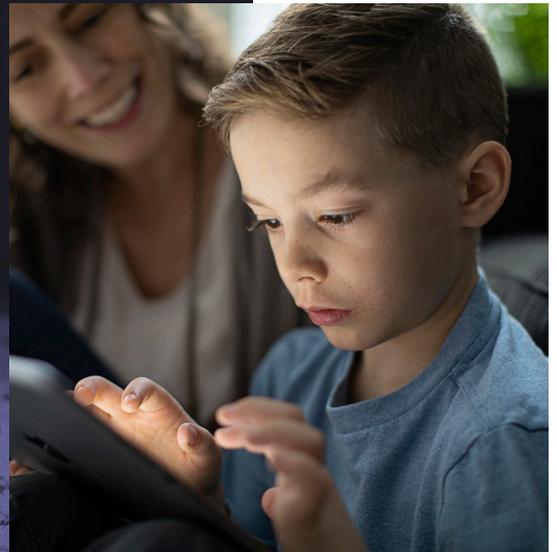




TECHNICAL PAPER



eSIM iPad setup with Jamf Pro



6 November, 2020

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Introduction

eSIM and Apple Mobile Devices

Traditionally, cellular devices included a slot where a small Subscriber Identity Module ("SIM") card could be inserted. Most of the time, devices came with a card already installed to link the device to a cellular carrier and service plan. Some modern devices are switching to use an Embedded SIM ("eSIM") that can store this information digitally, allowing cellular configuration to be managed remotely.

This document demonstrates how Jamf Pro can be used to install, update, and report on your devices' eSIMs, all from a central console.

Activating Cellular Service with eSIM without Jamf

Unless a device has been pre-configured, eSIM devices don't know which carrier will be providing their cell service when they're first turned on. There are no icons at the top of the screen to indicate cell service has been set up like there are when a carrier-specific physical SIM is installed.



When a consumer purchases a device with an included cellular plan, the retailer may configure the device for them. Or they can go into the cellular settings page on the device and pick a plan to purchase for themselves. In cases where the device was purchased directly from the carrier, Apple may already know that the device has a carrier and the device might provision its cell service automatically.

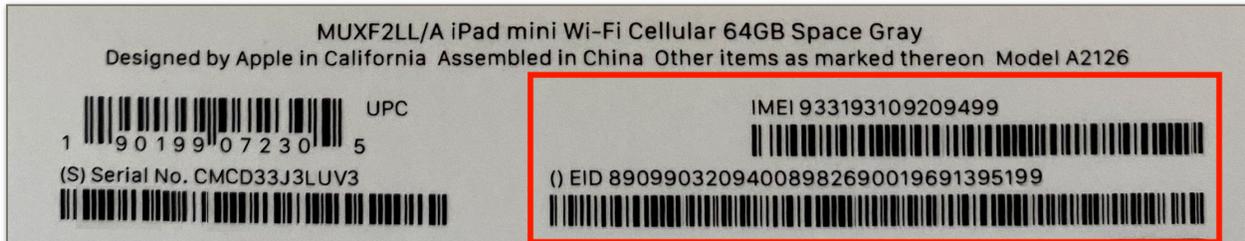
When an organization adds devices to its cellular plan, there are a number of manual methods available for setting up cell service with an eSIM. Most carriers have a web page with instructions for the methods they support. They may provide a URL and activation code that you can enter manually, a QR code to scan, an Apple App Store app, etc.

But going through the cellular configuration process is a lot of extra work if you're setting up a large number of devices and requires that you have physical access to the device. In these cases, we can use a Jamf Pro MDM command to instruct the device (or many devices at once) to contact your carrier's eSIM servers and configure themselves. We'll show you how in the next section. Throughout this document, the term SM-DP+ server and eSIM servers are interchangeable.

When an organization needs to add eSIM devices to their cellular account, they'll need to provide the Mobile Equipment Identity ("IMEI") number and eSIM ID Number or Electronic Identification Document ("EID"). If you don't already have a list of these, ask your Apple representative to provide them. They can work with their sales team to create a list as soon as your iPads have shipped and their serial numbers are known. You can pass the list on to your cellular provider, so they have the device information associated with your account and set up in their eSIM servers when you're ready to configure the

devices. Ask your carrier if there's any time limit on how long you have to download an eSIM profile to your devices.

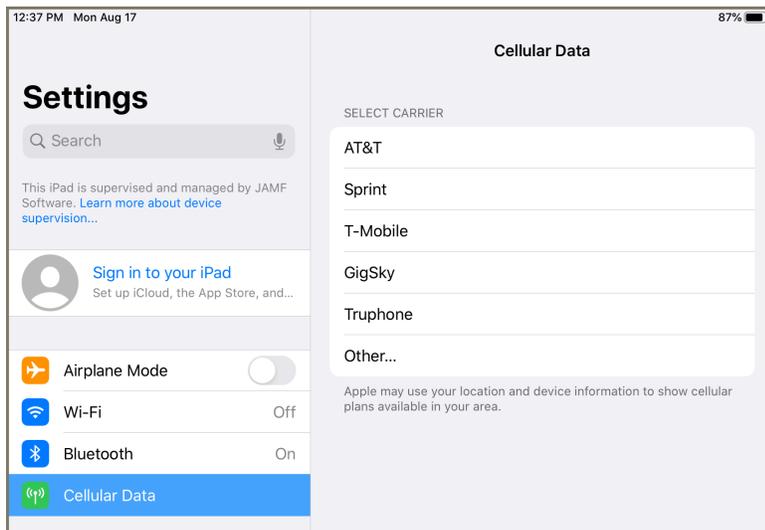
If you don't have a list of the cellular IDs for a device, you can find the IMEI and EID numbers on the outside of the iPad's box. You can read them in with a barcode scanner if one is available. It may also be helpful to include the device serial number in your list so the device can be referenced if you have to followup with your carrier should a device require troubleshooting.



The same information is also available on the device itself under "Settings > General > About".

Apple's <https://support.apple.com/en-us/HT209044> page has detailed information on these provisioning methods as well as tips for using an eSIM on a dual-SIM phone as might be the case when a corporate device has a separate SIM for personal or international use. Note that while some iPad models offer both a physical SIM slot and eSIM, they do not have dual-radio capabilities like some iPhones do—on an iPad, only one eSIM can be active at a time.

The image below shows the Cellular Data pane as it appears on an eSIM iPad that doesn't yet have an activated cellular data plan.



Automated Cellular Activation for iPad

Manual configuration of cellular settings in Settings is practical for consumer devices but too time-consuming when setting up large numbers of devices. Jamf products offer support for automated eSIM profile installation. Jamf Pro is used in organizations with large or complex management requirements.

Typical Provisioning Workflow

In a common mass-deployment scenario, an organization is going to be distributing iPads to end-users for home use. They often want to configure the devices at a central location or service provider depot to make sure everything is correct before handing out or shipping the device. In education, the student may be young and not an expert troubleshooter. In business, IT may not want employees to have the trouble of shipping a device back to IT if there's something wrong.

Boxes of new devices have been delivered by Apple (or their reseller), cellular service has been purchased, and the cellular carrier has added the EID and IMEI numbers for the device eSIMs to your organization's data plan account. To get the devices ready for the users, we'll first need to enroll the devices in a Mobile Device Manager ("MDM") like Jamf Pro. Once that's done, we can manage the cellular setup from a central console without ever having to touch them.

There are a few ways to enroll devices in MDM when doing mass-deployment:

Automated Enrollment – In this method, Apple School Manager (or Apple Business Manager) already knows your organization owns the devices so Apple School Manager will tell the devices to connect to your MDM automatically the first time they power on.

Apple Configurator – This is a free program available on the Mac App Store. It allows you to connect many iOS or iPadOS devices to a Mac via a multi-port USB hub and can install the initial software and settings you want. It's fast since it doesn't need to happen over a WiFi network.

Once the device is enrolled in Jamf Pro, it's easy to install more settings and software, or to push mobile device commands to large numbers of devices, for example, "Refresh Cellular Plans". This command tells the iPads to connect to your carrier to download an eSIM profile so they can start getting cellular data. That's a lot easier than setting up cell service on all your devices by hand.

