HIDDEN GEMS IN COLDFUSION 2023

- ▶ Charlie Arehart, Independent Consultant
- ▶ CF Server Troubleshooter
- ▶ charlie@carehart.org
- ▶ @carehart (Slack, Github, X, Fb, Li, Skype, etc.)

- ▶ Updated Feb 15, 2024

- CF2023 released May 2023
  - Maybe not as much new as in past releases, but still plenty—and hidden gems
  - And plenty of resources to be aware of/look into further on your own
- Other sessions in the Online CF Summit will cover some topics in more detail
- Slides for this talk available online:
  - *carehart.org/presentations*

INTRO

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- ▶ Language/platform features

- ▶ Installation/deployment, admin/config, and monitoring

- ▶ Compatibility/migration issues

- ▶ Various other considerations/gems

TOPICS

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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, online calendar, etc at *carehart.org/consulting*
- But to be clear, I'm not selling anything in this session! ☺

ME.ABOUT()

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- Docs are substantial, and nearly all have demo code!
  - Adobe also offered blog posts at release
- Key resources pointing to still other resources on the new release
  - *helpx.adobe.com/coldfusion/using/whats-new.html*
  - *coldfusion.adobe.com/2023/05/coldfusion2023-release/*
  - *carehart.org/blog/2023/5/17/cf2023_released*
    - and I point there to the Adobe posts from launch day

FINDING MORE ABOUT CF2023

LANGUAGE/PLATFORM FEATURES

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- Query language to access data from APIs

- *helpx.adobe.com/coldfusion/using/graphql-coldfusion.html*

    - 36 pages of docs, including sample code

- Related new functions: GenerateGraphQLModels, GetGraphQLClient

- GraphQL **server** is planned for CF2025, for exposing YOUR APIs via graphQL

GRAPHQL CLIENT

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- Expanding on AWS and Azure service integration added in CF2021
  - Again, CF docs offer much sample code
  - And Google offers free tier (like AWS, Azure) to get started using/exploring things
- GCP **Pub/Sub messaging service** (like AWS SQS and Azure Service Bus)
  - *helpx.adobe.com/coldfusion/using/integrate-coldfusion-gcp-pubsub.html*
    - 50 pages of docs, including sample code!
  - CFSummit Online session tomorrow: "*ColdFusion + GCP*"
- **Firestore** (cloud implementation of FireBase, as nosql document db)
  - *helpx.adobe.com/coldfusion/using/integrate-coldfusion-gcp-firestore.html*
  - CFSummit Online session Feb 20: "*GCP Firestore & ColdFusion 2023: the NoSQL easy button*"
- Google **Cloud Storage APIs** (similar to AWS S3 and Azure blog storage)
  - *helpx.adobe.com/coldfusion/using/integrate-coldfusion-gcp-storage.html*

GOOGLE CLOUD PLATFORM (GCP) INTEGRATION

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- For those using CFHTMLtoPDF (and cfscript equivalent), <u>not</u> CFDOCUMENT
  - Based on new engine, PDFReactor (licensed by Adobe for use with CF, *pdfreactor.com*)
  - Supports HTML5, CSS3, JS, SVG. embedded audio/video
  - CFHTMLTOPDFITEM headers/footers now support any HTML elements (previously limited)
  - New engine enabled by default in CF2023 (admin setting discussed later)
- Supported on Windows, Linux, MacOS, Solaris
- Also adds new **conformance** attribute
  - Part of ISO spec for long-term document archival support
  - Supports values like "PDFA1a" as well as 1b, 2-3[a/b/u]
- *helpx.adobe.com/coldfusion/using/coldfusion-enhanced-pdf.html*

CFHTMLTOPDF ENGINE REPLACEMENT

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- Create and/or issue web tokens, or verify JWTs issued by other apps/api's
- *helpx.adobe.com/coldfusion/using/coldfusion-json-web-tokens.html*
- Supports JWT features like signatures, encryption (JWE)
  - As well as claims, headers and payloads
- New functions
  - CreateSignedJWT, CreateEncryptedJWT
  - VerifySignedJWT, VerifyEncryptedJWT

JSON WEB TOKENS/JWT

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- CF2023 also supports these two standards for **schema-based serialization**
  - Avro (developed originally for Hadoop/Big Data project)
  - Protobuf ("Protocol Buffers", developed originally by Google)
  - Both support simple and complex datatypes, see CF docs for more, and pros/cons
- *helpx.adobe.com/coldfusion/using/avro-protobuf-coldfusion.html*
- New CFML functions for these: [de]serialize[avro|protobuf]
  - New GCP PubSub integration especially can leverage these

