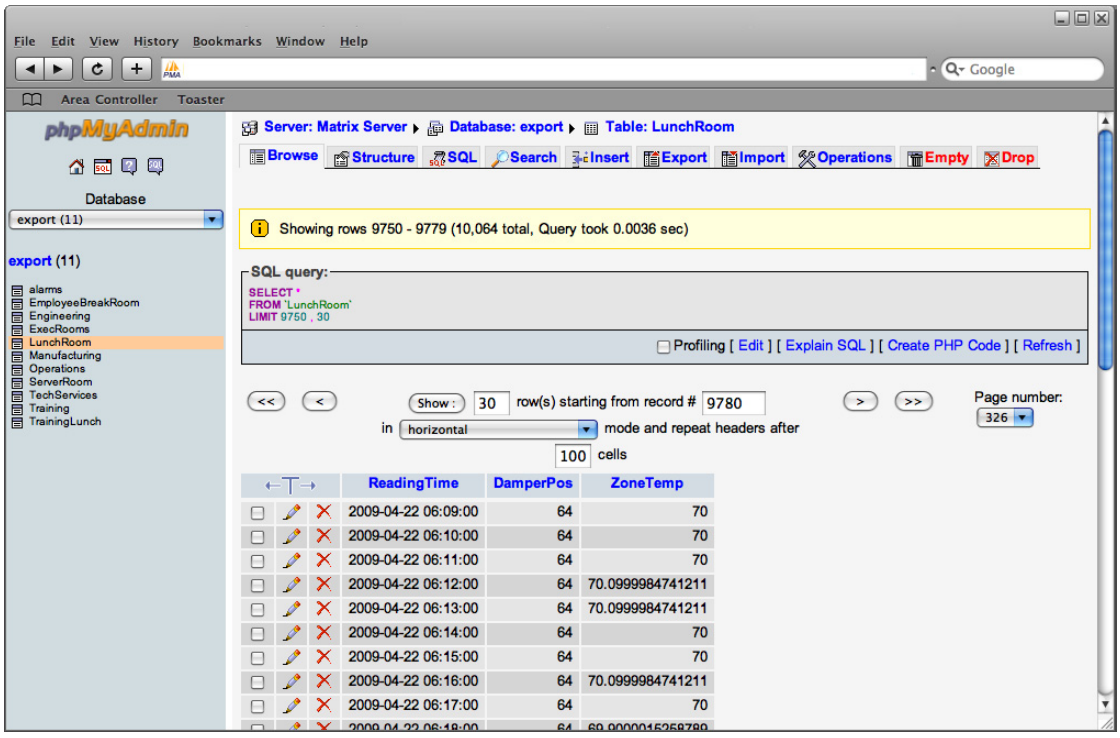

Figure 2-15 phpMyAdmin

2.6.2 SQLITE MAINTENANCE

The SQLite Maintenance page provides users with the ability to manage the SQLite database. This page shows the database files and sizes.

2.7 LICENSING

The license page provides the ability to view the current license status of the Aspect Nexus and Aspect Facility as well as a method to upload/download license files. If a license file is uploaded, AAM recommends rebooting the Aspect Nexus and Aspect Facility to ensure the license file is successfully applied.

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Figure 2-16 License Management

2.8 COMMUNICATION SETUP

The Communication Setup page provides administrators the ability to configure manual Out of Service entries, SDP Network Properties, BACnet IP Router, BBMD and Time Synchronization settings.

2.8.1 OOS MANAGER

The OOS Manager provides a single location that allows administrators to manually mark devices out of service using the Manual OOS check boxes.

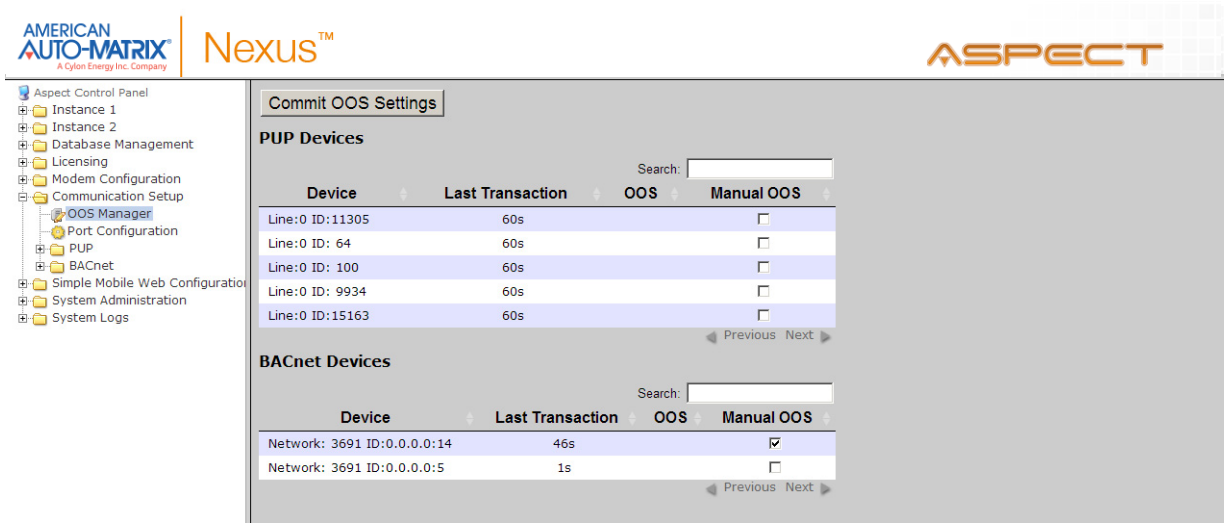

Figure 2-17 OOS Manager

2.8.2 SDP CONFIGURATION

The SDP Configuration page is used to configure network properties. These properties include read/write retries, the Out of Service timer and the timeout period.

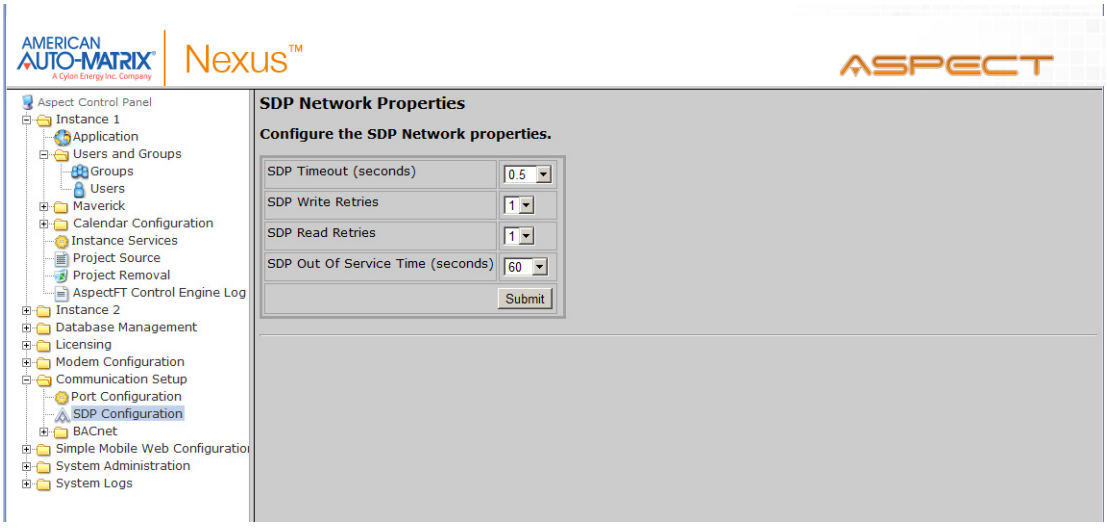

Figure 2-18 SDP Configuration Properties

2.8.3 BACNET SETTINGS

The BACnet Configuration area permits configuration of read/write retries, port configuration, and router settings for BACnet/IP.

