



VOSS-4-UC
Upgrade Guide with ISO and Template

Release 21.1

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Important:

- For VOSS-4-UC release 21.1, refer to the VOSS-4-UC 21.1 Release Changes and Impact document for details on model and workflow changes. Customizations related to these changes may be affected.
 - From Release 19.2.1 onwards, the minimum RAM hardware requirements for all unified nodes is 16GB. Refer to the topic on Memory (RAM) Increase for Large End User Capacity in the Platform Guide for steps to upgrade your virtual machine.
 - When upgrading from any of the following versions, first obtain and apply the patch corresponding to your version from the VOSS secure FTP site:
 - 19.1.2 - /software/patches/19.1.2/Recommended_Patches/EKB-3853-19.1.2_patch
 - 19.2.1 - /software/patches/19.2.1/Recommended_Patches/EKB-3853-19.2.1_patch
 - 19.3.1 - /software/patches/19.3.1/Recommended_Patches/EKB-3853-19.3.1_patch
 - 19.3.2 - /software/patches/19.3.1/Recommended_Patches/EKB-3853-19.3.2_patch
 - Any customer using the Microsoft / Cisco Hybrid (Direct Routing) adaptation will not be able to upgrade to the 21.1 release. This adaptation is only supported on release 19.3.4 and has not been made compatible with some of the core functionality in the new release.
-

Note: Normal operations will be interrupted during an upgrade. Carry out the upgrade in a maintenance window. Refer to the type of upgrade for details on the upgrade duration.

Note: From release 21.1 onwards, a new field called **Usage** has been added to Directory Numbers (DN). This field tracks the type of device which the DN has been assigned to. For example: for Phones, Device Profiles and Remote Destination Profiles the usage is “Device”. For Hunt Groups, the usage is “Hunt_Pilot”, and so on.

The **Usage** field is automatically populated when the DNs are assigned to and removed from various devices from 21.1 onwards.

In order to populate the **Usage** field once-off for all existing Directory Number inventory instances, the Audit Number Inventory tool should be run once post-upgrade for each customer.

The tool only needs to be run once when initially upgrading to a 2x.x release from a 18.x or 19.x release. If it was already run when upgrading to 21.1 for example, then it does not need to be run again when upgrading later versions, for example 21.2, 21.3, 22.1, and so on.

Before running the tool:

- Careful consideration must be taken when selecting where the Number Inventory is deployed: Customer or Site - this is usually Dial Plan dependent.
 - Please review the Audit Number Inventory topic in the Core Feature Guide.
-

1. Upgrade Planning

1.1. Upgrade and Data Migration

After the upgrade of the system with **app upgrade <file.ISO>** or **cluster upgrade <file.ISO>**, any changes and updates to core model schemas need to be added to the system database. It is recommended that this step is run in a terminal opened with the **screen** command.

This database upgrade is carried out from the Command Line Interface (CLI) by means of **voss upgrade_db**. It is recommended that this step is run in a terminal opened with the **screen** command.

From instructions in the newly upgraded ISO, the schemas of system core models are updated as required and existing data is migrated to these updated model schemas. Schema updates would include updated version numbers and may for example add or remove new model attributes to schemas and add new default data.

Migration instructions from existing model versions to new updated versions are used to create the updated model schemas and update data to be stored in the system database.

In the case of the installation of an updated template, the **app template <template_file>** command will also execute any migration instructions included in the template file to upgrade the database with the updated template data.

1.2. Using the `screen` command

The **screen** command is available to execute long-running commands (for example, when upgrading) in the background.

The following commands require the running of **screen**:

- **cluster provision**
- **cluster upgrade**
- **app template**
- **voss export type <args>**
- **voss export group <args>**
- **voss subscriber_data_export**

A message is displayed to indicate that **screen** should be run first:

```
This is a potentially long-running command and should be executed in a screen session
Run `screen` and then execute the command again
```

The use of **screen** is *not affected* by the use of the `--force` parameter with any of these commands.

The commands then run in a screen session that can be reconnected. The standard screen command parameters are available, in particular:

- **screen** - start a new session
- **screen -ls** - show sessions already available
- **screen -r [screen PID]** - reconnect to a disconnected session

The version of **screen** used in VOSS-4-UC also supports the creation of a log file. If long-running commands will be run, the log file captures screen console output up to the session timeout. A message shows:

```
timed out waiting for input: auto-logout
```

To create a screen log file:

1. Run **screen** and wait for screen to open.
2. Press **<Ctrl>-a** then **:** (colon). This will enter screen command mode at the bottom of the console.
3. Create your screen logfile in the `media/` directory:
 - a. In screen command mode, type **logfile media/<screen-logfilename>.log**
 - b. Press **<Enter>**
 - c. Press **<Ctrl>-a** and then **H** to start writing to the log file
 - d. Run your commands.

If the **screen** session times out, you can obtain console output from the log file, for example:

```
$ sftp platform@<host>:media/<screen-logfilename>.log
```

2. Multinode Upgrade

2.1. Upgrade a Multinode Environment with the ISO and Template

Important:

- When upgrading from VOSS-4-UC 18.1.3, refer to *Upgrading from 18.1.3 to 21.1 - summary*.
- Upgrading to release 21.1 *requires a system on 19.x, with security updates completed*. The upgrade includes:
 - an upgrade to the underlying operating system to Ubuntu 18.04.4.
 - the installation of a new **cluster check** command available from the 21.1 ISO by running **app install check_cluster**.
- While template installation and system upgrade takes approximately two hours at a single site, this may vary in accordance with your topology, number of devices and subscribers. Adjust your upgrade maintenance window to allow for your configuration.

You can follow the progress on the Admin Portal transaction list.

