Ellucian Solution Manager

User Guide

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Notices

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Contents

About Solution Manager

Solution Manager is a software system that provides the ability to download, install, configure, and manage Ellucian products.

Solution Manager provides the ability to perform the following tasks.

- Install upgrades and *deployments* to existing Banner *environments*.
- Provision a brand new Banner environment.
- Provision a new *application* into an existing Banner environment.
- Self-update (upgrade the application and manage the Solution Manager database).

Solution Manager is installed on a server (referred to as the Admin Server) connected to an institution's managed Banner environments.

Solution Manager refers to the product. The web user interface is referred to as Solution Manager or the *Solution Manager Admin Console*.

Note: Review the *Ellucian Solution Manager Installation and Configuration Guide* before continuing. Use the *Ellucian Solution Manager User Guide* and online help after Solution Manager has been installed.

Navigate the Admin Console

Review a summary of how to navigate the Solution Manager Admin Console.

Before you begin

Use either Google Chrome® or Mozilla Firefox® to access Solution Manager.

Note: Microsoft Internet Explorer® is not supported.

Access the Solution Manager application though a browser using the following URL: `http://your-admin-server-hostname:8081/admin/adminMain`.

Note: Use the available Worksheets contained in the *Ellucian Solution Manager Installation and Configuration Guide* to record configuration information needed to complete forms in Solution Manager.

Environments and system settings will not be populated after first signing into the Admin Console.

To access all Solution Manager documentation, go to the **Ellucian Client Support** > **Ellucian Hub** > **Ellucian Support Center**. Select **Ellucian Solution Manager** from the Documentation Libraries drop-down list.

Procedure

1. Click on the main navigation tabs to access the associated Solution Manager functionality.

2. Click the **Help** icon at the top of the Admin Console for information to assist in completing the forms.

   The initial landing page for the Solution Manager application is the Environments page, which you can access by clicking on the Environments navigation tab. When you first install Solution Manager, the Environments page does not have any defined environments, so the page is blank except for two buttons at the bottom of the page.

   - Click **Add** to add a new environment.
   - Click **Get new releases** to download updates.

   When you add environments to Solution Manager, the Environments page displays a table listing all of the environments.

3. Click in a row of the environment table to view and edit detailed information related to that environment.

   The **Environment** page displays a set of navigation tabs.

   Each of the tabs relates to the selected environment. Select one of the navigation tabs to display information about the environment. Use the **Env Settings** and **Credentials** tabs to view and edit general configuration information about the environment.

4. Click on either the **Applications**, ***App Servers***, or ***Machines*** tab to enter or edit information about objects in the environment.
5. Click in any row of the displayed table to view and edit information about that item.
6. Click **Add** to add an item for the selected environment.
7. Update settings for the environment, then click **Save**.
8. To return to the main navigation tabs, click on the **Home** icon at the top of the navigation panel.
9. To end the session, click **Sign Out** in the upper right corner of the Admin Console before closing the browser.

Enter system settings

You must define the Solution Manager system settings when you first use the product.

About this task

You must have credentials to connect to the Solution Manager automated release download services. You must have an authorized login and password to access the Ellucian Hub Download Center.

Institutions that are members of a consortium that uses support for a custom release repository introduced in Solution Manager version 1.9 must provide the URL and credentials required to access the repository.

Note: Only users with the Admin role may view and edit the information on this page for more information).

If you receive a `Download Center Login credentials are invalid` error message, the Download Center Login credentials are not valid when attempting to save changes on the System

Settings page, the Solution Manager Admin Console may be unable to connect to the Ellucian Release Services server. See the "Prerequisite Validation Scripts" section of the *Ellucian Solution Manager Prerequisites* document for more information. Go to **Ellucian Client Support** > **Ellucian Hub** > **Ellucian Support Center**. Select **Ellucian Solution Manager** from the Documentation Libraries drop-down list.

If you receive an error message that reads `The consortium site connection failed, please check the settings entered to ensure they match your consortium site configuration.` when you attempt to save the System Settings page, please verify that you have specified the correct URL and credentials for the consortium custom release repository.

Procedure

1. Complete **System Settings** fields after logging in.

Table 1: System settings fields

Property	Description	Sample Data
General Section	Solution Manager uses the Download Center Login and associated password to authenticate web service requests that Solution Manager sends to Ellucian Release Services. The web service requests check for and download environment provisioning templates, scripts and associated content files, and available Banner upgrade releases and associated documentation and installation metadata.	
Download Root URL	Read-only field that displays the Ellucian Release Services URL from which software is being downloaded.	`https://esmsvc.ellucian.com:8443`
Institution Name	Enter the institution name. This only displays the institution name on other Solution Manager pages.	`Ellucian University`
Download Center Login	Enter your login to the Ellucian Hub Download Center. The login and password are used to authenticate web service requests that Solution Manager sends to Ellucian Release Services. You must have an authorized login for code download in the Ellucian Hub Download Center. Ellucian validates the credentials when you attempt to save the page through the connection to the Ellucian Release Services at the URL that you specify in the Download Root URL field.	`ddpom`
Password	Enter the password to the Ellucian Hub Download Center.	`*****`
Consortium section	The fields in this section are only for use by institutions that are members of a consortium that is using the consortium custom release repository feature available in Solution Manager version 1.9 and later. Solution Manager uses the information in these fields to connect to the consortium custom release repository to pick up consortium custom releases when	

Property	Description	Sample Data
	you download new releases. Solution Manager users who are not members of a consortium that is using the consortium custom release repository feature should leave the fields in this section blank.	
Root URL	Enter the URL of the consortium repository provided to you by your consortium.	`https://esmrepo.consortiumsite.edu/member`
Username	Enter the consortium custom release repository username provided to you by your consortium.	`consortiumuser1`
Password	Enter the password associated with the username that you entered in the previous Username field.	`password1`
Diagnostic Info Section		
Send on Downloads	Select or clear the check box under Diagnostic Info to indicate whether or not to upload diagnostic configuration information from Solution Manager to Ellucian when checking for available releases.	

2. Click **Send Now** to send environment information to Ellucian.
3. Click **View Info** to view the sent environment information.
4. Select **Save** to validate your Download Center login credentials and save the data entered on the page. You cannot save the page without valid Download Center login credentials.
5. Select **Environments**, to display the institution name at the top of the **Environments** page.

Related Links

Wget on page 36

Manage users

Define and manage users who can access Solution Manager.

Procedure

1. In the Admin Console, click **Users**.
2. Click **Add** to add a new user. Otherwise, click in the row of an existing user to update the user information.
3. Enter or update the user information.

Table 2: User fields

Property	Description	Sample Data
Username	Enter a name for the new user you define in Solution Manager. The Username displays for an existing user.	`admin`
Current Password	For existing users, enter the current password to change the password using the New Password and Confirm New Password fields. (You do not need to enter anything here if you are not changing the password.)	`*****`
New Password	Enter a password for the new user, or a new password for an existing user to change the existing user's password.	`*****`
Confirm New Password	Confirm the password for the user.	`*****`
User Role	Select a check box to specify a role for the user: Admin, User, or Scripts. • "Admin" role is required to add or update environments and environment configuration information and to run upgrade installations and deployments. • "User" role allows a user to view information about environments but does not allow them to add or change environment information or run upgrade installations or deployments. • "Script" role does not provide access to the Admin Console. It is for users set up to support automated script execution on machines in the environment. **Note:** See Admin Console home page access by user role on page 11 for more information about differences in access between the "Admin" and "User" roles.	`Admin`

4. Select **Add** or **Update**.

Related Links

Machine management on page 21

Admin Console home page access by user role

There are differences in access for users with the “Admin” and “User” roles on the Solution Manager home (Environments) page.

Tab	Accessibility
Environments	The **Remove** and **Provision** columns in the Environments table are visible only to Admin users. The **Get New Releases** and **Add** buttons are visible only to Admin users.
Templates	The **Templates** tab is visible only to Admin users.
Users	The Admin role is required to add and delete users and edit user information. Users with the User role can view their user information and change their passwords.
System Settings	The **System Settings** tab is visible only to Admin users.
System Updates	The **System Updates** tab is visible only to Admin users.

Environment page access by user role

There are differences in access for users with the “Admin” and “User” roles on the Solution Manager Environment page.

Tab	Accessibility
Products	Users with the User role are able to view all installed and available releases, view documentation for releases, select one or more target releases from the available releases and see what prerequisite releases must also be installed to install the target release, and view upgrade-specific messages for a group of selected target releases and their prerequisites. Users with the User role are unable to start an upgrade job.
Upgrades	Users with the User role are able to see the list of upgrades and view upgrade and monitor details, but are unable to change the status of upgrades.
Deployments	Users with the User role are able to view the list of deployments and view information about individual deployments and deployment monitors. Users are unable to edit deployment properties or change the status of a deployment.

Tab	Accessibility
	Only Admin users are able to access the App Server selection table on the **Deployments** page, start deployments, and change the status of deployments.
Links	Only Admin users are able to access the **Links** tab.
Env Settings	Only Admin users are able to view and edit the **Env Settings** tab.
Applications	Users with the User role are able to view the list of Applications. Only Admin users are able to add or delete an Application or view and edit detailed information about each Application.
App Servers	Users with the User role are able to view the list of App Servers. Only Admin users are able to add or delete an App Server or view and edit detailed information about each App Server.
Machines	Users with the User role are able to view the list of Machines. Only admin users are able to add or delete Machines or view and edit detailed information about each Machine.
Credentials	Only Admin users can view and edit the **Credentials** tab.

Banner environment management with Solution Manager

To use the Solution Manager Admin Console to update your Banner environments, you must enter into the Admin Console the configuration and credentials information about each environment and the servers in the environment that Solution Manager needs to update when installing Banner upgrades and patches and deploying Banner web applications

Use the available worksheets to record configuration information needed to complete forms in Solution Manager. Access the developer worksheets found in the *Ellucian Solution Manager Installation and Configuration Guide*.

Tip: Most of the examples shown use Linux/Unix notation for directory/folder paths. Be sure to use Windows notation to enter directory/folder path information when the target machine is Windows instead of Linux/Unix.

Note: Windows users must configure a Windows environment setup batch script with the name `WinEnvSetup.bat` on the Jobsub machine. Do not change the name of the script.

1. Complete the fields in the template script provided.

   For the template batch script, see Sample Windows environment setup batch script on page 78.
2. Create an Upgrades folder under $BANNER_HOME if one does not exist already.
3. Place the batch script in the Upgrades folder in the Banner home directory. This script runs automatically by Solution Manager during an upgrade, when needed.

Define an existing Banner environment in Solution Manager

You must define characteristics of the Banner environment to Solution Manager, including the global environment settings, environment credentials, login sequence, machines, and applications hosted on those machines, to prepare for using Solution Manager to install upgrades and deploy applications into the environment.

Note: The environment you are defining to Solution Manager must be a fully functioning Banner environment for Solution Manager to successfully install upgrades and patches into the environment. The *Jobsub server* must have an upgrade installation user profile already set up in the environment to successfully install Banner upgrades and patches manually. The Solution Manager upgrade/patch installation process relies on the specified installation user to have appropriate file access permissions to the Banner code tree to support installation of Banner upgrades and patches, and to have an appropriate environment set up to support the execution of Oracle SQLPLUS scripts that update the Banner database during the upgrade/patch installation process. For additional requirements, see the *Ellucian Solution Manager Prerequisites* and the *Ellucian Solution Manager Installation and Configuration Guide*, available from the Ellucian customer support center.

Note: Only users with the Admin role may add and delete environments and edit environment configuration information. Users with the User role may view environment information (see Manage users for more information).

Network communication between machines

Network access requirements to consider for Solution Manager for running upgrades and deployments.

On the Admin Server, open the following ports for the Jobsub machine and any application servers to which Solution Manager deploys applications in each Banner environment you have configured to be updated by Solution Manager:

Sample Port	Description	Protocol	Reason
8444	The port you configure for accessing Jenkins	tcp	Jenkins master/agent communication
8443	The port you configure for accessing the Solution Manager Admin application	tcp	Access to Solution Manager services for processes in automated upgrade and deployment jobs
8445[1]	The port you configure for JNLP for Jenkins agents	tcp	Jenkins master/agent communication

Add an existing environment to Solution Manager

Connect Solution Manager to an existing Banner environment.

About this task

You must add an environment definition to Solution Manager to enable Solution Manager to view installed products, access release documentation, and enable automated upgrade and deployment features for the environment.

Note: Only users with the Admin role may add and delete environments and edit environment configuration information. Users with the User role may view environment information (see Manage users for more information).

Procedure

1. Select **Environments**, then click **Add**.
2. Enter an environment name and description.

[1] See “Secure Jenkins” in the *Ellucian Solution Manager Installation and Configuration Guide*.

Table 3: Environment configuration settings

Field	Description	Sample Data
Environment Name	Specify a name for the existing environment in Solution Manager.	`TEST`
Description	Enter an environment description in Solution Manager.	`Test environment`

3. Select **Add New Environment Definition for an Existing Banner Environment** to define an existing environment to Solution Manager.

   If you want the new environment definition to be a copy of an existing environment definition, select the desired environment from the **Existing Environment Definition to Copy** list. This feature can be useful if you have multiple environments with similar configurations, or if you have created a new environment by cloning an environment that was already defined in Solution Manager and you want to use Solution Manager to apply upgrades and deployments to the new environment.

   Note: If you copy an existing environment definition, you need to edit the configuration pages for the new environment definition to adjust the configuration details that are different for the new environment from the environment definition that you copied. Configuration items that must be changed in the new environment definition include, but are not limited to, the database SID and service name, IP addresses and host names of the machines in the environment, and names of the Jenkins communication agents that Solution Manager uses to orchestrate upgrade installation and deployments.

4. Click **Add**.
5. Click on the new environment in the table on the **Environments** page to access the **Environment** page for that environment.
6. Use the tabs on the **Environment** page to define or modify the configuration information for the environment to enable Solution Manager to install upgrades in the environment, as described in the following sections:

   - Define existing environment details on page 16
   - Enter environment credentials on page 32
   - Machine management on page 21
   - Application management on page 26
   - Automatically install Banner upgrades on page 38

   To use Solution Manager to deploy web applications to the environment, see Deployment jobs on page 64.

Define existing environment details

Add or mofify details of the existing Banner environment to Solution Manager to enable the use of Solution Manager to view installed releases, install Banner upgrade and patch releases, and deploy web applications in the environment.

About this task

Note: Only users with the Admin role may add and delete environments and edit environment configuration information. Users with the User role may view environment information (see Manage users for more information).

Procedure

1. On the main **Environments** page, click anywhere in the row of the newly created environment in the Environments table (excluding icons).
2. Click on the **Env Settings** tab to display the **Environment Configuration Information** page.
3. Complete the fields to define an existing environment to Solution Manager.

Table 4: Existing environment detail fields

Property	Description	Sample Data
Description	Displays the information that you entered when adding the environment to the Solution Manager configuration database. Change the description if necessary.	`Test environment`
Environment Type	Displays the environment type.	`Existing`
DB SID	Enter the Oracle database SID for the environment. If no DB Service Name is specified, Solution Manager uses this to connect to the environment database to query for the installed Oracle version and for installed versions of Banner products. Solution Manageralso uses this data to set the TWO_TASK variable for SQLPLUS connections to the environment from the Jobsub machine when installing Banner upgrades.	`SMPL`
DB Service Name	Enter the Service Name that Solution Manager should use to connect to the environment database to query for the installed version of Oracle and for the installed versions of Banner products. This field is optional. If you do not specify the Service Name, Solution Manager uses the DB SID to connect to the database.	`Banner_Test_DB`
DB Version	Displays the database version.	`11.2.0.2.0`
Database Port	Displays `1521`, the default Oracle communications port. The default value is 1521.	`1521`

Property	Description	Sample Data
	Note: If the Oracle database for the environment does not use port 1521 for Oracle database communications, enter the appropriate port number.	
Database MEP'd	Displays `Yes` if Multi-Entity Processing (MEP) is enabled in the environment, otherwise `No`. This property is set by querying the environment to see if there are any tables with a VPDI code column that cannot be made null. The value is reset each time Solution Manager queries the environment to determine the installed products and versions of those products.	`No`
Is Production	Select the check box if this is your production environment. Otherwise, clear the check box.	*Not selected*
Upgrade Agent Name	Enter the upgrade agent name that you defined during installation and configuration.	`TEST_BMUI_AGENT`
Agent Status	Displays the online status of the agent.	*Idle*
Banner XE Shared Config Dir	This value should contain the text shared_configuration. There is no need to change the default.	`shared_configuration`
Banner Wait For (secs)	Enter the number of seconds that BMUI, the Solution Manager component that installs Banner upgrades and patches (see Automatically install Banner upgrades on page 38 for more information), should wait for an expected response from an upgrade installation step before timing out and aborting the upgrade job. Be sure to allow enough time for long-running steps in the upgrade. Default value is 3600 (6 minutes).	`3600`
Banner Wait For Forms (secs)	Enter the number of seconds that BMUI should wait for Banner forms compilation to complete during upgrade installation. Be sure to allow enough time for long-running forms compilation for some upgrades. Default value is 7200 (12 minutes).	`7200`
Wait For Display	Select this option to cause BMUI to log the contents of the wait buffer when it times out due to not receiving an expected response during upgrade installation and forms compilation. This option is not selected by default. If an upgrade is timing out unexpectedly it may be useful to select this option and try the upgrade again to get additional information in the BMUI log to diagnose the cause of the problem.	*Cleared*

Property	Description	Sample Data
Upgrade Debug Level	Select a logging level for BMUI. The recommended logging level is Debug. Select Trace for more detailed logging.	`Debug`
Admin Server - Private Network		
Hostname	Enter or edit the hostname of the Solution Manager Admin Server. The default value for the property is the hostname portion of the URL used to access the Solution Manager Admin application. Solution Manager uses the hostname to generate the URL to connect back to the Solution Manager Admin Server for processes such as wget or BMUI that are part of the automated upgrade and deployment jobs orchestrated by Solution Manager in your Banner environment. If Solution Manager is set up for secure (HTTPS) connections, the hostname must match the hostname on the digital certificate that you configured for the Tomcat instance hosting the Solution Manager application.	`myesmserver.institution.com`
Port	Enter or edit the port number on which the Solution Manager application is running. The default value for the property is the port number from the URL used to access the Solution Manager Admin application.	`8443`
Use secure protocol?	Check the box to indicate that connections to the Solution Manager Admin application should use secure (HTTPS) protocol. If the box is not checked, Solution Manager will use HTTP protocol for the URLs generated to connect back to the Solution Manager Admin Server for processes such as wget or BMUI that are part of the automated upgrade and deployment jobs orchestrated by Solution Manager in your Banner environment.	`Checked`
Network IP	For all functions: Enter the IP address of the Admin Server on the network that connects the Admin Server to the existing Banner environment.	`192.168.100.101`
Subnet	For use when adding a new environment for provisioning: Enter the IP subnet for the network that connects the Admin Server to the machine in the existing Banner environment containing the *Banner code tree* (configured in Solution Manager as the Jobsub Machine for the environment).	
Gateway IP	For use when adding a new environment for provisioning: Enter the domain name of the network that contains the appservers in the existing Banner environment.	
Environment Application		

