

Deployment of Cisco Jabber or Extension Mobility in Enterprises

White Paper



ZERO TOUCH AUTOMATED PROVISIONING

Sync to Active Directory

Automated System to configure Cisco Jabber, and Extension Mobility profiles with voicemail based on end-user information in Microsoft Active Directory.

Change Tracking

Detects new, changed or deleted users in Active Directory to start the workflow.

Maximize Service Quality

Save costs, reduce errors and provide a consistently high end user experience.

USER COMMISSIONING THAT WORKS FOR YOUR BUSINESS

This white paper analyzes several deployment methods of Cisco Jabber, or Extension Mobility for Cisco Unified Communications and how to provide automated, rapid and cost-effective service provisioning for each end-user.

It presents how automatic configuration of Cisco CUCM end-users owning any combination of devices (Jabber, Extension Mobility, or any Softphone) can be achieved in an automated process with a clear workflow to minimize operational costs, reduce configuration errors, accelerate service requests and in doing so improves the service quality.

This white paper looks specifically at Jabber and Cisco Extension Mobility. UPLINX Auto-Provisioning can create all end-user setups for Cisco UC such as (multiple) phones with automated extension allocation, device profiles, Jabber, CSF, RDP, or any Softphone with Unity Connection or Microsoft voicemail based on Microsoft Active Directory.



Deployment of Cisco Jabber or Extension Mobility

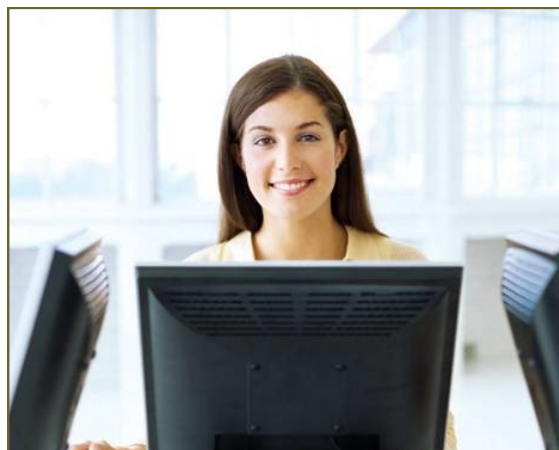
What is required for Cisco Jabber or Extension Mobility Provisioning?

Extension Mobility comprises of device profiles and logged out phones configured on the Cisco Unified Communications Managers. Once configured, an enterprise user can roam and log into any of the logged out phones or into the Jabber softphone client. This is similar to a PC login where a user can log into a shared PC in a meeting room with their user ID. After logging into a phone or into the Jabber softphone client, the user's settings are applied to the phone.

Any softphone profile is well suited for automated provisioning because it represents a "logical" layer that contains the user configuration and a "physical layer" that contains the application or the phone. Both these layers are largely decoupled, which allows for automatic and low cost deployment methods to be utilized.

To provision Cisco Extension Mobility, the following is required:

1. A pool of logged out phones. At a minimum, the phones must be extension mobility enabled and have a login phone service assigned for the user to login. In most cases, the phone must be in the correct site specific device pool.
2. A device profile linked to a CUCM end user and other telephony configuration objects such as voicemail and presence.



It is not sufficient or possible to auto register phones to obtain logged out phones. As such, auto registered phones are not enabled for Extension Mobility and do not have an assigned login service.

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Phone Deployment Options with CUCM

Deployment options do not only depend on the telephony configuration and company structure, but also on the life cycle of the telephony system.

During the rollout of a new system or a new site, experts are generally engaged to undertake the work as a project and they will generally utilize a systematic approach to configuration changes due to the large amount of phones and users to be configured at the same time. During the operational phase of a system however, project specific deployment methods might not be suited as they involve too many steps or overhead which would result in a great deal of time and effort being spent supporting changes for a few phones and users.

Hence, the following two chapters are structured according to the life cycle of the telephony system and the Business As Usual (BAU) processes required to support the telephony environment.

Deployment options for new installs

The following deployment options are available:

1. Scan the phone's MAC addresses to an Excel/CSV spreadsheet and use Cisco CUCM's Bulk Admin Tool (BAT) to import the phones into CUCM. During this process the phone can also be given an asset sticker and registered in an asset database.
2. Use auto registration, and then use CISCO TAPS (Tool for Auto-Registered Phones Support) for each phone, or update the auto-registered phones with BAT on CUCM.

TAPS has high costs associated with its use because the enrolment process with TAPS is time consuming as it involves:

- ❖ Walking the floor and calling TAPS from each phone to apply a preconfigured phone configuration.
- ❖ Requires UCCX Premium and a TAPS java script to be configured
- ❖ Requires a preconfigured phone with a dummy device name of the same model
- ❖ Requires manually deleting the original auto registered extension from CUCM

TAPS only solves the problem of applying a configuration to a phone after it has been configured. (Note: A common issue is that the phone model must be the same on the phone and the pre-configured dummy phone).

