



Recommendations and Practices for Content Caching



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Preface

The purpose of this document is to supply guidance and solutions around content caching to improve the user experience. This includes coaching and mentoring the technical staff on core concepts, configuration, content cache deployment options, and verification and troubleshooting steps.

What is Content Caching?

Content caching speeds up the downloading of software distributed by Apple and of data in users' iCloud accounts by caching content that local Mac computers, iOS and iPadOS devices, and tvOS devices have already downloaded. When you turn on content caching on your Mac, content caching stores local copies of items so downloads are faster for connected clients.

Content types supported by the content caching service*:

macOS

- macOS updates and Internet Recovery images (macOS 10.13.5 or later)
- System firmware and recovery updates
- macOS installers downloaded from the App Store or softwareupdate --fetch-full installer
- Apps and app updates from the Mac App Store
- GarageBand downloadable content
- iCloud data caching (photos and documents)
- Apple Books content
- Xcode downloadable components such as simulators (Xcode 10.2 or later)
- Rosetta
- Aerial screen savers and wallpaper
- Apple intelligence models

iOS, 7 and later, iPadOS, tvOS, visionOS, and Apple TV

- iOS and iPadOSOS updates (over the air)
- Apple TV updates (over the air) Aerial screen savers on Apple TV
- Apple TV screensavers (tvOS 12.2 or later)
- iOS and iPadOS apps, Apple TV apps, and app updates.
- On-demand resources support for iOS 10 and later, iPadOS, and tvOS 10 and later.
- iCloud data caching (photos and documents) for iOS 9 and later and iPadOS
- iTunes U course materials from the iOS App Store and Apple Books, as well as uploaded instructor materials such as audio, video, iWork, and iBooks Author files
- Apple Books content
- Certain mobile assets, such as Siri high quality voices, language dictionaries, and more
- Schoolwork content, including file attachments and multimedia files added to assignments
- Apple intelligence models

watchOS

- watchOS apps and app updates
- iCloud data caching

* This list is subject to change. The following Apple support article always contains the most up-to-date list:

https://support.apple.com/en-us/102860

Hardware Recommendations

- Mac computer with Apple Silicon and a solid-state drive (SSD)
- Gigabit Ethernet (10Gb Ethernet strongly recommended if capable) For more information go to: <u>https://support.apple.com/en-us/HT208405</u>
- 16 GB RAM or more
- Adequate storage for cache type (Shared Content vs iCloud Content)
- SSD strongly recommended



How does content caching work?

After you turn on content caching on a Mac, it keeps a copy of all supported content that local networked devices (called clients) download devices (called clients) on the local network can download.

For example, when the first client on your network downloads an App Store app, the content cache keeps a copy of the app. When the next client on the network connects to the App Store to download the app, the client downloads the app from the content cache rather than from the App Store.

Because your clients' connection to the local network is normally much faster than the connection to the internet, the second client (and all subsequent clients) download apps much faster. You also preserve internet bandwidth.

Service Registration & Discovery

When you first turn on the content caching service on your Mac, and every 55 minutes after that, the content cache service sends a registration request to Apple at icdn-registration.apple.com. The registration request includes the content caching service public IP address, private IP address, and the subnet ranges that it is open to serving. Note that TCP ports 80 and 443 need to be opened on your network firewall and/or filter for registration to succeed.

After the content cache has successfully registered, when a client requests a cacheable asset, the client sends a request to Apple for the asset. The request includes the client's public IP address and private IP address. If Apple finds a match for a content caching service that's registered at the same public IP address, Apple returns a list of potentially available content caches to that client. The client then sends a request for an asset directly to the content cache. If there's no reply from a local content cache, the client automatically downloads the asset directly from Apple.

Best Practices

- Allow all Apple push notifications
- Don't use manual proxy settings
- Don't proxy client requests to content caches
- Bypass proxy authentication for content caches
- Specify a TCP port for caching
- Manage inter-site caching traffic
- Block rogue cache registration



Section 1: Prepare for Content Caching

Content caching is primarily affected by two main factors: connectivity and hardware configurations. In order to get the best performance out of your content caching setup, Apple recommends that you take precise steps and gather the appropriate information.

Collect Network Information:

- A list of WAN IP(s) for initial caching service sites.
- A list of LAN IP ranges we will configure each content caching Mac.
- A list of internal static IP(s) and DNS/router information for initial caching Mac computers. - If a network topology diagram or visual overview is available, it should be collected.
- Confirmation from your network administrator that the identified caching service IP hosts will be exempt from SSL inspection or proxy rules for caching.
 - This includes network sercurity agents or other tools that might interfere with caching per resources below:
- Identify the process/contact person to get a DNS record published/updated in your external DNS when using multiple WAN IP(s) at any one site/internet route.
 - Confirm if you use BIND or Windows DNS TXT record format.

