

13. Unity Connection Voicemail

UNITY CONNECTION

CUC (Cisco Unity Connection)—Voicemail, auto-attendant and voice recognition on a Linux appliance (just like CUCM, CUP (Cisco Unified Presence), Cisco Emergency Responder, and Unified Contact Center Express).

- Up to 20,000 mailboxes per v10.x server
- Data and messages stored in local Informix database (normal for Cisco Applications)
- Supports integration with a variety of traditional PBX systems.
- Users can be imported from .csv, CUCM, or LDAP; Authentication can be LDAP
- MS Exchange integration to provide calendar & journal info to Cisco Unified MeetingPlace & Cisco Unified MeetingPlace Express accomplished via
 - WebDAV (Web-based Distributed Authoring and Versioning) for Exchange 2003
 - The web service's API for Microsoft Exchange 2007
- 3 user interfaces:
 - TUI (Telephone User Interface)— traditional touch-tone phone interface
 - VUI (Voice User Interface)
 - Voice View Express—voice-message headers on the IP phone screen or Jabber client

Deployment

- Recommended deployment is as a VMware guest on UCS (Unified Computing System)
- Single-site is simple, even with an active-active redundant pair of CUC servers. Added advantage of a single codec for all calls
- Multi-site deployment can reduce WAN and transcoder load while still appearing seamless

INTEGRATION

Supports concurrent integration with multiple PBX or IP phone systems.

- CUCM & CME via SCCP or SIP
- Some PBXs that can use SIP will
- Others can use a PIMG or TPIMG device to convert a digital TDM circuit to a SIP trunk

INTEGRATING CUC WITH CUCM VIA SCCP

Voicemail Port Wizard—part of CUCM; ports are used for calls to the autoattendant, checking & leaving voicemails, MWI indicator and other voicemail notification communication between CUC and CUCM.

- The wizard generates voicemail ports in CUCM and adds them to a line group
- The admin manually configures a hunt list and hunt pilot to support the line group

Structure—The Hunt Pilot is referenced by a Voicemail Pilot, which is itself referenced by a Voicemail Profile, i.e.

[Voice Mail Profile] --> [Voice Mail Pilot] --> [Hunt Pilot] --> [Hunt List] --> [Line Group]
and [Line Group] --> { [Voice Mail Port 1] ... [Voice Mail Port n] }

There are default entries for voicemail profiles and voicemail pilot, used by all CUCM users. These can be used & customized or new ones created for different user subsets.

CUC Server Ports—Limited by hardware & licensing. Config options on each port include whether the port should answer calls, do a MWI (below), etc. Call routing within CUC can be controlled by the phone system or the port group, or other things.

MWI (Message Waiting Indicator)—uses two DNS, one to turn the indicator on and one off. These must be configured (and match) in both CUCM and CUC. Dialing these DNS from a user's phone can test MWI functionality (or play a practical joke).

Security possible using digital certificates and SCCP over port 2448 instead of non-secure port 2000.

I N T E G R A T I N G C U C W I T H C U C M V I A S I P

Differences from SCCP Integration

- Instead of the voicemail pilot pointing to a Hunt Pilot, it points to a Route Pattern which points to a SIP trunk, which connects to CUC
- The number of ports is defined only in CUC; with SCCP, it was also on the CUCM server
- Each port is configured to register with a SIP server (which happens to be the CUCM server)
- There are no separate DNS for MWI on & off; SIP directly handles the lamp itself
- Security can use port 5061 instead of the non-secure port 5060.

Integration Components

[Voice Mail Profile] --> [Voice Mail Pilot] --> [Route Pattern] --> [SIP Trunk]

C U C S Y S T E M - L E V E L F E A T U R E S & S E T T I N G S

Configuration Setting Pages

- General Configuration—defaults for Time Zone, Language, and Max Greeting Length
- Enterprise Parameters & Service Parameters—What users can see and configure on their User Web Pages, QoS settings for CUC-generated traffic, etc.
- LDAP—These pages define user synchronization and (optional) authentication integration
- Roles—controls admin capabilities of users. 9 admin roles defined in the application (see table, following page):

| ROLE | DESCRIPTION |
|--|---|
| Audio Text Administrator | Administers call handlers, directory handlers, and interview handlers |
| Audit Administrator | Enable / Disable / Configure UC application and database auditing, view/delete audit logs |
| Greeting Administrator | Manages call handler recorded greetings via TUI |
| Help Desk Administrator | Resets user passwords, unlocks user accounts, and views user settings |
| Mailbox Access Delegate Account | Accesses all messages via messaging APIs |
| Remote Administrator | Administers the database using remote management tools |
| System Administrator | Top-level connection administrator; accesses all connection administrative functions, reports, and tools for server and users |
| Technician | Management of system and phone system integration settings, views all system and user settings, runs all reports and diagnostic tools |
| User Administrator | Administers users; accesses all user administration functions, user reports, and user administration tools |

