12. CUCM Mobility

CUCM MOBILITY FEATURES

Mobile Connect (AKA Single Number Reach)

- All devices configured for mobile connect ring at the same time. Whichever device answers receives the call and everything else stops ringing.
- During the conversation, a call can be seamlessly switched to a different device.
- If a user calls into the company from his mobile device (configured as part of mobile connect), the system recognizes the incoming caller ID (ANI—Automatic Number Identification) and changes it to be the caller's IP phone DN, preserving the concept of a single point of contact number.
- A side effect of the above is easy access to the internal voicemail, based on the system recognizing who's calling based on a single DN rather than all caller ID possibilities.

UNIFIED MOBILITY ARCHITECTURE

Remote Destination Profile—Used to configure virtual phones that are actually the "mobile" destinations that are really external to the system." They act like "phones with shared lines; when the primary number rings, the shared lines also ring, but the system configuration redirects the call out to the PSTN to ring the other devices."

- Many of their configs will match the physical IP phone: a Partition, Device Pool, CSS (Calling Search Space), User and Network Music on Hold, and the same DN.
- Up to 10 per user
- Complexities include how long to wait before ringing remote devices, how long to ring the remote device (don't let it go to cell phone voicemail)

Access List—allow admins and users to control which calls ring which Remote Destination Profile devices at what time of day.

- Matches are based on caller ID and matched to white & black lists in one of three kinds of match:
    - Not Available—no caller ID present
    - Private—caller ID not displayed
    - Directory Number—caller ID matches a specific number or wildcard (using 0-9, #, X, and !)

Time-of-Day Access—Controllable for each Remote Destination Profile—when to include that device in the set of ringing devices. By default, everything rings. Time zone of the actual remote device can be specified.

Processing order on incoming call—each step can (dis)allow the call.

- Time of Day Rules
- Access Lists
- Remote Destination Device

Empty Access Lists are bad

- In a white list—no calls are routed to the remote destination device
- In a black list—all calls are routed

CONFIGURING MOBILE CONNECT

Configure Softkey Templates—adding a mobile connect softkey to the user's phone(s)

(Admin) Device → Device Settings → Softkey Template

- Select, copy & modify a template or create a new one
- Choose "Configure Softkey Layout" from the "Related Tasks" pull-down & click [Go]
- Add the Mobility softkey to the "On Hook" and "Connected" call state lists, clicking [Save] after each move

Configure User Accounts for Mobility

(Admin) User Management → End User (and select a user)

- Check the "Enable Mobility" checkbox
- Set "Remote Destination Limit" (maximum 10)
- Set "Maximum Wait Time for Desk Pickup"—number of milliseconds allowed for the user to pick up a call that was redirected from a remote device to the IP phone. Default 10,000 (10 secs), maximum 30,000 (30 secs).

Configure the IP Phone to Support Mobility Features—linking the user configuration and softkey template

- Assign the Softkey Template to which you added the Mobility key
- Set the "Owner User ID" to the Mobility-configured user

Create Remote Destination Profiles, link them to user accounts, and ensure that calls can reach the remote numbers

(Admin) Device → Device Settings → Remote Destination Profile [Add New]

- Give it a name and select a "User ID" to associate with the profile
- Select the "Rerouting Calling Search Space"—"This CSS will redirect calls to remote devices and, therefore, must provide access to the remote devices' phone numbers."

Add Remote Destinations to Remote Destination Profiles—Linking them

Device → Remote Destination [Add New]

- Give it a name and set the "Destination Number." This must be a PSTN number exactly as it would be dialed from an IP phone (including access codes)
- Associate a user's "Remote Destination Profile." To change this association later, delete the Remote Destination and recreate it
- Check the "Enable Single Number Reach" box to add this remote destination to the list of those that will ring with the IP phone shared line
- Check the "Enable Move To Mobile" box so the IP phone's Mobility softkey can do manual hand offs
- Check the "Enable Mobile Connect" box, including this remote destination in the set of those that'll ring when the IP phone shared line does
- Under "Association Information," select one or more of the shared lines on the RD profile

Configure Ring Schedules for each Remote Destination—tune the RDs' functionality to limit when they ring

- Set days & times when should ring
- Set the time zone for the remote device

Configure Access Lists—Limit which numbers can ring remote destinations

(Admin) Call Routing → Class of Control → Access List [Add New]

- Give it a name and choose the "Owner User ID" of the Mobile Connect user from the pull down
- Choose "Allowed" or "Blocked" and click [Save] (the screen now refreshes)
- In the section "Access List Member," click "Add Member"
- On the "Access List Member Detail" page, select Filter Mask:
    - Directory Number—To enter a specific ANI number or wildcard pattern.
    - Private—Filter based on calls with Caller ID not displayed.
    - Not Available—Filter based on calls without Caller ID
- In the "DN Mask" field, you can enter a digit string, complete with wildcards (X=a single digit, !=any number of digits),