Test the environment:

- Possess in-hand at least one (1) test iOS or iPadOS and one (1) Mac computer.
 - Use Mac Evaluation Utility (MEU) on a content cache and inspect the report.
 - ♦ MEU is available through the AppleSeed for IT program in the resources below. You will need a Managed Apple Account to log in.
- Run the following command using the terminal on the content cache and inspect the output
 - dig txt _applcache._tcp.yourdomain.com
 - ◊ Replace yourdomain.com with your domain and verify all WAN IP(s) for each location are returned.
- Run the following terminal command on any Mac client on your internal network and inspect the output:
 - AssetCacheLocatorUtil
- If enrolled in your MDM already, verify someone will be available to adjust/change/remove settings or policies in the MDM for the content cache.

Best Practices

- Allow all Apple push notifications.
- Don't use manual proxy settings.
- Don't use a proxy to accept client requests and pass them to content caches.
- Bypass proxy authentication for content caches.
- Specify a TCP port for caching.
- Manage intersite caching traffic.
- Block rogue cache registration by enforcing the MDM restriction "Prevent content caching" on all Mac computers.



Additional Information for Review:

- Apple Mac Evaluation Utility via AppleSeed for IT Resources <u>https://beta.apple.com/for-it</u>
- Use Apple products on enterprise networks <u>https://support.apple.com/en-us/101555</u>
- Intro and planning for setup of content caching
- https://support.apple.com/guide/deployment/intro-to-content-caching-depde72e125f/web
- <u>https://support.apple.com/guide/deployment/set-up-content-caching-depe9b5c1aab/web</u>
 <u>https://support.apple.com/guide/mac-help/set-up-content-caching-on-mac-mchl3b6c3720/</u>
- <u>mac</u> - <u>https://support.apple.com/guide/deployment/advanced-content-caching-settings-</u> depc8f669b20/web
- https://support.apple.com/guide/deployment/use-dns-txt-records-depe6ded0780/web
- Content types supported by content caching in macOS, iOS, iPadOS, tvOS, and visionOS <u>https://support.apple.com/en-us/102860</u>
- Apple Training Content Caching <u>https://it-training.apple.com/tutorials/deployment/dm070</u>



Section 2: Mac Evaluation Utility

Apple recommends using Mac Evaluation Utility (MEU) before setting up the content caching service. MEU will evaluate the Mac and its network infrastructure to ensure that content caching has access to necessary Apple services for proper functionality. You obtain MEU from AppleSeed for IT.

- 1. Open a web browser, and navigate to <u>https://beta.apple.com/for-it</u>
- 2. In the upper right corner, click sign-in, then sign in with a Managed Apple Account. By default, all roles in Apple Business Manager and Apple School Manager are allowed to participate in AppleSeed for IT.
- 3. Once signed in, click Resources.

			beta.apple.com	Ċ		٩	≙ +	- 0
			🇯 Apple Beta					
🗯 Beta	Programs	Guide	Enroll Your Devices	Provide Feedback	Sign Out			
AppleSeed 1	or IT				Overview Resources			
			Parallel Terrestantia Terre	4	I			
		App	leSeed for IT					
AppleSe release so and miss	eed for IT provides ftware in your uniq ion critical apps to	T profession ue work envii make sure yo	als and technology managers an onments. Test against your IT inf ou are ready to support employed latest Apple software.	opportunity to e trastructure, corp es, staff, and stud	valuate pre- orate network, ents with the			

4. Scroll down to download Mac Evaluation Utility. Click Download (④).

$\bullet \bullet \bullet = \Box \bullet = < \rightarrow$				beta.apple.com	5		()
				🇯 Apple Beta			
	🗯 Beta	Programs	Guide	Enroll Your Devices	Provide Feedback	Sign Out	
		watch	IOS 11.5 RC	;			
		Build 22T572	Releas May 6,	ed , 2025			
		watchOS 11	1.5 RC (22T572) Rele	ease Notes 🕢			
	IC	Schoo	olwork 3.1 B	Beta 1			
	12	Released March 17, 2025	5				
		Schoolworl	k 3.1 Release Notes (•			
		Schoolwork	k 3.1 Test Plans 🕹				
		Schoolworl	k 3.1 Beta 1 🕹				
		Mac E	valuation L	Jtility			
		Version 4.6.6	Releas April 2	ed 2, 2025			
		Mac Evalua	ation Utility 4.6.6 Not	tes 🕘			
		Mac Evalua	ation Utility 4.6.6 🕹]			
	🔹 👌 Programs 👌	AppleSeed for IT	Resources				
	If you no longer want t	to participate, you can lea	ave AppleSeed for IT.				
	Copyright © 2025 Apr	ple Inc. All rights reserved	d. FAQ Terms Pri	vacy Policy Unenroll	English	٥	



5. Once you have downloaded MEU, open the installer package, then open Mac Evaluation Utility from the Applications folder.