Call Handlers—These handle all calls inbound to CUC. Three types;

| CALL HANDLER | PURPOSE |
|-----------------------------|--|
| System Call Handlers | Greetings that can be customized ("press 2 for sales") and automated to play a different greeting after closing. Three default system handlers defined for customization by the business: <ul style="list-style-type: none"> • Goodbye Call Handler • Opening Greeting—for random callers without a voice box • Operator Call Handler |
| Directory Handlers | Caller can search the CUC directory for a user. Different directories possible based on location, distribution list membership, etc. |
| Interview Handlers | Record a series of user answers to recorded questions in a single message. |

Call Routing—Meta-data available to CUC when it receives a call (and can base routing decisions on) and Routing Actions it can take:

| RULE CONDITIONS | CALL ACTIONS |
|--|---|
| <ul style="list-style-type: none"> • Calling Number • Called Number • Forwarded Station • Phone System • Port • Schedule | <ul style="list-style-type: none"> • Call Handler • Conversation • User with Mailbox |

Two primary routing criteria are built in to CUC:

- Direct Calls—Could be a user hitting the "messages" button on their phone or dialing the voicemail pilot manually. Could also be a call to the DID number of the CUC auto-attendant.

Default Rules for Direct Calls—based on whether the "from" number is recognized:

- Attempt Sign-In—If the "from" number is recognized as the primary DN associated with a voicemail box, send the call to the "Attempt Sign-In" Conversation, which prompts for the user's PIN so she can access her box
- Opening Greeting—If CUC doesn't recognize the number

More rules can be defined, like a separate call handler for calls to the company's help desk number. Rules are processed in top-down order for each call; order is important.

- Forwarded Calls—User was on the phone when the call came in, didn't answer, etc.

Default Rules for Forwarded Calls:

- Attempt Forward—Personal greeting for the voicemail box associated with the forwarding station
- Opening Greeting—If there's no VM box associated with the forwarding station

Filters available when creating routing rules (can use a combination):

- Calling Number
- Called Number
- Voicemail Port
- Phone System
- Forwarding Station (if forwarded)
- Schedule

Key Point: CUC Call Routing rules only apply if the call has been answered by CUC; for example, a PSTN call to a user's IP phone DID will not be answered by CUC unless the IP phone forwards it because of a Busy or No Answer condition.

Distribution Lists (DLs)—simple way to send a voice message to a group of users. Two types:

- System DL—Managed by admin and can be made available to all or a subset of users
- Private DL—Managed by a user and only usable by that user. Admin can limit how many private lists a user can create and the number of users in each

Authentication Rules—customizable (fails before lock out, lockout duration, password criteria & aging, etc.). Default rules apply to all users. Control access to Voicemail (TUI access via PIN) and Web Application (user web pages). New authentication rules can be applied to user templates or even individual users, e.g. 4-digit password for the "new user" template and 5-digits for another.

Dial-Plan—Partitions & Search Spaces are similar to CUCM

- Partition—for objects that can receive a call, like mailboxes and call handlers
- Search Space—for objects that can place or transfer calls
- The object being called must be in one of the partitions listed in the Search Space of the object making the call
- The default Search Space contains the default Partition so that all objects can reach all other objects until the system is customized.

