VOSS-4-UC 20.1.1 Release Changes and Impact

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Version 1.0

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Contents

Overview

The VOSS-4-UC 20.1.1 release introduces some breaking changes to various interfaces for some of its core features. This document outlines these changes in detail in order for system administrators to make necessary preparations for an upgrade to this version.

The following features have been reworked/updated

- User Management
- Number Inventory

and this impacts the following

- API integration
- Bulk load worksheets
- Configuration Templates
- Field Display Policies
- Access Profiles
- Menu Layouts
- Landing Pages

Preparing for the upgrade

In order to sufficiently prepare for the upgrade, it is recommended to review this document in detail and take note of any changes that could impact any integrations or customizations made to the existing platform.

We recommend that a staging or lab environment is created to match the production system as close as possible and this be upgraded first. This can be done through a backup and restore onto a standalone system.

API integration

The schema changes described below will result in a change in API behaviour. Depending on the specific usage of the endpoints and fields, will determine whether code changes will be required to any API client.

Bulk load worksheets

Any bulk load worksheet referencing an affected model as described below, will need to be updated. New bulk load templates can be exported from an upgraded system in order to determine the new columns to be used.

Configuration Templates

Any configuration template with an affected target model will need to be reviewed and potentially updated. It is recommended to export all customized configuration templates before performing the upgrade.

In particular, Configuration Templates for `relation/HcsUserRel` are migrated to `relation/User` and legacy fields are mapped to new fields, but the Configuration Template need to be updated manually with special attention paid to the macros used.

Configuration Templates for data/InternalNumberInventory specifying 'used' and 'available' fields are not migrated, but logged in the upgrade_db.log file.

Field Display Policies

Any field display policy with an affected target model will need to be reviewed and potentially updated. It is recommended to export all customized configuration templates before performing the upgrade.

Access Profiles

All access profiles will be automatically updated. It is recommended however to export all customized access profiles before the upgrade.

Menu Layouts

All menu layouts will be automatically updated. It is recommended however to export all customized access profiles before the upgrade.

Landing Pages

All landing pages will be automatically updated. It is recommended however to export all customized access profiles before the upgrade.

User Management

User management in 20.1.1 has been reworked to simplify interfaces and backend workflows in order to improve overall usability. To this end, various underlying data models, capturing different aspects of a user's information, are consolidated into a single data model.

Any API integration or bulk load sheets making use of the models below will stop working when upgrading to version 20.1.1.

Model Changes

The following models are being deprecated and consolidated into the data/User data model

- data/NormalizedUser
- data/HcsUserProvisioningStatusDAT
- data/LdapUser
- data/SsoUser
- data/UserAuthMethod
- data/HcsAdminUserDAT
- relation/HcsUserREL
- relation/HcsAdminUserREL

The following model has been deprecated
- view/HcsAuditUserSyncToVIEW

The following models have been introduced

- data/DataSyncWorkflow
- data/UserSyncSource
- data/UserFieldMapping
- relation/User
- view/UserProvisioningStatus

The following models have been updated (see updated schema)

- data/User

RBAC and Configuration Changes

On upgrading to version 20.1.1, a migration will make updates to all of the following

- Data Syncs
- Menu Layouts
- Landing Pages
- Access Profiles
- Configuration Templates
- Field Display Policies

Data Syncs

Updated

Certain Data Sync instances are automatically updated to change the workflows being called:

- HcsLdapUserPurge--X
    - HcsPurgeLdapUserEvtPWF --> UserLdapSyncPurge
- HcsUserPhonePurgeDS-[host]--[customer-cluster]
    - HcsAddCucmUserDsPWF --> UserCucmSyncAdd
    - HcsUpdateCucmUserDsPWF --> UserCucmSyncUpdate
    - HcsDeleteCucmUserDsPWF --> UserCucmSyncRemove
- HcsPull-[host]--[customer-cluster]
    - HcsAddCucmUserDsPWF --> UserCucmSyncAdd
    - HcsUpdateCucmUserDsPWF --> UserCucmSyncUpdate
    - HcsDeleteCucmUserDsPWF --> UserCucmSyncRemove
- HcsPurgeDS-[host]--[customer-cluster]
    - HcsDeleteCucmUserDsPWF --> UserCucmSyncRemove
- HcsUserPurgeDS-[host]--[customer-cluster]
    - HcsAddCucmUserDsPWF --> UserCucmSyncAdd
    - HcsUpdateCucmUserDsPWF --> UserCucmSyncUpdate
    - HcsDeleteCucmUserDsPWF --> UserCucmSyncRemove

