

HIDDEN GEMS IN COLDFUSION 2021



Charlie Arehart, Independent Consultant
CF Server Troubleshooter
charlie@carehart.org
@carehart (Tw, Fb, Li, Slack, Skype, GitHub)

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- ▶ Noting the major new features
- ▶ Less-heralded changes in many areas:
 - ▶ Installation, administration, configuration, and monitoring
 - ▶ Developer-oriented features and language changes
- ▶ Then other topics you should also consider:
 - ▶ Compatibility/migration issues
 - ▶ Updates to underlying libraries (their version numbers)
 - ▶ What's new in Standard vs Enterprise
 - ▶ Pricing, end of life/support, licensing
 - ▶ And still more, including coming CFBuilder 2021
- ▶ So, much more than just a “what's new in CF2021” list

TOPICS

2

- ▶ So much new in 2021
 - ▶ Could speak literally for a week on ALL the new features
- ▶ Will review briefly key (and less key) new features, and any gems along the way
 - ▶ Just want you to be aware of the opps and issues, to look into on your own
- ▶ Slides available online for you now or later:
 - ▶ *carehart.org/presentations*

LOGISTICS

3

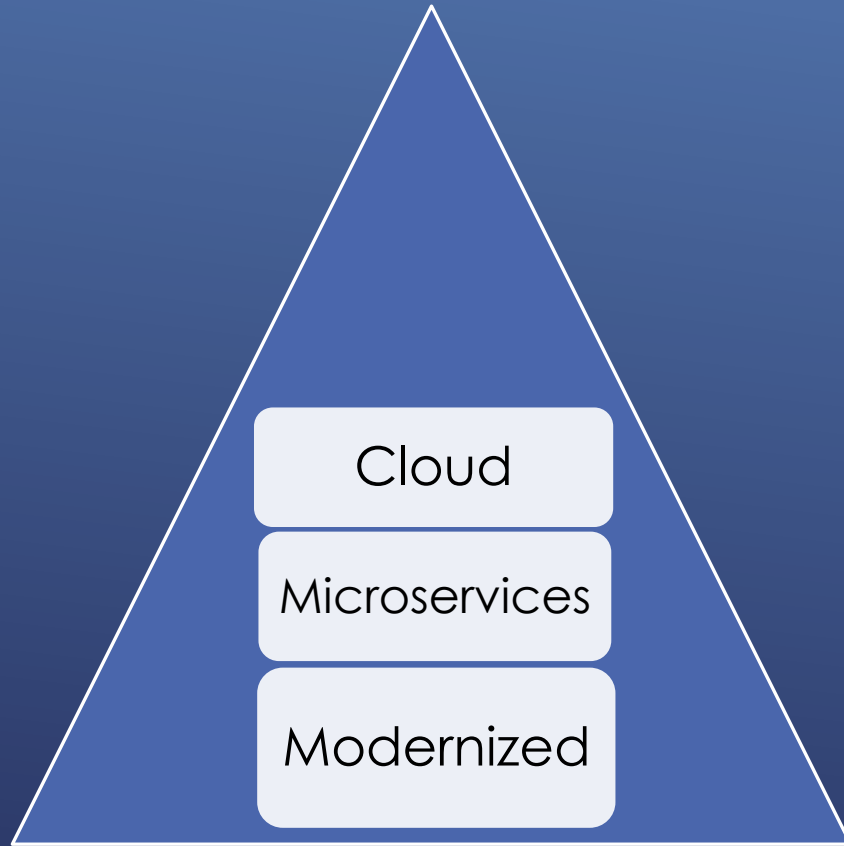
- ▶ See the few HUNDRED pages of docs for CF2021
 - ▶ During preprelease, was a single PDF
 - ▶ Now folded into online docs
 - ▶ The docs are substantial, and nearly all have demo code!
- ▶ See posts from me and Adobe listing links to docs
 - ▶ carehart.org/blog/client/index.cfm/2020/11/10/
 - ▶ community.adobe.com/t5/coldfusion/introducing-adobe-coldfusion-2021-release/td-p/11585468
 - ▶ helpx.adobe.com/coldfusion/user-guide.html/coldfusion/using/whats-new.ug.html
- ▶ A few sessions at CF Summit CF2020
 - ▶ which will surely go into much more depth on some topics
- ▶ Also available resources, listed later here