AVRO AND PROTOBUF

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- CFIMAGE, image functions support new formats:
  - JPEG 2000, JPEG2000, PNM, RAW
    - In addition to CF2021 values of BMP,GIF,JPEG,JPG,PNG,TIF,TIFF,WBMP
  - As reported by GetReadableImageFormats, GetWriteableImageFormats
- New XmlClear, XmlDeleteAt, XmlHasChild, XmlUpdate functions
  - I found these 4 in comparing results of CF's getfunctionlist() function
  - They're not in CFML Reference functions TOC, but I found one of them documented:
    - *helpx.adobe.com/coldfusion/cfml-reference/coldfusion-functions/functions-t-z/xmlclear.html*
    - Has live example via cffiddle.org
    - Works also as member function *xmlobjects*.**clear()**

STILL OTHER THINGS I'VE DISCOVERED

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- Member functions can now be chained to struct/array literals
  - Had been raised (by Brad Wood in 2014!) as bug CF-3844972
  - Things like these hadn't worked in CF11-2021, but now do:
    - `writeDump( { foo:'bar' }.append( { bum:'baz' } ) );`
    - `writeDump( [ 'a', 'b' ].append( [ 'c', 'd' ], true ) );`
- Bug with queryfilter second arg (index) has been fixed
- There are others of seeming less-wide impact, see:
  - *helpx.adobe.com/coldfusion/release-note/coldfusion-2023-release-notes.html#bug-fixes*

CHANGES DOCUMENTED AS BUGS FIXED

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INSTALLATION/DEPLOYMENT, ADMIN/CONFIG, MONITORING

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- ▸ Optional feature, for one or more CF instances identified by group/environment
- ▸ Changes to any instance in group stored centrally, propagated to all in group
  - ▸ **Whether change is made via CF Admin, using Admin API, or using cfsetup CLI tool**
  - ▸ Changes in an **environment** can also be applied to another (such as after testing)
- ▸ CCS audits/monitors all changes, tracks **version history**, supports rollback
- ▸ Settings that are not synced
  - ▸ Datasources, Java/JVM settings; Scheduled tasks; settings involving paths/passwords
  - ▸ Still several dozen admin settings remain beyond those
- ▸ *helpx.adobe.com/coldfusion/using/central-config-server-coldfusion.html*
  - ▸ 12 pages if printed

CF "CENTRAL CONFIGURATION SERVICE" (CCS)

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- CCS is started from cfusion/bin (or [*instance*]/*bin*) of some "server" CF instance
  - ccs.bat (or .sh) CLI accepts various commands, including "startserver"
- CF instances can be configured to act as clients to that
  - Can "auto-discover" instances from "server" CF Admin (via multicast/udp)
  - Or can be added manually in that "server" admin or the server's CCS CLI
    - Each client has a "secret" that must be provided in order to be added
- Two sections on CCS page of Admin
  - Server section appears for instance where CCS was enabled, for managing it
  - Client section indicates details of whether/how instance is enabled to use CCS
    - Shows version history of tracked admin changes, when enabled

CCS (CONT.)

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- In server CF instance (where CCS was started):
  - a *ccstore* folder is created in its *bin* folder
    - Within that is a folder for the name of defined CCS "cluster" and "environment"
    - That holds folder names with numerically increasing numbers
      - Has any changed files made from any member instance (neo-*.xml, etc.)
      - Also json file, tracking specific change (named changes.txt)
  - a *lib/ccs* folder holding:
    - *server.properties:* port the server will listen on, environments it will support
    - *nodes.properties*: what nodes are using it as central config
- **Client** instance's *lib/ccs* folder has ccs.*properties*, pointing to central server
  - Offers such things as *excludeFiles* property to name files to exclude from sync'ing

CCS FILES AND FOLDERS

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- New options enabled on *Security>Administrator page*
  - Choose "*Separate username and password authentication*" at top of page
    - Then "*External Authentication*" at bottom (otherwise it's greyed out/not selectable)
- Then configure users via *Security>User Manager* page
  - Choosing "*External user*" option, naming user or group from SAML or LDAP resource
  - Need to have configured that resource, in IDP and SP config pages in admin
- *helpx.adobe.com/coldfusion/using/integrate-saml-ldap-coldfusion-administrator.html*
- …

SSO SAML AND LDAP CF ADMIN LOGIN

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- SAML/LDAP options do not apply for RDS login users

- Using multiple users for CF Admin/RDS has been supported for decades

  - See my 2009 article on the feature:

    - *web.archive.org/web/20170307030754/http://www.adobe.com/devnet/coldfusion/articles/admin_multiusers.html*

- SAML/LDAP admin login can also be controlled via CFSETUP or Admin API

  - See docs for details on cfsetup commands, admin api methods

  - More on cfsetup a bit later

SSO SAML AND LDAP CF ADMIN LOGIN (CONT.)