- When upgrading from CUCDM 11.5.3 Patch Bundle 2 or VOSS-4-UC 18.1 Patch Bundle 2 and earlier, re-import specified CUC models according to your current version. Refer to the final upgrade procedure step.
- Tasks that are marked **Prior to Maintenance Window** can be completed a few days prior to the scheduled maintenance window so that VOSS support can be contacted if needed and in order to allow for reduce down time.
- If any Microsoft integrations exist in VOSS-4-UC pre-upgrade, then the existing device connections configured for Azure AD Online will be migrated to MS Graph. The MS Graph connection configuration requires additional details, which must be obtained prior to upgrade. Please see the *VOSS-4-UC Configuration and Sync* and *Microsoft Configuration Setup* topics in the Core Feature Guide. The connection configuration must be added to the migrated connection details after upgrade to ensure continued serviceability.
 - Ensure MicrosoftTenant, MSTeamsOnline and MSGraph instance have the same name by renaming instances.
- When upgrading to 21.1, the **app template** install step may not succeed if:
 - attempting to upgrade a LandingPage without any “Sections” defined
 - attempting to upgrade a MenuLayout without any “Menu Items” defined

If the installation is not successful, for the duration of the upgrade:

- Add any arbitrary entry in Sections to a LandingPage without any Sections

- Add any arbitrary entry in Menu Items to a MenuLayout without any Menu Items
- or
- remove any MenuLayout and LandingPage instances by first unlinking from any Roles and then deleting if this is acceptable
- then
- rerun the template install step

The standard **screen** command should be used where indicated. See: *Using the screen command*.

2.1.1. Download Files and Check (Prior to Maintenance Window)

Description and Steps	Notes and Status
<p>VOSS files: https://voss.portalshape.com > Downloads > VOSS-4-UC > 21.1 > Upgrade</p> <p>Download <code>.iso</code> and <code>.template</code> files.</p> <ul style="list-style-type: none"> • Transfer the <code>.iso</code> file to the <code>media/</code> folder of all nodes. • Transfer the <code>.template</code> file to the <code>media/</code> folder of the primary node. <p>Two transfer options:</p> <p>Either using SFTP:</p> <ul style="list-style-type: none"> • sftp platform@<unified_node_hostname> • cd media • put <upgrade_iso_file> • put <upgrade_template_file> <p>Or using SCP:</p> <ul style="list-style-type: none"> • scp <upgrade_iso_file> platform@<unified_node_ip_address>:~/media • scp <upgrade_template_file> platform@<unified_node_ip_address>:~/media <p>Verify that the <code>.iso</code> image and <code>.template</code> file copied:</p> <ul style="list-style-type: none"> • ls -l media/ <p>Verify that the original <code>.sha256</code> checksums on the SFTP server match.</p> <ul style="list-style-type: none"> • system checksum media/<upgrade_iso_file> Checksum: <SHA256> • system checksum media/<upgrade_template_file> Checksum: <SHA256> 	

2.1.2. Security and Health Check Steps (Prior to Maintenance Window)

Description and Steps	Notes and Status
<p>Verify that the primary node is the active primary node at the time of upgrade.</p> <p>database config</p> <p>Ensure that the node on which the installation will be initiated has the <code>stateStr</code> parameter set to PRIMARY and has the highest <code>priority number</code> (highest priority number could vary depending on cluster layout).</p> <p>Example output</p> <pre><ip address>:27020: priority: <number> stateStr: PRIMARY storageEngine: WiredTiger</pre> <p>Validate the system health. For upgrade to release 21.1, carry out the following (19.x only):</p> <ul style="list-style-type: none"> • system mount - mount the release 21.1 upgrade ISO. • app install check_cluster - install the new version of the cluster check command. For details, refer to the "Cluster Check" topic in the Platform Guide. • cluster check - inspect the output of this command for warnings and errors. You can also use cluster check verbose to see more details. While warnings will not prevent an upgrade, it is advisable that these be resolved prior to upgrading where possible. Some warnings may be resolved by upgrading. For troubleshooting and resolutions, also refer to the <i>Health Checks for Cluster Installations Guide</i> and <i>Platform Guide</i>. <p>If there is any sign of the paths below are over 80% full, a clean-up is needed, for example to avoid risk of full logs occurring during upgrade. Clean-up steps are indicated next to the paths:</p> <pre>/ (call support if over 80%) /var/log (run: log purge) /opt/platform (remove any unnecessary files from /media_ ↳directory) /tmp (reboot)</pre> <p>On the Primary Unified Node, verify there are no pending Security Updates on any of the nodes.</p> <hr/> <p>Note: If you run cluster status after installing the new version of cluster check, any error message regarding a failed command can be ignored. This error message will not show after upgrade.</p> <hr/>	

2.1.3. Schedules, Transactions and Version Check (Maintenance Window)

Description and Steps	Notes and Status
<p>Run cluster check and verify that no warnings and errors show.</p> <p>Turn off any scheduled imports to prevent syncs triggering part way through the upgrade.</p> <p>Two options are available:</p> <p>Individually for each job:</p> <ol style="list-style-type: none"> 1. Log in on the Admin Portal as a high level administrator above Provider level. 2. Select the Scheduling menu to view scheduled jobs. 3. Click each scheduled job. On the Base tab, uncheck the Activate check box. <p>Mass modify:</p> <ol style="list-style-type: none"> 1. On the Admin Portal, export scheduled syncs into a bulk load sheet. 2. Modify the schedule settings to de-activate scheduled syncs. 3. Import the sheet. 	
<p>Check for running imports. Either wait for them to complete or cancel them:</p> <ol style="list-style-type: none"> 1. Log in on the Admin Portal as a high level administrator above Provider level. 2. Select the Transaction menu to view transactions. 3. Filter the Action column: <ol style="list-style-type: none"> a. Choose Status as “Processing” and then choose each Action that starts with “Import”, for example, “Import Unity Connection”. b. Click Search and confirm there are no results. c. If there are transactions to cancel, select them and click Cancel. 	
<p>Customized ``data/Settings``</p> <p>If <code>data/Settings</code> instances have been modified, record these or export them as JSON. The modifications can be re-applied or exported JSON instances can be merged following the upgrade. See: Post Template Upgrade Tasks (Maintenance Window).</p> <p>Version</p> <p>Record the current version information. This is required for upgrade troubleshooting.</p> <ul style="list-style-type: none"> • Log in on the Admin Portal and record the information contained in the About > Extended Version 	

