Technical Guide



Upgrade Capability

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1. Overview

The purpose of this document is to detail all aspects of the Upgrade capability design and implementation as it relates to the <CUSTOMERNAME> - <PROJECTNAME> project. This document is for use by the <PROJECTNAME> project manager, <DELIVERYORG> technical specialists and <CUSTOMERNAME> IS and IT teams.

This document includes the design of features to support the Upgrade capability design including:

* Feature Upgrade
* Core Upgrade
* Upgrade Approach

1. Technical Design

This section outlines the design options, customer decisions and configuration for the capability.

The design of this service identifies the appropriate configurations, customer and external services that are required to successfully implement and operate the Upgrade capability.

The design comprises of three key areas:

* Core infrastructure dependencies – all dependent services required for capability to operate.
* External prerequisites – all external prerequisites in the System Center Configuration Manager offering.
* Design – details each of the features of the capability, including decisions and configuration parameters as discussed and captured through the design workshop for this capability.

The table below identifies key decisions that impact the overall implementation and ownership of the capability:

|  |  |  |
| --- | --- | --- |
| Decision | Justification | Impact |
| In-Place Upgrade of System Center 2012 environment will be conducted | Existing environment can support an In-Place Upgrade | Medium – Once upgrade has been initiated, any rollback tasks must be managed using source environment DR process |
| Site System Operating System versions do not require upgrade | All Site Systems currently run supported Operating System versions | N/A - No impact on the environment |
| Site Database SQL does not require upgrade | Site Database currently run supported SQL Server versions | N/A – No impact on the environment |
| Active Directory does not require update to Functional Leve | Active Directory is already running at Server 2008 R2 functional level or greater | N/A – No impact on the environment |
| WSUS will be updated to support native Windows 10 servicing | This provides the best Windows 10 servicing experience | Low – WSUS 4 KB3095113 Must be installed on all Software Update Points and Site Servers |
| Service Connector Point running in Online mode | Online mode provides the simplest management experience if the SCP server has connectivity to the internet | Low – Negligible performance impact on Site Server running this new role |
| Service Connector Point implemented on top-level site server | There can only be one SCP in the environment and installation on the Site Server provides simplest management solution (if the Site Server has internet access) | Low – Negligible performance impact on Site Server running this new role |
| Site System Operating System require upgrade | Site Systems currently run non-supported Operating System versions | Medium – In-place upgrade from Windows Server 2008 R2 must be undertaken prior to migration. This has the potential to impact the source environment |
| Site Database SQL Server requires upgrade | Site Database currently runs non-supported SQL Server version | Medium – In-place upgrade from SQL Server 2008 R2 must be undertaken prior to migration. This has the potential to impact the source environment |
| Active Directory requires Functional Level upgrade | Active Directory is not running at a supported Functional Level | High – Active Directory must be upgraded which could impact the wider customer infrastructure |
| WSUS 3.2 (on Server 2008 R2) will be retained in environment | Customer does not want to upgrade Site Servers to Windows Server 2008 R2 now | Medium – Task Sequences must be utilised to manage Windows 10 servicing |
| Service Connector Point running in Offline mode | Offline mode is required when the site system does not have access to the internet | Medium – Additional management overhead is introduced with manual management tasks required |
| Service Connector Point implement on remote site server | There can only be one SCP in the environment and installation and if Site Server doesn’t have access to internet remote system is required | Low – Installation on remote server requires use of a Site Installation Account for communication |

Table 1: Upgrade Design Decisions

When considering the Upgrade Capability design, the process is separated into several key areas:

Delete any features from the list below if Upgrade Capability <FEATURE> is not being migrated in the customer environment.