Property	Description	Sample Data
Servers - Public Network		
Domain	Enter the domain to use to access the application servers in the Banner environment.	`ellucian.com`
Subnet	For use when adding a new environment for provisioning: Enter the IP subnet used to connect to the application servers in the Banner environment you are provisioning.	
Gateway IP	For use when adding a new environment for provisioning: Enter the gateway IP address of the network that contains the application servers in the Banner environment you are provisioning.	
Environment Status	Displays the environment status.	`Ready`
Environment Configuration		
Identity Services URL	For Banner 9 Administrative Pages deployments on page 72: Enter the URL of the user authentication service used with the Banner 9 Administrative Pages deployment, such as Ellucian Identity Services (EIS) or Central Authentication Service (CAS). For additional information see the *Installation Guide* for the Banner Admin Common release that you intend to deploy.	`https://testapp1.ellucian.com:8443/cas`
Application Navigator URL	For Banner 9 Administrative Pages deployments on page 72: Enter the base URL for accessing the Application Navigator instance used to access the Banner 9 Administrative Pages deployment. For additional information see the *Installation Guide* for the Banner Admin Common release that you intend to deploy.	`https://testapp1.ellucian.com:8888`
Reports Server URL	For Banner 9 Administrative Pages deployments: Enter the URL for the reports server. For additional information, see the “Jasper Server Installation and Configuration for Banner Reports” section of the *Installation Guide* for the Banner Admin Common release that you intend to deploy.	`https://testapp2.ellucian.com:8080/jasperserver-pro`
Theme Server URL	For Banner 9 Administrative Pages deployments on page 72: Enter the URL of the custom theme server that Banner 9 Administrative Pages should use in the environment. For additional information see the *Installation Guide* for the Banner Admin Common release that you intend to deploy.	`http://themeserver.greatvalleyu.edu:8080/BannerExtensibility/theme/`

Property	Description	Sample Data
	Note: Admin Common 9.3.9 and later versions support the automated configuration of the theme server by Solution Manager.	`getTheme?name=greatvalleyu&template`
ID Image Files URL	For Banner 9 Administrative Pages deployments on page 72: Enter the URL of the ID images server that Banner 9 Administrative Pages should use in the environment. For additional information see the *Installation Guide* for the Banner Admin Common release that you intend to deploy. **Note:** Admin Common 9.3.13 and later versions support the automated configuration of the ID images server by Solution Manager.	`http://imgserver.greatvalleyu.com:8180/resources/id_images/`
ID Image Files Name Format	For Banner 9 Administrative Pages deployments on page 72: Select the ID image files name format value from the drop-down list. For additional information see the *Installation Guide* Guide for the Banner Common release that you intend to deploy. **Note:** Admin Common 9.3.13 and later versions support the automated configuration of the ID images server by Solution Manager.	1,9
ID Image Files Extension	For Banner 9 Administrative Pages deployments on page 72:Select the ID image files filename extension value from the drop-down list. For additional information see the *Installation Guide* for the Banner Admin Common release that you intend to deploy. **Note:** Admin Common 9.3.13 and later versions support the automated configuration of the ID images server by Solution Manager.	JPG

4. Click **Save**.

   When you save changes to the Env Settings page, Solution Manager attempts to connect to the environment database to query for the installed Oracle version, using the IP address specified for the DB-type Machine in the environment configuration, the Database Port specified on this page, and either the DB Service Name, if specified, or the DB SID. Any connection failure generates a warning message, but the data on the page saves anyway.

Machine management

For each physical or virtual machine that resides in the Banner environment, create a definition for the machine in Solution Manager. Enter either private or public network information for a machine.

Note: Only users with the Admin role may add, delete, and edit configuration information for machines.

To define public and private properties for all *logical* servers, define a Machine and assign it to appropriate Applications and App Servers. A Machine may be a virtual or physical machine with its own IP address and host name.

Note: The configuration pages for the database and Jobsub Machines only prompt for network configuration information for the private admin network because Solution Manager does not require the IP addresses of those machines, if any, on the external institution network.

Related Links

Manage users on page 9

Add a Machine

Add and configure the properties of an environment machine.

Before you begin

If you are entering configuration information for an existing Banner environment where the Banner code tree is the same machine as the database, Solution Manager requires that you define the machine as two separate machines with unique hostnames. You may need to set up an alias hostname for the machine for that purpose. Configure the DB machine role to reference the machine using one hostname, and the Jobsub machine role to reference the machine using the other hostname.

Procedure

1. Select **Machines**, then click **Add** to add a new machine
2. Enter an Admin Host name and select the machine role.

   Note: It is possible to change the properties associated with a machine later, but the same cannot be done for Admin Host Name or Role. If you add a machine with an incorrect Admin Host Name or Role, you must remove the machine by selecting the machine and clicking on **Remove Machine**, then re-adding the machine with the correct Admin Host Name and Role.

Table 5: Add machine fields

Property	Description	Sample Data
Admin (Private) Host Name	Enter the host name of the machine.	test-jobsub

Property	Description	Sample Data
	Although the label of the host name for the machine is Admin (Private) Host Name, existing environments do not require a private network connecting Solution Manager and the environment. **Note:** Although the label of the host name for the machine is Admin (Private) Host Name, existing environments do not require a private network connecting Solution Manager and the environment. When adding any machine for an existing environment you should enter the hostname and IP address that Solution Manager needs to use to connect to the machine as the Admin (Private) Host Name and IP address.	
Role	Select a machine role such as DB, App or Jobsub. • DB: the database machine • Jobsub: the machine with the Banner code tree (typically also runs Banner Job Submission) • App: any application server machine	Jobsub

3. Click **Add** to return to the **Machines** page.
4. Click on the new Machine in the table on the **Machines** page to enter configuration information for the new Machine. See Configure Machine properties on page 22 for details.

Configure Machine properties

Enter or edit the configuration information for a Machine.

Before you begin

If you are entering configuration information for an existing Banner environment where the Banner code tree is on the same machine as the database, Solution Manager requires that machine to be defined as two separate machines with unique hostnames. You may need to set up an alias hostname for the machine for that purpose. Configure the DB machine role to reference the machine using one hostname, and the Jobsub machine role to reference the machine using the other hostname

Procedure

1. Click in a row from the **Machines** tab to configure an existing machine.

2. Provide configuration information for the machine.

Table 6: Configure machine fields

Property	Description	Sample Data
Machine Role	Displays the role of the machine.	
Jobsub Network Type	This field is not used for existing environments.	
Machine Status	Set the machine status: • Ready: Use this status for any machine in the existing environment which already hasBanner software installed and operating. • Unprovisioned or OSInstalled: Specify only if you are adding a machine for the purpose of provisioning a new application.	Ready
Machine OS	Select an operating system from the drop-down list. Use Unix if the machine is running Linux or any Unix variant.	Unix
Admin (Private) Network Host Name	The machine host name.	test-jobsub
IP	The IP address for the machine on the network that the Admin Server uses to communicate with the machine unless you are configuring a machine for provisioning a new application into the existing environment. In that case, if you want to provision the application onto a machine which already has the operating system installed, you should set the Machine Status to OSInstalled and enter the root password here. Solution Manager uses the root password you specify to log onto the machine through SSH to configure the machine and install a Jenkins agent for provisioning the new application onto the machine..	149.24.19.36
Root Password	This field is not used for existing environments unless you are configuring a machine for provisioning a new application into the existing environment. If you want to provision the application onto a machine which already has the operating system installed, set the Machine Status to OSInstalled and enter the root password here. Solution Manager uses the root password that you specify to log onto the machine through SSH to configure the machine	

Property	Description	Sample Data
	and install a Jenkins agent for provisioning the new application onto the machine.	
Deployment Agent Name	Enter the name of the deployment agent you defined in Jenkins for the machine, if applicable. See Deployment agents on page 64.	TEST_DEPLOY_AGENT
Agent Status	Displays the deployment agent status if known.	Online: Idle
Bash Shell Path	Specify the path to the Bash shell on the machine, if different from the value /bin/sh.	`/bin/sh`
Link Command	The link command used in upgrade migration scripts. Defaults to `/bin/ln -f`. This field appears only on Machines with the Jobsub Machine Role. Solution Manager uses this command to link files into the `$BANNER_HOME/links` directory when upgrade migration scripts execute during automated upgrade installation on Linux/Unix Jobsub servers. This field is only editable when the Machine OS is "Unix" and the Machine Status is "Ready"..	`/bin/ln -f`
Banner Code Tree Path	Enter the Banner code tree path on the Jobsub Machine (also referred to as the Banner home directory) for the environment. This field appears only on Machines with the Jobsub Machine Role.	`/u01/app/sghe/banner/SMPL`
Banner Links	The path on the Banner code tree server (the Jobsub Machine for the environment) to the "links" directory in the Banner code tree. This field appears only on Machines with the Jobsub Machine Role. The Solution Manager automated upgrade installation process uses this directory to access form and report source files to transfer them to the forms compiler machine to perform the forms and report compilations when the upgrade process installs upgrades requiring forms compilation and deployment on Linux/Unix Jobsub servers. This field is only editable when the Machine OS is "Unix" and the Machine Status is "Ready".	`/u01/app/sghe/banner/SMPL/links`

Property	Description	Sample Data
Public Network (for machine type App only)		
Host Name	Specify the host name for the machine on the public network used by users to access the application server machine. If the public network is the same as the admin network used by Solution Manager to communicate with the machine, enter the same host name you entered for Admin (Private) Network Host Name. **Note:** This hostname should not include the domain name you specified for the Public Network on the Env Settings configuration page. For example, if the fully qualified hostname of the machine is appserver1.myinstitution.edu, and you entered myinstitution.edu as the Public Network Domain on the Env Settings configuration page, enter only `appserver1` here. When Solution Manager uses the Public Network Host Name to configure software that needs to access the machine through the public network it combines the Host Name you specify here and the Domain you specified on the Env Settings configuration page.	appserver1
IP	Enter the IP address of the machine on the public network. If the public network is the same as the admin network, enter the same IP address you entered for the Admin (Private) Network IP field.	149.26.17.101

3. Provide configuration properties for Deployment Staging Paths.

   You can leave these properties blank when you first define the Machine and fill them in later when you set up your environment for processing automated upgrade installation and deployment jobs. See Set up staging directories and Deployment jobs for additional information.

Table 7: Web Application Deployment Properties

Property	Description	Linux Sample Data	Windows Sample Data
Local deployment root (Windows only)	(Optional) Specify a local path for Solution		`D:\esmDeployRoot`

Property	Description	Linux Sample Data	Windows Sample Data
	Manager to copy large files		
Banner 8 Online Help Staging Path	Enter the path to the staging area for Banner 8 online help from the associated Machine definition	`/u50/test/tmp/deployments/ban8help`	`\\IP-ADDRESS\PATH\ban8help`
Banner 9 Online Help Staging Path	Enter the path to the staging area for Banner 9 online help from the associated Machine definition	`/u50/test/tmp/deployments/ban9help`	`\\IP-ADDRESS\PATH\ban9help`
Banner 9 War File Staging Path	Enter the path to the staging area for Banner 9 WAR files from the associated Machine definition	`/u50/test/tmp/deployments/ban9war`	`\\IP-ADDRESS\PATH\ban9war`
Banner SSB Cascade EAR File Staging Path	Enter the path to the folder on the SSB application server where BMUI places EAR files needing SSB deployment.	`/banapp/ssb/java`	`D:\banapps\ssb\java`

4. Enter the required configuration information for the machine, then click **Save** and return to the **Machines** page.
5. **Optional:** Remove the machine configuration information from Solution Manager by clicking **Remove Machine**.
6. Select the **Home** icon to return to the **Environments** page.

Application management

Application management allows you to create and edit Application configuration information.

An Application defines the configuration information for a software application in the environment.

Note: Only users with the Admin role may add, delete, and edit configuration information for Applications (see Manage users for additional information).

When provisioning a new environment, unless you are specifically directed by the documentation associated with the provisioning template you selected for the environment to be provisioned, it is not necessary to enter any additional Application configuration information for the environment, as that information is normally supplied by the provisioning template.

Add a new Application

Add a new Application to an environment.

About this task

To view installed Banner products and available releases in an environment, it is necessary to configure the DB (database) Application for an environment.

To use Solution Manager to install Banner upgrades and patches into an environment, you must configure a Jobsub Application for the environment.

For Solution Manager to automatically compile and deploy Banner INB forms delivered in Banner 8.x upgrades and patches, you must configure at least one INB Application. Solution Manager does not require an INB Application if you are only using Banner 9.x administrative pages.

For Solution Manager to deploy SSB components delivered in Banner 8.x self service upgrades and patches, you must configure an SSB Application. Solution Manager does not require an SSB Application to deploy only Banner 9.x self service applications.

To use Solution Manager for automated deployments of Banner 8.x online help and Banner 9 self service and administrative pages applications, you may need to define additional Applications. See Deployment jobs for more information.

Procedure

1. Select **Environments**. Click on an environment and select **Applications**.
2. Click **Add** to add an Application.
3. Complete the new Application fields as follows:

Table 8: Add new application fields

Field	Description	Sample Data
Application Name	Specify a name for the Application.	database
Application type	Select an application type. For example, DB (database), Jobsub (Banner code tree/job submission), IDM (Identity Management), Workflow, ODS EDW, INB, SSB, BXE (any Banner 9 application), or Luminis.	DB

4. Click **Add**.
5. Click in the row of the Application to access the **Application Configuration Information** page and enter configuration information for that Application. See Edit Application configuration properties on page 28.

Edit Application configuration properties

Define properties for each Application. You must have a Machine defined in the system before you can configure Applications for that Machine.

Procedure

1. Click **Applications**.

   Note: When provisioning an environment, Applications associate to their respective host Machines automatically. After you define the Machine properties, the system automatically populates the corresponding Application properties. Depending on the template, additional properties may appear for each Application or Machine based on its type or role. If additional properties appear, populate them before continuing. See Upgrade-related configuration data for managed environments on page 44 for more information.

2. Click in a row of the **Applications** table to configure an existing Application.
3. Provide configuration information for the Application.

   Review application-specific configuration information: Verify upgrade-related Application configuration information on page 44.

   Note: Windows deployments require the use of an IP address.

   Each example below contains an example Linux path and an example Windows path.

   Table 9: Configure Application fields

Property	Description	Sample Data
Application Type	Displays the application type	Jobsub
Machine / App Server	Identifies the Machine or App Server that hosts this Application.	Machine m013036-jobsub-149.24.19.36

4. Click **Save**.
5. Click **Go to Machine** to view and edit the properties of the Machine that hosts the Application.
6. **Optional:** Remove the Application configuration information from Solution Manager by clicking **Remove Application**.
7. Click **Save** and return to the **Applications** page.
8. **Optional:** Review the INB Application field information.

   You only need to configure an INB Application if you use Solution Manager to compile and deploy INB forms.

Table 10: INB Application fields

Field	Description	Sample Data
INB Host Forms Path	The path on the INB machine to the directory where the form executables ".fmx" and associated file types are stored	`/u01/app/sghe/banapps/SMPL/inb/forms/fmx`
INB Host Reports Path	The path on the INB machine to the directory where the report executables ".rep" and associated file types are stored	`/u01/app/sghe/banapps/SMPL/inb/reports/rep`
INB Host User	The user login that the automated upgrade installation process should use when logging on to the INB machine to update the form or report executables	oracle
INB Host Pwd	The password for the login that the automated upgrade installation process should be use when logging on to the INB machine to update the form or report executables	*******

9. **Optional:** Review the INB compiler properties.

   Enter these fields only if the INB Application that you are configuring is desiganted as the one to compile INB forms during upgrade processing.

Table 11: INB compiler properties

Property	Description	Sample Data
Host SID Name	This is the Oracle SID used on the INB forms compiler machine to set up the proper environment for the forms and reports compilations. (For more information about how this field is used, see the description of the Compile Login Sequence below.)	`SMPL`
Host TNSADMIN Path	The path to the Oracle admin directory in the Oracle instance on the INB forms	`/u01/app/oracle/middleware/as_1/network/admin`

Property	Description	Sample Data
	compiler machine that is set up for forms and reports compilation.	
Host FMB Path	The path on the INB forms compiler machine to the directory where the ".fmb" files (and associated file types) are stored for forms compilation.	`/home/oracle/compiledir/formcompile`
Host RDF path	The path on the INB forms compiler machine to the directory where the ".rdf" files (and associated file types) are stored for reports compilation.	`/home/oracle/compiledir/reportcompile`
Compile Host Oracle Home Path	The path to Oracle home directory for the Oracle instance on the INB forms compiler server.	`/u01/app/oracle/middleware/as_1`
Compile Host User	The user login that the automated upgrade installation process should use to log on to the INB forms compiler server to do forms and reports compilation.	oracle
Compile Host Pwd	The password for the login that the upgrade installation process should use to log on to the INB forms compiler server to do forms and reports compilation.	*******
Compile Login Sequence	A series of instructions for the automated upgrade installation process to use when logging on to the INB forms compiler for forms and reports compilation. The login instructions must be set up to recognize any prompts that occur during the login and to provide appropriate responses to those prompts. The login sequence must also set the Oracle environment for	See INB Applications: explanation of the example Compile Login Sequence on page 31 for an example.

Property	Description	Sample Data
	doing the forms and reports compilation.	

10. **Optional:** Review the SSB Application field information.

    You only need to configure an SSB Application if Solution Manager handles deployments of delivered SSB components.

    Table 12: SSB Application Properties

Field	Description	Sample data
User ID	The login that BMUI should use to connect to the SSB application server for copying items to the web server's document root.	oracle
Password	The password that BMUI should be use to connect to the SSB application server for copying items to the web server's document root.	*******
WebServer Doc Root Path	The path to the folder on the SSB application server where the upgrade process places images, CSS and JS files.	`/banapp/ssb`

Related Links

Deployment jobs on page 64

INB Applications: explanation of the example Compile Login Sequence

The Compile Login Sequence is a series of instructions that must be set up for the automated upgrade installation process to use when logging on to the INB forms compiler for forms and reports compilation.

When you create a new existing environment definition Solution Manager provides an example Compile Login Sequence to illustrate the commands that you can use for the login sequence. You should edit the example Compile Login Sequence to match your environment. The table below describes the commands in the example login sequence.

Example Compile Login Sequence

```
Wait $
RC source/usr/local/bin/oraenv
Wait ORACLE_SID =[oracle] ?
RC {banner.form.compile.host.sid.name}
Wait $
```

```
RC export ORACLE_INSTANCE=$ORACLE_BASE/asinst_1
Wait $
```

Table 13: Example of compile login sequence commands

Command	Description
`Wait $`	The `Wait` command waits for a prompt ending in the character sequence following `Wait` before executing the next command. In this example it is waiting for the last character in the standard operating system prompt ("$" in this case).
`RC source /usr/local/bin/oraenv`	The `RC` command enters the remaining text (in this case `source /usr/local/bin/oraenv`) after receiving the prompt indicated on the previous `Wait` command. In the example login sequence, this line sources the Oracle environment setup script.
`Wait ORACLE SID = [oracle] ?`	This command waits for a prompt character string `ORACLE SID = [oracle] ?`. This is coded this way because in the example login sequence, the previous command executes the environment setup script which issues this prompt.
`RC {banner.form.compile.host .sid.name}`	This command enters the value that you supplied for the Host SID Name field in the INB Compiler Server Properties section of the INB Application that is identified as the INB forms and reports compiler. The string *{banner.form.compile.host.sid.name}* references a BMUI variable that contains the Host SID Name value. (BMUI is the Solution Manager component that is used to install upgrades in your Banner environments. For more information see Automatically install Banner upgrades on page 38.)
`RC export ORACLE_INSTANCE= $ORACLE_BASE/asinst_1`	This `RC` command issues a command to the operating system to export the specified value for the environment variable *ORACLE_INSTANCE*.