Some helpful resources:

- [Deploy iPads with cellular connections](#)
- [Apple's "Get Cellular Coverage" page listing devices that support eSIM](#)
- [Apple Business Manager Guide](#)
- [Apple School Manager Guide](#)
- [Deploying iOS and tvOS Devices Using Apple Configurator 2 and Jamf Pro](#)
- [Enrolling macOS, iOS, and tvOS Devices in Jamf Pro Using Automated MDM Enrollment](#)

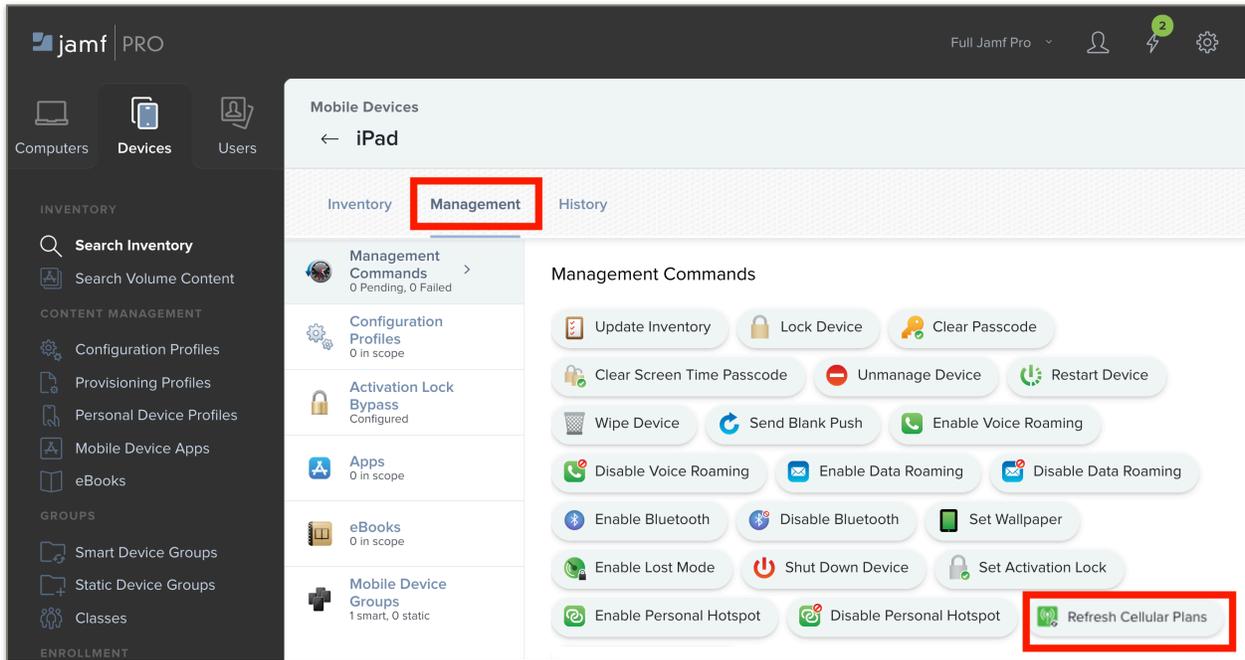
Activating eSIM Cellular Service with Jamf Pro

When a brand-new device is enrolled in Jamf Pro, we can open its inventory details ("Devices > Search Inventory" > click on the device item in the list > Network section) and see that it's a cellular device because it has values in fields like the IMEI number. We haven't downloaded an eSIM profile on this device yet so the Current Carrier Network field says, "iPad".

The screenshot displays the Jamf Pro interface for a mobile device. The left sidebar contains navigation options: INVENTORY (Search Inventory, Search Volume Content), CONTENT MANAGEMENT (Configuration Profiles, Provisioning Profiles, Personal Device Profiles, Mobile Device Apps, eBooks), GROUPS (Smart Device Groups, Static Device Groups, Classes), ENROLLMENT (Enrollment Profiles, Enrollment Invitations, PreStage Enrollments), and SETTINGS (Management Settings). The main content area shows the 'Mobile Devices' section for an 'iPad'. The 'Network' section is active, displaying various fields:

Field	Value
Home Carrier Network	iPad
Current Carrier Network	iPad
Carrier Settings Version	41.0
Cellular Technology	GSM
Phone Number	
IMEI	35 317
MEID	
ICCID	8901 3i
Current Mobile Country Code	65535
Current Mobile Network Code	65535
Home Mobile Country Code	310
Home Mobile Network Code	380
Voice Roaming Enabled	No
Data Roaming Enabled	No
Roaming Enabled	No
Personal Hotspot Enabled	No

The cellular fields will be blank for devices that don't have cellular capability. If we want to activate the cellular data services on this device, switch to the "Management" tab and click the "Refresh Cellular Plans" button.



You'll be prompted for the "eSIM Server URL".

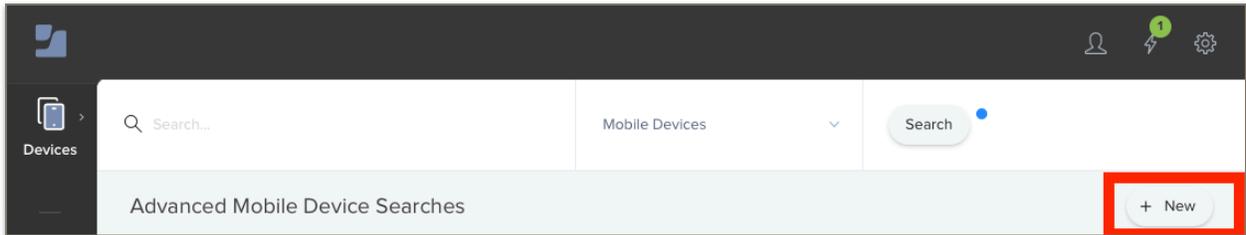
A screenshot of a dialog box titled 'Refresh Cellular Plans'. The dialog has a header with the title. Below the title is a label 'eSIM Server URL' followed by a descriptive text 'The carrier's eSIM server URL to query'. There is a text input field with a placeholder '[Required]'. At the bottom of the dialog, there are two buttons: 'Cancel' and 'Refresh Cellular Plans'.

Upon completion, the device will be activated and show cellular bars in the upper corner of the home screen. You can view details about the cell service in "Settings > General" on the device and you'll see the carrier information filled in on the device's network inventory details page in Jamf Pro. If you don't, refresh the device's inventory information using the button in the Management tab.

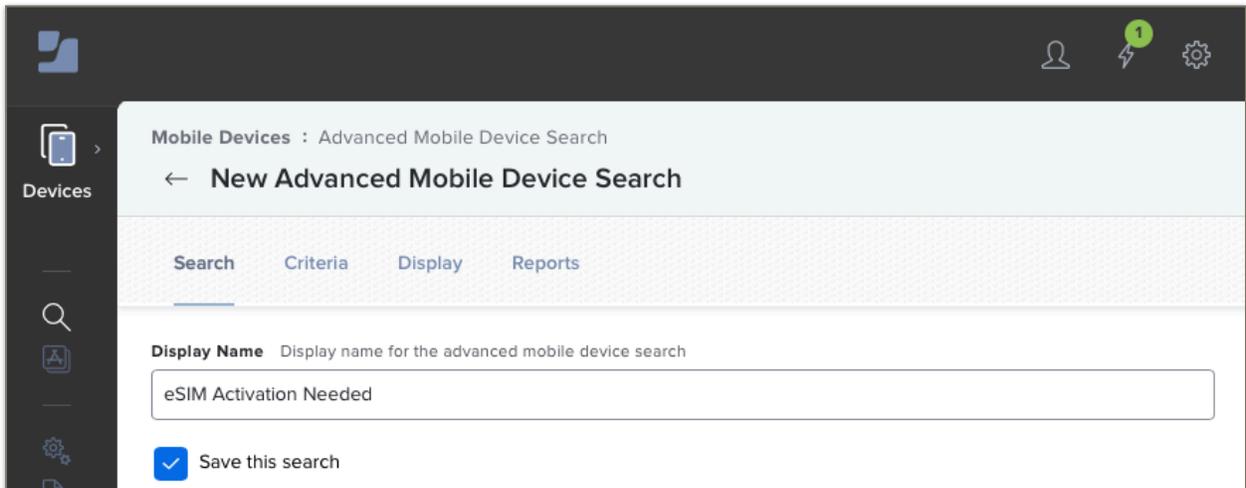
Listing the devices that need cell service activated

Suppose we spent a morning enrolling a large group of new iPads into Jamf Pro using either the Apple Automated Enrollment or Configurator methods and we want them to activate their cell service while we go to lunch. We can create a group of the devices to be activated and then tell Jamf Pro we want them to be setup for cell service all at once. It's a lot faster than clicking into each one individually and hitting the Refresh Cellular Plans button in the management tab.

