

Technical Manual
Bed Management Solution (BMS)
WEBB*3*8



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BMS v3.0
Department of Veterans Affairs

Revision History

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Table of Contents

- Revision History 2
- List of Tables 9
- List of Figures 10
- 1 Introduction 12**
 - 1.1 Purpose 12
 - 1.2 BMS Overview 12
 - 1.3 References 13
- 2 Implementation and Maintenance..... 14**
 - 2.1 BMS Infrastructure Diagram 14
 - 2.2 System Requirements (Hardware and Software) 15
 - 2.3 Configuration Parameters 17
 - 2.4 Ward Whiteboard Kiosk Mode Display Configuration (BMS Whiteboard Kiosk Setup) 19
 - 2.4.1 Create the Ward Whiteboard Kiosk URL 20
 - 2.4.3 Set up the Workstation / Kiosk Machine 24
 - 2.5 Bed Management Solution Contingency Report Setup 35
 - 2.5.1 Create Snapshot Folder 35
 - 2.5.2 Define Network Share 35
 - 2.5.3 Assign Rights to Master BMS Service Account User 38
 - 2.5.4 Assign Snapshot Folder Path to Ward Group 41
 - 2.5.5 Associate Scheduler with Whiteboard Report 41
 - 2.6 EMS Mobile Device Configuration 42
 - 2.6.1 Configure EMS Mobile Device Default Login User 42
 - 2.6.2 Configure EMS Mobile Device URL 44
 - 2.7 VistA Integration 45
 - 2.7.1 Choose VistA Site 45
 - 2.7.3 Define Schedulers 46
 - 2.7.4 Run Scheduler 47
 - 2.7.5 View Audit Results 48
 - 2.8 NUMI Integration 49
 - 2.8.1 Integration Settings 49
 - 2.8.2 Choose VistA Site 50
 - 2.8.3 Define Schedulers 50
 - 2.8.4 Select Scheduler 50
- 3 Application structure..... 52**
 - 3.1 Application Components 52
 - 3.2 Application Directory Structure 52
 - 3.3 Database Architecture 52

3.4	Component Files	53
4	Archiving.....	66
5	External Interfaces.....	67
6	Software Security.....	69
6.1	Authorization and Authentication	70
6.2	BMS AuthAction table.....	70
6.3	BMS AuthPermissions table.....	71
6.4	BMS AuthRoles table.....	71
6.5	BMS AuthRoleActions	72
6.6	BMS AuthUser table	72
6.7	BMS AuthUserRoles table.....	73
6.8	BMS AuthActions Listing	73
6.9	Business scenarios and use cases.....	84
7	Detailed Functional Model on Each Interface.....	87
7.1	BMS Authentication and Authorization	87
7.1.1	Authentication	87
7.1.2	Authorization.....	87
7.2	Data contracts	88
7.3	BMS Roles.....	88
8	Troubleshooting.....	90
8.1	Symptom 1	90
8.2	Symptom 2	90
8.3	Symptom 3	91
8.4	Symptom 4	91
9	Appendix A – BMS Diagrams	93
9.1	Business Process Diagrams	93
9.2	Activity Diagram.....	98
9.3	Functional Flow Diagram	99
9.4	Data Flow Diagram	100
9.5	Application Flow Map from APPDYNAMICS.....	101
10	Appendix B - Terms, Acronyms, and Abbreviations.....	102

List of Tables

Table 1-Server for Web Applications.....	15
Table 2-Application Server	15
Table 3-Database Server	16
Table 4-BMS Web Configuration Parameters	17
Table 5-Ward Whiteboard URL Configuration Parameters.....	20
Table 6-Facility Settings Page Parameters	43
Table 7-BMS Admin Page Parameters	44
Table 8-Description and Configuration for EMS Mobile Device URL Parameters.....	44
Table 9-New Scheduler Parameters.....	47
Table 10-View Audit Results Columns Report.....	49
Table 11-BMS Database Files	53
Table 12-BMS Service Files.....	54
Table 13-BMS Website Files.....	56
Table 14-Configuration Values.....	67
Table 15- BMS Operations.....	73
Table 16-Terms, Acronyms, and Abbreviations.....	102

List of Figures

Figure 1-BMS Infacstructure Diagram.....	14
Figure 2- BMS Ward Whiteboard Screen.....	19
Figure 3- Facility Settings	23
Figure 4-Whiteboard Kiosk User Role Assignment.....	24
Figure 5-Screen Saver Option.....	25
Figure 6-Screen Saver Settings Window.....	25
Figure 7-System and Security.....	26
Figure 8- Power Options Settings.....	27
Figure 9- Change Plan Settings Option.....	27
Figure 10- Run Window	28
Figure 11- Run Window with Command Entered.....	28
Figure 12-User Accounts Window.....	29
Figure 13-User Accounts	30
Figure 14- Settings of Microsoft Edge	31
Figure 15- When Edge Starts.....	32
Figure 16- Open Option	33
Figure 17- Microsoft Edge Selected.....	33
Figure 18-Windows Registry Editor.....	34
Figure 19- Whiteboard Snapshot Folder.....	35
Figure 20- Whiteboard Snapshot Folder Properties.....	36
Figure 21- Advanced Sharing Option.....	36
Figure 22- Share this Folder Option.....	37
Figure 23- Verify Network Path.....	38
Figure 24- Permissions for Whiteboard Snapshot.....	39
Figure 25- Permissions for Whiteboard Snapshot.....	39
Figure 26- Select Users	40
Figure 27- Remote Desktop Users Properties.....	40
Figure 28- Contingency Settings Page.....	41
Figure 29- Add Scheduler for Background Processors.....	42
Figure 30 - EMS Fields Filled on the Facility Settings Page.....	43
Figure 31-EMS Fields Filled on the BMS Admin Page.....	44
Figure 32-EMS Staff Page for Mobile Devices	45
Figure 33-Adding a VistA Site	46
Figure 34-Schedulers Tab.....	46
Figure 35-VistA Integration Tab.....	47
Figure 36- Audit Tab	48
Figure 37- View Audit Results.....	48
Figure 38-NUMI Tab.....	50
Figure 39- Selecting the VistA Site for NUMI data.....	51
Figure 40-Database Architecture.....	53
Figure 41-Backup Maintenance Plan.....	66
Figure 42-BMS External Interfaces.....	67
Figure 44- New tables added to BMS database for Policy Manager Replacement.....	70
Figure 45- AuthAction table.....	71
Figure 46- AuthPermissions table.....	71
Figure 47- AuthRoles table	72
Figure 48- AuthRoleActions table.....	72
Figure 49- AuthUser table	73
Figure 50- AuthUserRoles table	73
Figure 51- Authentication Use Cases.....	84
Figure 52- Authorization Use Cases.....	84
Figure 53- Authorization Administration Use Cases	85

Figure 54- Class Diagram for Data Contracts in PAP and PDP..... 88

Figure 55- 500 Server Error 90

Figure 56- Unhandled Exception 90

Figure 57- EMS Bed Status Report is Missing..... 91

Figure 58- Report Cannot be Found 91

Figure 59- Admit Patient to PPBP Business Process..... 93

Figure 60- Transfer Patients to PPBP Business Process..... 93

Figure 61- Display and Update PPBP Business Process..... 94

Figure 62- Display and Update Bed Status Business Process..... 94

Figure 63- Manage Bed Cleaning Business Process..... 95

Figure 64- Create Notification Business Process..... 95

Figure 65- Create Facility Diversion Business Process..... 96

Figure 66- Manage Whiteboard Business Process..... 96

Figure 67- Reports Business Process 97

Figure 68- BMS Overview Activity Diagram..... 98

Figure 69- BMS Overview Functional Flow Diagram 99

Figure 70- BMS Overview Data Flow Diagram..... 100

Figure 71- Application Flow map from APPDYNAMICS..... 101

1 Introduction

1.1 Purpose

This document is designed to provide sufficient technical information about the Bed Management Solution (BMS) application to the developers and Information Resources Management (IRM) technical personnel to operate and maintain the software.

1.2 BMS Overview

BMS is a real-time, user-friendly Web-based Veterans Health Information Systems and Technology Architecture (VistA) interface for tracking patient movement, bed status and bed availability. It provides performance information that can be used to improve patient flow within, and between, VA Medical Centers (VAMCs).

BMS allows administrative and clinical staff to record, manage and report on the planning, patient- movement, patient occupancy, and other activities related to management of beds. All patient admission, discharge, and transfer movements are sent directly from VistA to BMS.

BMS offers the following features:

- Tracks patient movement through the system;
- Displays patient and bed occupancy status for all beds in the facility and/or Veterans Integrated Service Networks (VISN);
- Provides visibility of bed availability within VAMCs to support emergency management;
- Automates request and assignment of beds;
- Displays and facilitates timely discharge appointments;
- Supports and facilitates efficient flow operations and is a catalyst to process improvement and best practices;
- Provides reports on performance measures associated with bed management and patient flow. BMS provides answers to the following questions:
 - How many beds do we have?
 - How many empty beds do we have?
 - How many available female beds do we have?
 - How many beds are out of service and why?
 - How long does it take to clean a bed?
 - How many patients are waiting for beds in community hospitals?
 - How many admissions, transfers, and discharges did my unit have yesterday?
 - How many discharges will we have tomorrow?
 - How many scheduled admissions do we have for today?

1.3 References

Requirements Specification Document (CLIN: 0002AA; title: Requirements Specification Document; file: Init8_BMS_RSD)

System Design Document; file: BMS_SDD)

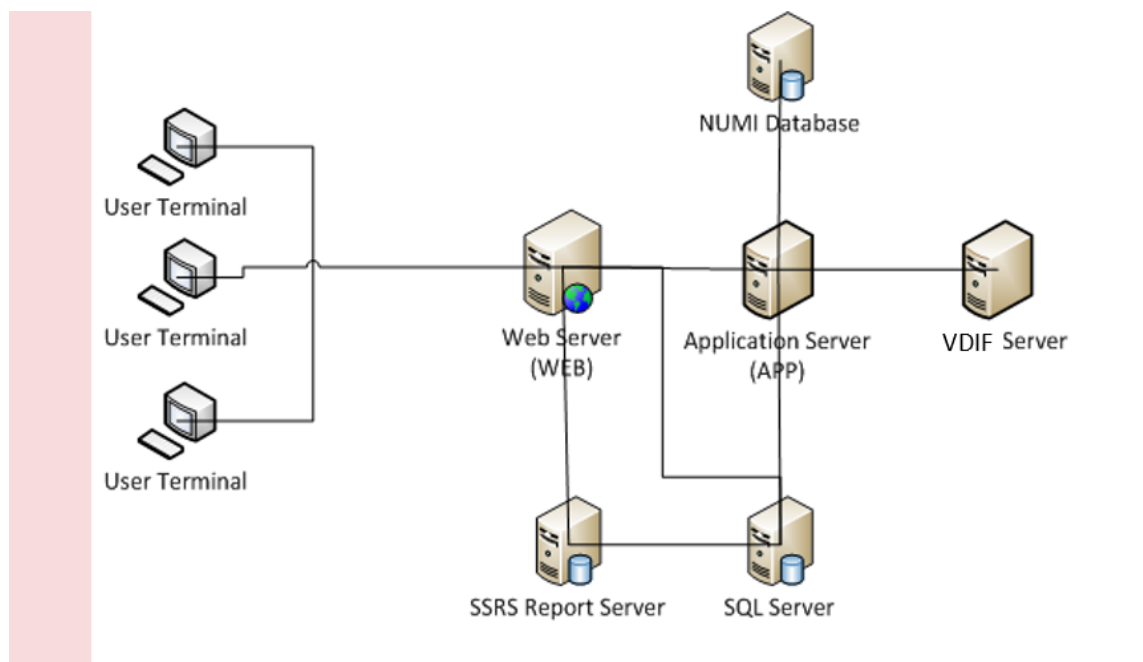
2 Implementation and Maintenance

2.1 BMS Infrastructure Diagram

The BMS application has a list of physical components that can be divided on more physical servers according with their roles.

The following diagram represents a possible schema of physical deployment.

Figure 1-BMS Infacstructure Diagram



BMS is divided into specific components:

1. Persistence layer: SQL Server 2019 Enterprise database
2. Application server layer: Windows Communication Foundation (WCF) Web Services installed as Windows Services
3. Web server layer: Active Server Pages (ASP) .NET Model-View-Controller (MVC) Web application hosted in Internet Information Services (IIS)
4. Data Exchange Servers:
 - a. National Utilization Management Integration (NUMI) SQL Server Database
 - b. VistA integration servers (servers that have access to VistA)
5. Client Layer: Web Application client launched from browsers

2.2 System Requirements (Hardware and Software)

BMS requires the creation of a Master Windows Service Account User and numerous facility/Site Service Account Users for execution and operations.

All the BMS Application Services run under a service account.

- AITC has created the Windows User (**aac\OITAUSBMSPRD**) as the master service account that the four BMS Services run under. This can be referred to as the Master BMS Service Account.
- The <SERVERADDRESS>240 server hosts the **BMS.BedManagerService** service application.
- The <ServerAddress>241 server hosts the **BMS.VI.ServiceHost** service application.

All BMS Facilities/Sites require at least one service account for certain site functionality.

- This service account will run the EMS Mobile Page and Whiteboard Kiosk Page functions.
- Under BMS version 1.xx a single service account can be used for both functions.
- The service account that runs the EMS Mobile Page and Whiteboard Kiosk Page functions must not have any Policies assigned that restrict its use to specific computers.

BMS minimum hardware and software requirements are presented below:

Table 1-Server for Web Applications

Basic software:	Microsoft Windows Server 2019 64 bit Standard IIS 10 ASP.NET MVC5 .NET Framework 4.7.2
Application software:	Dashboards web application
Processor(s):	24 x Intel Xeon E52698v4 or equivalent
Memory:	64 GB
Hard disks:	345 GB
Network controller:	Broadcom NetXtreme Gigabit Ethernet, or equivalent

Table 2-Application Server

Server 1	
Basic software:	Microsoft Windows Server 2019 64 bit Standard .NET Framework 4.7.2
Application software:	BMS
Processor(s):	12 x Intel Xeon E52698v4 or equivalent
Memory:	96 GB
Hard disks:	280 GB
Network controller:	Broadcom NetXtreme Gigabit Ethernet, or equivalent

Server 2	
Basic software:	Microsoft Windows Server 2019 64 bit Standard .NET Framework 4.7.2
Application software:	BMS
Processor(s):	20 x Intel Xeon E52698v4 or equivalent
Memory:	64 GB
Hard disks:	280 GB
Network controller:	Broadcom NetXtreme Gigabit Ethernet, or equivalent

Table 3-Database Server

Basic software:	Microsoft Windows Server 2019 64 bit Standard Microsoft SQL Server 2019 Enterprise .NET Framework 4.7.2 .NET 6.x – Required to run PPMS Community Care data collection tool from server command prompt
Application software:	Databases used by the services installed on APP
Processor(s):	40 x Intel Xeon E52698v4 or equivalent
Memory:	320 GB
Hard disks:	2620 GB
Network controller:	Broadcom NetXtreme Gigabit Ethernet, or equivalent

2.3 Configuration Parameters

This section describes configuration parameters of the BMS application.

Table 4-BMS Web Configuration Parameters

File	Section	Configuration key	Configuration values (ex.)	Description
Web.config	configuration/ appSettings/	webpages:Version	1.0.0.0	Version of the web site.
		ClientValidationEnabled	true/false	Gets or sets a value that indicates whether client-side validation is enabled.
		IsWeb	True/false	Indicates if running application is web app
	key	UnobtrusiveJavaScriptEnabled	true/false	Gets or sets a value that indicates whether unobtrusive JavaScript is enabled.
		ReportsPath	/BMS	Path of the reports in the reporting services.
		VAURL	http://vaww.esm.infoshare.va.gov/PMIC/Projects/BMS/Implement/default.aspx	BMS Sharepoint Site.
		TICKETURL	http://vaww.esm.infoshare.va.gov/PMIC/Projects/BMS/Implement/HDProcess/default.aspx	Enter a defect and enhancement ticket.
		WhiteboardRefreshRate	60	Time in seconds of refresh rate of the whiteboard page.
		THRESHOLD	0	Threshold value used to compare wait time value of the patient, from the Patients Pending Placement List, in order to display an alert on the Patients Pending Placement List.
		aspnet:MaxHttpCollectionKeys	2000	Maximum number of aps.net collection keys.
		WhiteboardAjaxRefreshRate	180	Time in seconds of AJAX refresh rate of the whiteboard page.
		WhiteboardRealRefreshRate	60	Time in minutes of standard refresh rate of the whiteboard page.
		HomePageRefreshRate	300	Time in seconds of refresh rate of the home page.
		Smtphost	VA_MAIL_SERVER	Mail Server host.
		DisplayDetailedErrorMessage	true/false	If set to true displays detailed error message, otherwise displays a generic message ("Please contact BMS administrator.").
Is_IIS_Single_Instance	true/false	If set to true a single IIS instance is used. If set to false multiple IIS instances are used (web farm scenario).		

File	Section	Configuration key	Configuration values (ex.)	Description
	configuration/system.serviceModel/client/endpoint	ProxyPoolMaxCount	100	The maximum number of proxies in the pool.
		EnableDevExpressContextMenu	true/false	if true, the DevExpress right-click functionality is enabled
		address	http://vaserver:17050/BMSConfigurationOperations	BMS ConfigurationOperations client endpoint address.
		address	http://vaserver:17050/BMSConfigurationOperations	BMS ConfigurationOperations Windows authentication client endpoint address.
		address	http://vaserver:17050/BMSQuery	BMS Query client endpoint address.
		address	http://vaserver:17050/BMSOperations	BMS Operations client endpoint address.
		address	http://vaserver:17050/VistaQuery	Vista Query client endpoint address.

2.4 Ward Whiteboard Kiosk Mode Display Configuration (BMS Whiteboard Kiosk Setup)

An electronic kiosk (or computer kiosk) houses a computer terminal designed to function while preventing users from accessing system functions. BMS has adopted the use of electronic kiosks to provide sites with the capability to setup Large Screen Displays for the BMS Ward Whiteboard for greater visibility. The Whiteboard Kiosk is a read only access page. It presents an overview of the beds in the current facility (or in the selected ward) and allows the user to assess at a glance the bed availability in their facility (or ward). Kiosk mode locks down the user interface to protect applications from accidental or deliberate misuse. These displays should be placed carefully, considering that confidential patient data (Social Security Number) should not be in view of people who are not authorized to see it.

Figure 2- BMS Ward Whiteboard Screen

The screenshot shows the BMS Ward Whiteboard interface. At the top, it displays 'Whiteboard Home' and 'CTX Whiteboard for: T CR - Last Update: Total Number Pending/Today's Scheduled Admission: 107/0'. There are also 'Export Report' and 'Icon Legend' links. The main table has columns for BED, PT, STAFF, ATTENDING, COMMENTS, DISCH STATUS, BED STATUS, WARD, NUM, and LOS WARD. The table lists several beds (CR400-1T, CR400-2T, CR400-3T, CR500-1T, CR500-2T, CR500-3T, CR700-1T, CR700-2T, CR700-3T) with their respective statuses and assignments. The bottom of the screen has navigation links for 'BMS Home', 'Icon Legend', and 'Information'.

BED	PT	STAFF	ATTENDING	COMMENTS	DISCH STATUS	BED STATUS	WARD	NUM	LOS WARD 000:HH
CR400-1T									
CR400-2T									
CR400-3T									
CR500-1T									
CR500-2T									
CR500-3T			PROVIDER, ONE				T CR - GENERAL CWT/TR	17:04	
CR700-1T									
CR700-2T			PROVIDER, TWO				T CR - GENERAL CWT/TR	33:04	
CR700-3T			PROVIDER THREE				T CR - GENERAL CWT/TR	21:04	

Setting up for the BMS Whiteboard Kiosk involves a series of steps that most often are performed by IT staff with access to Local Site network configuration and/or staff with authority to request the required Local Site and Active Directory (AD) network configuration changes. Steps for configuring the BMS Whiteboard Kiosk can be divided into three major categories:

- The Ward Whiteboard Kiosk URL
- The Network User for BMS Kiosk Access
- The Kiosk Workstation for Local Site Use

Each category involves a series of required steps to ensure successful operation of the Kiosk. Following is an outline of the process to setup and configure the BMS Whiteboard Kiosk for a local site.

- Create the Ward Whiteboard Kiosk URL. See details in 2.4.1 Create the Ward Whiteboard Kiosk URL
 - Determine the BMS Whiteboard Parameters for Kiosk Operation and Setup
 - Test the URL in a browser
- Set up a default user for the kiosk. See details in 2.4.2 Set up a default user for the BMS

Kiosk

- Set up the Network User for BMS Access
 - Configure the Whiteboard Kiosk Default Login User in BMS
 - Assign a Role to the Whiteboard Kiosk Default User in BMS
- Set up the Workstation / Kiosk Machine. See details in 2.4.3 Set up the Workstation / Kiosk Machine
 - Disable the Screen Saver
 - Configure the Power Settings to Disable Sleep and Standby Mode
 - Configure Auto Log in Option
 - Set the URL as the Home Page in Microsoft Edge
 - Add https://vaww.bms.va.gov to “Trusted Sites” in Microsoft Edge
 - Add to the start-up commands (Windows) the launch of the browser
 - Close ME, and restart to test
 - Set Registry Keys to configure Kiosk for local Site use

2.4.1 Create the Ward Whiteboard Kiosk URL

The Ward Whiteboard display uses parameters to determine the behavior of the display. For example, the whiteboard can display a specific ward or ALL wards for a site by setting the parameter **wardName**. Below is a description for each whiteboard display parameter along with available options for each.

Table 5-Ward Whiteboard URL Configuration Parameters

Parameter	Short Description	Options
facilityCode	Code of facility (e.g., BROCKTON = BRK).	Enter the 3 character facility ID.
wardName	Name of BMS Ward Name. To see all the wards the value that needs to be configured is ALL.	These are the BMS WARDS as defined in the Facility, Site Options, VistA Ward Add/Edit. The Ward name value should match the "BMS WARD GROUP TEXT". A single ward can be entered or the value "ALL" to display all the wards at the facility.
splitScreen	To split the page in two tables enters the value "Yes".	Yes No
displayPTCode	How the patient should be displayed under the column "Patient" (full name or 1st+Last 4) or LastName. LastName is required for Kiosk mode due to Privacy regulations.	FirstAndLast4 LastName
genderColorCode	To change the background color for the row according with patient's gender.	Blue/Pink None
displayFooterCensus	To view the footer census.	Yes No
displayStaffAttending	What column is displayed in the table? (Staff column, Attending column or both).	Staff and Attending Staff Attending
scrollRate	The timer interval will affect the scrolling speed. This parameter can be absent. (If specified then it represents seconds).	Null or an integer value.

2.4.1.1 Determine the parameters for the Kiosk, and create the URL

Sample URL to display All Wards for site BRK:

<https://vawww.bms.va.gov/WardWhiteboardUrl?facilityCode=BRK&wardName=ALL&splitScreen=No&displayPTCode=LastName&genderColorCode=Blue/Pink&displayFooterCensus=Yes&displayStaffAttending=Staff%20and%20Attending&scrollRate=20>

2.4.1.2 Test the URL

Once you have the URL, type it into a browser to test. The BMS Ward Whiteboard should come up. Note: a site can have a different URL for each kiosk.

2.4.2 Set up a default user for the BMS Kiosk

Create a network service account for accessing the BMS page. Make sure that it is in an Organizational Unit (OU) that will not get the Enterprise System Engineering (ESE) Federal Desktop Core Configuration (FDCC) / US Government Configuration Baseline (USGCB) User Settings. Set the “Log on to” so the account can only log onto the kiosk PC you are setting up.

2.4.2.1 Set up the Network User for BMS Access

- Create AD User with non-expiring password under Service Accounts for the local site. If you are not an AD administrator then provide the following instruction to the AD along with your request for a new service account.

In Active Directory Create a Generic User with a Non-Expiring password in Service Accounts for your location with Access to All Computers.

NOTE: You will create a single ID, not one for every PC. Also, do not setup auto login with this generic account at this point as PCs will automatically lock at this level.

- Right click the “Service Accounts” folder (VXX.med.va.gov/VISNxx/Facility(XXX)/Service Accounts) and select New...User.
NOTE: Do not use the “Service Accounts” folder directly under vXX.med.va.gov. Under First Name, enter vhaXXX_____ (such as vhaSTLBMSUser)
- Enter the same under “User Login Name”
- Enter a password when prompted and select
- Uncheck “User must change password at next logon”
- Check “Password never expires”
- Click “OK” at the warning that the user will not be prompted to change the password.
- Click “Next”
- At the top of the screen the path should read, “vXX.med.va.gov/VISNxx/Facility(XXX)/Service Accounts”
- Uncheck “Create an Exchange Mailbox”
- Click “Next”
- Review confirmation screen for accuracy and click “Finish”.
- Your new account should be available in your “Service Accounts” list. You may have to refresh your list to see it.
- Double-click your new account, in the description field, add
- SERVICE ACCOUNT: VHAxxxxxxx(YourUserName): BMS DISPLAY
- In the Account tab, ensure “This user can log on to “All computers”. Do not identify any specific computers.
- When you are finished, your new account in the Service Accounts list should only show a Name, Type, and Description. All other fields should be blank.

2.4.2.2 Configure the Whiteboard Kiosk Default Login User in BMS

For the current facility that will display the associated Whiteboard page, a default user needs to be configured in BMS application for the Ward Whiteboard Kiosk.

To configure the Whiteboard Kiosk Default User:

- **Go to the BMS Site Home Page**
- **Click on the Site Options link**
- **Click on the Facility Setting link**
- **Fill the fields “Whiteboard Kiosk Default User Name:”, “Whiteboard Kiosk Password:” and “Whiteboard Kiosk Password Confirm:” with the BMS Service Account ID**
- **Click Submit**

Figure 3- Facility Settings

Facility Configuration - VA NORTH TEXAS HEALTH CARE SYSTEM: DALLAS VA MEDICAL CENTER (NTX)	
PARAMETER	OPTIONS
BMS Server Time Zone	CENTRAL STANDARD TIME
Facility Site Time Zone	CST
Auto-Removal Patients Pending Bed Placement List?	Yes
Auto-Remove Edis Patients from Pending Bed Placement List?	No
Auto Placement of Transfers onto PPBP List?	Yes
Integrated Facility?	No
Facility Name:	VA NORTH TEXAS HEALTH CARE SYSTEM: DALLAS W
Facility Address 1:	123 a STREET
Facility Address 2:	DALLAS, TEXAS 75216
Facility Point-of-Contact:	ONE PROVIDER
Facility POC Email:	JEFFREYD.ALLEN@VA.GOV
Facility POC Telephone:	XXX-XXX-XXXX
Local Time Adjust:	0
EMS Default User Name:	ONEPROVIDER
EMS Password:	
EMS Password Confirm:	
Whiteboard Kiosk Default User Name:	PROVIDER.ONE@YOURSITE
Whiteboard Kiosk Password:	
Whiteboard Kiosk Password Confirms:	
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

2.4.2.3 Assign a Role to the Whiteboard Kiosk Default User in BMS

Each facility must assign the BMS “EMS USER” Role to the Service Account ID created to run the Whiteboard Kiosk URL. This assignment can be done from the **BMS Admin Section Add/Edit BMS User** hyperlink or Facility **Site Options BMS User Add/Edit** hyperlink.

- Click the **Select Existing NT User Name** button
- Select the correct VISN Domain from the left Drop Down Box
- In the **User Name** box Enter the BMS Service Account ID created for the BMS EMS/Whiteboard Kiosk. Then click the **Find** button
- Click the **Selected Radio** button for the user. Then click the **Select** button.
- In the **EMS User** box, select “Yes”. All other roles should be “No”
- In the **Default Region** box, select the correct Region.
- In the **Default VISN** box, select the correct VISN
- In the **Default Site** box, select your Site
- In the **READ Access** box, select “Yes”
- In the **WRITE Access** box, select “Yes”

Figure 4-Whiteboard Kiosk User Role Assignment

Admin Menu ADMINISTRATION SECTION - USERADD/EDIT Logout

Select Existing NT User Name Select Default

PARAMETER	OPTIONS
NT User Name	v17.med.va.gov\vphantxbedmgmt
Support User?	No
National User?	No
Regional User?	No
VISN User?	No
Admin User?	No
Audit Log User?	No
Site User?	No
EMIS User?	Yes
EMIS Supervisor User?	No
Guest User?	No
Default Region:	2
Default VISN:	17
Default Site:	NTX - VA NORTH TEXAS HEALTH CARE SYSTEM:
READ Access?	Yes
WRITE Access?	Yes

Display only the facilities with permissions

READ Access	WRITE Access	Region	VISN	Facility
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Region 2	VISN 17	DALLAS (549, NTX)

Submit Cancel

- Click **Submit**

2.4.3 Set up the Workstation / Kiosk Machine

After setting up the workstation / Kiosk machine, it will automatically log in to Windows, and automatically login to BMS.