FINDING MORE ABOUT CF2021

- ▶ I focus on CF server troubleshooting, as an independent consultant
 - ▶ Assist organizations of all sizes, experience levels
 - ▶ Work remotely 99% of the time, safe, secure, easy (via **shared desktop**)
 - ▶ **Solve most problems in less than an hour**, teaching you also as we go
 - ▶ **Satisfaction guaranteed**
 - ▶ More on rates, approach, etc at carehart.org/consulting
- ▶ But to be clear, I'm not selling anything in this session! 😊

ABOUT ME

5



MAJOR FEATURES OF CF2021

- ▶ Cloud Storage Svcs (AWS S3, Azure Blob)
- ▶ Cloud message queuing (AWS SQS, Azure Service Bus)
- ▶ AWS SNS (notifications) and SES (email)
- ▶ Multi-cloud RDS support
- ▶ Cloud noSQL support (Amazon DynamoDB, Azure Cosmos DB)

- ▶ And yes, all new features in 2021 are supported in Standard as well as Enterprise

RICH CLOUD SUPPORT

- ▶ Optional smaller zip/Express installer
- ▶ Available package manager (cfpm)
- ▶ Available JSON-based admin configuration (cfsetup)
- ▶ Serverless deployment, via AWS Lambda
- ▶ Improvements to PMT (monitor)
- ▶ Improved Docker and WAR deployment

MOVES SUPPORTING DEVOPS

8

- ▶ SAML (single sign-on/ logout) support (configuring an IDP or SP)
 - ▶ MongoDB (noSQL) support
 - ▶ In addition to cloud noSQL solutions, AWS DynamoDB and Azure Cosmos DB
 - ▶ Many new language features, and enhanced functions/script/tags
 - ▶ And more
-
- ▶ Other presenters talking about the major features, for those interested in each
 - ▶ I want to dig a bit into more practical aspects that apply to most
 - ▶ And share hidden gems along the way

OTHER MAJOR FEATURES

INSTALLATION, ADMINISTRATION, CONFIGURATION, MONITORING

10

- ▶ Some may be wondering why I start with this/elaborate topics
 - ▶ Sure, some folks are ONLY developers
 - ▶ But even most developers end up installing/configuring and may want to monitor CF

A PREFACE TO THIS SECTION

11

- ▶ Express/zip installer option (full/GUI installer still available)
 - ▶ Need to unzip that, then unzip what's in that
 - ▶ Then run ColdFusion/bin/cfinstall
 - ▶ Which makes a few prompts to configure and optionally enable svc for CF
 - ▶ Note that it does NOT cause running of migration wizard on first Admin launch
 - ▶ See helpx.adobe.com/coldfusion/user-guide.html/coldfusion/using/install-coldfusion-2021.ug.html#main-pars_header_607718620
 - ▶ Similarly, if this express installer is run on machine that had not yet run CF, need to install visual c++ 2012 redistributable run time
 - ▶ As indicated at top of the page above, though no link to it is offered

INSTALLATION CHANGES

- ▶ Now modular design reduces size (of Express installer) to a mere 147mb
 - ▶ Implements “core” package/engine by default, option to add other packages
- ▶ Size on disk (for core packages) reduced by **~300%**
 - ▶ Runtime memory (for core packages) reduced by **~350%**
 - ▶ Startup time has decreased by **~400%**
 - ▶ helpx.adobe.com/coldfusion/user-guide.html/coldfusion/using/coldfusion-package-manager.ug.html
- ▶ Optional packages can be installed...

