HIDDEN GEMS IN COLDFUSION 2018

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First up, hidden gems in many areas:
- Installation, administration, configuration, and security
- Performance improvements, and new monitoring tool (PMT)
- 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 CFBUILDER 2018

Wrapping up with what’s changed per recent CF2018 updates
So much more than just “what’s new in CF2018”
So much to cover in this session
  - Will be just quick discussion of each point, with pointers to much more info
  - Just want you to be aware of the opps and issues, to look into later

Slides available online for you now or later:
  - carehart.org/presentations
  - I also provide there a document with links for more info on every topic in preso

I’ve also created blog posts with more info on nearly every point
  - See my links doc for the URLs
  - Currently 5 parts, from admin to language changes. 3 remaining parts planned
At CF2018 launch, Adobe offered several **blog posts**
- See my post listing them just after launch, offered in links document

Also, several CF Summit sessions by Adobe on CF2018
- They go into MUCH more depth on many of the topics I’ll only mention
- **Slides available** for most of their presentations. See my links docs

And of course the **CF docs, release notes, what's new** go into things in more detail
- Again, see my links document for links to all these
- From now on, I won’t repeat that point each slide (but will at various points, for late-comers)
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! 😊
MAJOR FEATURES OF CF2018

- PMT
- Auto Lockdown
- CFML language
- Security
- Performance
SOME LESS NOTED FEATURES

- New UI for CF Admin
- Command-line REPL
- REST Playground
- New caching engines
- New language features, and more
  - Not so much "hidden", but might be missed by many
    - Will cover these and so much more
INSTALLATION, ADMINISTRATION, CONFIGURATION, SECURITY
CF2018 no longer offers 32-bit CF installer
Curiously, CF installer no longer offers web server integration step
  Must instead run CF “web server configuration tool” yourself (more in a moment)
First hidden gem: a new CF2018 installer was released in Feb 2019
  More on this later
Have you seen the CF 2018 Admin yet? Changed menu layout

Hidden Gem

ADMINISTRATOR CHANGES
CF Admin “Caching” page offers new options

- Hidden gem:
  - JCS settings in Admin offers option to store to database
  - Can also configure caching engine at app-level, overriding admin default

NEW CACHING OPTIONS
- Wsconfig UI enhancements in CF2018

- Related: CF2018 PMT adds new connector **auto-tuning** (more on PMT later)
CF2018 was released with Java 10 (previous CF releases came Java 8 or earlier)

- Support for **Java 11 was added in CF2018 Update 2**, in Feb 2019 (more later)
  - Also added for CF2016, per its update 8 or later
  - CF11 was not changed to support Java 11

- As a reminder, I have a page with links to more info on all topics in preso
  - Available, along with these slides, at carehart.org/presentations
CF has long had a lockdown guide
  ▪ CF2018 adds new (optional) auto-lockdown tool
  ▪ Available for Windows and Linux, and IIS or Apache
    ▪ And for macOS as of CF2018 Update 2
  ▪ Note: CF2018 autolockdown guide walks through using auto-lockdown tool
  ▪ See my links doc for docs, guide, tool download, more
  ▪ ...

SECURITY: NEW AUTO LOCKDOWN TOOL
Hidden gems regarding Auto Lockdown tool:

- Offers **rollback** and **uninstall** features, as well as **logs**
  - After running the tool, see [CF Home]\lockdown\ for logs and more
  - Uninstall at [CF Home]\lockdown\[Instance locked down]\Uninstall
- Also offers **silent install** option
Previously could do only in CF_SCHEDULE
Related changes for CF_SCHEDULE

Maybe you’re not an administrator, or don’t install/configure CF often

The next several sections may appeal more to developers 😊

PAUSING SCHEDULED TASKS, FINALLY
PERFORMANCE IMPROVEMENTS, AND NEW MONITORING TOOL (PMT)
CF2018 offers several performance improvements