2.4.3.1 Disable Screen Saver

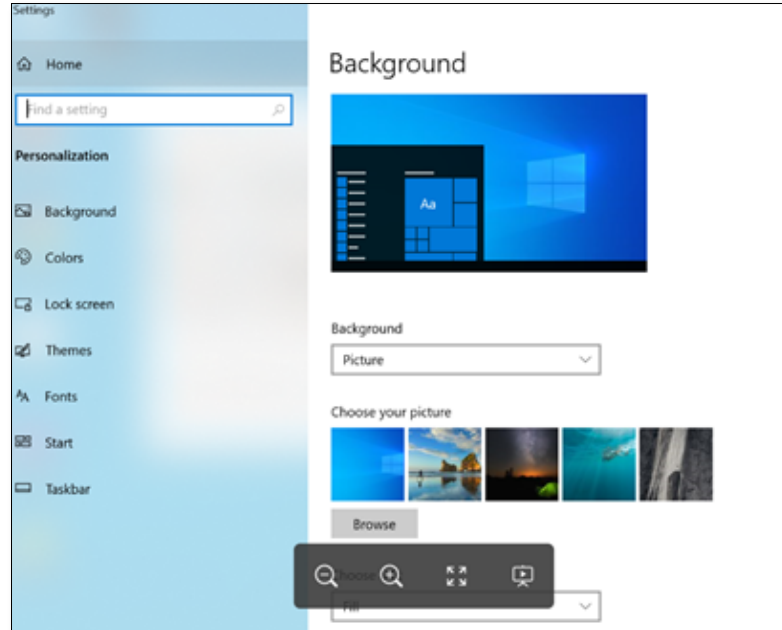
In order to display the Whiteboard page continuously the screen saver needs to be disabled.

NOTE: The Windows menu that allows the disable of the screen saver might be different from one version of Windows to another. For example, for Windows 10 the needed operations are:

- *Right click on the desktop*
- Click **Personalize**

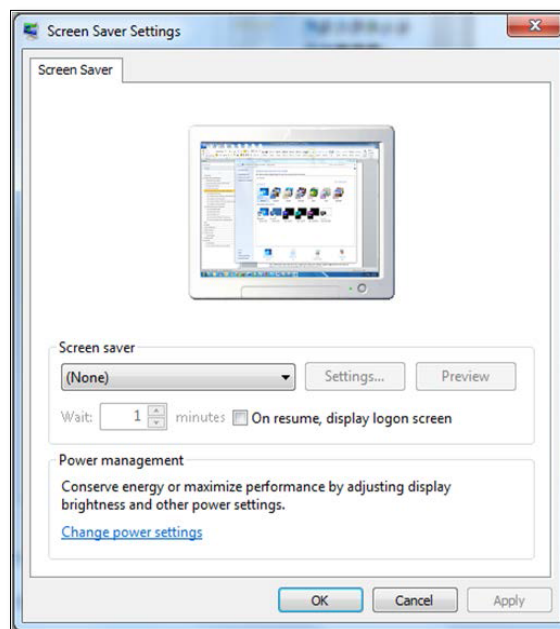
- Click on the **Lock Screen**
- Click on **Screen Saver Settings**

Figure 5-Screen Saver Option



- Select **None** from the screensaver drop down on the displayed form

Figure 6-Screen Saver Settings Window



- *Click **OK**.*

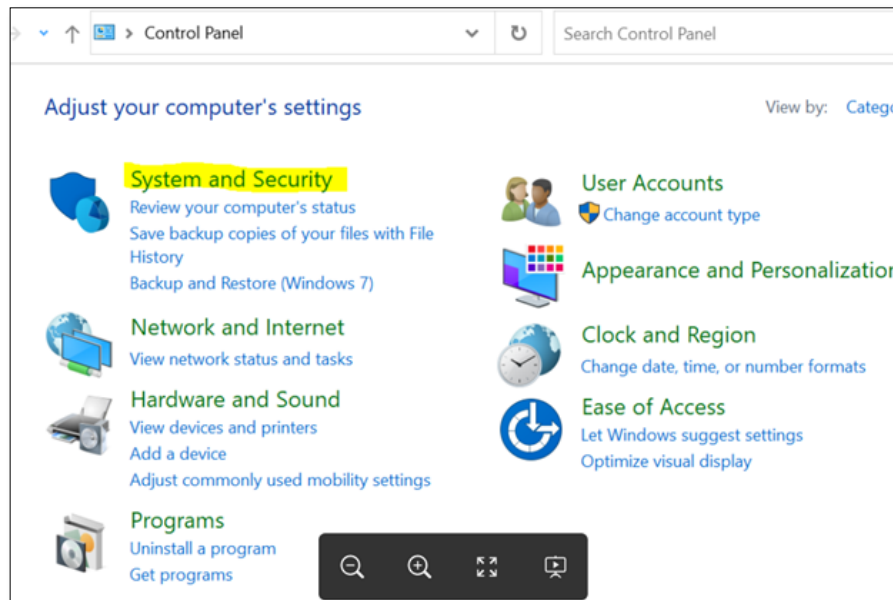
2.4.3.2 Configure Power Settings: Disable Sleep and Stand-by Mode

In order to display the Whiteboard page continuously the power settings need to be adjusted so that the computer will never enter into hibernate or stand-by and also the screen will never turn off.

NOTE: The Windows menu that allows the configuration of the power settings might be different from one version of Windows to another. For example, for Windows 10 the needed operations are:

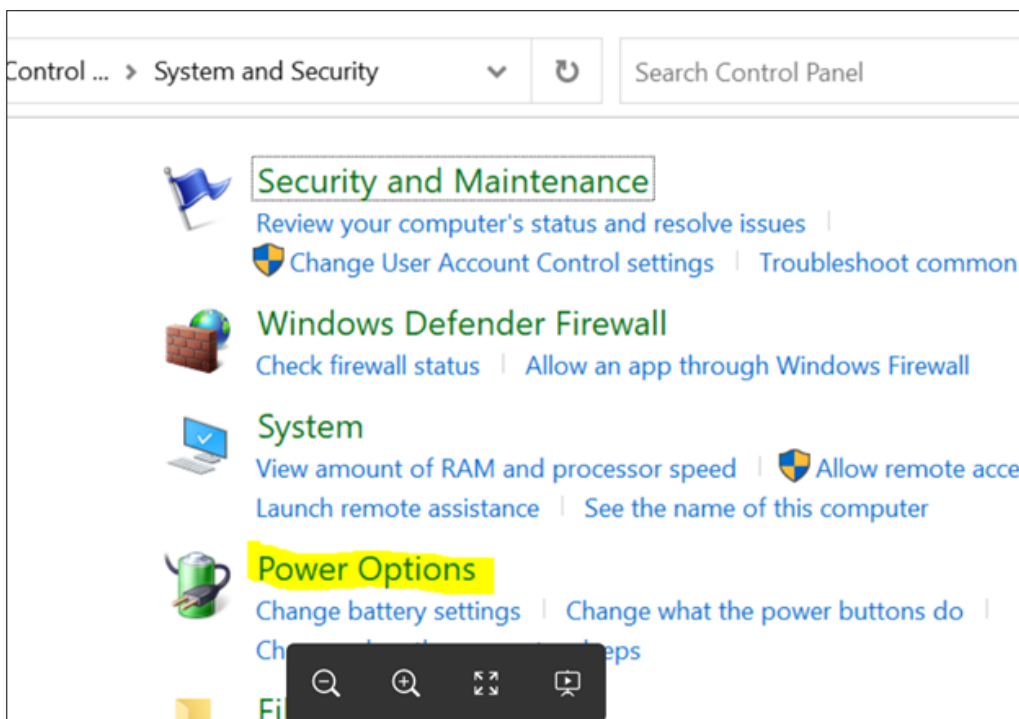
- *Go To **Control Panel***
- *Select **System and Security***
- *Select **Power Options***

Figure 7-System and Security



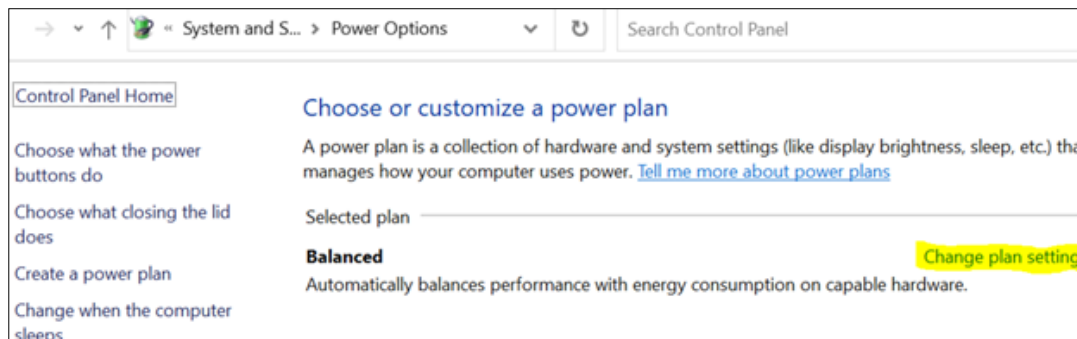
- *Click on “**Change Plan settings**” for the active plan*

Figure 8- Power Options Settings



- Select **“Never”** from the drop downs associated with **“Turn off the display”** and **“Put the computer to sleep”**

Figure 9- Change Plan Settings Option



- Click **“Save changes”**

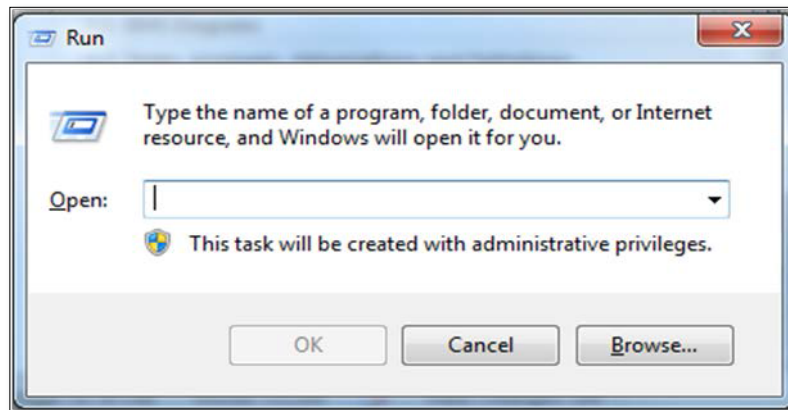
2.4.3.3 Configure Auto-login Option

Configure Auto-Login: The computer that will display the Whiteboard page needs to have the auto-login configuration set to” true”.

NOTE: The Windows menu that allows the configuration of the auto-login settings might be different from one version of Windows to another. For example, for Windows 7 the needed operations are:

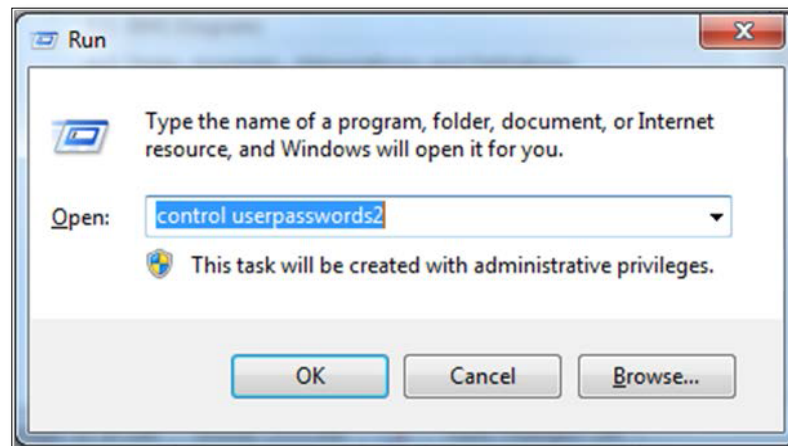
- Press the **Windows key + R** on your keyboard to launch the “**Run**” dialog box.

Figure 10- Run Window



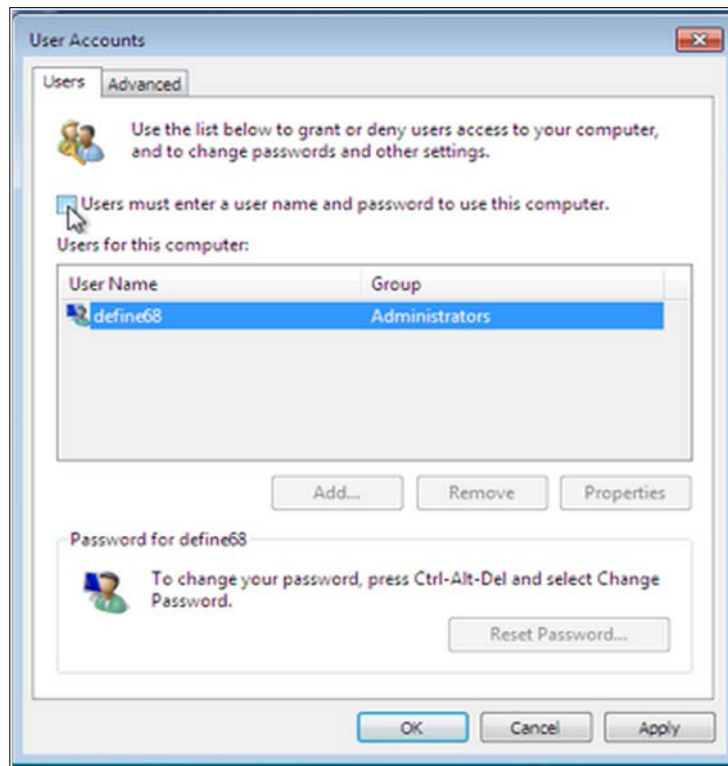
- Type in “**control userpasswords2**”

Figure 11- Run Window with Command Entered



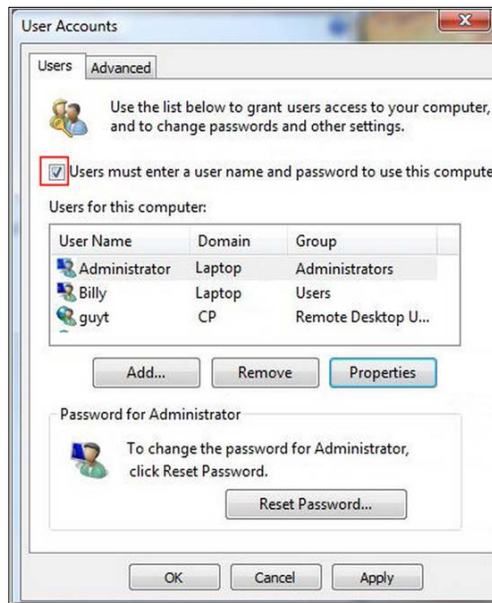
- Press **Enter**. The **User Accounts** window will display.

Figure 12- User Accounts Window



- *Uncheck the option “Users must enter a user name and password to use this computer” for the BMS Default Kiosk User Account*

Figure 13- User Accounts



- Click "OK"

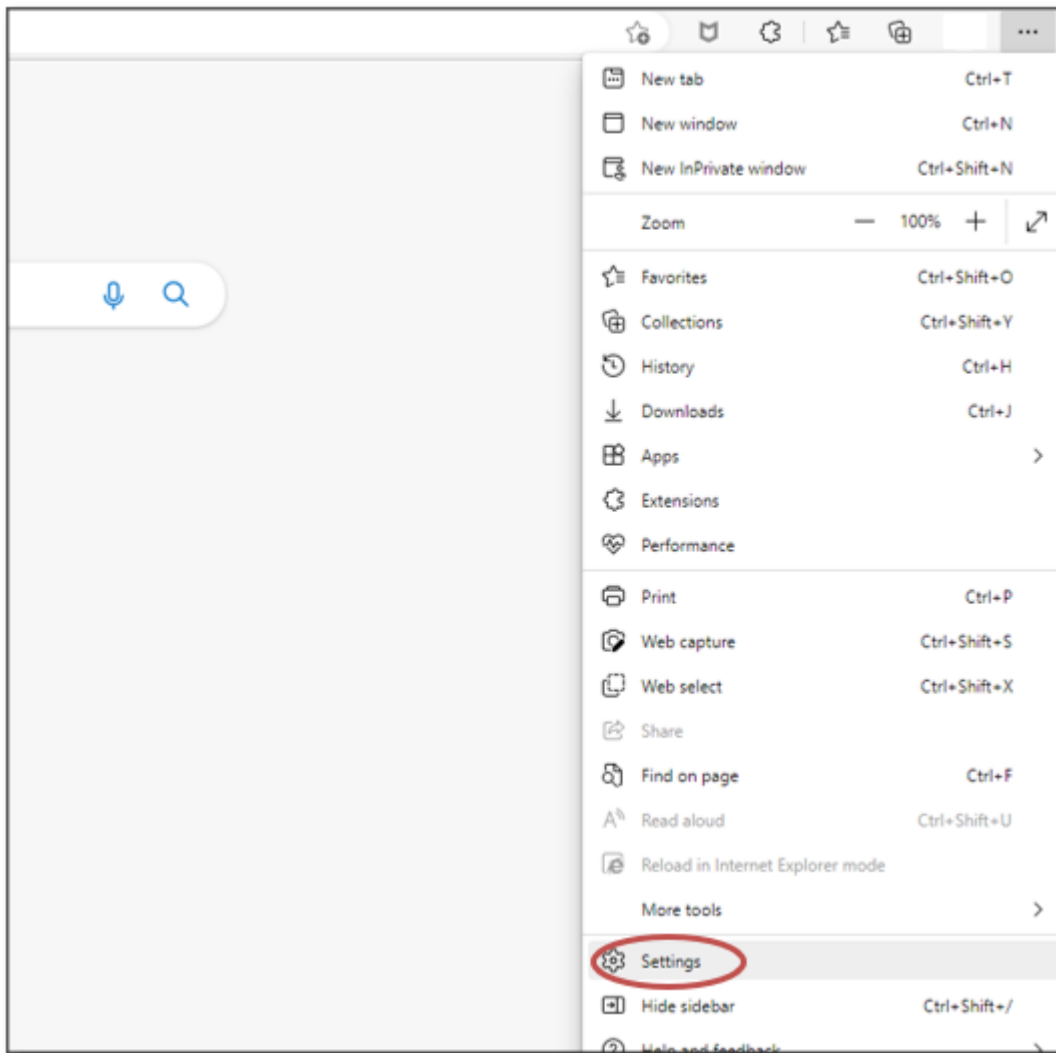
2.4.3.4 Set the URL ([from step 2.4.1](#)) as the Home Page in Microsoft Edge

The specific Ward Whiteboard Kiosk URL needs to be configured as the Home-Page for the intended browser. The menu to set the default home-page might differ from one browser to another.

For example, for Microsoft Edge the user needs to:

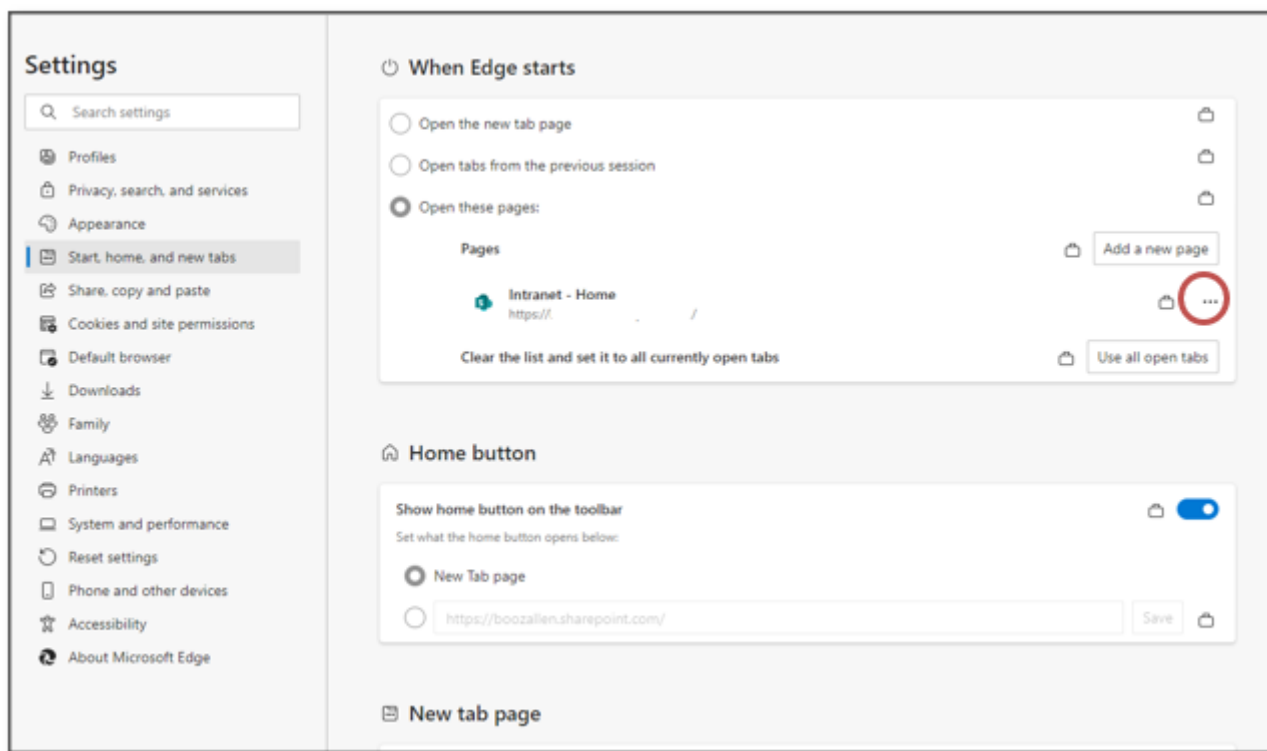
- Click the ellipsis ... in the top right of the screen

Figure 14- Settings of Microsoft Edge



- **Select *Settings***

Figure 15- When Edge Starts



- On the **Start,home, and new tabs**, category, under the **open these pages:** section select the ellipsis ...
- Select **edit**
- enter the URL
- Click **Save**

2.4.3.5 Add BMS to the “Trusted Sites”

To add BMS to “Trusted Sites” in Microsoft Edge

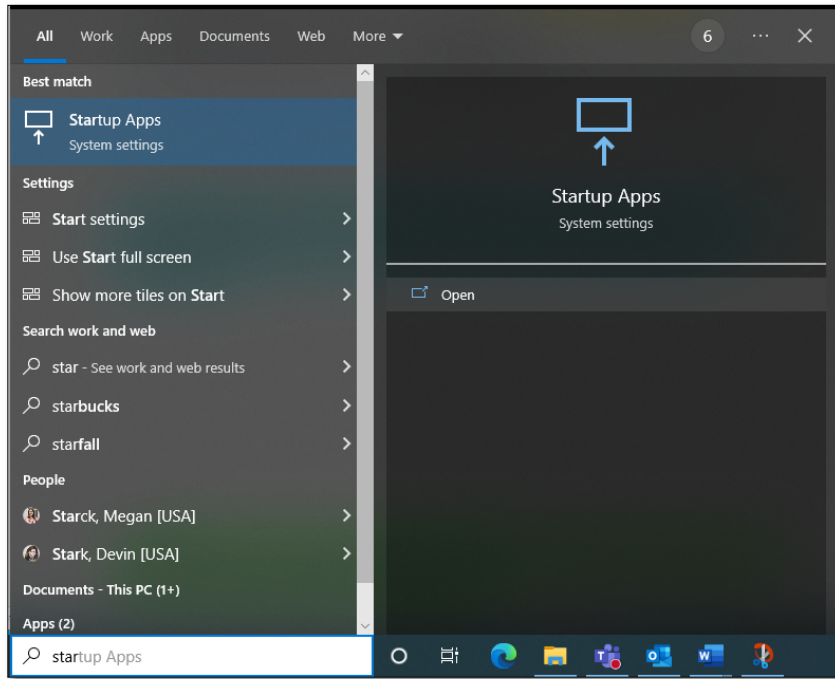
- Type “**Internet Options**” in the Type Here to Search bar by the start menu
- In the “**Add this website to the zone:**” field, enter **https://vaww.bms.va.gov**
- Click **Add**, Click **OK**

2.4.3.6 Add the launch of the browser to the Windows start up commands.

The next step is to add to the startup commands the launch of the chosen browser.

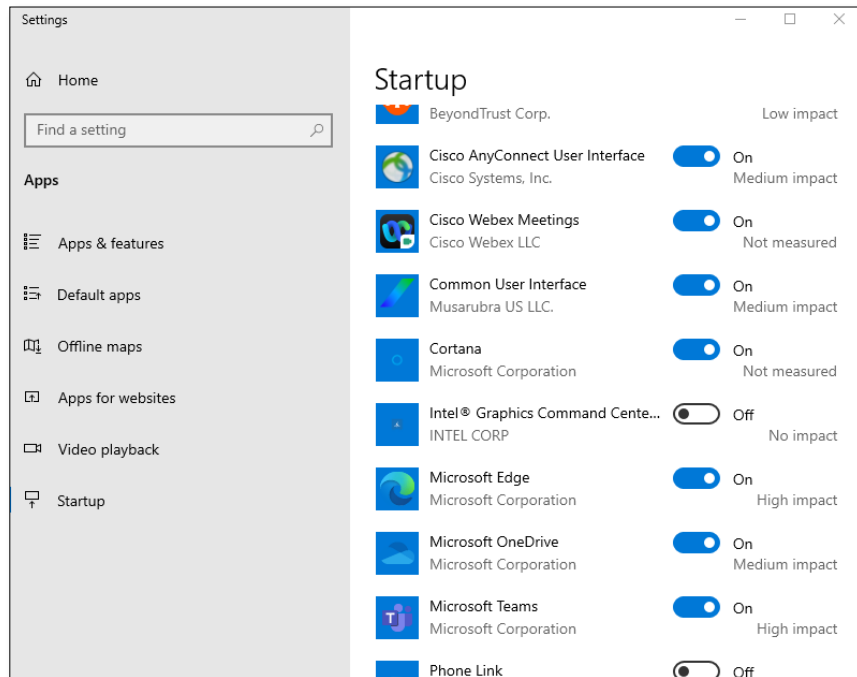
NOTE: This operation might differ from one version of Windows to another. For example, for Windows 10 the steps needed are:

Figure 16- Open Option



- Type “**Startup Apps**” in the Type Here to Search bar *by the start menu*

Figure 17- Microsoft Edge Selected



- *Scroll down to Microsoft Edge and toggle to On*

2.4.3.7 Test the Kiosk

Close Microsoft Edge. Restart Microsoft Edge. The BMS Ward Whiteboard for the Kiosk should come up.

2.4.3.8 Set the Registry Keys to configure the Kiosk for local site use.

The purpose of the following steps is to configure Kiosk workstation to serve one function only: BMS Ward Whiteboard display. The following instruction leads you through a series of steps that effectively lock down the workstation for this purpose. Access to workstation software and/or desktop will be prevented after the configuration setup is complete. The Whiteboard Kiosk is read only.

*Note: It is recommended that prior to performing the configuration steps outlined in this section a backup of the existing system be created for rollback / recovery purposes, and that a restoration point be created.