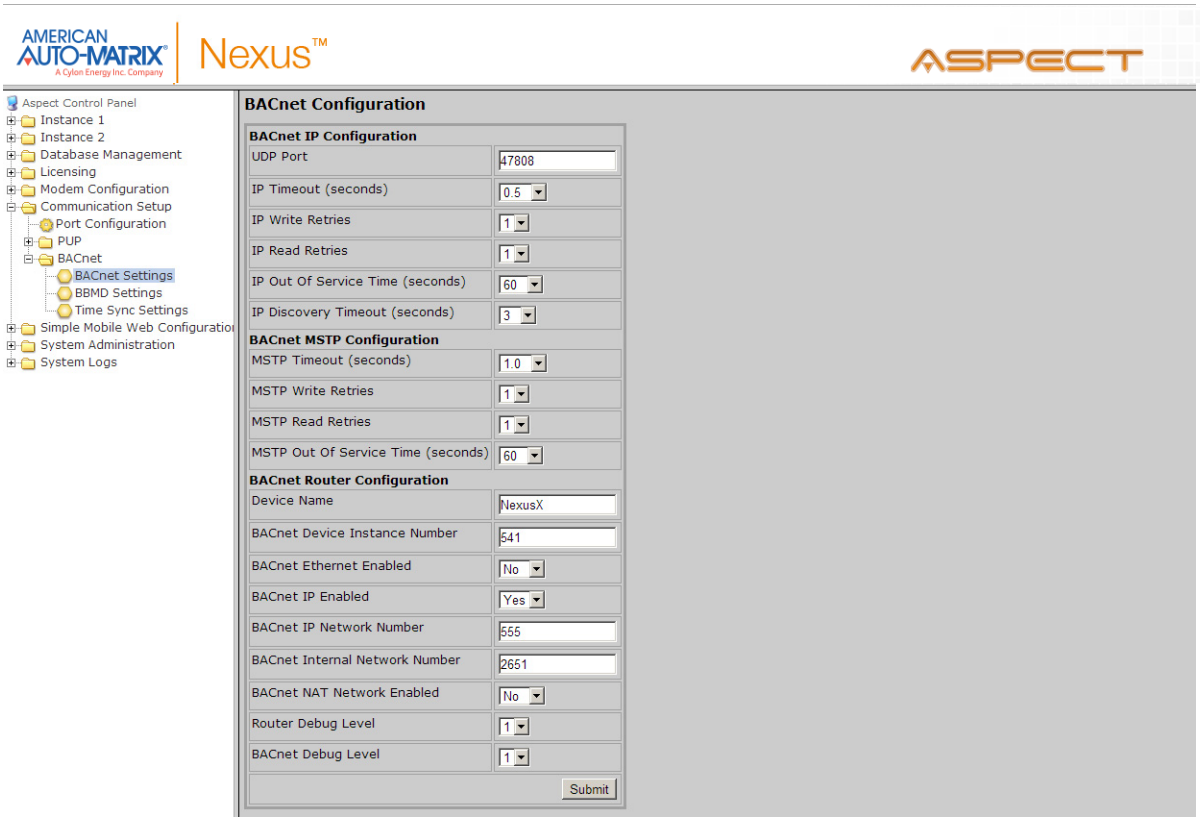

Figure 2-19 BACnet Router Configuration

2.8.4 BBMD SETTINGS

The BBMD settings area is used to configure the BBMD table setup for BACnet networks

.

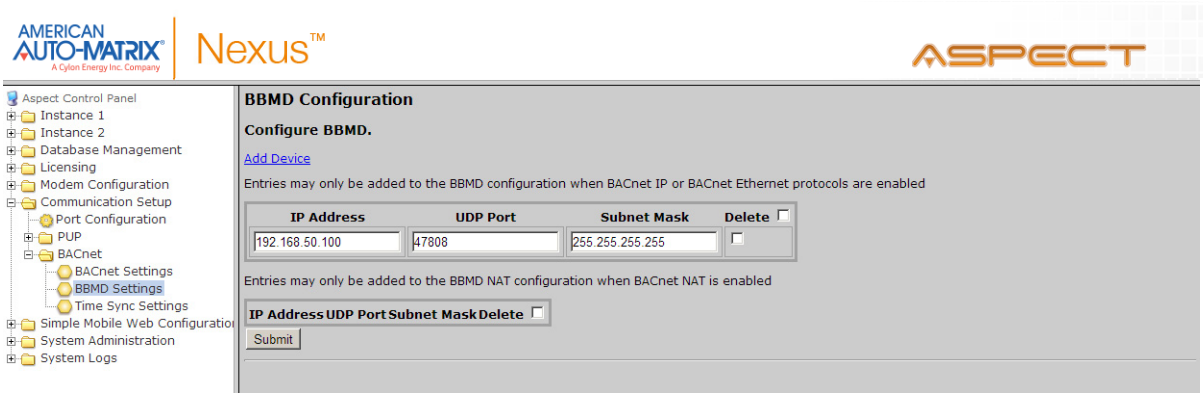

Figure 2-20 BBMD Configuration

2.8.5 TIME SYNC SETTINGS

The Time Sync Settings area provides the ability to configure BACnet network time synchronizations.

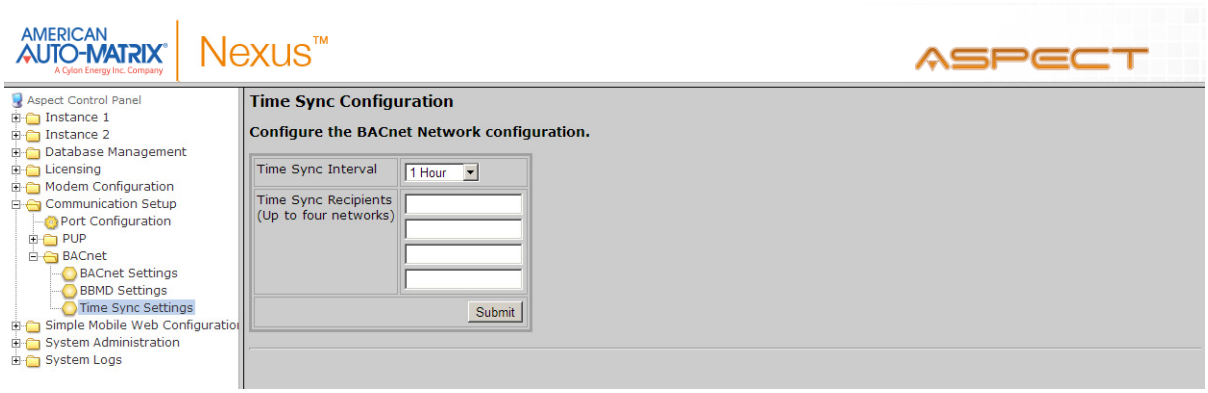

Figure 2-21 Time Synchronization Settings

2.9 SIMPLE MOBILE WEB CONFIGURATION

The Simple Mobile Web Configuration area provides users with the ability to generate web pages that can be viewed by handheld devices such as mobile communication devices(i.e. Mobile phone, PDA) that are unable to take on a full JVM implementation to view rich-graphic data displayed created and deployed to the target through Aspect Studio. The implementation requires the use of Database Raw Write blocks used within your application to populate database tables with point information.