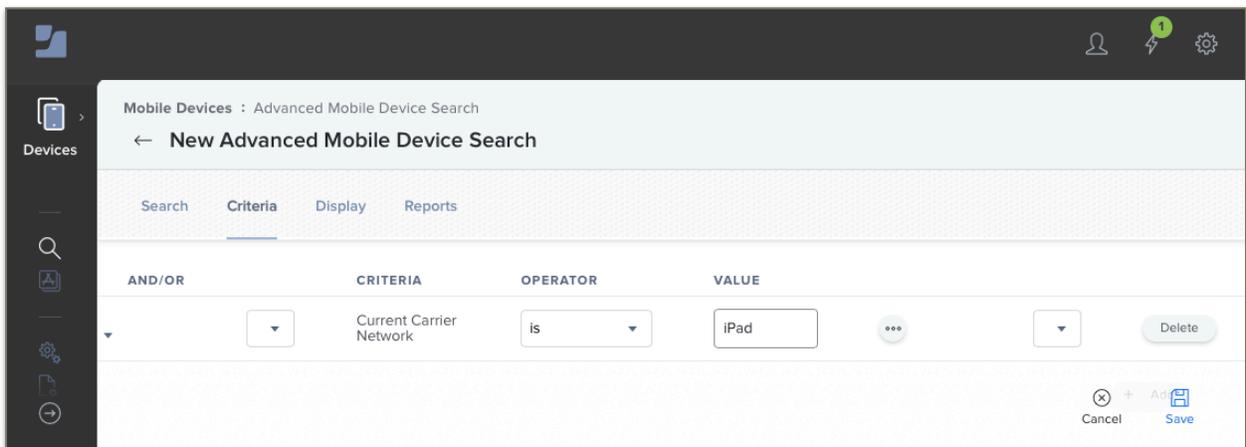
To begin, go to "Devices" and click the "+New" button for Advanced Mobile Device Searches.



If you're going to be doing some additional batches of device enrollments later, you can save the search for later use by clicking the "Save this search" checkbox and supplying a name.



Next we'll fill in the "Criteria" tab. When we looked at the network inventory details for an iPad that had been enrolled with Jamf Pro but had not yet been configured for cell service, we noted that the "Current Network Carrier" field was set to "iPad". We can use this behavior to quickly create a set of all devices that need to be setup with their cell service plan.



Once a device is activated with a carrier and inventory information has been updated, that field will change to the carrier's name and the devices will automatically drop out of the advanced search results.

Advanced Mobile Device Searches

In the preceding section, we created a simple advanced search to create a list of all iPads that still need to be activated. That would cover the majority of deployment scenarios, but there might be some more complicated cases. Jamf Pro has options to cover almost anything.

For example, if you're working over the course of a few days to set up lots of different iPads and only wanted to activate a batch of "iPad Pros 11-inch (2nd generation)" that you enrolled today, your criteria might be:

AND/OR	CRITERIA	OPERATOR	VALUE			
	Model	is	iPad Pro 11-inch (2nd)	...		Delete
and	Last Enrollment	less than x days ago	1			Delete

Cancel Save

This strategy is helpful because there may be cases where a device has activated its cell service but has not yet reported an updated inventory to Jamf Pro. In this case, just filtering for carrier = "iPad" could capture devices that already have their cell service running. In the above example, we're filtering on date and if this is the first time we've pushed out a cell plan reset command, we'll know we're only updating the devices that are ready for it.

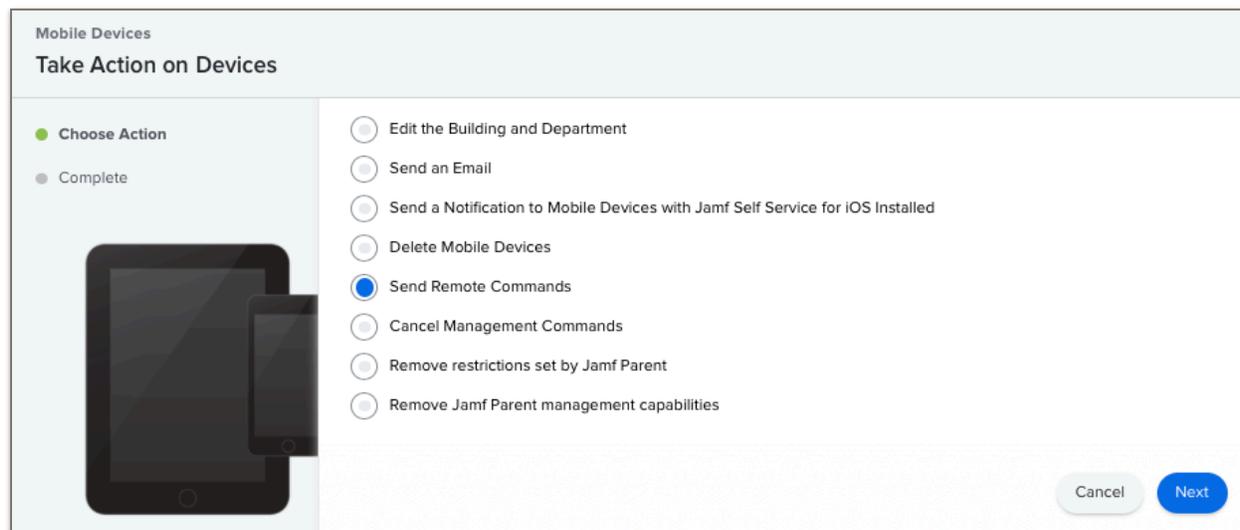
Suppose there are a few iPads that will only be used in the office and you don't intend to activate their cellular data plan. We could add a few "is not equal to" lines to exclude them by name, user, or serial number. If there were many such devices, we could create a "No Cell Service Needed" static group and add an "is not a member of" line to our advanced search to exclude them.

What if we're deploying lots of different models and the setup work is happening at many different sites? We could create a separate "Activation Needed" advanced search for each location and filter on external IP address.

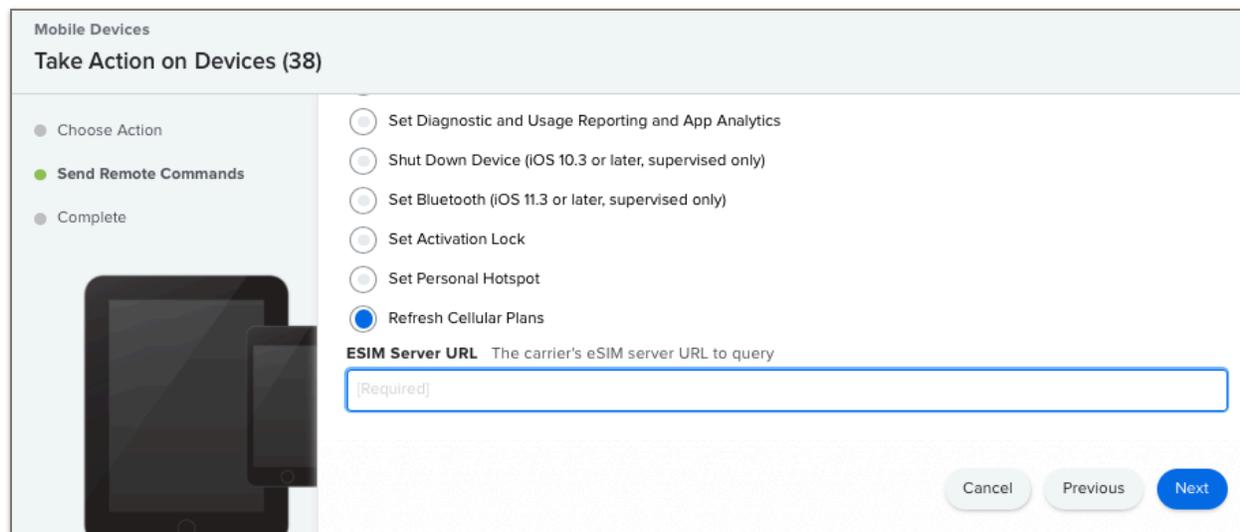
If you're doing a 1:1 deployment and assigning the devices to specific users, you can even use information like department of group membership from a directory service like Active Directory.