* Feature Configuration:
* Software Update Management
* Platform Delivery
* AMT-based Management
* Core Configuration:
* Deprecated Roles
* New Roles
* Client Agent
  1. Core Infrastructure Dependencies

This section identifies services required for the capability to operate. This includes the following mandatory services:

Delete any deployment infrastructure that isn’t required as part of the Upgrade

|  |  |
| --- | --- |
| Component | Description |
| Environment | The refers to the System Center Configuration Manager environment which will be upgraded. This environment consists of the infrastructure, software, tools, applications, source files and configuration that will be used to successfully manage devices in the estate. |
| Networking | DNS and DHCP are required for communication with the upgraded System Center Configuration Manager environment. |
| Active Directory Domain Services | Active Directory Domain Services is required for authentication and authorization of site systems. |

Table 2: Infrastructure Dependencies

* 1. Environment Prerequisites

This section details prerequisites for the Upgrade Capability and provides context for the design decisions documented in subsequent sections.

|  |  |
| --- | --- |
| Item | Description |
| System Center Configuration Manager Source Hierarchy | The System Center Configuration Manager source hierarchy refers to the existing implementation of System Center Configuration Manager in the production environment. The System Center Configuration Manager project requires the existing System Center Configuration Manager 2012 source hierarchy be patched at least SP1 to allow upgrade to complete. |

Table 3: Environment Prerequisites of Upgrade Capability.

This section should be changed and/or completed to detail the Upgrade Capability prerequisite design decisions specified by the customer. Update this section as required

The following table describes how the infrastructure considerations and prerequisites are addressed:

|  |  |  |
| --- | --- | --- |
| Component | Prerequisite Met | Description of service required |
| System Center Configuration Manager Source Hierarchy | <YES/NO> | Source Hierarchy must be patched to System Center 2012 Configuration Manager SP1 or greater to support In-Place Upgrade |
| Site Server OS Version | <YES/NO> | Site Server OS must be Server 2008 R2[[1]](#footnote-2) or greater. Note – Windows Server 2012 R2 is recommended. |
| SQL Server Version | <YES/NO> | SQL Server must be SQL Server 2008 R2[[2]](#footnote-3) or greater. Note – SQL Server 2014 is recommended. |
| Client OS Version | <YES/NO> | Windows XP, Windows Server 2003, and Windows Vista are no longer supported and must be upgraded to enable management through Configuration Manager |
| AD Domain Functional Level | <YES/NO> | AD Domain Functional Level must be Windows Server 2008 R2 or greater |
| Windows ADK | <YES/NO> | Windows ADK for Windows 10 (RTM – version 10.0.10240) required |
| .NET Framework | <YES/NO> | .NET Framework 4.5.2 required |
| Site Server Hardware Specification | <YES/NO> | Increased recommended site server hardware specifications introduced |

Table 4: Upgrade Capability Infrastructure Considerations and Prerequisites

* 1. Upgrade Approach

The scope of the project provides for the upgrade of one of each top-level component (i.e. Primary Site, Secondary Site, Management Console) and selected clients to be upgraded to test functionality.

The upgrade approach from System Center 2012 Configuration Manager is to conduct an In-place upgrade using a top-down methodology through the hierarchy.

* 1. Feature Upgrade

This section details decisions related to the features within Configuration Manager that will be upgraded as part of the Upgrade service.

The scope of the project provides for the definition of an upgrade strategy and the running of a pilot upgrade to confirm functionality

The table below provides a list of all design decisions related to the implementation in the customer production environment.

|  |  |  |  |
| --- | --- | --- | --- |
| Design Decision | Design Options | Decision | Justification |
| Software Update Management | * Use WSUS 4 and install KB3095113 **(Default)** * Retain WSUS 3.2 on Windows Server 2008 R2 * Not Required | **Use WSUS 4 and install KB3095113** | Provides native support for Windows 10 Servicing |
| Platform Delivery | * Update all custom platform delivery components **(Default)** * Create legacy Task Sequence * Not Required | * **Update all custom platform delivery components** * **Create legacy Task Sequence** | Ensures that Platform Delivery will continue to function correctly to clients assigned to upgraded sites as well as non-upgraded sites |
| AMT-based Management | * Not Required **(Default)** * Implement Intel SCS Add-on | **Not Required** | AMT-based management is not required in the new environment |

Table 5: Design decisions for Feature Upgrade

* 1. Core Upgrade

This section details decisions related to the core infrastructure aspects of System Center 2012 Configuration Manager that will be migrated as part of the Upgrade service.