- HcsUserSyncDS-[host]--[customer-cluster]
    - HcsAddCucmUserDsPWF --> UserCucmSyncAdd
    - HcsUpdateCucmUserDsPWF --> UserCucmSyncUpdate
    - HcsDeleteCucmUserDsPWF --> UserCucmSyncRemove

Menu Layouts

Removed

- LDAP Management --> LDAP Authentication Users
- User Management --> Provisioning Status
- User Management --> Manage Users

Any menu items configured to reference the following models are automatically removed from the corresponding menu layout

- data/NormalizedUser
- data/HcsUserProvisioningStatusDAT
- data/LdapUser
- data/SsoUser
- data/UserAuthMethod
- data/HcsAdminUserDAT
- relation/HcsUserREL
- relation/HcsAdminUserREL

Added

- User Management --> User Field Mapping
- User Management --> Advanced --> LDAP Users (person)
- User Management --> Advanced --> LDAP Users (InetOrgPerson)
- User Management --> Advanced → CUC Users (User)
- User Management --> Advanced --> UCCX Users (Agent)
- User Management --> Advanced --> WEBEX Teams Users (User)

Updated

- User Management --> Advanced --> LDAP Users (AD Only) to User Management --> Advanced --> LDAP Users (user)

- User Management --> Advanced --> CUCM Users to User Management --> Advanced --> CUCM Users (User)
- User Management --> Advanced --> Convert User Type: CUCM-LDAP to CUCM Local to User Management --> Advanced --> Convert to Local CUCM user

Landing Pages

Any landing page links configured to reference the following models are automatically removed from the corresponding landing page

- data/NormalizedUser
- data/HcsUserProvisioningStatusDAT
- data/LdapUser
- data/SsoUser
- data/UserAuthMethod
- data/HcsAdminUserDAT
- relation/HcsUserREL
- relation/HcsAdminUserREL

Access Profiles

Permissions for all of the following models are automatically removed from all access profiles

- data/NormalizedUser
- data/HcsUserProvisioningStatusDAT
- data/LdapUser
- data/SsoUser
- data/UserAuthMethod
- data/HcsAdminUserDAT
- relation/HcsUserREL
- relation/HcsAdminUserREL

Configuration Templates

Configuration Templates for all the following models are automatically deleted

- data/NormalizedUser
- data/HcsUserProvisioningStatusDAT
- data/LdapUser
- data/SsoUser
- data/UserAuthMethod
- data/HcsAdminUserDAT
- relation/HcsUserREL
- relation/HcsAdminUserREL

Field Display Policies

Field Display Policies for all the following models are automatically deleted

- data/NormalizedUser
- data/HcsUserProvisioningStatusDAT
- data/LdapUser
- data/SsoUser
- data/UserAuthMethod
- data/HcsAdminUserDAT
- relation/HcsUserREL
- relation/HcsAdminUserREL

Field Display Policies for the following models have been updated to account for the new schemas

- data/User
- relation/Subscriber

Number Inventory

Number Inventory in 20.1.1 has been updated to

- Improve the tracking of numbers
- Introduce the ability to reserve numbers
- Consolidate interfaces for adding number ranges between Enterprise and Provider deployments

Schema changes

Status

The schema of data/InternalNumberInventory has been updated to replace the boolean attributes "used" and "available" with a new string attribute, "status", with the following valid values:

- Available
- Used
- Used-Utility
- Reserved
- Cooling

Usage

The schema of data/InternalNumberInventory has been updated to introduce a new string attribute, "usage", indicating the type of device or utility which is consuming the INI instance (if any).