Bulk Cell Plan Activation in Jamf Pro

Once you have your Advanced Search criteria the way you want, click the "Save" button and then the "View" button at the bottom of the page to show the list of all the devices that meet your "Activation Needed" criteria. From the device listing screen, click the "Actions" button. Jamf Pro will display a list of things you can do to a group of devices. Select "Send Remote Commands" and click the "Next" button.

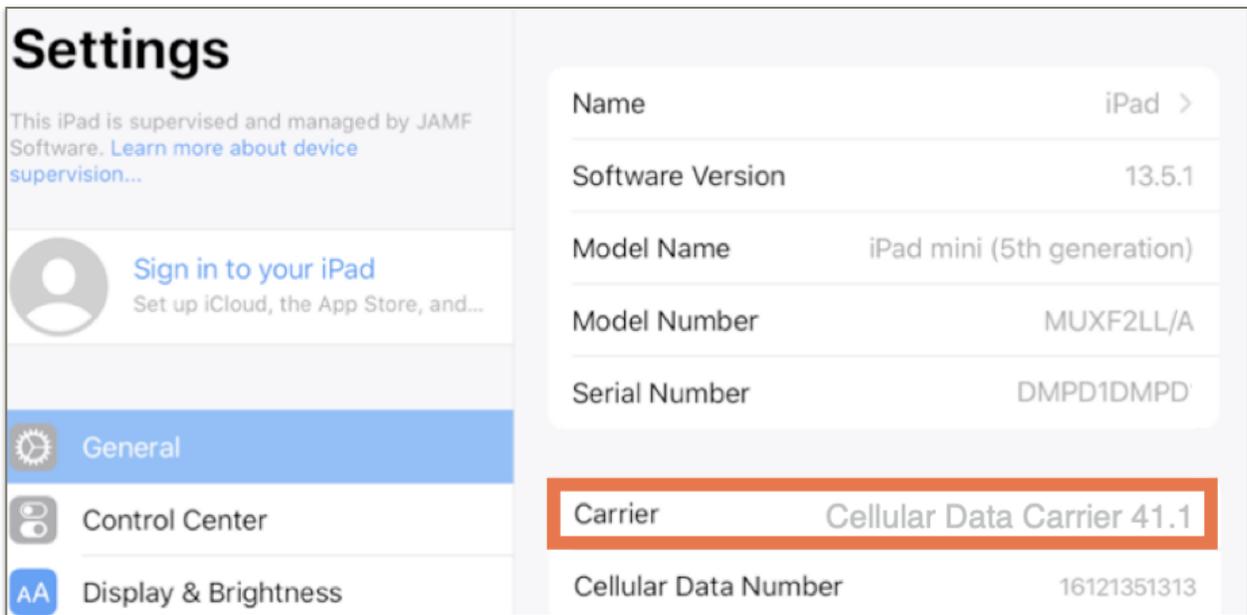


Select "Refresh Cellular Plans" and enter the eSIM Server URL provided by your carrier. Then click "Next".

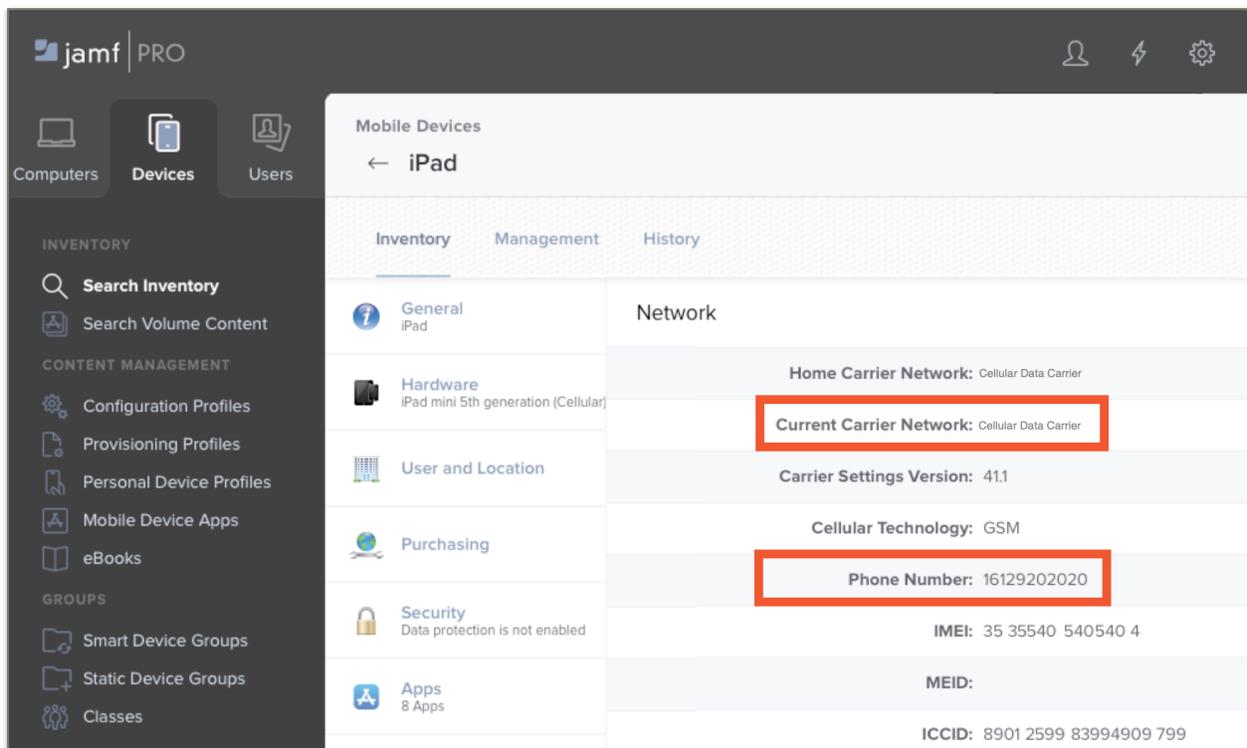


Jamf Pro will send the command to each device in the group. The devices will contact the carrier eSIM server you specified and retrieve their cell plan settings (the "eSIM Profile"). Then they can connect to the cellular network without requiring any manual steps on the device.

When checking the iPads, we'll see the cell service signal strength in the upper-right corner of the screen and the carrier will be listed if we go into Settings > About on the iPad.



Once the device has submitted its next inventory, the details for the cell service will appear in Jamf Pro's device details page, including Carrier and Phone Number information.



eSIM Implications for Device Reset

Device Reset and "Retain Cellular Plan" in iPadOS

Carriers may expire or remove device information from their eSIM servers once an eSIM profile has been downloaded, so unless you're changing to a new carrier, eSIM provisioning on an iPad should be considered a one-time event. We'll need to make sure the eSIM profile isn't accidentally erased. We can use Jamf to:

1. Prevent users from altering their cell plan.
2. Prevent users from deleting their eSIM profile via Settings's "Erase All Content and Settings" option.