The scope of the project provides for the definition of an upgrade strategy and the running of a pilot upgrade to confirm functionality

The table blow provides a list of all design decisions related to the implementation in the customer production environment.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Design Decision | Design Options | Decision | | Justification |
| Out of Band Management Point Role | * Not Applicable **(Default)** * Remove Role | **Not Applicable** | AMT-based Management functionality not used in legacy environment | | |
| Service Health Validator Point Role | * Not Applicable **(Default)** * Remove Role | **Not Applicable** | NAP functionality not used in legacy environment | | |
| Service Connection Point Location | * Implement on top-level Site Server **(Default)** * Implement on remote server | **Implement on top-level Site Server** | Simplest option and doesn’t required site installation account to be specified | | |
| Service Connection Point Operating Mode | * Online **(Default)** * Offline | **Online** | Provides simplest management experience of Windows Servicing and allows for Intune integration | | |
| Client Installation Agent Method | * Automatic Client Upgrade **(Default)** * Client Push * Machine Rebuild * Startup Script * Manual | **Automatic Client Upgrade** | Provides the simplest deployment mechanism | | |
| Client Agent Targeting | * Pre-Production Collection followed by site-wide deployment **(Default)** * Manual | **Pre-Production Collection followed by site-wide deployment** | Allows client testing to occur prior to site wide deployment | | |

Table 6: Design decisions for Core Upgrade

1. Technical Implementation

This section details the implementation of the Upgrade capability developed for the environment and the steps to install, configure, and operate the required component that will deliver the Upgrade Service capability.

The following high-level activities are needed:

|  |  |
| --- | --- |
| Section | Activity |
| 3.2 | Uninstall the site system roles not supported by System Center Configuration Manager |
| 3.3 | Pre-upgrade tasks |
| 3.4 | Install ADK for Windows 10 & |
| 3.5 | Update WSUS with KB3095118 |
| 3.6 | Upgrade CAS |
| 3.7 | Upgrade Primary Site |
| 3.8 | Upgrade stand-alone Configuration Manager consoles |
| 3.9 | Upgrade Secondary Site |
| 3.10 | Post-upgrade tasks |
| 3.11 | Upgrade clients |
| 3.12 | Upgrade Platform Delivery objects |

Table 7: List of tasks to prepare for the Platform Delivery Service

* 1. Implementation Activities and Tasks

Remove the high-level tasks that are not applicable to the chosen Upgrade approach

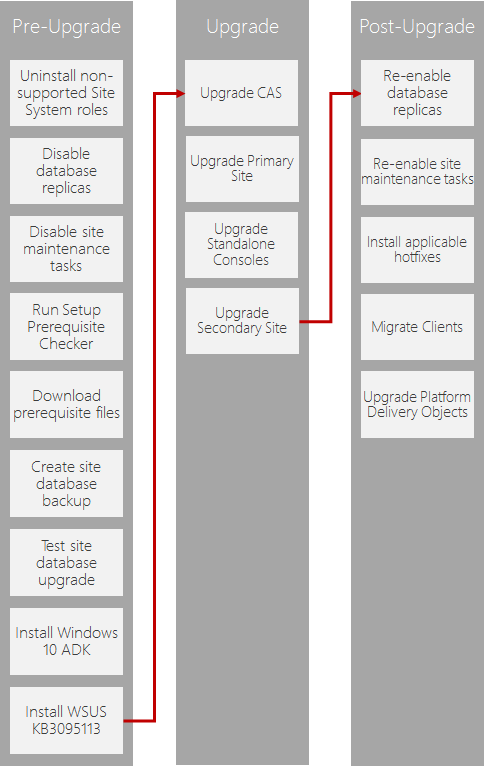


Figure 1: Upgrade component implementation steps

* 1. Uninstall the unsupported Site System Roles

Applicable only if AMT-based management and/or NAP functionality is used in customer legacy environment, delete if not applicable

The Out of Band Management Point and Service Health Validator Point site system roles must be uninstalled prior to initiating the upgrade of the environment.