In most cases, *deployment scenario 1 above (BAT imported phones) is the deployment model of choice* as it is simpler, more robust and faster. The individual steps for this method are:

1. Unpack the new phones out of their boxes
2. Assemble the phones
3. Scan the phone MAC addresses into a spreadsheet
4. (Optional) Apply the asset sticker, scan the asset number per phone
5. Modify the spreadsheet and use BAT to import the data into CUCM
6. Make sure to record the site (location) where to deploy the new phones as the required configuration (device pool, partitions) might vary
7. Deploy the phones
8. Phones will register and download the preconfigured settings for the device name to turn it into a logged out phone to be used with Cisco Extension Mobility. Important: Do not auto-register the phone before the configuration exists.



To avoid the scanning of the MAC addresses and if no asset stickers are required, a hybrid approach can be taken. The approach is to auto-register the new phones, export the newly created auto configurations, stop auto registration, and delete all auto-registered phone configurations and directory numbers. Next create a spreadsheet with the MAC addresses of the phones and format it for BAT import. Import it with BAT and the phones should then register correctly.



Current Deployment Options

During the operational phase of a system, new users need to be added, users' details need to be changed (due to name changes, change in job position, office moves) or users leave and need to be deleted. These events are referred to as MACDs (Moves, Adds, Changes, Deletions) and occur during the operational life cycle.

MACDs require a different strategy than a new installation for the following reasons:

- ❖ Change requests occur ad-hoc, sparsely but frequently at unpredictable times, and involve a small number of phones and users with a large variety of configurations (i.e. different sites, phone models, user classes)
- ❖ Change requests are run and reported to the helpdesk (generalists with a wide technical knowledge)
- ❖ There is time pressure as users need to wait for the provided service
- ❖ Priorities are applied for different requests (i.e. a managers request)
- ❖ Help desk resources generally have very little time to complete tasks and it is difficult for these resources to concentrate on any MACD that may require additional effort.








As such, project specific deployment methods are not very helpful in supporting existing telephony environments as they are too complex (create BAT spreadsheets in the right format and export, import into several servers, scanning of MAC addresses) and also require detailed knowledge about site specific configurations.

These project specific deployment methods require expert skills (how to format the BAT spreadsheet, what settings to use, how and where to import).

For resources to go on site or asking end users to use TAPS for phone enrolment requires additional effort to create instructions.

Real life operations have shown that these approaches are not well suited to supporting an existing telephony deployment. These methods also introduce some security risks to the telephony environment.

Many servers to log-in...

Cisco CUCM Cisco Unity + Connection Cisco CUPS Microsoft Active Directory Microsoft Exchange Microsoft Lync others

Many objects with even more settings

- 7965 Phone: **126**
- Each (!) Line: **67**
- CUCM end user: **36**
- Device Profile: **18**
- RDP for single number reach: **20**
- Voicemail: **> 50** (depends on server and mode)
- Presence **> 30** (depends on server and mode)

*An average new telephone user requires 7 config objects interlinked with a total of > 300 settings on 4 to 7 servers
→ 8 to 30 mins work (if you know what you have to do...)!*

A web interface which treats each objects separately on different servers

- CUCM: navigate through 12 screens per user
- Voicemail: 5 screens per user

To setup a new Cisco Extension Mobility user requires various configuration objects which require skills and time to add by hand. Mistakes happen quickly and lead to reduced service quality and higher costs due to troubleshooting by experts.

Help desks have to deal with ad-hoc cases and require automated tools

In most cases, MACDs are supported by the help desk in an ad-hoc manner as there are generally no systematic procedures in place and their actions depend on the circumstances of the request and the skills of the person performing the task. There are mostly no documented procedures available for these staff to follow and typically, the support staff have not received enough training to support all MACD scenarios they will be confronted with.



In most cases, the helpdesk will end up undertaking a "last resort" approach to handling the MACD which generally is to find a similar configuration on one of the telephony servers, copying a current configuration and manually changing the settings to match the MACD request in the "hope" that this will meet the MACD request.

This approach doesn't offer any verification that the changes applied are correct or meet company policy and this is why production systems can have many differing user configurations that ideally should be identical.



The Solution

UPLINX has optimized the ability to support MACDs for the previously mentioned deployment scenarios with its Auto Provisioning System (APS). The following chapters will describe how the UPLINX APS introduces a systematic approach to MACD provisioning specifically for Cisco Jabber, or Extension Mobility. This automated provisioning can be used for any user's softphone. Next to provisioning, updating and de-provisioning, verification tools ensure that MACDs are provisioned correctly the first time, every time.

Automated Provisioning of Jabber or Extension Mobility

UPLINX has designed the UPLINX Auto Provisioning System (APS) to support the deployment of Cisco Extension Mobility profiles and phones by simplifying the effort required to configure these items based on rules that are relevant to the deployment. The UPLINX Auto Provisioning System achieves the following:

1. **Automatic Provisioning of Auto-Registered Phones** according to model and location. There are no other steps involved other than connecting the phone on a desk to the network.
2. **Automatic Provisioning of Jabber, Extension Mobility Profiles** with all the required configurations coming from user information stored in Microsoft Active Directory including voicemail and presence.