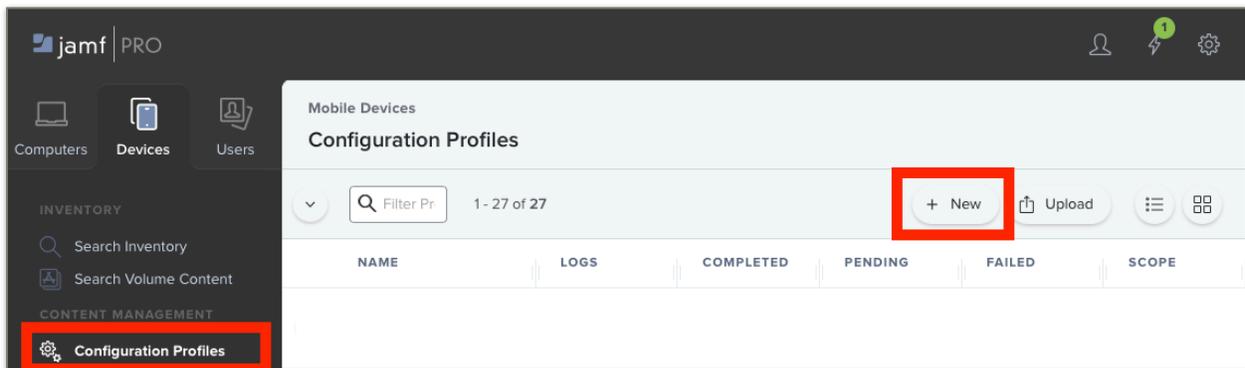
If cellular settings are unintentionally removed from a previously-activated eSIM device, by manually on the device in Settings, by sending a device wipe command via MDM, or by wiping the device with Apple Configurator, trying to reinstate it by sending the "Refresh Cellular Plans" MDM command probably won't work. The device is no longer in the carrier provisioning systems. The user will see a popup message on the iPad stating, "Cellular Plan Cannot Be Added; This code is no longer valid. Contact your carrier for more information." You'll need to contact your carrier and give them the device's IMEI and EID numbers so they can re-stage the eSIM profile for the device on their eSIM server. Once that's done, they may instruct you to restart the device. Then you should be able to re-activate the device's cellular service.

Because of all the carrier intervention required to get cell services back onto a device, we need to take precautions to prevent users from removing their cell plan inadvertently.

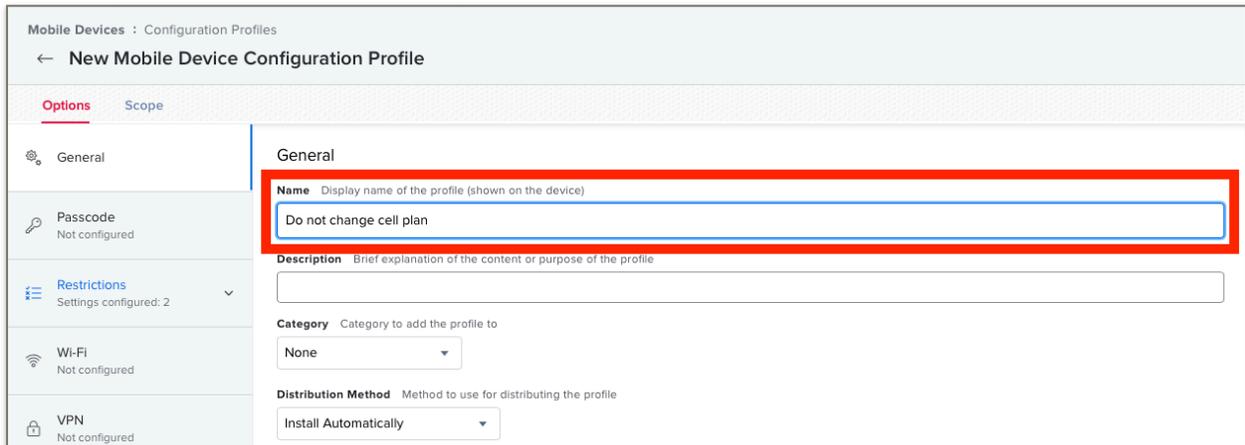
Restricting the user's ability to change cellular settings

We can create a restrictions configuration profile to ensure that users do not remove the cellular plan settings from their devices.

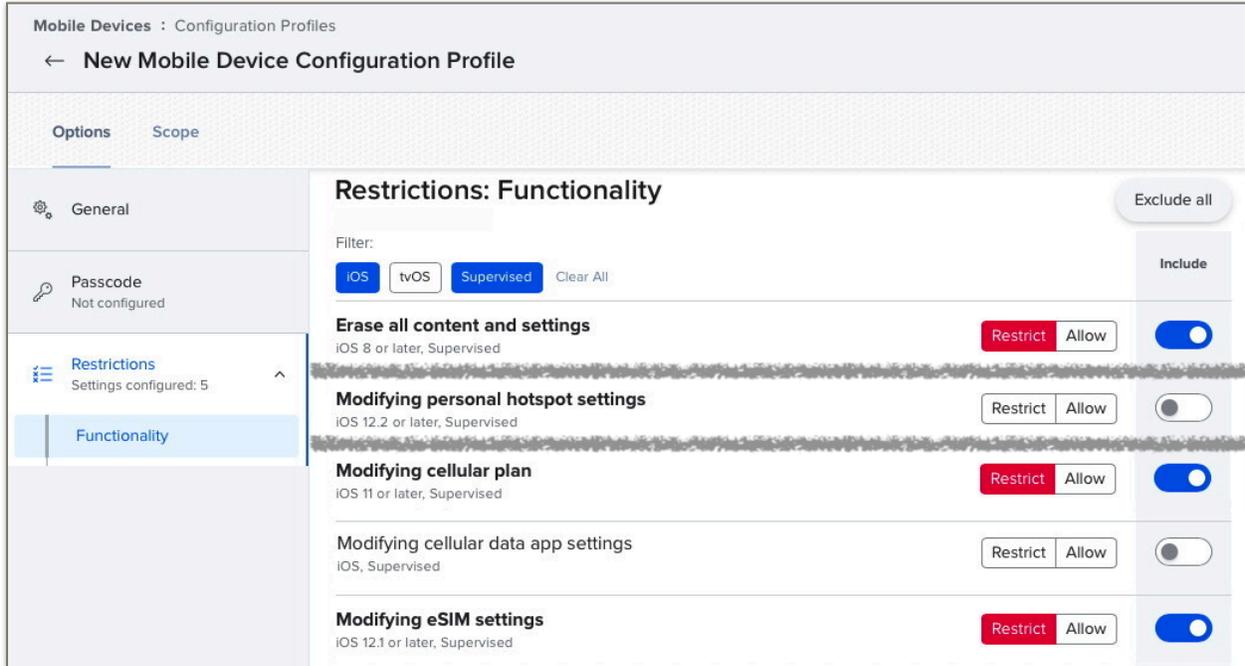
If you already have a standard restrictions profile for your devices, you may elect to edit it to add the cellular restrictions. Or, to create a new profile, go to "Devices > Configuration Profiles > New".



Give the profile a name in the General pane.



Next, switch to the "Restrictions > Functionality" pane and restrict "Modify cellular plan" and "Modify eSIM settings".



In the example shown, we are also preventing the user from erasing the device because if not done correctly, the eSIM profile can be deleted as well.

This example also places no restrictions on "Modifying cellular data app settings". This might be a good approach on a corporate device where we are allowing users to install apps like YouTube or Netflix but encouraging them to turn off cellular data for these apps in favor of using WiFi. In education, we might choose to turn this restriction on, and also restrict students' ability to install their own apps from the App Store. Then the admin can specify which of the apps we're installing should use cellular data and which should not. These settings are managed in the "Network Usage Rules" payload.

The hotspot restriction is another cellular-related option, though not specific to eSIM. This is usually unnecessary because the availability of this feature is typically managed by the carrier based on the cellular service plan purchased for the device.

Switch to the scope tab to select the devices that need these settings. This profile can be scoped to all mobile devices. It will have no effect on devices that do not have a cellular plan, or to a smart group with criteria of Mobile Carrier is not equal to "iPad" and is not equal to (no value). Save the profile when you've completed the setup. The users will not be able to alter their cellular settings. It's safe to push this profile to devices even before the cellular service has been activated. The "Refresh Cellular Plans" MDM command is not affected by this setting.

Avoid auto-erase after a number of incorrect passcode attempts

Unless your organization has an information security policy that requires it, do not set the option in the passcode payload that will wipe a device after a certain number of failed passcode attempts as this will also delete the eSIM profile settings.