6. MEU will open and describe its functionality. Click Get Started.

•	Content Cache 1 432 Tests	Mac Evaluation Utility		
Q Search				
Reports			Number of Tests	Enabled
Content Cache 1			6	v
15.5 Draft			12	\checkmark
			228	\checkmark
	Annual and a second sec	a contraction	103	~
	Welcome to Mac Evalu	ation Utility	1	✓
	Ensure your Mac is ready fo	r work.	7	\checkmark
			56	\checkmark
			9	~
	Verify Network Access		7	\checkmark
	Ensure access to necessary Apple service	ces.	2	✓
	Align to Best Practices Configure to management and security	best practices.	1	\checkmark
	Analyze the Report Review and export the results to collabo	rate with your team.		
@ New Ender	Get Started			

7. Leave the defaults selected. Click Play (▶) to run your first report.

•••	Þ	Content Cache 1 432 Tests	Mac Evaluation Utility		
Q Search			Tests		
Reports	Click the Play button to r	un your first report		Number of Tests	Enabled
Content Cache 1	>0	omputer Information		6	<
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Drait	> A	pple Network Services		228	 ✓
	> H	TTPS Interception		103	<
	> 0	ontent Caching		1	<
	> B	onjour Services		7	<
	> M	ac Management		56	<
	> Id	entity Management		9	Image: A start of the start
	> A	pplication Information		7	<
	> Ki	ernel Extensions		2	<
	> s	Extensions		1	
New Folder					



8. Once the report is complete, you will see information on the 432 tests that have run.

•••	Content Cache 1 432 Tests		Report Complete				
Q Search		Overview Results					
Reports Content Cache 1 15.5 Solution Now	Mac min	S Sequoia 15.5 (24F74) hi (M1, 2020)	Private Public 10.01.29 50.249.199.89	Mac Evaluation Utility Version 4.6.6 (MEU4F7)			
	Computer Information These tests return basic hardware and operating system information.						
	1 Computer Name	1	Conura Epoloua	Touch ID Socurity Status			
	a macOS Build Numb	er macOS Ver	sion Number				
	Network Information These tests summarize the network configuration of the Mac computer.						
① New Folder	1		3	5			

9. Scroll down in the report to Apple Network Services, then verify that Content Caching has a green checkmark (♥) next to it, indicating that access to Apple Network Services is functional.

•••	Content Cache 1 432 Tests	Report Complete	
Q Search		Overview Results	
Reports Content Cache 1 55 Content Cache 1 Now	macOS Sequoia Version 15.5 (24F74) Mac mini (M1, 2020)	IP Addresses Private Public 10.0.1.29 50.249.199.89	Mac Evaluation Utility Version 4.6.6 (MEU4F7)
	Apple Network Services These tests verify reachability of key service certificate validation, and software update se	s required to use macOS. These services i ervices.	nclude Apple Push Notification service (APNs),
	ApplePushService Daemon	Push No	tifications
	•	0	
	Device Setup	Device N	fanagement
	Ø	0	
	Apple Business Manager and Apple School	Manager Apple Bu	isiness Essentials Device Management
	0	0	
	Classroom and Schoolwork	Software	Updates
	•	0	
	Apps and Additional Content	Carrier L	Ipdates
	0	0	
	Content Caching	Beta Upo	lates
	0	Ø	
	Apple Diagnostics	Certifica	te Validation
	0	0	
	Apple Account	iCloud	
New Folder			

NOTE: Although the Content Caching shows up in the MEU report with a green check, It's important to know that Cloud proxy agents like Zscaler, Cisco Umbrella, and GlobalProtect often relay traffic through shared WAN IPs, masking the actual source. For Apple content caching to work, cache lookup requests must come from the true WAN IP the cache is registered to. These requests should be exempt from proxy routing, and proxy agents should never be installed on the caching Mac.



10.Scroll down further to HTTPS Interception, then verify that Content Caching has a green checkmark (♥) next to it, which indicates that HTTPS traffic isn't being inspected by a proxy server.