MODULAR DESIGN, SMALLER “CORE” ENGINE

- ▶ Can be done either from command line, via Admin, or as Docker env var
 - ▶ Via cmd line, new cfpm script (bat or sh, in cfusion/bin folder)
 - ▶ Demo'd during the first keynote today
 - ▶ Can run interactively or not, with several commands (see prev docs, cli help)
 - ▶ Available feature to scan your code to identify (and even install) needed packages
 - ▶ Available downloadrepo command, for those in offline environments
 - ▶ In CF Admin, new “package manager” section on lower left
 - ▶ See its two pages, “Packages” and “Settings”
 - ▶ In 2021 Docker image, new installModules env var (comma-sep list of pkgs)
 - ▶ And related importModules (to leverage file created by cfpm export feature)

INSTALLING “PACKAGES”

- ▶ New cfsetup script (in CF “config” folder)
- ▶ Again, was demo'd during first keynote
 - ▶ Yes, similar to Commandbox CFConfig module
 - ▶ No, not as powerful as it (can't use it across multiple engines or versions)
 - ▶ But it is valuable for what it does, and for use with CF2021 without adding anything
- ▶ Note that CF2021 Docker image has new importCFSettings to pull those in

JSON-BASED ADMIN CONFIG-CFSETUP

15

- ▶ See great talk earlier today by Brian Klass
 - ▶ Where he discusses and demos it, showing process from start to finish
 - ▶ Shares some “hidden gems”
 - ▶ Need to re-link the zip on any (and every) change to the deployed function
 - ▶ How to write to cloudwatch logs with `coldfusion.log.CFLogs` java object
 - ▶ Dealing with cold starts
 - ▶ His available “aws playbox” repo that makes it easier to work with
 - ▶ Working with AWS SAM (Serverless Application Model), and Paul Kukiel’s repo
 - ▶ Working with AWS xRay
 - ▶ And more

SERVERLESS DEPLOYMENT, VIA AWS LAMBDA

- ▶ PMT was added in CF2018, in Std and Ent, works with 2018 and 2021 only
- ▶ New “cloud services” and “nosql datasources” sections on left
 - ▶ Each with many pages and details that can be monitored, if enabled
- ▶ New options to enable/disable cloud svc, noSQL and SQL db monitoring
 - ▶ Off by default (db monitoring off by default in new behavior)
 - ▶ “External services” monitoring also newly off by default
 - ▶ Note: even if disabled, still see info on respective “Overview” pages
- ▶ New “active monitoring” options: current sessions, running async threads
 - ▶ And tracking of active async/cfthread thread counts over time in “CF Metrics”
 - ▶ And tracking of cfthread threads within a given request’s details
- ▶ New “system memory” graph (max, used), on “system” tab of “CF Server” page

- ▶ And several PMT configuration enhancements...

PERFORMANCE MONITORING TOOLSET (PMT) IMPROVEMENTS

- ▶ New page in PMT to manage its updates (Settings>Server>Updates)
 - ▶ See Settings tab, and option to enable auto-check on login
 - ▶ And like CF Admin updates, option to set email address to be notified of updates
- ▶ Improvements for datastore connection: https and authentication options
- ▶ Improvements for deleting data from datastore, manually or on schedule
- ▶ New ability to clear PMT alerts (those raised if alert conditions reached)
- ▶ New ability to capture only requests exceeding a given duration (default 0)
 - ▶ Settings>Node>Monitoring>Advanced

PERFORMANCE MONITORING TOOLSET (PMT) IMPROVEMENTS: CONFIGURATION

- ▶ Adobe has released Docker images since CF2016
 - ▶ They've been updated for CF2021 (and with each CF update)
- ▶ In 2021, they are **half as large and start twice as fast**
- ▶ New environment variables mentioned previously
 - ▶ `installModules` and `ImportModules`
 - ▶ `importCFSettings`
- ▶ And `importCFSettingsPassphrase` (if the json file is encrypted by CF)

IMPROVED CF DOCKER IMAGES

19

- ▶ New pages in “Data & Services”
- ▶ For Mongo, new “NoSQL Datasources” page
 - ▶ On giving DSN name and clicking “Add”, shown several config settings
- ▶ For cloud services
 - ▶ “Cloud Configuration”
 - ▶ Note how the “Add” button opens page of config settings, varying per svc
 - ▶ “Config Alias” can then be used to refer to that configuration
 - ▶ “Cloud Credentials”
 - ▶ Is more simply just the list of settings shown before clicking “Add”
 - ▶ “Profile” name can be used in code to refer to those credentials