2.1.4. Pre-Upgrade Steps (Maintenance Window)

<p>Shutdown servers and take snapshots from VMware and then power on all servers, starting with the primary:</p> <p>Use VMware snapshots. Consider the following:</p> <ul style="list-style-type: none"> • VOSS cannot guarantee that a VMware snapshot can be used to successfully restore VOSS-4-UC or any Cisco HCS Management application. If you cannot restore the application from a snapshot, your only recourse is to reinstall the application. • When the backup is complete and you do not need the VMware snapshot for restore activities, delete the snapshot immediately to preserve LUN space. • cluster run notme system shutdown followed by: system shutdown <p>Log into VMware and take snapshots of all unified nodes and all web proxies.</p> <p>After snapshots, restart the servers:</p> <ul style="list-style-type: none"> • Power up the servers via VMware. <p>Optional: If a backup is required in addition to the snapshot, use the backup add <location-name> and backup create <location-name> commands. For details, refer to the <i>Platform Guide</i>.</p>	
--	--

Description and Steps	Notes and Status
<p>After snapshot and before upgrading: validate system health and check all services, nodes and weights for the cluster:</p> <ul style="list-style-type: none"> • cluster run application cluster list Make sure all application nodes show 3 or 5 nodes. • cluster check - inspect the output of this command, for warnings and errors. You can also use cluster check verbose to see more details. <ul style="list-style-type: none"> – Make sure no services are stopped/broken. The message 'suspended waiting for mongo' is normal on the fresh unified nodes. – Check that the database weights are set. It is <i>critical</i> to ensure the weights are set before upgrading a cluster. Example output: <pre> 172.29.21.240: weight: 80 172.29.21.241: weight: 70 172.29.21.243: weight: 60 172.29.21.244: weight: 50 </pre> – Verify the primary node in the primary site and ensure no nodes are in the 'recovering' state (<code>stateStr</code> is not <code>RECOVERING</code>). On the primary node: 	

2.1.5. Upgrade (Maintenance Window)

Note: By default, the cluster upgrade is carried out in parallel on all nodes and without any backup in order to provide a fast upgrade.

Description and Steps	Notes and Status
<p>From VOSS-4-UC 18.1 or CUCDM 11.5.3 onwards, it is recommended that the upgrade steps are run in a terminal opened with the screen command.</p> <p>Verify that the ISO has been uploaded to the <code>media/</code> directory on each node. This will speed up the upgrade time.</p> <p>On the primary unified node:</p> <ul style="list-style-type: none"> • screen • cluster upgrade media/<upgrade_iso_file> <p>Note: If the system reboots, do not carry out the next manual reboot step. When upgrading from pre-19.1.1, an automatic reboot should be expected.</p> <p>Manual reboot <i>only if needed</i>:</p> <ul style="list-style-type: none"> • cluster run notme system reboot <p>If node messages: <code><node name> failed with timeout</code> are displayed, these can be ignored.</p> <ul style="list-style-type: none"> • system reboot <p>Since all services will be stopped, this takes some time.</p> <p>Close screen: <code>Ctrl-a \</code></p>	

All unused docker images except `selfservice` and `voss_ubuntu` images will be removed from the system at this stage.

2.1.6. Post-Upgrade, Security and Health Steps (Maintenance Window)

Description and Steps	Notes and Status
<p>On the primary unified node, verify the cluster status:</p> <ul style="list-style-type: none"> • cluster check • If any of the above commands show errors, check for further details to assist with troubleshooting: cluster run all diag health 	
<p>Check for needed security updates. On the primary node, run:</p> <ul style="list-style-type: none"> • cluster run all security check <p>If one or more updates are required for any node, run on the primary Unified node:</p> <ul style="list-style-type: none"> • cluster run all security update <p>Note: <i>if the system reboots, do not carry out the next manual reboot step.</i> Manual reboot <i>only if needed</i>:</p> <ul style="list-style-type: none"> • cluster run notme system reboot <p>If node messages: <code><node name> failed with timeout</code> are displayed, these can be ignored.</p> <ul style="list-style-type: none"> • system reboot <p>Since all services will be stopped, this takes some time.</p>	
<p>If upgrade is successful, the screen session can be closed by typing exit in the screen terminal. If errors occurred, keep the screen terminal open for troubleshooting purposes and contact VOSS support.</p>	

2.1.7. Database Filesystem Conversion (if required, Maintenance Window)

Important: This step is to be carried out *only if* you have not converted the file system before.

To check if the step is *not* required:

- Run **drives list** and ensure that the LVM storage shows for *all converted database nodes* under Volume Groups. If the output of the **drives list** command contains `dm-0 - mongoddb:dbroot`, the step is *not* required. Refer to the **drives list** command output example below.

The **database convert_drive** command provides parameters that allow for a flexible upgrade schedule in order to limit system downtime.

When the **database convert_drive** command is run, the `voss-deviceapi` service will be stopped first and started after completion. The command should therefore be run during a maintenance window while there are no running transactions.

The procedure and commands in this step depend on:

- your topology
- latency between data centers
- upgrade maintenance windows - **Window 1** to **Window 3** represent chosen maintenance windows.

First inspect the table below for guidance on the commands to run according to your configuration and preferences.

- Run all commands on the primary unified node:

- Ensure states of database nodes are not DOWN - otherwise the command will fail

database config (`stateStr` is not DOWN)

- Ensure database weights are set and have 1 maximum weight - otherwise the command will fail

database weight list (one `weight` value is maximum)

- For 2 and 3 maintenance windows: after the upgrade (prior to Windows 2 and 3), only nodes with converted drives will generate valid backups.