- Modify Registry Settings

Figure 18-Windows Registry Editor

Restriction.reg

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Microsoft\Internet Explorer\Restrictions]
"NoBrowserContextMenu"=dword:00000001
"NoFileOpen"=dword:00000001
"NoOpenInNewWnd"=dword:00000001
```

- Run Restrictions.reg by double-clicking filename from Windows Explorer. Verify settings have been applied.
- Modify Local Group Policy Settings

For local group policy changes run **gpedit.msc** and make the following changes:

User Configuration\Administrative Templates\System\Ctr+Alt+Del Options
Remove TaskManager..... Disable
Remove Lock ComputerEnable
Remove Change PasswordEnable
Remove Logoff.....Enable

User Configuration\Administrative Templates\Control Panel\Display
○ Password protect the screen saverDisabled

Verify all settings have been applied. The purpose of these settings is to lock down the workstation for one purpose only, BMS Whiteboard Kiosk.

- Reboot Kiosk Machine to test set up.

*Note: If Kiosk continually “freezes”, please contact the Service Desk to have an IE Refresher script installed.

2.5 Bed Management Solution Contingency Report Setup

The following steps will need to be completed in order to setup the BMS Contingency Report

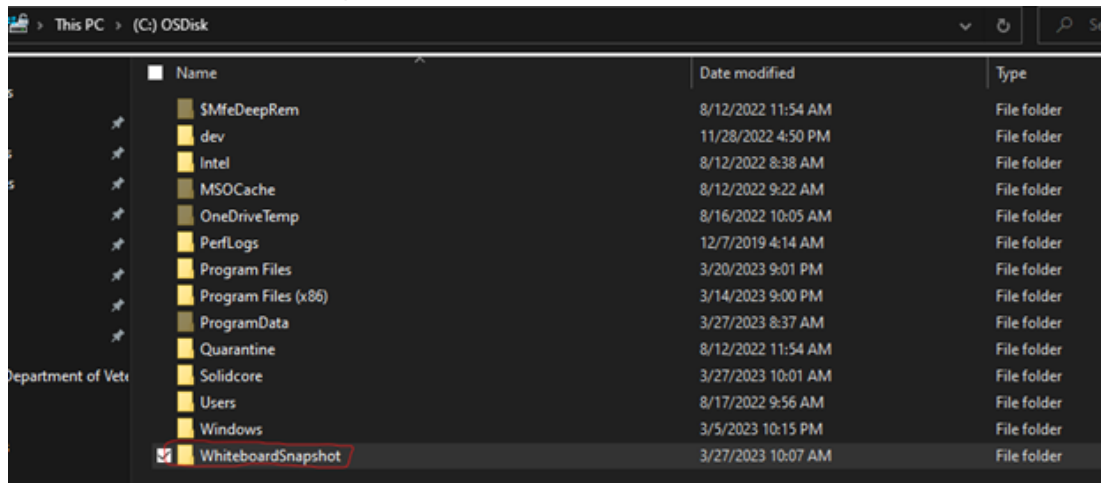
- Create snapshot folder
- Define network share
- Assign rights to user
- Assign snapshot folder path to ward group
- Associate scheduler with the whiteboard report

2.5.1 Create Snapshot Folder

To create the Snapshot Folder on Windows 10:

- **Open** File Explorer
- Go to the **C Drive** (or alternate drive letter if appropriate)
- Click **New Folder**
- Enter the Name of the folder, e.g., WhiteBoardSnapshot
 - Do not use spaces in the folder name

Figure 19- Whiteboard Snapshot Folder

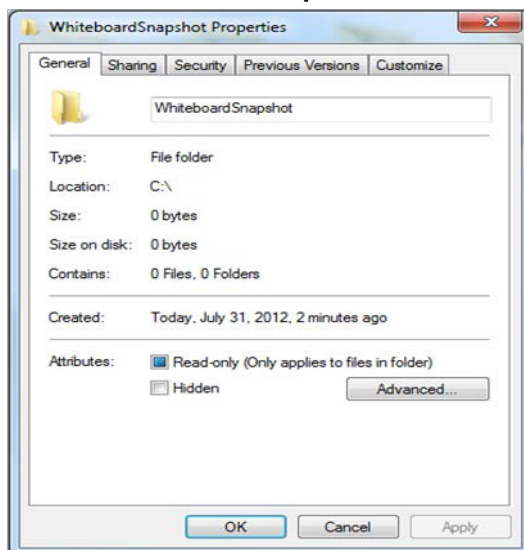


2.5.2 Define Network Share

Note: Admin rights to the machine are required for this step.

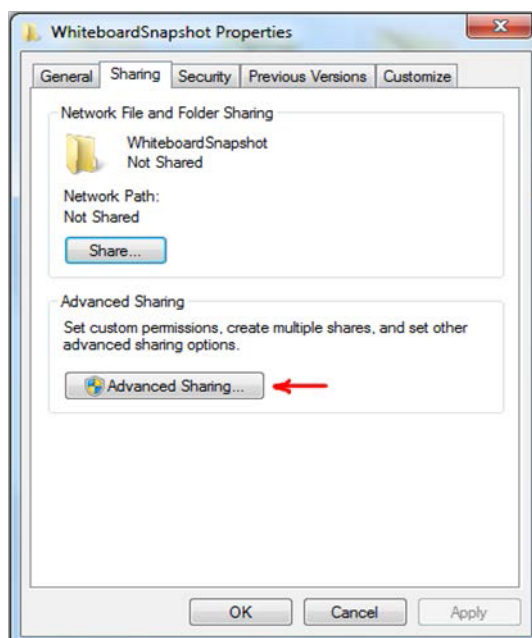
- Navigate to the “WhiteboardSnapshot” folder, right-click it and choose **Properties**

Figure 20- Whiteboard Snapshot Folder Properties



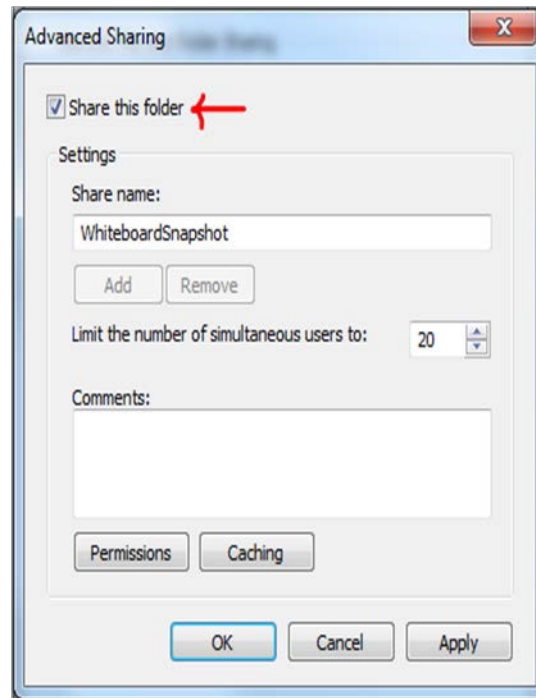
- Go to **Sharing tab** and select **Advance Sharing** option.

Figure 21- Advanced Sharing Option



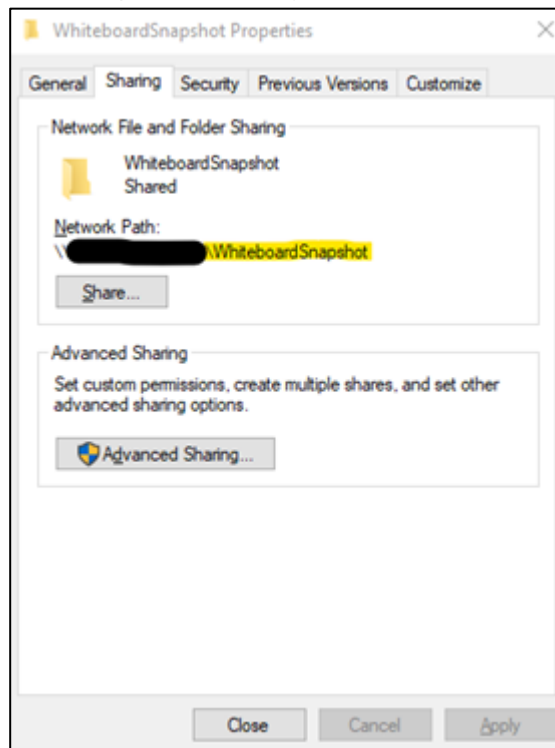
- In **Advanced Sharing** dialog, enable **Share this folder** option. It will automatically add folder's name as Share name.

Figure 22- Share this Folder Option



- Click **OK**
- Verify the network path is now populated with the computer name and folder

Figure 23- Verify Network Path



2.5.3 Assign Rights to Master BMS Service Account User

Note: Admin rights to the machine are required for this step.

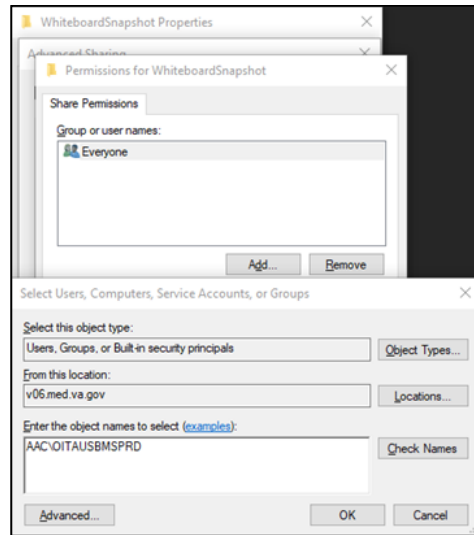
The BMS Application runs under a service account. AITC has created the Windows User (**aac\OITAUSBMSPRD**) as the master service account that the BMS Services runs under. The Windows user (**aac\OITAUSBMSPRD**) that is configured to be the Login that runs the four BMS Windows Services needs to have full rights to these shares.

This user must have full control on each facilities file folder that is used to store the Whiteboard Contingency Reports.

On Windows 10 the needed operations are:

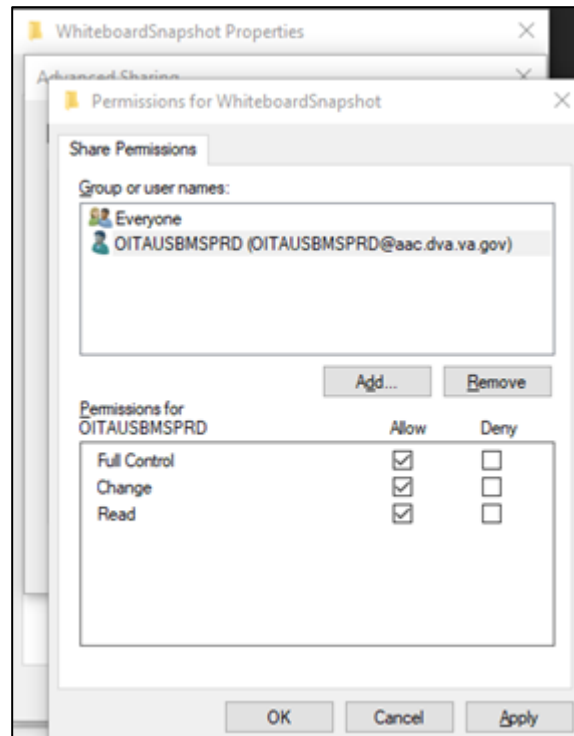
- Using the Advanced Sharing window (re-open from the previous steps), click Permissions
- Click **Add**
- Type in "**AAC\OITAUSBMSPRD**" and click Check Names

Figure 24- Permissions for Whiteboard Snapshot



- Click **OK**
- Select the Service Account and check the **“Full Control”** box

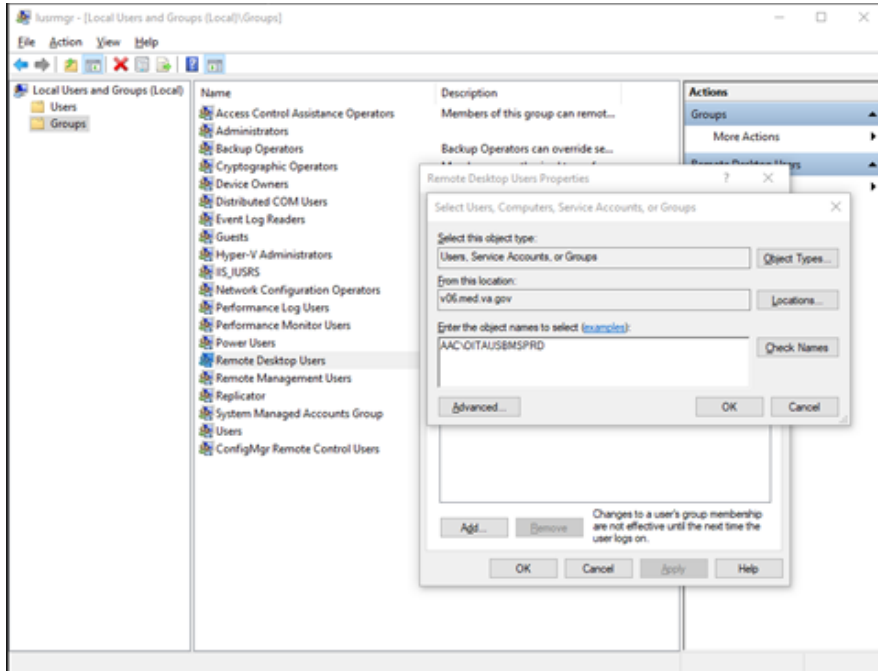
Figure 25- Permissions for Whiteboard Snapshot



- Click **OK** through the rest of the open Folder Properties windows
- Using the Windows Start button and Search, open **“edit local users and groups”**
 - Make sure to open as Administrator
- Click **Groups**
- Double click the **Remote Desktop Users** group

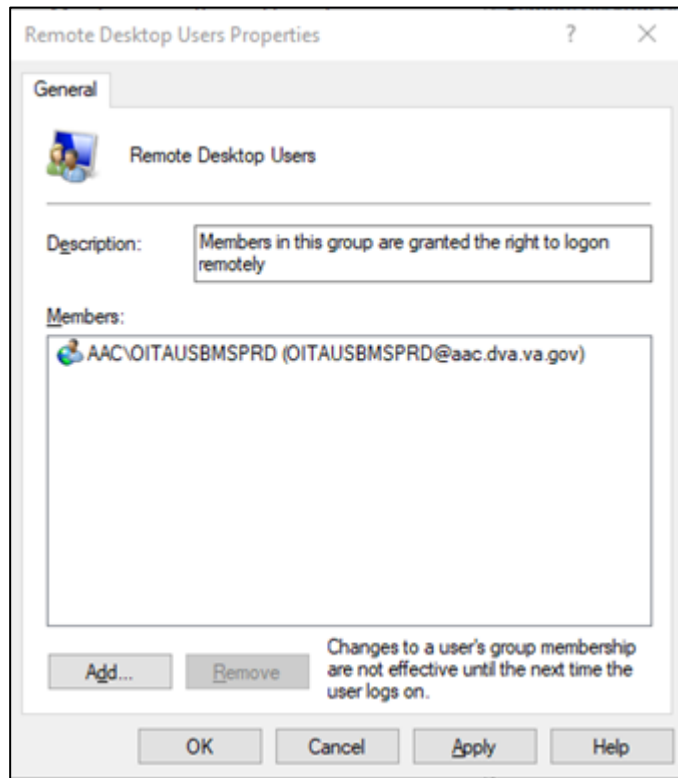
- Add the BMS Service Account

Figure 26- Select Users



- Click **OK**

Figure 27- Remote Desktop Users Properties



- Click **OK**

2.5.4 Assign Snapshot Folder Path to Ward Group

- Open BMS and navigate to the **Facility Home Page**
- Click **Site Options**
- Click **Contingency Settings**
- Add the Fully Qualified Domain Name for the configured Whiteboard Snapshot folder
 - `\\XYZ-CMP12345.v06.med.va.gov\WhiteboardSnapshot`
- Click **Save**

Figure 28- Contingency Settings Page

Ward Group	Whiteboard Report Path
ACUTE MH_10E	\\XYZ-CMP12345.v06.med.va.gov\WhiteboardSnapshot
ACUTE MH_10W	\\XYZ-CMP12345.v06.med.va.gov\WhiteboardSnapshot
DOM/RRTP_C-T	
DOM/5_LIBERTY	
ICU_MICU	
ICU_SICU	
MED/SURG_MX_3W	
MED/SURG_MX_5E	
MED/SURG_MX_5W	
MED/SURG_MX_BE	
MED/SURG_MX_8W	
MED/SURG_MX_PCU	\\XYZ-CMP12345.v06.med.va.gov\WhiteboardSnapshot
VIRT_ED_ICU	

Save

2.5.5 Associate Scheduler with Whiteboard Report

- Open BMS and navigate to the **Facility Home Page**
- Click **Site Options**
- Click **Background Processors**
- Change the drop-down selection for Add/Update Scheduler to the desired schedule

Figure 29- Add Scheduler for Background Processors

The screenshot shows a web interface for configuring background processors. At the top, there is a header bar with the text "Background Processors - KANSAS CITY VA MEDICAL CENTER (KAN)". Below this, the main content area is titled "Whiteboard Report". Inside this area, there are two lines of text: "Current Scheduler: NONE" and "Add/Update Scheduler: Every 15 minutes CST". The "Add/Update Scheduler" text is followed by a small downward-pointing arrow, indicating a dropdown menu. Below these fields, there is a button labeled "Save Scheduler".

- Click **Save Scheduler**

2.6 EMS Mobile Device Configuration

In order to configure the BMS EMS Mobile Devices, the following steps must be completed:

- *The local IS must create a local Service Account with a password that never expires and does not change. This account must not have any kind of policy that restricts its use to specific computers. The EMS Mobile Device will use this account to access the EMS Mobile page. This local Service Account can be the same as the Whiteboard Kiosk Default User Account created in Section 2.5.2.*
- *Each facility must enter the local Service Account and Password in the EMS Default User and Password fields on the Facilities Settings page.*
- *Configure the Mobile Device so that when it boots up, it will automatically open IE and go to the specified URL.*

2.6.1 Configure EMS Mobile Device Default Login User

For the current facility, a default user must be configured in the BMS application for the EMS Mobile Device.

To accomplish this, the Facility Admin User must do the following:

- *Go to the **Facility Home Page***
- *Click on the **Site Options** link*
- *Click on the **Facility Setting** link*
- *Fill the fields "**EMS Default User Name:**", "**EMS Password:**", and "**EMS Password Confirm:**" with the BMS Local Service Account*

Figure 30 - EMS Fields Filled on the Facility Settings Page

PARAMETER	OPTIONS
BMS Server Time Zone	CENTRAL STANDARD TIME
Facility Site Time Zone	CST
Auto-Removal Patients Pending Bed Placement List?	Yes
Auto-Remove Edis Patients from Pending Bed Placement List?	No
Auto Placement of Transfers onto PPBP List?	Yes
Integrated Facility?	No
Facility Name:	VA NORTH TEXAS HEALTH CARE SYSTEM: DALLAS V/
Facility Address 1:	123 A. STREET
Facility Address 2:	DALLAS, TEXAS 75216
Facility Point-of-Contact:	ONE PROVIDER
Facility POC Email:	PROVIDER.ONE@YOURSITE
Facility POC Telephone:	XXX-XXX-XXXX
Local Time Adjust:	0
EMS Default User Name:	ONEPROVIDER
EMS Password:	
EMS Password Confirm:	
Whiteboard Kiosk Default User Name:	ONEPROVIDERBMS
Whiteboard Kiosk Password:	
Whiteboard Kiosk Password Confirm:	
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

- Click the **Submit** button.

Table 6-Facility Settings Page Parameters

Column	Description
EMS Default User Name:	The BMS Service Account ID needed to load the EMS Mobile Page for Mobile Devices.
EMS Password:	The BMS Service Account ID password needed to load the EMS Mobile Page for Mobile Devices.
EMS Password confirm:	The confirmation of the password.

This setup can also be completed by the system Support User:

- Go to the **BMS Admin Page**
- Click on the **Edit BMS Facility Settings** link
- Click on the **Facility Name Drop Down** and select the name of the **Facility** to be configured
- Fill the fields “**EMS Default User Name**”, “**EMS Password**” and “**EMS Password Confirm**” with the BMS Local Service Account

Figure 31-EMS Fields Filled on the BMS Admin Page

The screenshot shows the 'ADMINISTRATION SECTION - FACILITY EDIT' page. Key fields filled include:

- Select Facility Name: NTX - DALLAS (549 - ACTIVE, YES)
- Facility Site ID: NTX (549 - DALLAS)
- Full Facility Name: NTX
- Facility Point-of-Contact: VIA NORTH TEXAS HEALTH CARE SYSTEM, DALLAS VA
- Facility POC Email: PROVIDER.ONE@VOURSITE
- Facility POC Telephone: XXX-XXX-XXXX
- Facility Address 1: 123 A STREET
- Facility Address 2: DALLAS, TEXAS 75216
- Facility City/State/ZIP: DALLAS TX 75216
- User operations: Includes a table with columns for 'Selected', 'User Name', 'BMS, Read', and 'BMS, Write'. Two users are listed: 'aac.dva.va.gov/BMS-0391Dev' and 'aac.dva.va.gov/VMAACBARDJ'.
- Configuration options: VSD: 17, Region: 2, BMS Active/Live Site? Yes, Allow Admin to Access Inactive Site? No, Integrated Facility? No, Auto Placement of Transfers onto PRIP List? Yes, Ward Prefix: (empty), Ward Suffix: (empty), EMS Mail Sender: VHANTYBMSMAILER@, Site Alias: (empty), Site Alias: (empty), EMS Default User Name: PROVIDER.ONE, EMS Password: (empty), EMS Password Confirm: (empty), BMS Server Time Zone: Central Standard Time, Facility Site Time Zone: Central Standard Time, Auto-Removal Patients Pending Bed Placement List? Yes, Auto-Remove Edits Patients from Pending Bed Placement List? No, Medical Center ID #: (empty), ADT Prefix: (empty), ADT Suffix: (empty), Event Mail Sender: VHANTYBMSSEVENTMA, Site Alias: (empty), Local Time Adjust: 0, Whiteboard Kiosk Default User Name: PROVIDER.ONEBMS, Whiteboard Kiosk Password: (empty), Whiteboard Kiosk Password Confirm: (empty).

- Click the **Submit** button

Table 7-BMS Admin Page Parameters

Column	Description
EMS Default User Name:	The BMS Service Account ID needed to load the EMS Mobile Page for Mobile Devices.
EMS Password:	The BMS Service Account ID password needed to load the EMS Mobile Page for Mobile Devices.
EMS Password confirm:	The confirmation of the password.

2.6.2 Configure EMS Mobile Device URL

For the current facility, the EMS Device URL must be configured in the EMS Mobile Device. The URL to be entered has a special format:
<https://vaww.bms.va.gov/EMSMobileLogon?code=BRK>.

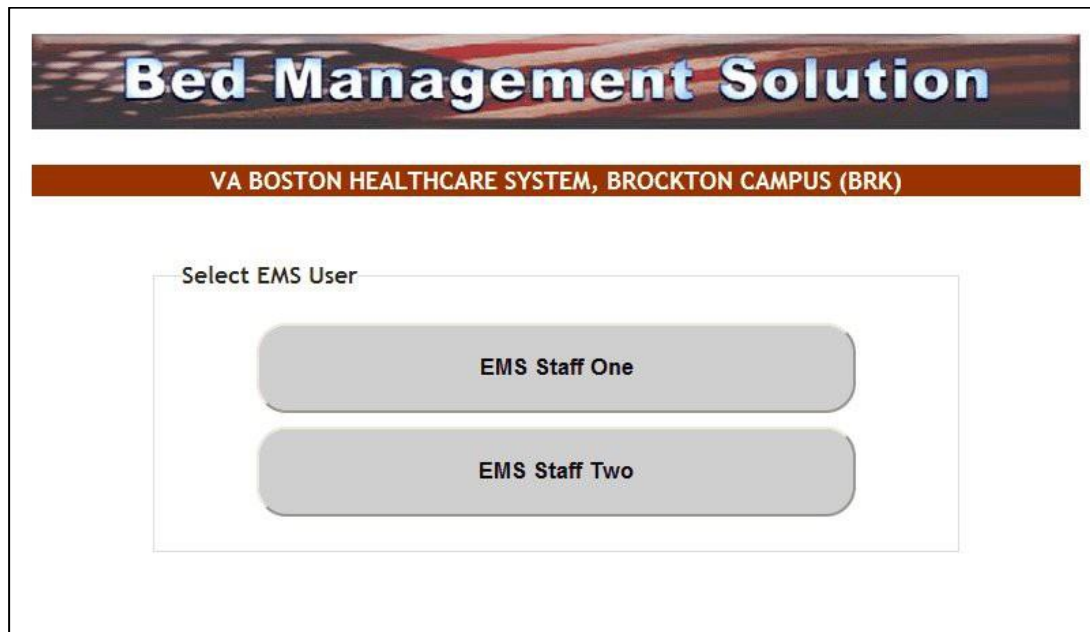
Table 8-Description and Configuration for EMS Mobile Device URL Parameters

Parameter	Short Description	Options
Code	Code of facility (e.g. BROCKTON = BRK)	Enter the 3-character facility ID.

EMS staff can access the BMS Web page for mobile devices at the URL set up by their local IS staff. Be sure to use the code of the facility for which access is needed.

The following page is displayed:

Figure 32-EMS Staff Page for Mobile Devices



2.7 VistA Integration

This chapter describes the process of importing vocabularies, entities, patient admission, transfer, discharge (ADT) and patient pending bed placement information from VistA.

In order to integrate with VistA certain steps should be completed:

- Choose VistA site
- Define Schedulers
- Run Scheduler
- View Audit Results

2.7.1 Choose VistA Site

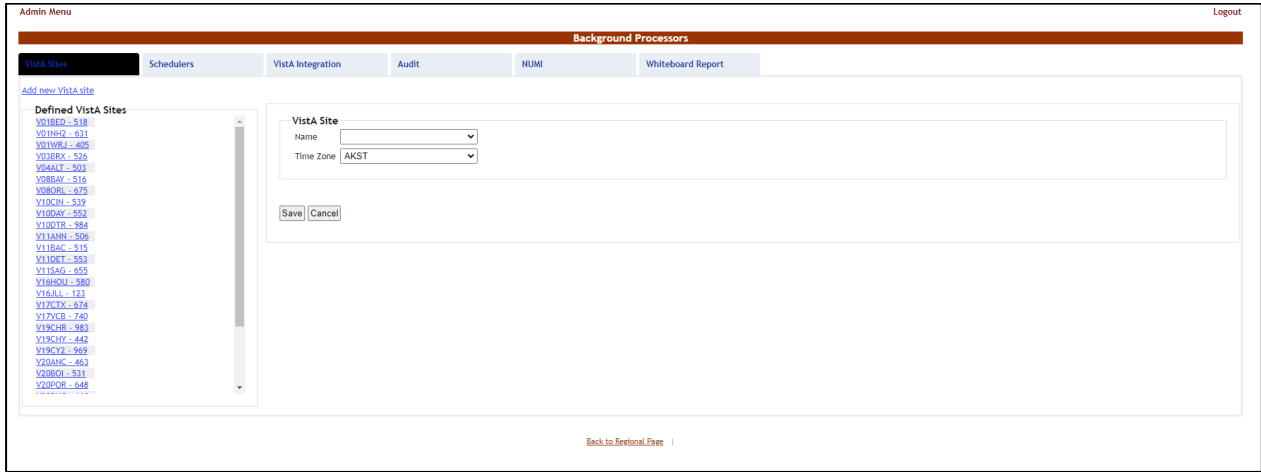
VistA Sites tab from Background Processors page of Admin section allows the user to view the list of VA facility sites sharing the same VistA instance and to add a new VA facility to a VistA instance.

2.7.2 Adding a New VistA Site

To add a VA facility site to a VistA instance, follow the steps presented below.

- From the Background Processors page of Admin section select VistA Sites to display the page in the following image. A list of VA facility sites is displayed in the column to the left of the page.

Figure 33-Adding a VistA Site



- Click the **Add new VistA site** link then from the VistA Site area use the Name field to select the code of the site you want to add to the current VistA instance, and then select the Time Zone.
- Press **Save** to enter new data into the system.

The newly added site will be added in the sites list to the left of the screen.

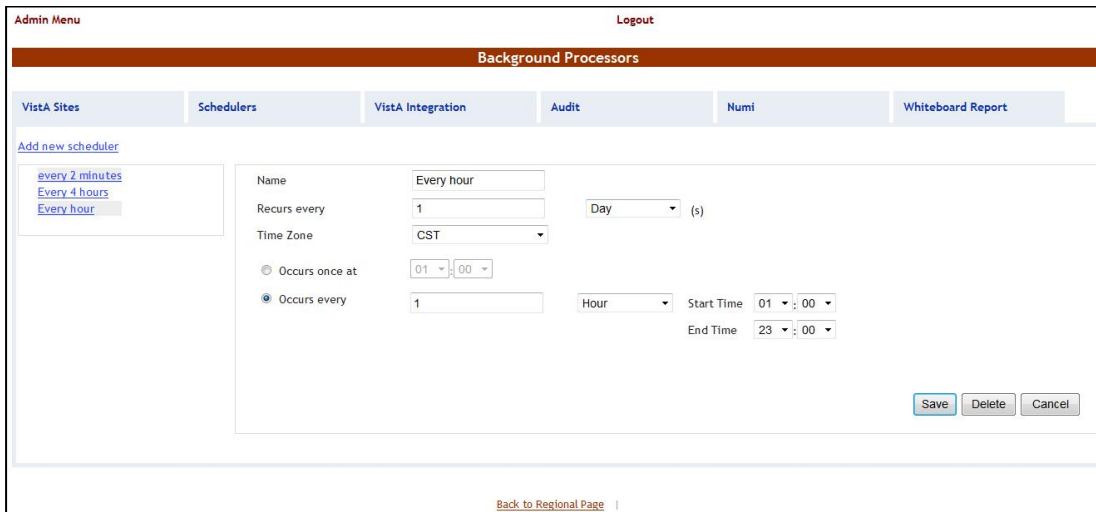
2.7.3 Define Schedulers

The Schedulers tab from Background Processors page of Admin section displays a list of schedulers defined by user. It allows the user to add new schedulers, edit or remove old schedulers.

NOTE: To run the schedulers, the VistA Integration tab must be used (see next section VistA Integration for details).

The Schedulers tab is displayed as in the following image:

Figure 34-Schedulers Tab



2.7.3.1 Adding a New Scheduler

To add a new scheduler, follow the steps presented below.

- From the Background Processors page select the Schedulers tab.
- In the Schedulers tab fill in the following data:

Table 9-New Scheduler Parameters

Column	Description
Name	The name of the scheduler.
Rekurs every	The frequency.
Time Zone	Time zone associated with the scheduler.
Occurs once at/Occurs every	The frequency values.

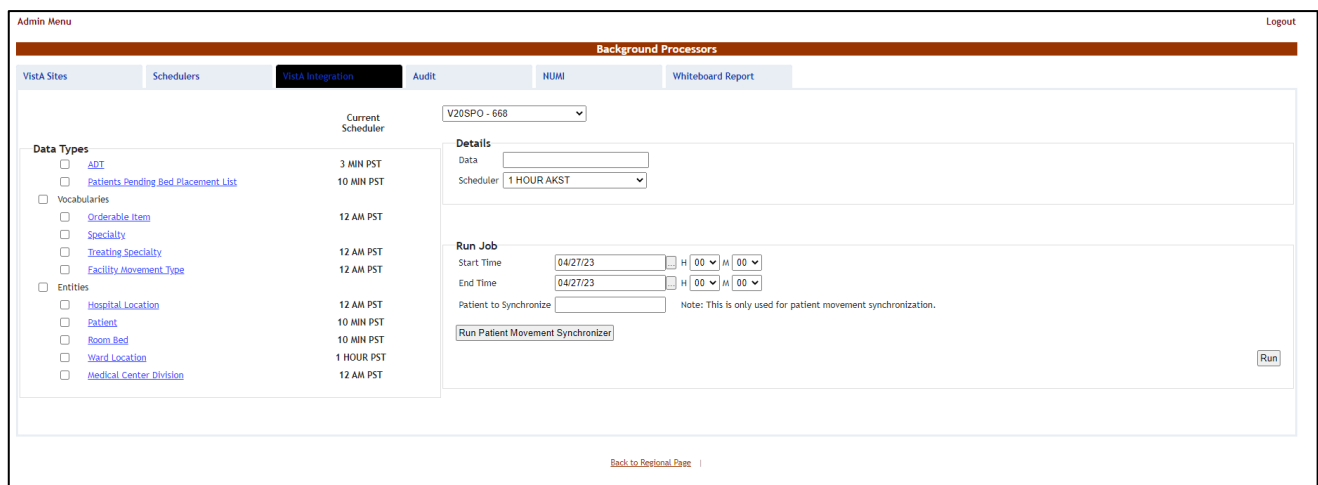
After setting the desired frequency for the new scheduler, do not forget to press the Save button to enter the data into the system.

2.7.4 Run Scheduler

The VistA Integration tab is used to run (automatically or manually) the defined schedulers and to select which data categories will be affected by a scheduler’s action.

The VistA Integration tab is displayed as in the following image:

Figure 35-VistA Integration Tab



From the field in the upper part of the page select the VistA site where the scheduler(s) will run.

- Either click one data category from the column to the left (its name will appear in the Data field) and then select a scheduler from the Schedulers fields in the Details area: this will cause the

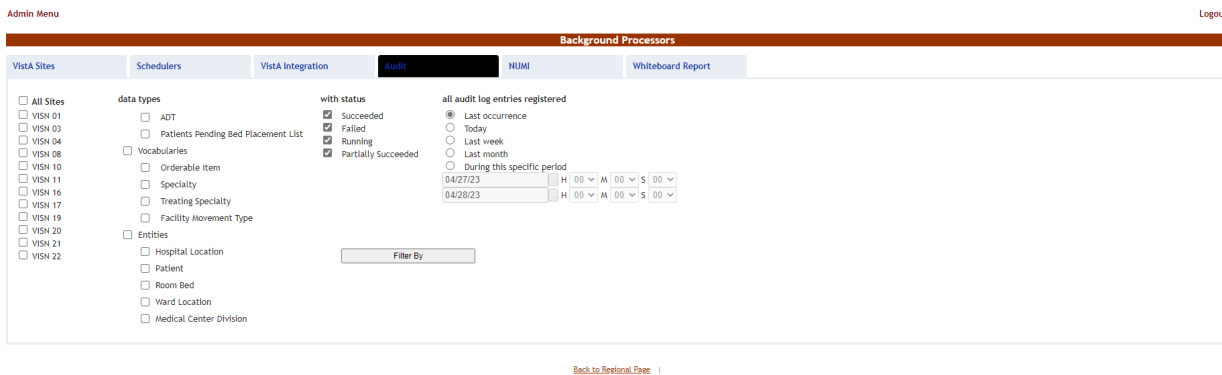
selected scheduler to run at the time set for it in the Schedulers tab and to bring data from the selected category.

- Or select several data categories (using the check-boxes) then set the Start time/End time and click the Run button: this will cause the scheduler set to start running now and bring the data from the selected categories.