OTHER ADMIN CHANGES: CONFIGURING MONGO, CLOUD SVCS

- ▶ These cloud DBs can now be configured in CF admin DSN page

AWS	Azure
Aurora MySQL Aurora PostgreSQL Oracle MySQL PostgreSQL SQL Server	MySQL PostgreSQL SQL Server

ADMIN CHANGES: SUPPORT FOR CLOUD RDS DATABASES

- ▶ Addition of SAML configuration in new pages under “Security” section
 - ▶ IDP Configuration, SP Configuration
 - ▶ Note that SAML can also be specified in application.cfc, instead
- ▶ Addition of AWS Elasticache, Azure Redis, as CF distributed caching options
 - ▶ CF Enterprise only (only thing “new” in CF2021 that is Ent only, it seems)
- ▶ Addition of Azure Redis cache as CF session storage option
- ▶ New admin API features related to most of the new features above
- ▶ URL for connector “heartbeat” has changed, for those aware of it:
 - ▶ Was /connector, now /__cf_connector_heartbeat__
 - ▶ Set in both workers.properties for connector and in wwwroot/WEB.INF/web.xml

OTHER ADMIN CHANGES

- ▶ Time for “the shoe to drop”
- ▶ When you put in a CF2021 license, that will need to be “activated”
 - ▶ Over the internet
 - ▶ And if a server doesn't have internet access, will require manual activation
- ▶ New CF Admin section (last one on bottom left) to view/manage this
 - ▶ Including new page to view Docker image usage (with production license)
- ▶ Again this activation does NOT apply to Development or Trial
- ▶ Let's move on to Developer features...

NEW ACTIVATION FEATURE

DEVELOPER FEATURES

24

Charlie Arehart
CArehart.org
@carehart

- ▶ Of course, all the cloud services
- ▶ noSQL support
- ▶ Serverless support
- ▶ SAML
- ▶ Docker improvements
- ▶ All of which can make a developer's life easier, but there's much more...

DON'T FORGET MAJOR FEATURES

25

- ▶ See session from Rakshith this morning with demos of many/most of these
- ▶ Improving how CFML can be written
 - ▶ Support for parallel programming, including in arrays, structs, and queries
 - ▶ Immediately invoked function expressions (IIFE)
 - ▶ Iterable objects, via Spread and Rest operators
 - ▶ Iterator support for CFCs
 - ▶ Support for static fields and methods for CFCs
 - ▶ Identity operator, "==" , testing if items are of the same type
 - ▶ ...

CORE LANGUAGE CHANGES

26

- ▶ Property shorthand
- ▶ Merging structs
- ▶ "Destructuring assignment" feature for structs, arrays
- ▶ Dynamic switch case

CORE LANGUAGE CHANGES (CONT.)

27

- ▶ Can use `structnew("casesensitive")`, and “ordered-casesensitive”
 - ▶ Or can use implicit notation (\$)
- ▶ Note that “ordered” structs were added in 2016 (“ordered”), or using [] vs {}
 - ▶ Can get confusing, as “ordered” does not mean “sorted” but “in insertion order”
 - ▶ There are also functions, `StructToSorted` (added in CF2016 update 3) and `structsort` (goes back at least to 4.5), which are quite different from each other
- ▶ Examples
 - ▶ <https://bit.ly/3pKM12n>

CASE-SENSITIVE AND ORDERED STRUCTS

28

- ▶ New bcrypt and scrypt functions, for creating password hashes (where scrypt adds more features) (were not in beta docs)
- ▶ Return type for cfquery and queryExecute (json/array, array, query)
- ▶ New array methods/member functions: ArrayPush, ArrayPop, ArrayShift, ArrayUnshift
- ▶ Strings as collections:
 - ▶ StringSort, StringFilter, StringReduce, StringMap, StringEach, StringEvery, StringSome
- ▶ New "start" arg for replace/replaceNoCase functions
- ▶ Support for enhanced/nested savecontents in cfscript
- ▶ Label support for loops with break and continue
- ▶ Support for Base64Url encoding in binaryEncode/binaryDecode functions