For example, if the primary drive is converted, backups from the primary node can be used to restore the database. If there is a database failover to the highest weight secondary node that was not converted, it will not be possible for backups to be generated on that secondary node until the drive is converted.

Topology	Window 1	Window 2	Window 3	Commands (DC = valid data center name)	Description
multinode	Y			database convert_drive primary database convert_drive secondary all	Recommended for a system with latency < 10ms.
multinode	Y	Y		Window 1: database convert_drive primary Window 2: database convert_drive secondary all	Can be used for a system with latency < or > 10ms. Allows for smaller maintenance windows. Cluster is not available during maintenance windows.
multinode	Y	Y	Y	Window 1: database convert_drive primary Window 2: database convert_drive secondary <first DC> Window 3: database convert_drive secondary <second DC>	Can be used for a system with latency > 10ms. Allows for smaller maintenance windows. Cluster is not available during maintenance windows.

Description and Steps	Notes and Status
<p>Database Filesystem Conversion step Shut down all the nodes. Since all services will be stopped, this takes some time.</p> <ul style="list-style-type: none"> • cluster run all system shutdown • Create a VMware snapshot for all the unified servers so that the system can easily be reverted in the case of a conversion error. Boot all the systems in VMware. • Run the convert_drive command <i>with parameters according to the table above</i>. Wait until it completes successfully. • database config Ensure that the storage engine for <i>all converted database nodes</i> shows as <code>storageEngine: WiredTiger</code>. • drives list Ensure that the LVM storage shows for <i>all database nodes</i> under Volume Groups. In the example below, <code>dbroot/dm-0</code> shows under Volume Groups, Logical volumes <pre>\$ drives list Used disks and mountpoints: sdcl - services:backups dm-0 - mongodb:dbroot Unused disks: none - if disks have been hot-mounted, it may be necessary →to reboot the system Unused mountpoints: services:SWAPSPACE Volume Groups voss - 10.0 GB free, 60.0 GB total Physical volumes: sddl Logical volumes: dbroot/dm-0 - 50.0 GB</pre>	

2.1.8. Database Schema Upgrade (Maintenance Window)

Important: For VOSS-4-UC release 21.1, refer to the VOSS-4-UC 21.1 Release Changes and Impact document for details on model and workflow changes. Customizations related to these changes may be affected by this step.

Description and Steps	Notes and Status
<p>From VOSS-4-UC 18.1 or CUCDM 11.5.3 onwards, it is recommended that the upgrade steps are run in a terminal opened with the screen command.</p> <p>On the primary unified node:</p> <ul style="list-style-type: none"> • screen • voss upgrade_db <p>Check cluster status</p> <ul style="list-style-type: none"> • cluster check 	

2.1.9. Template Upgrade (Maintenance Window)

Description and Steps	Notes and Status
<p>From VOSS-4-UC 18.1 or CUCDM 11.5.3 onwards, it is recommended that the upgrade steps are run in a terminal opened with the screen command.</p> <p>On the primary unified node:</p> <ul style="list-style-type: none"> • screen • app template media/<VOSS-4-UC.template> 	

The following message appears:

```
Running the DB-query to find the current environment's
existing solution deployment config...
```

- Python functions are deployed
- System artifacts are imported.

The template upgrade automatically detects the deployment mode: “Enterprise”, “Provider with HCM-F” or “Provider without HCM-F”. A message displays according to the selected deployment type. Check for one of the messages below:

```
Importing EnterpriseOverlay.json
Importing ProviderOverlay_Hcmf.json ...
Importing ProviderOverlay_Decoupled.json ...
```

The template install automatically restarts necessary applications. If a cluster is detected, the installation propagates changes throughout the cluster.

Description and Steps	Notes and Status
<p>Review the output from the app template command and confirm that the upgrade message appears:</p>	

```
Deployment summary of PREVIOUS template solution
(i.e. BEFORE upgrade):
```

```
-----
Product: [PRODUCT]
Version: [PREVIOUS PRODUCT RELEASE]
Iteration-version: [PREVIOUS ITERATION]
Platform-version: [PREVIOUS PLATFORM VERSION]
```

This is followed by updated product and version details:

```
Deployment summary of UPDATED template solution
(i.e. current values after installation):
```

```
-----
Product: [PRODUCT]
```

