COLDFUSION:
MORE MODERN THAN MOST REALIZE

Charlie Arehart, Independent Consultant

Server Troubleshooter

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Updated Jul 19, 2022

- ▸ Briefly: the most recent evolution, CF2021 (its modernizing features)
- ▸ Modernizing of CF and CFML over time (even many versions ago)
  - ▸ Developer features (updates to language, including cfscript and more)
  - ▸ Other CF aspects/features (deployment, security, monitoring, IDE support, more)
- ▸ Evolution in the CF community (tool-makers, learning and help resources, etc.)

TOPICS

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- Slides available online for you now or later:

  - *carehart.org/presentations*

- Videos of these Dev Week sessions should be online soon

  - *coldfusion.adobe.com/videos/*

LOGISTICS

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- I focus on CF server troubleshooting, as an independent consultant
  - Assist organizations of all sizes, experience levels
  - Work <u>remotely</u> 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! ☺

- And in fact, even this talk isn't "all about me" ☺ ….

ABOUT ME

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- "Modern Functional & Fluent CFML REST APIs"
- "Building apps with VueJS x ColdFusion APIs"
- "Learn DevOps: CI/CD and Pipelines with ColdFusion 2021"
- "A Sneak Peek into ColdFusion Builder on VSCode"
- "Enhance Your Web Pages with Alpine.js"
- "Improving Legacy Code while Retaining Your Sanity"
- "You handle the CRUD, let [cloud db's] handle the rest"
- "I Didn't Know S3 Could Do That!"
- And others

- …and yet still…

OTHER TALKS THIS WEEK ON "MODERN CF"

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- *"I haven't heard of CF since the millennium. Didn't know it's still used."*
  - **Just so sad!**

- *"I had to google what is ColdFusion to understand why someone would try to bring attention to it. So what I found is a proprietary system with an XML language."*
  - **XML? What?!**

- *"The problem with CF is not the language..., the problem is with the server. It just one gigantic Java monolith where, when one wants to use a couple of if statements, one gets 1GB of legacy Java dependencies loaded."*
  - **Not with CF2021!**

SOME TYPICAL PERSPECTIVES ON CF…

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- *"There's a huge "fake news" style of negative press surrounding CF that needs to be handled before this will turn around. Remember the adage -- if you tell a lie enough times, it becomes the truth."*

- *"Over the last five years it's matured a lot - if it wasn't for the Coldbox framework, CommandBox package manager, and Lucee on Docker I wouldn't be using it. But modern CF is pretty awesome, I think."*

- …and one more

BUT NOT ALL NEGATIVE…

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- *"When most folks think of ColdFusion, they think of the version they used in '05 with <cfdiv> and <cftable> and all that good stuff. Be serious. That legacy junk has been frowned upon for a long time. The real ColdFusion is a **JS-like syntax with full object-oriented functionality** coming straight from Java - **final and static functions, accessors**, etc - and **functional programming** features such as **threading, async and locking**. To me, that's what ColdFusion really is."*

- These quotes are from blog posts by Lucee fan Michael Born, and comments:
    - *dev.to/mikeborn/why-cf-3jal*
    - *dev.to/mikeborn/yes-coldfusion-is-unpopular-no-i-don-t-care-5f8c*

SOME RESPONSES (CONT)

KEY CF2021 MODERNIZATION FEATURES

No time to demo all these, and really they're <u>not</u> the main point of this talk

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

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

RICH CLOUD SUPPORT

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- Devops-oriented features
  - Optional smaller zip/Express installer (under 200 meg)
  - Available **package manager** (cfpm, letting you choose engine components)
  - Available **JSON-based configuration** (cfsetup)
  - CF2021 Docker containers (more in a bit) can leverage all 3 of the above
- Other features
  - **SAML** (single sign-on/ logout) support (configuring an IDP or SP)
  - MongoDB (noSQL) support
  - Addition of Azure Redis cache as CF session storage option
  - Addition of AWS Elasticache, Azure Redis, as CF distributed caching options
    - CF Enterprise only (only thing "new" in 2021 that is Ent-only)

OTHER FEATURES

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- Support for **parallel programming** 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, "==="
- Case-sensitive and ordered structs
- "**Destructuring assignment**" feature for structs, arrays
- Dynamic switch case
- …and much more!

LANGUAGE MODERNIZATION IN 2021

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- Each of these new features is well-documented!
- Can google the topics, or see links offered in these posts at time of release:
  - *carehart.org/blog/client/index.cfm/2020/11/10/the_many_new_and_improved_features_in_CF2021*
  - *community.adobe.com/t5/coldfusion/introducing-adobe-coldfusion-2021-release/m-p/11585468*
  - *helpx.adobe.com/coldfusion/cfml-reference/new-changed-functions-coldfusion-2021.html*
- See Adobe conference recordings of past year
  - "Modern Semantics Of ColdFusion 2021" (*video.tv.adobe.com/v/334883*)

- But maybe you're **not yet on CF2021**, or **don't have plans to be**
  - Am I saying you must move to CF2021 to benefit from "modern CFML"?...