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| Uninstall Out of Band Management Point | Site role no longer support and must be removed prior to initiating the Upgrade process | * In the Configuration Manager console, navigate to System Center Configuration Manager / Site Database / Site Management / <site code> - <site name>/Site Settings / Site Systems / <site system name> * In the results pane, right-click the Out of Band Management Point role currently assigned to the site system and click Delete |
| Uninstall Service Health Validator Point | Site role no longer support and must be removed prior to initiating the Upgrade process | * In the Configuration Manager console, navigate to System Center Configuration Manager / Site Database / Site Management / <site code> - <site name>/Site Settings / Site Systems / <site system name> * In the results pane, right-click the Service Health Validator Point role currently assigned to the site system and click Delete |

Table 8: Uninstall the unsupported Site System Roles

* 1. Pre-Upgrade Tasks

The following tasks should be undertaken prior to the initiation of the In-Place upgrade.

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| Disable database replicas | Configuration Manager cannot successfully upgrade a primary site that has a database replica for management points enabled | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/deploy/configure/database-replicas-for-management-points> |
| Disable all site maintenance tasks | Before upgrading to Configuration Manager, any site maintenance task that might run during the time the upgrade process is active should be disabled | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/manage/maintenance-tasks> |
| Run Setup Prerequisite Checker | The Prerequisite Checker validates that the site is ready to be upgraded | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/deploy/install/prerequisite-checker> |
| Download prerequisite and redistributable files | Avoids requirement for Setup to connect to internet to download prerequisite files during upgrade process | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/deploy/install/setup-downloader> |
| Create a backup of the site database at the central administration site and primary sites | A site database backup will allow for Disaster Recovery in the event of an upgrade failure | * Refer to <https://docs.microsoft.com/en-us/sccm/protect/understand/backup-and-recovery#a-namebkmksitebackupa-back-up-a-configuration-manager-site> |
| Test the database upgrade process on a copy of the most recent site database backup | The site database upgrade should be tested prior to initiating the full upgrade. This will help to identify any problems with the upgrade process before affecting the production database, which could render it inoperable | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/deploy/install/upgrade-to-configuration-manager#bkmk_test> |

Table 9: Pre-Upgrade Tasks

* 1. Install Windows 10 ADK

The Windows 10 ADK must be installed on each CAS and Primary Site server in the hierarchy, the SMS Provider site system server (if not residing on the Site Server), and any remote console servers.

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| Download Windows 10 ADK | Complete source files are required for the installation of Windows 10 ADK | * Download adksetup.exe from <http://go.microsoft.com/fwlink/p/?LinkId=526740> * Run adksetup.exe * Specify location to download the ADK on a separate computer, click Next * Specify privacy option, click Next * Accept license agreement, click Accept * Click Close to complete |
| Uninstall Windows 8.1 ADK | There is no upgrade option for Windows 10 ADK, it is a completely new install. Therefore, any previous version must be manually uninstalled first | * Refer to <https://technet.microsoft.com/en-us/library/dn621911.aspx> |
| Install Windows 10 ADK | Windows 10 ADK is required for Configuration Manager | * Run adksetup.exe from the previously download file location * Specify location for install path, click Next * Specify privacy option, click Next * Accept license agreement, click Accept * Select features to install (see requirements above), click Install * After installing, click Close |

Table 10: Install Windows 10 ADK

* 1. Update WSUS with KB3095113

Applicable for Native Windows 10 Servicing support only, delete if not applicable or when WSUS 3.2 will be retained in environment

To provide native support for Windows 10 servicing through WSUS, it is necessary to install KB3095113 on all Windows Server 2012-based Software Update Points and Site Servers to allow the new ‘Upgrade’ classification to be presented.

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| Install KB3095113 | This hotfix enables Windows Server Update Services (WSUS) on a Windows Server 2012-based or a Windows Server 2012 R2-based server to sync and distribute feature upgrades for Windows 10. This hotfix is not required to enable WSUS to sync and distribute servicing updates for Windows 10. | * Download KB3095113 from <https://support.microsoft.com/en-us/kb/3095113> * Install this hotfix on each Server 2012-based Software Update Point and Site Server in the hierarchy |

Table 11: Update WSUS with KB3095113

* 1. Upgrade CAS

Applicable if customer has a CAS in their environment, delete if not applicable

Prior to upgrading and child Primary Sites, the CAS must be upgraded.

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| Upgrade CAS | The CAS must be the first site upgraded using the top-down approach to ensure that sites and clients are not orphaned | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/deploy/install/upgrade-to-configuration-manager#bkmk_upgrade> |

Table 12: Upgrade CAS Upgrade Primary Site

* 1. Upgrade Primary Site

Prior to upgrading any child Secondary Sites, the parent Primary Site must be upgraded.