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```
Version: [UPDATED PRODUCT RELEASE]
Iteration-version: [UPDATED ITERATION]
Platform-version: [UPDATED PLATFORM VERSION]
```

Description and Steps	Notes and Status
<ul style="list-style-type: none"> If no errors are indicated, make a backup or snapshot. 	
<p>For an unsupported upgrade path, the install script stops with the message:</p> <p>Upgrade failed due to unsupported upgrade path. Please log in as sysadmin and see Transaction logs for more detail. You can restore to the backup or revert to the VM snapshot made before the upgrade.</p>	
<p>If there are errors for another reason, the install script stops with a failure message listing the problem. Contact VOSS support.</p>	
<p>Verify the <code>extra_functions</code> have the <i>same checksum</i> across the cluster.</p> <ul style="list-style-type: none"> cluster run application voss get_extra_functions_version -c 	
<p>Post upgrade migrations: On a single node of a cluster, run:</p> <ul style="list-style-type: none"> voss post-upgrade-migrations <p>Data migrations that are not critical to system operation can have significant execution time at scale. These need to be performed after the primary upgrade, allowing the migration to proceed whilst the system is in use - thereby limiting upgrade windows. A transaction is queued on VOSS-4-UC and its progress is displayed as it executes.</p>	

Description and Steps	Notes and Status
<p>Check cluster status and health</p> <ul style="list-style-type: none"> cluster status 	

2.1.10. Post Template Upgrade Tasks (Maintenance Window)

Description and Steps	Notes and Status
<p>Customized ``data/Settings`` Merge the previously backed up customized <code>data/Settings</code> with the latest settings on the system by manually adding the differences or exporting the latest settings to JSON, merging the customized changes and importing the JSON.</p> <p>Support for VG400 and VG450 Analogue Gateways Before adding the VG400 or VG450 Gateway, the <code>device/cucm/GatewayType</code> model needs to be imported for each Unified CM.</p> <ol style="list-style-type: none"> 1. Create a Model Type List which includes the <code>device/cucm/GatewayType</code> model. 2. Add the Model Type List to all the required Unified CM Data Syncs. 3. Execute the Data Sync for all the required Unified CMs. <p>Verify the upgrade Log in on the Admin Portal and check the information contained in the About > Extended Version menu. Confirm that versions have upgraded.</p> <ul style="list-style-type: none"> • Release should show XXX • Platform Version should show XXX <p>where XXX corresponds with the release number of the upgrade.</p>	
<ul style="list-style-type: none"> • Check themes on all roles are set correctly 	
<ul style="list-style-type: none"> • For configurations that make use of the Northbound Billing Integration (NBI), please check the service status of NBI and restart if necessary. 	

2.1.11. Restore Schedules (Maintenance Window)

Description and Steps	Notes and Status
<p>Re-enable scheduled imports if any were disabled prior to the upgrade. Two options are available:</p> <p>Individually for each job:</p> <ol style="list-style-type: none"> 1. Log in on the Admin Portal as a high level administrator above Provider level. 2. Select the Scheduling menu to view scheduled jobs. 3. Click each scheduled job. On the Base tab, check the Activate check box. <p>Mass modify:</p> <ol style="list-style-type: none"> 1. Modify the exported sheet of schedules to activate scheduled syncs. 2. Import the bulk load sheet. 	

2.1.12. Release Specific Updates (Maintenance Window)

Description and Steps	Notes and Status
<p>When upgrading from CUCDM 11.5.3 Patch Bundle 2 or VOSS-4-UC 18.1 Patch Bundle 2 and earlier, re-import the following from all CUCM devices, since this upgrade deleted obsolete CUC timezone codes from the VOSS-4-UC database:</p> <ul style="list-style-type: none"> CUC models: device/cuc/TimeZone <p>Note: This is a once off data migration step. If this was performed previously when upgrading to 19.1.x, then it does not have to be repeated.</p>	
<p>After upgrading, obtain and install the following patch according to its accompanying MOP file:</p> <ul style="list-style-type: none"> Server Name: secure.voss-solutions.com Path: /software/voss4uc/releases/Release-19.2.1 Patch Directory: Update_CUC_Localization_patch Patch File: Update_CUC_Localization_patch.script MOP File: MOP-Update_CUC_Localization.pdf <p>Note: This is a once off data migration step. If this was performed previously when upgrading to 19.1.x, then it does not have to be repeated.</p>	
<p>Re-import the following from all CUCM devices:</p> <ul style="list-style-type: none"> CUCM models: device/cucm/PhoneType <p>For steps to create a custom data sync, refer to the chapter on Data Sync in the Core Feature Guide.</p> <p>Note: This is a once off data migration step. If this was performed previously when upgrading to 19.1.x, then it does not have to be repeated.</p>	
<p>User Management migration updates default authentication types on SSO Identity Providers. If an SSO Identity Provider exists at the provider hierarchy level, the default authentication settings:</p> <ul style="list-style-type: none"> Authentication Scope: Current hierarchy level and below User Sync Type: All users <p>will not allow any non-SSO user logins (typically local administrators). The solution is to log in as higher level administrator account (full access) and set the SSO Identity Provider:</p> <ul style="list-style-type: none"> Authentication Scope: Current hierarchy level only User Sync Type: LDAP synced users only <p>Please refer to the <i>SSO Identity Provider: Field Reference</i> topic in the Core Feature Guide.</p>	

2.1.13. Log Files and Error Checks (Maintenance Window)

Description and Steps	Notes and Status
<p>Inspect the output of the command line interface for upgrade errors, for example <code>File import failed!</code> or <code>Failed to execute command</code>.</p> <p>Use the log view command to view any log files indicated in the error messages, for example, run the command if the following message appears:</p> <p>For more information refer to the execution log file with <code>'log view platform/execute.log'</code></p> <p>For example, if it is required send all the install log files in the <code>install</code> directory to an SFTP server:</p> <ul style="list-style-type: none"> • log send sftp://x.x.x.x install 	
<p>Log in on the Admin Portal as system level administrator, go to Administration Tools > Transaction and inspect the transactions list for errors.</p>	

2.1.14. Upgrading from 18.1.3 to 21.1 - summary

Below are the summarized steps to upgrade from 18.1.3.

- The steps require the necessary scripts, templates and ISOs to be in the `media/` directory.
