VOSS Automate Multi-Cluster Deployments Technical Guide

Release 21.2

Jan 14, 2022

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1. Introduction

1.1. Introduction

Multi-cluster UC support is a critical requirement for many large customers and is needed to support a variety of use cases. Primary Use Cases may include supporting larger user capacities, enabling geo-clustering for multi-national clients and supporting corporate segregation requirements. However, multi-cluster implementations present several deployment and configuration challenges. These include handling increased feature complexity, achieving consistent provisioning standards, facilitating a standard dial plan scheme for centralized management, catering for platform inheritance and systems integration, and providing seamless user integrations.

This document serves as an overview of VOSS Automate's current support for multi-cluster customer deployments. It offers several best practice recommendations pertaining to Global Directory Search, User Integrations, Day 2 User and Feature Provisioning, Dial Plan Management and Overbuild, leveraging current field implementations and internal test efforts. Furthermore, known caveated scenarios are clearly defined with mitigating options suggested as far as possible.

2. General

2.1. Deployment Recommendations

To prevent unexpected provisioning errors, data syncs must sync userid to VOSS Automate uniquely. In other words avoid having the same userid multiple times in VOSS Automate from different CUCM devices, even if at different hierarchy levels. It is acceptable to have duplicates in different customers.

For multi-cluster call routing, the SRND recommendations around multi-cluster deployments should still apply. For three or more leafs, an SME cluster should be deployed.

2.2. Caveats and Limitations

- Due to limitations for User Moves functionality, do not use multiple NDLs within a single cluster. Note that Inter-cluster moves are not yet supported.
- We recommend that you do not deploy UC Devices on intermediary hierarchy nodes. Scenarios for deploying other devices, for example LDAP, are discussed under User Integration. Setup any syncs and schedules at the same level as the UC apps, for example the customer level, and point them to a specific device for clarity.

3. Directory Search

3.1. Overview

In CUCM, there are several primary user journeys for directory search:

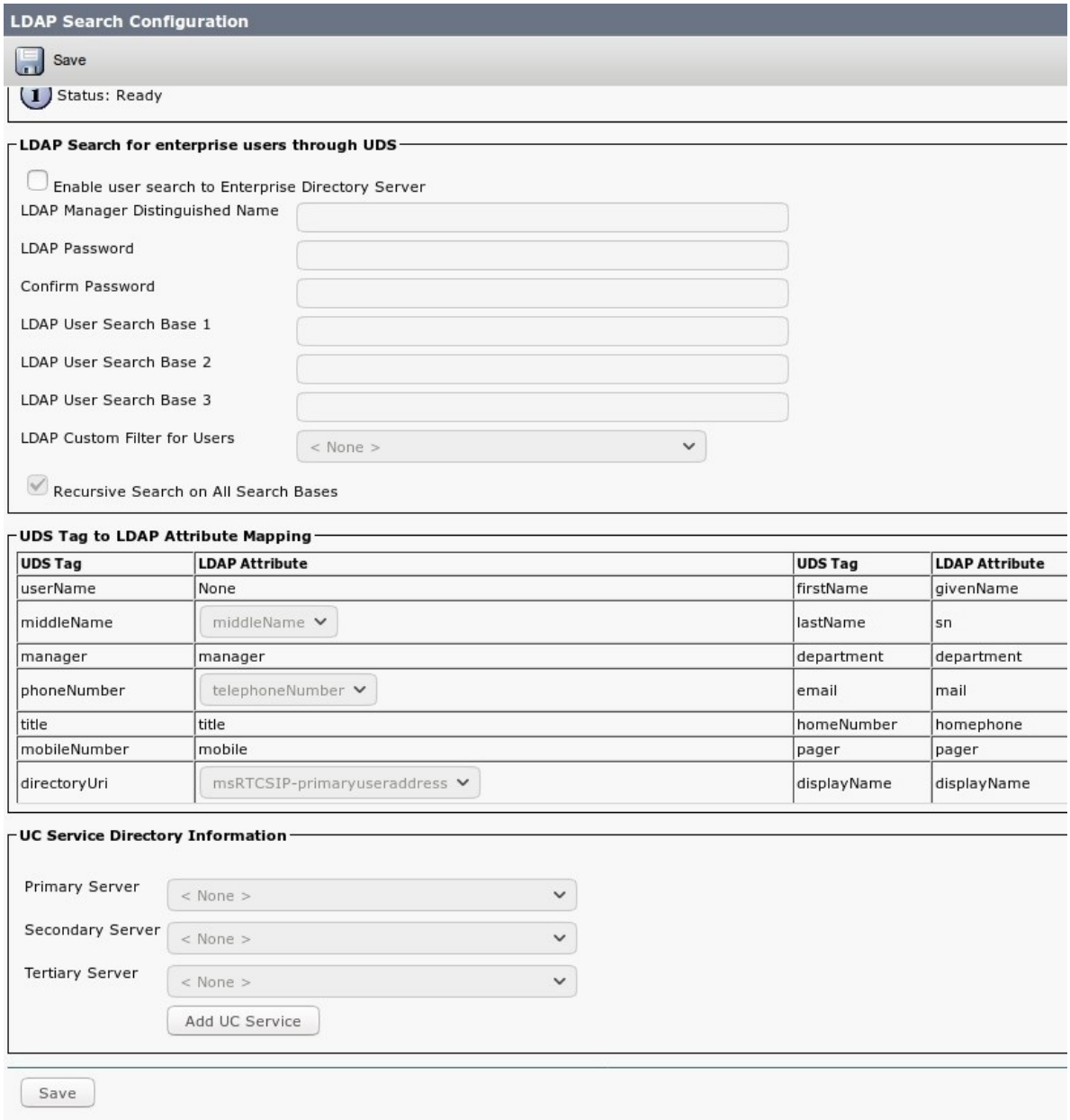
- Cisco Jabber (soft clients)
- Corporate Directory IP Phone Service (physical phones)
- 3rd-Party Integrations, such as:
  - CUAC
  - Billing
- In CUCM 10.6 and 11.0, Jabber (when integrated using UDS) requires all users provisioned in all clusters, which is problematic as it introduces userid duplication during data syncs.
- The CUCM 11.5(1) LDAP Search feature supports seamless support multi-cluster directory search. This means the external directory is used with UCM acting as a UDS Proxy for directory Search requests.
  - LDAP Search may be mandated for customers deploying MRA (Mobile and Remote Access), as this is a required configuration to support directory search outside the Enterprise for several directory integrations.