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- New option, **"Is SSL Enabled", for *Cache>Redis Cache Settings***

- **Support for GCP features** added

  - in *Data & services>Cloud Credentials* and *>Cloud Configuration*

- New **CF2023 PDF engine** setting on *Data & services> PDF Service*

  - Default is "2.0"

- Some admin/install/config-related items in bugs fixed page:

  - *helpx.adobe.com/coldfusion/release-note/coldfusion-2023-release-notes.html#bug-fixes*

  - See also "Known Issues" on that same page

OTHER ADMIN CHANGES

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- As always, CF2023 offers multiple installation/deployment options
  - Full/GUI installer (with optional silent install)
    - *helpx.adobe.com/coldfusion/installing/installing-the-server-configuration.html*
  - Zip installer option (was new for CF2021, also with optional silent install)
    - *helpx.adobe.com/coldfusion/user-guide.html/coldfusion/using/install-coldfusion-2021.ug.html*
  - JEE/WAR deployment
    - *helpx.adobe.com/coldfusion/installing/installing-the-jee-configuration.html*
  - Commandbox: adobe@2023
  - As well as …

INSTALLATION/DEPLOYMENT

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- Docker/container deployment (2023 images available)

  - *helpx.adobe.com/coldfusion/using/docker-images-coldfusion.html*

  - *carehart.org/presentations/#cf_docker_images_evolving*

  - I've not found any new config options for CF2023 docker images

- AWS AMI's for CF2023 (for Windows, Linux)

  - *aws.amazon.com/marketplace/search/results?searchTerms=coldfusion*

- Azure VMI's (VM Images) for CF2023 (for Windows, Redhat, Ubuntu, AlmaLinux)

  - *azuremarketplace.microsoft.com/en-us/marketplace/apps?search=coldfusion*

- GCP images are in the works

INSTALLATION/DEPLOYMENT (CONT.)

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- **Performance Monitoring Toolset**
  - PMT, added in CF2018, works w/ 2018-2023
  - *helpx.adobe.com/coldfusion/performance-monitoring-toolset/overview-coldfusion-performance-monitoring-toolset.html*
- **2023 version changes**
  - Monitoring of GCP Storage, Firestore, and PubSub features
  - Upgrade to underlying ElasticSearch engine from 5 to 8
    - Datastore takes less space, has improved performance
  - New TLS/SSL and Authentication for PMT with its ElasticSearch datastore
  - *helpx.adobe.com/coldfusion/performance-monitoring-toolset/configure-tls-ssl-performance-monitoring-toolset.html*

PMT CHANGES

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- CF Admin log display feature returned

- CF Windows installer now sets up Start menu for "all users", not just installing user!

SOME OTHER ADMIN HIDDEN GEMS

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COMPATIBILITY/MIGRATION ISSUES

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- Not aware of any migration issues to CF2023…from CF2021
  - But as with each version, issues exist if **skipping** from CF2018, 2016, or earlier
- I've discussed these more in my "hidden gems" talks for each past CF version
  - As well as my talk, "*Migrating apps to ColdFusion 2023 from earlier versions*"
  - Consider also "*Migrating or Comparing CF Admin Settings, between instances/versions/engines*"
- Recordings and PDF slides for all these are at carehart.org/presentations

COMPATIBILITY/MIGRATION ISSUES

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- CF2021 changed meaning of dateformat() function's capital-D format value
  - Used to mean same as lower-case d: day of month
    - Starting with CF2021, now means day of year!
  - Also affects datetimeformat()
  - To revert behavior, use CF startup jvm arg:
    `-Dcoldfusion.datemask.useDasdayofmonth=true`
  - Again, see my migration talk for more, as well as CF Docs on dateformat