Enter environment credentials

Enable Solution Manager to connect to your Banner environment, by entering credentials information for the environment.

About this task

Note: Only users with the Admin role may add, delete, and edit credentials information for the environment (see Manage users for additional information).

Procedure

1. From the Solution Manager home page, click **Environments**.
2. Click anywhere in the row for the environment in the Environments table to edit that environment.
3. Click on the **Credentials** tab.
4. Enter or edit the information in the fields on the **Credentials** page. See Verify upgrade-related credentials for more information.

Password text files

You may upload a text file containing some or all of the passwords on the Credentials page as an alternative to entering Oracle account passwords on the Credentials page that Solution Manager uses to automate the installation of Banner upgrades and patches.

When you upload the text file, Solution Manager immediately stores the specified password value for the specified Oracle account for any valid password definition lines in the file, even if you don't subsequently click **Save** on the Credentials page.

The input file must be a text file with the same syntax as a sqlplus `login.sql` file. Specifically, Solution Manager interprets the file as described in the following example.

Lines in the text file that define Oracle account passwords must be in the following format:

*ows*define *wsusername_passwordows=ows'password'ows*

where

- *ows* is optional white space, meaning zero or more spaces or tabs.
- *ws* is whitespace, meaning one or more spaces or tabs.
- *username* is the Oracle account name that the password is for. *username* must be one of the user name entries in the table below.
- *password* is the password value for the user.

Capitalization is ignored for the text in the line, except in the password value.

Warning! The password value is case sensitive and must be enclosed in single or double quotes.

The following examples are valid password definition lines for Oracle accounts for which Solution Manager stores passwords:

`define sys_password = 'something'` (*username = SYS, password value = 'something'*)

`DeFiNe SySTEM_paSSwoRD="soM3th1ng"` (*username = SYSTEM, password value = 'soM3th1ng'*)

The following exmples are not valid password definition lines:

`definesys_password = 'something'` (*username = SYS, password value = 'something', no space between ‘define’ and ‘password’)*)

`xxx define sys_password = 'something'` (*something other than whitespace before the word "define"*)

The following list contains all of the valid values for *username*:

Note: These are the schema owners listed in the `login.sql` file, plus SYS, SYSTEM, UPGRADE_OWNER, and INSTALL_USER. Although the list of schema owners are all uppercase, they may contain any mix of upper and lower case in the password definition lines in the input file.

SYS
SYSTEM
UPGRADE_OWNER (corresponds to the Upgrade Owner User specified on the Credentials page)
INSTALL_USER (corresponds to the Install User specified on the Credentials page)
ALUMNI
BANIMGR
BANINST1
BANSECR
BANSSO
BPISMGR
BWAMGR
BWFMGR
BWGMGR
BWLMGR
BWPMGR
BWRMGR
BWSMGR
DCRSMGR
FAISMGR
FIMSARC
FIMSMGR
GENERAL
ICMGR
INFMGR
LIMSARC
LIMSMGR
NLSUSER
OWA
PAYROLL
POSNCTL
SATURN
STREAMSADMIN
TAISMGR
UIMSMGR
VRSMGR
WTAILOR
XRISMGR

Upload a passwords text file

Upload the text file that contains the Oracle passwords to Solution Manager.

Procedure

1. Click **Upload Passwords File** on the **Credentials** page.
2. Click **Continue** on the pop-up dialog to continue to the file upload page, or click **Cancel** to return to the **Credentials** page.
3. On the **Upload Oracle Passwords File** page, click **Choose File** to select a file containing the Oracle passwords to upload to Solution Manager, then click **Upload** to upload the file.

   You may abort the file upload process and return to the **Credentials** page by clicking **OK** before selecting a file to upload or before clicking **Upload**.

   Solution Manager reads the selected file and a log of the upload process appears. For each line read from the input file, Solution Manager displays one of the following messages:

   - If Solution Manager does not recognize the line as a valid password definition line, the log displays "`IGNORED`: " followed by the text from the line.
   - If Solution Manager recognizes the line as a valid password definition format and the username as one of the Oracle accounts for which Solution Manager stores passwords, the log displays "`ACCEPTED`: " followed by the text of the password definition line, with a string of asterisks ('`**********`') appearing in place of the actual password value.

     Note: The password value for the specified Oracle account updates immediately in the Solution Manager configuration database, even if you do not subsequently click **Save** on the Credentials page.

   - If Solution Manager recognizes the line as a valid password definition format but does not recognize the username as one of the Oracle accounts for which Solution Manager stores passwords, the log displays "`ERROR: Field` *`username`* `was not found`", where *username* is the Oracle account name parsed from the input line, followed by a second line "`IGNORED`:" followed by the text of the line, with a string of asterisks ('**********') which displays in place of the actual password value. In this case, the Solution Manager configuration database does not update.

Banner environment servers configuration

To manage your Banner environment using Solution Manager, define characteristics of your environment in the Solution Manager Admin Console. This includes global environment settings,

machines, applications hosted on the machines, and may include environment credentials and login sequences, depending on what you plan to accomplish.

Wget

To use the automated upgrade and deployment features, install *wget* on the Banner environment Jobsub machine and any app servers where you deploy Banner 8 online help, Banner 9 online help, or Banner 9.x administrative pages or self service applications.

For the required version of wget, see the *Ellucian Solution Manager Prerequisites* document available in the Ellucian support center.

Add wget to the system path on your machine so that Solution Manager can find it. For example, `/etc/profile` or `/etc/profile.d` in Linux. Review Enter system settings on page 7 for any additional requirements before you begin.

Note: If you have set up secure (HTTPS) connections for Solution Manager and are using a self-signed certificate for the Solution Manager Admin Server, you may need to install your self-signed certificate so that wget can recognize theSolution Manager server to complete the secure connection. For additional information, see "Configure Solution Manager for secure (HTTPS) communications" in the *Ellucian Solution Manager Installation and Configuration Guide*.

Related Links

Enter system settings on page 7

Jenkins communication agents

You must have Jenkins communication agents installed and online on your Jobsub server and on all application servers that Solution Manager targets for application deployments.

See "Install upgrade communication agent into Banner environment" and "Install deployment communication agents" in the *Ellucian Solution Manager Installation and Configuration Guide* for details.

Create script execution user for managed environment

Solution Manager requires the setup of a special script execution user to allow managed environments to execute automated installation jobs.

About this task

Note: It is only necessary to define one scripting user in the Solution Manager Admin Console. You can use the credentials for this scripting user on the Jobsub machine and all application server machines and across environments.

Solution Manager automatically creates the script execution user for environments that Solution Manager provisions.

Perform these steps to create the script execution user and to set up credentials for the user in your existing managed Banner environment.

Procedure

1. Click on the **Users** tab to display the **User Management** page.
2. Click **Add** to add a new user. The **User** page displays.
3. Complete the script execution user information:

Table 14: Script execution user fields

Field	Description	Sample Data
Username	The username for the script execution user for your environment.	TEST1_SCRIPTING
New Password	The password of your choice for the new script execution user.	*****
Confirm New Password	Confirms the password of your choice for the new script execution user.	*****
User Role	Select the **Scripts** check box for the user role.	Scripts

4. Click **Add** to add the new script execution user.

Set up script execution user credentials on the Jobsub machine

Set up the credentials for the new script execution user in the managed Banner environment.

Procedure

1. Log onto the Jobsub machine in your environment as the user that runs the Banner upgrade installation script. This is the same user specified in the **Install User** field when setting up credentials for the environment.
2. In the home directory of the Install User, create a file named `.wgetrc`, containing the following lines. Substitute the scripting user name and password in place of *envt-scripting-username* and *envt-scripting-user-pwd*.

```
http_user = envt-scripting-username
http_password = envt-scripting-user-pwd
auth-no-challenge = on
```

3. Save the file.
4. Enter `chmod 600 .wgetrc` to change the permissions on the file so that only the Install User can view the contents of the file.

Set up script execution user credentials on the Jobsub machine (Windows)

Set up the credentials for the new script execution user in the Windows managed Banner environment.

Procedure

1. Log onto the Jobsub machine in your environment as the user that runs the Banner upgrades.
   This is the same user that you specify as the Install User when setting up credentials for the environment.
2. Locate the home directory for this user, and create an `esm` subdirectory if it does not already exist.
   If the user is "Banner", the directory would be similar to `c:\Users\Banner\esm`.
3. In the `esm` directory, create a file titled `esmGetFromWeb.xml`, containing the following lines (substituting the scripting user name and password you set up for *scripting-username* and *scripting-user-pwd*, respectively):

```
<Settings>
  <Creds>
    <Username>scripting-username</Username>
    <Password>scripting-user-pwd</Password>
  </Creds>
</Settings>
```

4. Save the file.

Automatically install Banner upgrades

Use Solution Manager to install Banner upgrade releases into managed Banner environments.

A managed Banner environment constitutes either an environment provisioned with Banner, as described in New Banner environment provisioning on page 81, or an existing Banner environment for which you entered configuration information into the Solution Manager configuration database. See Add an existing environment to Solution Manager on page 14 for more information about managed Banner environments.

After you select one or more upgrades to include in an upgrade job (see Install upgrades into Banner environment on page 50 for more information), Solution Manager creates and starts a Jenkins job to apply the selected upgrades to the Banner environment. The Jenkins job uses a Solution Manager component named Banner Multi-Upgrade Installer, or BMUI, to execute the installation scripts for the selected upgrades. BMUI is updated to the latest available version for the version of Solution Manager that you are currently using whenever you download new releases with Solution Manager.

Set up staging directories

Many Banner product releases have associated deployments (packaged web applications like Banner Online Help or Banner 9 applications) that must be configured for use after a release upgrade is installed.

About this task

Solution Manager automatically handles staging of this content during an upgrade, and after the upgrade, deploys the content to web application servers.

Procedure

1. Ensure that the staging directories have been created on the Jobsub machine.

   The Install User must have full permissions to the staging directories.

   Ellucian recommends creating and maintaining separate staging directories for each environment.

   The staging directories must be identified in the Solution Manager Admin Console on the Jobsub Machine's detail page. This is where Solution Manager places deployment artifacts during the upgrade process.
2. Ensure that the staging paths are entered on the Machine detail pages for the targeted application servers.

   These should indicate a path on the targeted application server that points to the Jobsub's staging area using a share or a mounted directory.
3. Create unique staging directories for each of the deployment types (i.e., Banner 8 Online Help, Banner 9 Online Help, and Banner 9 XE deployments).
4. Enter the paths on each appropriate Machine defined in the Solution Manager Admin Console.

   For additional information regarding configuring staging paths, see Edit Application configuration properties on page 28. Information on application deployment can be found in Deployment jobs on page 64.

Related Links

Deployment jobs on page 64

Set up the known_hosts file

The Solution Manager Banner upgrade process (BMUI) uses SSH and SFTP connections between Banner environment servers during the upgrade process.

About this task

For all expected communication paths between Banner environment servers, Solution Manager automatically populates the known_hosts file. The BMUI process will search for the "`Are you sure you want to continue connecting?`" prompt and will automatically send a response of `yes`. In some cases the connection may fail because of an inaccurate entry for the target server

in the known_hosts file so that BMUI does not receive the expected message, which will cause the upgrade job to fail. If that happens, use the following procedure to fix the problem:

Procedure

Open a secure session manually (using SSH) from the Admin Server to the environment server where the connection failed as the system user that was being used by BMUI when the connection failed. Then manually attempt to connect through SSH to the target server for which the BMUI connection failed.

The table below shows the conditions that may occur when you attempt the SSH connection depending on what is contained in the known_hosts file.

Relationship is not defined	A prompt appears (see example 1 below). Respond `yes` to continue. The `known_hosts` will automatically update. The next secure session will not include a prompt.
Relationship is defined and is correct	The secure session opens if the relationship is already defined and correct for the current user-id to the target host. No additional prompting occurs.
Relationship is defined and is incorrect	You will receive a message indicating that the connection cannot be completed because host key verification failed (see example 2 below). This can happen if the operating system was re-installed on the target server, or if you are attempting to connect using a hostname, the IP address has changed because the last connection was made to the targeted server from the current server. In this case, you must edit the known_hosts file and remove any lines in that file (stored in the SSH directory of the login ID you used to log in to the system to attempt the SSH connection) that match the hostname or IP address of the target machine. Try the connection again to ensure that the prompt appears as illustrated in the first row above.

Example 1

```
[root@somehost ~]# ssh 192.168.100.1

The authenticity of host '192.168.100.1
(191.168.100.1)' can't be established. RSA key
fingerprint is 45:1c:49:d2:27:a4:c8:e7:a5:1c:05:cf:2f:8d:41:5a.
Are you sure you want to continue connecting (yes/no)?
```

Example 2

```
[someuser@somehost ~]$ ssh banner@192.168.100.113
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ @ WARNING: REMOTE HOST
IDENTIFICATION HAS CHANGED!
@ @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
Someone could be eavesdropping on you right now (man-in-the-middle
 attack)!
It is also possible that the RSA host key has just been
changed. The fingerprint for the RSA key sent by the remote host
 is 45:d8:51:e3:e6:31:f2:a5:9e:ea:63:ac:31:f4:9b:5b. Please contact
 your
system administrator. Add correct host key in /home/someuser/.ssh/
known_hosts
to get rid of this message. Offending key in /home/someuser/.ssh/
known_hosts:2 RSA host key for 192.168.100.113 has changed and you
 have requested strict checking.
Host key verification failed.
```

New releases available for download

You can download Banner and other upgrade releases, associated documentation, and installation metadata from the Solution Manager Release Services.

To download available Banner upgrade releases, provide a login and password that is a valid login for the Ellucian Hub Download Center. Specify the login and password, by using the **System Settings** tab on the Solution Manager home page. See Enter system settings on page 7 for more information.

View and download available releases in Solution Manager

Use Solution Manager to automatically download Banner and other upgrade releases, associated documentation, and installation metadata from the Solution Manager Release Services hosted on ellucian.com.

About this task

Note: Only users with the Admin role may download new releases (see Manage users for more information).

When you use **Get New Releases** to download new available releases, after downloading available Banner releases, Solution Manager also downloads the latest version of BMUI for the version of Solution Manager that you are running, any updated or new templates, and any new versions of Solution Manager that are available. If a new version of Solution Manager is downloaded, the system displays a message when the downloads complete that alerts you that a new version of Solution Manager is available and directs you to the **System Updates** page to upgrade Solution Manager (see Self-update feature on page 99 for more information).

Procedure

1. On the Solution Manager home page, click **Get New Releases**.

   A download progress page that monitors the progress of checking for and downloading available releases appears. The download log summary may list releases that Solution Manager Release Services reports as “available” but could not be downloaded.
2. Control the refresh rate of the screen by navigating to the **Auto Refresh (secs)** field, then adjusting the refresh interval. Click **Refresh**.

   When the download completes, a `"Download Complete"` message appears in the **Monitor** page.
3. Navigate to the home page and click on the Environment you want to update.
4. Click on **Products** to display the available upgrades.

Installed products and available releases

You can use Solution Manager to view the products installed in the Banner environment and releases available for installation.

Releases may be available for either an environment provisioned by Solution Manager as described in Banner environment provisioning on page 81, or for an existing environment defined to Solution Manager as described in Add an existing environment to Solution Manager on page 14.

Access currently installed products and available releases

The Products page provides access to the list of licensed products, product versions installed, and available releases.

Procedure

1. Click on a row in the Environments table, then select the **Products** tab on the **Environment Information** page to view currently installed and available product versions.

Field	Description	Sample Data
Name	Lists the Banner products that are installed in the environment or that are licensed but not installed.	Banner Advancement
Type	Displays the type of Banner product.	BannerERP
Application	Displays the application type.	db
Current Installed Release	Shows the highest version release for the product installed in the environment.	8.6
Latest Available Release	Shows the highest version available release that has been downloaded by Solution Manager but has not yet been installed in the environment.	8.7.1

Field	Description	Sample Data
Selected Target Release	Shows any available releases that have been selected for installation but have not yet been installed.	8.7.1

2. View the product's installation history by selecting the version number displayed in the **Current Installed Release** column. Click **OK** to return to the **Products** page.
3. Select the version number displayed in the corresponding **Latest Available Release** column to view available releases for the product.
4. On the page that displays, select an available release for Solution Manager to install in the environment by selecting the **Target Release** column in the row for that release

   Solution Manager calculates prerequisite releases and determines if Solution Manager has already installed them in the environment. If any uninstalled prerequisite releases are unavailable for Solution Manager to install, an error message appears indicating that the missing prerequisite releases must be manually installed before Solution Manager can install the selected target release. If all uninstalled prerequisite releases are available for Solution Manager to install, Solution Manager automatically selects those releases to include in the Solution Manager upgrade job and displays them on the page.

   Solution Manager highlights any automatically selected prerequisite releases of the same product in the table that displays the available releases for that product. Solution Manager displays all selected target releases and automatically selected prerequisite releases from other products in a separate table below the available releases table.
5. **Optional:** Click on **Clear Selected** to clear a selected target release. Click on **OK** to return to the **Products** page.

Solution Manager supported upgrades

Solution Manager supports the automated installation of most standard Banner product upgrades released June 1, 2012 or later, patches released September 1, 2015 or later, and all Banner XE (9.x) upgrades.

- For the latest information on upgrades that are supported for automated installation by Solution Manager, see the *Banner Upgrades Support Status* document available under Ellucian Solution Manager in the Documentation Libraries section of the Ellucian Support Center.
- Solution Manager version 1.9 and later supports installation of upgrades that create new tables in Banner environments that have Multi-Entity Processing (MEP) enabled. Only upgrades that have release metadata prepared for MEP-enabled environments can be installed by Solution Manager in MEP-enabled environments. Upgrades with MEP-aware release metadata and upgrades that do not require any special processing for MEP environments (because they don't create new tables) are referred to as "MEP-compliant" upgrades. If a non-MEP-compliant upgrade is selected for installation into a MEP-enabled environment, ESM will display a warning indicating that the user should check the documentation for the upgrade to ensure that it's okay to install the upgrade into a MEP-enabled environment with ESM. The *Banner Upgrades Support Status* document indicates which Solution Manager-supported Banner upgrades are MEP-compliant.
- When determining if prerequisites have been satisfied during the upgrade process, Solution Manager identifies both patches and upgrades installed either manually or automatically.