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| Upgrade Primary Site | The Primary Site must be upgraded before any child Secondary Sites are upgraded using the top-down approach to ensure that sites and clients are not orphaned. | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/deploy/install/upgrade-to-configuration-manager#bkmk_upgrade> |

Table 13: Upgrade Primary Site

* 1. Upgrade Standalone Consoles

Applicable if customer has Standalone Consoles in their environment, delete if not applicable

Once a site has been upgraded, it is necessary to upgrade any additional standalone consoles used to manage that site

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| Upgrade Standalone Consoles | The Configuration Manager console can only manage sites at the same version as itself | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/deploy/install/install-consoles> |

Table 14: Upgrade Standalone Console

* 1. Upgrade Secondary Site

Applicable if customer has Secondary Sites in their environment, delete if not applicable

Once the parent Primary Site has been upgraded it is necessary to upgrade any child Secondary Sites in the hierarchy

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| Upgrade Secondary Site | The child Secondary Site can be upgraded once its parent Primary Site has been upgraded using the top-down approach to ensure that sites and clients are not orphaned | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/deploy/install/upgrade-to-configuration-manager#bkmk_upgrade> |

Table 15: Upgrade Secondary Site

* 1. Post-Install Tasks

Once migration has completed, the following post-upgrade tasks should be completed.

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| Re-enable database replicas | Reconfigure the Management Point database replicas to provide same level of functionality as before upgrade | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/deploy/configure/database-replicas-for-management-points#a-namebkmkdbreplicaconfiga-configure-database-replicas> |
| Re-enable all site maintenance tasks | All maintenance tasks should be re-enabled to provide smooth running of the new Configuration Manager environment | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/manage/maintenance-tasks> |
| Install all applicable hotfixes | Ensure that the new Configuration Manager environment has the latest updates applied | * Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/manage/updates> |

Table 16: Post-Install Tasks

* 1. Migrate Clients

Once a site has been upgraded, the new Configuration Manager client should be installed on all clients that are assigned to that site.

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| Configure preproduction collection | Only devices that are part of the preproduction collection are upgraded to the new client. Once the client upgrade has been tested in this preproduction collection, the client can then be promoted, which makes the new version of the client software available to the rest of the site | * Refer to <https://docs.microsoft.com/en-us/sccm/core/clients/manage/upgrade/test-client-upgrades> |
| Deploy Configuration Manager client to existing client machines using automatic client upgrade | Clients should have the new version installed. Note that the new client version will be blocked from communicating with older sites | * Refer to <https://docs.microsoft.com/en-us/sccm/core/clients/manage/upgrade/upgrade-clients-for-windows-computers> |

Table 17: Migrate Clients

* 1. Upgrade Platform Delivery Objects

To ensure that the Platform Delivery service continues to function correctly, it is necessary to upgrade several objects.

|  |  |  |
| --- | --- | --- |
| Task | Rationale | Implementation Guidance |
| When upgrading a CAS. Create new TS with custom client installer to deploy to non-upgraded sites during Upgrade | The default client install package gets updated immediately that the top-level site is upgraded. New clients cannot communicate with legacy sites and therefore to continue platform delivery through Upgrade it is necessary to be able to deploy the correct client version to clients assigned to the sites | * Create a custom client installer that references the legacy client * Copy the task sequence that is used to deploy to clients * Configure the copied task sequence to reference the custom client installation package that uses the older client installation source * Deploy this copied and modified task sequence to the legacy clients as applicable * For full steps, refer to <https://docs.microsoft.com/en-us/sccm/osd/deploy-use/create-a-task-sequence-for-non-operating-system-deployments> |
| Update Platform Delivery Media | Platform Delivery media is not automatically updated during the upgrade process | Refer to the following locations:   * For Standalone media - https://technet.microsoft.com/en-us/library/mt607016.aspx * For Bootable media - <https://technet.microsoft.com/en-us/library/mt627921.aspx> |
| Update custom boot images when you no longer require the original (older) version of Windows PE |  | * Refer to <https://technet.microsoft.com/en-us/library/hh397288.aspx> |
| Update custom client installer |  | * Refer to <https://technet.microsoft.com/en-gb/library/gg712298.aspx> |

Table 18: Upgrade Platform Delivery Objects

1. Test Plan

This section details the test plan for the Upgrade component developed for the environment.