3.2. Deployment Recommendations

- Based on existing VOSS Automate provisioning workflow capabilities, we strongly recommend that you employ the LDAP Search feature for UDS. This provides many ancillary benefits such as reduced upgrade and data sync times, as well as smaller DB backups.
- If this method is unacceptable for the customer environment, consider an alternative option for Bottom-Up Sync use cases, as described in the User Integration section.
- If the local CUCM database does not contain a global directory, then 3rd-Party Integrations, for example CUAC, needing to search all users, require an LDAP integration not just a CCM Integration. CUAC, for example, supports integrating to a CCM database and a single LDAP bind, so take care to support the global directory from the Attendant Console.

3.3. Caveats and Limitations

- When enabled, the local database is not searched, meaning that only LDAP users in the global directory are searchable - local CUCM users (temporary workers, common area phones, etc.) are not resolved. Add these users to the global directory if you want them to be searchable, etc.
- Unlike LDAP Directory configuration, LDAP Search only provides a single integration per cluster. Customers with complex AD environments may be forced to deploy AD-LDS to make use of this feature.



- There is no interaction with the Corporate Directory IP Phone Service in the current CUCM LDAP Search feature. Corporate Directory still looks to the local CUCM database, which requires the local database to maintain a list of all users in all clusters, unless a separate Web Server is used to host the global directory. Currently, there is no such feature in the HCS solution. You must factor all prominent

customer User Journeys into deployment model selection.

- There is an open enhancement to support the LDAP Search model in CUCM. Currently, this requires a once-off static configuration on each leaf cluster.

4. User Integration

4.1. Overview

Selecting an appropriate User Integration model is key to implementing multi-cluster successfully. An approach must be chosen to meet all user integration requirements. Both methods require consideration for Directory integration requirements, which are covered in detail. Several options are provided for both provisioning paradigms, which the preferred deployment practice being to utilize CUCM's LDAP Search feature.

Top-Down Syncs make VOSS-driven provisioning simpler, but current LDAP Server functionality may not be sufficiently flexible to meet all customer LDAP integration Requirements. Bottom-Up Syncs can work well when paired with Overbuild deployment models, but careful consideration is needed for directory integration due to the limited options afforded by Model Instance Filters.

4.2. Top-Down User Sync

4.2.1. Deployment Recommendations

LDAP Search (Preferred)

To meet user uniqueness for provisioning in VOSS Automate, we suggested that you use the CUCM LDAP Search feature and limit CUCM LDAP agreements user sync sizes as far as possible. A single global LDAP bind agreement can be applied at the customer hierarchy level, with users pushed uniquely to individual leaf clusters. Alternative approaches are discussed in Caveats and Limitations below.

4.3. Bottom-Up User Sync

4.3.1. Deployment Recommendations

Option 1 - LDAP Search (Preferred)