DN Use	Device	New Status	Usage	Vendor
Not Used by anything		Available	"blank"	
Phone Line	device/cucm/Phone (line instance)	Used	**Device** (Used to represent Phone, Device Profiles or Remote Destination Profile)	
Device Profile Line	device/cucm/DeviceProfile (line instance)	Used	**Device** (Used to represent Phone, Device Profiles or Remote Destination Profile)	

RemoteDestination Profile Line	device/cucm/RemoteDestinationProfile (line instance)	Used	**Device** (Used to represent Phone, Device Profiles or Remote Destination Profile)	
Hunt Pilot	device/cucm/HuntPilot	Used-Utility	**Hunt_Pilot**	
Pickup Group Pilot	device/cucm/CallPickupGroup	Used-Utility	**Pickup_Group_Pilot**	
System Call Handler	device/cuc/Callhandler (System only)	Used-Utility	**Call_Handler_Pilot**	
VoiceMailPilot	device/cucm/VoicemailPilot	Used-Utility	**Voicemail_Pilot**	
Meet Me	device/cucm/MeetMe	Used-Utility	**Meet_Me**	
CTI Route Point	device/cucm/CtiRoutePoint	Used-Utility	**CTI_RoutePoint**	
Call Park	device/cucm/CallPark	Used-Utility	**Call_Park**	
Directed Call Park	device/cucm/DirectedCallPark	Used-Utility	**Directed_Call_Park**	
VOSS Phone	data/GS_Shout_MultiVendorPhone_DAT	Used-Utility	**VOSS_Phone**	VOSS

Release Date

The schema of data/InternalNumberInventory has been updated to replace the string attribute "cooling_end_date" with a new date string attribute, "release_date", indicating the date when a number will be released if either cooling or reserved.

Vendor

The schema of data/InternalNumberInventory has been updated to introduce a new string attribute, "vendor", indicating the vendor of the device using the number e.g. Cisco, Microsoft etc.

Model Changes

- **data/InternalNumberInventory** will remain but any Menus and Access Profiles referring to the data model directly will be updated to use the new relation: **relation/NumberInventoryREL**

- The view for adding Internal Numbers in Provider deployments: **view/HcsDNMgmtVIEW** has been replaced with a new view which now supports Add, Update and Delete: **view/NumberInventoryRangeMgmtVIEW**

- The view for managing internal Numbers in Enterprise deployments: **view/UcsMaintainMultiInternalNumberInventoryVIEW** has been replaced with the same new view: **view/NumberInventoryRangeMgmtVIEW**

- The view used for auditing number inventory: **view/HcsDNInventoryMgmtView** has been replaced with a new view: **view/NumberInventoryAudit**

Migration

On upgrade the data/InternalNumberInventory instances will be migrated as follows:

Existing Values	New Friendly Value	New Data (actual) Value

Used = True, Available = True	Used	used
Used = True, Available = False	Used-Utility	used_util
Used = False, Available = True	Available	available
Used = False, Available = False and Cooling Date not Empty	Cooling	cooling
Used = False, Available = False and Cooling Date is Empty	Reserved	reserved

Adaptations

If you are making use of any adaptations, please contact your VOSS account manager for updated versions that are compatible with these changes.