Automatic Provisioning of Auto-Registered Phones

After plugging the phone in on a desk, the phone will auto-register with CUCM using standard Cisco auto-registration. The UPLINX Change Tracker running on the UPLINX Provisioning System will at specified times or periodic intervals check CUCM for any auto-registered phones. It does this by looking for phones which have a specific device pool (for example 'DP_Autoregistration'). This parameter is a configuration setting of Cisco's auto-registration process. For each phone in the auto registration device pool, it retrieves the phone device name, model and IP address. The IP address is now used to determine the site for the phone and reformat of the phone will take place utilizing site and phone model specific templates.



Auto registered phones can now be used without further manual efforts.

As an example, the site Los Angeles uses a different IP range than the site San Francisco, and both sites require specific unique site settings on the logged out template for the phone, such as a specific region and device pool.

The site information and model is then used by the UPLINX Auto-Provisioning System to reformat the phone configuration to a logged-out phone with the correct site settings, including enabling the phone for extension mobility and assigning the login service. The phone is then immediately ready for an extension mobility user to log-into. The process described above is fully automated and requires no operational.

Optionally, if logging of events or more control and system supervision is required, UPLINX APS can be configured so that an administrator must approve the reformatting of auto-registered phones. Once an auto-registered phone has been detected, the system will email the list of newly detected phones to a site administrator who can then approve the change.



Automatic Provisioning of Cisco Jabber or Extension Mobility Profiles

To provision Cisco Jabber, RDP, CSF, softphones or a user device profile for Extension Mobility, this configuration items needs to be added to a CUCM end-user along with other configuration items such as extensions, services and presence settings. These settings are either location or user specific. The user's devices or profiles contain user specific settings such as:

- ❖ Device name and description
- ❖ Extension and linking the user to the extension
- ❖ Subscribing to (login/logout) services
- ❖ CUCM PIN for login and PIN for Unity Connection voicemail login
- ❖ Features such as voicemail and presence. Single Number Reach (SNR) and presence might require a Remote Destination Profile (RDP) which includes the user's mobile phone number that can be read automatically from Active Directory.



Softphones like Jabber or any user profiles are perfectly suited for automatic provisioning, as all user information can be retrieved from Active Directory. No phone (hardware) specific information is required, decoupling the

LDAP (Microsoft Active Directory) as central data store for user contact information

Companies already rely heavily on a centralized user information data store such as Microsoft Active Directory or other products which implement LDAP to retrieve and update user information. Commonly available and implemented Identity Management solutions keep this information up to date.

UPLINX Provisioning System is LDAP enabled to retrieve and update user information in order to create any telephony configurations based on predefined rules. All master information from LDAP is re-utilized. The retrieved end-user information from LDAP is used to pre-set all fields in Cisco configurations, either from the manually driven UPLINX Console or when using automatic provisioning.



By using Cisco DirSync, CUCM uses LDAP as the data source of truth and any contact information for a user is synchronized from the master LDAP to CUCM.

Hence, with the use of the UPLINX Provisioning System, the Cisco telephony system becomes part of the LDAP master information store and unifies all contact information in

a centralized way. This works for Cisco telephony systems which are configured to use Cisco DirSync or which run in standalone mode.

The UPLINX Auto Provisioning System can automatically create the required configurations for device profiles based on end user information in Microsoft Active directory, or in Console (manual) provisioning mode for phone site administrator assisted provisioning.

Phone Inventory Reports



Phone inventory reports can be generated with our market leading Report Tool for Cisco Unified Communications (CUCM, IMP, CUC, CER, and UCCX) which produces reports and statistics per telephony site, including the network location (switch and port) and serial number of the phone.