NEW/CHANGED CFML TAGS/FUNCTIONS

- ▶ CFML has support Java integration since CF 4.0.1, which added calling Java objects from CFML
 - ▶ And of course with CF6, CF was rewritten on Java entirely
 - ▶ And CF10 added things like application-level class loading
 - ▶ CF2021 lets you literally create and execute Java within CFML
 - ▶ And adds support for implementing/extending Java Interfaces
- ▶ Set time zone for all requests in Application.cfc
- ▶ New Application.cfc values for many of the new features added in CF2021
- ▶ ...and that's it for language enhancements

OTHER CFML ENHANCEMENTS

30

OTHER CONSIDERATIONS

- ▶ Just a few areas remain...
 - ▶ Deprecated features
 - ▶ Compatibility issues
 - ▶ Updates to underlying libraries' versions numbers
 - ▶ What's new in Standard vs Enterprise
 - ▶ Pricing, licensing, end of life/support
 - ▶ CF Builder 2021 plans

OTHER CONSIDERATIONS

- ▶ See:
 - ▶ helpx.adobe.com/coldfusion/deprecated-features.html
- ▶ **Removed:**
 - ▶ Corba integration
 - ▶ LCDS integration
 - ▶ Flex integration
 - ▶ Flashpaper type for cfdocument, cfpresentation
 - ▶ cfschedule onmisfire="fire_now"
- ▶ Seemingly nothing deprecated or "retired", no new reserved words
- ▶ Related to all this, let's talk about other migration issues...

DEPRECATED FEATURES

- ▶ So it seems few will encounter any real problem migrating to CF2021...from 2018
 - ▶ But with each version, there may be compat issues depending on your starting point
 - ▶ If **jumping** to 2021, **skipping** CF2018, 2016, 11, or 10, there **are** compat issues each had
- ▶ I've discussed these more in my "hidden gems" talks for each past CF version
 - ▶ As well as "What was new in CF 10, 11, and 2016 that you may have missed"
 - ▶ *carehart.org/presentations*
- ▶ Issues learned since the release in mid-November:
 - ▶ Mac OS Big Sur came out the same week: neither CF nor CFBuilder currently support it
 - ▶ ...

COMPATIBILITY/MIGRATION ISSUES

34

- ▶ Potentially big deal for some: new dateformat mask of “D” was added
 - ▶ For “day in year”, along with some others, like M and Y (whose difference is unclear)
 - ▶ Problem is if you may have code using D or DD, where “d” should have been used
 - ▶ In prior releases, the fact that D was capitalized was ignored and produces same result
 - ▶ But now such code will return the number of days in the year, rather than in the month!
- ▶ Example: `dateformat("11-23-20","MM-DD-YY")`
 - ▶ In 2018 and before, produces 11-23-2020
 - ▶ In 2021, produces instead 11-328-2020
- ▶ Example: bit.ly/3m3sLdR
- ▶ carehart.org/blog/client/index.cfm/2020/11/24/breaking_change_in_cf2021_dateformat_D_vs_d
- ▶ Bug ticket: tracker.adobe.com/#/view/CF-4210921

- ▶ Antismy 1.5.7 (OWASP security library)
- ▶ Derby **10.15** (embedded DB)
- ▶ Ehcache **5.6.16** (caching library)
- ▶ Elasticache **5.6.16** (In PMT)
- ▶ Esapi **2.2.1.1** (OWASP Enterprise Security API)
- ▶ Hibernate 5.2.11 (ORM library)
- ▶ HttpClient 4.5.2 (underlies CFHTTP and more)
- ▶ Java **11.0.1** (the JVM which underlies CF)
- ▶ Jetty **9.4.31** (underlies Solr and PDFg)
- ▶ jQuery 3.1.1 and jQuery UI 1.12.1 (JS library which underlies various UI tags and Admin interface features)
- ▶ Lucene **6.6.1** (underlies Solr search engine in CF)
- ▶ POI **4.1.2** (underlies MS Office Integration features)
- ▶ Solr 5.2.1 (the embedded search engine, used by CFSEARCH/CFINDEX, etc.)
- ▶ Tomcat **9.0.37** (app server underlying CF, when deployed in traditional "Server" configuration)