- For details on the specific commands, refer to the corresponding steps above.
- For general usage of commands to carry out tasks, refer to the *Platform Guide*.

2.1. Upgrade a Multinode Environment with the ISO and Template

Command and task sequence	Comment
<code>cluster status</code>	no service mismatch, all nodes ok
<code>cluster run all diag disk</code>	check for disks over 90% full
<code>database config</code>	ensure all unified nodes have a weight, and are in a good state: primary, secondary,arbiter
manual check	stop / check for transactions running, stop where possible
external task	create backup (snapshots)
<code>cluster run all app install media/EKB-4124-18.1.3_patch.script</code>	refer to steps details above
<code>cluster upgrade media/platform-install-19.2.1-1570776653.iso --force</code>	refer to steps details above
<code>cluster run all security update --force</code>	refer to steps details above
<code>cluster run all app install media/EKB-4124-18.1.3_patch.script</code>	refer to steps details above
external task	create backup (snapshots)
<code>cluster upgrade media/platform-install-21.1-<nnnnnnnnnn>.iso</code>	refer to preliminary and upgrade steps details above; <nnnnnnnnnn> matches the downloaded release ISO
<code>cluster run all security update</code>	refer to steps details above
<code>database config</code>	make sure all databases are in the correct state
<code>database convert_drive secondary all</code>	refer to steps details above
<code>voss upgrade_db</code>	refer to steps details above
<code>app template media/<VOSS-4-UC.template></code>	refer to steps details above

3. Standalone Upgrade

3.1. Upgrade a Single Node Cluster Environment with the ISO and Template

Important:

- Upgrading to release 21.1 *requires a system on 19.x, with security updates completed.*
- While template installation and system upgrade takes approximately two hours at a single site, this may vary in accordance with your topology, number of devices and subscribers. Adjust your upgrade maintenance window to allow for your configuration.
- When upgrading from CUCDM 11.5.3 Patch Bundle 2 or VOSS-4-UC 18.1 Patch Bundle 2 and earlier, re-import specified CUC models according to your current version. Refer to the final upgrade procedure step.
- Tasks that are marked **Prior to Maintenance Window** can be completed a few days prior to the scheduled maintenance window so that VOSS support can be contacted if needed and in order to allow for reduce down time.
- When upgrading to 21.1, the **app template** install step may not succeed if:
 - attempting to upgrade a LandingPage without any “Sections” defined
 - attempting to upgrade a MenuLayout without any “Menu Items” defined

If the installation is not successful, for the duration of the upgrade:

- Add any arbitrary entry in Sections to a LandingPage without any Sections
- Add any arbitrary entry in Menu Items to a MenuLayout without any Menu Items

or

- remove any MenuLayout and LandingPage instances by first unlinking from any Roles and then deleting if this is acceptable

then

- rerun the template install step

The standard **screen** command should be used where indicated. See: [Using the screen command](#).

3.1.1. Download Files and Check (Prior to Maintenance Window)

Description and Steps	Notes and Status
<p>VOSS files: https://voss.portalshape.com > Downloads > VOSS-4-UC > 21.1 > Upgrade</p> <p>Download <code>.iso</code> and <code>.template</code> files. Transfer the file to the <code>media/</code> folder. Two options:</p> <p>Either using SFTP:</p> <ul style="list-style-type: none"> • <code>sftp platform@<unified_node_hostname></code> • <code>cd media</code> • <code>put <upgrade_iso_file></code> • <code>put <upgrade_template_file></code> <p>Or using SCP:</p> <ul style="list-style-type: none"> • <code>scp <upgrade_iso_file> platform@<unified_node_ip_address>:~/media</code> • <code>scp <upgrade_template_file> platform@<unified_node_ip_address>:~/media</code> <p>Verify that the <code>.iso</code> image and <code>.template</code> file copied:</p> <ul style="list-style-type: none"> • <code>ls -l media/</code> <p>Verify that the original <code>.sha256</code> checksums on the SFTP server match.</p> <ul style="list-style-type: none"> • <code>system checksum media/<upgrade_iso_file></code> Checksum: <SHA256> • <code>system checksum media/<upgrade_template_file></code> Checksum: <SHA256> 	

3.1.2. Security and Health Steps single node cluster (Prior to Maintenance Window)

Description and Steps	Notes and Status
<p>Validate the system health.</p> <p>Verify there are no pending Security Updates:</p> <p>security check</p>	
<p>Check system health.</p> <ul style="list-style-type: none"> • diag disk <p>If there is any sign of the paths below are over 80% full, a clean-up is needed, for example to avoid risk of full logs occurring during upgrade. Clean-up steps are indicated next to the paths:</p> <pre> / (call support if over 80%) /var/log (run: log purge) /opt/platform (remove any unnecessary files from /media directory) /tmp (reboot) </pre>	

3.1.3. Schedules, Transactions and Version Check (Maintenance Window)

Description and Steps	Notes and Status
<p>Turn off any scheduled imports to prevent syncs triggering part way through the upgrade. Two options are available:</p> <p>Individually for each job:</p> <ol style="list-style-type: none"> 1. Log in on the Admin Portal as a high level administrator above Provider level. 2. Select the Scheduling menu to view scheduled jobs. 3. Click each scheduled job. On the Base tab, uncheck the Activate check box. <p>Mass modify:</p> <ol style="list-style-type: none"> 1. On the Admin Portal, export scheduled syncs into a bulk load sheet. 2. Modify the schedule settings to de-activate scheduled syncs. 3. Import the sheet. 	
<p>Check for running imports. Either wait for them to complete or cancel them:</p> <ol style="list-style-type: none"> 1. Log in on the Admin Portal as a high level administrator above Provider level. 2. Select the Transaction menu to view transactions. 3. Filter the Action column: <ol style="list-style-type: none"> a. Choose Status as "Processing" and then choose each Action that starts with "Import", for example, "Import Unity Connection". b. Click Search and confirm there are no results. c. If there are transactions to cancel, select them and click Cancel. 	
<p>Customized ``data/Settings``</p> <p>If <code>data/Settings</code> instances have been modified, record these or export them as JSON. The modifications can be re-applied or exported JSON instances can be merged following the upgrade. See: Post Template Upgrade Tasks single node cluster (Maintenance Window).</p> <p>Version</p> <p>Record the current version information. This is required for upgrade troubleshooting.</p> <ul style="list-style-type: none"> • Log in on the Admin Portal and record the information contained in the About > Extended Version 	