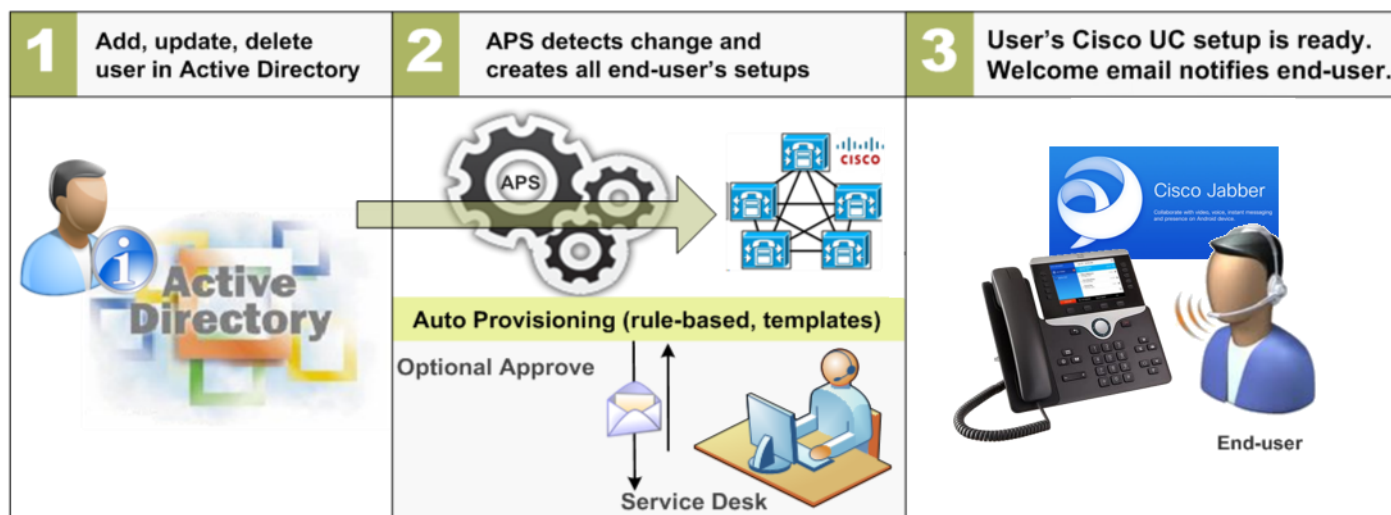
Automatic Provisioning of Cisco CUCM end-users

Cisco telephony deployments can now automatically synchronize telephony details from Microsoft Active Directory. UPLINX Auto Provisioning System (APS) allows for rapid service provisioning and fault free commissioning of every Cisco end-user in the enterprise.

APS creates all end-user setups for Cisco UC such as (multiple) phones with automated extension allocation, device profiles for Cisco Extension Mobility, Jabber, CSF, RDP and voicemail.

The UPLINX Change Tracker which is part of the UPLINX Provisioning System detects added, updated or deleted users in CUCM and Active Directory and then assigns a telephony site/location and telephony class (represents what to provision) for each user. The system supports one or multiple CUCM clusters each containing multiple telephony site/locations requiring specific settings.

CUCM end users and device profiles are now automatically provisioned (added, updated and deleted) based on defined enterprise rules when a change is detected. Changes to users in Microsoft Active Directory are automatically detected by the system and automatically (de-)commissioned, but can also be optionally approved by a telephony administrator.



Auto Provisioning creates for each end user all required devices and profile configurations—ready to go.

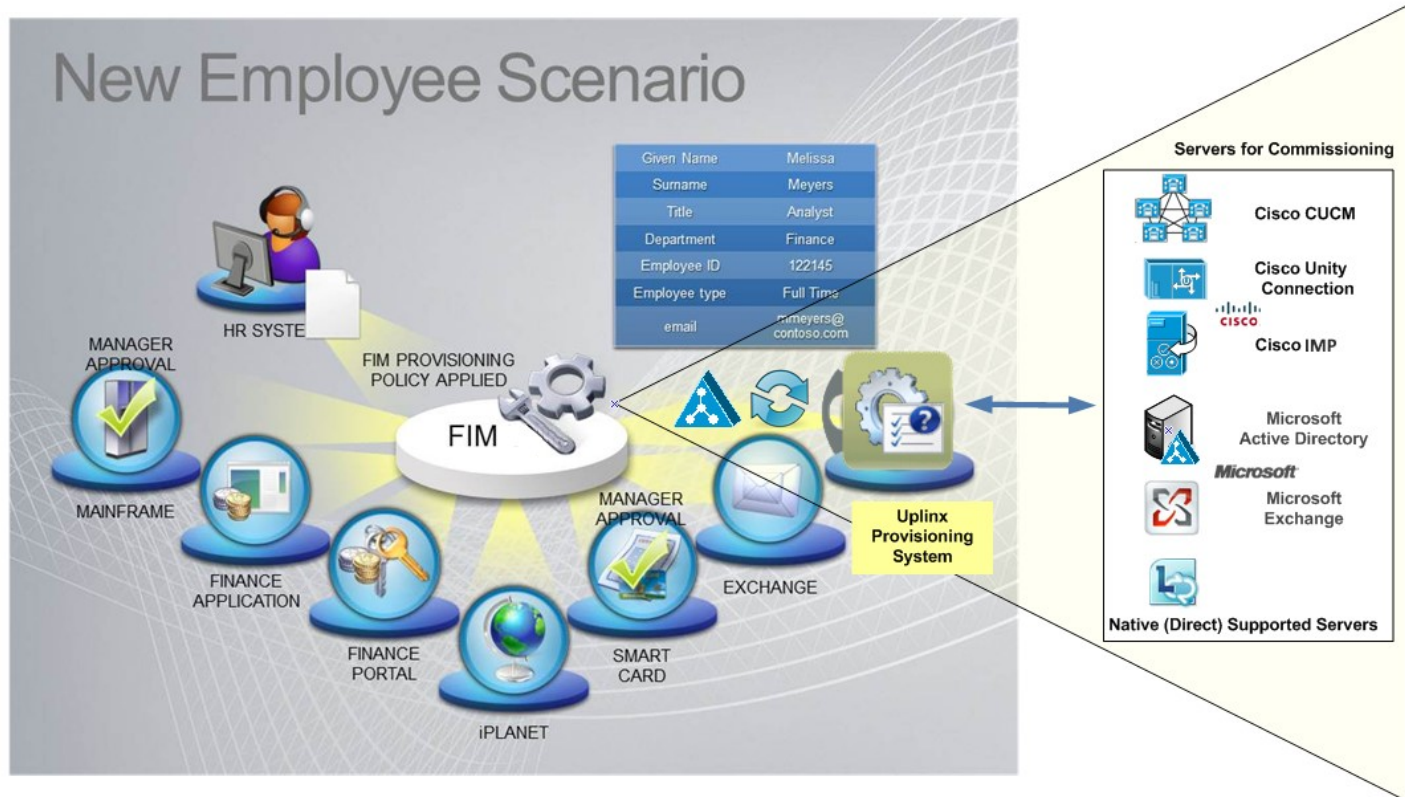
UPLINX Auto Provisioning for Cisco creates automatically, or upon approval by an administrator, the following configuration items based on user information stored in Microsoft Active Directory:

- ❖ CUCM end-user with roles and associated end-user configurations such as Jabber, RDP, CSF, device profile for Cisco Extension Mobility.
- ❖ Automatic, assigned or approved allocation of telephone extensions out of extension pools (per location or site). Write back of the (extended) extension to Active for a consistent directory.
- ❖ Voicemail on Cisco Unity Connection or Microsoft Exchange (other 3rd party servers can be supported via a custom plug-in).
- ❖ Presence on IM&P



Identity Management and Cisco UC Deployments

The UPLINX Provisioning System is fully compatible with an organization's Identity Management systems, due to its ability to integrate with LDAP data stores. User's information such as names, extensions and user credentials are first maintained within the master LDAP store. The UPLINX Provisioning System will track these adds, updates and deletes and "sync" them over to all involved Cisco Unified Communications servers.



Any provisioning or Identity Manager system can be used to maintain a central repository for identity management such as Microsoft Active Directory. UPLINX Provisioning System can then be used to synchronize end-user information to all related users' configuration items on Cisco Unified Communication.

Phone Extension Management and Active Directory

Phone extensions allocated by the UPLINX Provisioning System can be transformed to any format (such as full E.164 or custom formats) and written to any Active Directory attributes of end-users, as either standard or custom AD attributes. Internally used N-digits can be transformed to Direct Inward Dialing (DID) or any other required format and written to Active Directory or any other data store such as a SQL server.

This ensures that LDAP remains the primary source of data and all user information is consistent between LDAP and the CUCM.