2.7.5 View Audit Results

The Audit tab displays the results of the operations performed in the VistA Integration tab.

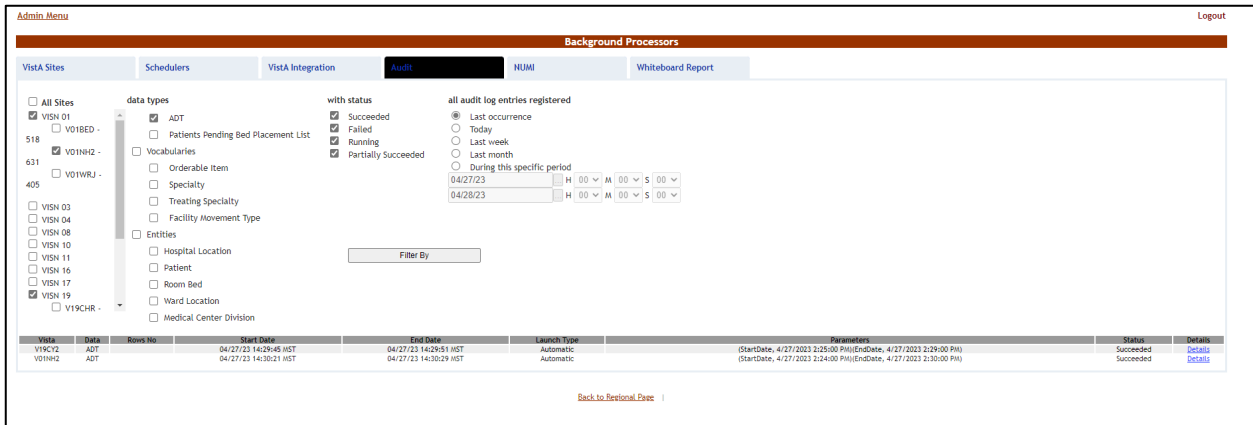
Figure 36- Audit Tab



The options to the left of the page allow the user to determine the filter criteria for the generated audit reports. The options to the right of the screen allow the user to select the type of operation to be captured by the audit report as well as the time interval for the audit.

After selecting the desired criteria, click the Filter by button to display the page as in the following image.

Figure 37- View Audit Results



A list of operations is displayed. For each entry the following data is available:

Table 10-View Audit Results Columns Report

Column	Description
VistA	The VistA site where the audit action has been performed.
Data	The type of data retrieved by the VistA integration operation.
Rows no	The number of operations of the selected type captured by the audit action.
Start Date	The start date of the retrieval operation.
End Date	The end date of the retrieval operation.
Launch Type	The way the audit action has been launched.
Parameters	Audit operation start date and time, and end date and time.
Status	The status of the VistA integration action.
Details	Clicking this link will display the number of entries in the report.

2.8 NUMI Integration

This chapter describes the process of importing patient level of care information from NUMI.

NUMI connects to VistA for synchronization of patient data using the NUMI Web Service that is part of the Commercial Off the Shelf McKesson product. Authentication to the NUMI Web Service is done by a NUMI supplied secret key.

NUMI Patient Level of Care transaction involves the following steps:

- Change patient level of care in NUMI.
- BMS Reader component will detect the patient level of care in NUMI.
- Patient level of care will be retrieved through a web service method call.
- BMS Writer component will update patient level of care in BMS database.

2.8.1 Integration Settings

There are a limited number of configuration parameters for NUMI.

- Secret Key
- Number of sites per call
- Path to NUMI web service

These configurations are stored in **BMS.Service.Host.exe.config**

The current secret key is: **<authorization key>**

The number of sites per call parameter how many sites will be bundled together in a transaction to NUMI. If this number is increased one should consider the frequency in which the calls are scheduled. Adding more sites will increase the transaction size and length.

Currently all NUMI servers operate on port 100 at the specified endpoint <https://<servername>.aac.dva.va.gov/Inpatient.asmx>.

In order to integrate with NUMI certain steps should be completed:

- Choose VistA site
- Define Schedulers
- Select Scheduler

2.8.2 Choose VistA Site

This step is the same as the one performed on VistA Integration process and can be referenced from [Section 2.7.1](#).

2.8.3 Define Schedulers

The process of defining schedulers can be referenced from Vista Integration process, [Section 2.7.2](#).

2.8.4 Select Scheduler

The NUMI tab is used to select the scheduler that will connect to the NUMI server and will retrieve data for a certain VistA site.

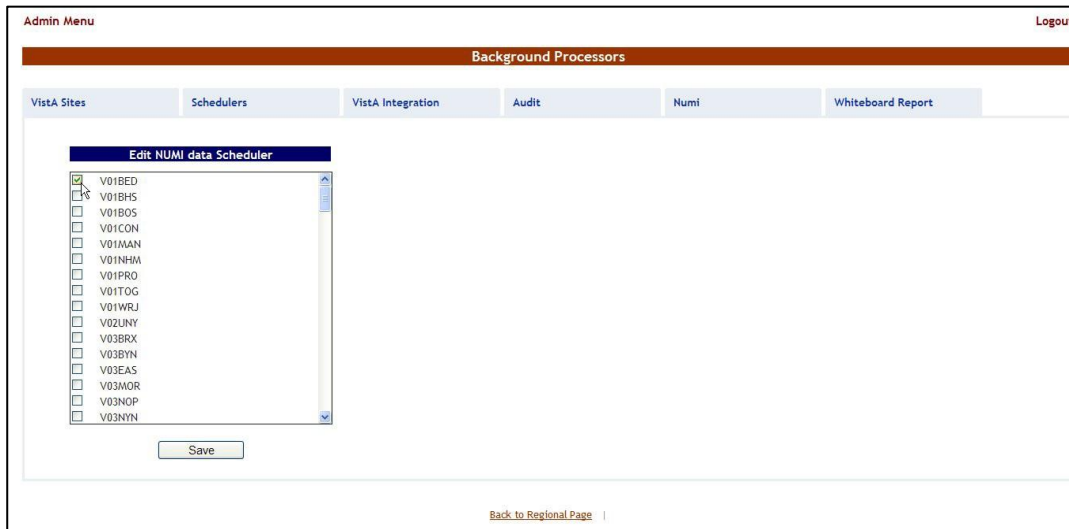
The NUMI tab is displayed as in the following image.

Figure 38-NUMI Tab



From the Schedulers field select the scheduler created to retrieve the NUMI data then click the **Add** button. The following page is displayed:

Figure 39- Selecting the VistA Site for NUMI data



Select the VistA site for which the selected scheduler will retrieve NUMI data then press the Save button. Use the Edit link to select a different site for which the scheduler should retrieve NUMI data.

3 Application structure

3.1 Application Components

BMS application consists of the following components:

- BMS Databases (BMS Database, BMS Authz, BMS EIS, BMS EVS, BMS_DS, BMS_DW, BMS InstanceStore and BMS History)
- BMS Services (BMS Service and Win ServiceHost)
 - BMS Service
 - Win Service Host (EIS Service, EVS Service, PAP service, PDP service, RS service and STS service)
- BMS Web Site
- WMI UserGroup

3.2 Application Directory Structure

BMS application directory is structured as is presented below:

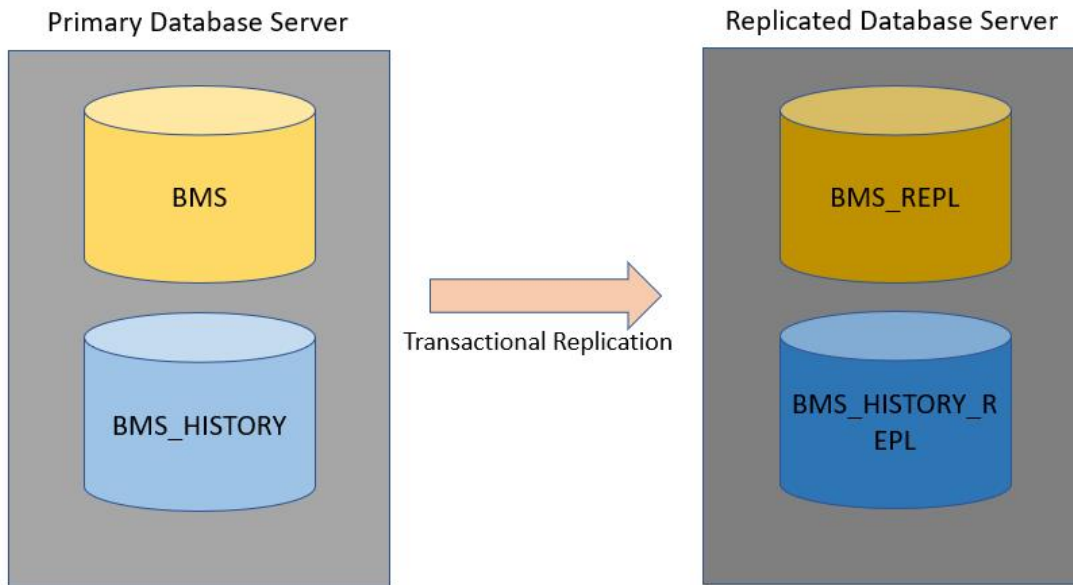
```
+---Consoles
| +---PolicyManager
+---Databases
| \---SQLData
| | \---Job Logs
+---Services
| +---BMS
| | \---DBRepository
| | \---LinqToSql
| | \---LocalReportWhiteboard
| | \---Scripts
+---WebSite
| +---bin
| | \--- LocalReportWhiteboard
| | \--- Scripts
| +---Content
| | \---images
| | +---themes
| | | +---base
| | | \---images
| +---Reporting
| +---ReportsLocal
| +---Scripts
| \---Views
```

3.3 Database Architecture

The BMS Database implementation is comprised of three main parts:

- BMS Database
 - BMS (Bed Management database).
 - BMS_History (BMS Transactional History)
 - BMS_InstanceStore (BMS Instances)

Figure 40-Database Architecture



3.4 Component Files

A list with files for each BMS component is presented below:

Table 11-BMS Database Files

Relative Path	File	Description
	BMS_Data.mdf	
	BMS_Data_F.ndf	
	BMS_Log.ldf	
	BMS_HISTORY_Data.mdf	
	BMS_HISTORY_Data_F.ndf	
	BMS_HISTORY_Log.ldf	
	BMS_InstanceStore_Data.mdf	

Relative Path	File	Description
Databases\SQLData Databases\SQLData2 Databases\SQLLogs	BMS_InstanceStore_Log.ldf	Database files
	BMS_Reports_Log.txt	
	BMS_Reports_Log_Incremental.txt	
	AdapterRepository.dll	
	Common.dll	
	connectionConfiguration.config	
	Connections.SingleDatabase.dll	
	ContextWriter.dll	
	General.MT.dll	
	Infoworld.Configuration.dll	
	LOOP_IT.bat	
	MessageRequest.bat	
	MiddleTier.dll	
MS.Common.dll		
Databases\SQLData\Job_Logs	MS.Configuration.dll	
	MS.Connections.dll	

Table 12-BMS Service Files

Relative Path	File	Description
Services\BMS	AdapterRepository.dll	The binaries of the BMS Service.
	AuditTrailSender.dll	
	AuthenticationProxy.dll	
	AuthorizationSubscriber.dll	
	BMS.CommonClasses.dll	
	BMS.Contracts.dll	
	BMS.DataAccess.dll	
	BMS.Facade.dll	
	BMS.Facade.Contracts.dll	
	BMS.Host.dll	
	BMS.Numi.dll	
	BMS.Schedulers.dll	
	BMS.ServiceHost.exe	
	BMS.ServiceHost.exe.config	
BMS.ServiceImplementation.dll		

	BMS.ServicesWrapper.dll	
	BMS.Utils.dll	
	BMS.VistaIntegration.dll	
	BMS.VistaIntegration.Cache.dll	
	BMS.VistaIntegration.Data.dll	
	BMS.VistaIntegration.Mdws.dll	
	BMS.VistaWorker2.Writer.dll	
	BMS.WhiteboardReport.dll	
	Common.dll	
	connectionConfiguration.config	
	Connections.SingleDatabase.dll	
	ContextWriter.dll	
	DataUtil.dll	
	EISContracts.dll	
	General.MT.dll	
	HL7DataTypes.dll	
	IContracts.dll	
	ICTSEdit.dll	
	Infoworld.Configuration.dll	
	InterSystems.Data.CacheClient.dll	
	log4net.dll	
	log4netAsync.dll	
	Mdws2ORM.dll	
	MiddleTier.dll	
	MS.Common.dll	
	MS.Configuration.dll	
	MS.Connections.dll	
	RS.Contracts.dll	
	Saml20.dll	
	SecurityTokenCache.dll	
	Tracing.dll	
	VistASites.xml	
	Xacml2.dll	
	XacmlCore.dll	
Services\BMS\LocalReportWhiteboard	WardWhiteboard.rdlc	Ward whiteboard report file.

Table 13-BMS Website Files

Relative Path	File	Description
WebSite	BMS App Offline.htm	The binaries of the BMS Web Site, web site configuration file.
	Global.asax	
	Web.config	
	WebTrace.log	
	additional_login_msg.txt	
WebSite\bin	AntiXSSLibrary.dll	
	AuditTrailSender.dll	Dynamic text for main login page
	AuthenticationProxy.dll	Web site's binaries.
	BMS.Contracts.dll	
	BMS.Facade.Contracts.dll	
	BMS.Facade.dll	
	BMS.PAPContracts.dll	
	BMS.Security.dll	
	BMS.ServicesWrapper.dll	
	BMS.Utils.dll	
	BMS.Web.dll	
	DevExpress.Data.v21.1.dll	
	DevExpress.Office.v21.1.Core.dll	
	DevExpress.Pdf.v21.1.Core.dll	DevExpress
	DevExpress.Printing.v21.1.Core.dll	DevExpress
	DevExpress.RichEdit.v21.1.Core.dll	DevExpress
	DevExpress.Utils.v21.1.dll	DevExpress
	DevExpress.Web.Mvc5.v21.1.dll	DevExpress
	DevExpress.Web.v21.1.dll	DevExpress
	EISContracts.dll	DevExpress
	HL7DataTypes.dll	DevExpress
	HtmlAgilityPack.dll	
	HtmlSanitizationLibrary.dll	
	ICContracts.dll	
	ICTSEdit.dll	
	Infoundland.Configuration.dll	
	log4net.dll	
	log4netAsync.dll	
	Microsoft.ReportViewer.Common.dll	
	Microsoft.ReportViewer.ProcessingObjectModel.dll	
	Microsoft.ReportViewer.WebForms.dll	
	Microsoft.Web.Infrastructure.dll	
	Microsoft.Web.Mvc.dll	
	RS.Contracts.dll	
	Saml20.dll	
	SecurityTokenCache.dll	
	System.Web.Helpers.dll	
	System.Web.Mvc.dll	
	System.Web.Razor.dll	
	System.Web.WebPages.Deployment.dll	
	System.Web.WebPages.dll	
System.Web.WebPages.Razor.dll		
Tracing.dll		
Web.config		
Xacml2.dll		
XacmlCore.dll		
WebSite\bin\LocalReportWhiteboard	WardWhitebord.rdlc	Ward Whiteboard report file.

Relative Path	File	Description
WebSite\Content	Controls.css	
	LayoutCss.css	
	LayoutCSS.css.bundle	
	LayoutCss.min.css	Images, themes and styles.
	LayoutVistaIntegrationCss.css.bundle	
	LayoutVistaIntegrationCss.min.css	
	Reports.css	
	Reports.min.css	
WebSite\Content\images	Site.css	
	add_tab_24.png	
	arrow_down.png	
	arrow_up.png	Images used by site.
	BMSLogoV6.jpg	
	check_inv.png	
	edit_staff_cancel.png	
	edit_staff_save.png	
	FavIcon.ico	
	Info.png	
	Ladybug.png	
	login_logo.png	
	logo.png	
	order_down.png	
	order_up.png	
sort_down.png		
sort_up.png		
	30day.png	
	Ambulatory.png	
WebSite\Content\images\EVS	AnticipatedDischarge.png	
	BedCleaned.png	
	Bedhold.png	
	BedInIsolation.png	
	BedNeedsCleaning	
	BedOutOfService(BedBoard).png	
	BedOutOfService(Vista).png	
	Blankroom.png	
	Blue Arrow.png	
	Blue Arrow inactive.png	
	Blue Box.png	
	Blue Box inactive.png	
	Blue Caution.png	
	Blue Caution inactive.png	
	Blue Circle.png	
	Blue Circle inactive.png	
	Blue Diamond.png	
	Blue Diamond inactive.png	
	Blue Heart.png	
	Blue Heart inactive.png	
	Blue X.png	
	Blue X inactive.png	
	Bluestar.png	
	Bluestar inactive.png	
	Browncircle.png	
	Browncircle inactive.png	
	Buckle.png	
	Choking.png	
	CleaningBed.png	
	Close Observation (Patient).png	

Relative Path	File	Description
	Convalescent (P).png	
	Convalescent (R).png	
	Convalescent Icon (P).png	
	Convalescent Icon (P) inactive.png	
	Convalescent Icon (R).png	
	Convalescent Icon (R) inactive.png	
	Dialysis.png	
	DischargeOrdered.png	
	DIVERT.png	
	DMFS.png	
	DMFS inactive.png	
	Electricwc.png	
	EMSNotified.png	
	Evacuate.png	
	Fall.png	
	Flu Confirmed.png	
	Flu Confirmed inactive.png	
	Flu Confirmed2.png	
	Flu Confirmed2 inactive.png	
	Flu Risk2.png	
	Green Circle.png	
	Green Circle inactive.png	
	Greenstar.png	
	Greenstar inactive.png	
	Hearingimpaired.png	
	InterwardTransfer.png	
	Legal.png	
	Lift Equipment (Patient) (EM).png	
	Lift Equipment (Room).png	
	NegativePressure.png	
	Negpres.png	
	NumiGreen.png	
	NumiRed.png	
	NumiYellow1.png	
	Observation.png	
	Oneto1.png	
	Orange Circle.png	
	Orange Circle inactive.png	
	Orange Star.png	
	Orange Star inactive.png	
	Oxygen (Patient) (EM).png	
	PAC Icon 2.png	
	PAC Icon 2 inactive.png	
	PatientSymbol.png	
	PICC.png	
	Placementproblem.png	
	Privateroompt.png	
	PTOptOut.png	
	Purplestar.png	
	Purplestar inactive.png	
	Red Stop.png	
	Red Stop inactive.png	
	Redflag.png	
	Redflag inactive.png	
	Redstar.png	
	Redstar inactive.png	
	Region.png	
	Respiratory Therapy (Patient).png	
	RoomBedSymbol.png	

Relative Path	File	Description
	Samename.png	
	Scripts.png	
	Seizure.png	
	Serviceanimal.png	
	Shared Bathroom (Room).png	
	Specmattress.png	
	Stretcher (Patient) (EM).png	
	Suicide Risk.png	
	Telemetry (Patient).png	
	Telemetry (Room).png	
	Ventilator (Patient) (EM).png	
	VirusBlack.png	
	VirusRed.png	
	VirusRed_inactive.png	
	Visuallyimpaired.png	
	WBCaution.png	
	Wheelchair Bound (Patient) (EM).png	
	WomenProgram2.png.png	
	Yellowcircle.png	
	Yellowcircle_inactive.png	
WebSite\Content\themes\base	Jquery.dynameter.css	
	jquery.ui.structure-1.11.4.css	
	jquery.ui.structure-1.11.4.min.css	jQuery controls style-sheets files.
	jquery.ui.theme-1.11.4.css	
	jquery.ui.theme-1.11.4.min.css	
	jquery-ui-1.11.4.css	
	jquery-ui-1.11.4.min.css	
WebSite\Content\themes\base images	ui-bg_diagonals-thick 18 b81900 40x40.png	
	ui-bg_flat 10 000000 40x100.png	
	ui-bg_diagonals-thick 20 666666 40x40.png	Images
	ui-bg_flat 0 aaaaaa 40x100.png	
	ui-bg_flat 75 ffffff 40x100.png	
	ui-bg_glass 55 fbf9ee 1x400.png	
	ui-bg_glass 65 ffffff 1x400.png	
	ui-bg_glass 75 dadada 1x400.png	
	ui-bg_glass 75 e6e6e6 1x400.png	
	ui-bg_glass 95 fef1ec 1x400.png	
	ui-bg_highlight-soft 75 cccccc 1x100.png	
	ui-icons 222222 256x240.png	
	ui-icons 2e83ff 256x240.png	
	ui-icons 454545 256x240.png	
	ui-icons 888888 256x240.png	
	ui-icons cd0a0a 256x240.png	
WebSite\Reporting	EvacuationPatientReportViewer.aspx	
	EvacuationPatientVISNReportViewer.aspx	
	LocalReportViewer.aspx	Report Viewer pages.
	PPBPRReportViewer.aspx	
	ReportError.aspx	
	ReportViewer.aspx	
	WhiteboardReportViewer.aspx	
WebSite\ ReportsLocal	BedStatusReport.rdlc	
	FacilityDiversion.rdlc	
	WardOccupancy.rdlc	Bed Status Report file.
WebSite\Scripts\Elements	CCFacility-DropDown.js	JavaScript File

Relative Path	File	Description
WebSite\Scripts	Ace.js	JavaScript files.
	antiForgeryToken.js	
	conditional-validation.js	
	element-change.js	
	Ext-language_tools.js	
	Globalize.cultures.js	
	Globalize.js	
	hoverIntent.js	
	jquery.autosize.js	
	jquery.base64.js	
	jquery.base64.min.js	
	Jquery.dynameter.js	
	jquery.jscrollpane.min.js	
	Jquery.limit-textrea.js	
	jquery.maskedinput-1.3.min.js	
	jquery.mousewheel.js	
	jquery.tablesroll.js	
	jquery.tablesroll.min.js	
	jquery.tablesorter.js	
	jquery.tablesorter.min.js	
	jquery.unobtrusive-ajax.js	
	jquery.unobtrusive-ajax.min.js	
	jquery.validate.js	
	jquery.validate.min.js	
	jquery.validate.unobtrusive.js	
	jquery.validate.unobtrusive.min.js	
	jquery.validate-vsdoc.js	
	jquery-1.11.0.js	
	jquery-1.11.0.min.js	
	Jquery-1.11.0.min.map	
	Jquery-ui-1.11.4.js	
	Jquery-ui-1.11.4.min.js	
	json2.js	
	Knockout-3.3.0.js	
	LayoutAdminAutoCompleteAndDatePicker.js	
	LayoutAdminScripts.min.js	
	LayoutAutoCompleteAndDatePicker.js	
	LayoutScripts.min.js	
	LayoutVistaIntegrationDatePicker.js	
	LayoutVistaIntegrationScripts.min.js	
	MicrosoftAjax.debug.js	
	MicrosoftAjax.js	
	MicrosoftMvcAjax.debug.js	
	MicrosoftMvcAjax.js	
	MicrosoftMvcValidation.debug.js	
MicrosoftMvcValidation.js		
modernizr-1.7.js		
modernizr-1.7.min.js		
Reports.min.js		
superfish.js		
supersubs.js		
whiteboardReport-script.js		
whiteboard-script.js		
whiteboard-script.min.js		
WebSite\Views	ViewStart.cshtml	
	Web.config	
WebSite\Views\Account	LogOff.cshtml	User Interface views.
	LogOn.cshtml	

Relative Path	File	Description
WebSite\Views\Admin	AddEditUser.cshtml	Login/Logout user interface views.
	AddUserOperations.cshtml	
	CacheConfirmation.cshtml	Admin section user interface views.