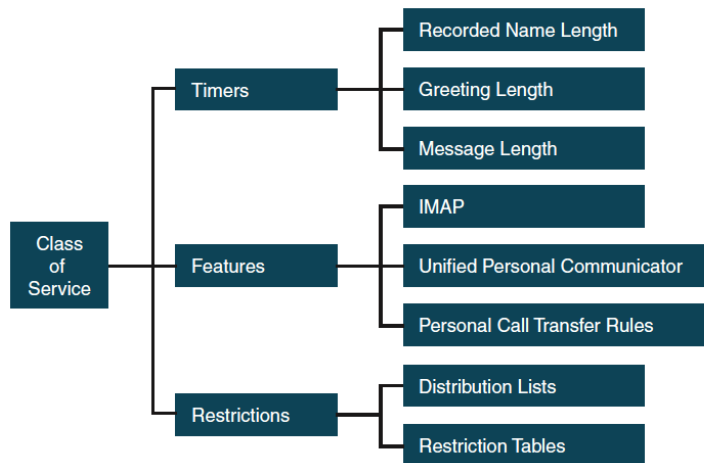
Example: The directory handler in the Vancouver Office could have a search space with only the Vancouver partition

User Templates—a pattern used to speed new account creation by specifying data in common.

Template contents are applied as each new user is created. Template changes aren't retroactive to existing users (use BAT for that). Two default templates, admins & users, can be modified and custom templates created. Template elements:

- Name—of the template, e.g. "Managers." You can also specify how Alias and Display Name fields are generated—default is first name, then last name
- Phone—Can specify the Dial-Plan (Partition/Search Space), CoS (Class of Service—below), and Schedule

CoS—Used for assigning and restricting user privilege. It defines greeting and message length timers, licensed feature access, advanced feature access, alternate extension definition, Private DL number, membership limits, and call transfer abilities. In other words, it has no relation to L2 QoS marking or cucm's "Class of Control." An unlimited number of CoS can be defined, each with a different combination of abilities and features for a different user set.



Components of a CoS (Table 13-4 from page 354)

- Location—Language localization & time zone

Password Settings—for voicemail and the web application. Admin can (un)lock an account, set password aging and the "Authentication Rule."

Roles—Defines one of the 9 default admin capability assignments described in the table at the top of page 3 (of notes)—Book Table 13-2, pages 349-350.

Transfer Rules & Greetings—Rules determine mailbox behavior, including which greeting is played. 3 transfer rules and 6 greetings are defined by default:

| TRANSFER RULE | PURPOSE |
|---------------|---|
| Standard | Can't be modified; active by default |
| Alternate | Can modify to be active on a different schedule or until a specified date |
| Closed | Takes effect during defined "closed" hours of the business |

| GREETING | PURPOSE |
|-----------|--|
| Alternate | Personalization with a custom greeting |
| Busy | When the extension is busy |
| Internal | Plays for internal (on-net) callers |
| Holiday | Plays when the holiday schedule is in effect |
| Closed | Plays when the closed schedule is in effect |
| Standard | "<username> is not available..." |

Call Actions—admin can select what happens after the greeting (typically "Take Message," but could be "hang up.") Could also send the call to any configured call handler or to a user mailbox.

Message Settings, Message Actions, & Caller Input

- Admin can control whether callers are allowed to edit their messages, mark them urgent, secure, etc. (a secure message might be restricted in its delivery destinations, e.g. not to an IMAP client)
- Admin can control what happens after a message is left (default say goodbye and hang up). A caller can be sent to any configured call handler or to a user mailbox.
- During a CUC conversation, a caller might be allowed to press keys to perform configured actions. Defaults are 0 for the operator and * to log in to the mailbox

TUI (Telephone User Interface?) Settings—Admin can customize the TUI user experience, changing the speed or volume, changing how long it waits for keypresses, and changing the playback order of different message types, etc.

C U C E N D U S E R S

Mandatory unique settings (rest pulled from templates):

- Alias (User ID)
- Name
- Mailbox Store
- Extension
- Alternate extensions

Extensions & Call Forward Options

Extension—The primary DN on the users phone because that's what caller ID will report when they hit the "messages" button or during no-answer when a call is forwarded to voicemail.

Call forward options on the phone can change things like allowing a different greeting for internal vs. external callers.

AAR (Automated Alternate Routing) or SRST (Survivable Remote Site Telephony) can route voice messaging traffic over the PSTN during a WAN failure, just like all the other voice traffic. For the 10-digit PSTN caller ID to be recognized (during failover) as a mailbox owner, it'll need to be added as an alternate extension for each user on the system.

Voicemail Box—admin can list the voicemail box in the directory, record the spoken version of the username or just let CUC speak it, and record a greeting. An admin can also simply require the user to do those things at next login.

Private Distribution Lists—Visible only to the user/owner and admins. If permitted, a user can create up to 99 of these, with max 999 members each. Lower limits can be set in the CoS or per user.