To initially configure Aspect Nexus and Aspect Facility to use this feature, you must first enter the hostname (IP address or resolvable name of the Aspect Nexus and Aspect Facility), as well as the username and password assigned in phpMyAdmin that contains permissions to create and write data to tables.

Figure 2-22 Simple Mobile Web Configuration

2.10 System Administration

The System Administration area contains system settings for the Aspect Nexus and Aspect Facility. These fields include the User Manager, System Services, System Status, System Updates, Ethernet Settings, Time Settings Web Server Configuration, Process Status, Image Proxy Configuration, and CalDAV Server Configuration.

2.10.1 User Manager

The User Manager area provides fields to setup, add and remove administrative users from the Aspect Nexus and Aspect Facility. Administrative users are granted full access to the Aspect Control Panel while users/groups created within an instance are only allowed access to deployed projects.

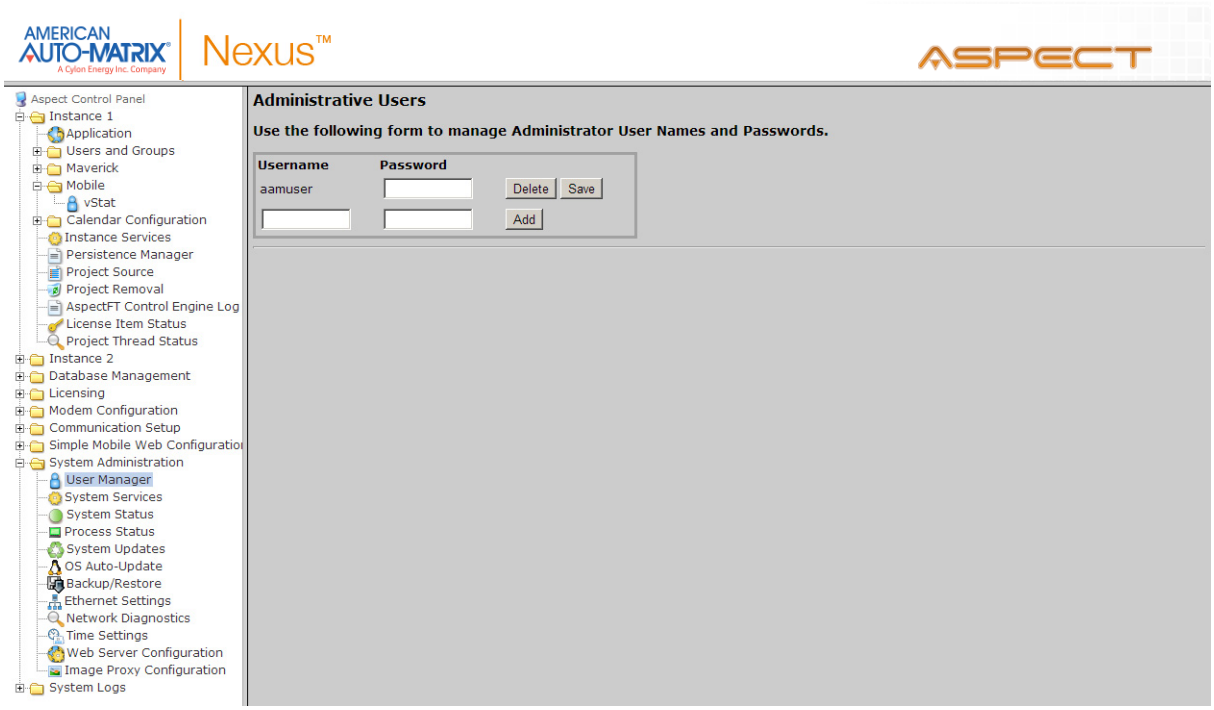

Figure 2-23 Administrative User Form

2.10.2 System Services

The System Services area provides administrators with the ability to control key services relative to the target. Through this area, users can restart specific services of the Aspect Nexus and Aspect Facility. Simply select an option from the drop-down and click Submit. A message will indicate that the service has been stopped/started/restarted successfully.

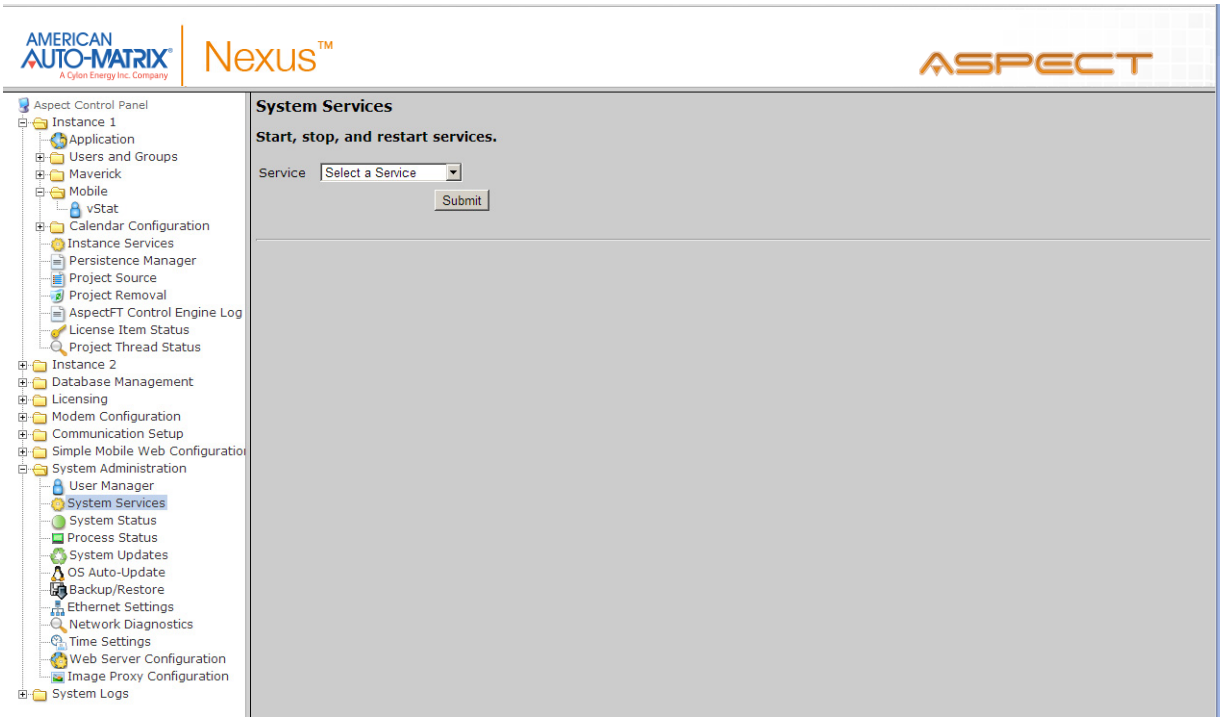

Figure 2-24 System Services

2.10.3 SYSTEM STATUS

The System Status page provides details on the current health of the system including Uptime, memory (RAM) utilization, disk space and all information pertaining to revision levels.

