

HIDDEN GEMS IN COLD FUSION 2021, A YEAR LATER



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- ▶ We'll note the major new features
- ▶ Then focus on less-heralded changes in many areas:
 - ▶ Installation, administration, configuration, and monitoring
 - ▶ Developer-oriented features and language changes
- ▶ Identify what's changed since this talk as offered at CFSummit 2020
- ▶ Touch on other topics you should consider:
 - ▶ Deprecated/removed features
 - ▶ Compatibility/migration issues
 - ▶ Changes per CF updates since original release
 - ▶ JVM changes since then
 - ▶ And still more

TOPICS

- ▶ So much new in 2021
 - ▶ Could speak literally for a week on ALL the new features
 - ▶ See several sessions from CF Summit 2020
 - ▶ coldfusion.adobe.com/videos/
- ▶ We'll review briefly key (and less key) new features
 - ▶ 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

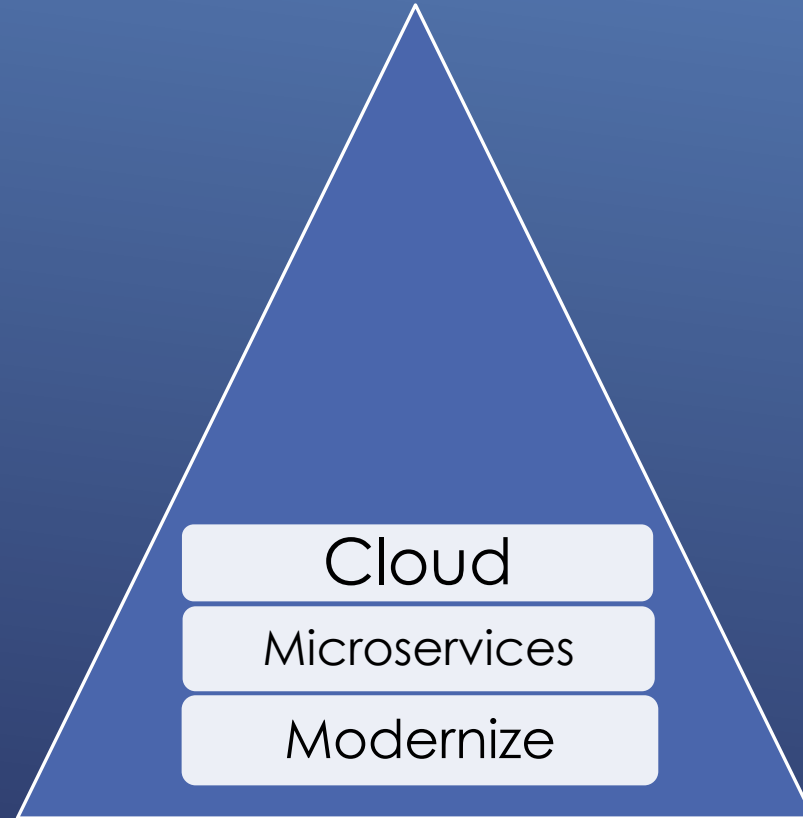
- ▶ See the few HUNDRED pages of docs for CF2021
 - ▶ Nearly all have demo code!
 - ▶ During prerelease, was a single PDF, then folded into online docs
- ▶ See posts from me and Adobe listing links to docs
 - ▶ carehart.org/blog/2020/11/10/the_many_new_and_improved_features_in_CF2021
 - ▶ community.adobe.com/t5/coldfusion-discussions/introducing-adobe-coldfusion-2021-release/td-p/11585468
 - ▶ helpx.adobe.com/coldfusion/using/whats-new.html
- ▶ Also other available resources, listed later in this talk

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



And note: all new features in 2021 are **supported in Standard as well as Enterprise**

MAJOR FEATURES OF CF2021

- ▶ Cloud storage services (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)