Appendix A - data/User Schema

```
{
    "meta": {
        "hierarchy": "sys",
        "model_type": "data/DataModel",
        "tags": [
            "user",
            "useroverhaul"
        ],
        "version_tag": "7.0.0"
    },
    "data": {
        "Meta": {
            "attr_props": [
                {
                    "description": "The username corresponding to the the Username in
Cisco Unified Communications Manager and Cisco Unity Connection server.",
                    "name": "username",
                    "required": true,
                    "title": "User Name",
                    "type": "string"
                },
                {
                    "description": "The email address corresponding to the the
Username in Cisco Unified Communications Manager and Cisco Unity Connection server.",
                    "name": "email",
                    "required": false,
                    "title": "Email Address",
                    "type": "string"
                },
                {
                    "description": "The first name corresponding to the user first
name in Cisco Unified Communications Manager and Cisco Unity Connection server.",
                    "name": "first_name",
                    "title": "First Name",
                    "type": "string"
                },
                {
                    "description": "The last name corresponding to user last name in
Cisco Unified Communications Manager and Cisco Unity Connection server.",
                    "name": "last_name",
                    "title": "Last Name",
                    "type": "string"
```

```
                },
                {
                    "description": "The password corresponding to the user password in
Cisco Unified Communications Manager. The password is hidden.",
                    "is_password": true,
                    "name": "password",
                    "pattern": ".{8,}",
                    "title": "Password",
                    "type": "string"
                },
                {
                    "description": "The role to which the user belongs. See: Role.",
                    "format": "uri",
                    "name": "role",
                    "required": true,
                    "target": "data/Role",
                    "target_attr": "name",
                    "title": "Role",
                    "type": "string"
                },
                {
                    "default": "en-us",
                    "description": "The preferred language for this user.",
                    "format": "uri",
                    "name": "language",
                    "required": false,
                    "target": "data/Language",
                    "target_attr": "lcid",
                    "title": "Language",
                    "type": "string"
                },
                {
                    "default": false,
                    "description": "Indicate if the user's language is set by language
default in the hierarchy.",
                    "name": "set_language",
                    "required": false,
                    "title": "Set by Default Language",
                    "type": "boolean"
                },
                {
                    "attr_props": [
                        {
                            "description": "Indicates if the user must be forced to
change their password the next time that login.",
                            "name": "change_password_on_login",
                            "required": false,
                            "title": "Change Password on Next Login",
```

```
                                "type": "boolean"
                            },
                            {
                                "description": "Indicates if the account has been locked
to prevent the user from logging in.",
                                "name": "locked",
                                "required": false,
                                "title": "Locked",
                                "type": "boolean"
                            },
                            {
                                "description": "Indicates if the account has been disabled
to prevent the user from logging in until an administrator enables the account
again.",
                                "name": "disabled",
                                "required": false,
                                "title": "Disabled",
                                "type": "boolean"
                            },
                            {
                                "description": "A description of why the account is
disabled.",
                                "name": "reason_for_disabled",
                                "required": false,
                                "title": "Reason for Disabled",
                                "type": "string"
                            },
                            {
                                "description": "Specifies the policy with the rules used
to govern this user's credentials.",
                                "format": "uri",
                                "name": "credential_policy",
                                "required": false,
                                "target": "data/CredentialPolicy",
                                "target_attr": "name",
                                "title": "Credential Policy",
                                "type": "string"
                            },
                            {
                                "description": "The time when the user account was locked
as result of the number of failed login attempts exceeding the permitted thresholds.",
                                "format": "date-time",
                                "name": "failed_login_lock_date",
                                "required": false,
                                "title": "Time Locked Due to Failed Login Attempts",
                                "type": "string"
                            },
                            {
```

```
                                "description": "The time when the password was last
changed.",
                                "format": "date-time",
                                "name": "password_last_change_time",
                                "readonly": true,
                                "required": false,
                                "title": "Time of Last Password Change",
                                "type": "string"
                        },
                        {
                                "description": "The time when the password was last
changed by the user.",
                                "format": "date-time",
                                "name": "password_last_change_time_by_user",
                                "readonly": true,
                                "required": false,
                                "title": "Time of Last Password Change By User",
                                "type": "string"
                        },
                        {
                                "description": "The time the user last logged in
successfully.",
                                "format": "date-time",
                                "name": "last_login_time",
                                "readonly": true,
                                "required": false,
                                "title": "Time of Last Successful Login",
