

USING REDIS FOR SESSION STORAGE IN CF AND LUCEE: WHY, AND HOW IT'S EASILY DONE



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- ▶ Ever reluctant to restart CF (or Lucee), for fear of users getting “logged out”?
 - ▶ Whether running a single or number of servers, it’s a concern
- ▶ What if you could restart without worrying about that?
 - ▶ Perhaps to perform CF or JVM updates, or OS updates, or fix a hang
- ▶ Both CF and Lucee do offer the option to store sessions in Redis
 - ▶ It’s just a simple CF/Lucee admin configuration: **no code change needed!**
 - ▶ And there are **many** options for installing Redis or using a Redis service, free or paid
- ▶ I’ll show you all this today

HAVE YOU EVER WISHED...

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- ▶ Quick demo of the benefit
 - ▶ Including support of complex session vars (structs, arrays, queries, CFC instances, etc.)
- ▶ How to enable, in CF and Lucee
- ▶ Redis deployment options: services (paid/free), installers, containers, and more
 - ▶ Redis licensing and alternatives
- ▶ CLI/UI tools to monitor Redis, view data
- ▶ Some additional related topics

TODAY'S TOPICS/DEMOS

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- ▶ I focus on CF/Lucee server troubleshooting, as an independent consultant
 - ▶ Assist organizations of all sizes, experience levels
 - ▶ Work remotely: safe, secure, easy via **shared desktop** (zoom, meet, teams, etc.)
 - ▶ **Solve most problems in less than an hour**, teaching you also as we go
 - ▶ **Satisfaction guaranteed**
 - ▶ More on rates, approach, online calendar, etc at carehart.org/consulting
- ▶ But to be clear, I'm not selling anything in this session! 😊
 - ▶ Just sharing my experience, and that of others
- ▶ Presentation online at carehart.org/presentations



ME.ABOUT()

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- ▶ We only have 50 mins...
 - ▶ So focus on the demo and the big picture/ease of implementation
- ▶ And I'll jump into demo first, to show the benefit
 - ▶ Then we'll see how easy it can be to setup in CF
 - ▶ Later will show any of many ways to RUN Redis...but for now, trust me that it's simple!
- ▶ I'm hoping to expand on details shared here in a series of blog posts
 - ▶ carehart.org/blog/client/index.cfm/redis-sessions

MY MULTI-PART BLOG SERIES, WITH DETAILS

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DEMO TIME

(Showing complex vars, cfc's preserved in a session across a CF or Lucee restart)

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- ▶ Let's discuss how to setup CF or Lucee to point to/use some running Redis
 - ▶ Will discuss setup of Redis itself soon

SETTING UP REDIS IN CF OR LUCEE

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- ▶ Available in CF2016 and above, Standard or Enterprise (or Developer)
- ▶ As for CF, in CF Admin, go to *Server Settings>Memory Variables*
 - ▶ In “Session Storage” setting, change “In Memory” to “Redis”
 - ▶ (Does require “redis-session-storage” package, if not all CF packages installed)
 - ▶ Note that you must disable the “J2EE sessions” feature on this CF Admin page
 - ▶ Don’t worry: cf sessions can be made as secure as J2EE sessions
- ▶ Point to the Redis server domain/ip, port, and provide password if needed
 - ▶ Click “verify connection” button, and if ok “submit changes”
 - ▶ On restarting CF, sessions created from then on are stored in Redis
- ▶ Can also automate using cfsetup, cfconfig, CAR files, admin API, in Docker, etc.

ENABLING REDIS SESSIONS IN CF

- ▶ CF Admin Redis session setting offers an option, “*Use Redis for CFLogin*”
- ▶ If your app does use cflogin / cfloginuser, note two things:
 - ▶ Where such logins are stored is controlled by **loginstorage** attribute in application.cfc/cfm, and it defaults to **cookie**
 - ▶ Sometimes chosen intentionally when app doesn’t otherwise use sessions
 - ▶ Such logins will NOT be saved to Redis, won’t persist across restarts
 - ▶ Only cflogins where **loginstorage** is set to **session** will be persisted across restarts
 - ▶ And assuming that option is enabled in Admin for Redis sessions
- ▶ More
 - ▶ helpx.adobe.com/coldfusion/cfml-reference/application-cfc-reference/application-variables.html

WHAT ABOUT CFLOGIN?

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- ▶ Just a little more challenging: first must choose an extension offering this
 - ▶ “Redis Sentinel Driver” (free from Lucee), “Ortus Redis Cache”
 - ▶ Either will work, but the Ortus one provides additional features you can explore
 - ▶ Install the extension via Lucee Admin (*Extensions>Applications* page)
 - ▶ For Ortus one, then go to new Ortus menu, choose “Redis Cache”, choose trial or license
 - ▶ redis-cache.ortusbooks.com/essentials/configuration
 - ▶ (Can only configure at server admin, not web)
- ▶ Then go to *Services>Cache* page, create new Redis cache instance
 - ▶ Near top, choose “Allow to use this cache as client/session storage”
 - ▶ Configure settings to name server, port, password (and more, optionally)
 - ▶ Use “verify” button on page that appears next, listing this and any other caches
- ▶ ...