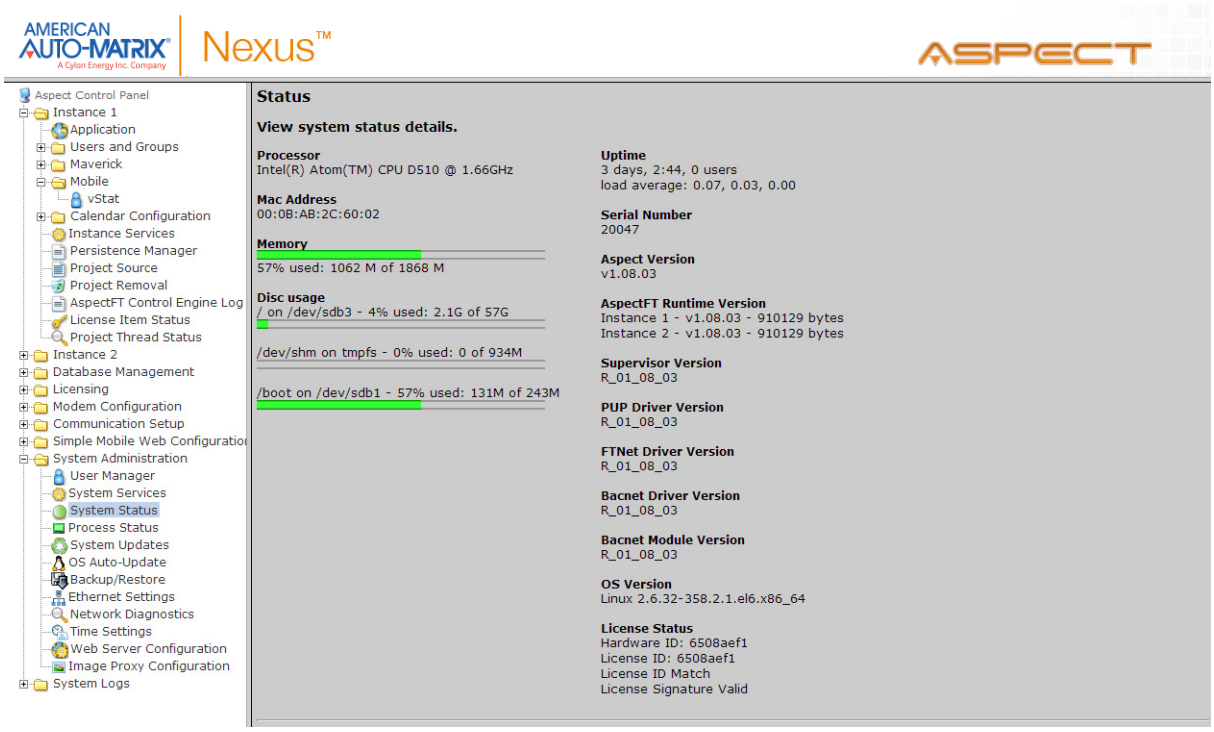

Figure 2-25 System Status Page

2.10.4 Process Status

This shows the result of a top command which produces an updating list of current processes running.

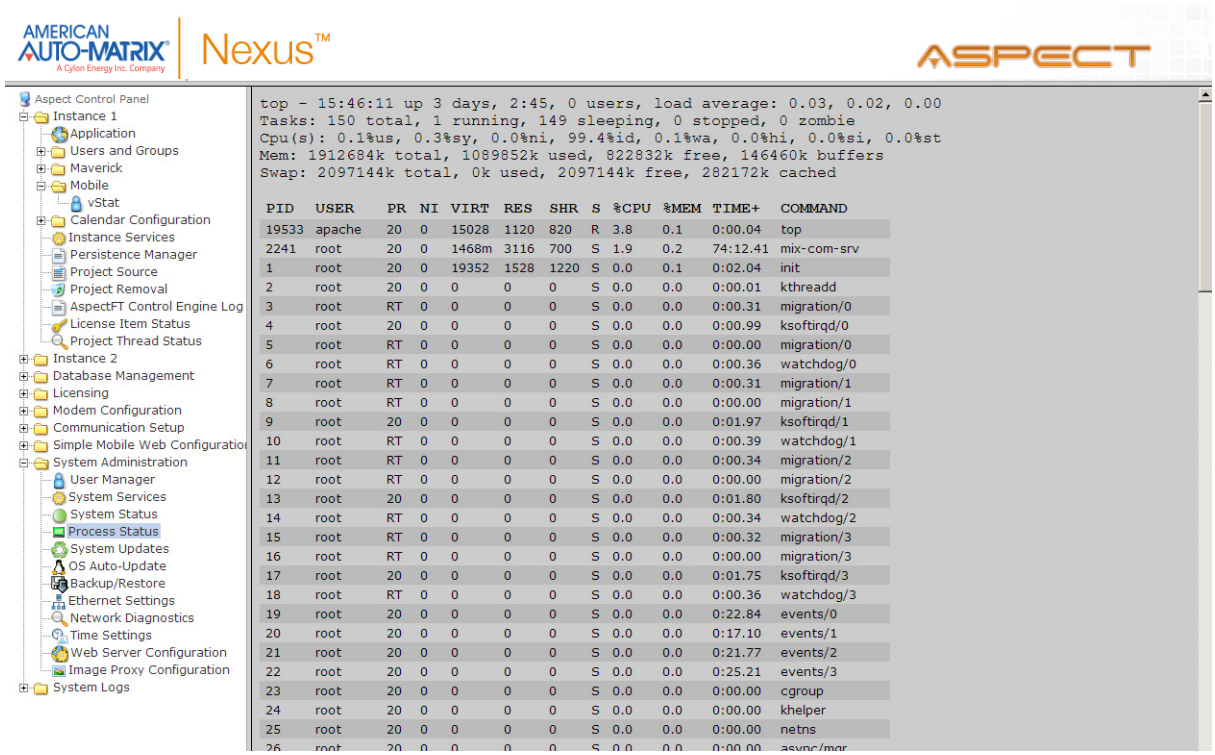

Figure 2-26 Process Status

2.10.5 System Updates

The System Updates area is used to perform firmware upgrades to the Aspect Nexus and Aspect Facility. These firmware updates can be obtained via download from the American Auto-Matrix Toolbox.