Notification Devices (beyond the MWI light)—Up to 3 PSTN numbers and email. Restriction tables limit what CUC can call (toll avoidance). When the user answers, CUC informs the user that a message is waiting and prompts for authentication.

Ways to Create End Users:

| CREATION | DESCRIPTION | ALL DATA IN CUC |
|----------------------------|---|-----------------|
| Manual | One at a time | X |
| Bulk Admin | From a .CSV file | X |
| Migration from Cisco Unity | COBRAS (Consolidated Object Backup and Restore Application Suite). Can migrate from a Cisco Unity system (old Windows NT) to a Cisco Unity Connection system, with or without their mailboxes | X |
| Import from CUCM via AXL | Sync the CUC user database with an existing CUCM user database. Some data is copied to CUC but maintained in CUCM; some is specific to CUC database and maintained there | |
| Import from LDAP | Sync the CUC user database with an existing LDAP user database. As before, some data is copied to CUC but maintained in LDAP, some is specific to CUC database and maintained there. Also possible to redirect web password authentication to LDAP. | |

CUC Voicemail Boxes—usually one per user. Held in a database and can be synchronized between two CUC servers in an active-active redundant pair.

Voicemail Box Quotas & Message Aging Policy—Admin options include:

- Aging policy to automatically move read messages to the Deleted Items folder after X days (default = never). Items in the Deleted Items folder are flushed after Y days (default 15)
- Quotas can warn users (12 MB default), prevent users from sending new messages (13 default), and prevent receiving (14 default). 12 MB is ~200 minutes with G.729 and 25 minutes with G.711

C O N F I G U R I N G E N D U S E R T E M P L A T E S

Unity Connection Navigation is done on the left pane, unlike CUCM.

Templates → User Templates

Select an existing template or create a new one.

Templates speed up creation of new users. Modify existing template or create a new one. CUCM only covers the “Edit” menu entries that follow, each with a table listing fields in its config screen.

User Template Basics (screen)

| FIELD | PURPOSE | REQ'D |
|---------------------------------------|---|-------|
| Alias | The name of the template, itself | X |
| Display Name | Template name as shown on "Find / List Templates" page | X |
| Display Name Generation | Choose: { first last last first } | |
| Outgoing Fax Server | the correct one for the users | |
| Partition | the correct one for the users | |
| Search Scope | the correct one for the users AKA "Search Space" | |
| Phone System | Usually only one available, but with multiple integrations, might matter | |
| Class of Service | What features the users can access | |
| Active Schedule | User Schedule—when standard & closed greetings play & what to do after the greeting | |
| Set for Self-Enrollment at next login | Force user to tutorial & record name & greetings on next CUC login | |
| List in Directory | in the CUC directory so outside callers can find & call users | |
| Time Zone | User default time zone. Changes messaged received time | |
| Language | For user instructions & text-to-speech; doesn't affect voice recognition conversation | |

Password Settings—each user has two passwords; select one & a page opens with options. The two passwords:

- The CUC web application user and admin (if allowed to the user) pages
- The actual voicemail PIN, used for TUI logins

Select which password you're editing from the top drop-down, then reload the page with [Save] and make your changes to that password.

| FIELD | PURPOSE |
|--------------------------------|---|
| Locked by Administrator | Prevent user login to CUC |
| User Cannot Change | (refers to the password) Good if more than one user on the same mailbox. You should also click the "Does not Expire" checkbox |
| User Must Change at Next Login | |
| Authentication Rule | (drop-down list) Set the authentication rule that will be applied to the user account's pass. HUH? |

Roles—by default, no roles (e.g. admin privileges) are selected for user accounts. Table 13-2 (top of page 3 in these notes) describes role functions in case you need them for an admin account.

Message Settings

| FIELD | PURPOSE |
|--------------------------------------|---|
| Maximum Message Length | Default 300 Secs. |
| Callers can Edit Msgs | If selected, users get an extra prompt after leaving message to edit, add to, or delete the message |
| Language that Callers Hear | From the installed messages. Used for "leave your message at the tone," etc. Can select "Inherit Language from Caller" for IP phone calls to look at the CUCM user locale setting of that phone |
| Unidentified Callers Message Urgency | Anyone without a message box of their own is unidentified. You can automatically set all such messages to normal or urgent (maybe good for customer service,) or tell the system to ask the caller. Urgent messages are played first. |

Message Actions—per message type (voicemail, email, fax, delivery receipt), set CUC action to take: accept, reject, relay, or accept & relay.