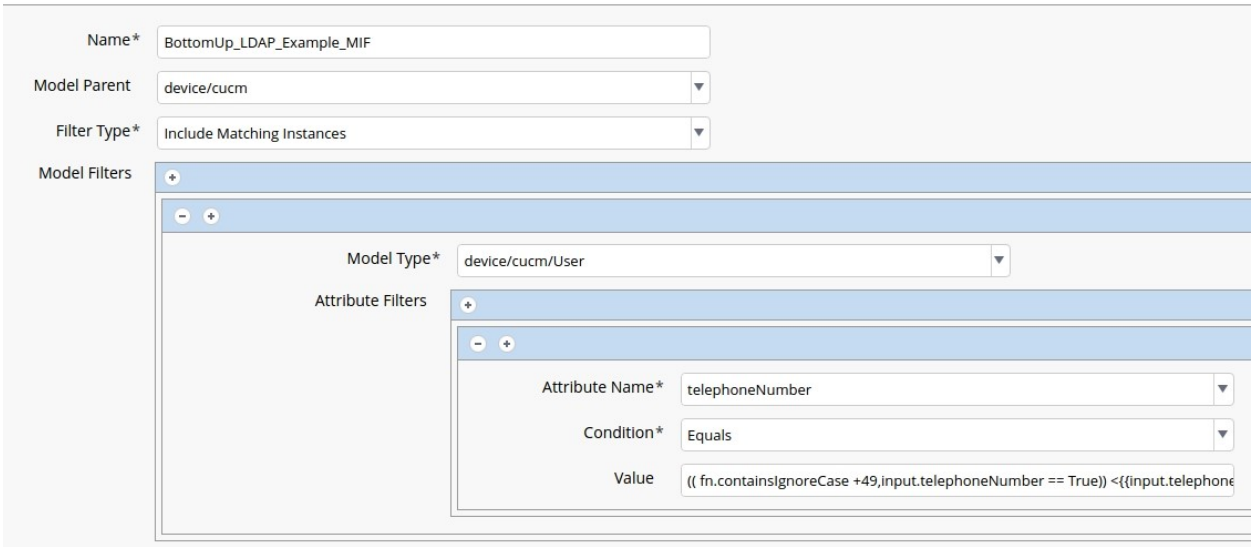
- To meet user uniqueness for provisioning in VOSS Automate, we suggest that the CUCM LDAP Search feature is used for Directory Search capabilities. LDAP Search limits the CUCM database size, reducing both UCM/VOSS Automate upgrade windows and VOSS Automate sync times.

- We strongly recommend using LDAP Filtering or multiple explicit bind agreements in UCM. Uniquely sync Users to each CUCM Cluster. If this is not possible, a hybrid approach using complementary Model Instance Filters (MIFs) can be applied, as detailed in Option 2.

Option 2 - Model Instance Filters (MIFs)

- If LDAP Search is not acceptable, use Model Instance Filters to provide userid uniqueness. The 'telephoneNumber' LDAP attribute is currently the most accurate mechanism to filter users.
  - If you want to explore other fields to use for the MIF, then practically it needs to be a user field that UCM pulls from the LDAP sync and is also in the listUser AXL response. The UCM User setting candidates based on those that can be pulled from LDAP are:
    - User ID
    - First Name
    - Middle Name
    - Last Name
    - Manager ID
    - Department
    - Telephone Number
    - Mail ID
    - Title
    - Home Number
    - Mobile Number
    - Pager Number
    - Directory URI
    - Display Name
- This is highly effective for geo-deployments. For 'flat' multi-cluster deployments, you may need to consider alternatives (refer to the Caveats and Limitations section below). An efficient configuration for a geo-cluster deployment, for example US cluster and APAC cluster, MIF's macro is suggested below. This filters based on E.164 country code:

  ((fn.containsIgnoreCase +49,input.telephoneNumber == True)) <{{input.telephoneNumber}}>



- For Bottom-Up LDAP synced deployments, filtering should rely on LDAP attributes, and not on CUCM provisioning attributes, for example the Home Cluster field. Using CUCM fields creates a non- VOSS Automate local cluster provisioning dependency. We recommend this to ensure consistent filtering and to retain consistency through MACDs.
- There are several caveats for Unity Connection relating to duplicate userids, and constructing useful CUC MIFs due to the lack of applicable LDAP fields to do this effectively. We strongly recommend that you make sure that each userid is unique when setting up LDAP agreements directly on CUC for bottom-up user integrations. Refer to Caveats and Limitations for more information.

4.3.2. Caveats and Limitations

- Unity Connection with Bottom Up is unlikely to be effective with MIFs, due to a lack of LDAP fields available to construct an effective MIF.
- Unity Connection Bottom-Up may have unexpected results for user duplication due to duplicates during the ImportUsers transaction. This may lead to unexpected failures during Quick Add Subscriber (QAS) transactions where voicemail is provisioned. This known issue is tracked in CSCvd58565. The workaround is to ensure that userid duplicates are filtered in the Unity Connection LDAP bind agreement(s) using multiple binds or LDAP filtering.
- When LDAP Search, that is UDS Proxy, is used, CUCM Local Users will not be listed in the UDS directory
- More complex MIFs could be required for non-geo clusters, where a separate macro may need to be defined, for example filtering on US Area Codes in telephoneNumber attribute. In this case, it could lead to many statements for large clusters with many sites. Some care will need to be taken to find the most effective macros for the deployment. MIFs containing a large number of attr_filters have the potential for data sync performance degradation. In such cases, consult your VOSS Automate Account Team before employing this approach to assess the performance impact.
- At this time, custom LDAP attributes are not yet supported with MIFs due to limitations in the CUCM AXL API.

5. Dial Plan

5.1. Overview

As of HCS 10.6, inter-cluster call routing for HCS is officially supported as a static configuration (see Manual Configuration for InterSite Cross Cluster Support). Inter-site routing will require ICT Route Patterns. This includes supporting customer-level INIs, such as when using customer-wide Hunt Pilots, multi-cluster VM pilots, etc.