RICH CLOUD SUPPORT

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

MOVES SUPPORTING DEVOPS

- ▶ SAML (single sign-on) support (configuring CF as an IDP or SP)
 - ▶ MongoDB (noSQL) support
 - ▶ Many new language features, and enhanced functions/script/tags
 - ▶ And more
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- ▶ Again, see CF Summit 2020 sessions and docs for more
 - ▶ Let's move on to what may be more “hidden gems”

OTHER MAJOR FEATURES

INSTALLATION, ADMINISTRATION, CONFIGURATION, MONITORING

10

- ▶ Some may be wondering why I start with/elaborate on these topics
 - ▶ Sure, some folks are ONLY developers
 - ▶ But even most developers end up installing/configuring CF
 - ▶ and may want to monitor it
 - ▶ And some admin aspects relate to architecture, capabilities of CF

A PREFACE TO THIS SECTION

- ▶ New Express/zip installer option
 - ▶ Note: full/GUI installer still available, **may be best choice for most**
 - ▶ With Express/zip approach, need to unzip that, then unzip what's in that
 - ▶ Then run ColdFusion/bin/cfinstall (prompts to configure, optionally enable svc for CF)
 - ▶ 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
 - ▶ With Express, migration wizard does NOT run on first Admin launch
 - ▶ See helpx.adobe.com/coldfusion/user-guide.html/coldfusion/using/install-coldfusion-2021.ug.html#main-pars_header_607718620
- ▶ New info: see my talk, *"Installing CF2021: choices, challenges, and solutions"*
 - ▶ carehart.org/presentations/#installingcf2021

INSTALLATION CHANGES

- ▶ Now modular design reduces size (of Express zip, Docker image) to mere 147mb
 - ▶ Implements “core” package/engine by default, with option to add other packages
 - ▶ Full/gui installer instead implements ALL packages by default
- ▶ Size on disk (for core engine/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 added or removed ...

MODULAR DESIGN, SMALLER “CORE” ENGINE

13

- ▶ Can be done either from command line, via Admin, or as Docker env var
- ▶ 1) Via cmd line, new *cfpm* script (*cfpm.bat* or *sh*, in *cfusion/bin* folder)
 - ▶ Can run interactively or not, with several commands (see prev docs page or cli help)
 - ▶ Available feature to scan your code to identify (and even install) needed packages
 - ▶ Available *downloadrepo* command, **for those in offline environments**
- ▶ 2) In CF Admin, new “package manager” section on lower left
 - ▶ See its two pages, “Packages” and “Settings”
- ▶ 3) 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/cfsetup” folder, *cfsetup.bat* or *.sh*)
- ▶ Yes, is similar to Commandbox CFConfig module
 - ▶ No, not as powerful as it (can’t use it across multiple engines or versions)
 - ▶ But is valuable for what it does, and for use with CF2021 without adding anything
- ▶ Note that CF2021 Docker image has new importCFSettings to pull in json config
 - ▶ As alternative to its existing feature to use a CAR file to configure container
- ▶ New info: see my talk: “*Migrating or Comparing CF Admin Settings, between instances, versions, and engines*”
 - ▶ carehart.org/presentations/#migrating_admin

JSON-BASED ADMIN CONFIG - CFSETUP

15

- ▶ Was originally about writing AWS Lambda functions in CFML
 - ▶ See great CF Summit 2020 talk by Brian Klass
- ▶ Feature pulled days after CF2021 release
- ▶ New info: Returned to us in CF2021 update 2 (Sept 2021)
 - ▶ Now only allows CALLING AWS Lambda functions (in AWS supported languages)
 - ▶ See my blog post:
 - ▶ carehart.org/blog/2021/10/22/aws_lambda_support_in_coldfusion_2021_update_2
 - ▶ helpx.adobe.com/coldfusion/using/get-started-aws-lambda.html