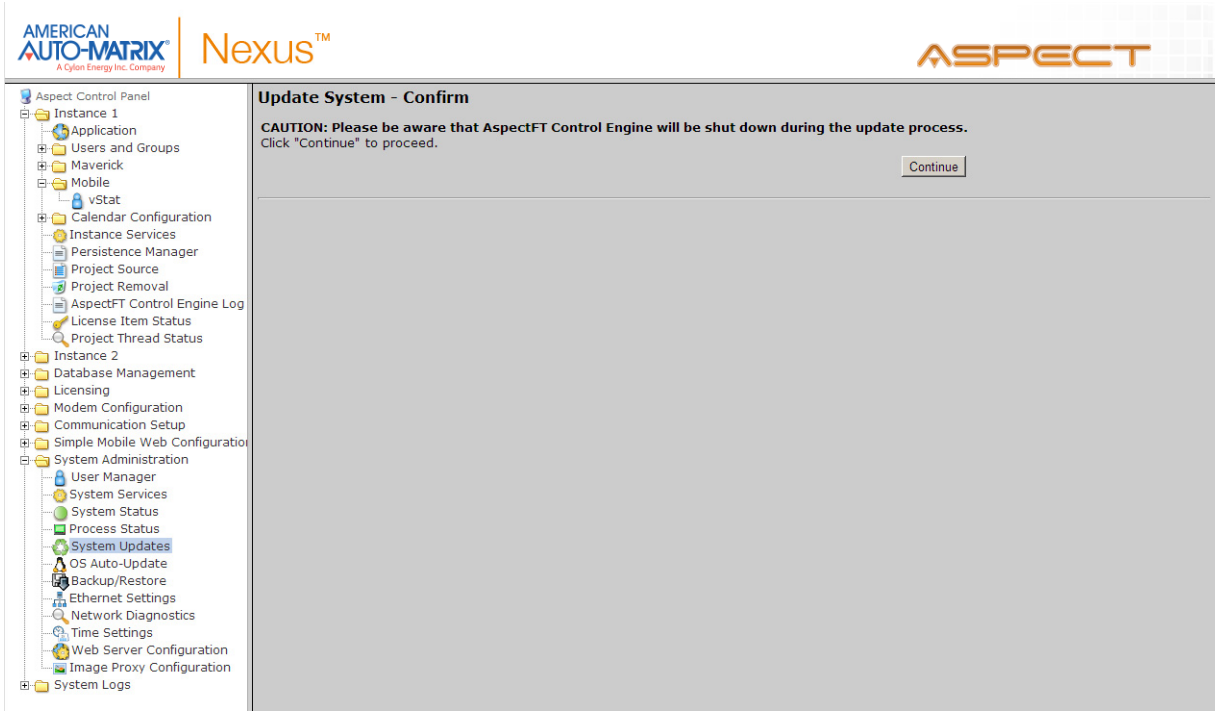

Figure 2-27 System Updates

2.10.6 OS Auto Update

Permits whether to allow or disallow automatic YUM updated to the Operating System. It is recommended to leave this setting at “Enabled”.

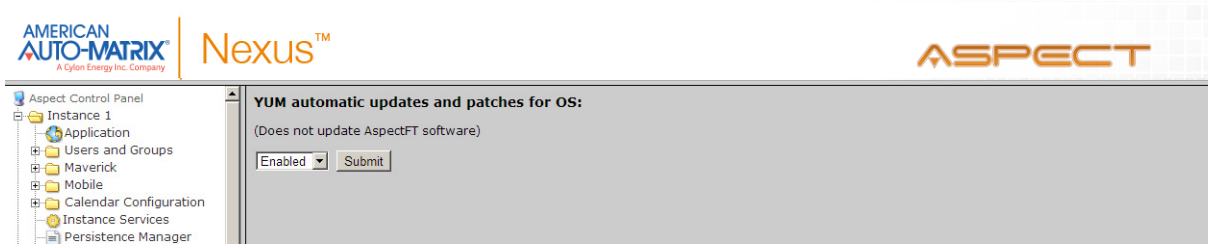

Figure 2-28 OS Auto Update

2.10.7 Ethernet Settings

The Ethernet Settings area permits for Ethernet address configuration of the Aspect Nexus and Aspect Facility. The Aspect Nexus and Aspect Facility can support static IP addresses or DHCP addressing from a valid DHCP server. Simply select the appropriate address setting for your application.

. To configure the device to use DHCP addressing, select the “Obtain an IP Address Automatically” radio button. In most DHCP environments, a resolvable DNS name or reserved IP address is assigned to the Aspect Nexus and Aspect Facility by the local network administrator prior to configuring the device for this option.

. To configure the device to use a static IP address, select the “Use the following IP Address” radio button, then enter your IP address, subnet mask, gateway, and DNS information into the boxes provided below.

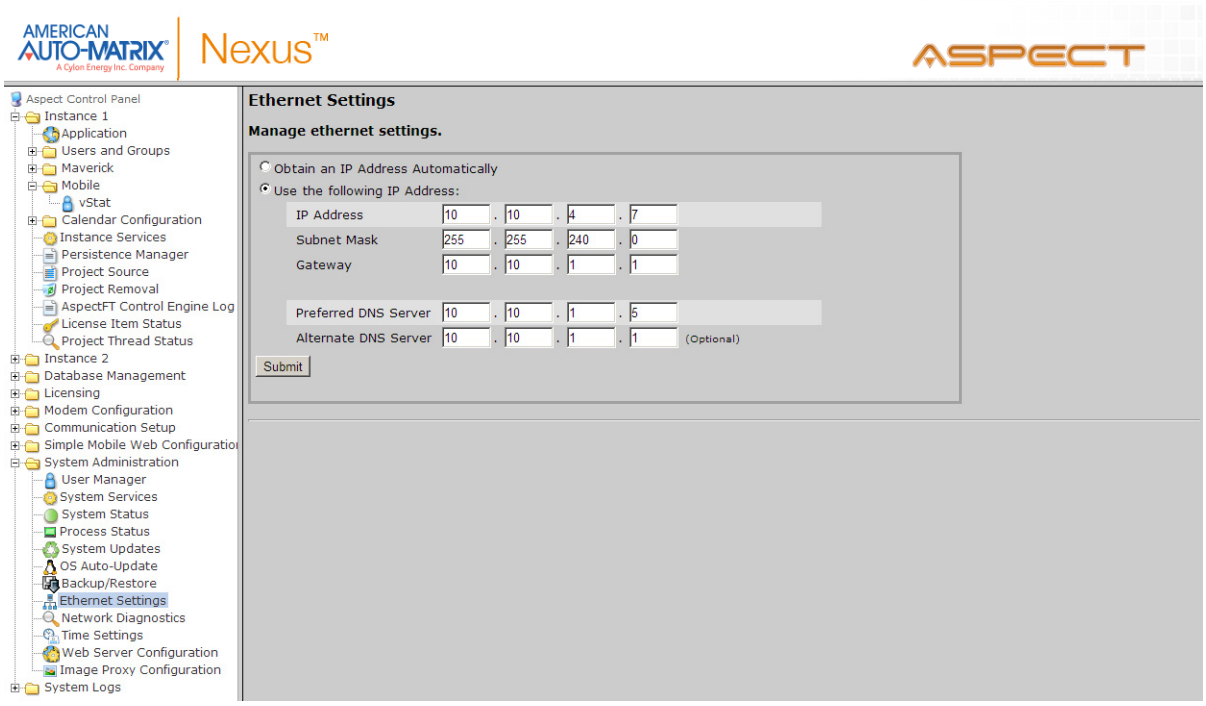

Figure 2-29 Ethernet Settings

2.10.8 Network Diagnostics

The Network Diagnostics area contains useful troubleshooting methods for network connectivity problems without the need for additional tools.