Note: Solution Manager supports the automated deployment of help but requires set up in advance of installing upgrades containing the help for the help delivered in the upgrade to be deployed correctly. See Deployment jobs on page 64.

Upgrade tasks

The following tasks must be complete to upgrade Banner environments.

Verify that the items listed have been added or configured:

- Upgrade-related configuration data for managed environments
- Upgrade-related Application configuration
- Upgrade-related credentials

Upgrade-related configuration data for managed environments

Verify upgrade-related configuration data for your managed environments.

Environments provisioned by Solution Manager are managed Banner environments. It is not necessary to enter upgrade-related configuration data for provisioned environments unless changes have been made to the configuration information from what was entered during the provisioning of the environment. If configuration information is changed, then you must also edit the configuration information for the existing Banner environments that you have added to Solution Manager.

Verify upgrade-related Application configuration information

Verify that the upgrade-related Application configuration steps are complete.

Procedure

1. Click on the **Applications** tab to ensure that a DB Application and a Jobsub Application have been defined. You also need an INB Application to support INB forms compilation and deployment, and an SSB Application to support SSB deployments, as described in the table below.

   If you have not configured these minimally required Applications, enter the information for those Applications now. See Manage Applications for more information.

Field	Description	Sample Data
DB Application	The DB (database) Application must be linked to the Machine with the DB (database) role.	`m013036-db`
Jobsub Application	The Jobsub Application must be linked to the Machine with the Jobsub role that corresponds to the machine on which the Banner code tree (or Banner home) directory is located. The Banner home directory for your environment may be on the same server	`m013036-jobsub`

Field	Description	Sample Data
	as the database for the environment, but you must configure separate DB and Jobsub Machines for the environment in Solution Manager. Enter the configuration information that Solution Manager requires to connect to the server on which the Banner code tree (home directory) is located.	
INB Application(s)	Solution Manager has the ability to compile forms and reports for the environment on a designated INB Compiler Server and to copy the compiled executable files to additional INB servers that are used to execute the forms and reports to provide access to the environment to users. • You must configure at least one INB Application linked to a Machine with the App role if you want Solution Manager to compile and deploy INB forms delivered in Banner 8.x upgrades and patches.. • If you only configure one INB Application, it must also be configured as the INB Compiler Application. • If you configure multiple INB Applications, you must designate one of them as the INB Compiler Application by clicking on the option in the Compile column of the Applications table.	`m013036-inb`
SSB Application	You must configure an SSB Application linked to a Machine with an App role if you want Solution Manager to handle deployment of SSB components delivered in Banner 8.x self service upgrades and patches. Solution Manager does not require an SSB Application to handle deployments of Banner 9 self service applications.	`m013036-ssb`

2. To enter or edit configuration information for an Application, click anywhere on the row for the Application in the Applications table to access the **Application Configuration** page.

App Server deployment properties

Verify App Server Deployment properties.

If it is necessary to perform any Banner 9 application or Banner 8 or 9 online help deployments after installing an upgrade, the App Server Deployment properties must be defined. See Define App Servers on page 67 for more information.

Verify INB Application properties / INB Compiler Application properties

For each INB server, verify that additional upgrade-specific configuration information is specified in the INB Application Properties section of the Application Configuration page.

Procedure

1. Enter or edit the information for INB Application Properties for each INB server.

   Table 15: INB Application properties

Field	Description	Sample Data
INB Host Forms Path	The path on the INB machine to the directory where the form executables ".fmx" and associated file types are stored	`/u01/app/sghe/banapps/SMPL/inb/forms/fmx`
INB Host Reports Path	The path on the INB machine to the directory where the report executables ".rep" and associated file types are stored	`/u01/app/sghe/banapps/SMPL/inb/reports/rep`
INB Host User	The user login that should be used by the automated upgrade installation process when logging on to the INB machine to update the form or report executables	oracle
INB Host Pwd	The password for the login that should be used by the automated upgrade installation process when logging on to the INB server to update the form or report executables	*******

2. Enter additional configuration information to allow the automated process to compile forms and reports to be installed. Enter or edit the INB Compiler Application Properties for the designated INB forms compiler server.

   Do this if the INB Application is the designated INB forms compiler server.

Table 16: INB Compiler Application properties

Property	Description	Sample Data
Host SID Name	The Oracle SID used on the INB forms compiler machine to set up the proper environment for the forms and reports compilations	SMPL
Host TNSADMIN Path	The path to the Oracle admin directory in the Oracle instance on the INB forms compiler machine set up for forms and reports compilation	`/u01/app/oracle/middleware/as_1/network/admin`
Host FMB Path	The path on the INB forms compiler machine to the directory where the ". fmb" files (and associated file types) are stored for forms compilation	`/home/oracle/compiledir/formcompile`
Host RDF Path	The path on the INB forms compiler machine to the directory where the ".rdf" files (and associated file types) are stored for reports compilation	`/home/oracle/compiledir/reportcompile`
Banner Links	The path on the Banner code tree server (the Jobsub machine) for the environment to the "links" directory in the Banner code tree. **Warning!** On Windows, you must create this folder / path manually. The automated upgrade installation process uses this directory to access form and report source files to transfer them to the forms compiler machine. The upgrade process then performs the form and report compilations.	`/u01/app/sghe/banner/SMPL/links`
Compile Host Oracle Home Path	The path to the Oracle home directory for the Oracle instance on the INB forms compiler machine that is set up for forms and reports compilation	`/u01/app/oracle/middleware/as_1`
Compile Host User	The user login used by the automated upgrade installation process to log on to the INB forms compiler machine to do forms and reports compilation	oracle
Compile Host Pwd	The password for the login used by the automated upgrade installation process to	*******

Property	Description	Sample Data
	log on to the INB forms compiler machine to perform forms and reports compilation	

Compile Login Sequence	A series of instructions for the automated upgrade installation process to use when logging on to the INB forms compiler for forms and reports compilation.
	
	This login instruction sequence must be set up to recognize any prompts that occur during the login sequence and to provide appropriate responses to those prompts. The login sequence must also set the Oracle environment for doing the forms and reports compilation. Please see INB Applications: explanation of the example Compile Login Sequence on page 31 for more information.
		`Wait $`
		`RC source /usr/local/bin/oraenv`
		`Wait ORACLE_SID = [SMPL] ?`
		`RC as_1`
		`Wait $`

The forms compilation process run by the automated upgrade installation process uses "SSH" to log into the INB forms compiler from the Banner code tree (or "Jobsub") machine to run the forms and reports compilations. The Compile Login Sequence allows you to customize what happens when the forms compilation process logs into the forms compilation machine to properly set up the environment for running forms and reports compilation.

The Compile Login Sequence uses properties containing values derived from previously entered configuration information:

- {banner.form.compile.host.user.password}

  This property contains the value entered in the Compile Host Pwd field.
- {banner.form.compile.host.sid.name}

  This property contains the value entered in the Host SID Name field.

Note: The Compile Login Sequence commands are executed by the automated upgrade installation process immediately after issuing the "login <*login-ID*>" (where "<*login-ID*>" is the value entered in the Compile Host User field) and responding to the password prompt with the corresponding password. To edit the Compile Login Sequence, use the `Wait` and `RC` commands and the properties listed above to respond to any additional prompts that occur after logging into the INB forms compiler machine to set the environment for forms compilation.

Verify upgrade-related credentials information

After entering or editing the upgrade-related Application configuration information, verify that the upgrade-related credentials information for the environment has been entered.

Procedure

1. From the **Solution Manager** home page, click **Environments**.

2. Click anywhere in the row for the environment in the **Environments** table to edit that environment.
3. Click on the **Credentials** tab.
4. Enter or edit the information in the fields on the **Credentials** page.

Field	Description	Sample Data
Database	The passwords for Oracle system administration users for the Oracle database (needed by the Banner upgrade installation process to execute SQL scripts)	
SYSTEM Password	The password for the SYSTEM user	******
SYS Password	The password for the SYS user	******
Banner Installer	The logins and associated passwords needed by the Banner upgrade installation process, in addition to the login instruction sequence used by the upgrade installation process to log on to the machine with the Banner code tree to run the upgrades.	
Upgrade Owner User	The Oracle user that is set up to own the modification tables for upgrades (defaults to “upgrade1”).	upgrade1
Upgrade Owner Pwd	The password for the upgrade owner user.	******
Install User	The login that the upgrade installation process should use to log into the machine containing the Banner code tree to install the upgrades.	banner or Administrator for Windows
Install Pwd	The install user password	******
Install User Login Sequence	Edit the instructions for the installation process for processing the login of the install user on to the machine containing the Banner code tree to install the upgrades. **Note:** This uses the same commands described for the Compile Login Sequence for the INB Compiler Application, but different properties from the configuration information that you have entered for the environment. The Install User Login Sequence available properties are: • {banner.target.user.password} = The value entered in the Install Pwd field. • {banner.target.sid} = The value entered in the DB SID field on the Env Settings tab.	Wait $ RC source / u02/ jobsub/ scripts/ banenv_{banner.target.si Wait $

The Login sequence uses the following commands:

Command	Description
Wait <prompt text>	Instructs the automated upgrade installation processor to wait for a designated prompt (specified by "<prompt-text>".
RC <response-text>	The Remote Command specifies the response (specified by "<response-text>") to the prompt specified by the preceding "Wait" command
{banner.target.user.password}	Contains the value that you entered in the Install Pwd field.
{banner.target.sid}	Contains the value that you entered in the DB SID field from the Env Settings.

The Login Sequence commands are executed by the automated upgrade installation process immediately after issuing the "login *login-ID*" (where "*login-ID*" is the value you entered in the Install User field).

Install upgrades into Banner environment

To install available Banner upgrade releases into a managed Banner environment, first select the releases to be installed.

Before you begin

Administrators must set up the Banner 8 help, Banner 9 help, and Banner 9 application staging areas before installing software. The Banner 8 and Banner 9 help must be seeded into the deployment areas. See Mount staging areas and seed help content on page 65 for more information.

Specify the path to the Bash shell on the Jobsub machine definition, such as `/bin/sh`. Version 3.2.25 or later is the required Bash for Solution Manager.

Procedure

1. Access Solution Manager and click anywhere in the row for the environment you want to update.
2. Select the **Products** tab to view installed and available releases in the environment.
3. Select the upgrades that you want to install into the environment from the **Products** page. See Select upgrade releases to install into Banner environment on page 51 for more information.
4. Select **Upgrade** to display the **Start Upgrade Job** page to enter any final configuration information needed for the upgrade installation. Begin the upgrade installation job. See Start upgrade installation job on page 52 for more information.

Select upgrade releases to install into Banner environment

Select an upgrade to install into the managed Banner environment.

About this task

The **Products** page displays a table containing all of the Banner products that you have installed in the managed Banner environment and licensed Banner products that have not yet been installed in the environment.

Procedure

1. Select the **Latest Available Release** column in the row for a product that has an available release on the **Products** page.

   Solution Manager displays all of the upgrade releases available for the product (that are not yet installed into the environment).
2. Select the Target Release to be loaded.
   - It is not necessary to choose the release that is the next release after the latest version currently installed.
   - If you choose a later release, Solution Manager will automatically determine any prerequisites that are required to install your selected target release and will select and install those releases in addition to your selected target release.

   Note: If you scroll the Available Releases table, any prerequisite releases automatically selected as a result of your selected target release will be highlighted.

   Note: If a prerequisite release is not installed in the environment and is also not in the available releases, an error message will be displayed indicating that the prerequisite must be installed manually. It will not be possible to select the target release without the prerequisite installed.

   For example, to install the Financial Aid 8.17 release, click on the button on the 8.17 row in the Available Releases table. Solution Manager determines that to install the 8.17 upgrade, the 8.16 upgrade must be installed. Solution Manager automatically selects the 8.16 upgrade and indicates that by highlighting the 8.16 release row in the Available Releases table.

   Note: In some cases, a selected target release could have a prerequisite from another product that needs to be installed. In that case, Solution Manager displays the prerequisites from other products, along with any other releases you have already selected from other products and their automatically selected prerequisites, in a separate table labeled Other Selected and Prerequisite Releases below the Available Releases table.
3. Select **OK** to accept your selected target release. Otherwise, click **Clear Selection** to clear the selected target release. Either action returns you to the **Products** page.

   After selecting a target release for a product, it will appear in the Selected Target Release column of the **Products** table (in the row for the product that the release applies to).
4. **Optional:** Remove a selected target release that shows up on the **Products** page.
   a) Click on the release that you want to remove in the Selected Target Release column on the Products table.

The Available Releases Detail page opens for that product.

b) Select **Clear Selection** to clear the selected target release and return to the **Products** page.

Start upgrade installation job

After selecting the desired target release for one or more products and the selected releases are ready for installation, it is possible to initiate automated installation of the selected releases and their uninstalled prerequisites.

Before you begin

Note: Only users with the Admin role may start an upgrade installation job (see Manage users for more information).

Review the upgrade manuals for upgrades that have been selected to install and any prerequisite upgrades that were automatically selected for installation by Solution Manager. Ensure that the environment is ready for each upgrade to be installed. Sometimes, an upgrade manual contains instructions for performing steps manually, such as ensuring that certain data exists in the environment before installing the upgrade. Make certain that any required actions are performed in the environment before initiating the automated upgrade installation job.

About this task

During an upgrade, if you have the environment configured to support INB forms compilation and deployment, Solution Manager copies required library forms to the INB compiler server with every upgrade. In addition to the forms delivered by the upgrade, Solution Manager copies the following forms and libraries from the `$BANNER_LINKS` directory on the Jobsub server to the forms and reports source directories on the INB compiler server that the INB Application, designated as the INB Compiler, specifies.

- toqolib.fmb
- goqrlib.fmb
- goqrpls.pll
- goqwflw.pll
- toqrpls.pll
- goqolib.fmb
- goqorep.pll
- eoqrpls.pll

If custom changes are made to any of these files, keep the necessary changes by ensuring that all customizations are made in the `$BANNER_LINKS` directory.

Procedure

1. After selecting the target releases that you want to install, initiate the automated upgrade installation job by selecting **Upgrade** on the **Products** page.

The Start Upgrade page appears.

2. Enter a description for this upgrade job.

   Below the description Solution Manager displays a table of the Selected Releases (the target releases you selected for installation), and below that a table of the uninstalled Prerequisite Releases which were automatically selected for inclusion in the upgrade job based on the target releases you selected.

Selected Releases	Displays the upgrade releases that you selected from the Products page before selecting **Upgrade**.
Prerequisite Releases	Displays any automatically selected uninstalled prerequisites for the selected releases that will be installed along with the selected releases.

   For MEP-enabled environments, a MEP Compliant column will appear in the Selected and Prerequisite Releases tables, with a "Yes" value in that column indicating that Solution Manager recognizes that upgrade is MEP compliant (either contains MEP-aware release metadata or has been designated as MEP compliant because it doesn't require any special MEP-aware release metadata). If any releases in the Selected or Prerequisite Releases tables do not show "Yes" in the MEP Compliant column, a warning will appear at the top of the page requesting that you check the documentation for the release to ensure that it can be installed successfully by Solution Manager even though it is not recognized as a MEP compliant release.

   Some releases may be acceptable to be installed by Solution Manager even though the MEP Compliant column does not display Yes. You should also check whether or not the release is designated as MEP Compliant in the *Banner Upgrades Support Status* document.

3. If an icon appears in the Upgrade Properties column for an upgrade in the Selected and Prerequisite Releases tables, click on the icon to view and acknowledge upgrade-specific messages and to provide values for requested parameters.

   Note: You must enter all upgrade-specific properties and acknowledge all upgrade-specific instructions (by selecting the check boxes) before Solution Manager allows you to start the upgrade process. After you acknowledge all messages and supply all requested parameters for an upgrade, the icon in the Upgrade Properties column displays a check mark.

4. Review the upgrade-specific instructions and enter any requested parameters, then select the check box for each step as indicated. If the check box is selected, the step has already been completed.
5. In MEP-enabled environments, releases which are MEP Compliant and create new tables will contain prompts for each new table created by the upgrade. Select **Yes** for each table that you want to be MEP'd. For the tables that you want MEP'd, specify the access privileges for the data in the table using the drop-down list.
6. **Optional:** Click **Reset** to set all upgrade-specific properties to the values that were last saved in the database, rather than what has been entered so far on this form.
7. Click **Cancel** to close and return to the main form without saving.
8. Click **OK** after entering values for all requested properties and acknowledging all upgrade-specific instructions (by selecting the check boxes), to save your responses.
9. Click **Start Upgrade**.

If you selected the **Auto-Start Jobs** check box on the Start Upgrade page, the newly created upgrade starts automatically and should show a status of "In Progress" on the Upgrade Job Monitor page. If you did not select the **Auto-Start Jobs** check box, the newly created upgrade job appears on the Upgrade Job Monitor page with a status of "Not Initialized".

View and monitor upgrade jobs

View upgrade installation jobs by accessing the Upgrades tab on the Environment page in Solution Manager.

Before you begin

See Install upgrades into Banner environment on page 50 for more information about installing Banner upgrade releases.

Procedure

1. Select an environment by clicking anywhere in the row for the environment (with the exception of the icons) in the **Environments** table.
2. Select the **Upgrades** tab to display the **Upgrade Jobs Status** page. Upgrade jobs display an Install Status.

Not Initialized	Indicates that the upgrade job was created with the "Auto-Start Jobs" option not selected and the job has not yet been started.
In Progress	Indicates that the upgrade job is currently being executed but has not yet completed. The job may be in progress either because it was just created with the "Auto-Start Jobs" option selected or because it was manually started from the Upgrade Job Monitor page.
Error in BMUI	An error occurred after BMUI was initialized. Check the BMUI log files for this upgrade job. See Upgrade job log directory for information on viewing log files.
Successfully Completed	Indicates that the upgrade job has already been executed and completed successfully. If the job has already been run but did not complete successfully, its Install Status will be one of the following: Error in Pre BMUI, Error in BMUI, Error in Post BMUI, or Error in BMUI and Post BMUI. For additional information about what caused the upgrade job to fail, review the Console Log from the completed job as described in the discussion of the Upgrade Job Status page.

The Upgrade Job Status page shows all of the upgrade jobs that you have created. The jobs are sorted chronologically with the most recent upgrade job listed first. For each upgrade job, the table shows the Upgrade ID, the Description you entered for the job, the Install Status, the Start Date, and the Completion Date. The Start Date indicates when the upgrade job was created. The Completion Date is shown for jobs that have already completed successfully or ended with an error.

View releases included in an upgrade job

Open the Upgrade Job Contents page to view the releases included in the upgrade job and the installation status of each release. View and manage releases that have associated deployment jobs.

Procedure

1. Click anywhere in the row for the upgrade job in the table on the **Upgrade Jobs Status** page to display the **Upgrade Job Contents** page.
2. View the install status for each release included in the upgrade.

   The release may display one of the following statuses:

   - Not Initialized
   - Initialized
   - In Progress
   - Errored Out
   - Manually Resolved
   - Successfully Completed
3. Click the icon that appears in the Deployments column to view and manage the list of deployment jobs associated with the release.

   See Deployment jobs on page 64 for detailed instructions on how to view and kick off deployment jobs.
4. Click **OK** to return to the **Upgrade Jobs Status** page.