Apply Access Lists to Remote Destinations

(Admin) Device → Remote Destination (and select a Remote Destination)

- Select "Always ring this destination" or Choose one radio button from { "Ring this destination if the caller is in (Allowed)" or "Do not ring this destination if the caller is in (Blocked)" }
- From the pull-down, choose the access list that has your desired filter & click [Save]

Configure Service Parameters

(Admin) System → Service Parameters (and Choose a server from the pull-down)

- At the "Service" pull-down, choose "CallManager"
- Scroll down to the section "Clusterwide Parameters (System-Mobility)"
- For the "Inbound Calling Search Space for Remote Destination" field, choose from:
    - Trunk or Gateway Inbound Calling Search Space—Default. Uses the CSS of the trunk or gateway that is routing the inbound call from the Remote Destination
    - Remote Destination Profile + Line Calling Search Space—Uses the combined line and Remote Destination Profile CSS
- For the "Matching Caller ID with Remote Destination" field, Chose from:
    - Complete Match—Default. Requires the incoming Caller ID to exactly match the Remote Destination number
    - Partial Match—You can specify how many digits must match (starting from least significant on the right)
- Scroll down to the section "Clusterwide Parameters (Feature - Reroute Remote Destination Calls to Enterprise Number)"
- Set "Reroute Remote Destination Calls to Enterprise Number" to True—(default false) Causes direct calls to a remote destination number to be extended to the IP phone number, allowing the user to take advantage of Mobility features
- Set "Ignore Call Forward All on Enterprise DN" to True to route calls to Remote Destinations, even if the IP phone has CFA (Call Forward All) active

MOBILE VOICE ACCESS

MVA (Mobile Voice Access)—users access the CUCM from their mobile device so that their outbound calls show caller ID matching their primary IP phone (either a DID or the main company number). So, whether you call from the IP phone on your desk, golfing with an important client, or the federal penitentiary, your caller ID will always look professional.

To use it,

- Dial in to a specific PSTN DID to access the MVA service
- A specially configured VoiceXML gateway routes calls to an Interactive Voice Response (IVR) application
- The IVR uses User ID and PIN to authenticate & prompts for the number to dial
- The user can switch to the IP phone during the call, if desired.

CONFIGURING MOBILE VOICE ACCESS

Activate the MVA Service—once enabled, it can be enabled globally *and* activated for each user. *Then*, it will actually function.

(Serviceability) Tools → Service Activation

- Select "Cisco Unified Mobile Voice Access Service" & click [Save]

Configure Service Parameters—enable the (now active) MVA service for the cluster

(Admin) System → Service parameters

- Select a server and "Cisco CallManager Service"
- Scroll down to "Clusterwide Parameters (System-Mobility)," set "Enable Mobile Voice Access" to True. Modify anything else you want, like access codes

Enable MVA for each User—Note: some other mobility-related parameters were discussed & configured in the "Mobile Connect" sections of this chapter.

- Go to the user configuration page for a particular user (Menu path ?!)
- Scroll down to "Mobility Information" Section & check box "Enable Mobile Voice Access"
- Verify that the "Remote Destination Profile" listed is correctly configured to provide authentication.

Configure the MVA Media Resource—automatically created when the MVA service is activated

(Admin) Media Resources → Mobile Voice Access

- Set the "Mobile Voice Access Directory Number"—the internal number where the H.323 MVA gateway will forward calls it receives on the PSTN number for MVA access. On the gateway, a dial peer must be configured that matches the PSTN MVA number to the MVA CUCM server
- Assign a partition (optional). The partition must be in the CSS of the MVA gateway.
- Move the locale "English, United States" to the list of selected locales. Set additional Locales (optional) to provide users with MVA IVR service in multiple languages.

Configure the MVA VXML Application at the IOS Gateway—The H.323 gateway config needs the following statements:

```
application
 service mva http://10.1.1.1:8080/ccmivr/pages/IVRMainpage.vxml
                    Define the MVA Application and URL
dial-peer voice 50001 pots
 service mva
                    Associate the MVA application to this dial peer
 incoming called-number 4085555000
                    Match the PSTN MVA access number to this inbound dial peer
 direct-inward-dial
dial-peer voice 50002 voip
 destination-pattern 4085555000
                    Match the PSTN MVA access number to this outbound dial peer
 session target ipv4:10.1.1.1
                    Identify the CUCM server running the MVA service VXML app referenced above
 dtmf-relay h245-alphanumeric
 codec g711ulaw
 no vad
```