OTHER ISSUES IF SKIPPING CF2021

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- New **modular design** reduces size (of zip, container) to ~ 150mb!
  - Implements "core" package/engine by default
  - New **CFPM** cli tool (or Admin UI page or docker env vars) can add/remove packages
  - *helpx.adobe.com/coldfusion/user-guide.html/coldfusion/using/coldfusion-package-manager.ug.html*
  - *carehart.org/presentations/#cfpm*
- New **CFSETUP** cli tool (in CF "config" folder) to manage admin settings
  - Including export/import to json, which can be imported via env var into container
  - *helpx.adobe.com/coldfusion/using/cfsetup-configuration-tool.html*
  - *carehart.org/presentations/#cfsetup_tool*
- **Activation** (added in CF2021) still required when licensing CF2023
  - *helpx.adobe.com/coldfusion/using/coldfusion-licensing-activation.html*

CHANGES IN 2021, TO NOTE FOR 2023

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OTHER CONSIDERATIONS/GEMS

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- CF2023 comes with Java 17.0.6 (latest as of Jan 2024 is 17.0.10)
  - *carehart.org/blog/2024/1/16/java_updates_jan_2024*
- CF2021 and 2018 ran on Java 11 (CF2016 ran first on Java 8 and later on 11)
  - Java 17 came out in late 2021, but CF has not supported it (or 12-16) until CF2023
  - (Perhaps a future CF2021 update will bring Java 17 support)
- Java 17 of course includes changes introduced in Java 12-16
  - Not to be confused with java 11 updates (currently 11.0.18, or 11.0.17, etc)
- Most JVM changes benefit only Java developers who change their code
  - Some may eventually accrue to us as Adobe leverages them
  - Or we can leverage java within cfml via cfobject/createobject, cfjava (cf2021+)
- I want to talk about just a few config things that might benefit some now…

JAVA UPDATED TO 17

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- GC changes:
  - **CMS (ConcMarkSweep)** <u>removed</u> in Java 14
  - **ZGC** and **Shendoah** added as prod-ready in Java 14/15
  - CF still configures **ParallelGC** as default (while Java 17 would default to **G1GC**)
- CDS (Class Data Sharing) Archives enabled in Java 12, enhanced in 13
- More informative error messages on null pointer exceptions (NPEs)
- Java Security Manager has NOT been removed (only deprecated)
  - <u>Is</u> used by CF Sandbox Security feature, so time will tell on its future

ADMIN/CONFIG BENEFITS OF JAVA 17

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- CF2023 (server deployment) came originally atop Tomcat 9.0.72
  - Updated to 9.0.78 as of Oct 2023 CF updates: CF2023 u5, CF2021 u11
  - Not the very latest, which is 9.0.85 from Jan 2024

TOMCAT UPDATED TO 9.0.72

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- Nothing in the CF deprecated features page refers to CF2023
    - Those coming from CF2018 or earlier should look for changes in cf2021, etc
- *helpx.adobe.com/coldfusion/deprecated-features.html*

DEPRECATIONS

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- No changes in pricing since CF2021

  - Nor any changes in differences between Standard and Enterprise

- As for EULA, which is in root of CF folder as *license.html:*

  - CF2021 defined "computer" this way:

    - "Computer" means a virtual machine or physical electronic device that accepts information in digital or similar form and manipulates it for a specific result based on a sequence of instructions, that conforms to the system requirements of the Software as specified in the Documentation.

  - CF2023 changes to (emphasis mine):

    - "Computer" means a virtual or physical device *for storing or processing data, such as servers, desktop computers, laptops, mobile devices and hardware products*. **Where a device contains more than one virtual environment (including Virtual Machines and virtual processors), each virtual environment will be counted as a separate Computer.**

  - "Backup and Disaster Recovery" section now covers Failover as well

PRICING, LICENSING, ETC.

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- When does public support (providing updates) end, for each recent version?
  - For CF2023, in May 2028
  - For CF2021, in Nov 2025
  - For CF2018, ended in July 2023
  - For CF2016, ended in 2021
  - For CF11, ended in 2019
- *helpx.adobe.com/support/programs/eol-matrix.html*
- *carehart.org/blog/2023/1/26/coldfusion2018_end_of_life_july_2023*