Apple Configurator Workflows

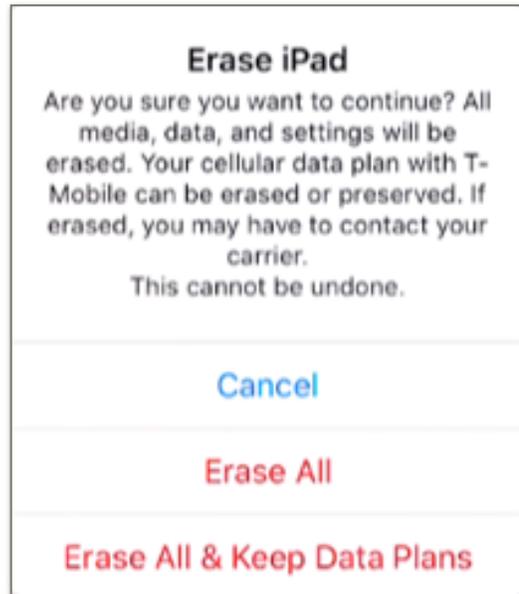
Remember that resetting a device using Apple Configurator will not preserve the eSIM profile. If you plan to use Apple Configurator as part of a workflow, coordinate with your cellular data network carrier to ensure new profiles will be provisioned for these devices. You will have to repeat the process for the device as if it were a new iPad.

Erasing Content and Settings

Erasing Content and Settings from an eSIM device

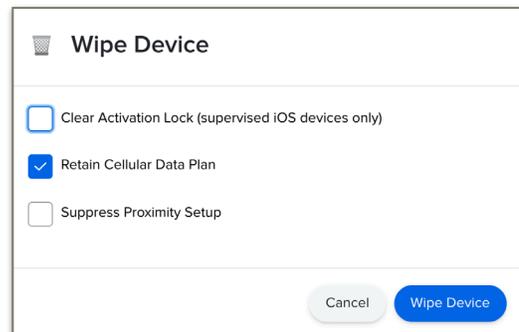
iPadOS allows users to erase content and settings from the device. If an eSIM profile is present on the device, iPadOS will offer two options. If the device is going to a new user but it will be on the same cellular plan, select the "Erase All & Keep Cellular Plans" option. If you're going to be disposing of the device, transferring ownership, no longer want the device to have cellular service, or need to switch to a new cellular account, select the "Erase All" option.

By default, end-users have access to the erase command on their iPad and may not understand that they may need to retain their cellular plan. For this reason, consider using a restrictions profile to prevent an end user from erasing their own device. If a device erase is ever needed, an administrator can use the MDM command instead.



Sending the Device Wipe command to an eSIM device in Jamf Pro

If you're using Jamf Pro to wipe a device with a remote action, be sure to check the "Retain Cellular Data Plan" option unless you no longer want the device to have cell service with your carrier. This command can be sent to an individual device from the Management tab in its inventory detail page or as a mass-action to a group of devices in an Advanced Search or Mobile Device Group.



Bulk Activation Considerations

Apple's enrollment and app delivery systems can scale to handle huge demand surges, as can the cell carriers' device activation infrastructure. Your organization's WiFi network and internet connection are more limited however, and so is the capacity of the cell tower covering your site. We should give some thought to what we're asking our networks to do when considering a device setup workflow.

Even if you're enrolling very large numbers of devices, they're typically being configured in batches. So in most real-world workflows, network demand required for MDM enrollment and cellular service activation is distributed over time. We won't expect to see too many problems, but downloading iPadOS updates and apps can require significant bandwidth, and an MDM will be busy negotiating device check-ins and Apple Push/App Store transactions during this period. We might have some issues if we try to activate cell service on too many devices at once, or while the devices are busy doing other things.

Examples:

- A Jamf admin pushed new versions of their company's in-house apps to 30,000 devices at the same time. A few cubes over, another admin was pushing the Refresh Cellular Plans command to some new devices she was setting up. She didn't know about the app installs and couldn't tell why her commands didn't seem to be going through. The admins found that both their management tasks and the app installations went much better when they broke their app installs into 5,000-device chunks with a few minutes break in-between.
- A group of IT staff members reserved a large conference room to use for their device setup project and recruited a team of assistants. Things went well at first but they ran into trouble after turning on a couple dozen devices. They discovered that the network administrator had placed a limit on the number of devices that could be connected to the conference room's WiFi access point.
- An organization decided to switch cellular providers and sent the Refresh Cellular Plans command to all their devices at once so they would activate with the new carrier. The switchover took longer than expected and failed on some devices.

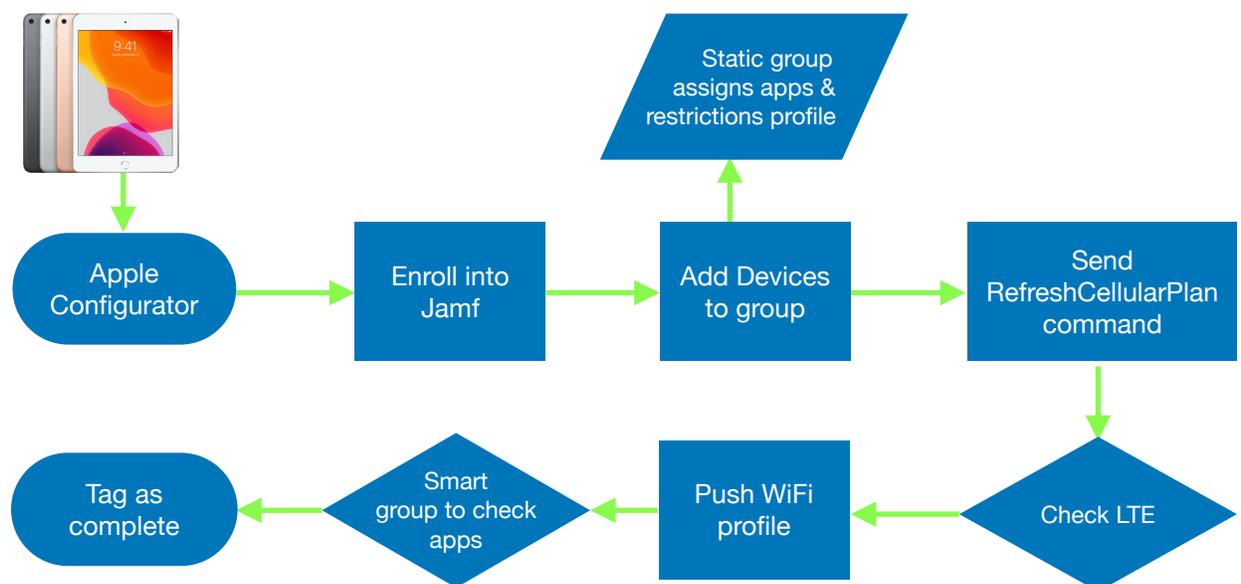
The main point here is that a setup workflow for hundreds of devices may need to include some extra time for downloads and processing. It's best to wait until data-intensive activities like OS/app updates are completed before sending the Refresh Cellular Plans command and we shouldn't try to activate 1,000 devices all at once on the first try. We may have better success if we activate a few devices to start and then increase the device count on subsequent batches as we observe success.

The use of Apple Caching Service can dramatically reduce the load on your organization's internet connection when Apple OS and App installations are needed. Ref: <https://support.apple.com/guide/mac-help/what-is-content-caching-on-mac-mchl9388ba1b/mac>

An Example Apple Configurator Workflow

One education customer was rolling out 1,200 new cellular iPads with a team of four working at a central location. The devices were intended for 1:1 user by younger students so the district wanted the devices to be fully configured and tested by IT prior to distribution. One team member unboxed devices for the 3 techs, each of whom tended an Apple Configurator workstation. The iPads were enrolled with Supervision and they used tethering to connect the devices to the network.

When the devices restarted following the Configurator phase, they received their apps, profiles, and the refreshCellularPlan MDM command from Jamf. The techs verified that the app installs and the cellular service was working. Initially, they saw some devices with incomplete app installs but this was resolved by turning on the Apple Caching service on their Mac workstations. A small number of devices needed to have the resetCellularPlan command pushed twice to get the cell service working. After all devices had cell service, they pushed out the WiFi profile. (They chose to delay installation of the WiFi profile so they could be sure they were running on cellular when they tested network connectivity after disconnecting the tether.)



STOP Remember that wiping a device with Apple Configurator will remove any existing eSIM data.

Cellular-related Popup Notifications

The following message may be seen in iPadOS.