FINDING OUT MORE ABOUT CF2021

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- ▶ Definitely not!
- ▶ CF and CFML have evolved with each release
  - ▶ Will chronicle some key aspects of modernizing CF/CFML in various releases
- ▶ Reminder of timeline of releases (the past 20 years)
  - ▶ CF2021, 2018, 2016
  - ▶ CF11 (2014), CF10 (2012)
  - ▶ CF9 (2009), CF8 (2007), CF7 (2005), CF6 (2002)
  - ▶ CF5 (2001) and before

CF EVOLUTION OVER THE RELEASES

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DEVELOPER-ORIENTED EVOLUTION

Several categories by which CFML has evolved!

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- ▶ CF4: initial release of cfscript
- ▶ CF8: increased support of cfscript
- ▶ CF9: **CFCs** could be **written entirely in cfscript** (no need for cfscript tag)
- ▶ CF11: complete support of **cfscript, for all tags**
- ▶ CF2018: **semi-colons** no longer required (still supported)
- ▶ **Don't miss cfscript.me** (from Pete Frietag)
  - ▶ Converts CF tags to cfscript, vice-versa, free and on a single page

CFSCRIPT EVOLUTION

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- CF9: **ternary** operator (?)
- CF11: **elvis** operator (?:)
- CF2016: **safe navigation** operator (?.)
- CF2018: **lambdas/fat arrow** functions (and in tags), **null** support
- CF2021: items listed earlier

LANGUAGE EVOLUTION (JUST SOME)

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- CF10: **closures**; **Array**Each/Filter, **Struct**Each/Filter, **List**Filter and more
- CF11:
  - **Map/Reduce** for arrays, structs, lists
  - **First-class functions**
- CF2016: map/reduce/each/filter for **queries**
- CF2018:
  - closures in tags
  - **array**some/every/splice; **struct**some/every; **query**some/every/slice/append/prepend & more
- CF2021: items listed earlier

FUNCTIONAL PROGRAMMING, CLOSURES, HIGHER-ORDER FUNCTIONS

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- CF7: **cfthread**

- CF2018: runAsync, **futures** (like **promises**)

- CF2021: **parallelism** option in various features

- Again, I realize demos would be awesome, but we're not half-done

  - We'd be here all morning!

  - Again, there are docs (often with demo code) for all these

THREADED/PARALLEL PROCESSING

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- CF11: **member functions** introduced
- CF2016: many new member functions
- CF2018:
  - More for arrays, queries, xml, numeric, date, async, more
  - **Chaining** of member functions
- CF2021: array push, pop, shift, unshift

MEMBER FUNCTION EVOLUTION

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- ▶ Forever we had structs (via **structnew**)
- ▶ CF8: **implicit notation** (**{...}**) syntax for creating structs (and arrays [...])
- ▶ CF10: use of **colon** for key/value **separator**
- ▶ CF2016 declaring **ordered/sorted** structs
- ▶ CF2021: declaring **casesensitive** and **ordered-casesensitive** structs

STRUCT EVOLUTION

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- CF8:
  - Added **serializeJson**, **deserializeJson**, isJson functions
  - added support of **returnformat** of CF methods **as json** (or plain or wddx)
  - As well as support of **returning json** from various tags, functions
- CF11: added support to serialize **queries** to JSON; and optional **useCustomSerializer**
- CF2016:
  - **serialization.structmetadata** property in application.cfc to declare **datatypes** for serialization
  - update 2 added **structSetMetadata()**
- CF2018: preservation of quoted **Booleans** and numbers as strings
- CF2021
  - **Returntype of json for cfquery** and queryExecute **(json/array)**, as well as **array**, **query**
    - And also **json/struct** and **struct** (not documented originally)

JSON EVOLUTION

- CF6: CFCs introduced
- CF8:
  - support for **interfaces**
  - added *onmissingmethod* (option to handle calls to a CFC for an undefined method)
- CF9:
  - Again, CFCs could be coded **entirely in script**
  - **implicit getters and setters**, via accessors="true"
  - support for *new* keyword to implicitly invoke CFCs
  - New *oncfcrequest* method in application.cfc (like onrequest, for CFC calls via http)
- CF10: **Implicit constructors** for CFCs, method chaining
- CF11: **invokeImplicitAccessor** property, for CFCs, including application.cfc

CFC EVOLUTION

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- CF2018
  - **Abstract** CFCs & Methods
  - **Subtyping/covariant** method return types
  - **Final** variables, methods, components
  - **Default** functions in **interface**
- CF2021
  - Support for **static fields and methods** for CFCs
  - **Iterator** support for CFCs
  - Property **shorthand** (creates keys with same name as those passed in)

CFC EVOLUTION (CONT.)