Monitor an upgrade job

Use the Upgrade Job Monitor page to monitor the the installation status of the upgrade job and to modify the refresh rate of the page if desired.

Procedure

1. Click on the icon in the Monitor column in the row for a displayed upgrade job to view the **Upgrade Job Monitor** page.

   If the upgrade job was created without the Auto-Start Jobs option (Install Status is "Not Initialized"), the status screen shows that it has not yet started (the shadow check mark icon) and a **Start Upgrade Job** button appears in the upper right part of the page.

2. Click **Start Upgrade Job** to initiate the automated upgrade installation job.
3. Monitor the execution of the upgrade job from the **Upgrade Job Monitor** page.
4. Change the time interval that Solution Manager should wait before automatically refreshing the page contents by entering the desired time interval in seconds in the Auto Refresh field and then clicking on the **Refresh** button. It is also possible to refresh the page manually by clicking on **Refresh**.

   If the upgrade job completes successfully, the status icon displays as a green circle with a white check mark. If the upgrade job does not complete successfully, the status icon displays as a red circle with an exclamation point.
5. Scroll through the Console Log section of the page to see the console output from the execution of the upgrade installation script in the managed Banner environment.

Advanced upgrade features

Advanced features are available for restarting failed upgrades and controlling whether or not Solution Manager executes some upgrade functionality.

Banner upgrade restartablility

The following is applicable to Banner upgrade jobs only: If the previous Banner upgrade job fails and the release that failed is restartable, it is necessary to select that job before you can kick off another Banner upgrade job.

If manual installation is preferred, go to the **Upgrades** screen to mark it as Manually Resolved.

Unless one of these is executed, it will not be able to kick off any other upgrades. Please note that not all releases are restartable. If a release installation fails, you can do the following: Go to the Upgrades form, click and select the failed upgrade. Then verify whether the release is restartable or not in the Is Restartable column.

Note: Only use the **Manually Resolved** button when you are certain that the upgrade job is not currently in progress and the update has been manually installed successfully.

You should not use the **Manually Resolved** button when an update job is in progress.

Environment variables used to control BMUI functionality

You may use environment variables to control the Solution Manager Banner upgrade processor (BMUI) functionality.

When the BMUI process is called to install a Banner upgrade, BMUI reads all of the environment variables that begin with BMUI_* on the Jobsub machine.

You can control how BMUI handles the upgrade processing tasks listed in the table below using environment variables specified in the table for each task.

Note: These environment variables may be defined in the login profile on the Jobsub machine of the Install User you specified on the Env Settings page, or you may include them in the Install User Login Sequence on the Credentials page. If you choose to define them in the Install User login profile, be sure to remove the definitions when you no longer want the effects of the environment variable on the BMUI process.

Note: If you use environment variables to skip a deployment (Banner 8 Help, Banner 9 Help, or Banner 9 War), then the upgrade process will skip the deployment steps. However, the Deployments jobs will still be created by the Admin Console. These corresponding deployment jobs should be ignored or marked as "Manually Completed".

Environment variables

The environment variables used to control BMUI functionality are listed, along with a description of the functionality controlled by each variable.

Task	ENV Variable Name	Value	Details
Forms and reports compilation	BMUI_FORMS_COMPILE	Yes or No	The BMUI_FORMS_COMPILE environment variable is used to control the Forms and Reports Compilation. If the environment variable is set to "No" then the forms and reports compilation is not performed.
SSB deployment	BMUI_SSB_DEPLOY	Yes or No	The BMUI SSB deployment is controlled by environment variable BMUI_SSB_ DEPLOY. If the environment variable is set to "No" then the SSB deployment is not performed.
Delete TRZ	BMUI_DELETE_TRZ	Yes or No.	After the installation of an upgrade is successful, BMUI removes the upgradespecific package file (.trz) so that there is sufficient disk space available on the system. However, deleting the TRZ file can be controlled by using environment variable BMUI_DELETE_TRZ. If the environment variable is set to "No" then the TRZ file is not deleted.

Task	ENV Variable Name	Value	Details
Banner 8 online help	BMUI_BAN8HELP_DEPLOY	Yes or No.	Banner 8 Online Help deployment is controlled by environment variable BMUI_BAN8HELP_DEPLOY. If the environment variable is set to "No" then the Banner 8 Online Help is not deployed.
Banner 9 online help	BMUI_BAN9HELP_DEPLOY	Yes or No.	Banner 9 Online Help deployment is controlled by environment variable BMUI_BAN9HELP_DEPLOY. If the environment variable is set to "No" then the Banner 9 Online Help is not deployed.
Banner 9 app deployment	BMUI_BAN9APP_DEPLOY	Yes or No.	Banner 9 App / WAR-deployment is controlled by environment variable BMUI_BAN9APP_DEPLOY. If the environment variable is set to "No" then the Banner 9 App deployment is not performed.

Customize the automated upgrade installation process

Administrators can customize BMUI functionality by providing custom scripts that will be executed by BMUI during the process of installing upgrades.

Installation script customizations before or after all upgrades

It is possible to customize the automated upgrade installation script for your environment by creating two scripts. These scripts are named `prebmui.sh` and `postbmui.sh`.

Store these scripts in a directory named *`banner-home`*`/upgrades/bmui_custom` on the Jobsub machine in the managed Banner environment (where *banner-home* is defined as described in the Automated Upgrade Installation Details.

Customization scripts are not required. If either script does not exist, then the installation script will skip it.

The scripts must have the execute privilege for the Install User and run as the Install User. See Enter Upgrade-Related Credentials Information for more information about the Install User.

The current directory when each script is run is *banner-home*.

Both scripts have access to the following environment variables:

- $BANNER_HOME has the value *banner-home* as defined above.
- $UPGD_DIR has the value `$BANNER_HOME/upgrades`.

Any output from either script is redirected into the Upgrade Job Logs directory (See Automated Upgrade Installation Details).

The `prebmui.sh` script is executed by the upgrade installation script before it executes the multi-upgrade installation tool. This script can be used to perform custom actions in the environment before installing the upgrades included in the upgrade job. For example, the script can verify that no users are logged into the environment database and can lock users out of the database while the upgrades are running.

Normal output from the `prebmui.sh` script is directed to the file named `prebmui.log` in the Upgrade Job Logs directory.

Error output from the `prebmui.sh` script is directed to the file named `prebmui_err.log` file in the Upgrade Job Logs directory.

If there is an issue during the execution of the `prebmui.sh` script that causes the installation job to halt, exit the script with a non-zero system return code. The installation script will halt and set an appropriate status for the upgrade job in Solution Manager.

Template for the prebmui.sh script

Review the `prebmui.sh` script information.

```
#!/bin/bash
# This optional custom script allows you to perform any environment-
# or institution-specific tasks before BMUI is executed to install
# upgrades.
#
# A normal exit from this script will allow BMUI to run.
# Use exit with a non-zero code to stop BMUI from running.
#
echo "This is the prebmui.sh custom script."
```

The `postbmui.sh` script is executed by the upgrade installation script after BMUI finishes processing the upgrades installed by the upgrade job, and can be used to perform custom actions in the environment after upgrades are installed. For example, if you used the `prebmui.sh` script to lock users out of the environment database, use the `postbmui.sh` script to open up the database to user logins again if the installation of the upgrades was successful.

The `postbmui.sh` script is executed regardless of whether BMUI successfully installed the selected upgrades or not. The script can access the environment variable *$BMUI_STATUS* to test the exit status of the multi-upgrade installer.

Normal output from the `postbmui.sh` script is directed to the file named `postbmui.log` in the Upgrade Job Logs directory.

Error output from the `postbmui.sh` script is directed to the file named `postbmui_err.log` file in the Upgrade Job Logs directory.

Exit the script with a non-zero system return code with an integer value from 1 to 9 to indicate an error condition or other non-standard condition.

Template for the postbmui.sh script

Review the `postbmui.sh` script information.

```
#!/bin/bash
# This optional custom script allows you to perform any environment-
# or institution-specific tasks after BMUI is executed.
#
# The following environment variables are available:
#   BANNER_HOME: Path to current Banner code tree
#   UPGD_DIR: Path to the upgrades directory
#   BMUI_STATUS: BMUI status - 0 = success
#                              anything else indicates failure
#
# This script always executes regardless of whether BMUI was
# successful.
#
# Test BMUI_STATUS so separate paths can be taken depending whether
# BMUI succeeded or failed.
#
# Use exit with a non-zero code to flag a failure to the upgrade
# installation script.
#
echo "This is the postbmui.sh custom script."
if [ $BMUI_STATUS-eq 0 ]; then
echo "BMUI was successful."
# Perform custom tasks here that should be executed when BMUI
# was successful.
else
echo "Detected BMUI failure."
# Perform custom tasks here that should be executed when BMUI
# failed for any reason.
fi
echo "Exiting postbmui.sh custom script."
```

The status returned to Solution Manager by the automated upgrade installation script is a composite of the status returned by the `prebmui.sh` script, the multi-upgrade installer, and the `postbmui.sh` script.

The returned status is calculated by a formula in which `BMUI_RETURN_CODE` is the composite return code for the automated upgrade installation script, `PREBMUI_STATUS` that represents the status returned by the `prebmui.sh` script, "BMUI_STATUS" represents the status returned by the multi-upgrade installation tool, and “POSTBMUI_STATUS" represents the status returned by the `postbmui.sh` script.

Additionally, the actual values returned for “PREBMUI_STATUS", “BMUI_STATUS", and “POSTBMUI_STATUS" are displayed in the console log for the upgrade installation job.

See below for the formula for BMUI_RETURN_CODE:

```
if PREBMUI_STATUS <> 0 then
BMUI_RETURN_CODE = 100
else
BMUI_RETURN_CODE = 0
endif
```

```
BMUI_RETURN_CODE = BMUI_RETURN_CODE + ( BMUI_STATUS * 10 ) +
POSTBMUI_STATUS
```

Installation customization for each upgrade in an upgrade job

You can customize the installation of each upgrade in an upgrade job using the scripts described in this section. These scripts are run by BMUI at specific points during the installation of each upgrade, and the return/exit code plays a significant role in the success of the BMUI installation process.

Scripts can be generic (not tied to any particular upgrade but occurring before or after each upgrade) or can be specific to a particular upgrade.

The table below contains information about the supported custom installation scripts.

Note: *{banner.current.upgrade}* is an internal BMUI variable that corresponds to the name of the upgrade (the name of the TRZ file without the ".trz" extension).

Task Name	Task Type	Shell Script
Pre Upgrade	Generic	pre_upgrade.shl
Pre Upgrade	Upgrade Specific	pre_ *{banner.current.upgrade}*.shl
Post Upgrade DB	Upgrade Specific	post_db_*{banner.current.upgrade}*.shl
Post Upgrade Code	Upgrade Specific	post_code_*{banner.current.upgrade}*.shl
Post Upgrade	Generic	post_upgrade.shl

Pre upgrade - generic task

The `pre_upgrade.shl` script, if it exists, runs before each upgrade installation.

For example, take a backup of code and database instance before each upgrade installation or perform a custom task before each upgrade installation. BMUI proceeds upon completing the task successfully; however BMUI stops installation of the upgrade if the task exits with error code other than zero(0).

You can use the following template to create your custom `pre_upgrade.shl` script.

```
# This optional custom script allows you to perform generic upgrade
 task
# before any upgrade installation is initiated.
#
# This is called by shell with command sh +xe <custom path>/
pre_upgrade.shl
# All the Shell environment variables are available
#
# Return/exit status - 0 = success
# anything else indicates failure
#
# Use exit with a non-zero code to flag a failure to the upgrade
```

```
# installation script so that installation aborts.
#
# Example:
# =======
# echo
# echo Start: pre_upgrade.shl
# echo
#
# echo `date`
#
# df -h
#
# echo
# echo Completed: pre_upgrade.shl
# echo
#
# exit 0
#
```

Pre upgrade - upgrade specific task

The `pre_{banner.current.upgrade}.shl` script, if it exists, runs at the beginning of the execution of the instructions for each upgrade, before executing any of the instructions in the release metadata delivered in the upgrade release package.

For example, list of all valid objects before installing a specific Banner Upgrade (General 8.6 release). BMUI proceeds upon completing the task successfully; however BMUI stops installation of the upgrade if the task exits with error code other than zero(0).

Post upgrade db - upgrade specific task

BMUI runs the `post_db_{banner.current.upgrade}.shl` script, if it exists, after executing the portion of the instruction set delivered in the release metadata for the upgrade that updates the database, and before executing the portion of the instruction set that runs the migration scripts and C, Cobol, and forms compiles, if applicable.

For example, you can display a list of all objects that are not valid after a database installation of a specific Banner Upgrade (Student 8.5.5 release). BMUI proceeds upon completing the task successfully; however BMUI stops installation of the upgrade if the task exits with error code other than zero(0).

Post upgrade code - upgrade specific task

BMUI runs the `post_code_{banner.current.upgrade}.shl` script, if it exists, after it completes the portion of the instruction set delivered in the release metadata for the upgrade that runs the migration scripts and C and Cobol compiles, if applicable, and before running the forms compiles, if applicable.

For example, perform code specific checks or take a backup of code tree or find code differences or any other after code installation processes for a specific Banner Upgrade (Financial Aid 8.9 release)

BMUI proceeds upon completing the task successfully. BMUI stops installation of the upgrade if the task exits with error code other than zero (0).

Post upgrade - generic task

BMUI runs the `post_upgrade.shl` script, if it exists, after the completion of all the installation instructions in the instruction set delivered in the release metadata for each upgrade

For example, it is possible to check installation consistency and integrity of the Banner database or perform custom tasks after each upgrade installation. BMUI proceeds upon completing the task successfully; however BMUI stops installation of the upgrade if the task exits with error code other than zero(0).

You can use the following template to create your custom `post_upgrade.shl` script.

```
# This optional custom script allows you to perform generic upgrade
 task
# after any upgrade is installed successfully.
#
# This is called by shell with command sh +xe <custom path>/
post_upgrade.shl
# All the Shell environment variables are available
#
# Return/exit status - 0 = success
# anything else indicates failure
#
# Use exit with a non-zero code to flag a failure to the upgrade
# installation script so that installation aborts,xi
# but Upgrade installation is fine because this is post action.
#
# Example:
# =======
# echo
# echo Start: post_upgrade.shl
# echo
#
# echo `date`
#
# df -h
#
# echo
# echo Completed: post_upgrade.shl
# echo
#
# exit 0
#
#
```

Deployment jobs

Deployment jobs are used by Solution Manager to deploy web applications delivered by installed upgrades.

Banner releases can contain one or more associated *deployments*. A *deployment job* is created automatically when the release is included on an upgrade job that has been started. Solution Manager supports Banner 9 Application, Banner 9 Online Help, Banner 8 Online Help, and Banner 9 Administrative Pages deployments.

The following items must be completed before kicking off a deployment job:

- Define one or more App Servers for each application where the jobs deploy to. (See "Define an App Server" for more details.)
- Define additional deployment settings.

  These settings must be defined for the Job Sub Application and any other Application that has an associated App Server. (See "Define Applications".)

Related Links

Set up staging directories on page 39
Edit Application configuration properties on page 28

Deployment agents

Deployment agents are Jenkins agents that facilitate the communication between servers, and orchestrate the deployment steps.

See the "Deployment Communication Agents" section in the *Ellucian Solution Manager Installation and Configuration Guide* for more information.

For deployment steps to be executed, Solution Manager requires a Jenkins agent to be running on the Job Sub server (where Solution Manager builds the application) and an agent running on each application server targeted for deployment.

When the existing Banner environment was added to Solution Manager, an upgrade communication agent was created on the Jobsub machine. Ellucian recommends reusing your existing upgrade communication agent for deployment steps that run on the Jobsub machine. (Creating a separate communication agent on the Jobsub machine specifically for deployments is optional.) Be sure to specify this agent name in the Jobsub Machine definition in the Admin Console, in the **Deployment Agent Name** field. Similarly, when the environment was added, a deployment communication agent was created on each application server targeted for deployment. Be sure to specify the deployment communication agent name in the corresponding Machine definition in the Admin Console, in the Deployment Agent Name field.

Banner 9 applications and Banner online help deployments

Solution Manager allows for the deployment of Banner 9.x Applications, Banner 9 Online Help, and Banner 8 Online Help.

For specific information regarding deployment of Banner 9 Administrative Pages, see Banner 9 Administrative Pages deployments.

Mount staging areas and seed help content

To perform automated deployments, Solution Manager requires access from the target application server to staged deployment content on the Jobsub machine.

About this task

These staging directories should already exist on the Jobsub machine before executing upgrades. See Application management on page 26 for more information.

Procedure

1. Create NFS mounts to the staging areas on the Jobsub machine on the application server.

   Solution Manager retrieves new deployment content from these directories and builds the application WAR file from the content.
2. Define the NFS mounted paths to the Banner 9 Online Help, Banner 8 Online Help and Banner 9 WAR staging directories that should already be in place on the Jobsub machine.
3. In Solution Manager, navigate to the appropriate Machine and enter the newly mounted paths for the three staging areas.

   This allows Solution Manager to access the staged content on the Jobsub machine.
4. **Optional:** For Online Help Only: Deploy a seed copy of Online Help in the Online Help staging area. This must be done before running any online help deployment jobs in Solution Manager.

   a) Retrieve and unpack `bannerOH.war` into Banner 8 help staging directory.

   b) Retrieve and unpack `banner9OH.war` into Banner 9 help staging directory.

   Note: If the seed copy of the online help .war file is not deployed, online help deployment jobs will cease. Java errors regarding a missing `MANIFEST.MF` file will appear.

Set up script execution user credentials

Set up the wget credentials for the appropriate user on the target application server.

Procedure

1. Log onto the target application server in the environment as the user who is responsible for installing deployments.

2. In the home directory of this user, create a file named `.wgetrc`, containing the lines below (substituting the scripting user name and password set up in place of *scripting-username* and *scripting-user-pwd*):

```
http_user = scripting-username
http_password = scripting-user-pwd
auth-no-challenge = on
```

3. Save the file.
4. Enter the command below to change the permissions on the file so that only the user can view the contents of the file by entering the following command:

```
$ chmod 600 .wgetrc
```

Set up script execution user credentials (Windows)

Set up the Windows credentials for the script execution user on Windows application servers in your managed Banner environment.

Procedure

1. Log onto the target application server in your environment as the user who is responsible for installing deployments.
2. Locate the home directory for this user, and create a subdirectory named `esm` if it does not already exist. For instance, if the user is "Administrator", the directory would be similar to `c:\Users\Administrator\esm`.
3. In the `esm` directory, create a file named `esmGetFromWeb.xml`, containing the following lines (substituting the scripting user name and password you set up for the environment):

```
<Settings>
      <Creds>
        <Username>scripting-username</Username>
        <Password>scripting-user-pwd</Password>
      </Creds>
</Settings>
```

4. Save the file.

Define Machines

In Solution Manager, define the Machine(s) on which the target web application server is installed.

About this task

Note: Only users with the Admin role may add, delete, and edit configuration information for Machines (see Manage users for more information).