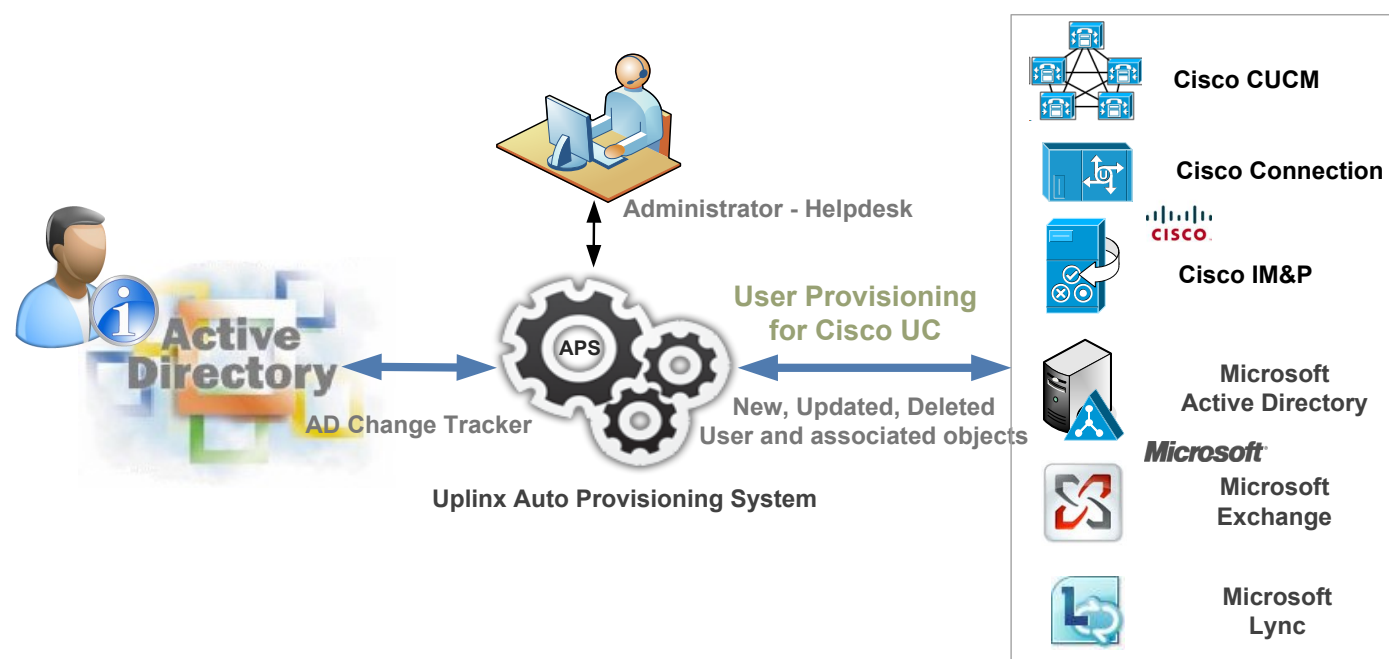


How it works

UPLINK has extended the Console driven Provisioning System to allow for fully automated, rule-based provisioning for any end-user setups required by Cisco UC based on the user's setting in Microsoft Active Directory.

CUCM end-users, phones, CSF, Jabber, RDP, voicemail, logged out phones and device profiles for Cisco Extension Mobility can now be automatically provisioned (added, updated and deleted) based on defined enterprise rules when changes are detected in the user settings of Microsoft Active Directory.

The UPLINK Change Tracker, which is part of the Auto Provisioning System, detects added, updated or deleted users and assigns a site and telephony class to generate an auto provisioning job. The system supports multiple CUCM clusters, each with multiple sites and telephony administrators.



The Auto Provisioning workflow with Active Directory Change Tracker, notification for approval to site administrator

Allocation of Extensions



Extensions can be predefined in the AD user, assigned by a telephony administrator or automatically allocated from the site extension range.

One or multiple extensions can be allocated per user. CSF or Jabber extensions can be separately allocated, or the same extension can be used to create a shared line to the user device profile for Cisco Extension Mobility. One of the extensions can be used as primary number for voicemail. Any extension can be modified, expanded to the full site in-dial number or full E.164 number and written back to any attribute of the user in Active Directory.

During commissioning the allocated extension will be updated in Active Directory to reflect the commissioned extension of the user. This means that extension information is always accurate across Cisco UC and Active Directory without manually managing free and used extension lists.



Supervised Automatic Provisioning

Fully automated, non-supervised systems have the disadvantage that if something goes wrong the consequences could be quite dramatic. For example deleting all accounts or adding a rogue account. For mission critical systems, such as the Cisco telephony system, supervision of automated actions is advantageous and doesn't take much time.

Any commissioning action of the UPLINX Auto Provisioning System can be supervised and the system waits for approval of suggested actions. The approval can be granted by non-technical personnel who can authorize commissioning on a per user basis.

Auto Provisioning Approver

Phone Control

	ID	Action	Time	AD User	CUCM User	Site	Job Template	Extension 1
<input checked="" type="checkbox"/>	83	Add	10:15:08 03 Apr, 2021	bstinson		HeadOffice (Sync)	[ADD] User w CUPS,UDP & VI	2005
<input checked="" type="checkbox"/>	84	Add	10:15:08 03 Apr, 2021	kbacon		HeadOffice (Sync)	Add User, Phone, UDP and VI	10004
<input checked="" type="checkbox"/>		Details...	10:08 03 Apr, 2021	tmosby		HeadOffice (Sync)	[ADD] User, UDP & VM	10000
<input type="checkbox"/>		Submit (2 jobs)	10:48 04 Apr, 2021	User_template	User_template	HeadOffice (Sync)	EM Auto: ADD User UDP VM	2001
<input type="checkbox"/>		Resubmit (1 job)	10:50 05 Apr, 2021	emtest3	emtest3	HeadOffice (Sync)	EM Auto: Update User UDP V	
<input type="checkbox"/>		Reevaluate (3 jobs)	10:04 05 Apr, 2021	emtest001	emtest001	HeadOffice (Sync)	EM Auto: Update User UDP V	
<input type="checkbox"/>		Delete (3 jobs)	10:20 05 Apr, 2021	emtest002	emtest002	HeadOffice (Sync)	EM Auto: Update User UDP V	
<input type="checkbox"/>			10:28 05 Apr, 2021	nstandage	nstandage	HeadOffice (Sync)	EM Auto: Update User UDP V	
<input type="checkbox"/>		Exclude AD user (3 jobs)	10:33 05 Apr, 2021	emtest003	emtest003	HeadOffice (Sync)	EM Auto: ADD User UDP VM	2000

Administrators can optionally approve each action of the system for better control.

De-Provisioning



Based on market research done by UPLINX, decommissioning activities pose greater challenges than commissioning, and this applies to most organizations.

In Commissioning, the end-user and the organization have a vested interest to perform the activities, whereas decommissioning encounters the following challenges:

- ❖ No notification that user has left and hence no decommissioning undertaken.
- ❖ Perception that it is "easy" to delete old records.