Oversite Desired Contraction 1 Now C	•••	Content Cache 1 432 Tests	Report Complete	
Personal Subject Paradom SLS 02 (2474)	Q Search		Overview Results	
ITTPS Interception These tests verify that HTTPS traffic isn't being inspected by a proxy serve. becessary macOS services may reject any SSL or TLS Image: Strip Service Setup Device Management Image: Apple Business Manager and Apple School Manager Image: Apple Business Essentials Device Management Image: Apple Business Sesentials Device Management Image: Apple Business Manager and Apple School Manager Image: Apple Business Manager and Apple School Manager Image: Apple Business Sesentials Device Management Image: Apple Business Manager and Apple School Manager Image: Apple Apple Business Manager Image: Apple Appl	Reports Content Cache 1 15.5 Content Cache 1 Now	MacOS Sequoia Version 15.5 (24F74) Mac mini (M1, 2020)	IP Addresses Private Public 10.0.129 50.249.199.89	Mac Evaluation Utility Version 4.6.6 (MEU4F7)
Device Stup Device Management Image: Apple Business Manager and Apple School Manager Image: Apple Business Essentials Device Management Image: Apple Business Manager and Apple School Manager Image: Apple Business Essentials Device Management Image: Classroom and Schoolwork Image: Software Updates Image: Classroom and Schoolwork Image: Software Updates Image: Classroom and Additional Content Image: Classroom and Additional Content Image: Content Caching Image: Software Updates Image: Content Caching I		HTTPS Interception These tests verify that HTTPS traffic isn't b connection inspected by a proxy.	eing inspected by a proxy server. Necessary m	acOS services may reject any SSL or TLS
Apple Business Manager and Apple School Manager Apple Business Essentials Device Management Classroom and Schoolwork. Classroom and Schoolwork. Software Updates Carrier Updates Carrier Updates Content Caching Content Ca		Device Setup	Device Man	igement
Apple Business Manager and Apple School Manager Apple Business Essentials Device Management Image: Classroom and Schoolwork Image: Classroom and Schoolwork Image: Classroom and Additional Content Image: Clarrier Updates Image: Classroom and Additional Content Image: Clarrier Updates Image: Content Caching Image: Content Caching Image: Content		0	0	
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Classroom and Schoolwork Software Updates Apps and Additional Content Carrier Updates Content Caching Beta Updates Content Caching Content		0	0	
Image: Apps and Additional Content Image: Carrier Updates Image: Content Caching Image: Carrier Updates Image: Carrier Updates Image: Carrier Updates Image: C		Classroom and Schoolwork	Software Up	dates
Apps and Additional Content Carrier Updates Content Caching Seta Updates Content Caching Domain Name System Resolution Apple Diagnostics Domain Name System Resolution Certificate Validation Apple Account Certificate Validation Apple Intelligence, Siri, and Search		0	0	
Content Caching Beta Updates Content Caching Domain Name System Resolution Apple Diagnostics Domain Name System Resolution Certificate Validation Apple Account Certificate Validation Apple Account Cicloud Apple Intelligence, Siri, and Search		Apps and Additional Content	Carrier Upda	ites
Content Caching Beta Updates Image: Caching Image: Caching		0	0	
Apple Diagnostics Onmain Name System Resolution Certificate Validation Image: Certificate Validation Image: Certificate Validation Image: Certificate Validaticate Validaticate Image: Certif		Content Caching	Beta Update	s
Certificate Validation Certificate Validation Apple Account		Apple Diagnostics	✓ Domain Nan	e System Resolution
iCloud Apple Intelligence, Siri, and Search		Certificate Validation	 ✓ Apple Account 	nt
(+) New Folder	(+) New Folder	✔	✓ Apple Intelli	gence, Siri, and Search

11. You may export the report by choosing File > Export Report.



Section 3: Content Caching Configuration - Configuration for Simple Networks

In the context of content caching, a simple network can be defined as a network that uses a single WAN IP address. Peers can be used in a simple network without additional configuration.

You can manually configure content caching by accessing the Content Caching settings found under System Settings > General > Sharing on macOS. However, a mobile device management (MDM) solution gives you the ability to use configuration profiles to configure and maintain content caching. In addition, there are settings that are not configurable in the user interface (UI) of Content Caching settings, such as the cache location and TCP port. Configuration Profiles allow you to be more efficient in configuring content caches, and to scale your solution. This guide uses Jamf Pro as a reference MDM solution.

General Settings for content caching

In a MDM that supports content caching, you create a configuration profile. In this section you learn about the configurable settings in the General tab of the Content Caching payload.

1. Automatically Activate Content Caching - This option both starts the content caching service and removes the ability to disable the service in Sharing preferencessettings on the computer running the content caching service. It's recommended that you select this option.

NOTE: Restart client devices ensures they immediately detect the content cache. Otherwise, it may take some time for them to recognize the presence of a local cache.





- 2. Cached Content Type(s) This setting impacts your storage needs on the Mac providing content caching.
 - All Content Store software updates and apps downloaded from Apple, and iCloud content on this Mac.
 - Only Shared Content Store only software updates and apps downloaded from Apple on this Mac; do not store iCloud content.
 - Only iCloud Content Store only iCloud content, such as photos and documents, on this Mac; do not store software updates and apps

NOTE: The All Content and the Only iCloud Content options will likely require significantly more storage space, depending on how many users with iCloud data are on your network, as it will store each user's iCloud data. All iCloud data is stored encrypted.