ENABLING REDIS SESSIONS IN LUCEE

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- ▶ Then go to *Settings>Scope* page,
 - ▶ change “Session Type” (top of that page) from “Application” to “JEE”
 - ▶ Reverse of CF (more in a moment)
 - ▶ change “Session Storage” to the newly created cache in previous step
- ▶ No need of Lucee restart. Sessions are now stored in Redis
 - ▶ Beware: Lucee does not currently warn you if you leave “session type” as “jee” when changing “Session Storage”
 - ▶ Sessions will just seem not to persist over restart. Will see error in Lucee Catalina log:
 - ▶ Exception loading sessions from persistent storage
 - ▶ `java.lang.ClassNotFoundException: lucee.runtime.type.scope.Jsession`
- ▶ ...

ENABLING REDIS SESSIONS IN LUCEE (CONT.)

- ▶ Can also automate adding extensions to Lucee via config:
 - ▶ docs.lucee.org/guides/Lucee5.3-kabang.html#extensions-2
 - ▶ Before that was added: blog.mattclemente.com/2018/08/17/install-lucee-extensions-on-commandbox-docker-containers/
- ▶ As for using Lucee on Docker, see Matt C's repo
 - ▶ github.com/mjclemente/redis-lucee-extension
 - ▶ See also blog.mattclemente.com/2019/11/14/lucee-redis-ortus-extension/

ENABLING REDIS SESSIONS IN LUCEE (CONT.)

- ▶ Lucee application.cfc settings (docs for Ortus Redis extension)
 - ▶ redis-cache.ortusbooks.com/essentials/configuration#application.cfc-connections
- ▶ Lucee manual configuration via .lex file (docs for Ortus Redis extension)
 - ▶ redis-cache.ortusbooks.com/essentials/installation#manual-docker-installation
- ▶ Commandbox (docs for Ortus Redis extension)
 - ▶ redis-cache.ortusbooks.com/essentials/configuration#cfconfig-connections
- ▶ Resources:
 - ▶ redis-cache.ortusbooks.com/essentials/installation
 - ▶ blog.mattclemente.com/2018/08/17/install-lucee-extensions-on-commandbox-docker-containers/

CONFIGURING LUCEE EXTENSIONS VIA CODE

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REDIS DEPLOYMENT, LICENSING, AND ALTERNATIVES

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- ▶ Redis is free (more on licensing later)
 - ▶ Redis, the company, also offers a commercial “Enterprise” edition
 - ▶ There are also plug-compatible alternatives to Redis, some free/some paid
- ▶ Installers are available (Linux, MacOS)
 - ▶ Previously offered for Windows—I have a tip to share in a moment
- ▶ Can implement on local machine, another machine in network
 - ▶ On VM, or via WSL (on Windows)
- ▶ Can also run Redis via containers (Docker, Podman, Kubernetes, etc.)
- ▶ There are also service implementations, where you need not install it at all!
 - ▶ Again, some free/some paid
- ▶ All are surprisingly simple to setup...

REDIS DEPLOYMENT OPTIONS

- ▶ There are pros and cons and things to consider...
- ▶ And I have a full presentation with more on all these deployment options:
 - ▶ **Options for running Redis (or Valkey, etc.), locally or as-a-service**
 - ▶ carehart.org/presentations/#redis_options
- ▶ I'll leave you to explore that, but let me quickly review a couple of options
 - ▶ Either might suit people just getting started, especially if not using Linux/macOS

REDIS DEPLOYMENT OPTIONS PRESO

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- ▶ Redis offers installers/binaries for Linux, MacOS
 - ▶ In the past they and MS offered Windows Redis installers, but no longer
- ▶ Again, Windows users could install Redis Linux binary on VM, WSL
 - ▶ Or can use containers, or Redis-as-a-service
- ▶ But what if you're on Windows and don't want to run locally?
 - ▶ Note that Adobe's CF API Manager datastore **is just a Redis installer**
 - ▶ And it offers a Windows installer, though it is an older Redis, version 3
 - ▶ Still, it works fine for CF (or Lucee) storage of Redis sessions
 - ▶ See my other preso for more, including finding installers, Redis password