Holistic multi-cluster dial plan support needs to cater for Enterprise and E.164 dialing behaviors. At present, HCS dial plan schemas support these dialing habits in the following manner for intra-cluster call flows.

- E.164 Dialling - Implemented at Customer Level as a Dial Plan Feature in CustomerFONet-Feature-VX-SCH
- Enterprise Dialling - Implemented at Customer Level using the HcsDefaultAddCustomerSchema Core Schema

Customer dial plans can extend these Dial Plan Schemas to support inter-cluster call routing. End-to-end dial plan template and workflow support for multicluster call routing is on the product backlog and is planned for an upcoming VOSS Automate release.

5.2. Number Inventory

The current VOSS Automate Internal Number Inventory (INI) is not partition-aware, or cluster aware. *Multi-cluster INIs must be unique across all clusters.*

5.3. Suggestions for Multi-cluster Dial Plans

5.3.1. HCS Dial Plans GDPR Support

- Canned HCS Dial Plans have not been formally extended to support all multi-cluster requirements. Several Dial Plan recommendations can be made after analysis of the HCS Customer and Feature Dial Plan Schemas, but are subject to further call flow testing. This does not serve as best practice for inter-cluster call routing when using HCS dial plans.
- To align with current best practices for dial plan design, it is recommended to employ GDPR/ILS to leverage the many benefits of dynamic call routing schemes. A detailed setup guide via VOSS

Automate is beyond the scope of this document but contact your VOSS account team or technical contact for the latest guides and configurations to load.

Reusing Existing HCS Dial Plan Partitioning

Using GDPR with HCS will enable the seamless support of multi-cluster call routing for multiple call flow scenarios. GDPR can easily be implemented on top of the existing HCS Looping Dial Plan by reusing existing Customer Dial Plan partitions:

- Forced Onnet Routing
  - `{{pwf.HcsDpUniqueCustomerPrefixMCR}}-E164LookUp-PT`
- Enterprise Dialling
  - `{{ macro.DP_CUST_PRE_INTER_SITE_ROUTING_PT }}`

In order to implement ILS/GDPR, the following high-level procedure is recommended:

1. Perform static configuration directly on CUCM to:
   a. Configure ILS Configuration for each respective Leaf Cluster/SME. Take note of the advertised route string.
   b. Define the GDPR Learned Patterns Partition for E.164 and Enterprise Dialling using the macro partition specification listed above.
      i. `{{pwf.HcsDpUniqueCustomerPrefixMCR}}-E164LookUp-PT`
      ii. `{{ macro.DP_CUST_PRE_INTER_SITE_ROUTING_PT }}`
2. Provision SIP Trunk Security Profiles, SIP Profiles, SIP Trunks, Device Pools, Leaf Cluster Ingress CSS's etc. on each respective Leaf Cluster/SME.
3. Provision SIP Route Patterns to match the advertised route string scheme, applying default route (e.g. `*.route`) in the event that SME is provisioned.
4. Provision GDPR advertised patterns for E.164 and Enterprise dialling.

The addendum of this document includes several relevant CFTs which may assist in streamlining a bulk-loaded configuration. Workflow adaptations are currently in progress to extend existing functionality to support GDPR as part of E164 associations and Number Management. In the interim, the VOSS Automate team has prepared a set of reference Bulk Loaders. Please contact your VOSS Automate Account Manager for more information.

Segregated GDPR Partitioning

Customers may wish to selectively partition GDPR patterns for greatly flexibility and dial plan control. This method requires additional configuration, and schema extensions to support new dial plan elements. Additionally, migrating existing dial plans to support multicluster may require a large number of Line CSS updates. For most environments, the proposal for re-using existing schema partitions will meet all business requirements, is simpler to maintain, and is the preferred multicluster system design. If you wish to implement a segregated dial plan partitioning for GDPR, please contact your VOSS Automate Account Team.

5.3.2. HCS Dial Plan Type Considerations for GDPR

- Type 1 Dial Plans have been identified as being problematic due to the required handling of ISP prefixing. As HcsDefaultAddCustomerSchema is shared for all Dial Plan Types in the current design, Type 1's ISP requirements have the potential for caveated behaviour, but has not been sufficiently explored at present. It's suggested that ISPs are included in GDPR patterns, but this introduced the need for Translation Patterns to strip the ISP inbound to the remote leaf. Caller ID ISP prefixing should also be considered. Supporting Type 1 Dial Plans requires non-trivial schema extensions and further testing.
- Type 2 and Type 3 Dial Plans are the easiest to support and should not require any Enterprise Number Called or Calling Party masking.
- Type 4 Dial Plans raise concerns over the feasible handling of between-cluster discontiguous numbering. Admittedly, this is a corner case only.

Overbuild Dial Plans

- Overbuild multi-cluster dial plans have not been formally tested, but are considered a low-risk area due to extensive use in the field.

Call Aggregation

- Call aggregation is recommended using SME for connecting three or more leafs. SME can be used in conjunction with ILS/GDPR to provide a global dial plan for Enterprise, Forced Onnet, Centralized Services, Offnet calling etc.
- For a sample set of ILS/GDPR Model Loaders, please contact your VOSS Automate Account Team.