Procedure

1. Go to the **Machines** tab for the environment to add a new machine.
2. Enter the **Admin (Private) Host Name** of the machine.
   a) Choose the app role, then click **Add** to save the new machine definition.
   b) Click in the row for the new machine in the Machines table to open up the **Machine configuration** page.
   c) Enter the **Deployment Agent Name**.
   d) Enter the rest of the configuration information for the machine and click **Save**.

   For detailed instructions on defining a machine in Solution Manager, see Machine management on page 21.

App Servers

App Servers must be defined to provide configuration information to Solution Manager for web application servers in an environment that are targets for web application deployments.

Note: Only users with the Admin role may add, delete, and edit configuration information for App Servers (see Manage users for more information).

Banner environments may have one or more web application servers that serve Banner Online Help or Banner 9 applications. Each web application server must be identified in Solution Manager by defining an App Server with the configuration information for the actual web application server. A single machine may contain one or more of these web application servers, so Solution Manager supports multiple web App Servers per Machine.

Solution Manager supports deployments to both WebLogic and Tomcat app servers. Solution Manager does not support deployments to WebLogic Clusters.

You may use Solution Manager to deploy the same application to multiple App Servers (Tomcat and WebLogic) by selecting more than one App Server or by re-running the deployment job and targeting a different App Server each time.

Define App Servers

Add one or more App Servers for the application and define properties for the App Server.

Procedure

1. Click on the **App Servers** tab.
2. Add a new App Server
   a) Click **Add** at the bottom of the App Servers table.
   b) Enter a name for the App Server (must be unique within the Environment).
   c) Select the App Server Type (Tomcat or WebLogic).
   d) Click **Add** to add the new App Server definition.

The App Servers table appears showing the newly added App Server.

3. Click on any row in the App Servers table to enter or edit the configuration information for the App Server on that row, including any newly added App Servers.

   The App Server configuration page is displayed. Enter or edit the fields on the page, which are described in the following table.

Table 17: App Server configuration fields

Property	Description	Sample Data
Machine	Select the desired machine from the drop-down list.	`TEST-EXISTINGENVIRONMENT -Xe2Machine-ADMIN - 192.168.50.10 - m034241 - 149.24.34.241`
App Server Name / Type	Displays the name and type of the app server.	`Banner9-Admin1 / WebLogic`
Managed Server Name	(Used for WebLogic App Servers only) Enter the name of the associated WebLogic managed server.	`Banner9-Admin1`
Admin Port Number	(Used for WebLogic App Servers only) Enter the port associated with the WebLogic AdminServer.	`7001`
Use SSL	Select the check box to use SSL. Otherwise, leave it cleared.	*Cleared*
Application Port Number	Enter the application port number.	`7030`
Admin Username	(Used for WebLogic App Servers only) Enter the server administrator's username. Not recommended. See WebLogic deployment credentials on page 70 for more information	`weblogic`
Admin Password	(Used for WebLogic App Servers only) Enter the server administrator's password. Not recommended. See WebLogic deployment	`password1`

Property	Description	Sample Data
	credentials on page 70 for more information	
User Config File	(Used for WebLogic App Servers only) Enter the absolute path on the App Server machine to the user configuration file that was created when you set up secure encrypted user credentials for WebLogic. This is the recommended way to setup credentials for WebLogic deployments. See WebLogic deployment credentials on page 70 for more information	`/u01/app/oracle/userconfig.secure`
User Key File	(Used for WebLogic App Servers only) Enter the absolute path on the App Server machine to the user key file that was created when you set up secure encrypted user credentials for WebLogic. This is the recommended way to setup credentials for WebLogic deployments. See WebLogic deployment credentials on page 70 for more information	`/u01/app/oracle/userkey.secure`
Domain Name	(Used for WebLogic App Servers only) Enter the domain name associated with the app server.	`base_domain`
Domain Environment Setup Script	(Used for WebLogic App Servers only) Enter the absolute path on the App Server machine to the domain environment setup script.	`/u01/app/oracle/Middleware/user_projects/domains/basicType2/bin/setDomainEnv.sh`
Catalina WebApps Path	(Used for Tomcat App Servers only) Enter the absolute path on the App Server machine	`/u01/app/tomcat/webapps`

Property	Description	Sample Data
	to the Tomcat instance deployment directory (webapps).	

4. Click **Save**.

WebLogic deployment credentials

When defining a WebLogic type App Server, you must provide credentials for Solution Manager to use to connect to the WebLogic AdminServer to manage deployments.

Solution Manager supports two methods for providing credentials:

- (Recommended) Set up secure user credentials for WebLogic on the WebLogic application server machine and then enter the path to the secure credentials configuration file in the **User Config File** field, and the path to the secure credentials key file in the **User Key File** field, on the App Server configuration page.

  See "Setup secure WebLogic administrator credentials" in the *Ellucian Solution Manager Installation and Configuration Guide*.
- (Not recommended) Enter the WebLogic AdminServer username and password in the **Admin Username** and **Admin Password** fields, respectively, on the App Server configuration page.This method is supported only for backward compatibility with earlier versions of Solution Manager.

  Warning! Entering Admin Username and Admin Password for WebLogic credentials results in the WebLogic Admin password being stored in clear text in files named `deploy.py` or `deploy_help.py` in the Jenkins agent workspace on the machine where WebLogic is running when you run a deployment job. You may delete those files from the Jenkins agent workspace when the deployment job is completed.

Define Applications

In Solution Manager, define the Applications associated with the target web application server.

About this task

Note: Only users with the Admin role may add, delete, and edit configuration information for Applications (see Manage users for more information).

Procedure

1. Navigate to the **Applications** tab and click **Add** to add a new Application.
2. Enter the Application Name.
   a) Choose the type of application, and click **Add** to save the new definition.
   b) Click on the row for the new Application in the Applications table to open up the **Application** configuration page. See Configure Application properties for more information.

c) Use the **Machine/App Server** drop-down to select the App Server and Machine combination that corresponds to the web Application server installed for deployment of this Application.

3. Click **Save**.

Kick off deployments

After the deployment settings have been defined and one or more app servers have been defined for the environment, you can kick-off the deployment jobs for a release.

About this task

Note: Only users with the Admin role may kick off a deployment job (see Manage users for more information).

Procedure

1. Click on the **Upgrades** tab to view the list of deployments associated with a particular release.
2. Click on the row for a particular upgrade to see the list of releases included on that upgrade. Alternatively, you can click on the **Deployments** tab to see all the deployment jobs for an environment.

   If a release has one or more deployment jobs associated with it, a deploy icon will be displayed in the Deployments column.
3. Click on the **Deployments** icon to view the list of deployments for that release.
4. Click on the row that corresponds with the deployment to be kicked off.

   If an upgrade job containing multiple upgrades is installed, each upgrade with deployment content will create a new entry in the **Deployments** tab. For multiple online help deployment jobs, only one deployment needs to be run.
5. Choose one or more App Servers where you would like to deploy.
6. Edit any information that shows on the deploy screen (for example, the App Name can be customized, if desired, for Banner 9 War deployments).
7. Click on **Start Deployment** to start the deployment job.

   The **Start Deployment** button only appears if the corresponding release is successfully installed in the environment. As the deployment job is running, a monitor window will show the progress of the deployment.
8. Click on **Start Deployment** to start the deployment job.

   The **Start Deployment** button appears only if the corresponding release installs successfully in the environment. As the deployment job is running, a monitor window shows the progress of the deployment. When the deployment job completes successfully, each of the three steps should show an icon that appears as a green circle with a white check mark.

   If the deployment job fails, hangs or displays an error message, manually mark the deployment job as either "Cancelled" or "Completed". For example, if the deployment is manually resolved outside of Solution Manager, click **Mark Cancelled** or **Mark Completed**.

The application can be re-deployed after a deployment job has completed by running the deployment job again. This is useful if you would like to deploy to a new app server or simply re-deploy to the original app server. The deployment screen will show a history of deployment runs in a table at the bottom of the deployment screen.

Banner 9 Administrative Pages deployments

Solution Manager allows for the deployment of Banner 9 Administrative Pages applications.

For all other deployment types, see Banner 9 applications and Banner online help deployments on page 65. Before using Solution Manager to deploy a Banner 9 Administrative Pages application, you must enter web application server configuration information into Solution Manager as described below.

For additional information about requirements for deploying Banner 9 Administrative Pages, see the *Banner Admin Pages Installation Guide* in the documentation package for the Banner Admin Common release that you want to deploy.

Set up a Banner 9 Administrative Pages App Server

Define an App Server in Solution Manager for the web application server to which you want to deploy the Banner 9 Administrative Pages application.

About this task

Note: Only users with the Admin role may add, delete, and edit configuration information for App Servers (see Manage users for more information).

You must also set up a deployment agent on the web application server machine. The deployment agent should be installed to run as the same system account that you use to run the web application server. See Deployment agents on page 64 for additional information on setting up a deployment agent.

Procedure

Define the machine on which the web application server is installed.

1. Define the machine as part of the environment setup.
   a) Navigate to the **Machines** tab.
   b) Enter the Admin (Private) Host Name of the machine.
   c) Choose the App role, and click **Add** to save the new machine definition.
   d) Click on the row for the new machine in the Machines table to open up the Machine configuration page.
   e) Enter the Deployment Agent Name. This is the name of the agent you defined for this particular server in Deployment agents on page 64.
   f) Enter the rest of the configuration information for the machine.
   g) Click **Save**.

Use The Public Network Host Name to form the URL for accessing the Human Resources 9.0.1 transformed pages web application. The name entered must be just the first node of the fully qualified domain name of the machine. Enter the domain name in the **Env Settings** configuration page for the environment. For example, if the qualified domain name of the machine is `appserver1.myinstitution.edu`, enter `appserver1` for the Public Network Host Name of the machine.

For additional detailed instructions on defining a machine in Solution Manager, see Machine management on page 21.

Define App Servers

2. Go to the **App Servers** tab for the environment to add a new app server.
   a) Enter the name for either the WebLogic or Tomcat web application server.
      The App Server name may be any name that uniquely identifies that web application server for the environment in Solution Manager.
   b) Choose the appropriate Type and add a new app server definition.
   c) Click in the row for the new app server in the table to access the **App Server** configuration page.
   d) Use the **Machine** drop-down list to select the corresponding machine.
   e) If the web application server you are adding is a WebLogic managed server, enter the WebLogic managed server name in the **Managed Server Name** field.
   f) Enter additional configuration information as described in Define app servers.
3. Click **Save** to save the configuration information.
4. Set up a staging directory on your Jobsub machine and enter the Banner 9 War File Staging Path on the Application that you defined for the Jobsub machine for your environment.
   The deployment process uses this path to stage the Banner 9 Administrative Pages application for deployment. See Deployment jobs on page 64 for more information about setting up staging directories for Solution Manager automated deployments.
5. Go to the **Applications** tab for the environment.
   a) Click on the row for the Jobsub type Application in the Applications table.
   b) Enter configuration information for the Jobsub Application.
6. Go to the Machine associated with the Jobsub Application, enter the Banner 9 War File Staging Path, and click **Save** to save the configuration information.

Define an Application for the Banner 9 Administrative Pages deployment

Define an Application in Solution Manager for the Banner 9 Administrative Pages application

About this task

Note: Only users with the Admin role may add, delete, and edit configuration information for Applications (see Manage users) for more information).

Procedure

Note: If the Application has not yet been defined in Solution Manager, do so now.

1. Go to the **Applications** tab for the environment.
2. Give the Application a unique name and select the *BXE* type.
3. Click **Add** to add the new Application.
4. Click on the row for the new Application in the Applications table to enter configuration information.
   - Use the **Machine/App Server** drop-down to select the App Server and Machine combination that corresponds to the web application server installed for deployment of the Banner 9 Administrative Pages application.
   - Enter the Banner 9 War File Staging Path from the perspective of the machine on which the transformed pages web application server is installed. This path will be used by the deployment process to stage the Banner 9 Administrative Pages application for deployment.

   See Deployment jobs on page 64 for detailed instructions of how to set up staging directories for Solution Manager automated deployments.
5. Click **Save** to save the Application configuration information.

Environment Configuration

6. Go to the **Env Settings** tab for the environment and enter the required information in the **Define Environment Details** fields.

   This information will be used by the deployment process to configure and deploy the Banner 9 Administrative Pages application.
7. Click **Save** to save the **Env Settings** configuration information.

Enter the Credentials information

8. Go to the **Credentials** tab for the environment. Enter the required information in the Enter environment credentials on page 32 section of this guide.

   This information will be used by the deployment process to configure and deploy the Banner 9 Administrative Pages application.
9. Click **Save** to save the Credentials configuration information.

Kick off Banner 9 Administrative Pages deployments

Kick off deployment jobs after the Banner 9 Administrative Pages deployment settings and associated Application and App Server are defined for the environment.

Procedure

Note: Only users with the Admin role may kick off a deployment job (see Manage users for more information).

Note: For customized Banner 9 Administrative Pages to be deployed automatically by Solution Manager with the Ellucian-released Banner 9 Administrative Pages, follow the instructions in Deploy Banner 9 Administrative Pages customization first.

1. Go to the **Deployments** tab for the given environment and click on the row in the Deployments table that corresponds to the upgrade job you used to install the Banner 9 Administrative Pages upgrade.
2. Select the application server to target for deployment of the Banner 9 Administrative Pages application from the table of application servers.
3. Click on **Start Deployment** to start the deployment job.
4. Go to the **Deployments** tab for the environment and click on the **Monitor** icon to monitor the deployment job.
5. After deployment is completed, check the *Installation Guide* for the Banner 9 Administrative Pages release to see if there are any additional steps that need to be performed following deployment before the application is ready for use.

   Banner 9 Administrative Pages are now accessible by logging into Application Navigator and selecting the desired page.

Banner 9 Administrative Pages customizations

Customization of Banner 9 Administrative Pages releases is performed using the Banner 9 Administrative Pages extensions toolkit provided by Ellucian. The modified and custom pages are then built into an extension JAR file, which must be included in the Banner 9 Administrative Pages WAR file that is deployed by Solution Manager.

After you build the Banner 9 Administrative Pages extension JAR file, Solution Manager can automatically deploy your extensions along with the Banner 9 Administrative Pages release from Ellucian, as long as you place your extension files in the appropriate location in the Banner code tree in a ZIP file (with the appropriate name and structure).

Ellucian Banner 9 Administrative Pages releases are delivered in a set of files named `release-`*`name`*`-`*`version`*`.zip`.

- For the Banner Human Resources and Position Control 9.0. 9.1, and 9.1.1 releases, the *name* portion of the filename is `HumanResources` (for example, `release-HumanResources-9.1.1.3.zip`).
- For the Banner Administrative Pages 9.2.x and 9.3.x releases, which includes Banner General, Student, Finance, Human Resources, Position Control, Document Management and Document Retention, the *name* portion is *Admin* (for example, `release-Admin-9.3.3.4.zip`, and `release-Admin-Student-9.3.3.9.zip`).

Ellucian Banner 9 Administrative Pages releases are delivered into the java sub-directory of the appropriate product in the Banner code tree.

Extension ZIP file name and location

For Solution Manager to automatically deploy your extensions along with the Ellucian Banner 9 Administrative Pages release, your extension JAR files must be packaged in an extension ZIP file with the appropriate file name

The ZIP file must be named `release-`*`name`*`-ext-ID-version.zip`, where *name* matches the name of the Ellucian Banner 9 Administrative Pages release that you are extending, *ext-ID* is an identifier for your extension, and *version* matches the version of the release you are extending. The extension ZIP file may contain one or more extension JAR files. You may create more than one extension ZIP file as long as each has a unique *ext-ID*.

For the Banner Human Resources 9.0, 9.1, and 9.1.1 releases:

- The extension file must be named `release-HumanResources-`*`ext-ID-version`*`.zip`. For example, an extension ZIP file for the Banner Human Resources 9.1.1 release might be named `release-HumanResources-MyHRExt-9.1.1.3.zip`.
- In order for an extension ZIP file to be automatically deployed by Solution Manager it must be located in the *`banner-home`*`/payroll/java` directory, the same directory where the Ellucian-delivered file is stored (where *banner-home* is the value in the Banner Code Tree Path field on the **Env Settings** page in Solution Manager for the environment, commonly referred to as “Banner home”).

For the Banner Administrative Pages 9.2.x and 9.3.x releases:

- The extension file must be named `release-Admin-`*`ext-ID-version`*`.zip`, where *ext-ID* is a unique identifier that is different from any of the product identifiers for release packages that are part of the Ellucian Banner Administrative Pages 9.2.x and 9.2.3 releases and is unique for the Banner product that is extended, and *version* must be at least a three-part version number in the format “9.2.x” or “9.3.x”, depending on which release is being extended. For example, valid extension ZIP file names for extensions of the Finance product for the Banner Student 9.3.3 release (which is delivered as `release-Admin-Student-9.3.3.4.zip`) would be `release-Admin-MyStudentExt-9.3.0.zip`, or `release-Admin-MyStudentExt2-9.3.3.1.zip`.
- If you have multiple extensions, the *ext-ID* portion of the name must be unique within a Banner product directory. For example, two files named `release-Admin-MyStudentExt-9.2.0.zip` and `release-Admin-MyStudentExt2-9.2.1.zip` would be considered two versions of the same extension, and only the higher version number would be deployed. But in the example given in the previous item, both `release-Admin-MyStudentExt-9.3.0.zip` and `release-Admin-MyStudentExt2-9.3.3.1.zip` would be deployed because they each have a unique *ext-ID* portion of the name and so would be considered to be different extensions.
- In order for an extension ZIP file to be automatically deployed by Solution Manager it must be located in the “java” sub-directory of any Banner product directory under Banner home except it must not be under the “upgrades” directory or the “bmui” directory. For example files named *`banner-home`*`/posnctl/java/release-Admin-MyPCExt-9.2.0.3.zip` and *`banner-home`*`/custom/java/release-Admin-MyBanExt-9.3.1.zip` would both be picked up by the Solution Manager deployment logic. A file named *`banner-home`*`/upgrades/general-admin-9020018u/java/release-Admin-MyBanExt-9.2.0.5.zip` would not be picked up for deployment because even though the name is the proper format the directory path in which the file is located contains a directory named “upgrades”. A file named *`banner-home`*`/custom/java/ext/release-Admin-MyBanExt-9.2.1.zip` also would not be picked up because it is not directly in a sub-directory named “java”.

At deployment time, Solution Manager will deploy the JAR files in the extension ZIP file with the highest valid version number that matches the first two version number components of the Banner 9 Administrative Pages release deployed with the same <ext-ID>. For example, when deploying a Banner 9.3.x Administrative Pages release, if there are two files in the *banner-home*/finance/java directory named release-Admin-MyFinExt-9.3.0.5.zip and release-Admin-MyFinExt-9.3.1.zip, the JAR files from the file with the version number "9.3.1" would be deployed because "9.3.1" is a higher version number than "9.3.0.5". A file in the same directory named release-Admin-MyFinExt-9.2.0.1.zip would not be selected for deployment because the first two components of the version number don't match the Ellucian release ("9.3").

Extension ZIP file structure

The JAR files in each extension zip file must be stored in an appropriate directory structure to be automatically deployed with the Ellucian-released Banner 9 Administrative Pages release.