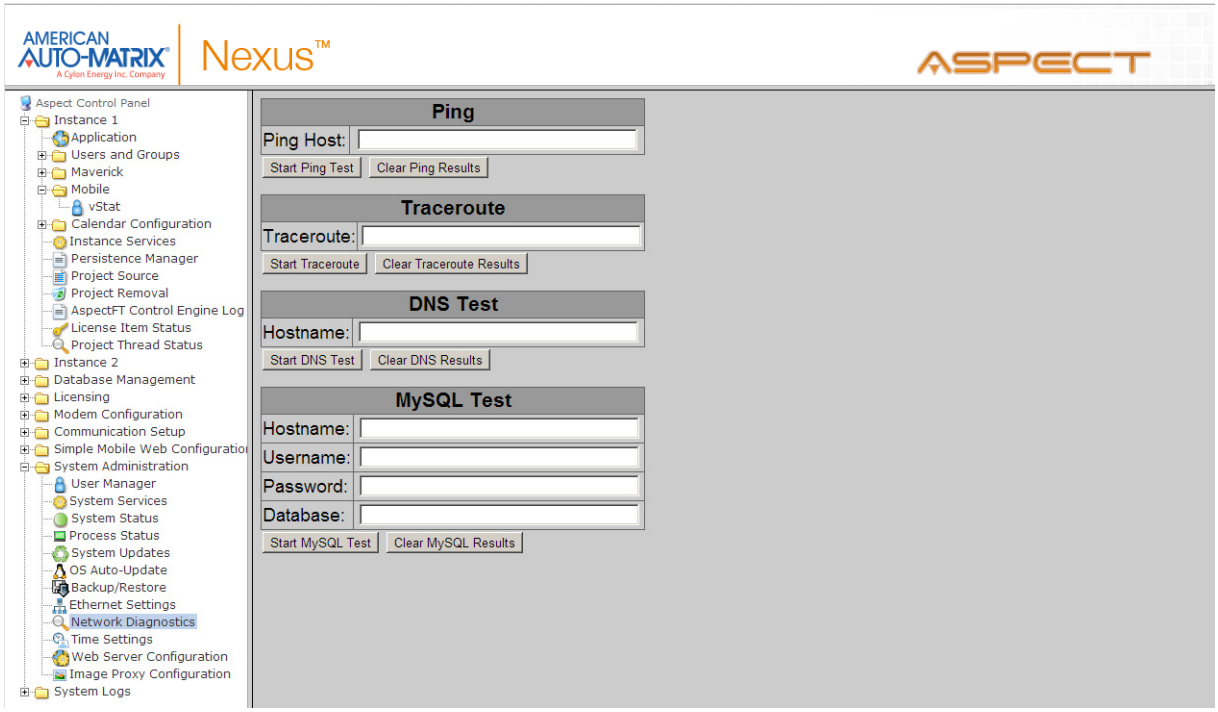

Figure 2-30 Network Diagnostics

2.10.9 Time Settings

The Time Settings area allows users to configure the Aspect Nexus and Aspect Facility Time and Date parameters. In this section, users can set the following items using the appropriate drop-downs and editors:

- System Time - specified in military time
- System Date - specified in MM/DD/YYYY
- TimeZone/Region - specified in one of many configurable options
- Time Server Synchronization - Specifies an NTP time server on the Internet with which to sync the system time to. Refer to pool.ntp.org for information relative to other available NTP servers available.

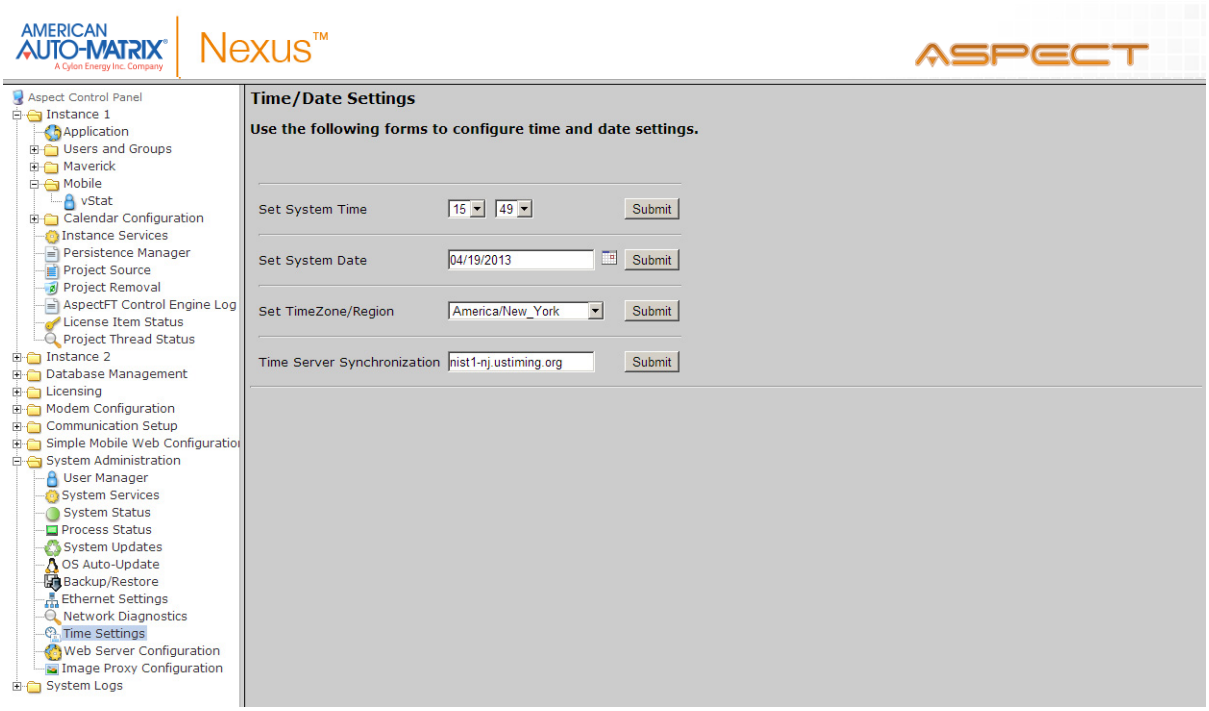

Figure 2-31 Time/Date Settings

2.10.10 Web Server Configuration

The Web Server Configuration area is used to set a label for the login screen and change port settings for the following:

. Aspect Control Panel - defaults to port 80 (HTTP)
. Aspect Control Engine - defaults to port 7226
. Simple Mobile Web - defaults to port 8080

.

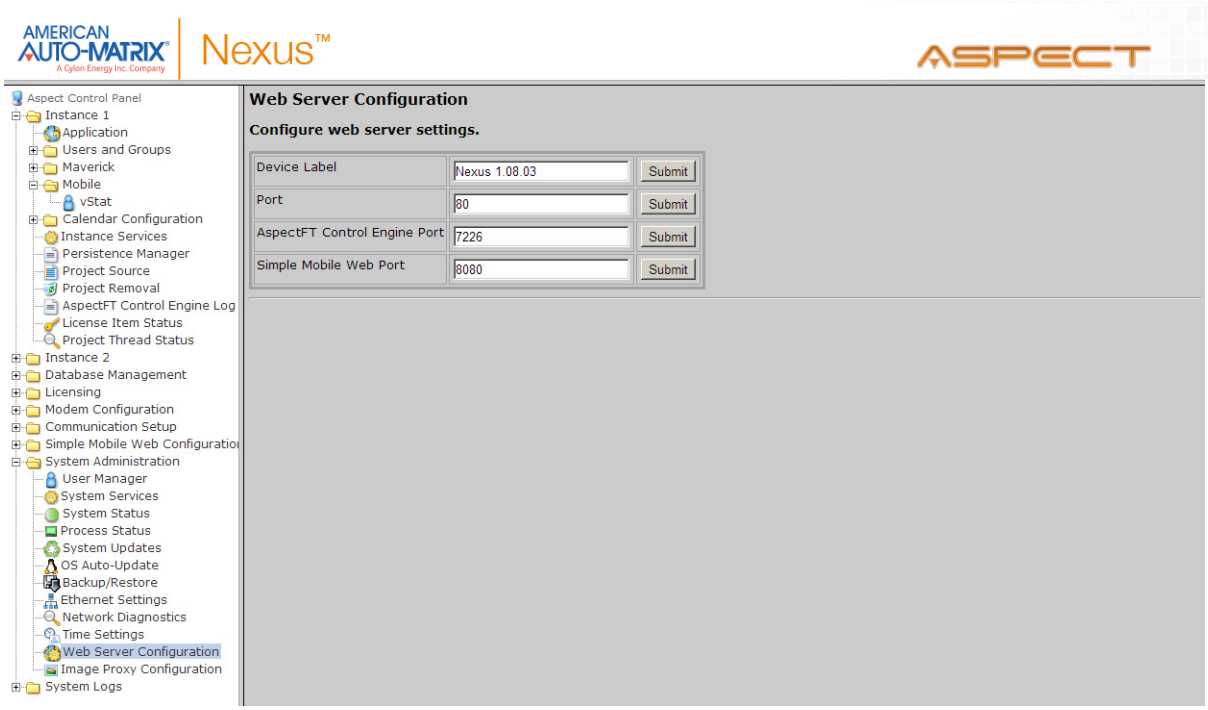

Figure 2-32 Web Server Configuration Page

2.10.11 Image Proxy Configuration

The Image Proxy Configuration page permits users to enable to disable image proxy, allowing Aspect to access external sites retrieve graphics.