Phone Menu

| FIELD | PURPOSE |
|-----------------------------------|---|
| Touchtone Conversation Menu Style | Full or brief detail levels for caller instructions |
| Conversation Volume | of the CUC conversation |
| Conversation Speed | |
| Time Format | 12/24 hour clock and how CUC expresses time to caller |
| Use Voice Recognition Input Style | reverts to touch-tone if voice resources are unavailable |
| Touchtone Conversation Style | What kind of legacy system to emulate |
| Enable Message Locator | Allow users to search messages by user name, extension, caller ID |

Playback Message Settings

| FIELD | PURPOSE |
|--|--|
| Message Volume | |
| Message Speed | |
| For New Messages, Play | Checkboxes to announce message counts for <ul style="list-style-type: none"> • Total (all new messages) • E-mails • Faxes • Receipts |
| For Saved Messages, Play | Checkbox to announce number of saved messages |
| Before Playing Messages, Play | Checkbox for a message-type menu so the user can press a key for what kind of messages (above) they want to listen to |
| New Message Order and Saved Message Play Order | Types are above. To hear e-mails & faxes, the user CoS must allow access to third-party message stores and allow fax features. For faxes, CUC announces the sender, the date, and the time. (It doesn't try to read the fax body) |
| Before Playing Each Message, Play | Checkboxes: <ul style="list-style-type: none"> • Sender's Information—recorded name or ANI for internal callers • Include Extension (internal)—recorded name too. Adds to above. • Message Number • Time Message Sent • Sender's ANI—for external caller messages • Message Duration |

Message Notification Devices—Don't confuse with MWI. This refers to CUC actively making a phone call or sending an e-mail to tell the user they have a message. By default, supports Pager, Work Phone, Home Phone, Mobile Phone, and SMTP (e-mail). For each device:

| FIELD | PURPOSE |
|---------------------------------------|---|
| Enable | CUC can send notifications to this device |
| Display Name | |
| Delay Before First Notification Event | After the message is left and before this device is notified |
| Notification Repeat Interval | |
| Notify Me Of: | Checkboxes for (and for each, a checkbox limiting to urgent messages): <ul style="list-style-type: none"> • All Messages • All Voice Messages • Fax Messages • Calendar Appointments • Calendar Meetings |
| Pager / Phone Settings | The phone number CUC should call. Extra settings has wait times, extra digits... All of this should be applied at the user account, not the template |

CONFIGURING CUC END USERS MANUALLY

Add user-specific data to the chosen template as each user is put in system.

Manually Create a New User

Users → Users

Specify a user type (e.g. User with Mailbox) and fill in the following:

- “Based on Template”—choose a template
- Alias (must be unique), First Name, Last Name, Display Name
- Mailbox Store—If more than one mailbox store is in use, choose the correct one
- User extension (IP phone primary DN). [Save]

Alternate Extensions—allows a user to be recognized, skip the opening greeting, and access their mailbox when calling in from elsewhere.

(Same User Configuration page) → Edit (menu) → Alternate Extensions (click “Add New”)

- Type of Phone—drop down of Work, Home, Mobile
- Display Name
- Phone Number—to match against caller ID (ANI) as it appears to CUC. Often, this is the full PSTN, but beware CUCM stripping and/or modifying digits before they get to CUC.

Alternate Names—nicknames or phonetic spellings to help callers search by name. For example J.D. as a nickname and Jaydee to help voice recognition

(Same User Configuration page) → Edit (menu) → Alternate Names

Private DIs (Distribution List)—Can be added by the user via their PCA (Personal Communications Assistant) web page or admin (opens same page, logged in as the user). Each needs a unique name. (scope of uniqueness? User or System?)

(Upper right hand corner “Navigation:” drop-down = “Cisco PCA Home”) ...

IMPORTING END USERS FROM CUCM

Combined with filled-in templates, this is a fast & accurate way to add lots of users. Even better if you can sync with another system to reduce redundancy.