END OF LIFE/SUPPORT OF VERSIONS

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- ▸ ICMY: did you know there's a VSCode-based version of CFBuilder? That's <u>free</u>?
  - ▸ Released in July 2022, in extensions marketplace as **Adobe ColdFusion Builder**
  - ▸ Prior Eclipse-based versions of Adobe CFBuilder are no longer updated
    - ▸ *helpx.adobe.com/coldfusion/coldfusion-builder-extension-for-visual-studio-code/get-started-coldfusion-builder-extension-visual-studio-code.html*
- ▸ Updated version supports CF2023, new tags/attributes, functions, statements
  - ▸ Updatable within VS Code Extensions pane
  - ▸ Current version v1.0.507 (from Jan 2024)
    - ▸ *helpx.adobe.com/coldfusion/coldfusion-builder-extension-for-visual-studio-code/release-notes-coldfusion-builder-extension-vs-code-update.html*

CFBUILDER 2023 IMPROVEMENTS

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- There have been 6 updates as of Nov 2023
  - Most have been security updates, addressing essentially different aspects of one issue
    - Fourth update (in August) addresses the issue in a more complete way
    - This was also offered only for CF2021 but NOT CF2018, with its EOL in July
  - Oct 2023 update had bug fixes (for CF2023 and CF2021)
- New installers offered in Oct 2023 for CF2023, includes update 5

- Finally, let's wrap up with quick overview of library and version support info…

COLDFUSION 2023 UPDATES OFFERED SINCE INITIAL RELEASE

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- Antisamy 1.5.13 (OWASP security library)
- Avro 1.11.1 and Protobuf 3.21.5
- Axis 2 1.2.1(web services library)
- Ckeditor 4.19 (underlies cftextarea)
- Ehcache 2.10.3 (caching library)
- ElasticSearch **7.17.5** (new caching option)
- Ext JS **7.6.0.41** (JS library underlying various UI tags)
- Esapi **2.5.1.0** (OWASP Enterprise Security API)
- Hibernate **5.6.11** (ORM library)
- Httpclient 4.5.9 (underlies CFHTTP and more)
- Java **17.0.6** (the JVM which underlies CF)
- Jedis **4.3.1** (underlies Redis caching)

- Jetty **9.4.51** (underlies Solr and PDFg)
- jQuery **3.6** and jQuery UI **1.13.1** (JS library underliying various UI tags and Admin interface features)
- Log4j 2.17.2
- Lucene **8.11.1** (underlies Solr search engine in CF)
- PDFReactor **11.4** (new cfhtmltopdf engine)
- POI 4.1.2 (underlies MS Office Integration features)
- Quartz **2.4.0** (underlies schedules tasks)
- Solr **8.11.2** (embedded search engine for cfsearch)
- Tomcat **9.0.72** (app server underlying CF, when deployed in traditional "Server" configuration)
- ZingChart **2.9** (underlies cfchart)

Per <u>original</u> CF2023 release: and bolded values are upgrades since CF2023 <u>latest</u> update

UPDATES TO SOME UNDERLYING LIBRARIES' VERSIONS NUMBERS

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- FORMAL support for "older" DBs dropped, though they may still work fine
- MS SQL Server v2022, v2019
- MySQL 8
- PostgreSQL 14
- Apache Derby 10.11
- And as provided in in CF Enterprise only:
  - IBM DB2 11.x
  - Oracle 19c (LTS)
- *helpx.adobe.com/pdf/coldfusion2023-suport-matrix.pdf*
- See that for version support on DB-as-a-service: Azure, AWS, GCP

DATABASE VERSIONS SUPPORTED

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- Again, what's FORMALLY supported as of CF2023

- Windows Server 2022/2019/2016 (Datacenter, Standard, Essentials)

- Windows 11/10 (Home, Pro, Enterprise)

- MacOS 13.x x64/ARM64 (Ventura)

  - Before launching CF installer dmg, run "xattr -rc" command against it

- Red Hat Enterprise Linux 9.1 & later

- Ubuntu 22

- SUSE 15.3 & later

- Solaris 11.4

OPERATING SYSTEMS SUPPORTED

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- IIS 10
- Apache 2.4.56 & later
- JEE App servers
  - WebLogic 14.1.1 & later
  - WebSphere 9.0.5.4 & later
  - Tomcat 9.0.72 & later
  - JBoss EAP 7.4
  - WildFly 26.1.3 & later

OTHER SUPPORTED VERSIONS

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- So, lots of changes, beyond just the major features Adobe may highlight
- Hope you may be more motivated—and informed—to consider CF2023
- Again, my contact info for follow-up:
  - Charlie Arehart
  - charlie@carehart.org
  - @carehart (Slack, Github, X, Fb, Li, Skype, etc.)
  - Slides: carehart.org/presentations
- Time for questions?

SUMMARY

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