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- ▶ Forever we had application.cfm
- ▶ CF6: introduced **application.cfc**
- ▶ CF8:
  - ▶ application-level **mappings**
  - ▶ new **onmissingtemplate** handler
- ▶ CF10:
  - ▶ this.sessioncookie; this.authcookie
  - ▶ application-level java **class** loading
  - ▶ **onabort** method
  - ▶ **applicationGetMetadata** function
- ▶ CF11: app-level **datasource** definition
- ▶ …

APPLICATION.CFC/CFM EVOLUTION

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- CF2016: this.**searchImplicitScopes**, this.**passArrayByReference** options added

- CF2018: this.**enableNullSupport** option added

- CF2021: **this.timeZone** option added

  - along with many things related to new features discussed initially today

- To name just a few!

- More: *helpx.adobe.com/coldfusion/cfml-reference/application-cfc-reference/application-variables.html*

APPLICATION.CFC/CFM EVOLUTION

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OTHER FEATURE EVOLUTION

A few categories beyond CFML the language

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- ▸ Forever we've had installer
- ▸ CF6: **silent install**; optional **WAR file** deployment
- ▸ CF8: **CAR** file admin config **export/import**
- ▸ (2014: Ortus **CommandBox** released)
- ▸ Since CF2016: **Docker images** (more in a moment); **Amazon AMI**
- ▸ (2018: CommandBox **Cfconfig** module released
- ▸ CF2021: **zip installer** and cfinstall; **modular** deployment; json-based config (**cfsetup**)

DEPLOYMENT OPTIONS EVOLUTION

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- In 2018, **CF2016** and **CF2018** first offered as images, then **CF2021** in 2020
  - (Ortus also offers Commandbox Docker images for CF and Lucee)
  - Adobe images originally offered via bintray.com
    - Now offered via **dockerhub.com** and **Amazon ECR**
  - Adobe images offered admin **config via CAR fil**e, CFML script/**Admin API**
- 2018: InLeague published "CF Swarm" guide to CFML docker deployment
- 2021
  - Adobe images offer admin **config** via **json**/cfsetup; **support modules**/cfpm
- BTW: CF images can of course be deployed to Kubernetes, Cloud services, etc
  - Adobe images for each new update to supported CF versions

DOCKER SUPPORT EVOLUTION

- CF8:
  - **Developer Security Guidelines** (last updated in **CF11**)
  - initial **ColdFusion Lockdown Guide** (still updated in 2021)
- 2009: **Fuseguard**, **Hackmycf** released (from Foundeo)
- CF10
  - Many security features introduced into CFML and CF, for **XSS, CSRF, CRLF**, more
  - **Secure Profile**:
    - Option to make 20 admin settings most secure
- CF11: Secure profile causes cfhttp addtoken to default to "no"
- …

SECURITY EVOLUTION

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- CF11
  - **Anti-samy** support bundled, **isSafeHTML/getSafeHTML**
- CF2016
  - **Security Code Analyzer**
    - Introduced in 2016 originally for CF **Enterprise** only; now also for **Standard/Dev** in CF2021
  - **Samesite cookie** support (per update 15; CF2018 update 9)
  - CF **Admin no longer accessible via external web server**, by default
- CF2018
  - ▶ **Auto Lockdown tool**
- ▶ 2019: **Fixinator** released (from Foundeo, at fixinator.app)

SECURITY EVOLUTION (CONT.)

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- 2006: **FusionReactor**, **SeeFusion** released
- CF8: **ColdFusion Server Monitor** (for CF Enterprise-only)
- CF2018: ColdFusion **Performance Monitor Toolkit** (PMT, for CF Ent, Std, Dev)
  - Replaced CF Server Monitor

MONITORING EVOLUTION

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- ▸ CF5 had rudimentary command-line support
- ▸ CF2016: re-introduced more capable **CLI**, naming file to execute
  - ▸ CF Docker images also support CLI for execution of a single named file
- ▸ CF2018: introduced a true **REPL**
- ▸ (Commandbox has long offered a still more capable CLI and REPL)
  - ▸ for CF and Lucee

CLI EVOLUTION

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- Deprecation/obsoletion/retirement of features:
  - *helpx.adobe.com/coldfusion/deprecated-features.html*
- Underlying libraries updated each release
- Supported OS's, db servers, web servers updated each release, or in CF updates
- CF11 opened Enterprise features to Standard
  - Security Sandbox, CAR export/import, Multiple Admin users, HTML5 charts
- CF2016 added powerful API Manager (for CF Enterprise-only)