Cached Content Type(S) Shared content includes app	s and software updates. iCloud content includes photos and documents
✓ All Content Only Shared Content Only iCloud Content	

3. Maximum Cache Size - Maximum number (in bytes) that will be used to store content caching data. Setting to zero (0) means unlimited disk space.

ſ	Maximum Cache Size	1
L	Maximum number of bytes that will be used for content cache. O means unlimited disk space	
	0	
l		ļ

4. Cache Location - By default, content cache data is stored in /Library/Application Support/Apple/ AssetCache/Data. If you use external storage, use this field to enter the absolute path to that location.

Cache Location	
Changing this setting does not automatically move cached content from the old to the new location. The path should end with /Library/Application Support/Apple/AssetCache/Data	

5. **Port** - This is a TCP port that is used for content caching requests. By default, this value is set to zero (**0**), which results in the service automatically selecting a random port. It is recommended to set a specific port.

Port	
TCP port on which the content caching service accepts requests for uploads or downloads. Set to 0 to pick a random port	
0	

6. Allow Internet Connection Sharing/Automatically Activate Internet Connection Sharing (macOS 10.15.4 or later) - These options allow you to share the internet connection of your Mac with iOS and iPadOS devices connected over USB, even if their Wi-Fi and cellular connections are disabled. This can be particularly useful for iOS and iPadOS devices to enroll in MDM, "side-load" apps, and receive configuration profiles like corporate Wi-Fi, without the need for a provisioning network. You can also take advantage of hardware, like sync carts, to make the onboarding process faster for your mobile devices.





7. Log Client Details - Log the IP address and port number of the clients that request content. You can use the logged information for troubleshooting, for example, to verify that client devices are receiving content from the expected content caching Mac computer.



8. Remove content from the cache when the system needs disk space for other apps - For content caching to be most effective, turn this setting off so cache data is not deleted unnecessarily.

~	Remove content from the cache when the system needs disk space for other apps

9. Display Status Alerts - Turn this setting on for user interface alerts related to the content caching service. The user of the Mac that's running the content caching service will receive notifications if the user is logged in.



10. Prevent the computer from sleeping when caching is on - The Mac that's running the content caching service should not go to sleep. Select this checkbox to keep the computer awake. Alternatively, you can manually adjust Energy Saver settings. If you are using this computer as a content cache only, it's recommended to configure this setting in the your configuration profile payload.





Section 4: Content Caching Configuration - Configuration for Advanced Networks

When you configure content caching beyond the basic settings, or when your outbound traffic spans more than one public IP address, you need to configure additional settings to ensure that the content cache is configured correctly. You also have the ability to tune your content cache depending on the topology of your network. When you configure advanced settings and multiple content caches with MDM, prepare to use a unique configuration payload for each content cache.

Clients

Use the Clients pane in content caching advanced options to specify the devices that can access the content cache.

1. There are two menus to configure: Cache Content For and My Local Networks.

devices using the same local networks	•
·	
My Local Networks:	
My Local Networks:	
My Local Networks:	

2. The first menu is Cache Content For:.



- devices using the same local networks This computer caches content for devices that use the same network segment as this computer.
- devices using the same public IP address This computer caches content for devices that use the same public IP address as this computer.
- devices using the same local networks This computer caches content for devices that use the same network segment as this computer.
- devices using custom local networks This computer caches content for devices that use the specified network segment(s) Listen Ranges (specified network segment(s)) as this computer.
- devices using custom local networks with fallback This computer caches content for devices that use Listen Ranges (the specified network segment(s)), and for devices that use the same public IP address as this computer when their preferred content cache is unavailable. This combines the first second and third options in this MDM.



 If you configure the Cache Content For menu, also configure the My Local Networks menu. Contact your network administrator if you are unsure of the configuration that is necessary. Matching your network topology is critical for clients to be able to access your content cache.

devices using the same local pa	tworke
My Local Networks:	
My Local Networks:	

- use one public IP address Select this option when your devices and your content cache share one public IP address.
- use custom public IP addresses Select this option to use a specific public IP address, or if you use multiple public IP addresses. Note: If you select this option, additional DNS configuration is required. Enter the multiple WAN IP addresses or range of IP addresses.

If your network uses multiple public IP addresses to connect to the internet, the content cache might register using a different address than a client uses for discovery. In this case, you need to provide both the content cache and the clients with a list of those addresses. These lists are used to cross- match registration and discovery requests involving multiple public IP addresses.

4. You can easily obtain the TXT record or command to add to your DNS by navigating to System Settings > General > Sharing > Content Caching on a Mac computer. Click info (①).

Content Caching	
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- 5. Hold down the option key, select Advanced Options, then select Clients.
- 6. Choose use custom public IP addresses
- 7. Configure the range
- 8. Choose DNS Configuration.



DNS Configuration - This button is available when you specify custom public IP addresses. After you click this button, select BIND or Windows, depending on the type of your DNS Server, and use the information that's displayed to create a TXT record on that server. You may need to send the information to another administrator with the ability to create the DNS record.