                                "type": "string"
                        },
                        {
                                "default": "0",
                                "description": "The total number of failed login attempts
since last successful login.",
                                "name": "num_of_failed_login_attempts",
                                "required": false,
                                "title": "Number of Failed Login Attempts Since Last
Successful Login",
                                "type": "integer"
                        },
                        {
                                "items": {
                                    "attr_props": [
                                        {
                                                "displayable": true,
                                                "maxLength": 128,
                                                "name": "question",
                                                "required": true,
                                                "title": "Question",
```

```
                                              "type": "string"
                                  },
                                  {

                                              "maxLength": 128,
                                              "name": "answer",
                                              "required": true,
                                              "title": "Answer",
                                              "type": "string"
                                  }
                          ],
                          "type": "object"
                  },
                  "name": "security_questions",
                  "title": "Security Questions",
                  "type": "array"
          },
          {
                  "description": "List of passwords that have been used by
user.",
                  "items": {
                      "attr_props": [
                          {
                                  "description": "Used password",
                                  "name": "password",
                                  "title": "Password",
                                  "type": "string"
                          },
                          {
                                  "description": "Time when password was
created.",
                                  "name": "time_created",
                                  "title": "Time Created",
                                  "type": "string"
                          }
                      ],
                      "type": "object"
                  },
                  "name": "used_passwords",
                  "title": "Used Passwords",
                  "type": "array"
          }
      ],
      "description": "Additional account information for the given
user.",
      "name": "account_information",
      "required": false,
      "title": "Account Information",
      "type": "object"
```

```json
                },
                {
                    "displayable": false,
                    "format": "uri",
                    "is_password": false,
                    "maxLength": 1024,
                    "name": "entitlement_profile",
                    "readonly": false,
                    "required": false,
                    "target": "data/HcsEntitlementProfileDAT",
                    "title": "Entitlement Profile",
                    "type": "string"
                },
                {
                    "description": "Sync source of the user. Identifies where the user
was synced from. This value will determine the master of the data. The data in the
User model will be derived from the fields of the master application (E.G. CUCM, CUC,
MS-LDAP).",
                    "format": "uri",
                    "name": "sync_source",
                    "target": "data/UserSyncSource",
                    "target_attr": "name",
                    "default": "LOCAL",
                    "title": "Sync Source",
                    "type": "string"
                },
                {
                    "description": "Building name or number.",
                    "name": "building_name",
                    "title": "Building Name",
                    "type": "string"
                },
                {
                    "description": "Country name.",
                    "name": "country",
                    "title": "Country",
                    "type": "string"
                },
                {
                    "description": "Department names and numbers.",
                    "name": "department",
                    "title": "Department",
                    "type": "string"
                },
                {
                    "description": "Alphanumeric Directory URI (e.g. SIP URI)",
                    "name": "directory_uri",
                    "title": "Directory URI",
```

```
                    "type": "string"
                },
                {
                    "description": "Display name of the user",
                    "name": "display_name",
                    "title": "Display Name",
                    "type": "string"
                },
                {
                    "description": "Employee number of the user",
                    "name": "employee_number",
                    "title": "Employee Number",
                    "type": "string"
                },
                {
                    "description": "Employee type",
                    "name": "employee_type",
                    "title": "Employee Type",
                    "type": "string"
                },
                {
                    "description": "Facsimile Telephone Number",
                    "items": {
                        "type": "string"
                    },
                    "name": "facsimile_telephone_number",
                    "title": "Facsimile Telephone Number",
                    "type": "array"
                },
                {
                    "description": "Contains strings that represent the user's home
phone number(s).",
                    "items": {
                        "type": "string"
                    },
                    "name": "home_phone",
                    "title": "Home Phone",
                    "type": "array"
                },
                {
                    "description": "Contains strings that represent the user's IP
phone number(s).",
                    "items": {
                        "type": "string"
                    },
                    "name": "ip_phone",
                    "title": "IP Phone",
                    "type": "array"
```

```
                },
                {
                    "description": "Jabber ID",
                    "name": "jabber_id",
                    "title": "Jabber ID",
                    "type": "string"
                },
                {
                    "description": "Contains the name of a person's locality.",
                    "name": "city",
                    "title": "City",
                    "type": "string"
                },
                {
                    "description": "Manager.",
                    "name": "manager",
                    "title": "Manager",
                    "type": "string"
                },
                {
                    "description": "The user can be a member of a variety of groups.",