3.1.4. Pre-Upgrade Steps single node cluster (Maintenance Window)

<p>Shutdown server and take snapshots from VMware and then restart server: Use VMware snapshots. Consider the following:</p> <ul style="list-style-type: none"> • VOSS cannot guarantee that a VMware snapshot can be used to successfully restore VOSS-4-UC or any Cisco HCS Management application. If you cannot restore the application from a snapshot, your only recourse is to reinstall the application. • When the backup is complete and you do not need the VMware snapshot for restore activities, delete the snapshot immediately to preserve LUN space. • system shutdown <p>Log into VMware and take a snapshot. After the snapshot, restart:</p> <ul style="list-style-type: none"> • Power up the servers via VMware. <p>Optional: If a backup is required in addition to the snapshot, use the backup add <location-name> and backup create <location-name> commands. For details, refer to the <i>Platform Guide</i>.</p>	
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Description and Steps	Notes and Status
<p>Before upgrading, check all services: Make sure no services are stopped/broken. The message 'suspended waiting for mongo' is normal on a fresh node.</p> <ul style="list-style-type: none"> • app status <p>Verify the node is not in the 'recovering' state (<code>stateStr</code> is not <code>RECOVERING</code>)</p> <ul style="list-style-type: none"> • database config 	

3.1.5. Upgrade single node cluster (Maintenance Window)

Description and Steps	Notes and Status
<p>From VOSS-4-UC 18.1 or CUCDM 11.5.3 onwards, it is recommended that the upgrade steps are run in a terminal opened with the screen command.</p> <p>On the primary unified node:</p> <ul style="list-style-type: none"> • screen • If upgrading from <i>earlier</i> than release 20.1.1: app upgrade media/<upgrade_iso_file> <hr/> <p>Note: If upgrading from release 20.1.1, on the <i>primary unified</i> node, use the command: cluster upgrade media/<upgrade_iso_file></p> <p>If upgrading from release 21.1 and up, on the <i>primary application</i> node, cluster upgrade media/<upgrade_iso_file></p> <hr/> <p>All unused docker images except <code>selfservice</code> and <code>voss_ubuntu</code> images will be removed from the system at this stage.</p> <p>Note: If the system reboots, do not carry out the next manual reboot step. When upgrading from pre-19.1.1, an automatic reboot should be expected.</p> <p>Manual reboot <i>only if needed</i>:</p> <ul style="list-style-type: none"> • system reboot <p>If node messages: <code><node name> failed with timeout</code> are displayed, these can be ignored.</p> <p>Since all services will be stopped, this takes some time.</p> <p>Close screen: <code>Ctrl-a \</code></p>	

3.1.6. Post-Upgrade, Security and Health Steps single node cluster (Maintenance Window)

Description and Steps	Notes and Status
<p>Verify the status:</p> <ul style="list-style-type: none"> • diag health 	
<p>If upgrade is successful, the screen session can be closed by typing exit in the screen terminal. If errors occurred, keep the screen terminal open for troubleshooting purposes and contact VOSS support.</p>	
<p>Complete all the security updates.</p> <ul style="list-style-type: none"> • security update <p>The docker images <code>selfservice</code> and <code>voss_ubuntu</code> will be removed from the system at this stage.</p> <p>Note: If the system reboots, do not carry out the next manual reboot step . When upgrading from pre-19.1.1, an automatic reboot should be expected.</p> <p>Manual reboot <i>only if needed</i>:</p> <ul style="list-style-type: none"> • system reboot 	

3.1.7. Database Filesystem Conversion single node cluster (Maintenance Window, if required)

Important: To check if the step is *not* required:

- Run **drives list** and ensure that the LVM storage shows for *all converted database nodes* under Volume Groups. If the output of the **drives list** command contains `dm-0 - mongoddb:dbroot`, the step is *not* required. Refer to the **drives list** command output example below.

The **database convert_drive** command provides parameters that allow for a flexible upgrade schedule in order to limit system downtime.

When the **database convert_drive** command is run, the `voss-deviceapi` service will be stopped first and started after completion. The command should therefore be run during a maintenance window while there are no running transactions.

For a single node cluster system drive conversion, ensure the `standalone` parameter is used.

Description and Steps	Notes and Status
<p>Shut down. Since all services will be stopped, this takes some time.</p> <ul style="list-style-type: none"> • system shutdown <p>Create a VMware snapshot so that the system can easily be reverted in the case of a conversion error. Boot the system in VMware. Stop transactions from being scheduled. Run:</p> <ul style="list-style-type: none"> • database convert_drive standalone <p>Note: this step may take a few hours. Wait until it completes successfully.</p> <ul style="list-style-type: none"> • database config <p>Ensure that the storage engine for the <i>database node</i> shows as <code>storageEngine: WiredTiger</code></p> <ul style="list-style-type: none"> • drives list <p>Ensure that the LVM storage for the <i>database node</i> shows under Volume Groups In the example below, <code>dbroot/dm-0</code> shows under Volume Groups, Logical volumes</p> <pre>\$ drives list Used disks and mountpoints: sdcl - services:backups dm-0 - mongoddb:dbroot Unused disks: none - if disks have been hot-mounted, it may be necessary ->to reboot the system Unused mountpoints: services:SWAPSPACE Volume Groups voss - 10.0 GB free, 60.0 GB total Physical volumes: sddl Logical volumes: dbroot/dm-0 - 50.0 GB</pre>	

3.1.8. Database Schema Upgrade single node cluster (Maintenance Window)

Important: For VOSS-4-UC release 21.1, refer to the VOSS-4-UC 21.1 Release Changes and Impact document for details on model and workflow changes. Customizations related to these changes may be affected by this step.

Description and Steps	Notes and Status
From VOSS-4-UC 18.1 or CUCDM 11.5.3 onwards, it is recommended that the upgrade steps are run in a terminal opened with the screen command. <ul style="list-style-type: none"> • screen • voss upgrade_db 	

3.1.9. Template Upgrade single node cluster (Maintenance Window)

Description and Steps	Notes and Status
From VOSS-4-UC 18.1 or CUCDM 11.5.3 onwards, it is recommended that the upgrade steps are run in a terminal opened with the screen command. <ul style="list-style-type: none"> • screen • app template media/<VOSS-4-UC.template> 	

The following message appears:

```
Running the DB-query to find the current environment's
existing solution deployment config...
```

- Python functions are deployed
- System artifacts are imported.

The template upgrade automatically detects the deployment mode: “Enterprise”, “Provider with HCM-F” or “Provider without HCM-F”. A message displays according to the selected deployment type. Check for one of the messages below:

```
Importing EnterpriseOverlay.json
Importing ProviderOverlay_Hcmf.json ...
Importing ProviderOverlay_Decoupled.json ...
```

The template install automatically restarts necessary applications.

3.1. Upgrade a Single Node Cluster Environment with the ISO and Template

Description and Steps	Notes and Status
<p>Review the output from the app template command and confirm that the upgrade message appears:</p> <pre>Deployment summary of PREVIOUS template solution (i.e. BEFORE upgrade): ----- Product: [PRODUCT] Version: [PREVIOUS PRODUCT RELEASE] Iteration-version: [PREVIOUS ITERATION] Platform-version: [PREVIOUS PLATFORM VERSION] This is followed by updated product and version details: Deployment summary of UPDATED template solution (i.e. current values after installation): ----- Product: [PRODUCT] Version: [UPDATED PRODUCT RELEASE] Iteration-version: [UPDATED ITERATION] Platform-version: [UPDATED PLATFORM VERSION]</pre>	

Description and Steps	Notes and Status
<ul style="list-style-type: none"> If no errors are indicated, make a backup or snapshot. 	
<p>For an unsupported upgrade path, the install script stops with the message:</p> <pre>Upgrade failed due to unsupported upgrade path. Please log in as sysadmin and see Transaction logs for more detail. You can restore to the backup or revert to the VM snapshot made before the upgrade.</pre>	
<p>If there are errors for another reason, the install script stops with a failure message listing the problem. Contact VOSS support.</p>	
<p>Post upgrade migrations:</p> <ul style="list-style-type: none"> voss post-upgrade-migrations <p>Data migrations that are not critical to system operation can have significant execution time at scale. These need to be performed after the primary upgrade, allowing the migration to proceed whilst the system is in use - thereby limiting upgrade windows. A transaction is queued on VOSS-4-UC and its progress is displayed as it executes.</p>	

Description and Steps	Notes and Status
<p>Check status and health</p> <ul style="list-style-type: none"> diag health app status 	

3.1.10. Post Template Upgrade Tasks single node cluster (Maintenance Window)

Description and Steps	Notes and Status
<p>Customized ``data/Settings`` Merge the previously backed up customized <code>data/Settings</code> with the latest settings on the system by manually adding the differences or exporting the latest settings to JSON, merging the customized changes and importing the JSON.</p> <p>Support for VG400 and VG450 Analogue Gateways Before adding the VG400 or VG450 Gateway, the <code>device/cucm/GatewayType</code> model needs to be imported for each Unified CM.</p> <ol style="list-style-type: none"> 1. Create a Model Type List which includes the <code>device/cucm/GatewayType</code> model. 2. Add the Model Type List to all the required Unified CM Data Syncs. 3. Execute the Data Sync for all the required Unified CMs. <p>Verify the upgrade: Log in on the Admin Portal and check the information contained in the About > Extended Version menu. Confirm that versions have upgraded.</p> <ul style="list-style-type: none"> • Release should show 21.1 • Platform Version should show 21.1 <p>If your web browser cannot open the user interface, clear your browser cache before trying to open the interface again.</p>	
<ul style="list-style-type: none"> • Check themes on all roles are set correctly 	

3.1.11. Restore Schedules single node cluster (Maintenance Window)

Description and Steps	Notes and Status
<p>Re-enable scheduled imports if any were disabled prior to the upgrade. Two options are available: Individually for each job:</p> <ol style="list-style-type: none"> 1. Log in on the Admin Portal as a high level administrator above Provider level. 2. Select the Scheduling menu to view scheduled jobs. 3. Click each scheduled job. On the Base tab, check the Activate check box. <p>Mass modify:</p> <ol style="list-style-type: none"> 1. Modify the exported sheet of schedules to activate scheduled syncs. 2. Import the bulk load sheet. 	

3.1.12. Release Specific Updates single node cluster (Maintenance Window)

Description and Steps	Notes and Status
<p>When upgrading from CUCDM 11.5.3 Patch Bundle 2 or VOSS-4-UC 18.1 Patch Bundle 2 and earlier, re-import the following from all CUCM devices, since this upgrade deleted obsolete CUC timezone codes from the VOSS-4-UC database:</p> <ul style="list-style-type: none"> CUC models: device/cuc/TimeZone <p>Note: This is a once off data migration step. If this was performed previously when upgrading to 19.1.x, then it does not have to be repeated.</p>	
<p>After upgrading, obtain and install the following patch according to its accompanying MOP file:</p> <ul style="list-style-type: none"> Server Name: secure.voss-solutions.com Path: /software/voss4uc/releases/Release-19.2.1 Patch Directory: Update_CUC_Localization_patch Patch File: Update_CUC_Localization_patch.script MOP File: MOP-Update_CUC_Localization.pdf <p>Note: This is a once off data migration step. If this was performed previously when upgrading to 19.1.x, then it does not have to be repeated.</p>	
<p>Re-import the following from all CUCM devices:</p> <ul style="list-style-type: none"> CUCM models: device/cucm/PhoneType <p>For steps to create a custom data sync, refer to the chapter on Data Sync in the Core Feature Guide.</p> <p>Note: This is a once off data migration step. If this was performed previously when upgrading to 19.1.x, then it does not have to be repeated.</p>	

3.1.13. Log Files and Error Checks single node cluster (Maintenance Window)

Description and Steps	Notes and Status
<p>Inspect the output of the command line interface for upgrade errors, for example <code>File import failed!</code> or <code>Failed to execute command</code>.</p> <p>Use the log view command to view any log files indicated in the error messages, for example, run the command if the following message appears:</p> <p>For more information refer to the execution log file with <code>'log view platform/execute.log'</code></p> <p>For example, if it is required send all the install log files in the <code>install</code> directory to an SFTP server:</p> <ul style="list-style-type: none"> log send sftp://x.x.x.x install 	
<p>Log in on the Admin Portal as system level administrator, go to Administration Tools > Transaction and inspect the transactions list for errors.</p>	

For Upgrading from 18.1.3 to 21.1, see: [Upgrading from 18.1.3 to 21.1 - summary](#).

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