Some in ColdFusion2021/cfusion/lib, some in ColdFusion2021/bundles/repo

UPDATES TO SOME UNDERLYING LIBRARIES' VERSIONS NUMBERS

- ▶ Only one thing **added in 2021** is Enterprise-only: new distributed caching options
 - ▶ Feature was added in CF2018, supporting redis and memcached
 - ▶ CF2021 adds Azure Cache for Redis and AWS ElastiCache
 - ▶ CF Standard still supports long-standing ehCache and JCS (added in C2018)
- ▶ To BE CLEAR: **I am NOT saying this is the ONLY difference** between CF2021 Standard and Enterprise
 - ▶ I'm saying this is the only thing ADDED in 2021 that IS Enterprise-only
 - ▶ I said originally nothing “new” in 2021 was Ent-only. Dist caching not “new” 😊
- ▶ For more on differences between CF Std and Ent:
 - ▶ adobe.com/content/dam/cc/us/en/products/coldfusion/coldfusion-family/home/Buying%20Guide_Family.pdf
 - ▶ carehart.org/presentations/#differences_std_ent

STANDARD VS ENTERPRISE

37

- ▶ Price for CF2021 has not changed compared to CF2018
 - ▶ Standard: US\$ 2,499 (per 2 cores)
 - ▶ Enterprise US\$ 9,499 (per 8 cores)
- ▶ Upgrade discount for those on CF2018 (none for those on CF2016 or earlier)
- ▶ Consider buying CF from resellers, for still more discounts
 - ▶ *buy-cf.com* (from makers of FusionReactor)
- ▶ And what if you may still want to buy CF2018?

PRICING

38

- ▶ First, as happened with CF2016 when 2018 came out...
- ▶ Can no longer access CF2018 installers on Adobe public CF site
 - ▶ Look instead to *cfmlrepo.com* (community-run site)
- ▶ Can't even license CF2018 anymore
 - ▶ Must buy CF2021 (if from Adobe, only via "volume licensing")
 - ▶ and then request "**backward license**" to CF2018, at least was case in CF2018/2016
 - ▶ *blogs.coldfusion.com/post.cfm/adobe-coldfusion-backward-licensing*
 - ▶ Good news: if CF2016 bought from a reseller, that COULD be backward-licensed

WHAT IF YOU STILL WANT CF2018?

39

- ▶ When does public support (providing updates) end, for each recent version?
 - ▶ For CF2021, in 2025
 - ▶ For CF2018, in 2023
 - ▶ For CF2016, in 2021
 - ▶ For CF11, in 2019
- ▶ helpx.adobe.com/support/programs/eol-matrix.html

END OF LIFE/SUPPORT OF VERSIONS

40

- ▶ No significant difference from CF2018, from my assessment
 - ▶ You and your lawyers should do a compare for yourself
- ▶ Finding EULA on your CF installation or online:
 - ▶ coldfusion.adobe.com/2018/01/finding-the-eula-end-user-licensing-agreement-for-your-installed-cf-version/
 - ▶ Updated for CF2021
- ▶ ...ok, onto last changed “feature”: what about CFBuilder 2021?

LICENSING ISSUES (EULA)

- ▶ No new CFBuilder 2021 yet
- ▶ But plans have been announced for next version to be VSCode-based
 - ▶ Prior versions were based on Eclipse
- ▶ Said to be offered either as a VSCode plugin or as “stand-alone”
 - ▶ CFBuilder on Eclipse had offered same two options
 - ▶ Difference is that few CF developers were Eclipse users, so most used “stand-alone”
 - ▶ Never really knew it was based on Eclipse, was “just CFBuilder”
 - ▶ Today, many CF developers are VSCode users, so will likely favor plug-in approach

CFBUILDER 2021 IMPROVEMENTS

42

- ▶ So, lots of changes, right?
 - ▶ I count nearly 60 (major and minor)
- ▶ Hope you may be more motivated—and informed—to consider CF2021
 - ▶ To understand if and how it may work for you
 - ▶ Or at least where things stand regarding it as of now
- ▶ Again, my contact info for follow-up:
 - ▶ Charlie Arehart
 - ▶ charlie@carehart.org
 - ▶ @carehart (Tw, Fb, Li, Slack, Skype, GitHub)
 - ▶ Slides: carehart.org/presentations

SUMMARY