	ConfirmBulkRevoke.cshtml	
	FacilityEdit.cshtml	
	FacilityEditSaved.cshtml	
	Index.cshtml	
	RefreshUsersConfirmation.cshtml	
	RemoveUserOperations.cshtml	
	SelectUser.cshtml	
	SisterSiteAddEdit.cshtml	
	SisterSiteEditSaved.cshtml	
	UserEditHasSaved.cshtml	
	UserOperationsView.cshtml	
WebSite\Views\AdminComments	Index.cshtml	
	NotifyChange.cshtml	
WebSite\Views\AdminIcon	Delete.cshtml	
	DeleteConfirmation.cshtml	
	Edit.cshtml	
	Index.cshtml	
	SaveConfirmation.cshtml	
	Search.cshtml	
WebSite\Views\AdminSpecialtyAssociation	Delete.cshtml	
	Index.cshtml	
WebSite\Views\AdminUnavailableReason	AddConfirmation.cshtml	Admin specialty association user interface views.
	Delete.cshtml	
	DeleteConfirmation.cshtml	Admin unavailable reason user interface
	Edit.cshtml	
	EditConfirmation.cshtml	
	Index.cshtml	
	MissingUnavailableReasonText.cshtml	
	UnavailableReasonAlreadyExists.cshtml	
UnavailableReasonList.cshtml		
WebSite\Views\AdminWaitingArea	AddAction.cshtml	
	Delete.cshtml	
	DeleteAction.cshtml	Admin waiting area user interface views.
	Edit.cshtml	
	EditAction.cshtml	
WebSite\Views\AdminWhiteboardReport	Index.cshtml	
	Delete.cshtml	
	Edit.cshtml	
WebSite\Views\AdminWhiteboardReport	Index.cshtml	Admin whiteboard report user interface
	Confirmation.cshtml	
	Delete.cshtml	
WebSite\Views\AdtOrderableItems	Index.cshtml	
	OrderableItemsList.cshtml	ADT Orderable Items user interface views.
	OrderableItemsList.cshtml	
WebSite\Views\ApplicationParameters	Index.cshtml	
	Saved.cshtml	

Relative Path	File	Description
WebSite\Views\BackgroundProcessors	AddEditConfirmation.cshtml	
	DeleteConfirmation.cshtml	
	Index.cshtml	Background Processors user interface views.
WebSite\Views\BedBoard	BedBoardGrid.cshtml	
	Index.cshtml	
WebSite\Views\BedBoardModule	Index.cshtml	VISN user interface views.
WebSite\Views\BedBulkManagement	BulkBedGridPartialView.cshtml	
	Index.cshtml	Bed Board Module user interface view.
WebSite\Views\BedInformation	ClearAll.cshtml	
	Index.cshtml	
	NotifyChange.cshtml	Bed Information user interface views.
WebSite\Views\BedStatusReport	Index.cshtml	
WebSite\Views\CommunityCare	Index.cshtml	Community Care Tracking List Views
	AddEdit.cshtml	
	EditAction.cshtml	
	Patient.cshtml	
	Remove.cshtml	
	CCTLGrid.cshtml	
	Index.cshtml	Community Care Facility Management
WebSite\Views\ContingencySettings	Confirmation.cshtml	
	Index.cshtml	Patients Pending Placement Status report user interface view.
WebSite\Views\DischargeClinic	Index.cshtml	Contingency settings user interface views.
	MessageConfirmation.cshtml	
	Delete.cshtml	Discharge clinic user interface views.
WebSite\Views\EmsBedStatusAdmin	Edit.cshtml	
	EMSBatchAssign.cshtml	
	Index.cshtml	EMS bed status user interface views
	SaveConfirmation.cshtml	
WebSite\Views\EMSMobile	EMSList.cshtml	
	Users.cshtml	
WebSite\Views\EMSMobileLogon	Index.cshtml	EMS Mobile user interface views.
WebSite\Views\EmsNotification	AddEdit.cshtml	
	AddEditAction.cshtml	EMS Mobile Logon user interface view.
	Delete.cshtml	EMS Notification user interface views.
	DeleteAction.cshtml	
	Index.cshtml	
WebSite\Views\EmsStaff	Delete.cshtml	
	Edit.cshtml	
	Index.cshtml	EMS Staff user interface views.
WebSite\Views\EventNotification	AddConfirmation.cshtml	
	AddEdit.cshtml	
	Delete.cshtml	Event Notification user interface views
	DeleteConfirmation.cshtml	
	EditConfirmation.cshtml	
	Index.cshtml	

Relative Path	File	Description
WebSite\Views\Exception	Index.cshtml	
	WFException.cshtml	
WebSite\Views\FacilityDiversion	Add.cshtml	Exception user interface views.
	Confirmation.cshtml	
	Edit.cshtml	Facility Diversion user interface views.
	Index.cshtml	
WebSite\Views\FacilitySettings	Index.cshtml	
	SaveConfirmation.cshtml	
WebSite\Views\Home	AdmissionList.cshtml	Facility Settings user interface views.
	AdmissionSuccessRemove.cshtml	
	AdmissionSuccessUndoRemove.cshtml	Home user interface views.
	ChangeIntegratedSiteError.cshtml	
	Edit.cshtml	
	EmergencyManagementAdmissionGrid.chhtml	
	FeeUtilizationAdmissionList.cshtml	
	Index.cshtml	
	MentalHealthAdmissionGrid.cshtml	
	PatientFlowAdmissionList.cshtml	
	PatientInHouseAdmissionList.cshtml	
	PatientInquiry.cshtml	
	RemoveAdmission.cshtml	
	StandardAdmissionList.cshtml	
UndoRemoveAdmission.cshtml		
WebSite\Views\IconLegend	Index.cshtml	
WebSite\Views\IconLibrary	Edit.cshtml	
	Index.cshtml	Icon Legend user interface view.
	ResetConfirmation.cshtml	Icon Library user interface views.
	SaveConfirmation.cshtml	
WebSite\Views\Information	Index.cshtml	
WebSite\Views\LogOff	Index.cshtml	
WebSite\Views\MaintainMarquee	Index.cshtml	Information user interface view.
	Saved.cshtml	LogOff user interface view.
WebSite\Views\NationalAndRegional	Index.cshtml	Maintain Marquee user interface view.
	NationalAndRegionalGrid.cshtml	
	PatientListView.cshtml	National user interface views.
WebSite\Views\NewEvents	Index.cshtml	
WebSite\Views\Numi	Delete.cshtml	
	Edit.cshtml	New events user interface view.
	Index.cshtml	NUMI user interface views.
WebSite\Views\Patient	Admission.cshtml	
	Confirmation.cshtml	
	EvacuationData.cshtml	Patient user interface views.
	GenericWfFault.cshtml	

Relative Path	File	Description
	MentalHealthData.cshhtml	
	PatientWaitingAdd.cshhtml	
	PatientWaitingEdit.cshhtml	
	Select.cshhtml	
WebSite\Views\Reports	Index.cshhtml	
WebSite\Views\Shared	Layout.cshhtml	
	LayoutAdminPages.cshhtml	Patient user interface views.
	LayoutDevExpress.cshhtml	Shared user interface views.
	VistaIntegrationLayout.cshhtml	
	Error.cshhtml	
	Header.cshhtml	
Website\Views\SiteList	Index.cshhtml	
WebSite\Views\SiteOptions	EvacuationConfirmation.cshhtml	
	Index.cshhtml	Site list user interface view.
WebSite\Views\Transfer	AddEditResult.cshhtml	Site options user interface views.
	AddTransfer.cshhtml	
	EditTransfer.cshhtml	
	FinalizeResult.cshhtml	
	FinalizeTransfer.cshhtml	
	Index.cshhtml	
WebSite\Views\Unauthorized	PermissionAuth.cshhtml	
WebSite\Views\UserConfiguration	ConfirmBulkRevoke.cshhtml	
	Index.cshhtml	Unauthorized user interface view.
	SelectUser.cshhtml	User configuration views.
	UserEditHasSaved.cshhtml	
WebSite\Views\UnavailableReason	AddConfirmation.cshhtml	
	Delete.cshhtml	
	DeleteConfirmation.cshhtml	Unavailable reason user interface views.
	Edit.cshhtml	
	EditConfirmation.cshhtml	
	Index.cshhtml	
	MissingUnavailableReasonText.cshhtml	
	UnavailableReasonAlreadyExists.cshhtml	
	UnavailableReasonList.cshhtml	
WebSite\Views\VistaIntegration	Audit.cshhtml	
	AuditLogEntries.cshhtml	
	Categories.cshhtml	VistA integration user interface views.
	DeleteScheduler.cshhtml	
	EditScheduler.cshhtml	
	EditVistASite.cshhtml	
	ErrorDetail.cshhtml	
	Index.cshhtml	
	Schedulers.cshhtml	
	VistASites.cshhtml	
WebSite\Views\WaitingArea	AddAction.cshhtml	
	Delete.cshhtml	
	DeleteAction.cshhtml	
	Edit.cshhtml	

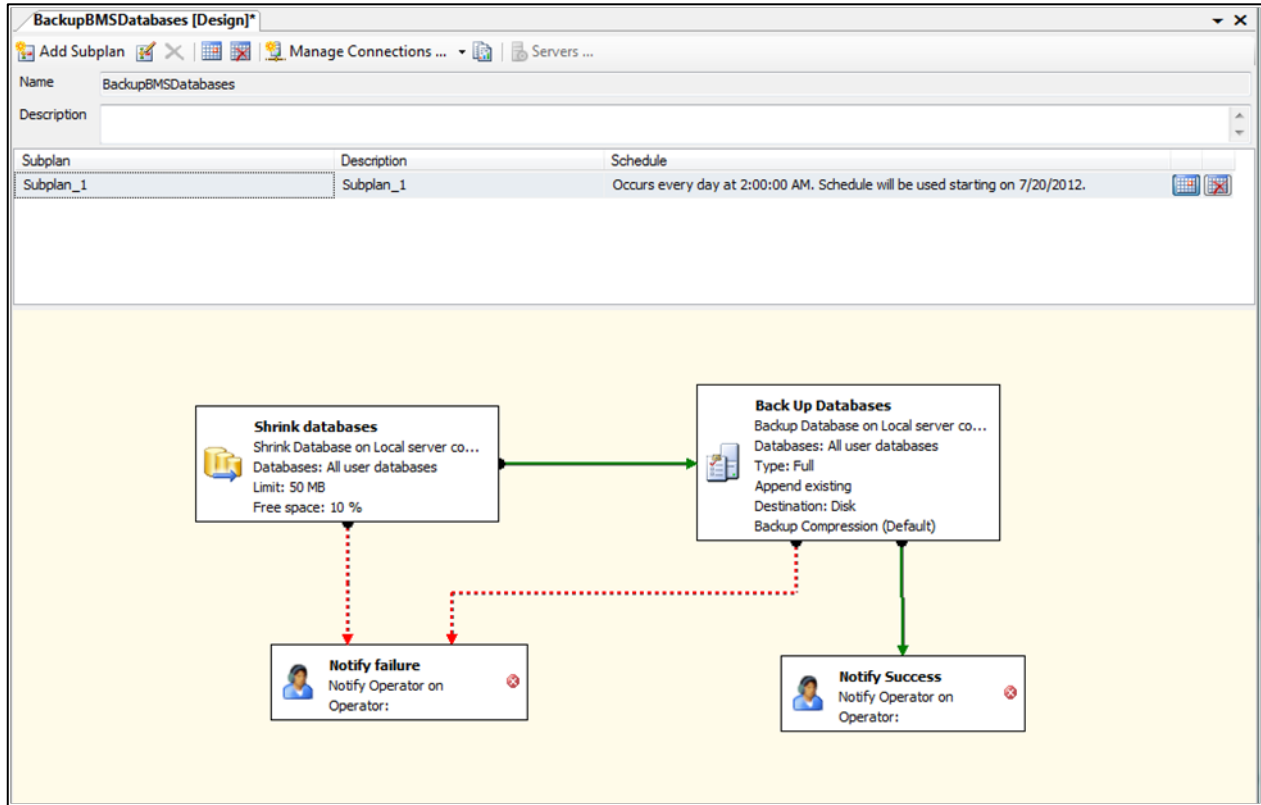
Relative Path	File	Description
	EditAction.cshtml	
	Index.cshtml	
WebSite\Views\WardConfiguration	AddEditWardConfirmation.cshtml	
	Delete.cshtml	
	DeleteConfirmation.cshtml	Ward configuration user interface views.
	Index.cshtml	
	Wards.cshtml	
WebSite\Views\WardOccupancy	Index.cshtml	
WebSite\Views\WardWhiteboard	ClearAll.cshtml	
	Edit.cshtml	Ward occupancy user interface view.
	Index.cshtml	Ward whiteboard user interface views.
	NotifyChange.cshtml	
	WardWhiteBoard.cshtml	
	WhiteboardDataOne.cshtml	
	WhiteboardDataTwo.cshtml	
WebSite\Views\WardWhiteboardUrl	Index.cshtml	Ward whiteboard url user interface view.
WebSite\Views\WhiteboardStaff	Index.cshtml	Whiteboard staff user interface view.

4 Archiving

All the sensitive data in the BMS solution is persisted in a collection of SQL Server Databases. Therefore the archiving process is implying the definition of maintenance plans that will regularly make backups of these databases, backups that can be restored if needed.

The maintenance plan can be defined as detailed in the following pictures:

Figure 41-Backup Maintenance Plan

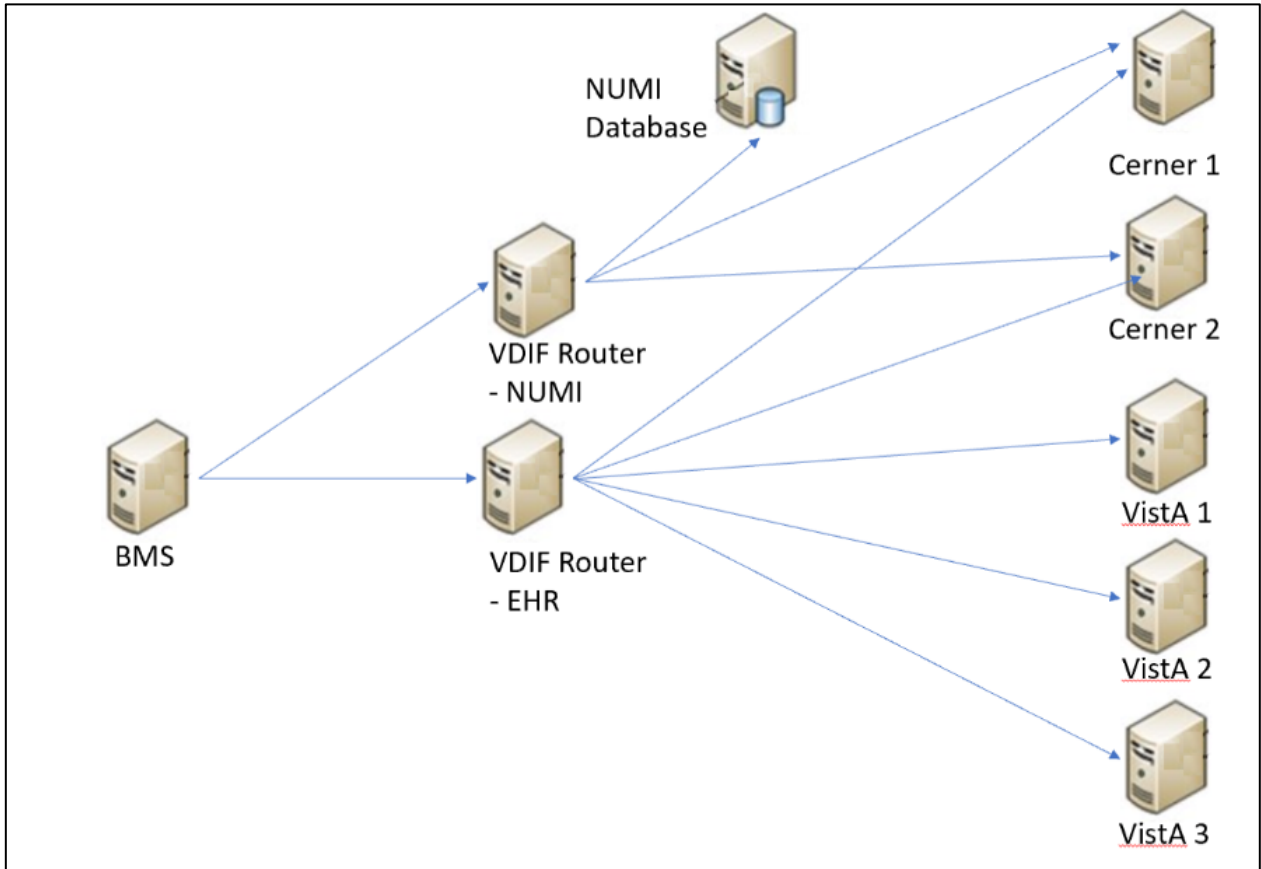


5 External Interfaces

*External relationships can be referenced from External Interfaces in this section.

VistA and NUMI are the external interfaces that are connected with the BMS system (see screenshot below):

Figure 42-BMS External Interfaces



- All the VISTA deployments will be connected through VDIF which has replaced VIA. In order to connect to VDIF, BMS service configuration file (BMS.ServiceHost.exe.config) should be changed as follow, see Table 4 – BMS ServiceHost Configuration Parameter section:

Table 14-Configuration Values

ServiceEndpointUrl	value="https://vdif-lb-vwsl.va.gov/csp/healthshare/hsaccvdapl/HS.Local.VA.HS.Access.VWSL.Service.BMSRouterService.cls"
RequestingApp	value="BMSBatch"
WSDLusername	value="BMSB_ID577"
WSDLpassword	value="*****"

STSEndpoint	value="https://services.eauth.va.gov:9301/STS/RequestSecurityToken"
STSCertificatePath	value="D:\\BMS_Services\\BMSSYNC.pfx"
STSCertificatePassword	value="*****"
HostFQDN	value="BMSAppServer"
MinimumFilemanDate	value="01/01/1992"

- NUMI - A connection string to NUMI database needs to be set in service configuration file (BMS.ServiceHost.exe.config), see **Table 4 - BMS ServiceHost Configuration Parameters** section:

<ConnectionString>Data Source=numiserver;Initial Catalog=NUMI;Integrated Security=True;</ConnectionString>

NOTE: All the configurations described above are using dummy servers and ports. Real deployment should use appropriate server, port and database connection strings.

6 Software Security

BMS Security is implemented at two levels:

- The first level of security consists in deciding which users have access to what pages (National/Regional, VISN, facility, EMS page).
- The second level of security refers to the read/write permissions (which are the pages a user can edit/update).

The security services are based on well-established standards and practices such as:

- LDAP protocol;
- WS-Security specification;
- X509 certificates.

These services are in charge of providing for the following 'functionalities':

- CIA:
 - Confidentiality – encrypted message.
 - Integrity – message hasn't been tampered.
 - Authentication – prove identity.
- Authorization – role based access.
- Accountability – audit trail.
- Policies – mutually agreed by involved parties.

From the client application perspective, the security services are in charge of:

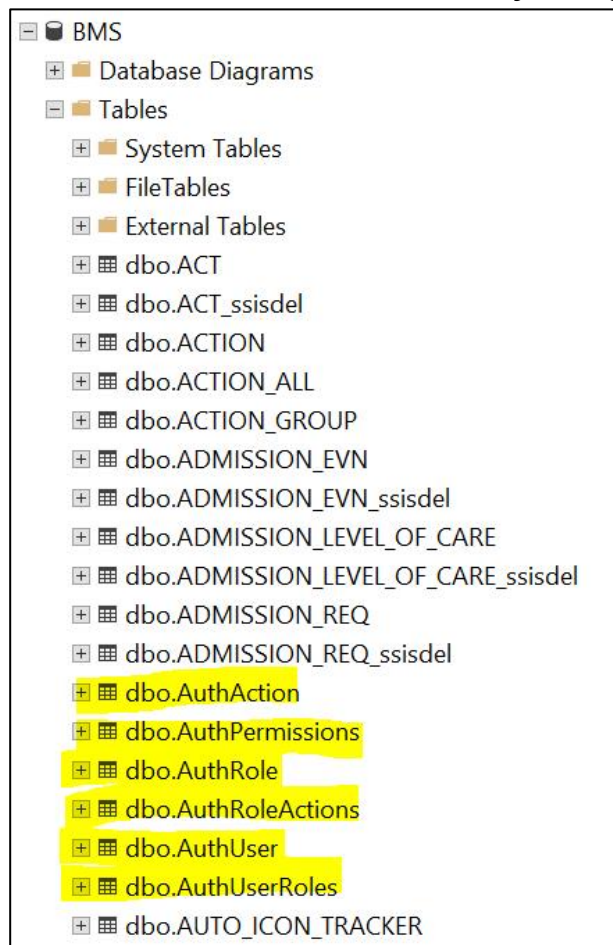
- Authentication:
- Role based authorization:
 - Roles stored in LDAP.
- Record level authorization.
- Audit trail.

The audit services provide the means to address the issues of liability management, asset protection and quality of service. To facilitate a timely response to policy violations, security incidents or infrastructure and application failures, InFlow will support monitoring, logging, analysing, and reporting on every level of its architecture.

6.1 Authorization and Authentication

The Policy Manager has been removed as part of the Inflow-AUTHZ replacement. To perform modifications to Actions, Permissions, Roles, or Users, the BMS database tables below will be used.

Figure 43- New tables added to BMS database for Policy Manager Replacement



6.2 BMS AuthAction table

The previously known “Operation Definitions” from using the policy manager have now been mapped to the new AuthAction table. Figure 44 displays the table example. The previous AuthActionUId has now been augmented with an integer primary key, AuthActionID. The AuthActionUId has been retained for backward compatibility, but will likely be phased out by the end of the Inflow project. The original “operation definitions” names have been maintained in the AuthActionName and AuthActionDescription fields, as well as the IsGroup and _ssis_timestamp.

Figure 44- AuthAction table

	AuthActionId	AuthActionUid	AuthActionName	AuthActionDescription	IsGroup	_ssis_timestamp
1	1	9C5F89A1-7F4F-41DB-9433-011A6626B6EB	AdminComments, Delete Read	AdminCommentsController, Delete (GET)	0	2013-03-11 15:59:00.097
2	2	41C6C7A0-B439-42C5-B9ED-02F62D11905F	Role, SiteUsers		0	2013-03-11 15:59:00.070
3	3	54CF8822-E14F-470D-8A0A-0443467CE7BA	AdminSpecialtyAssociation, Index Read	AdminSpecialtyAssociationController, Index (GET)	0	2013-03-11 15:59:00.083
4	4	AE6CCEAC-3FDD-4CFD-996A-05123F9792B9	AdminUnavailableReason, Update		1	2013-03-11 15:59:00.093
5	5	AB8FFB61-422B-46AC-8412-058012119652	BedInformation, ClearAll Read	BedInformationController, ClearAll (GET)	0	2013-03-11 15:59:00.017
6	6	B25CB8A4-A6B4-4C73-A997-06709737B745	EmsNotification, Index Read	EmsNotificationController, Index (GET)	0	2013-03-11 15:59:00.017
7	7	5B2AC262-DF97-48B0-A546-0812C4090F4D	AdminWhiteboardReport, Edit Read	AdminWhiteboardReport, Edit (GET)	0	2013-03-11 15:59:00.080
8	8	050E1999-6489-4054-8AB8-0829791E09B5	http://tempuri.org/IAdministrativeFunctions/GetR...		0	2013-03-11 15:59:00.067
9	9	3F8AFA34-595B-413E-85FA-083FA7DCB544	rep, UserAccess		0	2016-10-01 10:44:53.867
10	10	BDBDA25B-40BF-483D-BCAA-089B4B81DC25	Transfer, EditTransfer Read	TransferController, EditTransfer (GET)	0	2013-03-11 15:59:00.017
11	11	1FF676D0-B781-46EC-8E75-09C313EB432B	Admin, SisterSiteAddEdit Update	AdminController, SisterSiteAddEdit (POST)	0	2013-03-11 15:59:00.017
12	12	1911A116-7066-457F-9CE2-0A7B07F53542	WaitingArea, DeleteAction Update	WaitingAreaController, DeleteAction (POST)	0	2013-03-11 15:59:00.017
13	13	559A5214-F14D-4272-ACE4-0AC4649ED3C1	EmsBedStatusAdmin, Edit Read	EmsBedStatusAdminController, Edit (GET)	0	2013-03-11 15:59:00.017

6.3 BMS AuthPermissions table

The AuthPermission table handles the permission mappings between the facility, user, and Permission type. (read or write) utilizing the unique key AuthPermissionsId, AuthUserId, PermissionName, and FacilityId. LastModifiedDate and LastModifiedBy is kept for auditing purposes.

Figure 45- AuthPermissions table

	AuthPermissionsId	AuthUserId	PermissionName	FacilityId	LastModifiedDate	LastModifiedBy
1	1	77988	BMS, Read	102	2021-03-24 16:13:19.447	<hidden>
2	2	89619	BMS, Read	102	2021-03-24 16:13:19.447	<hidden>
3	3	13987	BMS, Read	102	2021-03-24 16:13:19.447	<hidden>
4	4	31184	BMS, Read	102	2021-03-24 16:13:19.447	<hidden>
5	5	78697	BMS, Read	102	2021-03-24 16:13:19.447	<hidden>
6	6	18031	BMS, Read	14	2021-03-24 16:13:19.447	<hidden>
7	7	31437	BMS, Read	14	2021-03-24 16:13:19.447	<hidden>
8	8	18031	BMS, Write	14	2021-03-24 16:13:19.447	<hidden>
9	9	31437	BMS, Write	14	2021-03-24 16:13:19.447	<hidden>
10	10	17739	BMS, Read	14	2021-03-24 16:13:19.447	<hidden>
11	11	34409	BMS, Write	14	2021-03-24 16:13:19.447	<hidden>
12	12	34409	BMS, Read	14	2021-03-24 16:13:19.447	<hidden>
13	13	78697	BMS, Read	14	2021-03-24 16:13:19.447	<hidden>