5.4. Caveats and Limitations

5.4.1. ILS/GDPR

- As the GDPR feature is limited to a single GDPR partitioning scheme per cluster, multi-tenancy is not achievable. Therefore GDPR is only supported for dedicated customer deployments. Shared Architecture deployments using GDPR are unsupported. Such dial plan designs are recommended to use static routing mechanisms.
- GDPR Failover scenarios have not been investigated. These open a series of questions pertaining to:
  - Overlapping AAR requirements in hybrid breakout (LBO/CBO) scenarios. This is a corner case.
  - Lack of FAC support for GDPR PSTN Failover (this is a generic caveat for CUCM redirected call flows). This feature gap's limitations are detailed in CSCuv41940 (sev6). PSTN Failover is not a present requirement, making FAC support thereof a corner case only.
- +E.164 model provisioning (plus-prefixed patterns e.g. +1408123XXXX) for GDPR Advertised and Blocked Patterns fail - fix targeted for 11.5.1ES1
- There are several AXL limitations for ILS and GDPR configurations that singletons. These do not support 'list' methods, and as such cannot currently be bulk loaded. At present, ILS Configuration and GDPR Learned Partitions will require static configuration on CUCM.

5.4.2. Intercluster Trunking

- No basic dial plan elements (Device Pools, CSS, etc) defined for Intercluster SIP Trunks. Future work required for template development. For a sample set of model loaders, contact your VOSS Automate Account Team.

5.4.3. HCS Dial Plans

- Type 1 Dial Plans require handling of ISP prefixing/stripping. It's suggested that ISPs are stripped inbound to remote leaf, required possible static Partition/CSS and Translation Pattern configuration - for both Called and Calling Party.
- Inter-cluster Call Forwarding to Offnet destinations still requires some thought. Inter-cluster Onnet call flows use Enterprise number for CLI/RDNIS.

6. Overbuild

6.1. Overbuild Considerations

- Overbuild multi-cluster support has not been formally tested in this iteration, but is considered a low-risk area due to extensive use in the field and is fully supported for multicluster deployments.
- Using User Audit workflows with multicluster customers may lead to unexpected results. Please see ‘Caveated Deployment Scenarios’ below.

7. Caveated Deployment Scenarios

7.1. Scenarios

These features have not been specifically designed or solution tested.

- The Move User feature is not supported between NDLs. Intercluster moves are therefore not possible today although there is a roadmap item to manage cross-cluster user moves.
- EMCC is not automated but can be supported with a combination of static configuration/device models and adjustments to FDPs/CFTs around subscriber features.
- Shared CUC Clusters for Multi-Cluster Customers

  This deployment paradigm was considered a corner case and was not prioritized for solution testing. It is not anticipated there would be any issues with the workflows in supporting this scenario.
- User Audit workflows have known limitations with determining cluster references and are not expected to work for multicluster customers. Using this functionality may lead to unexpected results.

8. Conclusion

8.1. Notes

In conclusion, VOSS Automate Day 2 Provisioning is expected to cater for multi-cluster customer requirements adequately.

Several critical deployment decisions are required before implementation to ensure successful User Integrations. Some care must be taken to select a model that affords adequate user filtering, considering the functionality available when using VOSS-integrated LDAP, UC App-integrated LDAP, CUCM LDAP Search and Model Instance Filters. Several deployment options are presented, with current best practice strongly recommending using LDAP Search for Directory Integration in conjunction with both Bottom-Up and Top-Down Data Syncs.

Despite the fact that fully-tested multi-cluster dial plan extensions for canned HCS Dial Plans not yet being available, the suggestions contained herein should facilitate basic intercluster routing in most call flows. Several extensions may still be required, with the primary caveats listed in this documents. ILS/GDPR is the recommended method for intercluster trunking and route propagation but is a static configuration at this time. INIs are not yet partition-aware and must be unique across all clusters.