The JAR file names must not duplicate the names of any of the JAR files delivered in the Ellucian releases.

The JAR files in each extension zip file must be stored in an appropriate directory structure to be automatically deployed with the Ellucian-released Banner 9 Administrative Pages release. The JAR file names must not duplicate the names of any of the JAR files delivered in the Ellucian releases.

- An extension ZIP file for the Banner Human Resources 9.0, 9.1, and 9.2 releases may contain one or more extension JAR files and must have the following directory structure:

```
BannerHumanResources
         ext
               WEB-INF
                  lib
                        file-name-1.jar
                        file-name-2.jar
```

- Extension ZIP files for the Banner 9 Administrative Pages 9.2.x or 9.3.x releases may contain one or more extension JAR files and must have the following directory structure (note that this is the same directory structure as the ZIP files delivered by Ellucian as part of the Banner 9.2.x or 9.3.x Administrative Pages releases):

```
BannerAdmin
         ext
               WEB-INF
                  lib
                        file-name-1.jar
                        file-name-2.jar
```

Sample Windows environment setup batch script

Use this script as the Windows environment setup batch template `WinEnvSetup.bat`.

Note: The script name must be changed.

```
REM @echo off
REM ################################################################
REM BANNER_HOME, Banner code tree location
REM Example:
REM SET BANNER_HOME=F:\univ\SMPL
REM ################################################################
SET BANNER_HOME=
REM ################################################################
REM
REM
REM ################################################################
REM ORACLE_HOME, Oracle home path location
REM Example:
REM ORACLE_HOME=E:\Oracle\product\11.2
REM ################################################################
SET ORACLE_HOME=
REM ################################################################
REM
REM
REM ################################################################
REM ORACLE_SID, DB SID on database
REM Example:
REM SET ORACLE_SID=SMPL
REM ################################################################
SET ORACLE_SID=
REM ################################################################
REM
REM
REM ################################################################
REM ICU_HOME, ICU Compile path
REM Example:
REM SET ICU_HOME=F:\icu
REM ################################################################
SET ICU_HOME=
REM ################################################################
REM
REM ################################################################
REM PERL_HOME, PERL home path
REM Example:
REM SET PERL_HOME=C:\Perl
REM ################################################################
SET PERL_HOME=
REM ################################################################
REM
REM
REM ################################################################
REM COBOL_COMP_HOME, COBOL Compiler home path
REM Example:
```

```
REM SET COBOL_COMP_HOME=E:\NetCobol10_1
REM ###############################################################
SET COBOL_COMP_HOME=
REM ###############################################################
REM
REM
REM ###############################################################
REM COBOL_HOME, COBOL Library path
REM Example:
REM SET COBOL_HOME=C:\Program Files\Common Files\Fujitsu\NetCOBOL
REM ###############################################################
SET COBOL_LIB_HOME=
REM ###############################################################
REM
REM
REM ###############################################################
REM VS_VC_PATH, Visual Studio's Visual C path
REM Example:
REM SET VS_VC_PATH=D:\msvc8\VC
REM ###############################################################
SET VS_VC_PATH=
REM ###############################################################
REM
REM
REM ###############################################################
REM MS_SDK, Microsoft Software delevopment kit path
REM Example:
REM SET MS_SDK=D:\msvc8\SDK
REM ###############################################################
SET MS_SDK=
REM ###############################################################
REM
REM
REM ###############################################################
REM VC_VER, Microsoft Visual Studio batch script to set environment
REM variables
REM Example:
REM SET VC_VER=vcvars32.bat
REM ###############################################################
SET VC_VER=
REM ###############################################################
REM
REM
REM ###############################################################
REM ProC's default configuration path
REM Example:
REM PROC_DFLT=PROC config=E:\Oracle\product\11.1\precomp\admin
\pcscfg.cfg
REM ###############################################################
SET PROC_DFLT=PROC config=
REM ###############################################################
REM
REM
REM ###############################################################
REM ProCOB's default configuration path
REM Example:
```

```
REM PROCOB_DFLT=PROCOB config=E:\Oracle\product\11.1\precomp\admin
\pcbcfg.cfg;F:\univ\SMPL\alumni\plusccob7.cfg
REM ################################################################
SET PROCOB_DFLT=PROCOB config=
REM ################################################################
REM
REM
REM ################################################################
REM Please do not modify the below settings.
REM ################################################################
SET BANNER_C_COMPILER=MSVC
SET BANNER_COB_COMPILER=FJS
SET BANNER_COBPREF="perl banfjsv.pl "
SET BANNER_COBSUFX=exe
SET BANNER_PATH_POS=END
SET NLS_LANG=AMERICAN_AMERICA.AL32UTF8
REM ################################################################
SET BANNER_PROC_INC=INCLUDE=%BANNER_HOME%\proc_inc
SET BANNER_EXE=%BANNER_HOME%\general\exe
SET BANNER_STUDENT_DATA_HOME=%BANNER_HOME%\student
SET BANNER_WORK_DIR=%BANNER_HOME%\temp
SET BANNER_FINAID_DATA_HOME=%BANNER_HOME%\finaid
SET BANNER_JOBSUB_HOME=%BANNER_HOME%\jobsub
SET BANNER_PATH=%BANNER_HOME%\general\misc;%BANNER_HOME%\baninas\misc;
%BANNER_HOME%\finaid\misc;%BANNER_HOME%\student\misc;%BANNER_HOME%
\alumni\misc
SET LIB=%MS_SDK%\Lib\x64;%ORACLE_HOME%\lib;%COBOL_LIB_HOME%
REM ################################################################
SET PERL5LIB=%BANNER_HOME%\general\misc
REM ################################################################
SET PRO22=%ORACLE_HOME%\precomp
SET PRO18=%ORACLE_HOME%\precomp
SET INCLUDE=%ICU_HOME%\include;%MS_SDK%\Include
SET SQLPATH=%BANNER_HOME%\general\misc;%BANNER_HOME%\general\plus;
%SQLPATH%
SET FORMS_PATH=%BANNER_HOME%\winfmx
SET TNS_ADMIN=%ORACLE_HOME%\NETWORK\ADMIN
SET BANNER_COBOL_LINK_PATH=%COBOL_COMP_HOME%
SET COBLIB=%COBOL_COMP_HOME%
SET PATH=%ICU_HOME%\bin;%PERL_HOME%\bin;%ORACLE_HOME%\BIN;
%COBOL_COMP_HOME%;%BANNER_HOME%\general\exe;%BANNER_HOME%\general\misc;
%MS_SDK%\Bin\x64;%BANNER_HOME%\plus
REM ################################################################
call "%VS_VC_PATH%\bin\%VC_VER%"
```

Banner environment provisioning

Solution Manager allows for the provisioning of a Banner environment or provisioning a new application to an existing Banner environment.

New Banner environment provisioning

Solution Manager allows for the installation of a complete Banner environment, including the operating system and infrastructure software and Banner ERP software, onto a set of physical or virtual machines (VMs) pre-allocated with appropriate hardware resources.

Note: Only users with the Admin role may provision new Banner environments (see Manage users for more information).

The installation process is referred to as "provisioning the environment". The environment is provisioned based on a provisioning template (referred to as "template") that contains provisioning scripts and content files. Solution Manager allows for the automatic download of provisioning templates, associated scripts, and content files from the Solution Manager Release Services hosted on ellucian.com.

Appropriate hardware resources include items such as CPUs, memory, disk storage, and network interface cards.

For information about preparing Solution Manager for provisioning new Banner environments, see "Configure Solution Manager for Banner environment provisioning" in the *Solution Manager Installation and Configuration Guide*. For more information about the specific hardware and software requirements for a specific Banner environment provisioning template, see the documentation for that template, available in the Ellucian Solution Manager Documentation Library in the Ellucian Support Center.

Note: Although Solution Manager supports accessing Jenkins through a secure (HTTPS) connection (See "Configure Jenkins for secure (HTTPS) connections" in the *Solution Manager Installation and Configuration Guide*) for installing and deploying updates to a Banner environment, during provisioning, the Jenkins master on the Solution Manager Admin Server needs to be configured to be accessed through HTTP (not HTTPS). Modify the jenkinsUrl property in the `config.properties` file to use HTTP rather than HTTPS (see "Configure Solution Manager for Jenkins" in the *Solution Manager Installation and Configuration Guide*). After provisioning the new environment is complete, you may reconfigure Jenkins to require secure (HTTPS) connections and modify the jenkinsUrl property in `config.properties` to use HTTPS.

Note: If the provisionCleanup flag is not present or is set to anything other than "Yes" in the `config.properties` file for the Solution Manager application (`/u01/adminApp/config.properties`), then all of the provisioning scripts will be left in the provisioned environment for diagnostic purposes. These scripts contain passwords. If the provisioning scripts are to be deleted as a final step in provisioning, set the cleanup flag by adding the line "`provisionCleanup=Y`" to the `config.properties` file before provisioning an environment. If the script artifacts are left in place when provisioning an environment, you must manually remove these files to remove the leftover information. These files are in the Jenkins workspace directory (`/u01/Jenkins/workspace`) for each provisioned application.

Environment provisioning modes

Solution Manager supports two modes for provisioning an environment. The two modes are full provisioning and OS-installed provisioning.

You choose whether to use the full provisioning mode or the OS-installed provisioning mode (with the operating system already installed) when you enter the configuration information into Solution Manager for the machines in the environment to be provisioned, as described in Configure an environment.

Full provisioning

Full provisioning mode provisions software, including the operating system, on machines that don't have any software installed except for a BIOS.

The first mode, referred to as full provisioning mode, provisions the software, including the operating system, onto machines that have no software installed except for a BIOS with pxe-boot capability. This mode requires using a separate, virtual private network for each managed environment, with the Admin Server having separate connections to each environment's private admin network. During provisioning, the Solution Manager Admin Server acts as the DHCP server on the private network and responds to the pxe-boot of each machine to initiate the download and installation of the operating system on each machine (a process called "kickstarting" the machine).

The private admin network also ensures that administration and transactional communications within each environment are not visible to the admin networks of other environments or to the general institutional network. For non-critical environments, a single private admin network for multiple environments can be used, with the Admin Server having a single connection to the network. Ensure that each machine in each environment has a unique address on the private admin network.

See the documentation for the specific Banner environment provisioning template that you have selected, available in the Ellucian Solution Manager Documentation Library in the Ellucian Support Center, for specific information about the hardware and software requirements for that template for each provisioning mode.

Note: When you provision an environment in the full provisioning mode, the `jenkinsUrl` property in the Solution Manager `config.properties` file must use the IP address, rather than the hostname, of the Solution Manager Admin Server. The IP address used should be the IP address of the network interface on the Solution Manager Admin Server that connects the Admin Server to the private network that contains the VMs for the environment to be provisioned. That should be the same IP address that is specified as the **Admin Server - Private Network IP** address on the **Env Settings** page for the environment to be provisioned.

OS-installed provisioning

OS-installed provisioning mode provisions application software onto machines that already have the operating system installed.

The second provisioning mode supported by Solution Manager, referred to as "OS-installed provisioning", requires you to pre-install the operating system on each machine in the environment to be provisioned. Solution Manager then uses SSH to connect to each machine initially during provisioning to finalize the configuration of the machine and install a Jenkins agent before initializing the provisioning steps which install the application software in the environment.

OS-installed provisioning does not require a private admin network connecting the Solution Manager Admin Server to the machine in the environment, but Solution Manager still refers to the connections between the Admin Server and the machines in the environment as the "Private Admin Network" in the forms used to configure the environment.

See the documentation for the specific Banner environment provisioning template that you select, available in the Ellucian Solution Manager Documentation Library in the Ellucian Support Center, for specific information about the hardware and software requirements for that template for each provisioning mode.

Note: Some of the provisioning scripts that are generated by Solution Manager to execute on the machines being provisioned during OS-installed provisioning need to connect to Jenkins on the Solution Manager Admin Server, and the URL used to connect to Jenkins is whatever is specified in the `jenkinsUrl` property in the Solution Manager `config.properties` file (see "Configure Solution Manager for Jenkins" in the *Solution Manager 1.12 Installation and Configuration Guide*) when the provisioning process is started. Ensure that the Jenkins URL specified in the `config.properties` file is a valid reference to the Solution Manager Admin Server from the perspective of the machines to be provisioned, specifying either a valid IP address for the Admin Server, or a hostname that will be defined in the `/etc/hosts` file on the machines being provisioned or that will resolve correctly by DNS. If you use a different Jenkins URL with Solution Manager for applying upgrades to environments you may reset the `jenkinsUrl` property when provisioning the new environment is complete.

Environment provisioning preparation

The following steps must be complete to prepare for provisioning a new environment.

1. Ensure that you have a set of virtual machines defined or physical machines installed with the necessary specifications and network topology. To get the full requirements for the hardware, software, and network topology for the environment you want to provision, see the

documentation that accompanies the template that you plan to use for provisioning, along with the *Ellucian Solution Manager Installation and Configuration Guide*.

2. Determine which subnet address will be used for the virtual private network (that will serve as the admin network for the environment) if you plan to use the full provisioning mode.
3. Determine which IP addresses and host names are to be assigned to the Admin Server and to each of the environment machines on the admin network.
4. Assign IP addresses and host names to the environment application server endpoints exposed on the institution network (the "public network").

Note: Record this information so that it is available to enter into Solution Manager during the provisioning configuration process.

Provision an environment

Provision a new Banner environment.

About this task

The process of "provisioning" the environment entails installing Banner ERP software, including Oracle database software and required application server software, optionally including the operating system and infrastructure software if you choose the full-provisioning mode, onto a set of physical or virtual machines that have been pre-allocated with appropriate hardware resources (CPUs, memory, disk storage, and network interface cards).

Procedure

1. Add the new environment in Solution Manager.
2. Enter appropriate configuration information for the environment.
3. Tell Solution Manager to provision the environment, which generates kickstart or configuration scripts for all environment machines and a series of provisioning jobs that install Banner and all of the required infrastructure software for the Banner environment.

   The kickstart or configuration scripts are tailored for each machine in the environment. Each kickstart or configuration script installs the OS (if the full provisioning mode is chosen) and certain common infrastructure software, including a Jenkins remote job execution agent, on the target machine according to its role in the Banner environment and configures the machine according to its role in the Banner environment.

   The series of provisioning jobs that installs Banner into the environment installs additional required infrastructure software (such as Oracle database, Oracle Fusion Middleware, single sign on, and LDAP) and the Banner database schema and programs on each machine as appropriate for that machine’s role in the environment.
4. After generating the provisioning scripts and jobs (which occurs when you kick off provisioning) if the full provisioning mode is chosen you must pxe-boot each machine from the private admin network interface so that it gets the operating system installled with the appropriate kickstart script.

In this mode the Admin Server serves as the DHCP server for the private admin network to assign each environment machine the appropriate IP address (based on the MAC address of the network adapter that connects the machine to the private admin network) and as the TFTP server for the kickstart scripts.

After each machine is kickstarted, it connects to the Admin Server, and the Admin Server starts the series of provisioning jobs through Jenkins to install the appropriate Banner components on each machine according to its role in the Banner environment.

If you chose the OS-installed provisioning mode, when you kick off provisioning, the Admin Server connects to each machine you configured for the new environment through SSH using the configuration information, including the root password that you entered for the machine. This executes a configuration script that sets the machine up for the provisioning jobs, including installation of the required Jenkins remote job execution agent, before starting the provisioning jobs through Jenkins that install the Banner system.

Templates

Review information about the template to be used for defining, populating, or provisioning an environment.

Solution Manager uses a template to provision an environment (referred to as a “provisioning template”). The template provides the information needed by Solution Manager to define the environment configuration and to install the software needed to provision a Banner environment on the targeted machines. Templates can be designed for different environment configurations, and each template has its own specific hardware and networking requirements, and specifications for the operating system version and configuration that needs to be pre-installed on the machines in an environment to be provisioned if you choose the OS-installed provisioning option. Templates are downloaded automatically when you download new releases with Solution Manager. Each template has associated documentation that you can get from the Ellucian Support Center Documentation Library, under Solution Manager. Each provisioning template also requires you to download provisioning content files.

Acquire template content

About this task

Acquire the content files associated with the provisioning template.

Procedure

Note: Only users with the Admin role may view and edit template information (see Manage users for more information).

1. Select **Templates** to view templates that you have downloaded.
   If the **Templates** table does not display any rows, click **Refresh Templates** at the bottom of the page.

2. Click anywhere except in the **View XML** column on the row for the template in the **Templates** table to access the **Template Contents** page to acquire the content files associated with the provisioning template.

Set up an environment

Add an environment definition to Solution Manager to use for provisioning a new environment. Then define and configure the environment for provisioning.

About this task

Note: Only users with the Admin role may add an environment (see Manage users for more information).

Note: Upon opening Solution Manager, the **Environments** and **System Settings** will be empty.

Procedure

1. From the **Solution Manager** options, select **Environments**.
2. Click **Add**.
3. Provide the environment details:

Table 18: Add environment fields

Field	Description	Sample Data
Environment name	Specify a name for the environment.	TEST
Description	Enter an environment description.	Banner test environment
Environment type	Select **Add New Environment Definition for Provisioning a New Banner Environment**.	
Template	Choose a template from the list to use for provisioning the new environment.	BannerXE-US-EN-WL-1.4

Configure an environment

Define and configure an environment for provisioning.

About this task

Only users with the Admin role may define and configure an environment for provisioning (see Manage users for more information).

Procedure

1. Enter the relevant environment configuration information for the environment being provisioned by selecting the **Env Settings** tab.

   Note: On the **Env Settings** page, the **Environment Type** field displays "Existing" if the environment was added to Solution Manager as an existing environment. It displays "New" if added as a new environment to be provisioned. If added as a new environment to be provisioned, the **Template** field displays the name of the provisioning template selected when the environment was added.

   Table 19: Configure environment fields

Property	Description	Sample Data
Description	Displays the information that was entered when adding the environment to the Solution Manager configuration database. You can change the description.	`Banner environment MO13036`
Environment Type	Displays the environment type.	`New`
DB SID	Enter the SID name you want to use for the Oracle database instance in the environment to be provisioned.	`SMPL`
Admin Server - Private Network		
Subnet	Enter the IP subnet for the network that connects the Admin Server to the machines in the environment to be provisioned	`192.168.100`
Network IP	Enter the IP address of the Admin Server on the admin network that connects the Admin Server to the machines in the environment to be provisioned.	`192.168.100.101`
Gateway IP	Enter the gateway IP address of the admin network (should be the same value as the Network IP field.).	`192.168.100.101`
Environment Appservers - Public Network		
Domain	Enter the domain name that will be used to access the application servers in the environment to be provisioned.	`ellucian.com`
Subnet	Enter the IP subnet for the network that will be used to access the application servers in the environment to be provisioned.	

Property	Description	Sample Data
Gateway IP	Enter the gateway IP address of the network that will be used to access the application servers in the environment to be provisioned.	
Environment Status	Displays the environment status.	`Unprovisioned`
Environment Configuration		
Is Cascade used (Y/N)	Not used during environment provisioning.	`Y`
Banner 9x Help URL	Not used during environment provisioning.	
Identity Services URL	Not used during environment provisioning.	
Application Navigator URL	Not used during environment provisioning.	