For manual decommissioning, an IP telephony admin is required to login into multiple servers in order to delete all configuration items of an end-user. This involves finding first all related items and manually deleting each one of them in the correct order.

The UPLINX Auto Provisioning System eases the burden associated with decommissioning users and its devices as it offers the same options for decommissioning as it does for commissioning:

- ❖ Change Tracking to Active Directory detects when a user has been deleted in Active Directory and starts the workflow to decommission this user.
- ❖ Supervised approval of a deletion activity by a site administrator.
- ❖ Deletes (configurable) all related configuration items (such as devices, extensions and voicemail) on all involved servers if not in use by any other users.
- ❖ Logging and auditing of all decommissioning actions.



Configuration Updates

Configuration updates are required because users details change for personal or business reasons. To update all related telephony configuration items, there are two options available with the UPLINX Provisioning System:

Automatic updates

The Change Tracker will detect changes to an end user's details in the centralized LDAP store (Microsoft Active Directory) and recommend a job to update it by asking (if enabled) for approval.

Manual update

The helpdesk can use the UPLINX Console to perform updates quickly while a user is on the phone. Common scenarios that can be executed include:

- ❖ Configuration updates by pushing the AD user details to the CUCM
- ❖ PIN or password resets
- ❖ Change of extension

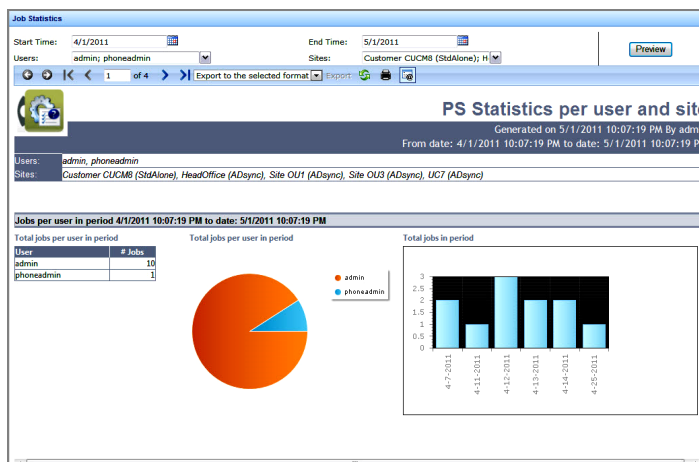
An end-user can also reset his CUCM and CUC passwords and PIN by using the **UPLINX Self Service web page** which uses authentication against Active Directory. Change requests can also be submitted via the UPLINX Commissioning Request update web page.

In most cases, fixing a problem is more complex than recreating the user's configuration from scratch. The UPLINX Console allows easily deleting and recreating of all users telephony objects in less than a minute. This ensures a fully working solution in minimal time with minimal effort.

Logging and Reporting

The Provisioning System provides built-in reporting, allowing an enterprise or outsourcer to track details based on the number of MACDs received and the number processed. Detailed job logs and an activity report per telephony admin user or time period are also available.

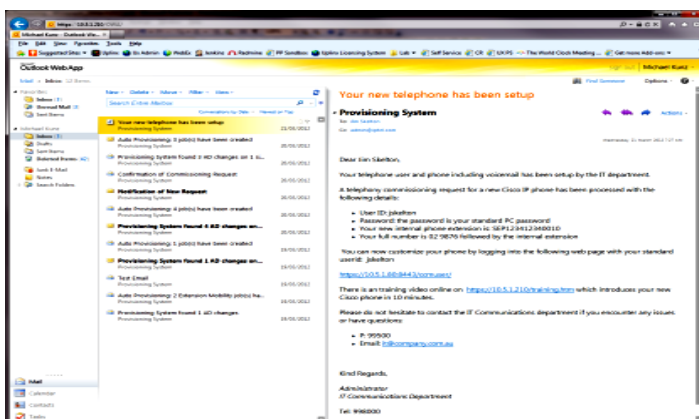
Scheduled reports can email out utilization of site extension ranges, summary of how many jobs have been performed per site and in which period, or detailed steps performed for each commissioning job.



Inbuilt reporting for billing and auditing per site and period.

Welcome Email to new Users

After all the required configuration items for a Cisco end-user have been successfully created; a welcome email can notify the end-user of their setup and how to use their telephony device. The email can also include attachments for training purposes.



Email notifications to end users with details and user guides.



Manual Provisioning with UPLINX Console at Helpdesk

For more complex setups, or if end-users cannot be automatically classified into telephony classes, the telephony administrator can use the UPLINX Console to select telephony specific settings such as site, extensions and calling permissions to complete a new or updating provisioning MACD request.

The system uses the same rules and templates as in automatic provisioning but enables the telephony administrator to over-rule the system or use it in ad-hoc scenarios that require more granular control over settings and dependencies. For example a lobby phone would be directly configured with an extension and not use extension mobility. The web-based Console of the UPLINX Provisioning System also allows the application of a different template over an existing phone to reset all its settings.