9. The record is a comma separated range of IP addresses. It can be a single IP address or a range of addresses in CIDR notation.

The client searches for this known DNS TXT Record prior to making a request to Apple. The contents of this record are then forwarded by the client to Apple. Apple is made aware that these multiple addresses are actually from the same network, allowing a match to take place and to return the appropriate list of available content cache(s).

DNS Type:	O BIND Windows
Command:	dnscmd . /RecordAdd <zonename>_aaplcachetcp 259200 TXT *prs=69.: -69. '</zonename>
	Replace <zonename> with the network's DNS zone and run the command on the Windows DNS server.</zonename>

For more information on DNS TXT records, go to:

https://support.apple.com/guide/deployment/use-dns-txt-records-depe6ded0780/web

Peers

Peers are other content caches on the same network that share content with each other. A benefit to peering is to reduce bandwidth and strain on the network. In a simple network with a single subnet, content caching peers can automatically discover each other after registering the service with Apple. This is similar to the client discovery process. With advanced or complex networks, it may be necessary to adjust advanced settings so peers do not attempt to communicate across multiple subnets or different buildings.

There are three possible settings for configuring content caching peers:

- content caches using the same local networks (default) Peering will occur with other content caches on the same local network.
- content caches using the same public IP address If other content caches have the same public IP, they will act as peers.
- content caches using custom local networks Selecting this option allows manual entry of network ranges for two types of communication:

- "Peer Listen Ranges" This is a range to accept incoming connections from peers that request cached content.

"- "Peer Filter Ranges" This is a range of content caches to request cached content from.

Share Content With:			
content caches using cu	stom local networks 🔹		
Peer Listen Ranges IP address ranges of the pee	ers to accept connections from		
START IP ADDRESS	END IP ADDRESS		
10.0.21.2	10.0.21.254	Edit	Delete
172.16.24.2	172.16.28.254	Edit	Delete
			+ Add
Peer Filter Ranges IP address ranges of the pee	ers to query content from		
START IP ADDRESS	END IP ADDRESS		
10.0.21.2	10.0.21.254	Edit	Delete
			+ Add



Parents

Use Parents to arrange your content caches in a hierarchy. When you add the IP address of other content caches here, they will be parents to the content cache that receives this configuration profile. Parent content caches download any requests from Apple, and serve them to children content caches, saving bandwidth and potentially allowing children content caches to serve more clients.

It might be appropriate to configure a parent to serve only child content caches (instead of serving macOS, iOS, iPadOS, and tvOS clients). If you define more than one parent, select the appropriate Parent policy.

- Round robin Rotate through the parents in order. This is also useful for load balancing.
- First available Always use the first parent in the list that is available. This is useful for designating permanent primary, secondary, and subsequent parents.
- Random Choose a parent at random. This is useful for load balancing.
- Sticky available Always uses the first parent in the list exclusively, and continues to use that parent until it becomes unavailable. When it becomes unavailable, move to the next parent. This is useful for designating floating primary, secondary, and subsequent parents.
- Hash Hash the path part of the requested URL so that the same parent is always used for the same URL. This is useful for maximizing the size of the combined caches of the parents.

Parents IP Addresses		
IP ADDRESS		
10.0.21.24	Edit	Delete
		+ Add
Parent Selection Policy		
✓ Round robin		
First available		
Random		
Sticky available		
Hash		

Configuration plist keys and values

On Mac, the content caching plist is located at /Library/Preferences/com.apple.AssetCache.plist. You modify this file using the defaults command, or by using the Custom Settings payload in MDM.

Refer to "Configure advanced content caching settings on MacAdvanced content caching settings on Mac," in the macOS User Apple Platform Deployment Guide for a list of the keys and values that can be set on a content cache.

https://support.apple.com/guide/deployment/advanced-content-caching-settings-depc8f669b20/ web



Section 5: Verification & Troubleshooting

Overview

It is critical to verify that each Mac that provides content caching is providing the service as expected. This includes caching content, either from Apple, a peer, or a parent, and sending that content to clients consistently.

Logging & Metrics

Use the following tools to analyze logging and metrics related to content caching.

Activity Monitor

On the content cache, you use Activity Monitor to view data served for up to 30 days. Depending on how many other peers and parents exist, additional information may be displayed.