REDIS WINDOWS INSTALLER OPTION

- ▶ Easiest deployment option may be to run Redis as a service
- ▶ Redis offers Redis Cloud (redis.io)
 - ▶ Lets you create one free Redis database
 - ▶ Has low limits, but capable to demonstrate this capability (for CF or Lucee)
- ▶ Login to *redis.io*, create free account
 - ▶ Create database as “cache”, choose “30 mb” size (give it any name you like)
 - ▶ Copy its ‘public endpoint” (domain and port), and “default user password”
- ▶ Use these to configure CF or Lucee admin, as shown before

REDIS CLOUD FREE ONLINE SERVICE

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- ▶ **Aiven** (aiven.io), free and commercial
 - ▶ (“**Aiven for Caching**” is Redis: aiven.io/caching)
 - ▶ See also their Aiven for DragonFly, Valkey (alternatives I’ll discuss shortly)
- ▶ **Digital Ocean Managed Databases for Redis**, commercial
 - ▶ digitalocean.com/products/managed-databases-redis
- ▶ **Upstash** (upstash.com), free and commercial

OTHER REDIS-AS-A-SERVICE OPTIONS

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- ▶ Maybe you're already deploying infrastructure in the cloud
- ▶ All the major cloud providers offer Redis-as-a-service
 - ▶ **Amazon ElastiCache for Redis**
 - ▶ **Azure Cache for Redis**
 - ▶ **Google Memorystore for Redis**
 - ▶ **Alibaba ApsaraDB for Redis**, and Alibaba Tair
 - ▶ **Tencent DB for Redis**
- ▶ Some offer free tiers, most are low-cost to start up (but costs can add up)
 - ▶ Again, you get all the benefits of a managed service, which is worth the cost for many
- ▶ See online resources for each of the above, for clear intros, setup, usage info

IMPLEMENTING VIA CLOUD PLATFORMS

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- ▶ I discuss this more in my other talk
 - ▶ Redis 7.4 (July 2024) changed from BSD to “dual license” (RSAL/SSPL)
 - ▶ Mostly affects only managed service providers/cloud providers offering Redis services
 - ▶ And does not affect use of previous versions at all
- ▶ FWIW, similar changes happened with MongoDB, ElasticSearch, Terraform, Kafka, Neo4j, CockroachDB, etc.
 - ▶ Still, the IT world kind of blew up over this one especially
 - ▶ Alternatives have come out of the woodwork (though some existed previously)
- ▶ More:
 - ▶ redis.io/blog/redis-adopts-dual-source-available-licensing/
 - ▶ redis.io/blog/what-redis-license-change-means-for-our-managed-service-providers/

REDIS LICENSING CHANGES

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- ▶ There are many plug-compatible Redis alternatives: some free, some commercial
 - ▶ Some downloadable, some for Windows, some as Docker images, **some as cloud services**
 - ▶ Aiven
 - ▶ Apache Kvrocks
 - ▶ Dragonfly
 - ▶ Garnet
 - ▶ KeyDB
 - ▶ Memurai
 - ▶ Redict
 - ▶ Upstash
 - ▶ Valkey
- ▶ More: cf411.com/redisdb (where I track if downloadable, what's offered for free svcs)

REDIS ALTERNATIVES

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- ▶ Speaking of version 7.4, CF and Lucee don't seem sensitive to Redis version number
 - ▶ I've found **both work with older Redis versions (like 3)** or newer ones (like 7)
- ▶ And while implementation and setup of Redis is surprisingly simple...
 - ▶ there's of course more one CAN learn about configuring and managing it
 - ▶ Configuration options, tuning options
 - ▶ SSL/TLS
 - ▶ Replication and clustering
 - ▶ And more
 - ▶ No time in this session to cover that, but ample resources exist online
- ▶ Let's at least talk briefly about monitoring Redis, viewing data saved there...

MORE ON REDIS

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CLI/UI TOOLS TO MONITOR REDIS, VIEW DATA

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► Redis-cli

- **info** (reports info about Redis instance: version, count of keys/commands, more)
- **monitor** (watches every command sent to Redis)
 - Time shown is in “epoch time”. Use online epochconverter.com to convert to local time
 - See my note on this at stackoverflow.com/a/78561234/90802
 - Redis monitoring tools may send commands
 - RedisInsight will send “info” command every 5 secs, while viewing the Redis instance
 - Pay attention to identifier (after time) of what client is sending the command
 - Shows ip address and port of the client. Can match with more info in “client list” command
- **--stat** (shows rolling status of key count, mem used, client/connection/request counts)
- **--bigkeys** (sample Redis keys to provide some profiling info on the data)
- **keys *** (list all keys)
- And much more

CLI: FOR MONITORING; VIEWING DATA

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- ▶ RedisInsight (open source, multiplatform, redis.io/insight/)
 - ▶ Browse feature: when viewing data, choose “java serialized” option
 - ▶ Turns CF session key values into json (sadly, doesn't work for Lucee session values)
 - ▶ Profiler feature (does equivalent of redis-cli monitor)
- ▶ Navicat for Redis (commercial, navicat.com/en/products/navicat-for-redis)
- ▶ Reddisson (free and commercial, redisson.pro)
- ▶ And still others