“Carrier Settings Update”

Carriers may occasionally ask Apple to adjust some cellular radio and network settings on cellular-capable devices after they've been purchased. You might see a prompt informing you that such an update is available as you're activating your iPads. Select the “Update” or “OK” option if you see this prompt. Ref: <https://support.apple.com/en-us/HT201270>

“Cellular Plan is Ready to be Installed”

Once your carrier has entered the IMEI and EIDs for your devices into their system, you might see a prompt on an iPad saying that it's ready to set up cellular data. You can activate the cellular plan on these devices if you're doing manual setups. But if you're configuring lots of devices and don't want to tap the activation by hand, disregard this message and instead use the “Refresh Cellular Plans” mass-action command in Jamf Pro.

“No SIM Card Installed”

It's OK if you see this message on an eSIM device. It just means that in addition to the eSIM, there's also a slot for a physical SIM card and it's empty. Once the eSIM is downloaded, you will see that the device has cellular service via the eSIM in "Settings->General->About" or by looking for the vertical signal-strength bars at the top of the home screen. Ref: <https://support.apple.com/en-us/HT201420>

“Unable to Update Cellular Plan”

We've seen this when there was a content filter on the customer network that blocked access to the carrier's eSIM server URL. See the Troubleshooting section of this document for more details.

“Unable to Complete Cellular Plan Change”

This occurs when the MDM has sent the Refresh Cellular Plans command to a device that is already activated. It won't hurt anything on the device if you accidentally send the command, but you should avoid doing so if a user already has the device so they aren't confused by the message.

“Cellular Plan Cannot Be Added; This code is no longer valid.”

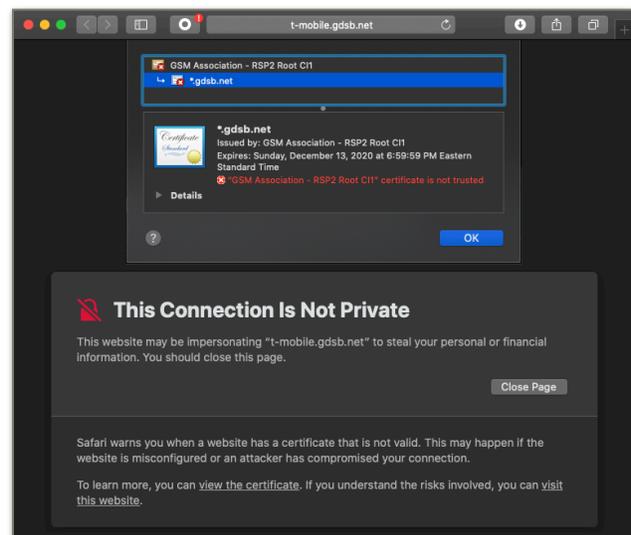
This happens if you send the "Refresh Cellular Plans" MDM command after removing the cellular settings on a previously activated eSIM device. The device's information is no longer active in the carrier's automated systems. You'll need to contact your carrier and give them the device's IMEI and EID numbers so they can re-enable the device in their eSIM servers. Once that's done, they may instruct you to restart the device. Then you should be able to re-activate the device's cellular service.

Troubleshooting

Cell service is not activating after sending the Refresh Cellular Plans command

1. Ensure your carrier had added your device IMEI and EID numbers to their eSIM server.
2. Check for a typo in the eSIM Server URL you sent to the device(s). Ensure it matches the URL provided by your carrier and does not include a trailing "/".
3. Ensure device is turned on/charged.
4. Check that the device is on WiFi or has a tethered data connection so that it can communicate with Apple, Jamf, and your cell carrier.

5. A content filter (e.g., Cisco Umbrella, Lightspeed, etc.) on your network may be blocking access to your carrier's eSIM URL. In this case, you will see an *"Unable to Update Cellular Plan"* error message on the device when you push the Refresh Cellular Plans MDM command. To check, navigate to the carrier's eSIM Server URL in Safari. If you see a message saying that your content filter blocked the connection, contact your network administrator. If your network is allowing traffic to flow to the eSIM server, you will instead see a message stating that the "Connection Is Not Private". This warning is expected and indicates a successful test because eSIM servers use a private certificate trusted only for eSIM activation.



6. Perform the activation in a location where cellular service is available from your carrier.
7. Verify that there aren't any backlogged/pending MDM commands, OS updates, or app installs.

Carrier Switching

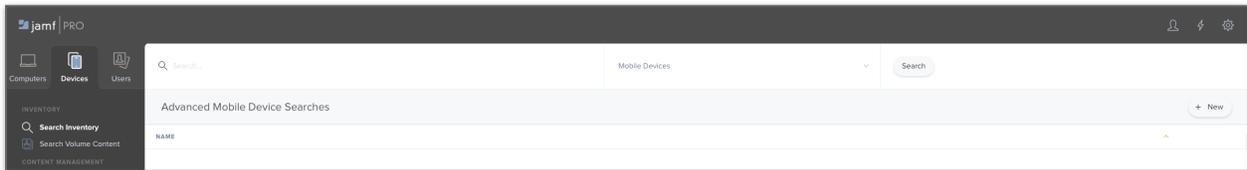
There may come a time when you and your team have a need to switch cellular data carriers. This need can occur with device acquisition, financial considerations, and many more reasons.

The workflow for “switching” is not that different from activation discussed earlier; however, there are some considerations and resources which can make your life easier.

As with your initial deployment, you will need to gather some critical information. The key pieces of data will be the device’s IMEI and EID.

- One option is to collect the data from the exterior of the iPad’s original shipping box. This was discussed in depth on page 2.
- You can also gather the IMEI numbers from the devices themselves. This information is found in Settings > General > About.
- And as a final option, you can provide your serial numbers to your Apple Sales team and have them provide the needed data.

Open your console and proceed to the Devices section. Now you will create a new Advanced Mobile Device Search.



Press the +New Button. Click to Save this search and give it a name.



In this case we will name it the current cellular data carrier. Press Save.



Click the Edit button and select the Criteria for your search. You will need to select the Show Advanced Criteria.



You have a vast array of criteria from which you may base your search. The critical item here is Current Carrier Network.

The screenshot shows the 'Current Cellular Data Carrier' search criteria configuration screen. It features a header with 'Mobile Devices : Advanced Mobile Device Search' and a back arrow. Below the header are tabs for 'Search', 'Criteria', 'Display', and 'Reports'. The main area is a table with columns for 'AND/OR', 'CRITERIA', 'OPERATOR', and 'VALUE'. The 'CRITERIA' column contains 'Current Carrier Network', the 'OPERATOR' column contains 'is', and the 'VALUE' column is an empty text input field. There are 'Delete' and 'Add' buttons at the bottom right.

Press the ... and all of the carriers which are on your inventoried devices will be available, including the carrier iPad. Remember when a device shows a carrier of iPad, it means it does not have an eSIM profile for access to a cellular data network. Press Save.

Now that you have an Advanced Mobile Device Search, it will be listed on the Advanced Search page.

The screenshot shows the 'Advanced Mobile Device Searches' page. It has a search bar at the top left and a 'Mobile Devices' dropdown menu. Below the search bar is a table with a header 'Advanced Mobile Device Searches' and a '+ New' button. The table has a 'NAME' column and one row with the text 'Current Cellular Data Carrier'. At the bottom left, there is a link for 'eSim Needs Activation'.

Now you will be able to click on the saved Advanced Search and select View.



Here you can select the Action button.

The screenshot shows the search results page for 'Current Cellular Data Carrier'. It displays '3 Devices in "Current Cellular Data Carrier"'. There is a 'Filter By' dropdown and a '1-3 of 3' indicator. The table has a 'NAME' column and two rows, both containing the text 'iPad'. Below the table, there is a 'pro-robot.davis' label and a 'Show: 100' dropdown. At the bottom right, there are 'Report' and 'Action' buttons.

Now, select the Send Remote Commands, and press Next.

The screenshot shows a 'Choose an Action' dialog box. On the left, there is a 'Choose Action' section with a 'Complete' radio button. On the right, there is a list of actions with radio buttons: 'Edit the Building and Department', 'Send an Email', 'Send a Notification to Mobile Devices with Jamf Self Service for iOS Installed', 'Delete Mobile Devices', 'Send Remote Commands', 'Cancel Management Commands', and 'Remove restrictions set by Jamf Teacher'. At the bottom right, there are 'Cancel' and 'Next' buttons.

When the new window appears, select Refresh Cellular Plans. Now you will see the eSIM URL. Enter the new carrier's SM-DP+ server address. The cellular data carrier should provide this information.

