# HIDDEN GEMS IN COLDFUSION 2021



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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

#### ▶ 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

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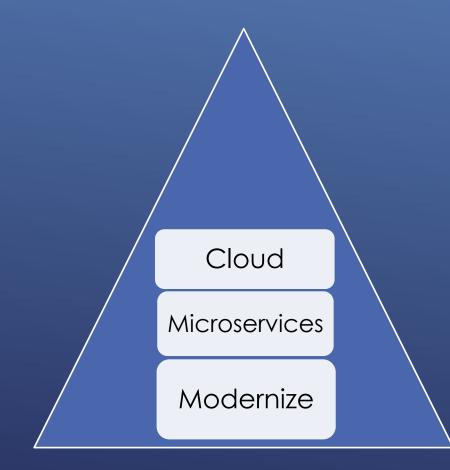
- See the few HUNDRED pages of docs for CF2021
  - ► During prerelease, was a single PDF
    - Now folded into online docs
  - ▶ The docs are substantial, and nearly all have demo code!
- See posts from me and Adobe listing links to docs
  - carehart.org/blog/client/index.cfm/2020/11/10/
  - community.adobe.com/t5/coldfusion/introducing-adobe-coldfusion-2021-release/td-p/11585468
  - helpx.adobe.com/coldfusion/user-guide.html/coldfusion/using/whats-new.ug.html
- 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 <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! ☺

## ABOUT ME



## 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 CLI admin configuration and json export/import (cfsetup)
- Serverless deployment, via AWS Lambda
- Improvements to PMT (monitor)
- Improved Docker and WAR deployment

## MOVES SUPPORTING DEVOPS



- SAML (single sign-on/ logout) support (configuring an IDP or SP)
- MongoDB (noSQL) support
- Many new language features, and enhanced functions/script/tags
- ► And more
- ► CF Summit 2020 presenters talked about major features, for those wanting more
  - 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



#### 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

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

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- ▶ 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-packagemanager.ug.html
- ► Optional packages can be installed...

# MODULAR DESIGN, SMALLER "CORE" ENGINE

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- 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

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- ► Feature pulled days after release, seemingly about licensing issues
  - Expected to return at some point
- ► See great CF Summit 2020 talk by Brian Klass
  - Discussion and demos, 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

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- 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 behavor)
  - "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

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- 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

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- 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 mentioned previously
  - installModules and ImportModules
  - importCFSettings
  - And importCFSettingsPassphrase (if the json file is encrypted by CF)

# IMPROVED CF DOCKER IMAGES



- ► 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

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- 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
- Maxmetaspace jvm arg removed from CF2021 by default (as I lobbied for)
  - carehart.org/blog/client/index.cfm/2020/2/24/solving\_metaspace\_errors

# 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



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

# DON'T FORGET MAJOR FEATURES



- 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



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

# CORE LANGUAGE CHANGES (CONT.)

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► 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/

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- 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)
  - 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



#### 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

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#### ► 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 compatissues 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



- 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
- ► Available fix made available in late Nov 2020, then folded into CF2021 Update 1 (in Mar 2021)
- Example: bit.ly/3m3sLdR
- carehart.org/blog/client/index.cfm/2020/11/24/breaking\_change\_in\_cf2021\_dateformat\_D\_vs\_d
- carehart.org/blog/client/index.cfm/2020/12/7/cf2021\_hotfix\_datemask\_compatibility\_issue

# COMPATIBILITY/MIGRATION ISSUES (CONT.)



#### ► For "trusted authentication" for CF DSN to SQL Server

Need to add new connectionstring value, AuthenticationMethod=ntlm

# COMPATIBILITY/MIGRATION ISSUES (CONT.)



- Antisamy 1.5.7 (OWASP security library)
- Axis 2 1.7.0 (web services library)
- Derby 10.15 (embedded DB)
- Ehcache 2.10.3 (caching library)
- Elasticache 5.6.16 (new caching option)
- Ext JS 6.6.0.258 (JS library underlying various UI tags)
- Esapi 2.2.1.1 (OWASP Enterprise Security API)
- Hibernate 5.2.11 (ORM library)
- Httpclient 4.5.9 (underlies CFHTTP and more)
- Java 11.0.1 (the JVM which underlies CF)
- ► JDBC Drivers 5.1 (the built-in Progress DB drivers, such as for SQL Server, Oracle, etc.)