Submit New Jobs

Server: Demo Test Site

Action: Add: User,1x Phone & VM New Job

Site: Sydney

☒ User: ADD User for Phone w AD upd ✓

☒ Phone: ADD Phone w 1 Line ✓

☐ UDP

☒ VM: ADD Basic Voicemail ✓

☐ RDP

☐ Phone 2

☐ Phone 3

Job Details

Reference: Add Phone of Elle Diess in Sydney #4009

Description: Add: User,1x Phone & VM (ADD User,ADD Phone,ADD Voice Mail) Submit Job

User Phone Voice Mail

Phone

- Phone Name: SEP123412349901

- Description: Phone of Elle Diess Location: Sydney

- Phone Model: Cisco 8851

- Device Pool: DP_Sydney

- AAR CSS: CSS_Sydney

- Owner User ID: elled ...

Line #1# (Button 1)

- Extension: 4009 ...

- Partition: P_Sydney_1

- External Number Mask: 0290004XXX

- CSS: CSS_Sydney

- Line text on phone: Elle Diess - 4009

- Line alert text: Elle Diess

- Update all Shared Lines: ☒

- Display: Elle Diess

- Forward to voicemail: ☒

- voicemail profile: VMP_Sydney

- Forward CSS Def: CSS_Sydney

- Pickup Group: PG_2 ...

- Associate user: ☒

The web-based Console of UPLINX Provisioning System enables anyone to easily add, update and delete user with devices

Once a commissioning job has been completed, an email containing the user's details such as their login username and password can be easily emailed out by pre-populating an email template presented by the Provisioning System. User guides can be attached to these emails.

For Console based provisioning, please see our datasheet "UPLINX Provisioning System" or watch our videos on <https://www.uplinx.com/provisioningsystem/>



Verification and Troubleshooting

Verification and reproducing functionality defects is the first step to resolve an issue in any troubleshooting. First, the helpdesk or technical expert needs to fully understand the problem in order to provide a solution.

Without additional tools, the helpdesk is not able to see the Cisco phone screen, or reproduce the problem, without 'walking the floor' or travelling to a remote site.

For this purpose, UPLINX has created the **UPLINX Remote Phone Control Tool** which allows support staff to:

- ❖ Follow a user's actions by monitoring the phone screen, so the user can "walk" the helpdesk staff member through the problem they are encountering. This helps in quickly identifying issues arising from incorrect usage and also supports the training of a user over the phone.
- ❖ Remotely using the phones. For example placing calls through a voice gateway to verify and troubleshoot call functionality at a remote site.
- ❖ Remotely login and logout of a device profile on a phone.
- ❖ Logging and user audits.

The tool enables direct phone operations to be executed remotely but with the same level of control as if sitting in front of the phone. It allows for provisioning activities to be validated immediately ensuring that changes have been successful which saves an organization both time and money.

The benefits of the tool are:

- ❖ Remotely validate phone functionality
- ❖ Remote Training/Support
- ❖ Extension Mobility login/logout
- ❖ Bulk operations and Macros
- ❖ Screen Captures and Phone configuration reports
- ❖ Multi-user and multi-cluster support

Web Edition – can be used as a central standalone application or together with the UPLINX Provisioning System to validate new setups and remotely troubleshoot telephony issues. It is designed for helpdesks and operational support staff tasked with supporting production telephony systems.

Desktop Edition – is a Windows based standalone application for deployment engineers to troubleshoot and perform batch operations on Cisco IP handsets such as: Bulk EM login/logout, pushing background images to phones and running Phone Key macros.

For a *feature comparison* web vs desktop remote phone control tool, please see:

<https://www.uplinx.com/phonecontroltool-web-usd/>



Web based Remote Phone Control allows to fully operate a phone like sitting in front of it.



Conclusion

Companies can now automate any Cisco UC deployment and reduce provisioning costs by using the UPLINX Provisioning System.

Companies that wish to reduce their operating IT costs by minimizing provisioning efforts, raising service quality to end-users, are now able to do so by using the *UPLINX Provisioning System*, which:

- ◆ Automate all end-user setups for Cisco UC such as (multiple) phones with automated extension allocation, device profiles for Cisco Extension Mobility, Jabber, CSF, RDP and voicemail based on LDAP user information.
- ◆ Automatically configures logged out phones for use by extension mobility, by using auto registration and pre-defined rules.
- ◆ Introduces an automated workflow.
- ◆ Reporting and logging of all commissioning activities.
- ◆ Allows site administrators to supervise any automatic actions by the system.
- ◆ Emails login and training instructions to end users.
- ◆ Updates (keeps synchronized) user details between LDAP and CUCM.
- ◆ Supports de-provisioning of users in the same way as provisioning users.
- ◆ Is a standard, off the shelf, proven product with software maintenance and support.
- ◆ Saves costs and provides consistent and high level end user service.

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