9. Appendices

9.1. Model Instance Filter Samples

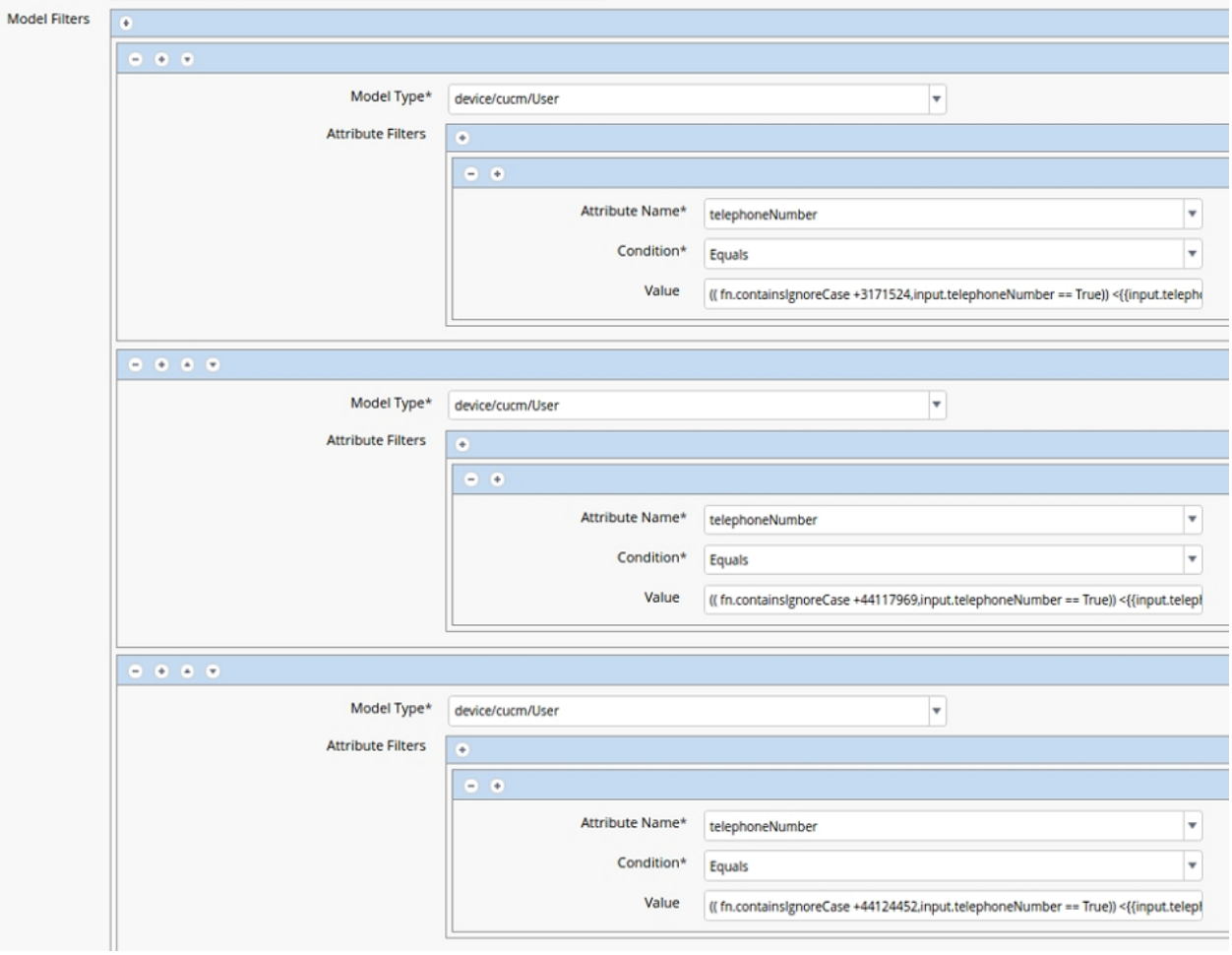
9.1.1. Single telephoneNumber MIF

Be sure to contact you VOSS account team or technical contact for the latest examples Single telephoneNumber MIF

```
{
    "meta": {},
    "resources": [
        {
            "meta": {
                "model_type": "data/ModelInstanceFilter",
                "pkid": "5881dc281ff8cb203c907061",
                "schema_version": "0.1.4",
                "hierarchy": "sys.hcs.Provider.Reseller.Customer",
                "tags": []
            },
            "data": {
                "model_parent": "device/cucm",
                "name": "BottomUp_LDAP_Example_MIF",
                "filter_type": "inclusion",
                "model_filters": [
                    {
                        "model_type": "device/cucm/User",
                        "attr_filters": [
                            {
                                "attr_name": "telephoneNumber",
                                "condition": "equals",
                                "value": "(( fn.containsIgnoreCase +49,
                                  input.telephoneNumber == True))
                                  <{{input.telephoneNumber}}>"
                            }
                        ]
                    }
                ]
            }
        }
    ]
}
```

9.1.2. Multiple telephoneNumber MIF

The above MIF can be expanded by adding to the attr_filters list:



9.2. Configuration Template Samples

9.2.1. Intercluster Trunking, ILS/GDPR CFTs

Be sure to contact you VOSS account team or technical contact for the latest examples

```
{
    "meta": {},
    "resources": [
        {
            "meta": {
                "model_type": "data/ConfigurationTemplate",
                "pkid": "58aacd351ff8cb1e5e63aa02",
                "schema_version": "0.1.8",
                "hierarchy": "sys.hcs",
```