SERVERLESS DEPLOYMENT, VIA AWS LAMBDA

16

- ▶ 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**
 - ▶ Disable detailed tracking, still high-level db, svc monitoring on PMT “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 PMT updates** (Settings>Server>Updates)
 - ▶ Like CF Admin updates, see option to enable auto-check on login
 - ▶ Also 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 is 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 the size and start twice as fast** as previous versions
- ▶ New environment variables for features mentioned previously
 - ▶ installModules and ImportModules
 - ▶ importCFSettings
 - ▶ And importCFSettingsPassphrase (if the json file is encrypted by CF)
- ▶ New info: still more new env vars, as of update 2 image
 - ▶ profile, deploymentType, allowedAdminIPList
- ▶ New info: CF images now available on Dockerhub, Amazon ECR
 - ▶ See my post:
 - ▶ coldfusion.adobe.com/2021/09/adobe-coldfusion-2021-docker-image-now-available-dockerhub/

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

OTHER ADMIN CHANGES: SUPPORT FOR CLOUD RDS DATABASES

- ▶ Maxmetaspace jvm arg removed from CF2021 by default (as I lobbied for)
 - ▶ carehart.org/blog/2020/2/24/solving_metaspace_errors
- ▶ 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
- ▶ Addition of SAML configuration in new pages under “Security” section
 - ▶ IDP Configuration, SP Configuration (SAML can be specified in application.cfc, instead)
- ▶ Addition of AWS ElastiCache, Azure Redis, as CF distributed caching options
 - ▶ CF Enterprise only (only “new” changed in CF2021 that is Ent-only, it seems)
- ▶ Addition of Azure Redis cache as CF session storage option
 - ▶ Ability to store CF sessions in Redis was added in CF2016
- ▶ New admin API features related to most of the new features mentioned

OTHER ADMIN CHANGES: MISC

- ▶ Time for “the shoe to drop”
- ▶ When you put in a CF2021 license, that will need to be “activated”
 - ▶ Over the internet
 - ▶ If 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)
- ▶ Activation does NOT apply to Development or Trial (no license needed)
- ▶ Let's move on to Developer features...

NEW ACTIVATION FEATURE

DEVELOPER FEATURES

24

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- ▶ Of course, can leverage all the cloud services, as well as...
- ▶ 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 CF Summit 2020 session from Rakshith 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
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- ▶ New info: these are some aspects of how CF and CFML have modernized over its 25 years
 - ▶ See my talk, "*ColdFusion at 25: more modern than most realize*"
 - ▶ carehart.org/presentations/#cf_at_25

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 script functions, for creating password hashes (where script adds more features) (were not in beta docs)
- ▶ Return type for cfquery and queryExecute (json/array, array, query)
 - ▶ And also (not documented originally): json/struct and struct
- ▶ 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

- ▶ Set time zone for all requests in Application.cfc
- ▶ New Application.cfc values for many of the new features added in CF2021
- ▶ CF2021 lets you literally create and execute Java within CFML
 - ▶ And adds support for implementing/extending Java Interfaces
 - ▶ CFML has supported 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
- ▶ ...and that's it for language enhancements

OTHER CFML ENHANCEMENTS

30

OTHER CONSIDERATIONS

- ▶ Just a few areas remain...
 - ▶ Deprecated/removed features
 - ▶ Compatibility issues
 - ▶ New info: Changes from CF2021 updates
 - ▶ And more

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/REMOVED 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
 - ▶ New info: Also, "What was new in CF 10, 11, and 2016 that you may have missed"
 - ▶ carehart.org/presentations#missed2016
- ▶ ...

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, that capitalized D was ignored and produces same result as d, day of month
 - ▶ But now, such code will return the **day of the year!**
- ▶ Example: `dateformat("11-23-20","MM-DD-YY")`
 - ▶ In 2018 and before, produces 11-23-2020
 - ▶ In 2021, produces instead 11-328-2020
- ▶ Available fix made available in late Nov 2020, then folded into CF2021 Update 1 (in Mar 2021)
 - ▶ Requires use JVM arg to revert behavior
 - ▶ `-Dcoldfusion.datemask.useDasdayofmonth=true`
- ▶ carehart.org/blog/2020/12/7/cf2021_hotfix_datemask_compatibility_issue

COMPATIBILITY/MIGRATION ISSUES (CONT.)