                    "items": {
                        "type": "string"
                    },
                    "name": "member_of",
                    "title": "Member Of",
                    "type": "array"
                },
                {
                    "description": "Contains strings that represent the user's IP
mobile number(s).",
                    "items": {
                        "type": "string"
                    },
                    "name": "mobile",
                    "title": "Mobile",
                    "type": "array"
                },
                {
                    "description": "The name of the person's organization.",
                    "name": "organization",
                    "title": "Organization",
                    "type": "string"
                },
                {
                    "items": {
                        "is_password": false,
                        "type": "string"
```

```
                },
                "minItems": 0,
                "name": "object_class",
                "title": "Object Class",
                "type": "array"
            },
            {
                "items": {
                    "is_password": false,
                    "type": "string"
                },
                "minItems": 0,
                "name": "other_mailbox",
                "title": "Other Mailbox",
                "type": "array"
            },
            {
                "description": "The name of the person's organization unit.",
                "items": {
                    "is_password": false,
                    "type": "string"
                },
                "minItems": 0,
                "name": "ou",
                "title": "Organizational Unit",
                "type": "array"
            },
            {
                "description": "Photo URL.",
                "name": "photo_url",
                "title": "Photo URL",
                "type": "string"
            },
            {
                "description": "Physical Delivery Office Name.",
                "name": "physical_delivery_office_name",
                "title": "Physical Delivery Office Name",
                "type": "string"
            },
            {
                "description": "Contains code used by a Postal Service to identify
    postal service zones.",
                "name": "postal_code",
                "title": "Postal Code",
                "type": "string"
            },
            {
                "description": "Preferred Language.",
```

```
        "name": "preferred_language",
        "title": "Preferred Language",
        "type": "string"
    },
    {
        "description": "Contains full names of state or province.",
        "name": "state",
        "title": "State",
        "type": "string"
    },
    {
        "description": "Contains site information from a postal address.",
        "name": "street",
        "title": "Street",
        "type": "string"
    },
    {
        "description": "Telephone Number.",
        "items": {
            "type": "string"
        },
        "name": "telephone_number",
        "title": "Telephone Number",
        "type": "array"
    },
    {
        "description": "Timezone.",
        "name": "timezone",
        "title": "Timezone",
        "type": "string"
    },
    {
        "description": "Title.",
        "name": "title",
        "title": "Title",
        "type": "string"
    },
    {
        "description": "Unverified Mail Box.",
        "name": "unverified_mailbox",
        "title": "Unverified Mail Box",
        "type": "string"
    },
    {
        "description": "Custom String",
        "name": "customString1",
        "title": "Custom String 1",
        "type": "string"
```

```
            },
            {
                "description": "Custom String",
                "name": "customString2",
                "title": "Custom String 2",
                "type": "string"
            },
            {
                "description": "Custom String",
                "name": "customString3",
                "title": "Custom String 3",
                "type": "string"
            },
            {
                "description": "Custom String",
                "name": "customString4",
                "title": "Custom String 4",
                "type": "string"
            },
            {
                "description": "Custom String",
                "name": "customString5",
                "title": "Custom String 5",
                "type": "string"
            },
            {
                "description": "Custom String",
                "name": "customString6",
                "title": "Custom String 6",
                "type": "string"
            },
            {
                "description": "Custom String",
                "name": "customString7",
                "title": "Custom String 7",
                "type": "string"
            },
            {
                "description": "Custom String",
                "name": "customString8",
                "title": "Custom String 8",
                "type": "string"
            },
            {
                "description": "Custom String",
                "name": "customString9",
                "title": "Custom String 9",
                "type": "string"
```

```
        },
        {
            "description": "Custom String",
            "name": "customString10",
            "title": "Custom String 10",
            "type": "string"
        },
        {
            "description": "Custom List of Strings",
            "items": {
                "type": "string"
            },
            "name": "customListOfStrings1",
            "title": "Custom List of Strings 1",
            "type": "array"
        },
        {
            "description": "Custom List of Strings",
            "items": {
                "type": "string"
            },
            "name": "customListOfStrings2",
            "title": "Custom List of Strings 2",
            "type": "array"
        },
        {
            "description": "Custom List of Strings",
            "items": {
                "type": "string"
            },
            "name": "customListOfStrings3",
            "title": "Custom List of Strings 3",
            "type": "array"
        },
        {
            "description": "Custom List of Strings",
            "items": {
                "type": "string"
            },
            "name": "customListOfStrings4",
            "title": "Custom List of Strings 4",
            "type": "array"
        },
        {
            "description": "Custom List of Strings",
            "items": {
                "type": "string"
            },
```

```
            "name": "customListOfStrings5",
            "title": "Custom List of Strings 5",
            "type": "array"
        },
        {
            "description": "Custom List of Strings",
            "items": {
                "type": "string"
            },
            "name": "customListOfStrings6",
            "title": "Custom List of Strings 6",
            "type": "array"
        },
        {
            "description": "Custom List of Strings",
            "items": {
                "type": "string"
            },
            "name": "customListOfStrings7",
            "title": "Custom List of Strings 7",
            "type": "array"
        },
        {
            "description": "Custom List of Strings",
            "items": {
                "type": "string"