14	14	27597	BMS, Read	14	2021-03-24 16:13:19.447	<hidden>
15	15	62243	BMS, Read	51	2021-03-24 16:13:19.447	<hidden>

6.4 BMS AuthRoles table

The AuthRoles table handles the Role definitions to be associated to Actions and Users. As noted in AuthAction, we've maintained the AuthRoleUid for backward compatibility, but added an integer primary key to quickly associate/join tables. The AuthRoleName, AuthRoleDescription column, AuthRoleAssigned, and _ssis_timestamp were maintained from the previous BMS_AUTHZ database.

Figure 46- AuthRoles table

	AuthRoleId	AuthRoleUid	AuthRoleName	AuthRoleDescription	AuthRoleAssigned	_ssis_timestamp
1	11	75741CAB-4E26-499F-ABDA-04B068E3D223	SiteUsers		1	2016-05-18 17:59:35.830
2	21	4BD4C907-0738-4EF1-833A-098CF5473F95	Administrators		1	2016-05-18 17:59:35.830
3	31	95FF0FC0-EBB3-44E2-8513-16ADEFB29B2A	AuditLogUsers		1	2016-05-18 17:59:35.830
4	41	564610E5-F44C-448B-9D7C-309C0EFD1988	SupportUsers		1	2016-05-18 17:59:35.830
5	51	14F3AE64-AC4D-4AE2-994D-57535B0F9487	EmsStaff		1	2016-05-18 17:59:35.830
6	61	43FB60BA-5D0A-4340-93EB-5C63754310B2	VisnUsers		1	2016-05-18 17:59:35.830
7	71	94F870F1-6D91-436C-B046-6B06E2A93CB3	Guests		1	2016-05-18 17:59:35.830
8	81	AE4A7568-D240-4E74-8A9A-71FA52F96F46	EMSSupervisorUsers		1	2016-05-18 17:59:35.830
9	91	7CECD071-0AC1-49A4-B364-7A4DE8988D55	EmsDispatch		1	2019-09-26 07:30:57.740
10	101	9A3F005A-486E-432B-95A6-A2041FE3FDE8	NationalUsers		1	2016-05-18 17:59:35.830
11	111	3A7D7517-3ECA-4EC8-A28E-B9EB077315E4	RegionalUsers		1	2016-05-18 17:59:35.830
12	121	CC9D6237-FEE5-4F78-A814-BA754E3BA9F4	CommunityCareUser		1	2023-05-04 11:37:19.160
13	131	CAD1E895-58AF-45ED-BB6C-5693EE8D8BD5	CommunityCareTransferUser		1	2023-07-27 07:35:34.650
14	141	2DB3FC63-DB96-4CC2-B52E-B786E52A156B	CommunityCareAdmin		1	2023-07-27 07:35:46.030

6.5 BMS AuthRoleActions

The AuthRoleActions table associates the AuthActionId from the AuthActions table and the AuthRoleId from the AuthRoles table for purposes of tying the Roles and Actions together.

Figure 47- AuthRoleActions table

	AuthRoleActionId	AuthRoleId	AuthActionId	LastModifiedDate	LastModifiedBy
1	1	10	2	2021-03-24 16:12:26.960	<hidden>
2	2	10	14	2021-03-24 16:12:26.960	<hidden>
3	3	10	20	2021-03-24 16:12:26.960	<hidden>
4	4	10	25	2021-03-24 16:12:26.960	<hidden>
5	5	10	34	2021-03-24 16:12:26.960	<hidden>
6	6	10	37	2021-03-24 16:12:26.960	<hidden>
7	7	10	79	2021-03-24 16:12:26.960	<hidden>
8	8	10	110	2021-03-24 16:12:26.960	<hidden>
9	9	10	156	2021-03-24 16:12:26.960	<hidden>
10	10	10	169	2021-03-24 16:12:26.960	<hidden>
11	11	10	187	2021-03-24 16:12:26.960	<hidden>
12	12	10	201	2021-03-24 16:12:26.960	<hidden>
13	13	10	213	2021-03-24 16:12:26.960	<hidden>

6.6 BMS AuthUser table

The AuthUser table maintains BMS user information, with a new integer primary key, AuthUsername (hidden for security purposes), the previously tracked AuthUserSID and LegacyUserPK (kept for backwards compatibility), IsSuperUser, and _ssis_timestamp.

Figure 48- AuthUser table

	AuthUserId	AuthUserName	AuthUserSID	LegacyUserPK	IsSuperUser	_ssis_timestamp
1	1	<hidden>	S-1-5-21-682003330-839522115-725345543-50421	1	0	2013-03-12 14:20:13.140
2	2	<hidden>	S-1-5-21-682003330-839522115-725345543-500	2	0	2013-03-12 14:20:13.343
3	3	<hidden>	S-1-5-21-682003330-839522115-725345543-70969	3	0	2013-03-12 14:20:13.423
4	4	<hidden>	S-1-5-21-1814438218-152777602-930774774-308614	4	0	2013-03-12 14:20:13.513
5	5	<hidden>	S-1-5-21-1814438218-152777602-930774774-246201	5	0	2013-03-12 14:20:13.593
6	6	<hidden>	S-1-5-21-1814438218-152777602-930774774-320914	6	0	2013-03-12 14:20:13.650
7	7	<hidden>	S-1-5-21-682003330-839522115-725345543-71328	7	0	2013-04-02 06:35:53.670
8	8	<hidden>	S-1-5-21-1814438218-152777602-930774774-282579	8	0	2013-04-02 10:50:23.490
9	9	<hidden>	S-1-5-21-618345698-627661479-316617838-3708	9	0	2013-04-13 12:20:59.763
10	10	<hidden>	S-1-5-21-618345698-627661479-316617838-170777	10	0	2013-04-13 12:20:59.817

6.7 BMS AuthUserRoles table

The AuthUserRoles table associates the User and the Role they are mapped to, using The AuthUserID and the AuthRoleID. The AuthUserRoles use the integer primary key column named AuthUserRolesId and also maintains the _ssis_timestamp.

Figure 49- AuthUserRoles table

	AuthUserRolesId	AuthUserId	AuthRoleId	_ssis_timestamp
1	1	2	100	2018-03-07 12:24:21.093
2	2	5	10	2013-04-15 07:20:57.333
3	3	5	20	2013-04-22 10:44:49.397
4	4	5	30	2013-04-22 10:44:51.477
5	5	5	40	2020-12-17 10:45:37.050
6	6	5	50	2013-04-15 07:20:57.120
7	7	5	60	2020-12-17 10:24:07.720
8	8	5	80	2013-04-22 10:44:51.607
9	9	5	100	2020-12-17 10:45:36.957
10	10	5	110	2020-12-17 10:45:36.987
11	11	6	10	2020-05-19 14:41:43.650

6.8 BMS AuthActions Listing

The entire listing of AuthActions (previously known as Task Definitions) is presented below:

Table 15- BMS Operations

Operation Name	Operation Description
Admin, AddEditUser Read	'Add/Edit BMS User' hyperlink from the Administration section's menu.
Admin, FacilityEdit Read	'Edit BMS Site' hyperlink from the Administration section's menu.
Admin, Index Read	'BMS Admin' hyperlink from the National And Regional Page.
Operation Name	Operation Description
Admin, SelectUser Read	'Select Existing NT User Name' button from the ADMINISTRATION SECTION - USERADD/EDIT page.

Admin, SisterSiteAddEdit Read	'Edit Sister Sites' hyperlink from the Administration section's menu.
Admin, AddUserOperations Read	'Add User' button from the ADMINISTRATION SECTION - FACILITY EDIT page (Edit BMS Site submenu).
Admin, RemoveUsers Read	'Remove Selected' button from the ADMINISTRATION SECTION - FACILITY EDIT page (Edit BMS Site submenu).
Admin, SearchUser Read	'Find' button from the 'Select user' page ('Select Existing NT User Name' button from the Administration Section menu, 'Add/Edit BMS User' submenu).
Admin, SearchUsers Read	'Find' button from the ADMINISTRATION SECTION - FACILITY EDIT page (Edit BMS Site submenu).
Admin, ClearCache Read	'Clear Cache' link from the Administration section's menu.
Admin, AddEditUser Update	'Submit' button from the ADMINISTRATION SECTION - USERADD/EDIT page.
Admin, FacilityEdit Update	'Submit' button from Administration section's menu 'Edit BMS Site' hyperlink (page ADMINISTRATION SECTION - FACILITY EDIT).
Admin, SisterSiteAddEdit Update	'Edit Sister Sites' hyperlink from the Administration section's menu, 'Submit' button.
Admin, AddUserOperations Update	'Add' button from Add users page (Add User button from the Facility page).
Admin, RemoveUserOperations Update	'Remove Selected' button from the ADMINISTRATION SECTION - FACILITY EDIT page (Edit BMS Site submenu).
AdminComments, Delete Read	'Delete' hyperlink from the Common Medical Terms page.
AdminComments, Edit Read	'Edit' hyperlink from the Common Medical Terms page.
AdminComments, Index Read	'Common Medical Terms' hyperlink from the Administration section's menu.
AdminComments, Index Update	'Save' button from the Common Medical Terms page.
AdminIcon, Delete Read	'Delete Icon' button on ADMINISTRATION SECTION - EDIT ICON page (Add/Edit Icon Submenu)
AdminIcon, Edit Read	'Edit' Link on ADMINISTRATION SECTION - ICON ADD/EDIT page (Add/Edit Icon Submenu)
AdminIcon, Index Read	'Add/Edit Icon' link on ADMINISTRATION SECTION
AdminIcon, Search Read	'Search' Link on ADMINISTRATION SECTION - ICON ADD/EDIT page (Add/Edit Icon Submenu)
AdminIcon, ViewIconReport Read	"Report" Link on ADMINISTRATION SECTION - ICON ADD/EDIT page (Add/Edit Icon Submenu)
AdminIcon, Delete Update	'Remove' button on ADMINISTRATION SECTION - DELETE ICON page (Add/Edit Icon Submenu)
AdminIcon, Edit Update	'Save' button on ADMINISTRATION SECTION - EDIT ICON page (Add/Edit Icon Submenu)
AdminIcon, Index Update	'Up/Down arrow' buttons on ADMINISTRATION SECTION - ICON ADD/EDIT page (Add/Edit Icon Submenu)
AdminSpecialtyAssociation, Delete Read	'Delete' Link on ADMINISTRATION SECTION - Treating Specialty/NUMA/HAvBED Edit page (Treating Specialty/NUMA/HAvBED Submenu)
AdminSpecialtyAssociation, Index Read	'Treating Specialty/NUMA/HAvBED' Link on ADMINISTRATION SECTION
Operation Name	Operation Description
AdminSpecialtyAssociation, Delete Update	'Delete' Button on ADMINISTRATION SECTION - Treating Specialty/NUMA/HAvBED Delete page (Treating Specialty/NUMA/HAvBED Submenu)

AdminSpecialtyAssociation, Index Update	'Save' Button on ADMINISTRATION SECTION - Treating Specialty/NUMA/HAvBED Edit page (Treating Specialty/NUMA/HAvBED Submenu)
AdminUnavailableReason, Delete Read	'Delete' link on ADMINISTRATION SECTION - National Unavailable Reason page (National Unavailable Reason Submenu)
AdminUnavailableReason, Edit Read	'Edit' link on ADMINISTRATION SECTION - National Unavailable Reason page (National Unavailable Reason Submenu)
AdminUnavailableReason, Index Read	'National Unavailable Reason' Link on ADMINISTRATION SECTION
AdminUnavailableReason, Delete Update	'Delete Record' button on ADMINISTRATION SECTION - National Unavailable Reason Delete page (National Unavailable Reason Submenu)
AdminUnavailableReason, Edit Update	'Submit' button on ADMINISTRATION SECTION - National Unavailable Reason Edit page (National Unavailable Reason Submenu)
AdminUnavailableReason, Index Update	'Add' button on ADMINISTRATION SECTION - National Unavailable Reason page (National Unavailable Reason Submenu)
AdminWaitingArea, Delete Read	'Delete' link on ADMINISTRATION SECTION - National Waiting Areas Parameter page (National Waiting Area Submenu)
AdminWaitingArea, Edit Read	'Edit' link on ADMINISTRATION SECTION - National Waiting Areas Parameter page (National Waiting Area Submenu)
AdminWaitingArea, Index Read	'National Waiting Area' Link on ADMINISTRATION SECTION
AdminWaitingArea, DeleteAction Update	'Delete Record' button on ADMINISTRATION SECTION - National Waiting Area Parameter Delete page (National Waiting Area Submenu)
AdminWaitingArea, Edit Update	'Submit' button on ADMINISTRATION SECTION - National Waiting Area Parameter Edit page (National Waiting Area Submenu)
AdminWaitingArea, Index Update	'Add' button on ADMINISTRATION SECTION - National Waiting Area Parameter page (National Waiting Area Submenu)
AdminWhiteboardReport, Delete Read	'Delete' link on ADMINISTRATION SECTION - Whiteboard Report page (Background Processor Submenu)
AdminWhiteboardReport, Edit Read	'Edit' link on ADMINISTRATION SECTION - Whiteboard Report page (Background Processor Submenu)
AdminWhiteboardReport, Index Read	'Whiteboard Report' tab on ADMINISTRATION SECTION - Background Processor page
AdminWhiteboardReport, Delete Update	'Delete Record' button on ADMINISTRATION SECTION - Whiteboard Report Delete page (Background Processor Submenu)
AdminWhiteboardReport, Edit Update	'Save' button on ADMINISTRATION SECTION - Whiteboard Report Edit page (Background Processor Submenu)
AdtOrderableItems, Index Read	Site Options, ADT Orderable Items Add/Delete hyperlink
AdtOrderableItems, Delete Update	'Delete' hyperlink from the list of orderable items.
AdtOrderableItems, Index Update	'Add' button from the Bed Board ADT Orderable Items Configuration.
Operation Name	Operation Description
BackgroundProcessors, Index Read	'Background Processors' hyperlink from Site Options page.

BackgroundProcessors, Index Update	'Save Scheduler' button from Background Processors page within Site Options.
AuditLogReport, Index Read	'View audit log' link on ADMINISTRATION SECTION
rep, Audit Log Report	Access the Audit Log Report.
BedBoard, ChangeFacility Read	Click on a facility link from the VISN Network Bed Boards list.
BedBoard, Index Read	'Return to VISN Network' hyperlink from the home page.
BedBoard, ShowFacilityBedSummaryReport Read	Click on a Facility Summary Report on VISN Network Bed Boards list
BedBoard, ShowVISNBedSummaryReport Read	Click on a VISN Summary Report on VISN Network Bed Boards list
BedBoardModule, Index Read	Site Options, Bed Board Module Enable/Disable link.
BedBoardModule, Index Update	'Submit' button from the Bed Board Module Activation and Configuration page.
BedInformation, Index Read	Ward Occupancy, click on a hyperlink from the BED column.
BedInformation, ClearAll Read	Click on button 'Clear ALL Comments For ALL Wards Associate To This Bed...'
BedInformation, NotifyChange Read	'Submit' button from the Add/Edit Bed Unavailable Reason page.
BedInformation, Index Update	Click on buttons 'Submit' and/or 'Update Reason and Comments'.
ContingencySettings, Index Read	'Contingency Settings" link on Site Settings pages.
ContingencySettings, Index Update	'Save' button on Contingency Settings page on Site Settings pages.
DischargeClinic, Index Read	Site Options, 'Discharge Appt Clinics Add/Delete' hyperlink.
DischargeClinic, Delete Update	Site Options, 'Discharge Appt Clinics Add/Delete' hyperlink, 'Delete' button.
DischargeClinic, Index Update	Site Options, 'Discharge Appt Clinics Add/Delete' hyperlink, 'Add' button.
EmsBedStatusAdmin, EMS Supervisor Read/Update	'Assigned To' drop down on EMS Bed Edit page
EmsBedStatusAdmin, EMSBatchAssign Read	'Batch Assign' button on Ems Bed Status Admin page
EmsBedStatusAdmin, EMSBatchAssign Update	'Submit' button on EMS Bed Edit page on EMS Bed Status Admin page
EmsBedStatusAdmin, Edit Read	RoomBed column link click.
EmsBedStatusAdmin, Index Read	'Return to VISN Network' link from the home page, 'Return to Regional Page' link, 'Go To Facility Bed Cleaning Page (EMS Staff Only) button.
EmsBedStatusAdmin, SaveConfirmation Read	'Submit' button click in the Environmental Management Service Bed Status page.
EmsBedStatusAdmin, Edit Update	'Submit' button click in the Environmental Management Service Bed Status page.
EMSMobile, EMSList Read	Load Bed Clean Requests on EMS Mobile Pages
EMSMobile, Users Read	Click on a User button on EMS Mobile Pages
EMSMobile, EMSList Update	Click on a Bed Clean Request button on EMS Mobile Pages
EMSMobile, Users Update	Click on Submit button after entering a PIN on EMS Mobile Pages
Operation Name	Operation Description
EmsNotification, AddEdit Read	'Edit' link from the Current Locations table (EMS Bed Notification).

EmsNotification, AddEditAction Read	'Submit' button from the EMS Bed Notification Edit page.
EmsNotification, Delete Read	'Delete' link from the Current Locations table (EMS Bed Notification).
EmsNotification, Index Read	Site Options, 'EMS Notification Add/Edit' link
EmsNotification, DeleteAction Update	'Delete Record' button from the EMS Bed Status Notification Delete page.
EmsNotification, Index Update	'Submit' button from the EMS Bed Notification Edit page or Notifications Add page.
EmsStaff, Delete Read	'Delete' link on EMS Staff page on Site Options pages