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```
                "tags": []
            },
            "data": {
                "description": "Default cluster-wide SIP profile for use
                   by HCS ICT ILS SIP Trunks.",
                "template": {
                    "rsvpOverSip": "Local RSVP",
                    "cucmVersionInSipHeader": "Major And Minor",
                    "sendRecvSDPInMidCallInvite": "(( False ))",
                    "useCallerIdCallerNameinUriOutgoingRequest": "(( False ))",
                    "optionsPingIntervalWhenStatusOK": "60",
                    "startMediaPort": "16384",
                    "mlppUserAuthorization": "(( False ))",
                    "timerT1": "500",
                    "timerT2": "4000",
                    "sipSessionRefreshMethod": "Invite",
                    "userInfo": "None",
                    "timerInvite": "180",
                    "stopMediaPort": "32766",
                    "sipBandwidthModifier": "TIAS and AS",
                    "timerSubscribe": "120",
                    "callStats": "(( False ))",
                    "description": "Default SIP Profile for deployed HCS Voice Mail␣
↪services",
                    "anonymousCallBlock": "Off",
                    "timerSubscribeDelta": "5",
                    "earlyOfferSuppVoiceCall": "Best Effort (no MTP inserted)",
                    "enableAnatForEarlyOfferCalls": "(( False ))",
                    "optionsPingIntervalWhenStatusNotOK": "120",
                    "meetmeServiceUrl": "x-cisco-serviceuri-meetme",
                    "dtmfDbLevel": "Nominal",
                    "maxRedirects": "70",
                    "acceptAudioCodecPreferences": "Default",
                    "enableVad": "(( False ))",
                    "timerOffHookToFirstDigit": "15000",
                    "sdpTransparency": "Pass all unknown SDP attributes",
                    "fallbackToLocalRsvp": "(( True ))",
                    "deliverConferenceBridgeIdentifier": "(( False ))",
                    "t38Invite": "(( False ))",
                    "sipRe11XxEnabled": "Send PRACK if 1xx Contains SDP",
                    "inactiveSDPRequired": "(( False ))",
                    "callpickupListUri": "x-cisco-serviceuri-opickup",
                    "timerRegisterDelta": "5",
                    "sipOptionsRetryCount": "6",
                    "isScriptTraceEnabled": "(( False ))",
                    "abbreviatedDialUri": "x-cisco-serviceuri-abbrdial",
                    "redirectByApplication": "(( False ))",
                    "semiAttendedTransfer": "(( True ))",
                    "allowiXApplicationMedia": "(( False ))",
                    "isAssuredSipServiceEnabled": "(( False ))",
                    "sipOptionsRetryTimer": "500",
                    "retryNotInvite": "10",
                    "callpickupUri": "x-cisco-serviceuri-pickup",
                    "gClear": "Disabled",
                    "rejectAnonymousOutgoingCall": "(( False ))",
                    "earlyOfferSupportForVoiceCall": "(( False ))",
```

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```
                "allowMultipleCodecs": "(( False ))",
                "timerKeepAlive": "120",
                "destRouteString": "(( False ))",
                "rejectAnonymousIncomingCall": "(( False ))",
                "enableOutboundOptionsPing": "(( True ))",
                "videoCallTrafficClass": "Mixed",
                "name": "Standard SIP Profile for HCS ICT ILS Service",
                "defaultTelephonyEventPayloadType": "101",
                "callHoldRingback": "Off",
                "callingLineIdentification": "Default",
                "telnetLevel": "Disabled",
                "allowPresentationSharingUsingBfcp": "(( False ))",
                "callForwardUri": "x-cisco-serviceuri-cfwdall",
                "callpickupGroupUri": "x-cisco-serviceuri-gpickup",
                "ringing180": "(( False ))",
                "dndControl": "User",
                "dialStringInterpretation": "Phone number consists of
                   characters 0-9, *, #, and + (others treated as URI addresses)",
                "callerIdBlock": "Off",
                "rerouteIncomingRequest": "Never",
                "confJointEnable": "(( True ))",
                "rfc2543Hold": "(( False ))",
                "retryInvite": "6",
                "timerRegister": "3600",
                "enableUriOutdialSupport": "(( True ))",
                "stutterMsgWaiting": "(( False ))",
                "userAgentServerHeaderInfo": "Send Unified CM Version
                   Information as User-Agent Header"
            },
            "merge_strategy": "additive",
            "target_model_type": "device/cucm/SipProfile",
            "name": "ILSSipProfileCFT"
        }
    },
    {
        "meta": {
            "model_type": "data/ConfigurationTemplate",
            "pkid": "58aace7f1ff8cb1e5e63aa31",
            "schema_version": "0.1.8",
            "hierarchy": "sys.hcs",
            "tags": []
        },
        "data": {
            "description": "Default cluster-wide SIP trunk security
              profile for use by HCS ICT ILS Trunks.",
            "template": {
                "digestAuthentication": "(( False ))",
                "name": "SIP Trunk Security Profile for HCS ICT ILS Service",
                "acceptPresenceSubscription": "(( True ))",
                "acceptUnsolicitedNotification": "(( True ))",
                "sipV150OutboundSdpOfferFiltering": "Use Default Filter",
                "acceptOutOfDialogRefer": "(( True ))",
                "outgoingTransport": "TCP",
                "securityMode": "Non Secure",
                "applLevelAuthentication": "(( False ))",
                "allowChargingHeader": "(( False ))",
```