Remove the test scenarios that are not applicable to the chosen Upgrade approach

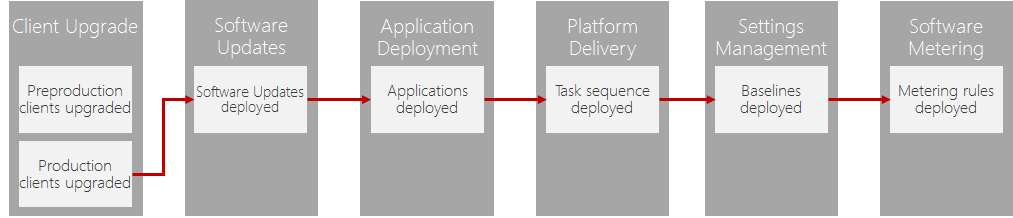


Figure 2: Upgrade Test Scenario

The following sections define the description of how testing should start, pause, and stop for each test criteria. These are key quality metrics to be used in ensuring the items under test are ready to progress to the next stage in the testing process.

* 1. Client Upgrade

List of tasks we need to perform to test client Upgrade

|  |  |  |
| --- | --- | --- |
| Task ID | Description | Pass / Fail |
| 1 | Preproduction machines upgrade to the Configuration Manager client and successfully communicate with the site infrastructure | Choose an item. |
| 2 | Production machines upgrade to the Configuration Manager client and successfully communicate with the destination site infrastructure | Choose an item. |

Table 19: Client Upgrade Test Criteria

* 1. Software Updates

List of tasks we need to perform to test software updates

|  |  |  |
| --- | --- | --- |
| Task ID | Description | Pass / Fail |
| 1 | Software Update deploy successfully to machines in the Configuration Manager environment | Choose an item. |

* + - 1. Table 20: Software Updates Test Criteria
  1. Application Deployment

List of tasks we need to perform to test application deployment

|  |  |  |
| --- | --- | --- |
| Task ID | Description | Pass / Fail |
| 1 | Applications deploy successfully to machines in the Configuration Manager environment | Choose an item. |

Table 21: Application Deployment Test Criteria

* 1. Platform Delivery

List of tasks we need to perform to test the Operating System Deployment components

|  |  |  |
| --- | --- | --- |
| Task ID | Description | Pass / Fail |
| 1 | OSD Task Sequences deploy successfully to machines in the Configuration Manager environment | Choose an item. |

Table 22: Platform Delivery Test Criteria

* 1. Settings Management

List of tasks we need to perform to test settings management

|  |  |  |
| --- | --- | --- |
| Task ID | Description | Pass / Fail |
| 1 | Settings Management Baselines deploy successfully to machines in the Configuration Manager environment | Choose an item. |

Table 23: Settings Management Test Criteria

* 1. Software Metering

List of tasks we need to perform to test software metering

|  |  |  |
| --- | --- | --- |
| Task ID | Description | Pass / Fail |
| 1 | Software Metering Rules deploy successfully to machines in the Configuration Manager environment | Choose an item. |

Table 24: Software Metering Test Criteria

1. Component Operation

This section details the operation of the capability as implemented in the production environment. The following scenarios encompass the common operational tasks required during the upgrade process.

|  |  |  |
| --- | --- | --- |
| Scenario | Outcome | Tasks |
| Monitor alerts and status system | No alerts relating to the upgrade process are returned | Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/manage/use-alerts-and-the-status-system> |
| Monitor status of hierarchy and replication | Hierarchy and replication functions with no errors | Refer to <https://docs.microsoft.com/en-us/sccm/core/servers/manage/monitor-hierarchy-and-replication-infrastructure> |

Table 25: Component Operation for Upgrade Capability

1. Windows Server 2008 R2 support deprecated with the first update released after 12/31/2016 [↑](#footnote-ref-2)
2. SQL Server 2008 R2 support deprecated with the first update released after 12/31/2016 [↑](#footnote-ref-3)