EmsStaff, Edit Read	'Edit' link on EMS Staff page on Site Options pages
EmsStaff, Index Read	EMS Staff link on Site Options page
EmsStaff, Delete Update	'Delete Record' button on Ems Staff Delete page on Site Options pages
EmsStaff, Edit Update	'Submit' button on Ems Staff Edit page on Site Options pages
EventNotification, AddConfirmation Read	'Submit' button from the Event Notification Add page.
EventNotification, AddEdit Read	'Add' button or 'Edit' link from the Event Notifications page.
EventNotification, EditConfirmation Read	'Submit' button from the Event Notifications Edit page.
EventNotification, Index Read	Site Options, 'Event Notification Add/Edit' hyperlink.
EventNotification, Index Update	'Submit' button from the Event Notification Add page.
Exception, Index Read	Appears when an exception occurs.
FacilityDiversion, Add Read	'Add' button from the Facility Diversion page.
FacilityDiversion, AddConfirmation Read	'Add' button from the Add New Diversion Status page.
FacilityDiversion, Edit Read	'Edit' link from the Facility Diversion page.
FacilityDiversion, EditConfirmation Read	'Save' button from the Diversion Status edit page.
FacilityDiversion, FilterDiversions Read	'Current Diversions' or 'All Diversions' button from the main Facility Diversions page.
FacilityDiversion, Index Read	'Facility Diversion' hyperlink from the home page.
FacilityDiversion, Index Update	'Add' button or 'Edit' link from the Facility Diversion page.
FacilitySettings, Index Read	Site Options, Facility Settings link
FacilitySettings, Index Update	Site Options, Facility Settings link, Submit button
Home, Index Read	Home page.
Home, Index2 Read	Current, Past 30-Days, Past 60-Days, Past 90-Days home page's buttons.
Home, PatientInquiry Read	Click on the patient link from the Patients Pending Placement list (Home page).
Home, RemoveAdmission Read	Remove link from the Patients Pending Placement list (Home page).
Home, UndoRemoveAdmission Read	Undo link from the Patients Pending Placement list (Home page).
Operation Name	Operation Description
Home, RemoveAdmissionPost Update	Remove link from the Patients Pending Placement list (Home page), Remove button from the confirmation page.

Home, UndoRemoveAdmissionPost Update	'Undo' button on Undo Remove Admission Page on Facility HomePage
IconLegend, Index Read	'Icon Legend' link from the bottom of the Home page or Site Options, BMS Icon Legend link.
IconLibrary, Edit Read	'Edit' Link on Site Options - Site Configurable Icons page.
IconLibrary, Index Read	Site Options, Site Configurable Icons link.
IconLibrary, ResetConfirmation Read	'Reset' button on Edit Site Configurable Icon page.
IconLibrary, Edit Update	'Save' button on Site Options - Site Configurable Icons page.
IconLibrary, Index Update	'Up/Down arrow' buttons on Site Options - Site Configurable Icons page.
IconLibrary, ResetConfirmation Update	'Reset' button on Reset Site Configurable Icon page.
Information, Index Read	'Information' link from the bottom of the Home page.
MaintainMarquee, Index Read	'Maintain Marquee Text' link from the Administration Section's menu.
MaintainMarquee, ChangeMarquee Update	'Submit' button from the ADMINISTRATION SECTION - MAINTAIN MARQUEE TEXT page.
NationalAndRegional, Index Read	Home page, Return to VISN Network link, Return to Regional Page link.
NewEvents, Index Read	Home page, New Events link.
Numi, Add Read	'Add' button on ADMINISTRATION SECTION - Background Processors page (Background Processors Submenu).
Numi, Delete Read	'Delete' Link on ADMINISTRATION SECTION - Background Processors page (Background Processors Submenu).
Numi, Edit Read	'Edit' Link on ADMINISTRATION SECTION - Background Processors page (Background Processors Submenu).
Numi, Index Read	'Numi' tab on ADMINISTRATION SECTION - Background Processors page (Background Processors Submenu).
Numi, Delete Update	'Delete Record' button on ADMINISTRATION SECTION - Background Processors Delete page (Background Processors Submenu).
Numi, Edit Update	'Save' button on ADMINISTRATION SECTION - Background Processors Add/Edit page (Background Processors Submenu).
http://tempuri.org/IAministrativeFunctions/GetDomains	Functions used in the Administration Section, Add/Edit BMS User and Edit BMS Site submenus.
http://tempuri.org/IAministrativeFunctions/GetCurrentDomain	
http://tempuri.org/IAministrativeFunctions/GetRoles	
http://tempuri.org/IAministrativeFunctions/GetBulkPolicies	
http://tempuri.org/IAministrativeFunctions/GrantPermission	
http://tempuri.org/IAministrativeFunctions/RevokePermission	
Operation Name	Operation Description
http://tempuri.org/IAministrativeFunctions/GetRoleByName	
http://tempuri.org/IAministrativeFunctions/GetPermissionsByResourceType	

http://tempuri.org/IAdministrativeFunctions/GetAllUsersAndDomain	
http://tempuri.org/IAdministrativeFunctions/GetAllUserRoles	
http://tempuri.org/IAdministrativeFunctions/AssignUser	
http://tempuri.org/IAdministrativeFunctions/DeassignUser	
http://tempuri.org/IAdministrativeFunctions/GetPolicy	
http://tempuri.org/IAdministrativeFunctions/ClearPermissionsForResource	
http://tempuri.org/IAdministrativeFunctions/AddActionEntityType	
http://tempuri.org/IAdministrativeFunctions/AddOperation	
http://tempuri.org/IAdministrativeFunctions/AddRole	
http://tempuri.org/IAdministrativeFunctions/AddTask	
http://tempuri.org/IAdministrativeFunctions/AssignOperations	
http://tempuri.org/IAdministrativeFunctions/AssignRole	
http://tempuri.org/IAdministrativeFunctions/ChangeUserPassword	
http://tempuri.org/IAdministrativeFunctions/DeassignOperations	
http://tempuri.org/IAdministrativeFunctions/DeassignRole	
http://tempuri.org/IAdministrativeFunctions/DeleteActionEntityType	
http://tempuri.org/IAdministrativeFunctions/DeleteOperation	
http://tempuri.org/IAdministrativeFunctions/DeletePermissionForResourceAndOperation	
http://tempuri.org/IAdministrativeFunctions/DeletePermissionsForResourcesAndOperations	
http://tempuri.org/IAdministrativeFunctions/DeleteRole	
http://tempuri.org/IAdministrativeFunctions/DeleteTask	
http://tempuri.org/IAdministrativeFunctions/GetActionEntityTypes	
http://tempuri.org/IAdministrativeFunctions/GetAvailableDomains	
http://tempuri.org/IAdministrativeFunctions/GetCallerIsSuperUser	
http://tempuri.org/IAdministrativeFunctions/GetConnectedRolesAndOperations	
http://tempuri.org/IAdministrativeFunctions/GetEntityTypes	
http://tempuri.org/IAdministrativeFunctions/GetOperationByName	
http://tempuri.org/IAdministrativeFunctions/GetOperationByNameExcludingId	
Operation Name	Operation Description
http://tempuri.org/IAdministrativeFunctions/GetOperations	
http://tempuri.org/IAdministrativeFunctions/GetRoleByNameExcludingId	

http://tempuri.org/IAAdministrativeFunctions/GetRoleDefinition	
http://tempuri.org/IAAdministrativeFunctions/GetRolesDefinitionIntersect	
http://tempuri.org/IAAdministrativeFunctions/GetRoleUsers	
http://tempuri.org/IAAdministrativeFunctions/GetSubscriptions	
http://tempuri.org/IAAdministrativeFunctions/GetTaskByName	
http://tempuri.org/IAAdministrativeFunctions/GetTaskByNameExcludingId	
http://tempuri.org/IAAdministrativeFunctions/GetTaskDefinition	
http://tempuri.org/IAAdministrativeFunctions/GetTasks	
http://tempuri.org/IAAdministrativeFunctions/GetUserBySid	
http://tempuri.org/IAAdministrativeFunctions/GetUserByUserName	
http://tempuri.org/IAAdministrativeFunctions/GetUserDefinedRoles	
http://tempuri.org/IAAdministrativeFunctions/GetUserGroupId	
http://tempuri.org/IAAdministrativeFunctions/GetUserRoles	
http://tempuri.org/IAAdministrativeFunctions/InsertPermissionForResourceAndOperation	
http://tempuri.org/IAAdministrativeFunctions/InsertPermissionsForResourcesAndOperations	
http://tempuri.org/IAAdministrativeFunctions/InsertResource	
http://tempuri.org/IAAdministrativeFunctions/IsChild	
http://tempuri.org/IAAdministrativeFunctions/RefreshCache	
http://tempuri.org/IAAdministrativeFunctions/SearchUsers	
http://tempuri.org/IAAdministrativeFunctions/SetCurrentDomain	
http://tempuri.org/IAAdministrativeFunctions/SynchronizeAllSubscribers	
http://tempuri.org/IAAdministrativeFunctions/UpdateOperation	
http://tempuri.org/IAAdministrativeFunctions/UpdateRole	
http://tempuri.org/IAAdministrativeFunctions/UpdateTask	
Patient, Admission Read	'Edit' link from the Home page, Patients Pending Placement list.
Patient, Select Read	'Add New Patient' link from the Home page, Patients Pending Placement section.
Patient, Admission Update	'Submit' button from ADD/EDIT Patients Pending Placement page.
Operation Name	Operation Description
rep, Active Admission Orders Report	Access the Active Admission Orders Report.
rep, Active Discharge Orders Report	Access the Active Discharge Orders Report.
rep, Active Transfer Orders Report	Access the Active Transfer Orders Report.

rep, Antic Discharge Orders Report	Access the Antic Discharge Orders Report.
rep, Audit Log Report	Access the Audit Log Report
rep, BED AVAILABILITY STATUS REPORTQu	Access the BED AVAILABILITY STATUS REPORT.
rep, Bed Specialty Report	Access the Bed Specialty Report.
rep, Bed Specialty Roster	Access the Bed Specialty Roster.
rep, Bed Summary Report	Access the Bed Summary Report.
rep, Bed Turnaround Time Report	Access the Bed Turnaround Time Report.
rep, Beds Out of Service Report (All)	Access the Beds Out of Service Report (All).
rep, Beds Out of Service Report (By Date)	Access the Beds Out of Service Report (By Date).
rep, Discharge Order Difference Report	Access the Discharge Order Difference Report
rep, Discharges In Progress	Access the Discharges In Progress.
rep, Emergency Management Report	Access Emergency Management Report
rep, EMS Bed Status Report (Admin)	Access the EMS Bed Status Report
rep, Facility Diversion Report	Access the Facility Diversion Report
rep, Icon Usage Report	Access the Icon Usage Report
rep, Patient Inquiry	Access the Patient Inquiry report.
rep, Patient Movement Report	Access the Patient Movement Report.
rep, Patient Movements by Date	Access the Patient Movements by Date.
rep, Patients w Discharge Appointments	Access the Patients w Discharge Appointments.
Rep, PPBP by Date Range Report	Access the PPBP By Date Range Report
rep, Scheduled Admissions by Date	Access the Scheduled Admissions by Date.
rep, Scheduled Admissions Report	Access the Scheduled Admissions Report.
rep, UserAccess	Access the UserAccess Report
rep, VISN Bed Summary Report	Access VISN Bed Summary Report
rep, VISN Emergency Management Report	Access the VISN Emergency Management Report
rep, VISN Diversion Report	Access the VISN Diversion Report
rep, VISN Network Active Report	Access the VISN Network Active Report.
rep, VISN Network Audit Report	Access the VISN Network Audit Report.
rep, VISN Network Contract Report	Access the VISN Network Contract Report.
rep, VISN Network Disposition Report	Access the VISN Network Disposition Report.
rep, Wait List Status Report	Access the Patients Pending Placement Status Report.
Reports, Index Read	'Submit' buttons from the Home page corresponding to the reports.
SiteOptions, Index Read	Home page, Site Options link.
SiteOptions, EvacuationConfirmation Read	Access to Evacuation Confirmation page.

SiteOptions, Index Update	'Submit' button from Site Options page.
SiteOptions, EvacuationConfirmation Update	'Save' button from Evacuation Confirmation page.
Transfer, AddTransfer Read	VISN page, Add New Patient button, Submit button from the Select Patient page.
Transfer, EditTransfer Read	'Edit' link from the VISN page, Patients in Community

Operation Name	Operation Description
	Hospitals list.
Transfer, FinalizeTransfer Read	'Finalize' link from the VISN page, Patients in Community Hospitals list.
Transfer, Index Read	VISN page, Add New Patient button.
Transfer, AddTransfer Update	VISN page, Add New Patient button, Submit button from the Select Patient page, and Submit button from the Enter Patient Data page.
Transfer, EditTransfer Update	'Edit' link from the VISN page's Patients in Community Hospitals list and then Submit button.
Transfer, FinalizeTransfer Update	'Finalize' link from the VISN page's Patients in Community Hospitals list and then Submit button from the Finalize Patient Data page.
UnavailableReason, Delete Read	'Delete' link from the Bed Board Site Unavailable Reason page's list.
UnavailableReason, Edit Read	'Edit' link from the Bed Board Site Unavailable Reason page's list.
UnavailableReason, Index Read	Site Options, Unavailable Reason Add/Edit link.
UnavailableReason, Delete Update	'Delete' link from the Bed Board Site Unavailable Reason page's list and then 'Delete Record' button.
UnavailableReason, Edit Update	'Edit' link from the Bed Board Site Unavailable Reason page's list and then Submit button.
UnavailableReason, Index Update	'Add' button from the Bed Board Site Unavailable Reason page.
UserConfiguration, Index Read	Site Options, Add/Edit BMS User link.
UserConfiguration, SearchUser Read	'Find and Save' buttons from the 'Select user' page ('Select Existing NT User Name' button from the Site Options, 'Add/Edit BMS User' link).
UserConfiguration, SelectUser Read	'Select Existing NT User Name' button from the Site Options - Add/Edit BMS User page.
UserConfiguration, Index Update	'Submit' button from the Site Options - Add/Edit BMS User page.
VistaIntegration, Audit Read	'Audit' tab on ADMINISTRATION SECTION - Background Processors page (Background Processors Submenu) and 'Filter By' button from the 'Audit' tab.
VistaIntegration, Categories Read	'Vista Integration' tab on ADMINISTRATION SECTION - Background Processors page (Background Processors Submenu).
VistaIntegration, DeleteScheduler Read	'Add new scheduler' link and select a scheduled name from the 'Scheduled' tab.
VistaIntegration, Index Read	'Background Processors' link on ADMINISTRATION SECTION.
VistaIntegration, Schedulers Read	'Schedulers' tab on ADMINISTRATION SECTION - Background Processors page (Background Processors Submenu).
VistaIntegration, TestMDWConnection Read	'TestMDWConnection' button from the 'VistA Sites' tab.
VistaIntegration, TestODBCConnection Read	'TestODBCConnection' button from the 'VistA Sites' tab.

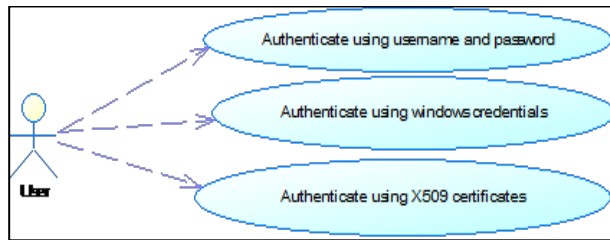
VistaIntegration, VistASites Read	'Vista Sites' tab on ADMINISTRATION SECTION - Background Processors page (Background Processors Submenu).
VistaIntegration, Categories Update	'Save and Run' buttons from the 'Vista Integration' tab.
VistaIntegration, DeleteScheduler Update	'Delete' link from the 'Scheduled' tab and then 'Delete Record' button.

Operation Name	Operation Description
VistaIntegration, Schedulers Update	'Save' button from the 'Scheduled' tab.