            },
            "name": "customListOfStrings8",
            "title": "Custom List of Strings 8",
            "type": "array"
        },
        {
            "description": "Custom List of Strings",
            "items": {
                "type": "string"
            },
            "name": "customListOfStrings9",
            "title": "Custom List of Strings 9",
            "type": "array"
        },
        {
            "description": "Custom List of Strings",
            "items": {
                "type": "string"
            },
            "name": "customListOfStrings10",
            "title": "Custom List of Strings 10",
            "type": "array"
```

```
        },
        {
            "description": "Custom Boolean",
            "name": "customBoolean1",
            "title": "Custom Boolean 1",
            "type": "boolean"
        },
        {
            "description": "Custom Boolean",
            "name": "customBoolean2",
            "title": "Custom Boolean 2",
            "type": "boolean"
        },
        {
            "description": "Custom Boolean",
            "name": "customBoolean3",
            "title": "Custom Boolean 3",
            "type": "boolean"
        },
        {
            "description": "Custom Boolean",
            "name": "customBoolean4",
            "title": "Custom Boolean 4",
            "type": "boolean"
        },
        {
            "description": "Custom Boolean",
            "name": "customBoolean5",
            "title": "Custom Boolean 5",
            "type": "boolean"
        },
        {
            "description": "Custom Boolean",
            "name": "customBoolean6",
            "title": "Custom Boolean 6",
            "type": "boolean"
        },
        {
            "description": "Custom Boolean",
            "name": "customBoolean7",
            "title": "Custom Boolean 7",
            "type": "boolean"
        },
        {
            "description": "Custom Boolean",
            "name": "customBoolean8",
            "title": "Custom Boolean 8",
            "type": "boolean"
```

```
                },
                {
                    "description": "Custom Boolean",
                    "name": "customBoolean9",
                    "title": "Custom Boolean 9",
                    "type": "boolean"
                },
                {
                    "description": "Custom Boolean",
                    "name": "customBoolean10",
                    "title": "Custom Boolean 10",
                    "type": "boolean"
                },
                {
                    "choices": [
                        {
                            "title": "Local",
                            "value": "Local"
                        },
                        {
                            "title": "Automatic",
                            "value": "Automatic"
                        },
                        {
                            "title": "LDAP",
                            "value": "LDAP"
                        },
                        {
                            "title": "SSO",
                            "value": "SSO"
                        }
                    ],
                    "default": "Local",
                    "description": "The type of authentication that our user would be
using. Typically this would be choices between a Standard VOSS 4 UC user, an LDAP user
or an SSO user.",
                    "name": "auth_method",
                    "title": "Auth Method",
                    "type": "string"
                },
                {
                    "description": "A reference to the LDAP server which this user
must authenticate against.",
                    "format": "uri",
                    "name": "ldap_server",
                    "required": false,
                    "target": "data/Ldap",
                    "title": "LDAP Server",
```

```
                    "type": "string"
                },
                {
                    "description": "The login attribute of the associated LDAP device
model instance",
                    "name": "ldap_username",
                    "title": "LDAP Username",
                    "type": "string"
                },
                {
                    "description": "The entity id of the SSO Identity Provider.",
                    "format": "uri",
                    "name": "sso_idp",
                    "required": false,
                    "target": "data/SsoIdentityProvider",
                    "target_attr": "entity_id",
                    "title": "SSO Identity Provider",
                    "type": "string"
                },
                {
                    "description": "The name identifier that is used for an SSO
authenticated user.",
                    "name": "sso_username",
                    "required": false,
                    "title": "SSO Username",
                    "type": "string"
                },
                {
                    "choices": [
                        {
                            "title": "Admin",
                            "value": "Admin"
                        },
                        {
                            "title": "End User",
                            "value": "End User"
                        }
                    ],
                    "default": "Admin",
                    "description": "Indicate the user's login type.",
                    "name": "user_type",
                    "required": false,
                    "title": "User Type",
                    "type": "string"
                },
                {
```

```
                    "description": "Exclude from Directory flag to control the Phone
Services directory lookup. If set to true the User's phone number will not appear in
the directory lookup.",
                    "name": "exclude_from_directory",
                    "title": "Exclude from Directory",
                    "type": "boolean"
                }
            ],
            "constraints": [
                {
                    "business_key": true,
                    "hierarchy": true,
                    "unique": [
                        "username"
                    ]
                },
                {
                    "business_key": true,
                    "hierarchy": false,
                    "unique": [
                        "email"
                    ]
                }
            ],
            "operations": [
                "get",
                "list",
                "add",
                "clone",
                "update",
                "remove",
                "export_bulkload_template",
                "bulk_update_form",
                "configuration_template",
                "field_display_policy",
                "export",
                "migration",
                "help",
                "tag",
                "tag_version"
            ],
            "summary_attrs": [
                "username",
                "last_name",
                "first_name",
                "email",
                "role",
                "entitlement_profile",
```

```
                "sync_source",
                "user_type",
                "auth_method",
                "department"
            ]
        },
        "doc": "The User model for user details that correspond with Cisco Unified
Communications Manager and Cisco Unity Connection server.",
        "name": "User"
    }
}
```