- See CF2018 Performance Whitepaper, and my part 3 blog post for more
- New monitoring solution for CF2018
  - Substantial tool, really worthy of an entire talk, indeed multiple talks
  - Screen below is just one of dozens, covering many things
  - See my links doc for MUCH more: downloading, configuring, launching, using
DEVELOPER FEATURES
CF2016 had added new command-line interface (CLI)
  - Accessed using cf.bat or cf.sh in cfusion/bin folder, pointing to a file
CF2018 adds true REPL (read-eval-print-loop)
  - Use cfscript at command line (started via same cf.bat / .sh)
CF does not even need to be running
Output gets auto-printed to the console when typing...
  - an assignment, a function, or an expression evaluating to some value
Consider also Commandbox (open source CF CLI, REPL and more)
On topic of “trying out” code easily, consider Adobe’s CFFiddle.org site
  - Can choose to run CF2018 or CF2016; save scripts to share with others, and more
  - Useful way to get started with “trying out” CF2018, without installing it
  - Updated last year to no longer require login
  - CF docs are being enhanced to leverage this for “live docs”
  - Consider also a long-existing similar service: trycf.com
Somewhat along the same lines…

The CF2018 REST playground is a new way to work with CF REST services

- Web app bundled with CF Admin, to help visualize, test, and debug them
- Works with all REST apps registered to CF, and can be used to add REST apps to CF
- Can be launched from CF Admin “REST Services” page
  - Or via URL as <hostname>:<port>/restplay (via CF's built-in web server only)
  - Does require “developer profile" feature (added in CF2016) to be enabled
Finally, still another way to facilitate development with CF: Docker images

- If you didn’t know, Adobe has released Docker images since CF2016
- They’ve been updated for CF2018 (and with each of its updates)

Let’s move on to language feature gems
LANGUAGE CHANGES
SEVERAL CATEGORIES

- New language features
- New OO language features
- New CFML functions
- New member functions
- Changed language features

- Many of these were covered in keynote, other sessions here
  - So I will just list them, not demonstrate each of them
  - Again, see my links document (with slides at carehart.org/presentations)
NEW LANGUAGE FEATURES

- Null support (can be optionally enabled)
- Async feature
- Enhanced support for new operator (for CFCs, Java, web svcs, more)
- Semi-colon optional
- Named parameters
- Closures in tags (previously only in script)
NEW OO LANGUAGE FEATURES

- Abstract CFCs & Methods
- Subtyping/covariant method return types
- Final variables, methods, components
- Default functions in interface
NEW CFML FUNCTIONS

- ArrayFirst, ArrayLast
- QueryDeleteColumn, QueryDeleteRow
- CacheGetEngineProperties
- RunAsync
- StructIsOrdered
NEW MEMBER FUNCTIONS

- Too many to list, but new functions for:
  - query objects
  - array objects
  - xml objects
  - async objects
  - numeric objects
  - date objects
  - As well as changes to some existing member functions
Member functions can now be chained

Arrays can be sliced

New control for CF’s auto-return of generated primary keys
  - Previously controllable only at DSN level, now at code level
  - `cfquery` attribute `disableAutoGenKeys`
  - `queryexecute`, via `disableAutoGenKeys` in `queryOptions` struct

`cfchart` adds support for responsive client-side charts
  - Can specify height and width in percentages

...
Array and string enhancements
  - Typed arrays
  - Array negative indexes
  - Array slices
  - Member functions now supported for string literals

Datatype preservation: inferred at compile time, rather than runtime
  - New jvm arg to disable that

Developers can of course leverage the new caching options discussed previously in Admin gems

...and that’s it for language enhancements
COMPATIBILITY ISSUES
See:

- helpx.adobe.com/coldfusion/deprecated-features.html

Lists some features as **deprecated** (still exist, but should not be used)
- Most are things rarely used by most anymore (COM, DCOM, etc.)