- Jedis 2.9.0 (underlies Redis caching)
- 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)
- PostgreSQL 42.2.14 (db driver)
- Quartz 2.2.1 (underlies schedules tasks)
- 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)
- Zingcharts 2.8.4/2.8.6 (underlies cfchart)

See carehart.org/blog/client/index.cfm/2021/1/3/what\_are\_cf2021\_embedded\_library\_version\_numbers

#### UPDATES TO SOME UNDERLYING LIBRARIES' VERSIONS NUMBERS

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- Version numbers of the commercial Progress JDBC Drivers included with CF:
  - ▶ Note: this is **not** about the VERSION OF THE DB supported, just the JDBC driver version
  - DB2 Driver: 5.1.4.000278 (F000432.U000208)
  - MySQL Driver: 5.1.4.000223 (F000438.U000209)
  - Oracle driver: 6.0.0.000264 (F000695.U000370)
  - SequeLink (Access/ODBC) Driver: 6.0.006707
  - SQLServer Driver: 6.0.0.000367 (F000702.U000374)
  - Sybase Driver: 5.1.4.000120 (F000411.U000196)
- ► Postgres driver version: 42.2
- Note that CF no longer includes a MySQL community driver

These are as of the initial release of CF2021, and may change with CF updates

UPDATES TO SOME UNDERLYING LIBRARIES' VERSIONS NUMBERS (CONT)

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- ► Apache Derby 10.11
- ▶ MS SQL Server v2014, v2016, v2017, v2019
- ▶ MySQL 5.7 and 8
- ► PostgreSQL11
- ► And in CF Enteprise only:
  - ► IBM DB2 11.x
  - Oracle 12c, 18c, 19c (including RAC support)
  - Sybase Adaptive Server Enterprise 16
- Again, at least at initial release, and as documented (per updates) here:
  - helpx.adobe.com/pdf/coldfusion2021-support-matrix.pdf
- ► Correction: SQL Server 2019 IS supported. See Adobe comment here:
  - community.adobe.com/t5/coldfusion/introducing-adobe-coldfusion-2021-release/mp/11591120#M186905

## DATABASE VERSIONS SUPPORTED



- ► Windows Server 2019
- Windows Server 2016 (Datacenter, Standard, Essentials)
- ► Windows Server 2012 R2
- Windows 10 (Home, Pro, Enterprise)
- ► Mac 10.15.x
- ▶ Red Hat Enterprise Linux 8.x
- ► Ubuntu 20.04
- ► CentOS 8.x
- ► SUSE 12.X
- ► Solaris 11.4
- ► Again, at least at initial release, and as documented (per updates) here:
  - helpx.adobe.com/pdf/coldfusion2021-support-matrix.pdf

#### OPERATING SYSTEMS SUPPORTED



- ► IIS 10, 8.5
- ► Apache 2.4.x
- ► Oracle Java 11
- ► JEE App servers
  - ► WebLogic 14c
  - ► WebSphere 9.0.5.x
  - ► Tomcat 9.0.x
  - ► WildFly 20.x
  - ► JBoss EAP 7.3 and later versions
- ► Again, at least at initial release, and as documented (per updates) here:
  - helpx.adobe.com/pdf/coldfusion2021-support-matrix.pdf

# OTHER SUPPORTED VERSIONS



- ► 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: <u>I am NOT saying this is the ONLY difference</u> between CF2021 Standard and Enterprise
  - ▶ I'm saying this is the only thing <u>ADDED</u> in 2021 that <u>IS</u> 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



- 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?





- ▶ 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 with CF2016
    - blogs.coldfusion.com/post.cfm/adobe-coldfusion-backward-licensing
    - if CF2016 bought from a reseller, that COULD be backward-licensed

## WHAT IF YOU STILL WANT CF2018?



#### 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



- ► 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

#### Came out along with updates for CF2018 and 2016 (final one) in Mar 2021

- Security fix, bug fixes, support for updated DB servers/app servers
- helpx.adobe.com/coldfusion/kb/coldfusion-2021-update-1.html

#### CF2021 UPDATE 1 RELEASED



- ► 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