2. Select **Save**.

Machines

Update configuration information for the machines in the environment you are provisioning.

Note: Only users with the Admin role may add, delete, and edit configuration information for machines (see Manage users on page 9 for more information).

Each machine can have either private only or both private and public network information associated with it, depending on the machine type.

The machines for the environment are initially defined by the provisioning template, but you need to provide the network connection information for each machine based on the hardware environment you have provided for provisioning.

In some cases you may need to add a new machine definition during provisioning if directed to do so by the provisioning template documentation. To add a new machine, click **Add** on the **Machines** page.

Configure a machine

Configure a machine in an unprovisioned environment.

Procedure

1. Click in a row from the **Machines** tab to configure an existing machine.
2. Provide configuration information for the machine.

3. Enter the required configuration information for the machine, then click **Save**.

Table 20: Configure machine fields

Property	Description	Sample Data
Machine Role	Displays the role of the machine. DB: The machine will be provisioned as the Database server. Jobsub: The machine will be provisioned as the Jobsub server. App: The machine will be provisioned as an application server.	Jobsub
Network Type	Displays the network type of the machine.	internal
Machine Status	Set the machine status: • Unprovisioned: An empty machine that Solution Manager kickstarts when the machine is pxe-booted during provisioning to install the OS and required infrastructure software, including the Jenkins provisioning agent. • OSInstalled: Machines that already have an operating system on them. Solution Manager uses SSH to connect to the machine to perform post configuration processes (this requires a root password to connect to the existing root account). The post configuration process will update configuration information on the machine and will reboot several times before the machine is ready to start executing provisioning jobs. • Ready: This status is only used for configuring machines in an existing environment and should not be used when configuring machines for environment provisioning. **Note:** Before provisioning, all machines in an Unprovisioned state must have the Admin Host Name, Admin IP, and Admin MAC properties completed. All machines in the OSInstalled state must have the Admin Host Name, Admin IP, and Root Password properties completed.	Ready
Admin (Private) Network Host Name	The machine host name on the admin network.	m019036-jobsub
IP	The admin network IP address for the machine.	149.24.19.36
MAC Address admin network	The MAC address of the network card connecting the machine to the admin network. (Only used for machines in the Unprovisioned state.)	149.24.19.36

Property	Description	Sample Data
Root Password	Enter the root password for the network. (Only used for machines in the OSInstalled state.	
Bash Shell Path	Not used for provisioning.	
Public Network Host Name	This field only appears if the Machine Role is defined as App. Enter the host name for the machine on the public network used by users to access the application server machine. If the public network is the same as the admin network used by Solution Manager to communicate with the machine, enter the same host name you entered for Admin (Private) Network Host Name. Note that this hostname should not include the domain name you specified for the Public Network on the Env Settings configuration page. For example, if the fully qualified hostname of the machine is appserver1.myinstitution.edu, and you entered myinstitution.edu as the Public Network Domain on the Env Settings configuration page, enter only `appserver1` here. When Solution Manager uses the Public Network Host Name to configure software that needs to access the machine through the public network it will combine the Host Name you specify here and the Domain you specified on the Env Settings configuration page.	`appserver1`
Public Network IP	Enter the IP address of the machine on the public network. If the public network is the same as the admin network, enter the same IP address you entered for the Admin (Private) Network IP field.	149.26.17.101

Kick off environment provisioning

Use the Kick Off Environment Provisioning form to start the provisioning process after defining and configuring an environment. Ensure that all configuration information is accurately entered for the machines in the target environment before kicking off environment provisioning for the new environment.

Procedure

1. Select **Environments** from Solution Manager options, .
2. In the list of available Environments, click the **Provision** icon associated with the new unprovisioned environment.
3. Complete the required fields.

Table 21: Kick off environments fields

Property	Description	Sample Data
Kickstart OS Dir	Specify a path to the directory where the operating system installation file is stored. The Kickstart OS Dir should not be changed unless the documentation associated with the provisioning template you selected when you added the environment directs you to do so.	`/u02/installs/oel5/58`
Reboot After Kickstart	Select the check box to reboot the machines automatically after they are kickstarted. Otherwise, unselect the check box so that you can manually control the reboot sequence.[2] This option is only relevant if you choose the full provisioning mode, rather than the OS-installed provisioning mode.	Selected
Disk Type	Select an appropriate disk type for the machines you are provisioning. The only supported option at this time is “scsi”.	scsi
Kernel Type	Select an appropriate Kernel type for the VMs being provisioned. The only supported option at this time is “standard”.	standard
Autostart Jobs	Specify whether or not to autostart provisioning jobs. If the check box is cleared, you will need to start the provisioning jobs manually when the machines have all been kickstarted (if using full provisioning) or configured (if using OS-installed provisioning).	Selected

4. Click **Start Provisioning** to generate the configuration scripts and provisioning jobs for the environment being provisioned.

   If you provision with the full OS installation option (machine status “Unprovisioned”), you need to manually PXE boot each machine, as described in Use VMWare to provision an environment. When each machine is PXE booted, a kickstart script tailored for that machine installs the OS including execution of some configuration scripts and installation of a Jenkins provisioning agent. When that process completes, the Jenkins provisioning job(s) for that machine starts automatically if you have selected the Autostart Jobs option. The documentation accompanying the provisioning template tells you what order to PXE boot the machines to optimize the provisioning sequence.

   If you provision machines with the OS already installed, Solution Manager connects through SSH to each machine with a status of OSInstalled to install a Jenkins provisioning agent and perform some configuration tasks and then starts the Jenkins provisioning jobs.

[2] In VMWare, use the default value of “Reboot after kickstart”= checked. Solution Manager should be allowed to control the reboot sequence.

The Provisioning Monitor page opens in a new browser tab. The monitor does not display anything until the machines in the environment are all kickstarted or configured and starting to run their provisioning jobs. There is no way to monitor the VMware pxeboot/kickstart and OS configuration processes from Solution Manager.

5. **Optional:** Monitor the provisioning jobs.

   The display will return to the Environments page, where the status of the new environment is now set to "Provisioning in Progress".

Environment machines start up

After jobs are provisioned, start the machines for the environment.

If you chose the full provisioning mode, pxe-boot each machine from the private admin network (if you are using VMs, boot the machines from the VM manager) to access the kickstart script for the machine which loads

- the operating system

  and

- the Solution Manager required infrastructure software onto the machine then registers the Solution Manager administration agent on the machine with the Admin Server.

If you chose the OS-installed provisioning mode, make sure that each machine has started and is ready to accept SSH logins from the Admin Server so that Solution Manager can run the machine role specific configuration scripts generated when you kicked off environment provisioning on each machine.

Virtual machine-specific information

You can set VMware, the VMs to boot from the network interface that is on the private virtual network, then fall through to boot from the disk drive if the network boot times out. With that setup, you power on the VM and then access the console.

The console should show the VM acquiring its IP address on the admin network from the Admin Server acting as the DHCP server on the admin network, and then display a "boot" prompt as it boots from the admin network interface.

Pxeboot machines

Configure virtual machines to pxeboot.

Procedure

1. Go to the console on the database server to access the BIOS configuration screen for the VM.
2. Set the machine to boot from the network.
   a) Access the BOOT menu.

b) Use the up/down sequence to move the network interfaces (intel e1000) to the top of the list.

3. Press **F10** to save and exit the BIOS screen.
4. Type `linux` in the boot: field after encountering the BIOS prompt.
5. To begin the kickstart process, press **Enter**.

   See Get started with VMWare on page 94

   During the kickstart process, the virtual machine reboots several times. Each time after the initial reboot, the virtual machine pauses at the boot: prompt for about 15 seconds before booting from the disk drive.

   After a VM has registered itself with the Admin Server, then any provisioning jobs for that machine can be run by Solution Manager.
6. Start each of the machines in the order prescribed in the provisioning template documentation.

Monitor provisioning jobs

Monitor provisioning jobs and review the status of each job.

Procedure

1. Click the **Monitor** icon on the environment being provisioned.

   The **Provisioning Monitor** page appears. The status column indicates the status of each provisioning job.

Status Icon	Description
	The provisioning job has not yet started.
	The provisioning job is in progress.
	The provisioning job completed successfully.
	The provisioning job failed. **Note:** If a provisioning job fails and you reset the environment to kickoff provisioning again by PXE booting any machines, then you need to ensure that the machine statuses for those machines is set back to "Unprovisioned" in Solution Manager before kicking off provisioning.
	The provisioning job is complete.

2. Control the refresh rate of the screen by changing the refresh interval in the **Auto Refresh (secs)** field, then click **Refresh**.

New provisioned environments access

When provisioning jobs are complete, and you have completed any post-provisioning instructions in the documentation that is associated with the provisioning template you selected when you added the environment to Solution Manager, the newly provisioned Banner environment will be ready for use.

Completed provisioning jobs can be viewed by clicking on the Monitor icon in the row for the environment in the Environments table.

To begin managing the new environment with Solution Manager, including processing upgrades and deployments, click anywhere in the row for the environment in the Environments table to access the Environment page. Use the navigation tabs on the Environments page to view installed and available releases, add additional Machines, App Servers, or Applications to the environment or modify configuration information for any of those, and install and deploy upgrades. Select the Links tab to access Banner components in the environment, as described in the documentation associated with the provisioning template you selected when you added the environment to Solution Manager.

Using VMWare to verify VMs ready for environment provisioning

A system administrator can use the VMWare console to access and configure the settings particular to provisioning that will ensure that the VMs will come online. Provisioning can then begin through use of the Solution Manager server provisioning functionality.

Get started with VMWare

The VMWare console contains a list of available machines that you can access to configure the settings for provisioning. This will ensure that the VMs come online.

Procedure

1. Access the **Summary** tab.

   View an empty VM shell that was set up by IT with memory, CPU, and disk space allocated. These specifics needed are documented in *Ellucian Solution Manager Installation and Administration*. The VMWare administrator at your client site will create this.

2. View Oracle Linux installed on a VM.

   VMs that will be fully provisioned by Solution Manager start without an operating system installed. Solution Manager will install the operating system during the pxeboot/kickstart of the machine unless you specifically want to add an operating system and set the machine to the “OSInstalled” state within Solution Manager to force a machine to be configured using SSH instead of pxeboot.

3. Go to the **Commands** > **Edit Settings** tab.

   Network adapters are defined for this virtual machine (VM). The two-network configuration example is for an appserver type. (Other server types may have single network configurations.)

Note: The two machines can communicate with one another, but outside servers cannot go through VLAN38 to access the servers on the internal network.

- The internal network adapter (for example, OSD_VLAN908) is defined with addresses that are not route-able and also contains the Solution Manager Admin Server.
- The VLAN38 network adapter is publicly accessible unless blocked by a firewall. This is the public network for the environment's VMs.

You can set up the internal network as shared across multiple ESX servers. If you did not configure the internal VLAN (for example, OSD_VLAN908) to span ESX servers, then the VMs must all live on the same ESX server.

Note: The network adapters must be added in a particular order. The publicly accessible adapter must be set up after the internal network adapter.

4. Verify that the Adapter Type is set to E1000.
   E1000 is the only Adapter Type that works with Solution Manager.
5. Write down the MAC address.
   The MAC address is necessary to provide appropriate boot information.
6. Go to **Edit Settings** > **Advanced** > **Boot Options** and select the check box that corresponds with the **Force BIOS Setup** option.
   Before booting a server for the first time, check that it is capable of booting from the network, rather than just from the hard disk. Then when you access the BIOS settings, you can modify the boot order of the VM to specify that it will boot from the network.
7. Click **OK**, then provision an application server to ensure that it goes online.

New application provisioning to an existing environment

You can provision a new application using Solution Manager in an existing Banner environment.

Note: Only users with the Admin role may provision a new application to an existing environment (see Manage users).

The environment must be in the "Ready" state. Execute either **Add a New Environment for Provisioning** or **Add an Existing Environment to Solution Manager**. After the environment has been provisioned using Solution Manager, follow the procedure.

Prerequisites

Review the items below before beginning the provisioning process.

Procedure

1. Select **Environments** and click **Get New Releases**.

2. Select and download an application provisioning template.
   For example, "bnr_svr_provision".
3. After selecting **Templates**, click on the row for the application provisioning template.
4. Download the template contents using either the **Get Local** option or by selecting the **Get From Ellucian** option.
5. After all of the content is downloaded, select **Mark Template Active**.
   The template appears in the Application Provisioning workflows.

Provision a new Banner application

An environment that displays a status of "Ready" can have an application provisioned to it.

Procedure

1. After selecting the **Environments** tab, click in the **Provision** column for the selected environment.
2. Choose an application provisioning template from the drop-down list. A template may provision one or more Applications to the environment.
3. Enter a name for each new Application to be provisioned. The template may require one or more existing Applications during the provisioning process.
4. If the template prompts for existing Applications, select the existing Application(s) that the template uses during provisioning. The existing Application(s) that are referenced by the template must have a Solution Manager agent that is online when provisioning is kicked off, as provisioning steps may execute on these systems.
   A template may contain additional properties. These properties could be application-specific or environment-specific, or simply specific to that provisioning job.
5. Click the **Setup Server Provisioning** button.
   This sets the environment to an "Application Provisioning Pending" status and defines the entries for the new Applications that will be provisioned.
6. Go to those new Machines and Applications to define all of the relevant properties.

   Warning! Even if you previously specified properties, you may need to define new properties. Selecting a new template for provisioning could add new fields to these pages that are required by the provisioning process.

7. Return to the **Environment Settings** page and to all of the existing Application pages to specify any new fields that appear.

   Warning! Even if you previously specified properties, you may need to define new properties. Selecting a new template for provisioning could add new fields to these pages that are required by the provisioning process.

8. On the **Provision** page, complete the provisioning fields.
9. Clear the check box for any Goals that can be skipped during the provisioning process. This is advanced functionality and should only be used when requested by Ellucian support staff.

A template may contain additional properties. These properties could be application-specific or environment-specific or simply specific to that provisioning job.

10. Select the **Kickoff Application Provisioning** button to start the application provisioning process. It may take several minutes before the first job starts up and appears in the **Monitor Provisioning Jobs** page.
    - For an OSInstalled application, SSH will run automatically then run the Solution Manager agent. The machine will come online to do its provisioning.
    - For the kickstart through PXE Boot option (no OSInstalled), consult Using VMWare to Provision an Environment.
    - The environment will show a status of "Application Provisioning in Progress".
11. Click the **Monitor** icon for the environment on the **Environments** page to monitor the provisioning progress. When complete, the environment will revert to a "Ready" state.

Use VMware to provision a new Banner application

Return to the Solution Manager Admin Console to an environment in a “Ready” state.

Procedure

1. Click the **Provision** icon for an environment in the Ready state from the **Environments** page and add a new Application to the environment by selecting an appropriate Application provisioning template from the drop-down list.

   The environment will enter a Server Provisioning Pending state.

   Tip: Additional Applications, App Servers, or Machines may be added to the environment based on the application provisioning template chosen (see the documentation accompanying the template you selected for details of what the template adds to the environment).

   Configure any new Machines (see Machines), Applications, or App Servers required for the application provisioning template. (see the documentation accompanying the template for additional information regarding required configuration information).
2. Return to the **Provision** page by clicking on the **Provision** icon in the row for the environment in the table on the **Environments** page.

   See the documentation accompanying the application provisioning template for information about the data to enter for the fields on this page.
3. Select **Kickoff Server Provisioning**.

   The status changes to "Server Provisioning in Progress".

   For an OSInstalled server, ensure that the machine is booted and ready to accept SSH connections so that Solution Manager can automatically run SSH to configure the machine and install the Jenkins agent. Then the machine will come online to execute any required provisioning steps.
4. If you choose full provisioning mode for any new machines, return to the VMware console.
   a) Select the machine to boot from the menu. Click on it and select **Open the Console**. Repeat this sequence for all of the machines that need to be booted.

b) Select the **Play** icon and **Power On**.

If you have the system set to force boot to BIOS on the next startup, continue with step 4.c on page 98. Otherwise, skip to step 4.e on page 98.

c) Click within the window to control the virtual machine.

d) On the Boot tab, move "Intel E1000" to the top of the list.

e) Click **Save** and **Exit**.

f) Enter `linux` at the boot prompt and select **Enter**.

This initiates the kickstart process, with the operating system installation files being pulled from the Solution Manager server. Several reboots occur as the post installation processes occur. Then the machine comes online in Jenkins awaiting its Solution Manager jobs and provisions the IDM service.

Warning! You must repeat the same set of instructions for each machine in VMWare as described in step 4 on page 97.

5. Click **Save** and **Exit**.

You can now use the Monitor Provisioning Jobs functionality in Solution Manager.

Self-update feature

Update the Solution Manager application with the latest upgrade release using the Solution Manager self-update feature.

About this task

You can choose to download all of the new releases available to your current Solution Manager version including updates to Solution Manager by selecting **Get New Releases** on the Environments page (see New releases available for download on page 41 for more information) or download only the latest updates to Solution Manager by selecting **Get Latest Updates** on the **System Updates** page. In either case, updates to Solution Manager will download, including the latest updates to BMUI and templates for the version of Solution Manager that you are currently running in addition to any available new versions of Solution Manager.

Note: If you select **Get New Releases** on the Environments page, all available new Banner releases will download before the Solution Manager updates. This may take a long period of time depending on the number of new Banner releases that are available for download.

Procedure

You may download the latest updates to Solution Manager from either the Environments page or the System Updates page. This steps listed below describe how to download the latest updates to Solution Manager from the System Updates page.

Note: Only users with the Admin role may download new releases (see Manage users on page 9 for more information).

1. Log in to Solution Manager and select the **System Updates** tab.

   This page displays all available updates for Solution Manager.
2. Click on **Get Latest Updates** to update the list and download the latest available updates.

   A download progress page that monitors the progress of checking for and downloading updates opens. The download log summary lists only available Solution Manager and BMUI updates.

   To control the refresh rate of the screen, adjust the refresh interval in the **Auto Refresh (secs)** field, then click **Refresh**.

   When the download is complete a `Download Complete` message appears on the **Monitor** page. If a new version of Solution Manager has been downloaded a message appears to alert you that a new version is available.
3. To view the latest updates, close the download progress tab and go back to the **System Updates** page. Click **Refresh List**.

   The newly available system updates appear in the system updates list.
4. Select the release that you want to install. Ellucian recommends upgrading to the latest release with the highest build number.
5. Click the **Rel Doc** icon to review the related documentation
6. Click **Perform Update**

The application shuts down while the update is in progress and displays an `Upgrade in Progress` message. No further action is necessary while the update is in progress.

Note:

Ellucian recommends that you do not click on the page while the update is in progress as this may result in a `404 Not Found` error.

If an error occurs, a backup of the war file can be restored manually. A backup of the war file is made before the update begins and is located in the persistence directory (normally `/u01/adminApp`) on the Admin Server under `EsmUpgradesStage/StageBackup/`.

If you are unable to access Solution Manager after an upgrade attempt and find that Tomcat is not running, you should attempt to restart the program.

When the update is complete, the page refreshes and displays the login page for the updated application.