Does deprecate older cfc-based approaches to script tag equivalents
- CF11 introduced a new more standard way to call any tag as script

Also concept there of “**unsupported**” or “**removed**”
- Only thing “removed” in CF2018 is old CF Enterprise Server Monitor

New concept: "**retired**" (feature **not enabled by default**)
- Some may be things rarely used by most (flash remoting, flash-based UI elements, xml forms, blazeds, lcds, AIR, CF actionscript functions, CORBA, portlets, etc.)
- Some you may use: UI tags (more on that in a moment)

...
Page also lists things as “removed since 11”, which worked in 2016, but no longer do

- `cfschedule’s timeout` attribute (used in creating a new task)
  - can add `cfsetting requesttimeout` to page being called (if under your control)
- `cfcache’s cachedirectory` and `timeout` attributes
- `cfcollection’s map` and `repair` values for `action` attribute
- `cferror’s monitor` and `option` values for `type` attribute
- And more
Among things listed as “retired” are UI tags based on YUI javascript library

- Includes these tags:
  - cfmenu, cftree, cftooltip, cfcalendar, cfinput (autosuggest attribute), cfinput (sourcetootlip attribute)

- These will not work out of the box with 2018, but you can “enable” them
  - was also true as of CF2016 update 3 and per installer starting in Dec 2016

To re-enable these, you just copy needed YUI library files back into CF

- See bottom of deprecated features page

Note: some compat-related things are NOT documented there...
Watch out: newly **reserved words** *(discussed on another page in docs)*
- As part of the new OO support: **abstract**, **function** and **final**
- And **null**, if null support enabled

If you have code using those as variables, etc., will have conflicts/errors
- You may think you don’t use these, but frameworks might
- ColdSpring does use both abstract and function as variables (as in coldspring\aop\framework\AopProxyUtils.cfc)

You must carefully find and replace those variable names, properties
- May not want to do global replace, as you may have text that shouldn’t be replaced
- Could just run through code and fix those which get errors, but that’s risky, too

Potential trap…
Also, though not listed on those pages, I found also that:

- `cfqueryparam/cfproccparam` fail if undocumented `cfsqltype` abbreviation used
  - `CF_SQL_int` should instead be `CF_SQL_integer`
  - `CF_SQL_DateTime` should be `CF_SQL_date`, `_time`, or `_timestamp`
  - `CF_SQL_Num` should be `CF_SQL_Numeric`
  - And so on

- `cfsocialplugin` failed if width attribute specified

Beware: CF2018 changed caching so that region names are app-specific

- Could also lead CF2018 to use more heap, in some situations
- See my comments at CF tracker: CF-4203636

Related to all this, let’s talk about other migration issues…
The PMT (monitoring tool) should have zero impact on CF, of course

But there was one issue affecting cfthrad processing

- This was fixed by an update to the PMT, with CF2018 Update 2
- But you must apply that update manually! More later

Some have complained of “blank pages”, which they feel is fixed by setting “heartbeat interval” (in wsconfig, for PMT) to 0
With each version, there may be compat issues depending on your starting point

- If you jump to 2018, skipping CF2016, 11, or 10, there are compat issues each had
- I’ve discussed these more in my “hidden gems” talks for each past CF version
  - carehart.org/presentations

Here’s a quick review of key compat features for each…
CF 10 COMPATIBILITY/MIGRATION ISSUES

- CF 10 removed Verity search engine, replaced with Solr
- Web services changed to support version 2, can change back to v1
  - See Admin-, application-, and code-level options to change wsversion, etc
- Can no longer run JSPs via external web server, but web server only
- So not too many issues (but the move to CF on Tomcat affected config issues)
- Again, these issues would apply to you on move to CF2018 skipping 10/11/2016
As for CF11, more compat issues than in CF10 or 2016

- CF11 update 11 broke any use of an /api folder off the root of your site
  - CF now uses that (like /rest folder) for REST feature
  - If you will never use that CF REST feature, could tweak/remove config file references to /api:
    - [cf]\cfusion\wwwroot\WEB-INF\web.xml (and [cf]\config\wsconfig\[n]\uriworkermap.properties)