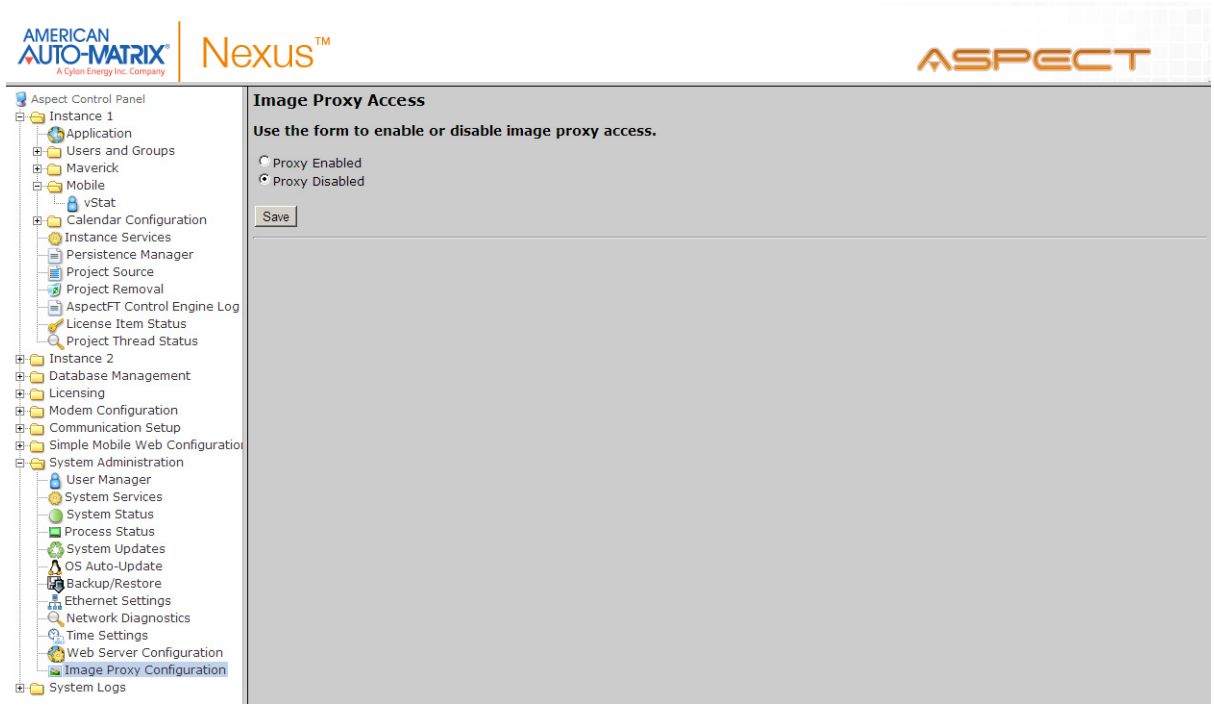

Figure 2-33 Image Proxy Configuration

2.10.12 CalDAV Server Administration

CalDAV is installed on the Aspect family using two open source applications- Baïkal Server and AgenDAV. From here users are able to launch Baïkal Server administration as well as the AgenDAV HTML5 CalDAV Client. Customization of the Client Interface is also configured through this menu option. For installation, requirements, and additional details regarding the CalDAV setup, please refer to the Aspect Studio Online Help file.

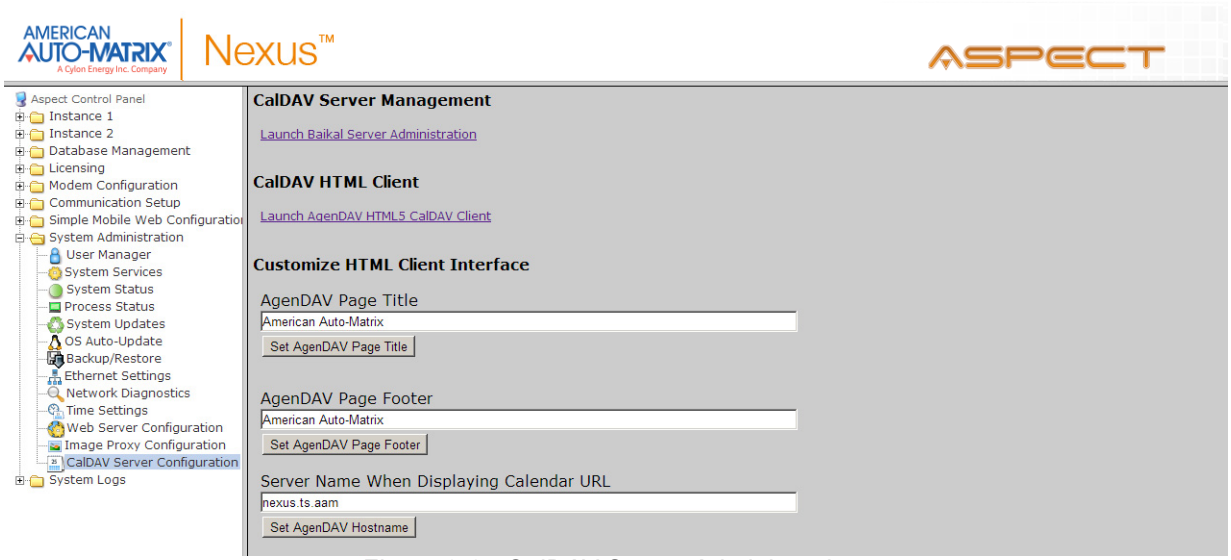

Figure 2-34 CalDAV Server Administration

2.11 System Logs

The System Logs area provides users with the ability to view and download messages generated by the Aspect Nexus and Aspect Facility and the Aspect control engine. The System Logs area provides three logs:

- System Log - contains information processed by the sub-level operating system outside of Aspect
- Diagnostic Buffer - provides kernel operating system output for the device. The information shown here is for diagnostic purposes and may be referenced during troubleshooting session with AAM
- Technical Services. No configurable properties or values are present in this area.
- Remote Logging - The Remote Logging page is used to allow or disallow centralized syslog messaging. All Aspect targets support the ability to send their log information to a centralized Aspect target or IT-supported syslog server.
- Update Log- shows any recent YUM updates in the system.

2.11.1 Diagnostic Buffer

The Diagnostic Buffer provides diagnostic information regarding the Aspect Nexus and Aspect Facility hardware and OS details.