One value that is often overlooked is Cache pressure. If this value rises above 50%, it is likely that the cache needs more storage space. Either a larger volume or additional content caches should be considered. For more details, refer to "View cache activity in Activity Monitor on Mac," in the Activity Monitor User Guide and "Get cache pressure data" in the Apple Platform Deployment guide at the links below.

https://support.apple.com/guide/activity-monitor/view-cache-activity-actmcdbbd395/mac

https://support.apple.com/guide/deployment/content-caching-metrics-dep0504346e1/1/web/1.0

Activity Monitor My Processes	i 💮 🗸	CPU Memory	Energy D	Disk Network	Cache Q
Name		Last Hour	Last 24 Hours	Last 7 Days $$	Last 30 Days
Data Served		0 bytes	43 KB	593.5 MB	593.5 MB
Data Served To Clients		0 bytes	43 KB	591.0 MB	591.0 MB
Data Served From Origin		0 bytes	0 bytes	411.8 MB	411.8 MB
Data Served From Peers		0 bytes	0 bytes	169.5 MB	169.5 MB
Data Served From Cache		0 bytes	43 KB	12.2 MB	12.2 MB
Data Served To Peers		0 bytes	0 bytes	2.5 MB	2.5 MB
Data Dropped		0 bytes	0 bytes	0 bytes	0 bytes
Data Served From Parents		0 bytes	0 bytes	0 bytes	0 bytes
Data Served To Children		0 bytes	0 bytes	0 bytes	0 bytes
Data Uploaded		0 bytes	0 bytes	0 bytes	0 bytes
Maximum Cache Pressure		0%	0%	0%	0%
				201/50	
CACHE PRESSURE		LASTHOUR C	DATA SE	RVED	
	Total data	served: 0 bytes			
	Served fro	om cache: 0 bytes			
、					

Another set of data to pay close attention to is that the Data Served From Cache is close to the Data Served totals. Values rising in this column indicate Content Caching is working, and data is being served locally as opposed to over the internet. If not, this value would remain at 0 or static.

Terminal

The log command in Terminal can display detailed information about the content caching service. Content caching logs to the subsystem com.apple.AssetCache. Open Terminal, enter the following command, then press Return:

log show --predicate `subsystem == ``com.apple.AssetCache"'

Similar to Activity Monitor, the output from that log command reveals information about data served to clients, as well as the source of the data served (ie. From Origin, peers, parents).



Console

You can use Console to investigate logs. Open Console, then in the Search field, enter:

s:com.apple.AssetCache

Choose Start streaming, then press Return. This will narrow down the amount of data being displayed to focus only on content caching.

You can turn on verbose logging by editing the plist for content caching. You can perform this with MDM using a Custom Settings configuration profile payload or manually using the defaults command. For example, use the following command:

NOTE: The command below includes line breaks. You need to enter the entire command before you press Return.

sudo -u _assetcache defaults write /Library/Preferences/com.apple.AssetCache.plist verbose yes

https://support.apple.com/guide/deployment/advanced-content-caching-settings-depc8f669b20/ web

Devices I Ali Mee Content Cache 1 Reports Crash Reports	Stages Errors and Faults Time 12:05:33.002043-0000 12:05:36.591979-0500 12:05:36.591979-0500	Process AssetCaci	Mess #Typ	Activities sage iswnu/zhog	Clear	query	Info	Share				Sav
Content Cache 1 Type Reports Crash Reports	Time 12:05:36.591979-0500 12:05:36.591979-0500	AssetCaci AssetCaci	Mess #Tyj	sage 15wnu7zHoQ	Cache							
Reports	12:05:33.002043-0500	AssetCaci	#193	LSWNU/ZHOW	ASSEL							
Crash Reports	12:05:36.591979-0500	AssetCac				/itunes	-asset	s/Purpie	211/04/03/	48//1/	0348/180-0131-	-2014-7
	12.05.36 592308-0500	AssetCacl	#00l	UP7PFWwcDs	Cache	(AiNuD	TOM 10	.0.1.2:4	9210 for a	iNuDOA	AINUDQABIyIYP4	+8CW1KQ
😢 Spin Reports	12:05:36.862498-0500	AssetCacl	#b91	1spuEAc4Cs	Cache	query 1	rom 10	.0.1.2:4	9210 for a	sset /	16YAyOkBlyIc0	ekCW28m
E Log Reports	12:05:36.862888-0500	AssetCacl	#b91	1spuEAc4Cs	Asset	/16YAy0	kBlyIc	∂ekCW28m	[icloud:1	6YAyOk	BlyIc0ekCW28m]: not
Ӿ Diagnostic Re												
Mac Analytics Data												
Subsystem:	Category: Details											

AssetCacheLocatorUtil

The steps above focus on investigating and troubleshooting the content caching service from a computer providing caching. However, a handy utility within Terminal is AssetCacheLocatorUtil. You can use this on Mac to detect any content caches, either on the local computer or on the network.