- CFCHART removed use of XML to configure charts--now must pass json
  - Tool to help: cfusion/bin/cfchart_xmltojson (bat/sh)

...
- New strict number validation: if true (default), results of numeric validations (in tags, functions, return from methods) fail if value is not truly numeric
  - Settable in cfapplication or application.cfc: strictNumberValidation
- Good news: things formerly Enterprise-only **ARE now available in Standard**
  - CF archive (car) mechanism (to move CF admin settings from server to server)
  - Security Sandbox (to lockdown what code in different directories can do)
  - HTML5 charts
  - Web socket limit lifted
Bad news: CF11 Update 3 re-enabled long-dormant CFProcparam `DBVARNAME`
  - Had been ignored since CF6, except briefly in 7.0.1
  - Problem: some DBs now require prefix to `dbvarname` value
    - ( `:` for Oracle and `@` for SQLServer)
  - You may have old code that just says `dbvarname = "param1"` which would now fail
    - For SQL Server, should be `dbvarname = "@param1"`, for instance
  - Note: a jvm arg was added then to revert this, but it is NOT supported in CF2016 and above
    - blogs.coldfusion.com/coldfusion-11-and-dbvarname-attribute/
  - Again, these issues would apply in move to CF2018, if skipping 11 and 2016
CF2016 compatibility/migration issues are very few
- CFCollection ignores PATH attribute, uses path defined in CF Admin
- MS Access: workarounds from 10/11 to enable it no longer work
- The aforementioned removal of YUI, spry, portlets libraries in CF2016 Update 3

But see also licensing changes in the EULA about cores, VMs, and staging/test

As for that point about staging/test
- Since CF9, we could use a production license in a test, staging, or central dev instance
- CF2016 EULA (Section 3.2) seems to read that for each Enterprise license bought, you can use it that way; but for Standard, it’s only if two licenses have been bought
- Developer *edition* remains free, of course

These issues would apply to you on move to CF2018 skipping 2016
- Clearly, CF11 had more compat issues either than 10 or 2016
See also known issues discussions in CF2018 release notes, and in each update
  
  - We will discuss CF2018 updates shortly
  
  - Recall the new datatype inference at compile time, which can be disabled
OTHER HIDDEN GEMS
OTHER HIDDEN GEMS

- Just a few areas remain...
  - Updates to underlying libraries’ versions numbers
  - What’s new in Standard vs Enterprise
  - Pricing, licensing, end of life/support
  - CF Builder 2018 enhancements
  - Updates to CF2018 since initial release
Updates to Some Underlying Libraries’ Versions Numbers

- Antisamy 1.5.7 (OWASP security library)
- Derby 10.11 (embedded DB)
- Ehcache 2.10.3 (caching library)
- Esapi 2.1.0 (OWASP Enterprise Security API)
- Hibernate 5.2.11 (ORM library)
- HttpClient 4.5.2 (underlies CFHTTP and more)
- Java 10.0.1 (the JVM which underlies CF)
- Jetty 9.3.6 (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 (underlies Solr search engine in CF)
- POI 3.7 (underlies MS Office Integration features)
- Solr 7.2.1 (the embedded search engine, used by CFSEARCH/CFINDEX, etc.)
- Tomcat 9.0.10 (app server underlying CF, when deployed in traditional "Server" configuration)

See later discussion of further version changes, per CF updates
- Only thing **new** that is Enterprise-only is distributed caching
  - redis and memcached options
  - Again, Standard support long-standing ehCache **and** the new JCS option
- The CF2018 perf. whitepaper also says “web server path caching” is Ent-only
  - But it’s not a new feature (has been there for many releases)
  - And I see the option in the CF2018 Standard Admin Caching page