Appendix B - data/InternalNumberInventory Schema

```
{
    "meta": {
        "model_type": "data/DataModel",
        "version_tag": "1.8",
        "tags": [
            "ini",
            "inicooling"
        ]
    },
    "data": {
        "name": "InternalNumberInventory",
        "doc": "The DataModel that V4UC uses to manage INI items.",
        "Meta": {
            "operations": [
                "add",
                "bulk_update_form",
                "configuration_template",
                "export",
                "export_bulkload_template",
                "field_display_policy",
                "get",
                "help",
                "list",
                "migration",
                "remove",
                "tag",
                "tag_version",
                "update",
```

```
            "move"
    ],
    "list_operations": [
        "ReserveNumber"
    ],
    "summary_attrs": [
        "internal_number",
        "status",
        "usage",
        "e164number",
        "release_date",
        "tag",
        "description",
        "reservation_notes",
        "vendor",
        "extra1",
        "extra2",
        "extra3",
        "extra4",
        "extra5",
        "extra6"
    ],
    "attr_props": [
        {
            "required": true,
            "type": "string",
            "name": "internal_number",
            "title": "Internal Number"
        },
        {
            "name": "status",
            "title": "Status",
            "required": true,
            "type": "string",
            "choices": [
                {
                    "title": "Available",
                    "value": "Available"
                },
                {
                    "title": "Used",
                    "value": "Used"
                },
                {
                    "title": "Used-Utility",
                    "value": "Used-Utility"
                },
                {
```

```json
                "title": "Reserved",
                "value": "Reserved"
            },
            {
                "title": "Cooling",
                "value": "Cooling"
            }
        ]
    },
    {
        "name": "usage",
        "title": "Usage",
        "type": "string"
    },
    {
        "name": "reservation_notes",
        "title": "Reservation notes",
        "type": "string"
    },
    {
        "name": "release_date",
        "title": "Release Date",
        "description": "A value indicates that the number is in temporary
'cooldown' isolation (and therefore also temporarily unavailable until the cooling
duration expires, refer to global settings).",
        "help_text": "A value here indicates that the number is in
temporary 'cooldown' isolation and therefore also temporarily unavailable until the
cooling duration expires (refer to global settings).",
        "type": "string"
    },
    {
        "type": "string",
        "name": "tag",
        "title": "Tag"
    },
    {
        "type": "string",
        "name": "description",
        "title": "Description"
    },
    {
        "type": "string",
        "name": "e164number",
        "title": "E164Number"
    },
    {
        "type": "string",
        "name": "vendor",
```

```
            "title": "Vendor"
        },
        {
            "type": "string",
            "name": "extra1",
            "title": "Extra1"
        },
        {
            "type": "string",
            "name": "extra2",
            "title": "Extra2"
        },
        {
            "type": "string",
            "name": "extra3",
            "title": "Extra3"
        },
        {
            "type": "string",
            "name": "extra4",
            "title": "Extra4"
        },
        {
            "type": "string",
            "name": "extra5",
            "title": "Extra5"
        },
        {
            "type": "string",
            "name": "extra6",
            "title": "Extra6"
        },
        {
            "type": "string",
            "name": "extra7",
            "title": "Extra7"
        },
        {
            "type": "string",
            "name": "extra8",
            "title": "Extra8"
        },
        {
            "type": "string",
            "name": "extra9",
            "title": "Extra9"
        }
    ],
```

```
        "constraints": [
            {
                "hierarchy": true,
                "unique": [
                    "internal_number"
                ],
                "business_key": true
            }
        ]
    }
}
}
```