Remote Commands Remote commands to send to mobile devices

- Update OS Versions on supervised devices
- Clear Passcode
- Update Passcode Lock Grace Period (Shared iPad only)
- Set Storage Quota Size (iPad OS 13.4 or later, Shared iPad only)
- Lock Device
- Update Inventory
- Restart Device (iOS 10.3 or later, or tvOS 10.2 or later, supervised only)
- Wipe Device (for tvOS, requires 10.2 or later)
- Unmanage Institutionally Owned Device
- Set Wallpaper (supervised only)
- Set Diagnostic and Usage Reporting and App Analytics
- Shut Down Device (iOS 10.3 or later, supervised only)
- Set Bluetooth (iOS 11.3 or later, supervised only)
- Set Activation Lock
- Set Personal Hotspot
- Refresh Cellular Plans
- Renew MDM Profile
- Set Time Zone (iOS 14 or later, or tvOS 14 or later, supervised only)

ESIM Server URL The carrier's eSIM server URL to query

[Required]

Cancel Previous Next

Press Next and the command will be sent. Now the devices will add the new eSIM profile and update their subscription. The new carrier will be active and data traffic will travel.

At next inventory update, the device will no longer be in this inventory group. You may choose to make a second saved Advanced Search with the new carrier to monitor the progress.

As with new deployments, it is recommended that you plan your deployment to occur with the carrier recommended window to ensure a smooth migration. Be sure to verify with the new carrier the complete URL for your new SM-DP+ servers.

A suggested task prior to any action is to “test” your device’s ability to connect to the SM-DP+ server from the devices on the current cellular data and Wi-Fi networks. If you are planning a “switch” and only wish to use the cellular data network, be sure to test your device’s ability to connect to the SM-DP+ server on the cellular data network and not Wi-Fi. Again you may experience a warning as outlined in the Troubleshooting Section on page 17. This behavior is to be expected. Should you be unsuccessful in attempting to reach the URL, check with your network team to ensure that nothing is preventing the device from communicating with this server.

Then the process is the same as outlined in Activating eSIMs with Jamf Pro beginning on page 4. A tip here is to leverage the current carrier as your inventory or smart group filter.

The same Bulk Activation Considerations on page 15 and Troubleshooting on page 17 should be followed.

When the new eSIM profile is installed, you will notice there are now 2 Cellular Plans listed in Settings > Cellular Data. This result is expected and is no cause for alarm.

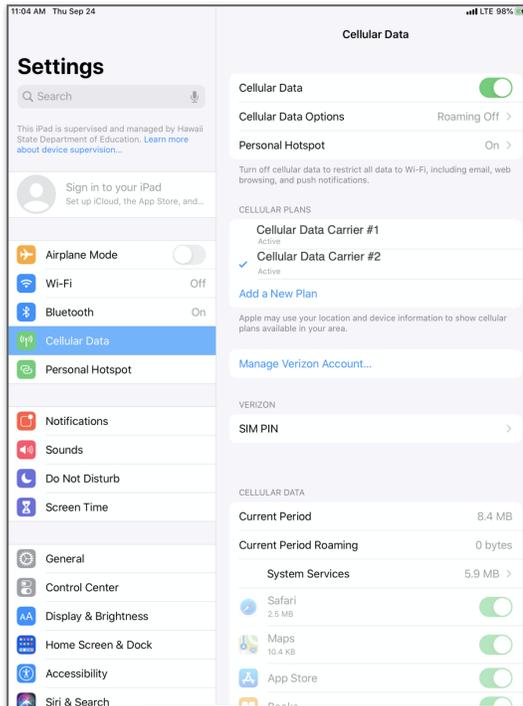
The reason for this behavior is that an eSIM can support multiple profiles with multiple carriers. In fact, some customers may have a need for multiple Cellular Data plans and desire the ability to switch between them. This action is very easy. The user simply presses the desired plan and it becomes active on the device. Remember, an iPad can only have 1 active cellular data network at a time.

At this point, if the user has the ability, they may delete the profile by “swiping” left on the old plan. Please note this action will not terminate the carrier service. The data plan owner must contact the “old” plan carrier and terminate the plan.

Jamf administrators can deploy a Configuration Profile which prevents the end user from being able to “Modify the cellular data plan” as well as other restrictions. In this scenario, the administrator would simply terminate the cellular data plan from the carrier. The user display is merely showing that an eSIM profile for that carrier is installed, even though the service has been terminated.

The last installed eSIM profile is the default; therefore the newest profile in this example is the active profile, unless the end user selects the “old” plan.

As with all deployments, quality testing is the key. Take your devices and turn off Wi-Fi and make sure that information can travel only on the cellular data network. This simple test will save countless Help Desk calls.



Terms Related to eSIM iPad Provisioning

We've tried to avoid using excessive lingo in this document, but the following terms might come up when discussing eSIM iPads.

Cellular Networking

4G / 4G LTE "Fourth Generation/Long Term Evolution" is a mobile communications standard released in 2008 to improve speed and reliability. This is the most common cellular networking standard in use today.

5G "Fifth Generation" is a new mobile communications standard. Carriers and cellular device manufacturers are currently working on implementing 5G. It is anticipated that the significant speed improvement offered will lead to many new applications for mobile technology.

SIM A "Subscriber Identity Module" is a small plastic card that contains a chip to store the international mobile subscriber identity (IMSI) number and its key. This is used to identify and authenticate subscribers when they connect to a carrier network. They are usually specific to a particular carrier so changing service often requires a new SIM card.

eSIM An "embedded SIM" stores the same information as a physical SIM, but the data is written to memory within the device, eliminating the need for a carrier-specific physical SIM card.

eSIM Profile This "profile" is retrieved from a SM-DP+ server. The profile configures the eSIM so that a device may access a cellular network. iPads may have multiple eSIM profiles from different carriers. Keep in mind that the default profile will be the last profile installed on the device. iPads can only utilize one cellular data network at a time.

EID The "Electronic Identifier Document" is a unique number that identifies an eSIM.

IMEI The "International Mobile Equipment Identity" number is used to identify a physical device to cellular networks. The number identifies the hardware and is not tied to any particular carrier or subscriber. The IMEI can be found on an iPad or iPhone in the Settings App > General > About. On an iPhone, you can access the information by simply dialing"*#06#" using the Phone app. The IMEI is one of the values a cellular data carrier needs to provision an eSIM.

SM-DP+ "Subscription Manager - Data Preparation Plus" servers distribute the eSIM profiles needed to utilize a carrier's cellular data network. Data carriers will collect IMEI and EID numbers from subscribers and "provision" an eSIM for each device on their server. When you push an SM-DP+ URL to a device using the Refresh Cellular Plans MDM command, the device will contact the SM-DP+ server to download its eSIM profile. In this document, we have referred to these servers as "**eSIM servers**".

Apple Technologies and Services

Apple Business Manager ("ABM") is accessed via a [web portal](#) and integrates with Jamf Products. It allows IT administrators to assign devices to Jamf for automated enrollment, to purchase apps and content, and to configure managed Apple IDs.

Apple School Manager ("ASM") is similar to Apple Business Manger and adds the ability to integrate with a Student Information System to support the Apple Classroom app. Ref: <https://help.apple.com/deployment/education/>

Apple Configurator 2 is a macOS application used to prepare iOS, iPadOS and tvOS devices for use. Apple Configurator connects to these devices via a USB connection and assists in the deployment of settings, apps, and other data. Apple Configurator is available from the [Apple App Store](#).

Automated Enrollment combines features of an Apple device management program, Apple's OSs, and Jamf to [automatically enroll](#) an organization's devices in management during the Setup Assistant flow on a new device.

Hotspot/Tethering is provided by a cellular device that shares its data connection with nearby devices, or by a network-connected Mac computer. A hotspot will act as an ad hoc wireless network on either Wi-Fi or Bluetooth PAN (Personal Area Network). Tethering allows data connections to be shared with another device via a cable and can be useful in the initial setup of new devices that do not yet have a configured Wi-Fi network.

For an additional resource, review the Apple resource "Deploying iPad with cellular connections." It is available online at <https://support.apple.com/guide/deployment-education/deploy-ipad-with-cellular-connections-apd36c581d6d/web>.

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Put this workflow in place and empower your students
and educators with the best Apple has to offer.

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