**LET ME BE CLEAR:** **I am NOT saying these are ONLY difference between CF2018 Standard and Enterprise**
- I’m saying these are only things **NEW** in 2018 that **ARE** Enterprise-only

- For more on differences between CF Std and Ent:
And now, the shoe drops. The price of CF2018 has increased:

- Standard: US$ 2,499 (per 2 cores)
- Enterprise US$ 9,499 (per 8 cores)

Upgrade discount for those on CF2016 (none for those on CF11 or earlier)

Consider buying CF from resellers, for still more discounts

- buy-adobe-software.com (from makers of FusionReactor)

And what if you may still want to buy CF2016 only?
First, can no longer access CF2016 installers on Adobe public CF site
  ▷ Look instead to cfmlrepo.com (community-run site)
  ▷ Can’t even license CF2016 anymore
    ▷ Must buy CF2018 (if from Adobe, only via “volume licensing”)
      ▷ and then request “backward license” to CF2016
    ▷ blogs.coldfusion.com/post.cfm/adobe-coldfusion-backward-licensing
  ▷ Good news: if CF2016 bought from a reseller, that CAN be backward-licensed
When does public support (providing updates) end, for each recent version?

- For CF2018, in 2023
- For CF2016, in 2021
- For CF11, in Apr 2019
- No real difference from CF2016
- More:
- ...ok, onto last changed “feature”: what about CFBuilder 2018?
► Built-in FTP support
  ► Window>Show View>Other>Remote Systems
  ► in previous releases, you’d have to know to get it, Remote Systems Explorer
  ► helpx.adobe.com/coldfusion/using-coldfusion-builder/managing-servers.html#remote

► Asserted to load large files faster, and use less memory

► Support to import code profiler data from PMT
  ► helpx.adobe.com/coldfusion/using-coldfusion-builder/managing-projects.html#profiler

► …
Cordova replaces Phonegap
- helpx.adobe.com/coldfusion/mobile-application-development/packaging-mobile-applications.html

Standalone edition now built upon Eclipse Oxygen 4.7.2

More:

CFBuilder 2018 update 1 released along with CF2018 Update 2
- Includes many bug fixes, updates Eclipse to SimRel (https://wiki.eclipse.org/SimRel/Overview)
- Incorporates Builder aspects of Update 2 changes, related to mobile dev and PMT profiler
Finally, let’s talk about CF 2018 updates

- Update 1 released in Sep 2018
- Update 2 released in Feb 2019
- Update 3 released in Mar 2019
- We will address these in reverse chrono order
Update 3 primarily only addressed an urgent security alert

- More details in links offered in my links document
Like most updates, Update 2 adds important security update (priority 2)
  Also, important bug fixes in security, language, core runtime, document management, AJAX, and more
But also adds much more than just bug fixes and security patches
To start, again update 2:
  adds support for Java 11 (CF2018 originally came on Java 10)
  offers a macOS installer for Server Auto-Lockdown
Web server connector is updated (from version 1.2.41 to 1.2.46)
  Can use “upgrade” button in wsconfig UI to update the connector
...
UPDATE 2 (CONT.)

- Update 2 also adds new platform support:
  
<table>
<thead>
<tr>
<th>OS’s</th>
<th>Application Servers</th>
<th>Web Servers</th>
<th>Databases</th>
<th>External Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Windows Server 2019</td>
<td>• WildFly 14.0</td>
<td>• Apache HTTPD 2.4.37</td>
<td>• Oracle 18c</td>
<td>• Microsoft Exchange 2016</td>
</tr>
<tr>
<td>• Solaris 11.3</td>
<td>• WebSphere 9.0.0.9</td>
<td></td>
<td>• PostGreSQL11</td>
<td>• Microsoft SharePoint 2016</td>
</tr>
<tr>
<td>• OSX 10.14</td>
<td></td>
<td></td>
<td>• IBM DB2 v11.1</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Apache Derby-10.14.2</td>
<td></td>
</tr>
</tbody>
</table>