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```
                    "noncePolicyTime": "600",
                    "allowReplaceHeader": "(( True ))",
                    "incomingPort": "5060",
                    "incomingTransport": "TCP+UDP",
                    "transmitSecurityStatus": "(( False ))",
                    "description": "Default Non Secure SIP Trunk Profile
                     for deployed HCS ILS Services"
                },
                "merge_strategy": "additive",
                "target_model_type": "device/cucm/SipTrunkSecurityProfile",
                "name": "ILSSipTrunkSecurityProfileCFT"
            }
        },
        {
            "meta": {
                "model_type": "data/ConfigurationTemplate",
                "pkid": "58aace021ff8cb1e5e63aa1a",
                "schema_version": "0.1.8",
                "hierarchy": "sys.hcs",
                "tags": []
            },
            "data": {
                "description": "Deploy a CUCM customer-level ICT ILS trunk.",
                "template": {
                    "protocol": "SIP",
                    "routeClassSignalling": "Default",
                    "useDevicePoolCgpnTransformCssUnkn": "(( True ))",
                    "sipAssertedType": "Default",
                    "dtmfSignalingMethod": "No Preference",
                    "sipProfileName": "Standard SIP Profile for HCS ICT ILS Service",
                    "callingSearchSpaceName":
                      "{{ macro.HcsDpUniqueCustomerPrefixMCR }}-DirNum-CSS",
                    "networkLocation": "OnNet",
                    "preemption": "Disabled",
                    "packetCaptureDuration": "0",
                    "useTrustedRelayPoint": "Default",
                    "sipTrunkType": "None(Default)",
                    "runOnEveryNode": "(( True ))",
                    "pstnAccess": "(( True ))",
                    "tunneledProtocol": "None",
                    "mlppIndicationStatus": "Off",
                    "packetCaptureMode": "None",
                    "acceptOutboundRdnis": "(( True ))",
                    "useDevicePoolCgpnTransformCss": "(( True ))",
                    "product": "SIP Trunk",
                    "description": "ICT ILS Service",
                    "subscribeCallingSearchSpaceName":
                      "{{ macro.HcsDpUniqueCustomerPrefixMCR }}-DirNum-CSS",
                    "useDevicePoolCdpnTransformCss": "(( True ))",
                    "acceptInboundRdnis": "(( True ))",
                    "class": "Trunk",
                    "securityProfileName": "SIP Trunk Profile for HCS ICT ILS Service",
↪
                    "presenceGroupName": "Standard Presence group",
                    "retryVideoCallAsAudio": "(( True ))",
                    "rerouteCallingSearchSpaceName":
```

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```
                    "{{ macro.HcsDpUniqueCustomerPrefixMCR }}-DirNum-CSS",
                "protocolSide": "Network",
                "sipPrivacy": "Default",
                "locationName": "Hub_None",
                "referCallingSearchSpaceName":
                  "{{ macro.HcsDpUniqueCustomerPrefixMCR }}-DirNum-CSS",
                "useDevicePoolCntdPnTransformationCss": "(( True ))",
                "devicePoolName": "Default",
                "callingAndCalledPartyInfoFormat":
                  "Deliver URI and DN in connected party, if available"
            },
            "merge_strategy": "additive",
            "target_model_type": "device/cucm/SipTrunk",
            "name": "ILSSpokeICTSipTrunkCFT"
        }
    },
    {
        "meta": {
            "model_type": "data/ConfigurationTemplate",
            "pkid": "58aad0cc1ff8cb1e5e63aa70",
            "schema_version": "0.1.8",
            "hierarchy": "sys.hcs",
            "tags": []
        },
        "data": {
            "name": "ILSSpokeSipRoutePatternCFT",
            "template": {
                "usage": "Domain Routing",
                "pattern": "*.route",
                "useCallingPartyPhoneMask": "Default",
                "description": "SIP Route Pattern for ILS Spoke Routing",
                "blockEnable": "(( False ))"
            },
            "merge_strategy": "additive",
            "target_model_type": "device/cucm/SipRoutePattern",
            "description": "Deploy a sip route
              pattern associated with ILS routing"
        }
    },
    {
        "meta": {
            "model_type": "data/ConfigurationTemplate",
            "pkid": "58aaf1881ff8cb1e5e63b016",
            "schema_version": "0.1.8",
            "hierarchy": "sys.hcs",
            "tags": []
        },
        "data": {
            "name": "GDPRRoutePartitionsForLearnedPatternsCFT",
            "template": {
                "markVariableLengthE164Patterns": "(( True ))",
                "partitionForEnterprisePatterns":
                  "{{ macro.DP_CUST_PRE_INTER_SITE_ROUTING_PT }}",
                "markLearnedEntAltNumbers": "(( False ))",
                "partitionForE164Pattern":
                  "{{pwf.HcsDpUniqueCustomerPrefixMCR}}-E164LookUp-PT",
```

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```
                    "markFixedLengthE164Patterns": "(( True ))",
                    "markLearnedE164AltNumbers": "(( True ))",
                    "markFixedLengthEntPatterns": "(( False ))",
                    "markVariableLengthEntPatterns": "(( False ))",
                    "partitionForEnterpriseANo":
                      "{{ macro.DP_CUST_PRE_INTER_SITE_ROUTING_PT }}",
                    "partitionForE164ANo":
                      "{{pwf.HcsDpUniqueCustomerPrefixMCR}}-E164LookUp-PT"
                },
                "merge_strategy": "additive",
                "target_model_type": "device/cucm/RoutePartitionsForLearnedPatterns",
                "description": "Assign Route Patterns for GDPR"
            }
        }
    ]
}
```