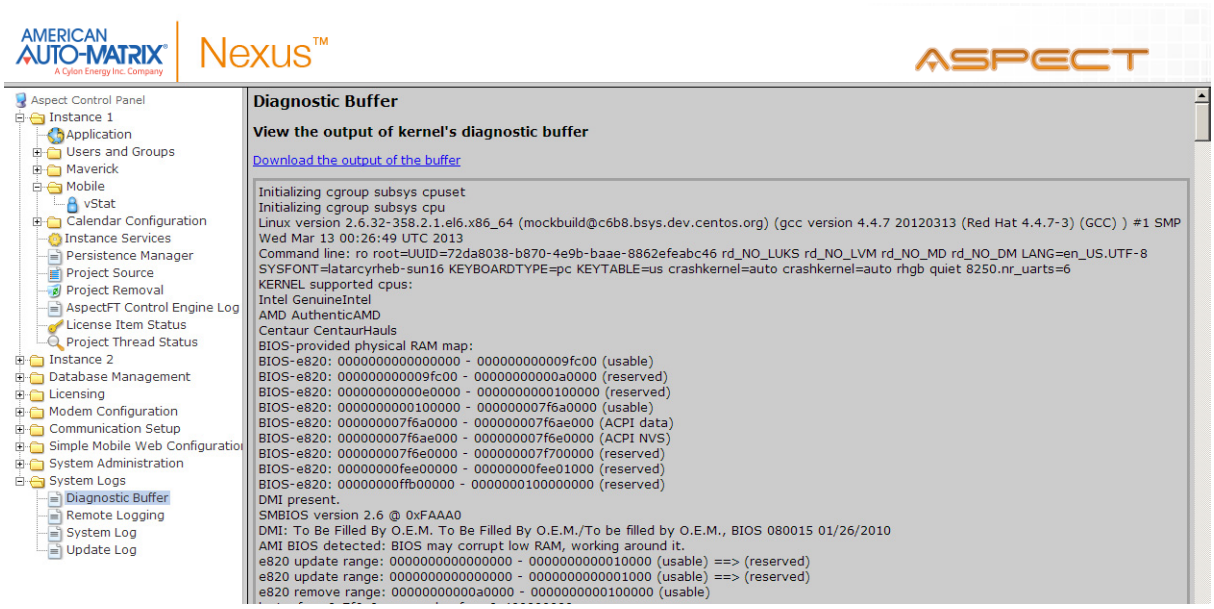

Figure 2-35 Diagnostic Buffer

2.11.2 Remote Logging

The Remote Logging page is used to allow or disallow centralized syslog messaging. All Aspect targets support the ability to send their log information to a centralized Aspect target or IT-supported syslog server.

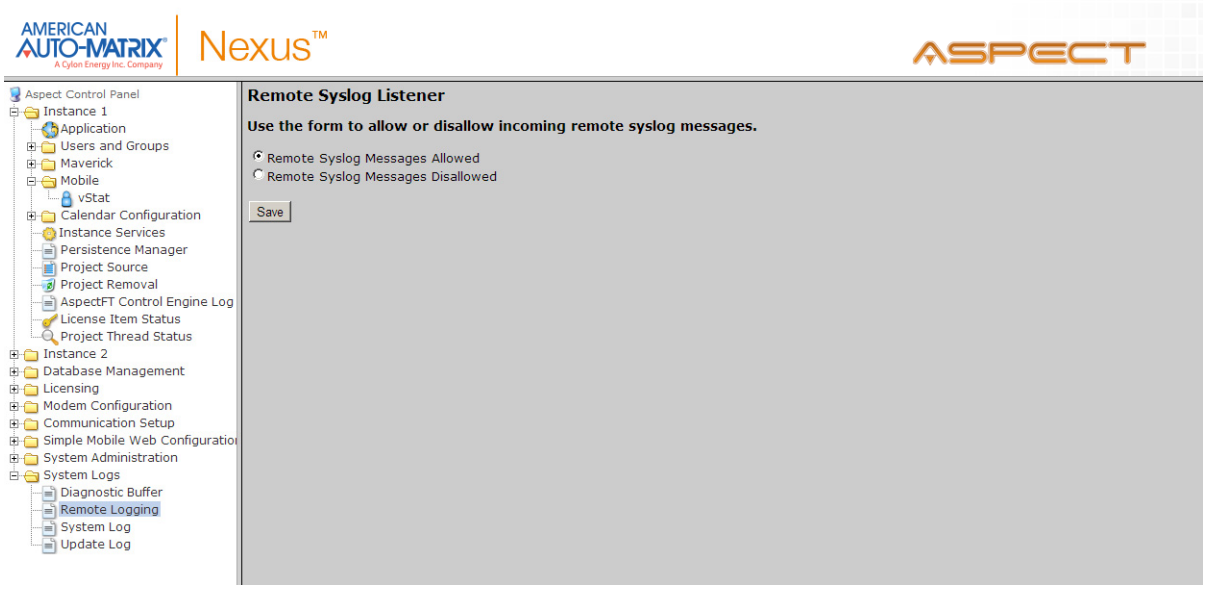

Figure 2-36 Remote Logging

2.11.3 System Log

The System Log area provides complete syslog information for the hardware. Information provided within this log includes boot up details and lower level information regarding runtime of the system.

2.11.4 Update Log

The update log shows all recent updates to the operating system.

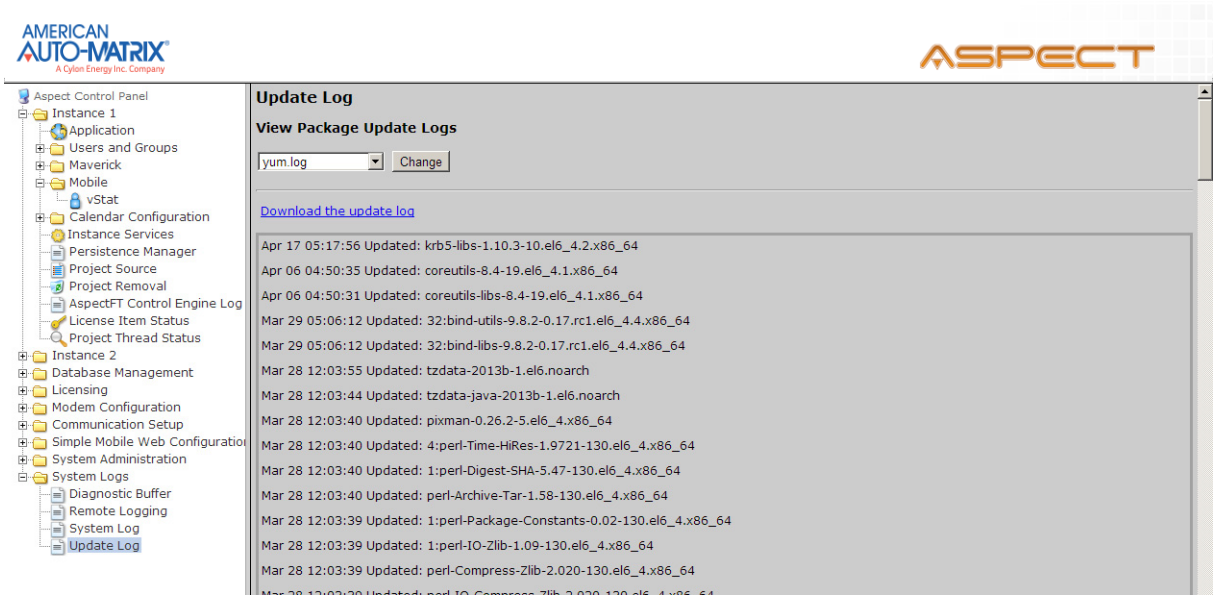

Figure 2-37 Update Log

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