- Adds new features in PMT (and fixes https and PMT issues):
  
  

- Now, let's move on to language-oriented changes in update 2 …
» Adds new create and modify actions for cfschedule action
  » Previously, we used action="update" to add OR update a task
  » Create is ONLY to add a task, and will fail if it exists
  » Modify action is ONLY to modify, will fail if it does not exist
» Adds new cfloop as script, as alternative to traditional script looping
  » For looping over query, array, list, or struct
  » Live demo:
    » cffiddle.org/app/file?filepath=368f3754-a8d7-42b3-b385-0bd7db9fdddef/d9a31ed2-7c4d-4df0-9e15-95059f170c77/038514fc-f536-4b25-bad4-3c94e2f58674.cfm
  » See update release notes link for more
» Adds calendar arg to dayofweek function ("Gregorian" or "ISO")
» Adds new capabilities to mobile development (which came out in CF11)
» ...
UPDATE 2 (CONT.)

- Also updates some library versions:
  - Jetty 9.4.12
  - ExtJS 6.6.0.258 for AJAX UI components
  - JPedal 8.6.2 for Document Management
  - PDFgServlet 9.4.12

- Again, the PMT gets an update with update 2, to be applied manually

- Remember also extra step for update, if autolockdown is applied
  - See update release notes for more

- ...
CF2018 Installer refreshed, when Update 2 was released
- Includes update 2 as well as java 11.0.1
- Still incumbent on you to update to update 2, or Java 11.0.2, or later

- Also makes some small changes
  - CF Admin debug ip addresses page adds “::1” (ipv6 version of 127.0.0.1, already there)
  - Preconfigures packetSize="65535" for AJP connector in server.xml (previously not there)

- You can tell version, at least of Windows installer, by file “properties”
  - Whose “details” tab shows “file version” of 2018.0.2 or new, 2018.0.0 for original
- …Finally, onto what update 1 had introduced…
Update 1 added only one new “feature”
  - New GetCanonicalPath function
    - Was also added to CF2016 and 11 per their updates released at the same time
  - Bug fixes
  - Tomcat updated to 9.0.10

One challenge: the update icon in top right (starburst, showing number of updates) does NOT work as of base CF2018 version
  - Just leaves you on whatever page you are already on
  - Instead, use “updates” icon/menu item on bottom left of Admin

Still other things to be aware of about update 1…
Potential trap: update 1 adds `packetsize` to server.xml for the ajp and http "connector" xml elements

- Someone complained they had already added that, and the update just added it again, making it a dupe and this preventing thus CF coming up!
  - And the server.xml file did NOT get backed up in the hf-updates folder
- Mentioned now in "known issues" section of bugs fixed page for update

Remember also extra step for update, if autolockdown is applied

- See update release note for more

More:
Lists of updates, links to technotes, and offers jar download links
  - helpx.adobe.com/coldfusion/kb/coldfusion-2018-updates.html

Also available for CF 2016, 11 and 10:
  - helpx.adobe.com/coldfusion/kb/coldfusion-2016-updates.html
  - helpx.adobe.com/coldfusion/kb/coldfusion-11-updates.html
  - helpx.adobe.com/coldfusion/kb/coldfusion-10-updates.html

Again, updates are cumulative, need only apply latest!

If you have troubles applying CF updates in 10/11/2016/18, see my blog post:
  - carehart.org/blog/client/index.cfm/2016/9/6/solve_common_problems_with_CF_updates_in_10_and_above
  - coldfusion.adobe.com/2019/03/problems-applying-cf-update-check-first/

...we're almost done...

SINGLE PAGE LISTING ALL CF2018 UPDATES
Note that CF Docker images are also updated with each update
  - bintray.com/eaps/coldfusion/cf:coldfusion/#release

And that...is...it!
So, lots of changes, right?
- I count nearly 100 (major and minor)

Hope you may be more motivated—and informed—to consider CF2018
- 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, links document, blog series: carehart.org/presentations