VistaIntegration, VistASites Update	'Save' button from the 'Vista Sites' tab.
WaitingArea, Delete Read	'Delete' link from the Patient Waiting Areas page's list of Current Waiting Areas.
WaitingArea, Edit Read	'Edit' link from the Patient Waiting Areas page's list of Current Waiting Areas.
WaitingArea, Index Read	Site Options, Waiting Area Add/Delete link.
WaitingArea, DeleteAction Update	'Delete' link from the Patient Waiting Areas page's list of Current Waiting Areas and then 'Delete Record' button.
WaitingArea, Edit Update	'Edit' link from the Patient Waiting Areas page's list of Current Waiting Areas and then Submit button.
WaitingArea, Index Update	'Add' button from the Patient Waiting Areas page.
WardConfiguration, Delete Read	'Delete' link from the Bed Board Ward Configuration, Current Vista Wards list.
WardConfiguration, Index Read	Site Options, Vista Ward Add/Edit link.
WardConfiguration, Index Update	Site Options, Vista Ward Add/Edit link, Save button.
WardConfiguration, DeleteWard Update	Site Options, Vista Ward Add/Edit link, Delete operation.
WardOccupancy, Index Read	'Submit' button from the Home page corresponding to the Ward Occupancy.
WardWhiteboard, Edit Read	Click on a link from the BED column from WARD Whiteboard Report.
WardWhiteboard, EditPT Read	Click on a link from the PT column from the WARD Whiteboard Report.
WardWhiteboard, Index Read	Home page, 'Ward Whiteboard' link.
WardWhiteboard, NotifyChange Read	Click on a link from the BED column from WARD Whiteboard Report and then on the Submit button.
WhiteboardStaff, Index Read	Click on the checkbox from the STAFF column from the WARD Whiteboard Home.
WardWhiteboard, ShowReport Read	'Export Report' link from the right of the WARD Whiteboard Home page or WARD Whiteboard Report page, Export Report.
WardWhiteboard, Submit Read	'Submit' button from the WARD Whiteboard Home page.
WardWhiteBoard, WardWhiteBoard Read	Home page, 'Ward Whiteboard' link, Submit button from the WARD Whiteboard Home.
WardWhiteboard, ClearAll Read	Click on a link from the BED column from WARD Whiteboard Report and then click on the button 'Clear ALL Comments For ALL Wards Associate To This Bed...'
WardWhiteBoard, WardWhiteBoard Update	Click on a staff name from the STAFF column from the WARD WhiteBoard Report and then click on the image 'Save Staff'.
WhiteboardStaff, Index Update	Click on the checkbox from the STAFF column from WARD Whiteboard Report and then on the 'Save' button.
WardWhiteboard, Edit Update	Click on a link from the BED column from WARD Whiteboard Report and then on the Submit button.

6.9 Business scenarios and use cases

Authentication

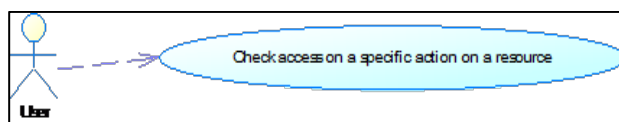
Figure 50- Authentication Use Cases



Section	Description
Use Case Name	User authentication
Summary	In the above diagram it is represented the methods that a client application can use to authenticate their users.
Preconditions	The users, that will use the client application, need to be defined in an Active Directory
Triggers	External
Basic course of events	<ol style="list-style-type: none"> 1. The client application will validate through SSOi 2. SSOi verifies the login information and BMS verifies the user has a role. 3. The system returns the result of the verification to the client application.

Authorization

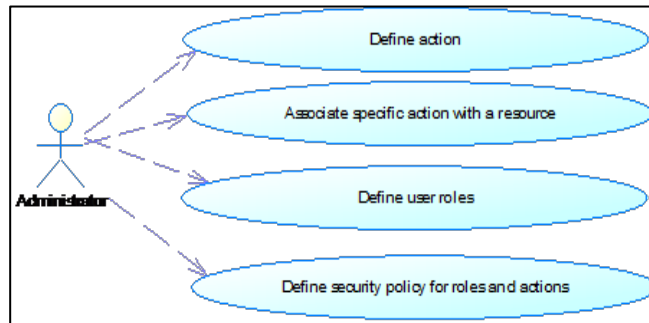
Figure 51- Authorization Use Cases



Section	Description
Use Case Name	User authorization
Summary	In the above diagram it is represented the methods that a client application can use to check if an authenticated user has access to a specified action on a resource.

Section	Description
Preconditions	The users, actions and resources must be defined in an Active Directory structure that the Security Service is using.
Triggers	External
Basic course of events	<ol style="list-style-type: none"> 1. The client application will invoke a check access method for a specified action on a specific resource 2. The system will find the actions that the requesting users has access 3. The system returns true/false if the action requested is among the users defined actions

Figure 52- Authorization Administration Use Cases



Section	Description
Use Case Name	Action and resource management
Summary	Administrative console can define actions and resources and associate an action with a resource type.
Preconditions	The association method mandates that the action and the resource type should already be defined
Triggers	External
Basic course of events	<ol style="list-style-type: none"> 1. The client application will invoke a create action 2. The system will try to create requested action. 3. The system will fail if the specified action name already exists, or specified id already exists.

Section	Description
Use Case Name	Role management
Summary	Administrative console can define user roles and associate

Section	Description
	users/user groups with roles.
Preconditions	The association method mandates that the role should already be defined
Triggers	External
Basic course of events	<ol style="list-style-type: none"> 1. The client application will invoke a create role 2. The system will try to create requested role. 3. The system will fail if the specified role name already exists, or specified id already exists.

Section	Description
Use Case Name	Security policy management
Summary	Administrative console can associate users (groups of users) with roles. These roles are then associated with an action (operation).
Preconditions	The association method mandates that the action and the resource type should already be defined.
Triggers	External

7 Detailed Functional Model on Each Interface

7.1 BMS Authentication and Authorization

7.1.1 Authentication

BMS connects with single sign-on (SSOi) and the user inputs their PIV pin. The SSOi headers are supplied by the SSOi service validating their user credentials to the BMS Application. Their user credentials are parsed from the SSOi headers in order to verify that the user is authenticated and has a role in the BMS application. If the user does NOT have a role in BMS, the login is rejected.

7.1.2 Authorization

Authorization occurs within the BMS Service layer. The application utilizes the Security Wrapper to Check Action and Check Permission for the user's account. The Security Wrapper queries the BMS database and the new Auth tables defined beginning in section 7.1.

- Check Action

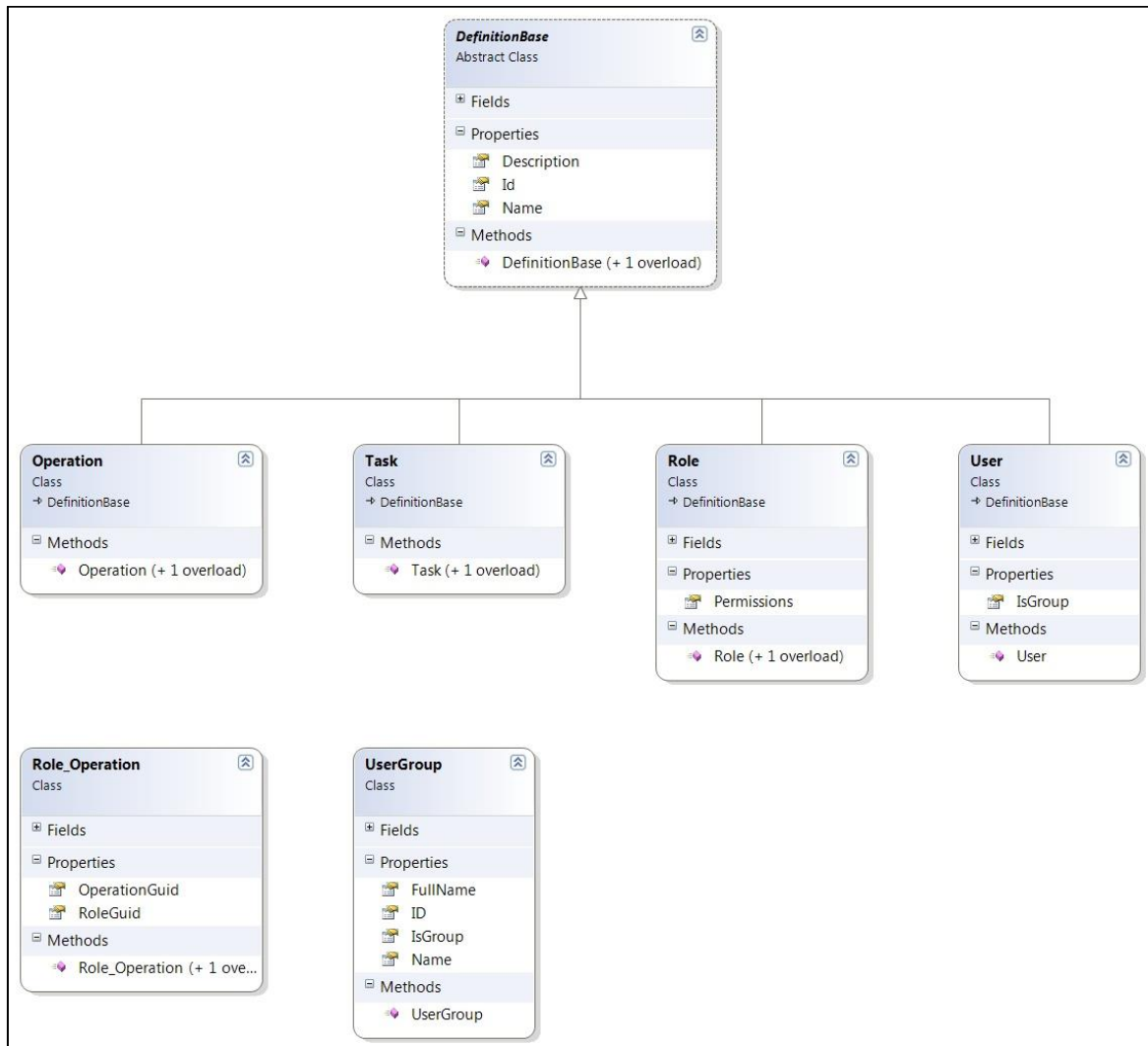
Check Action queries the BMS database via the Security Wrapper for User Roles (BMS.AuthRole and BMS.AuthUserRoles) against the defined Actions (BMS.AuthAction and BMS.AuthRoleActions).

- Check Permission

The BMS Application validates the user's permission via the Security Wrapper by calling the CheckPermission to determine Read or Write access to a specific facility. This functionality is primarily reading the BMS.AuthUser and BMS.AuthPermissions tables.

7.2 Data contracts

Figure 53- Class Diagram for Data Contracts in PAP and PDP



7.3 BMS Roles

BMS users fall under the following categories:

Administrators: This type of user will customize the BMS settings according to the needs of a facility. They will have access to the Site Options pages. This role refers to a group of users whose members are the person(s) responsible for setting up BMS options for the current facility.

AuditLogUsers: This type of user will have access to Audit Log Report. This role cannot be used alone, only together with another role.

CommunityCareUser: This type of user will have access to the Community Care Tracking List page. Note that Admin User role or higher will always have this role's permissions.

CommunityCareTransferUser: This type of user will have access to both the Community Care Tracking List page and Add to PPBPL function. Note that Admin User role or higher will always

have this role's permissions. In addition, the Community Care Transfer User role will always have Community Care User role permissions automatically.

CommunityCareAdmin: This type of user will have access to the Community Care Sites page. Note that Admin User role or higher will always have this role's permissions.

EmsStaff: The EMS group of users will be allowed to edit and update the bed cleaning process but not the other parts of the bed board. Any member of your EMS staff that will be interacting with BMS must be in this group.

EMSSupervisorUsers: The EMS supervisor group of users will be allowed to view the requests for bed clean operations, to filter existing requests by different criteria and to select requests in order to assign them to EMS staff. This role cannot be used alone, only together with EmsStaff role.

Guests: The guest user will be allowed to generate the National Bed Availability report from National/Regional page.

National Users/Regional Users: This type of user will have access to the National/Regional page only.

Site Users: This type of user only has access to the BMS facility page.

Support Users: This type of user will have access to the Administrative page of the BMS solution. They configure the sites for the BMS facilities and grant access and read/write rights to the users.

VISN Users: This type of user will have access to the pages of different facilities within the VISN where they have been granted access.

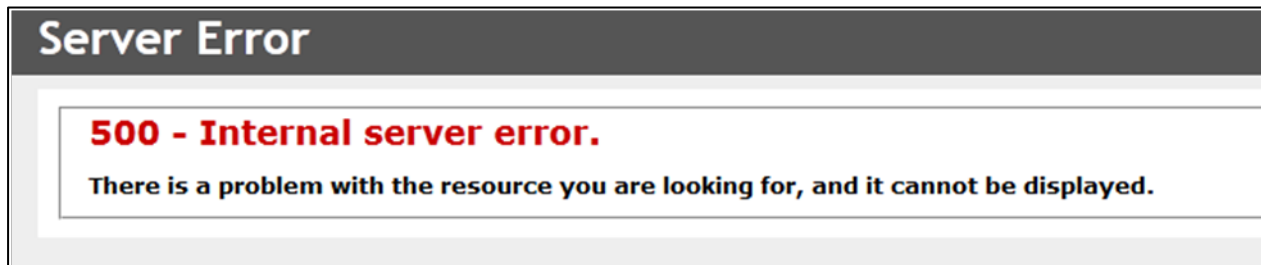
8 Troubleshooting

This section contains information on common issues with using BMS solution and how those may be resolved.

8.1 Symptom 1

When you try to load the BMS application, one of the following error messages appear:

Figure 54- 500 Server Error



Problem

IIS is not started/running.

Diagnoses and Solutions

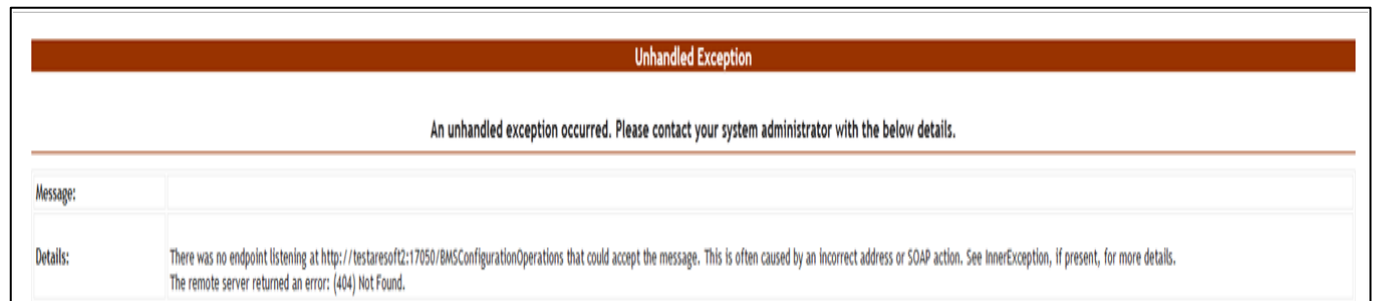
Start the IIS Manager and check if the Application Pool Identity is set to the correct service account. (.) Verify the BMS pool is started, If stopped right click on the BMS, Select 'Start'.

Verify the Site 'BMS' is started. If not select 'BMS' under the Site folder in IIS Manager, select 'Start' from the 'Manage Web Site' panel on the right side of the IIS Manager.

8.2 Symptom 2

When trying to load the BMS application, one of the following error messages appears:

Figure 55- Unhandled Exception



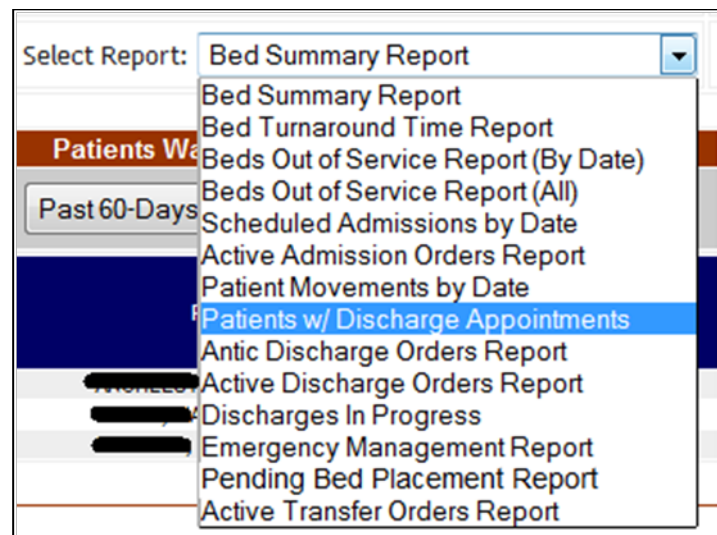
Diagnoses and Solutions

- Check if BMS.BMService service is stopped or SQL Server might also have stopped.
- Go to the SQL Server machine and start the SQL Server from the SQL Server Configuration Manager. Verify if the connection string to the database server is set properly.
- Then go to the services' machine, start the services.msc console and start the BMS.BMService service.

8.3 Symptom 3

A report is missing from Other Reports section on the Facility Home Page (e.g. *EMS Bed Status Report (Admin)*).

Figure 56- EMS Bed Status Report is Missing



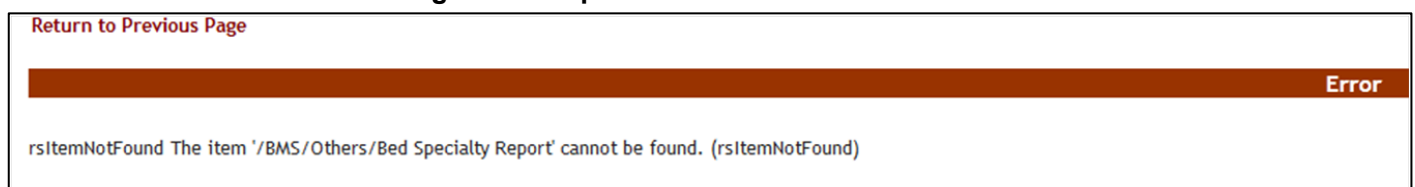
Diagnoses and Solutions

Check if the report is missing from the SQL Server Reporting Services. Go to the management web page and add the missing report (Upload File).

8.4 Symptom 4

When trying to view one of the reports (other than the *Other Reports*) the following error appears:

Figure 57- Report Cannot be Found



Diagnoses and Solutions

Check if the mentioned report is missing from the Reporting Services. Go to the management web page and add the specified report.

BMS Log Files

There are two log files available to anyone supporting the BMS system, the **BMS.VI.ServiceHost** and the **WebTrace log**.

- The BMS.VI.ServiceHost logfile is named BMS.VI.trace.log and its location is on the application server (vaausbmsmulx6) at D:\BMS\Bin\BMS.
- The Web trace log is named WebTrace.log and its location is on the web server (vaausbmswebx5) at D:\BMS\BMS.Web.

These logs contain various types of information (informational, warnings, and errors) with the exception of the web trace log, which only contains error messages.

9 Appendix A – BMS Diagrams

9.1 Business Process Diagrams

Figure 58- Admit Patient to PPBP Business Process

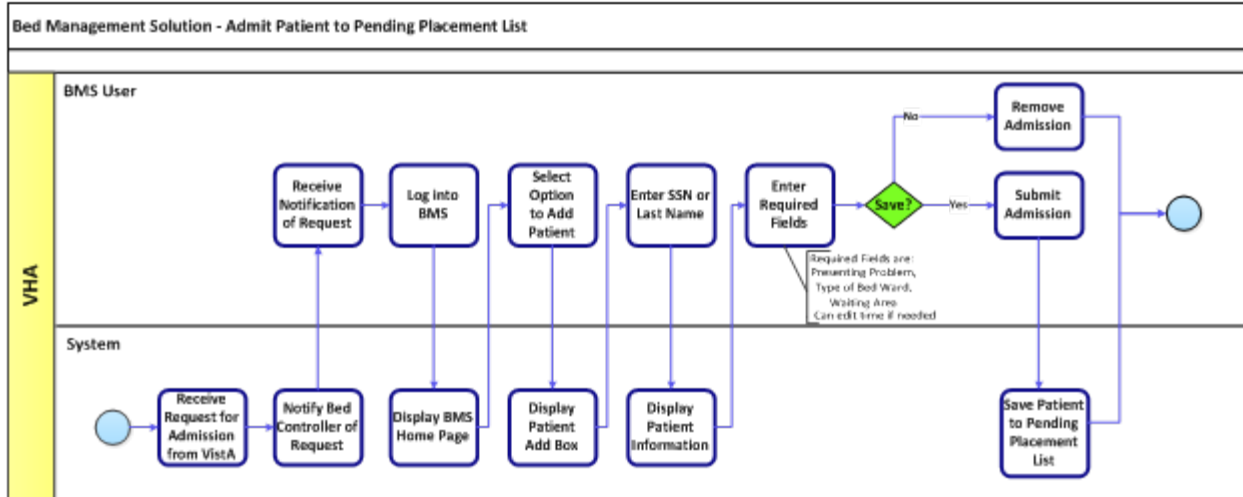


Figure 59- Transfer Patients to PPBP Business Process

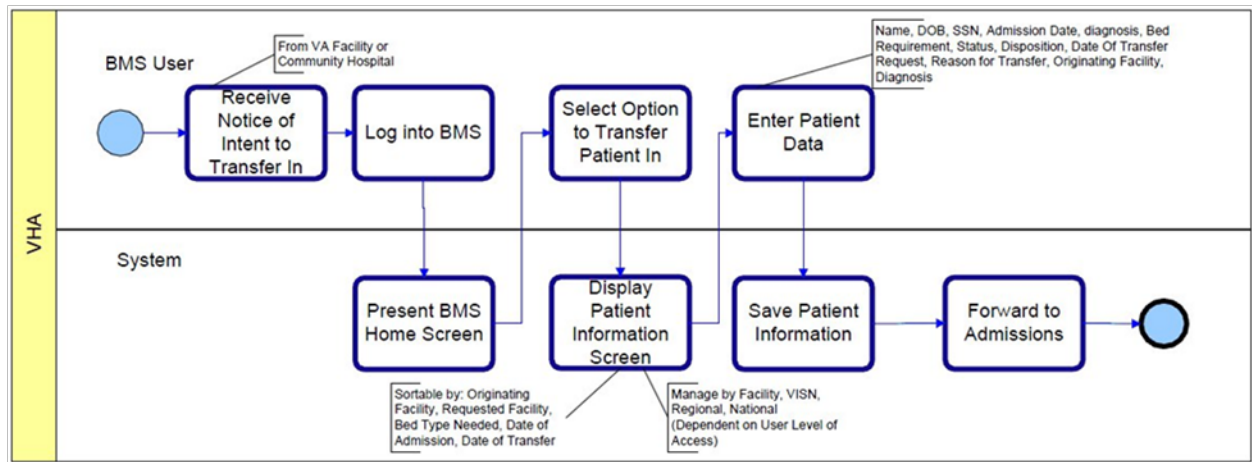


Figure 60- Display and Update PPBP Business Process

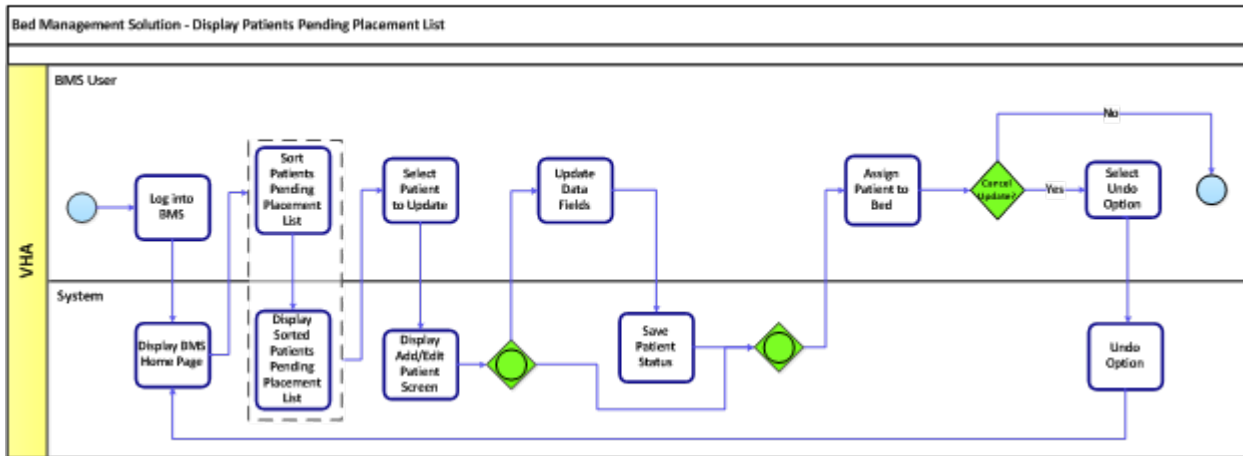


Figure 61- Display and Update Bed Status Business Process

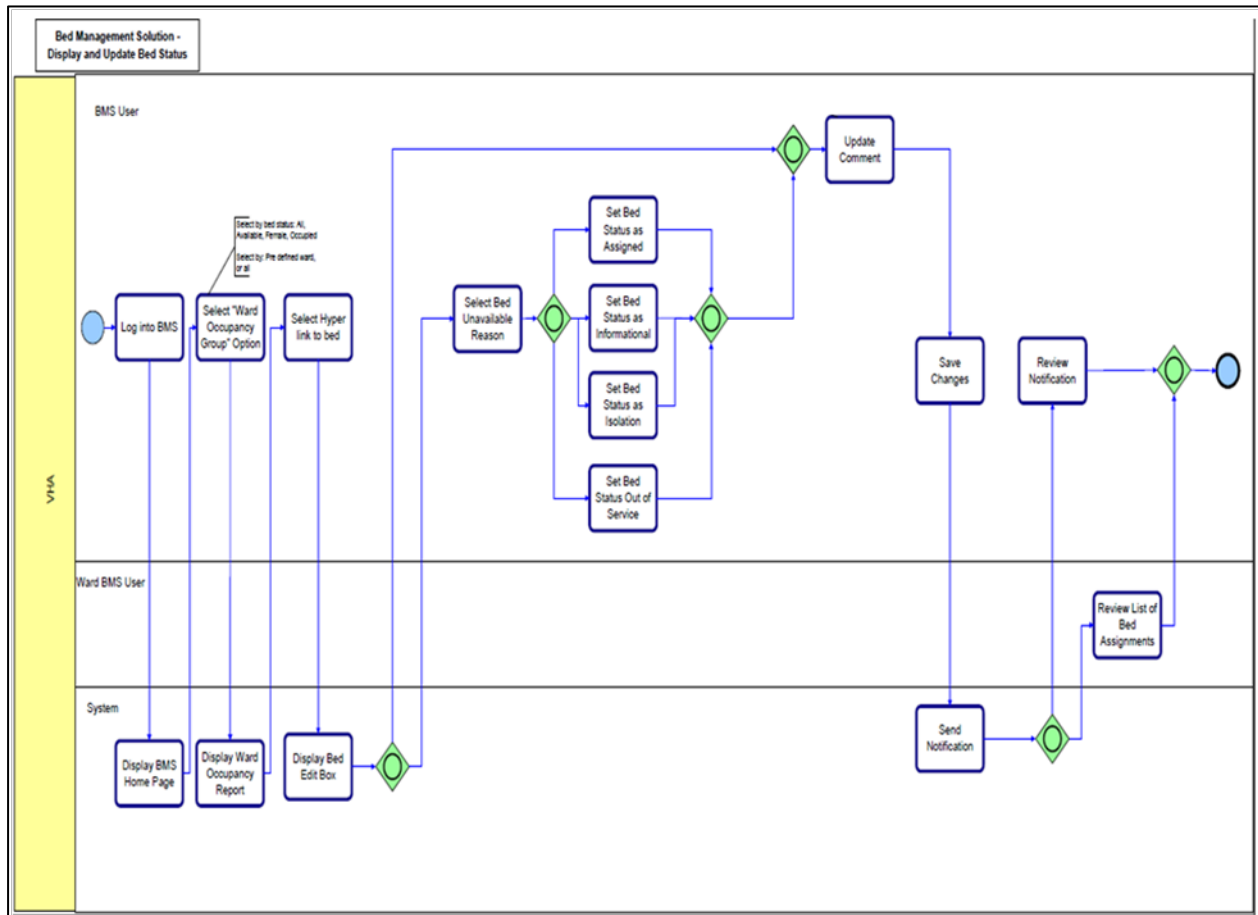


Figure 62- Manage Bed Cleaning Business Process

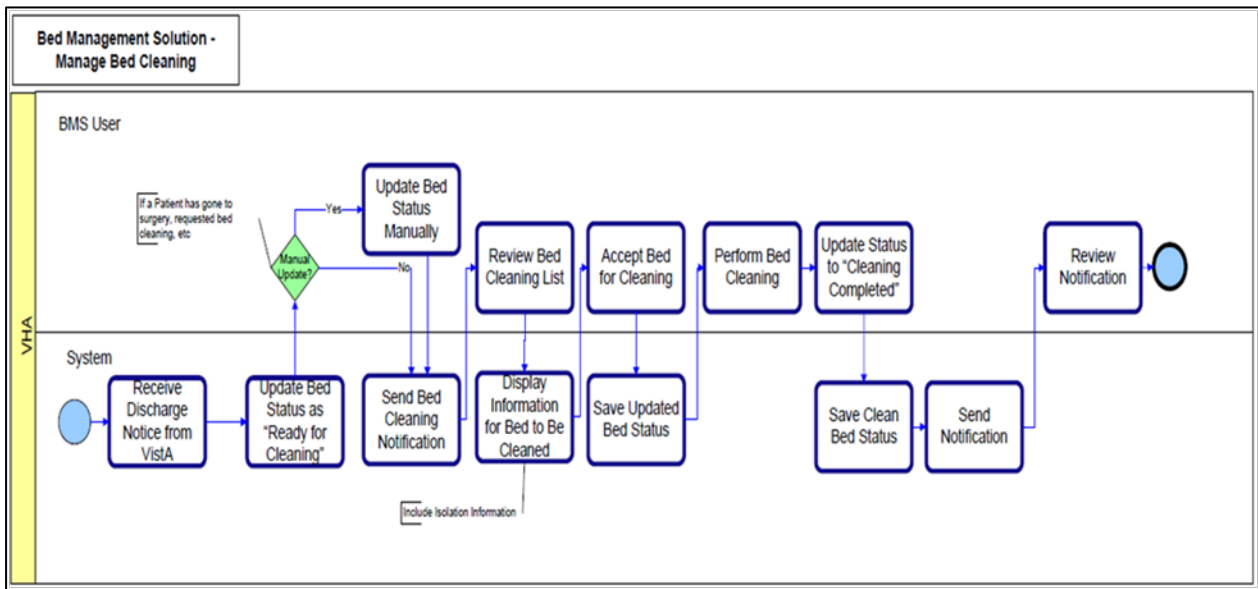


Figure 63- Create Notification Business Process

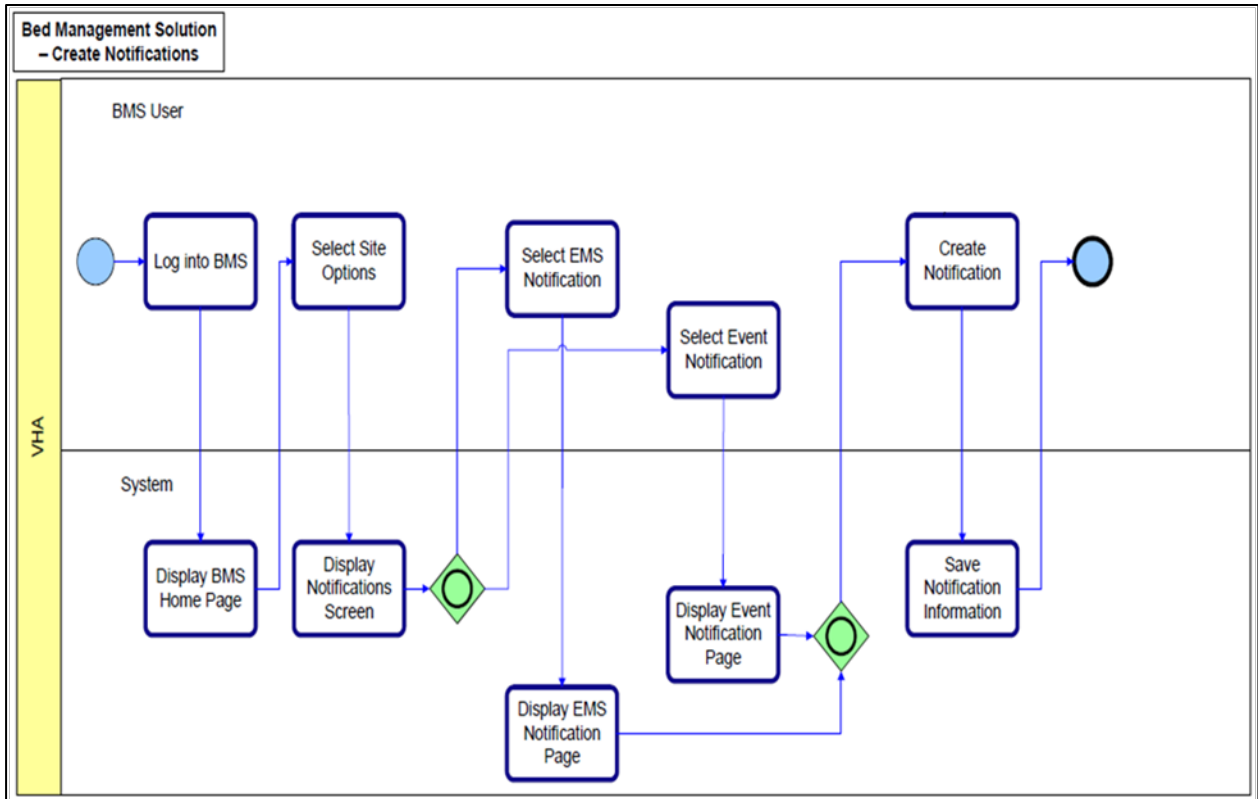


Figure 64- Create Facility Diversion Business Process

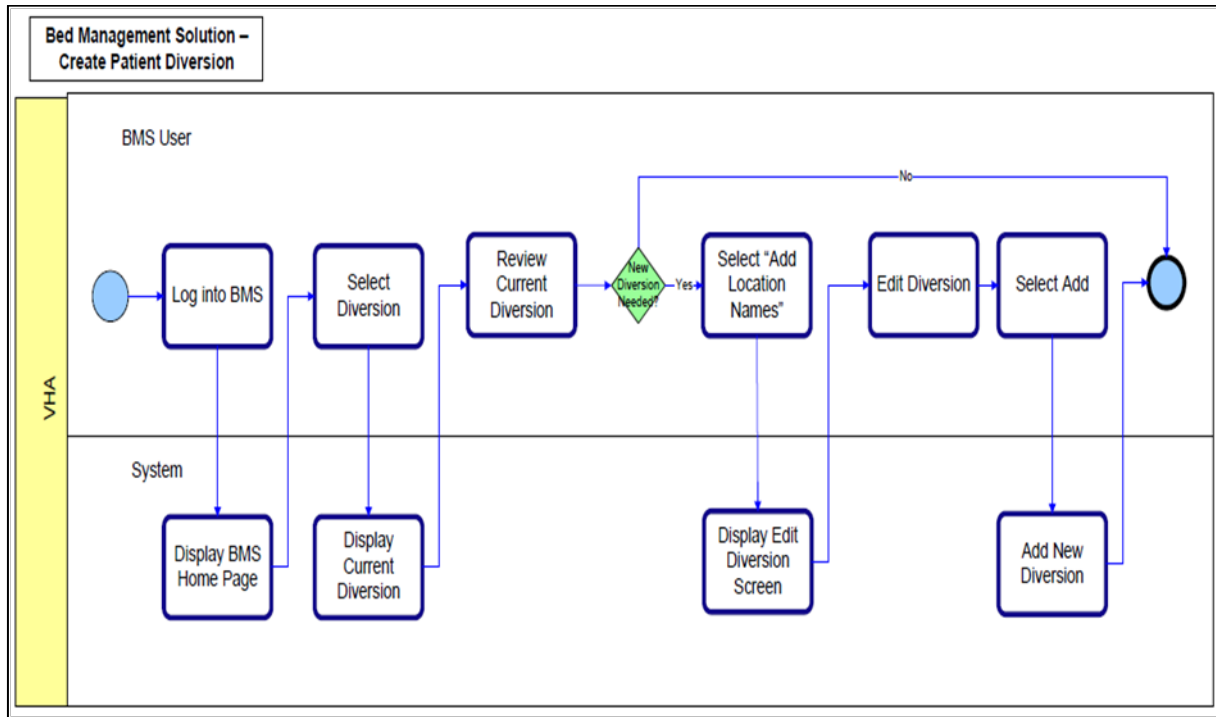


Figure 65- Manage Whiteboard Business Process

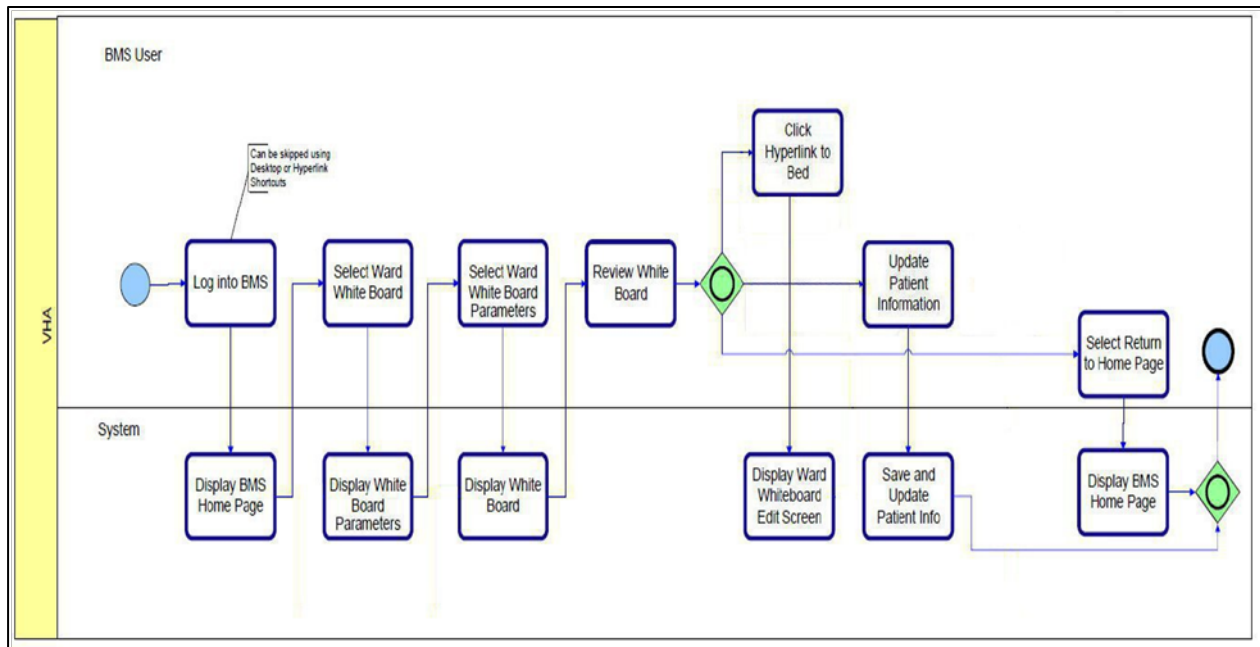
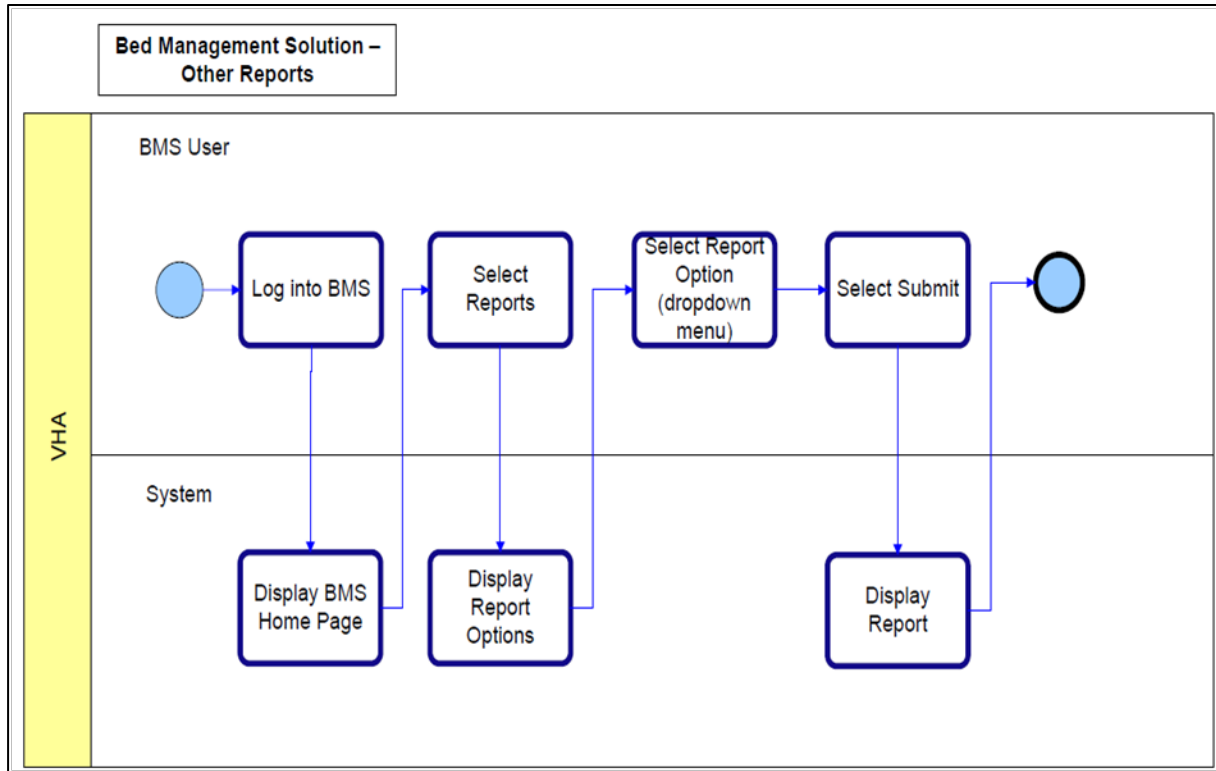
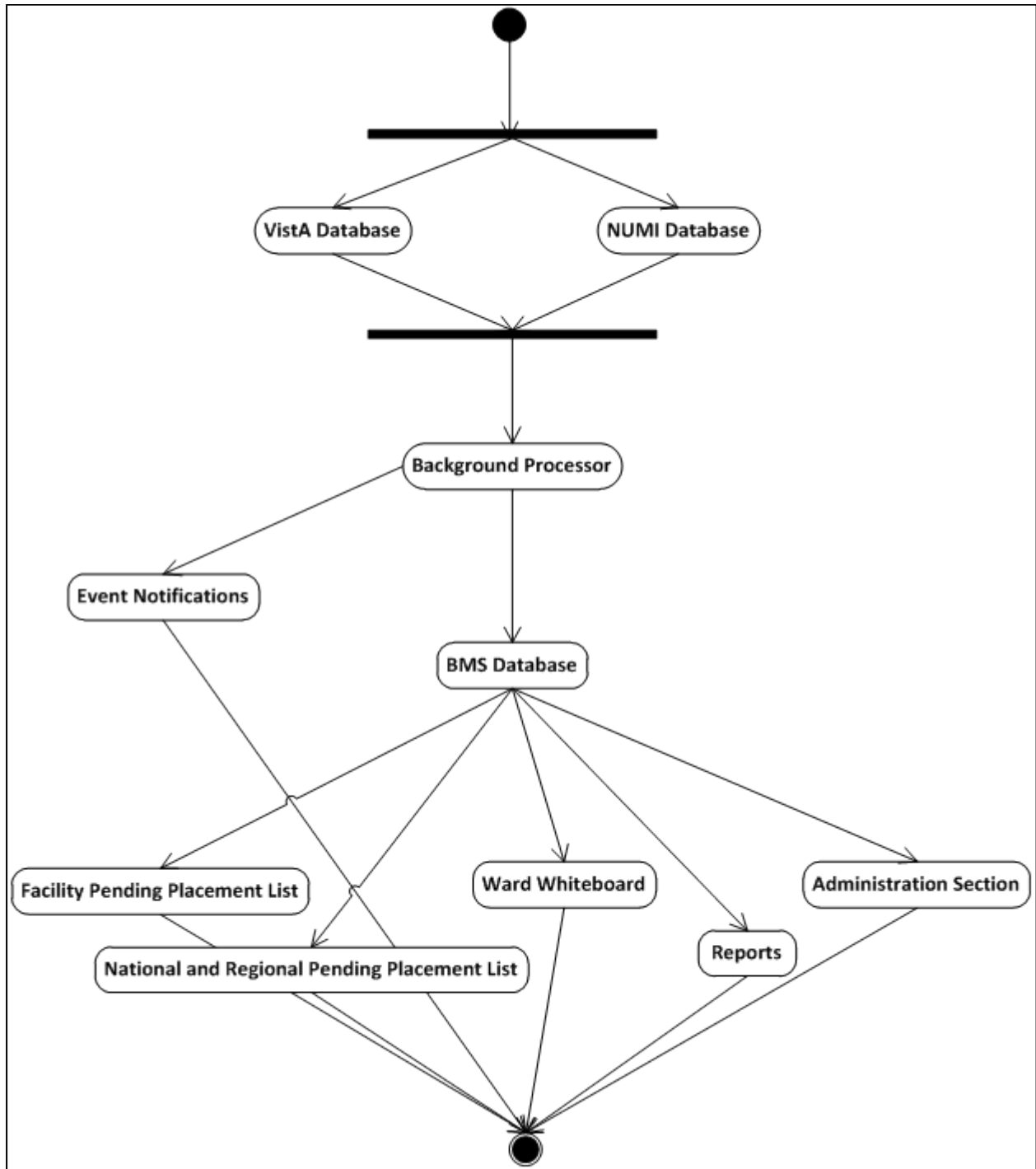


Figure 66- Reports Business Process



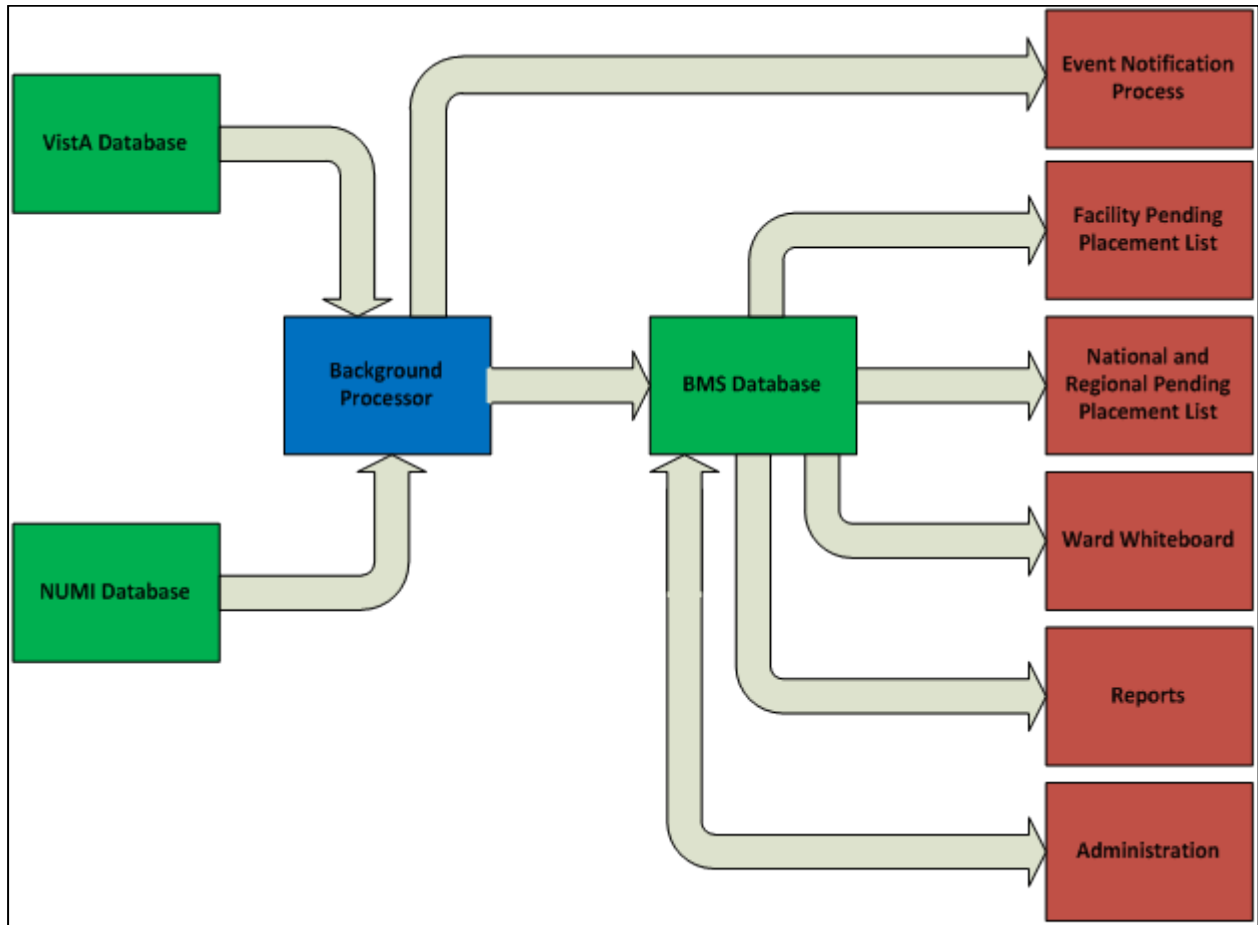
9.2 Activity Diagram

Figure 67- BMS Overview Activity Diagram



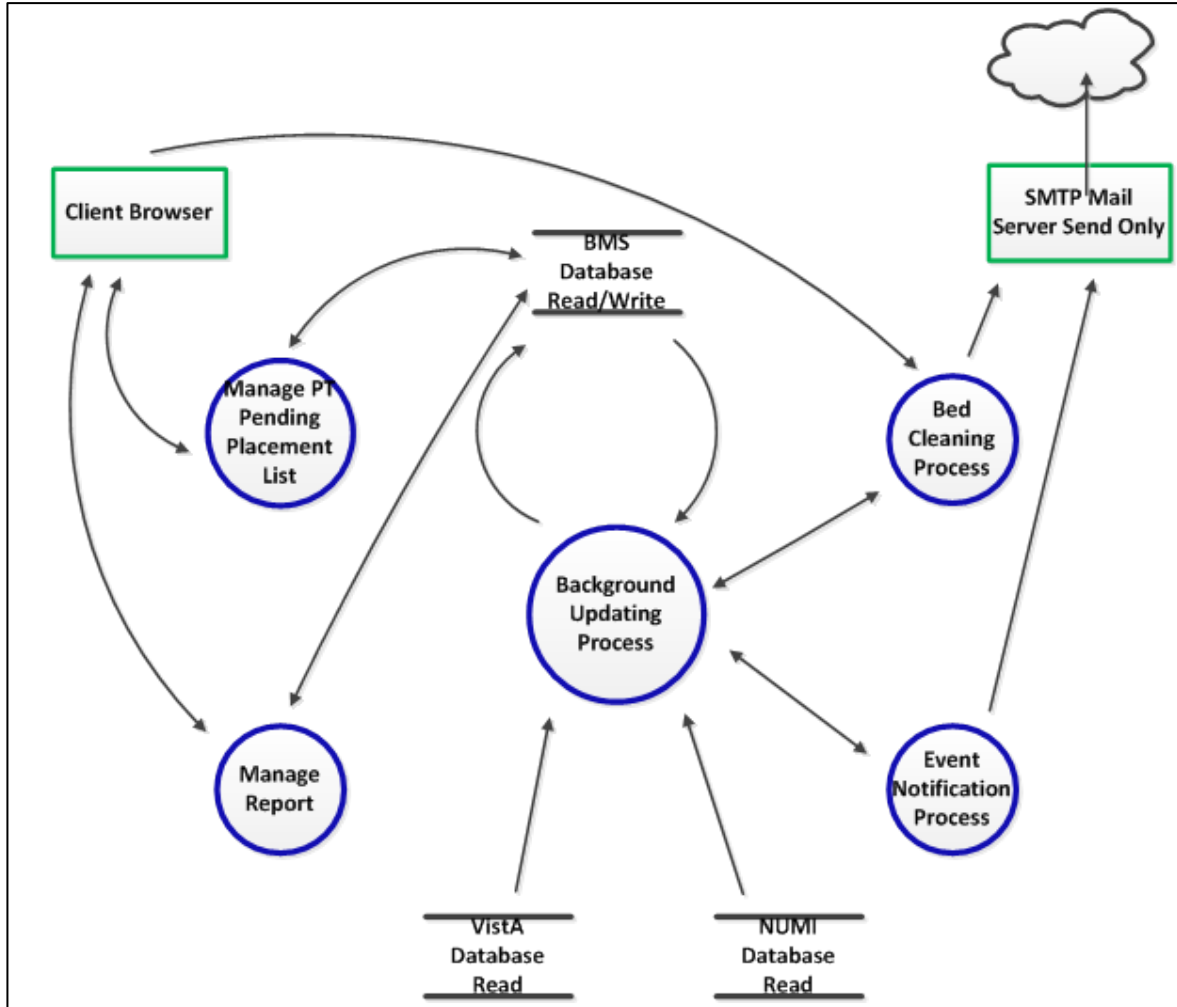
9.3 Functional Flow Diagram

Figure 68- BMS Overview Functional Flow Diagram



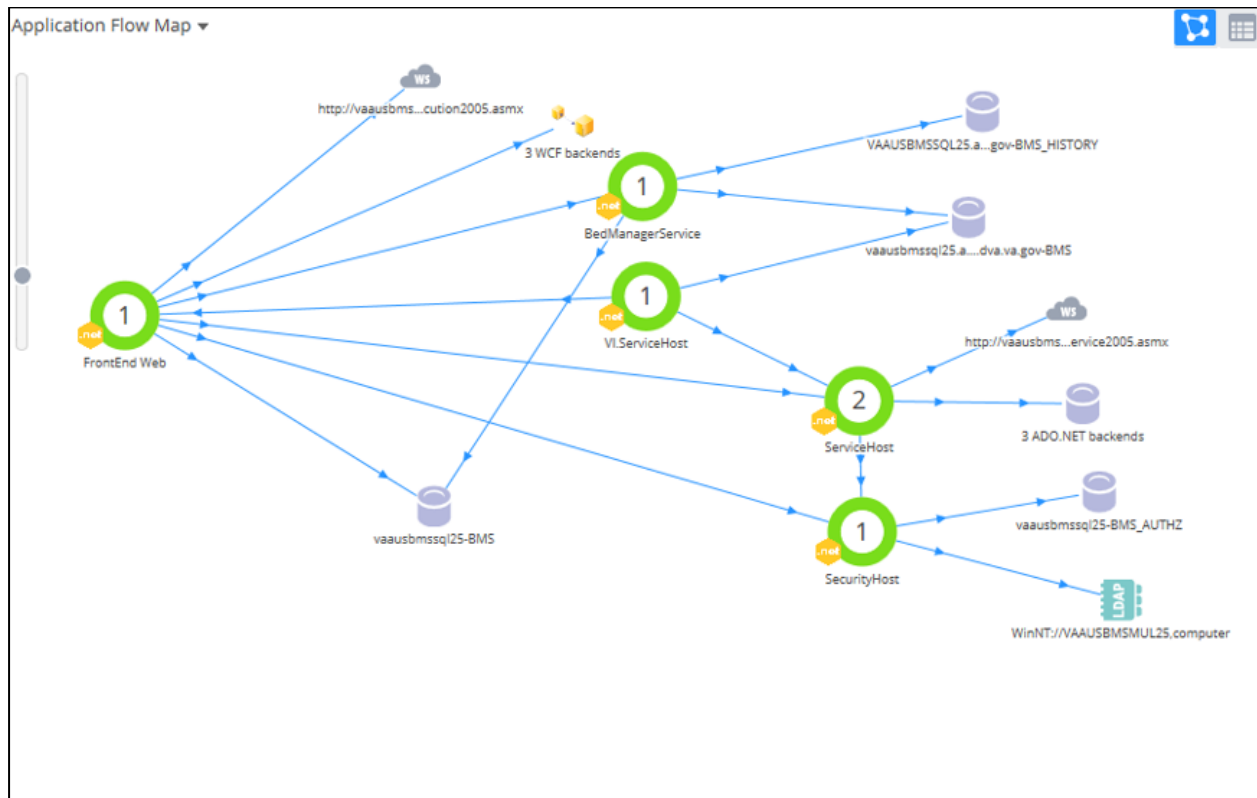
9.4 Data Flow Diagram

Figure 69- BMS Overview Data Flow Diagram



9.5 Application Flow Map from APPDYNAMICS

Figure 70- Application Flow map from APPDYNAMICS



10 Appendix B - Terms, Acronyms, and Abbreviations

Table 16-Terms, Acronyms, and Abbreviations

Terms, Acronyms, Abbreviations	Definitions
ASP	Active Server Pages
BMS	Bed Management Solution
CRUD	Create, Read, Update, Delete
EIS	Entity Identification Service
EMS	Environmental Management Service
ETL	Extract Transform Load
EVS	Enterprise Vocabulary Service
IE	Microsoft Edge
IIS	Internet Information Services
IRM	Information Resources Management
MDO	Medical Domain Objects
MDWS	Medical Domain Web Services
MVC	Model-View-Controller
NUMI	National Utilization Management Integration
ODBC	Open Database Connectivity
PAP	Policy Administration Point
PPBPL	Patients Pending Bed Placement List . A list of patients in need of beds at VA facilities
PPMS	Provider Profile Management System
PDP	Policy Decision Point
RS	Reporting Services
SOA	Service Oriented Architecture
SQL	Structured Query Language
STS	Secure Token Service
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
VA	Department of Veterans Affairs
VAMC	VA Medical Center
VDIF	Veterans Data Integration and Federation
VIA	Vista Integration Adapter
VISN	Veterans Integrated Service Network
VistA	Veterans Health Information Systems and Technology Architecture
WCF	Windows Communication Foundation
XAML	Extensible Application Markup Language
XML	eXtensible Markup Language
WMI	Windows Management Instrumentation