In CUCM, turn on AXL (Administrative eXtensions for xML)

(Serviceability) → Tools → Service Activation

- Select “Cisco AXL Web Service” & click [Save]

In CUC, set up the integration (how CUC logs into CUCM for sync)

(CUC Administration) → Telephony Integrations → Phone System

- Click the name of the CUCM server you're importing from

Edit (menu) → Cisco Unified Communications Manager AXL Servers

- Under “AXL Server Settings” enter the User Name and Password of the account that CUC will use to login to the CUCM AXL server. Click “Save.”
- Under “AXL Servers” section, click [Add New]

- Enter the IP Address and Port of the CUCM server. (CUCM 8.x supports SSL, so use port 8443 or 443.)
- Click the “Test” button & look for “Test message successfully sent to AXL server <IP:port>” in the “Status” section
- Click [Save] to complete the integration

NOW that AXL is working, we can actually do some importing. From the CUC Server,

(CUC Administration) Users → Import Users

- From the drop-down “Find End Users In...” choose the CUCM server
- From the “Based on Template” drop-down, choose the user template you want
- Click [Find]
- From the resulting list, choose the users you want to import and click [Import Selected]

NOTE: CUCM users who lack a primary extension won't appear in the above list

I M P O R T I N G E N D U S E R S F R O M L D A P

Importing Users from LDAP—Data stays in LDAP, with read-only entries in CUC. You can even redirect authentication to LDAP too. Can only integrate with one LDAP database.

(CUC “Cisco Unified Serviceability”) Tools → Services

- Choose the DirSync service & click [Save]

(CUC Administration Interface) System Settings → LDAP → LDAP Setup

- Click the checkbox “Enable Synchronizing from LDAP Server”
- Choose the LDAP Server Type from the drop-down
- In the drop-down “LDAP Attribute for User ID” choose an LDAP attribute to map to CUC Alias attribute—Field must be unique for each record. User accounts won't be imported if their field is NULL.

(CUC Administration Interface) LDAP → LDAP Directory Configuration

- Name the LDAP configuration. Best Practice = name the config after the users to be imported.
- Choose the LDAP account that CUC will use to read and import: “LDAP Manager Distinguished Name” & “LDAP Password”
- LDAP User Search Base—Point within the hierarchical LDAP tree that defines the sub-tree to search, e.g. “cn=Users, DC=cisco, DC=com”
- Under “LDAP Directory Synchronization Schedule” section,
 - “Perform Sync Just Once” will only refresh and update current user info. To import new users (since the last sync), need to do a new user import.
 - “Perform a Re-sync Every” is another option
- Under “User Fields to be Synchronized” section, configure mappings between LDAP and CUC

I M P O R T I N G E N D U S E R S W I T H B A T

Bulk Administration Tool Import of CUC Users—uses a .csv file. Best Practice is to do a CUC (not CUCM) BAT export of a single user to get the format of the .csv file right. The CUC BAT tool doesn't provide downloadable excel template spreadsheets with macros to properly format the input in the way that the CUCM BAT tool does.

Tools → Bulk Administration Tool

- Under “Select Operation” select “Create” (Update, Delete, or Export are the other choices)
- Under “Select Object Type” choose “Users With Mailbox”
- Under “Override CSV Fields When Creating User Accounts” select “User Template Yes” and choose a template
- Under “Select File” browse to the .csv file
- Specify a file name for “Failed Objects” & click [Submit]

M A N A G I N G T H E C U C M E S S A G E S T O R E

Checking size, number of mailboxes, when created; setting max size before warning. At 90% warnings are logged; at 100% errors.

Message Storage → Mailbox Stores (& choose which store)

Mailbox Stores Membership—Can create additional stores & move users to them if running out of space.

Message Storage → Mailbox Stores Membership

- Select users to move
- Select the database to move them to
- Click [Move Selected Mailboxes]

Message Aging Policy—Default deletes items in the “Deleted Items” folder after 15 days.

Message Storage → Message Aging Policy

- Select “Default System Policy”
- Can deselect the “Enabled” checkbox (default = enabled)
- Under the heading “Message Aging Rules Based on When the Message Was Last Modified,”
 - Can select whether to move new messages to the “Saved” folder & how soon
 - Can select whether to move saved messages to the “Deleted Items” folder & how soon
- Under the heading “Secure Message Aging Rules Based on When the Message Was Created,”
 - Can choose to permanently delete secure touched messages or all secure messages of a certain age.

Mailbox Quotas—Warning, Send, and Send/Receive thresholds. These are system-wide, but can be overridden in a User Template or per-user.

Message Storage → Mailbox Quotas