- ▶ Finally, for “trusted authentication” for CF DSN to SQL Server
 - ▶ Need to add new connectionstring value, AuthenticationMethod=ntlm
- ▶ New info: for more on migrating from CF2018, 2016, 11, or 10 to CF2021
 - ▶ See my talk, “*Migrating apps to ColdFusion 2021 from earlier versions*”
 - ▶ carehart.org/presentations/#cf2021_migration

COMPATIBILITY/MIGRATION ISSUES (CONT.)

- ▶ Came out in Mar 2021
 - ▶ Along with updates for CF2018 and 2016 (final one)
- ▶ Security fix, bug fixes, version support updates
 - ▶ RHEL 8.3, WildFly 23, Tomcat 9.0.43, PostgreSQL 13, Oracle 19c (2018), MS SQL Server 2019
- ▶ helpx.adobe.com/coldfusion/kb/coldfusion-2021-update-1.html

NEW INFO: CF2021 UPDATE 1

37

- ▶ Came out in Sep 2021
 - ▶ Along with updates for CF2018 in Sep 2021
- ▶ Also new CF installer, with updates 1 and 2 applied, updated jvm (11.0.10)
- ▶ Security fix, bug fixes, cfsetup updates, version support updates
 - ▶ macOS Big Sur (v11.0) and Tomcat 9.0.50
- ▶ helpx.adobe.com/coldfusion/kb/coldfusion-2021-update-2.html
- ▶ Beware query of queries bug, with fix: tracker.adobe.com/#/view/CF-4212383
- ▶ Mentioned also new Docker image env vars, as of update 2
 - ▶ profile, deploymentType, allowedAdminIPList

NEW INFO: CF2021 UPDATE 2

38

- ▶ See my blog posts on each JVM update since last Nov:
 - Updates available for Java 8 and 11 (and 17), Oct 2021
 - coldfusion.adobe.com/2021/10/updates-available-java-8-11-17-oct-2021
 - Updates available for Java 8 and 11, as of July 20, 2021
 - coldfusion.adobe.com/2021/07/java-updates-available-as-of-july-20-2021
 - Updates available for Java 8 and 11, as of Apr 2021
 - coldfusion.adobe.com/2021/04/java-updates-apr-2021
 - ColdFusion users should note and apply new Jan 2021 updates for Java 11 and Java 8
 - coldfusion.adobe.com/2021/01/coldfusion-users-note-apply-new-updates-java-11-java-8
- Also, a table of what Java versions can be used with what ColdFusion versions
 - coldfusion.adobe.com/2021/01/table-of-java-to-cf-versions

NEW INFO: JAVA UPDATES (SINCE LAST TALK)

- ▶ In my version of this talk at CF2020 Summit, I also covered:
 - ▶ Updates to underlying libraries' versions numbers
 - ▶ What's new in Standard vs Enterprise
 - ▶ Pricing, licensing, end of life/support
 - ▶ CF Builder 2021 plans (we're still awaiting that)
- ▶ In the interest of time, I've removed these from this version
 - ▶ See that 2020 talk for the details on these things
 - ▶ carehart.org/presentations/#cf2021gems

AS FOR REMAINING TOPICS...

40

- ▶ ColdFusion Security Code Analyzer now works with CF2021 Standard and Developer editions
 - ▶ coldfusion.adobe.com/2021/07/coldfusion-security-analyzer-works-with-standard-and-developer/
- ▶ ColdFusion 2021 Lockdown Guide available, since Dec 2020
 - ▶ coldfusion.adobe.com/2021/04/coldfusion-2021-lockdown-guide-available/
- ▶ Adobe CF certification now only US\$149, including many hours of training
 - ▶ coldfusion.adobe.com/2021/05/adobe-cf-certification-now-us149-including-many-hours-training/

OTHER NEW INFO, AND MY BLOG
POSTS ON EACH

- ▶ 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/how it may work for you
 - ▶ Or at least where things stand as of now
- ▶ Again, my contact info for follow-up:
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 - ▶ Slides: carehart.org/presentations

SUMMARY