OTHER FEATURE EVOLUTION

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- 2010: **CFBuilder** released, replacing Dreamweaver, CF Studio, HomeSite
  - Based on Eclipse
- CFML **extensions** existed also for Sublime, NotePad++, IntelliJ, Atom, others
- 2015: VisualStudio Code (**VSCode**) released, gained traction quickly
  - Multiple CFML extensions created in years since
- 2021
  - Adobe announced plans to change CFBuilder from Eclipse to VSCode
  - Finally coming out this summer

IDE/EDITOR EVOLUTION

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- Enterprise integrations (databases, exchange)

- PDF generation and processing

- Websockets

- ORM/hibernate

- Caching (including support for Redis, elasticcache, memacached, ehcache, JCS)

- And much, much more

ALL THIS ON TOP OTHER CF FEATURES

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EVOLUTION IN THE CF COMMUNITY

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- Many have come and gone, **these still stand** and are ever-evolving:
  - Ortus: **CommandBox, ForgeBox, TestBox, WireBox, CacheBox**, and more
  - Foundeo (**Fixinator, Fuseguard, HackmyCF**, etc.)
  - Intergral (**FusionReactor, NerdVision**, etc.)
  - **Lucee** (open source CFML engine)
  - And more
- Also, a search for "coldfusion" at github returns over 2200 projects
  - With more than 300 showing update date of 2021 or greater

CF-ORIENTED TOOL MAKERS

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- Many have come and gone, but these still stand and are evolving:
  - ColdBox
  - CFWheels
  - Fw/1
  - And others
- And still other "kinds" of CFML frameworks
  - Taffy (REST), DI/1 (injection), etc.
- Several CMSs (CommonSpot, CONTENS, Contentbox, FarCry, Preside, and more)

FRAMEWORKS

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- CF docs (more than just the CFML Reference)
  - *coldfusion.adobe.com/2017/11/did-you-know-theres-far-more-to-the-cf-docs-than-just-the-cfml-reference*
- Cfdocs.org
- Learn Modern CFML in 100 Minutes (*modern-cfml.ortusbooks.com*)
- Learn cf in a week (*learncfinaweek.com*)
- Modernize or Die podcast (*cfmlnews.modernizeordie.io*)
- CF Alive podcast (*teratech.com/podcast/*)
- *cfcasts.com*
- CF Conferences: DevWeek, CFSummit, IntoTheBox, etc.
- …

LEARNING RESOURCES

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- See also *cffiddle.org*, *trycf.com* (online code testing tools for different CFML engines/versions)

- *akbarsait.com*, who lists the blog posts/resources about new features of **each CF release**

- Online ColdFusion Meetup (*coldfusionmeetup.com*)

- My "Hidden Gems" presentations on each release, at *carehart.org/presentations*

- And still others, indeed much more, at my site: *cf411.com*

LEARNING RESOURCES (CONT.)

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- ▶ Cf forums (*community.adobe.com*)
- ▶ CF portal (*coldfusion.adobe.com*)
- ▶ Cf slack (*cfml.slack.com*)
- ▶ Facebook CF Programmers group

- ▶ Finally, what about Adobe and the future of CF?

GETTING HELP

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- 5 releases in past 10 years
  - About 15-20 updates per release
  - Hundreds of bugs fixed over each release
  - Support cycle of 5 years per version
  - Next release already in planning state
- Resources they support:
  - CF Devweek, CF Summit conferences
  - Ongoing webinars (from Brian Sappey, Mark Takata, and others)
  - CF Portal, community forums
  - Certification program
  - Free install support, free trial, free developer edition

- Phew…just about done

ADOBE'S COMMITMENT TO CF

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- As for **finding developers**, help them see these options for using modern CFML
  - **They should find modern CFML more familiar than they'd likely expect!**
- As for **management buy-in**, help them see that CF need not be a dead-end
  - Refactoring does not have to presume "move off of CF"
  - Nor does cloud deployment/integration, as we have seen amply!

- One last reminder/plea/quiz…

WRAP-UP: MODERNIZING CF IN YOUR ORG

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- Closures
- Promises/futures
- Lambdas/fat arrow functions
- Functional programming
- Higher order functions
- Destructuring assignment

- Docker/container deployment

- Cloud service integration
- noSQL support
- SAML/Single-signon
- Json-based configuration
- Package management
- 140mb core engine
- CLI/REPL
- And more

ASK A CF SKEPTIC:
DOES CF SUPPORT...?

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- I welcome feedback, corrections, questions, challenges
- Again, my contact info for follow-up:
    - Charlie Arehart, charlie@carehart.org
    - @carehart (Tw, Fb, Li, Slack, Skype, GitHub)
    - Slides: carehart.org/presentations
- Adobe's DevWeek Gift card giveaway

THAT'S ALL, FOLKS!

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