The output of the command includes details about the type of content being cached and information such as listen ranges and warnings about potential issues. In more complex networks, these warnings could relate to public IPs differing between content caches and clients, which would prevent the client from using the content cache. Lastly, these warnings can report information on the health status of a content cache. For example, if there have been multiple communication failures with a particular content cache, it may be deemed as unhealthy

	adam.hcs — -zsh — 127×32
Last login: Fri May 30 12:10:36 on console	
adam.hcs@ł Q6LR ~ % AssetCacheLocatorU	til
2025-05-30 12:10:52.318 AssetCacheLocatorUtil[1232	:10034] AssetCacheLocatorUtil version 135.1, framework version 135.1
2025-05-30 12:10:52.319 AssetCacheLocatorUtil[1232	:10034] Determining public IP address
2025-05-30 12:10:52.826 AssetCacheLocatorUtil[1232	:10034] This computer's public IP address is 5 9.
2025-05-30 12:10:52.826 AssetCacheLocatorUtil[1232:	:10034] Information for system services:
2025-05-30 12:10:52.826 AssetCacheLocatorUtil[1232	:10034] Checking whether there might be content caches available
2025-05-30 12:10:52.829 AssetCacheLocatorUtil[1232	:10034] There might be content caches available.
2025-05-30 12:10:52.829 AssetCacheLocatorUtil[1232	:10034] Finding saved content caches supporting personal caching
2025-05-30 12:10:52.830 AssetCacheLocatorUtil[1232	:10034] There is no saved result. (This is not an error.)
2025-05-30 12:10:52.831 AssetCacheLocatorUtil[1232	:10034] Finding saved content caches supporting personal caching and import
2025-05-30 12:10:52.832 AssetCacheLocatorUtil[1232	:10034] There is no saved result. (This is not an error.)
2025-05-30 12:10:52.832 AssetCacheLocatorUtil[1232:	:10034] Finding saved content caches supporting shared caching
2025-05-30 12:10:52.832 AssetCacheLocatorUtil[1232:	:10034] There is no saved result. (This is not an error.)
2025-05-30 12:10:52.832 AssetCacheLocatorUtil[1232:	:10034] Determining saved configured public IP address ranges
2025-05-30 12:10:52.833 AssetCacheLocatorUtil[1232:	:10034] No public IP address ranges are configured.
2025-05-30 12:10:52.833 AssetCacheLocatorUtil[1232	:10034] Determining saved favored server ranges
2025-05-30 12:10:52.833 AssetCacheLocatorUtil[1232:	:10034] No favored server ranges are configured.
2025-05-30 12:10:52.833 AssetCacheLocatorUtil[1232	:10034] Finding refreshed content caches supporting personal caching
2025-05-30 12:10:53.558 AssetCacheLocatorUtil[1232	:10034] Found 2 content caches
2025-05-30 12:10:53.558 AssetCacheLocatorUtil[1232	:10034] Finding refreshed content caches supporting personal caching and impo
rt	
2025-05-30 12:10:53.559 AssetCacheLocatorUtil[1232	:10034] Found 2 content caches
2025-05-30 12:10:53.559 AssetCacheLocatorUtil[1232	:10034] Finding refreshed content caches supporting shared caching
2025-05-30 12:10:53.560 AssetCacheLocatorUtil[1232	:10034] Found 2 content caches
2025-05-30 12:10:53.560 AssetCacheLocatorUtil[1232	:10034] 10.0.1.2:49210, rank 1, not favored, healthy, guid D072EC79-904A-47C9
-8868-817F738B3363, valid until 2025-05-30 13:10:53	3; supports personal caching: yes, and import: yes, shared caching: yes
2025-05-30 12:10:53.560 AssetCacheLocatorUtil[1232	:10034] 10.0.1.29:49259, rank 1, not favored, healthy, guid 36CA9C8D-71BB-4C6
D-8D55-C7A87EDF1855, valid until 2025-05-30 13:10:5	53; supports personal caching: yes, and import: yes, shared caching: yes
2025-05-30 12:10:53.560 AssetCacheLocatorUtil[1232	:10034] Determining refreshed configured public IP address ranges
2025-05-30 12:10:53.560 AssetCacheLocatorUtil[1232	:10034] No public IP address ranges are configured.



AssetCacheManagerUtil

From the Mac providing content caching, use AssetCacheManagerUtil to display and manage settings. This can assist in situations where you may want to use SSH or run remote commands to activate the service, flush the cache, or view details of the content cache settings. To learn more visit:

https://support.apple.com/guide/deployment/advanced-content-caching-settings-depc8f669b20/ web

Log Client Identity

This feature can be particularly useful as it allows you to review the logs to confirm the IP addresses of clients communicating and requesting cached data. This makes it easy to identify the client when a request is made. Enabling this feature can be done within the content caching payload in MDM or by adjusting the plist by changing the key LogClientIdentity to Yes.



Apple Intelligence and Content Caching

Apple Intelligence has a large data footprint, equivalent to another OS install. As Apple Intelligence becomes more prevalent, it is important that content caches are updated to reduce the network load. Apple Intelligence models are cached as mobile assets as in the screenshots below



This completes the guide.