- ▶ Site to convert epoch time shown in Redis: epochconverter.com

UI'S FOR MONITORING; VIEWING DATA

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ADDITIONAL RELATED TOPICS

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- ▶ What if Redis server named in Admin is unavailable at startup?
 - ▶ CF will start (since a recent CF update), but requests using sessions will get:
 - ▶ Cannot invoke "coldfusion.runtime.session.SessionStorage.sessionExists(String, String)" because "coldfusion.runtime.SessionTracker.sessionStorage" is null
 - ▶ Lucee quietly ignores the error (and doesn't use/store sessions in redis, of course)
- ▶ What if the Redis server goes down while CF is running?
 - ▶ Will get error on any page using sessions, perhaps either of these:
 - ▶ `redis.clients.jedis.exceptions.JedisConnectionException: Failed to connect to any host resolved for DNS name`
 - ▶ Failed to create socket.
 - ▶ Again, Lucee quietly ignores the error and soldiers on without Redis.
 - ▶ Beware: you might restart Lucee and NOT benefit from recovery of session from Redis!
- ▶ Of course, this is somewhat like a key app losing access to its primary db

WHAT IF REDIS GOES DOWN?

- ▶ Bug in CF2023/2021 may create excessive calls to Redis (per second/per session)
 - ▶ Can be easily resolved by removing “pmt agent” module, if not using PMT
 - ▶ carehart.org/blog/2024/5/28/workaround_for_seeming_CF_Redis_sessions_bug
 - ▶ tracker.adobe.com/#/view/CF-4222211
- ▶ Be aware that there were a couple of bugs fixed in Oct 2023 CF updates
 - ▶ helpx.adobe.com/coldfusion/kb/coldfusion-2023-update-5.html
 - ▶ helpx.adobe.com/coldfusion/kb/coldfusion-2021-update-11.html
- ▶ With CF or Lucee, do be sure to monitor Redis (as just discussed)
 - ▶ You could exceed memory size chosen for Redis (a config Redis choice)
 - ▶ Redis could unexpectedly start evicting least-recently used data
 - ▶ blog.mattclemente.com/2020/01/21/lucee-redis-session-cache-settings/

A COUPLE OF GOTCHAS

- ▶ Multiple CF or Lucee instances pointing at single Redis db will share sessions
 - ▶ Such that a given user running on one instance will stay logged in if sent to another
 - ▶ Only across same engine, of course (not shared between CF AND Lucee)
- ▶ Redis **replication, clustering**: can also be done, for increased reliability
 - ▶ As well as **persistence** of Redis database(s), across Redis restarts
 - ▶ All beyond scope of this session
 - ▶ Brief mention of backup/aof at bottom of helpx.adobe.com/coldfusion/using/external-session-storage.html

BEYOND SESSION PERSISTENCE: ROBUSTNESS

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- ▶ Note that both Lucee and CF offer use of Redis for caching OTHER than sessions
 - ▶ In the case of CF, it's offered only with the Enterprise (or Developer) edition of CF2018+
 - ▶ learncfinaweek.com/course/index/section/Caching/item/Advanced_Caching.html
- ▶ Note that Lucee also offers option to store sessions in database
 - ▶ And CF Enterprise clustering offers option to replicate sessions between members

BEYOND REDIS SESSIONS FOR CF/LUCEE

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- ▶ On CF/Lucee Redis sessions:

- ▶ helpx.adobe.com/coldfusion/using/external-session-storage.html
- ▶ redis-cache.ortusbooks.com

- ▶ On Redis in general:

- ▶ redis.io/docs/latest/get-started/
- ▶ redis.io/docs/latest/operate/oss_and_stack/install/install-redis/#install-redis-properly
- ▶ redis.io/docs/latest/operate/oss_and_stack/management/
- ▶ carehart.org/presentations/#redis_options

OTHER RESOURCES

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- ▶ Redis sessions are an easy enhancement for CF or Lucee
 - ▶ Easily configured in CF or Lucee admin, or via code, or via config
 - ▶ Several easily implemented options, whether on-prem, on-network, or in cloud
- ▶ Tools exist to monitor Redis processing, view Redis data
- ▶ Take this ball and run with it!
 - ▶ Can learn more about Redis as you may see fit
- ▶ Reach out to me with questions on talk/share feedback (direct or publicly)
 - ▶ Slack, Github, X, Fb, Li, Skype, etc. simply as @carehart
 - ▶ Email: charlie@carehart.org
- ▶ Again, presentation online at carehart.org/presentations



SUMMARY

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