CF8 Server Monitor
Introduction

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Topics

- Overview
- A walkthrough of features
  - Overview page
  - Request, query, environmental monitoring
  - Terminating threads, Alerts, Snapshots
  - MultiServer monitor, Admin API
- Frequently Asked Questions
About Charlie Arehart

• Independent consultant since April 2006
• 11 yrs CF experience (26 in Enterprise IT)
  • Member, Adobe Community Experts
  • Certified Adv CF Developer (4 - 7), Cert. Adobe Instructor
  • Writer in CFDJ, FAQU, DevCenter, CommunityMX, more
  • Contributor to Ben Forta’s CF8 books, past ColdFusion MX Bible
  • Frequent speaker to user groups, conferences worldwide including CFUnited, cf.Objective, webDU, webManiacs, et al
  • Run the Online ColdFusion Meetup (coldfusionmeetup.com)
  • Living in Alpharetta, Georgia (north of Atlanta)
• Web home at www.carehart.org
  • 200+ blog entries, 50+ articles, 70+ presentations, more
  • UGTV: recordings of presentations by nearly 200 CFUG speakers
  • Consulting: available for troubleshooting, tuning, training
    • For as few as days, hours, or even minutes; remote or on-site
What is the CF 8 Server Monitor?

- A Flex-based interface for observing CF’s internal operations
  - What requests are running, for how long, what they’re doing, and more
  - Presents graphs, charts, and text tables to identify worst offenders, targets for further analysis
- Most of the core data is being gathered by CF8 anyway
  - Admin API lets you access the data yourself
  - Monitor is just an interface to present that API data
- Is also an alerting and protection mechanism
  - Can both notify you of trouble, and act to prevent it
Why use it?

- Various circumstances can affect performance
  - Increase in traffic
  - Failure in related services
  - Problems with configuration
  - CFML coding practices
  - Sometimes simply bugs in CF or underlying services

- What if you could better understand why they’re happening, and when?
  - And even be notified? Or have the server prevent some problems?
  - Also, setting some Admin config values is a black art
  - Monitor (and related features) helps with these
When to use it?

More than just monitoring

- Alerts: detect, notify, log, and even protect the server
- Profiling: where, in code, is time being spent?
- Memory tracking: tracking memory used by features
- Snapshots: current status of important system conditions
- Multiserver monitor: watch other CF8 servers
Where can I use it?

- Works only on CF8
  - Can’t monitor 6 or 7
  - Comes only on Enterprise or Developer editions

- Is useful for development as well as prod
  - Development: what happens when...?
    - No longer need to "just wing it" when making a choice
  - Production: what’s going on?
    - Why performing poorly? How many requests? How much memory used? How much DB I/O?
How to launch it?

- How to launch the monitor
  - From CF Admin
    - Server Monitoring > Server Monitor > Launch Server Monitor
    - Can also launch the Multiserver monitor from there
  - Or from browser as
    - http://[servername]/CFIDE/administrator/monitor/launch-monitor.cfm
  - Requires Admin password (or username/password if using new multiuser admin—Enterprise-only—feature)
A walkthrough of features

- Overview page: key metrics (but not all)
  - Top two report pods discussed shortly, others discussed later
- Reports pod
  - Tabular data, with drill-downs (double-click)
    - Again, some have no value if no “Start” buttons enabled
  - Drill-downs often have filter to control what’s shown
    - And these reports then have more drill-downs also
  - Return to list view using icon
A walkthrough of features (cont)

- Available tabs atop monitor
  - Overview, statistics, alerts, snapshots

- Statistics tab has much more detail
  - Itself broken into sections
    - Request Statistics, Memory Usage, Database, Errors

- “Start” buttons
  - Monitoring, profiling, memory tracking
    - Some reports require one or more to be enabled
    - They increase in overhead, left to right
    - Some reports don’t require any enabled
      - I call these “zero overhead” reports
Request Monitoring
Request Monitoring

- Average Response Time, Requests Per Second
  - Most traditional measures of server performance
  - First graphs shown on Overview page
    - Require “start monitoring”
  - Other reports show details on requests
  - Note that this chart, like many, has popup data
Request Monitoring (cont.)

- **Active requests**
  - Statistics > Request Statistics > Active Requests
  - Observe requests actually running on your server at a given point of time
    - understand why server not responding/poorly
    - help configure simultaneous request setting

- **Active ColdFusion Threads**
  - Statistics > Request Statistics > Active ColdFusion Threads
  - Shows data on threads spawned with CFTHREAD
  - Again, can help set admin thread settings
Request Monitoring (cont.)

- Observing Requests
  - If can catch request running (CF8 is fast!)
  - Can see
    - template file/path, type of request, IP address, web server thread name, time taken so far
  - Can drill down to see details of variable values in all scopes
    - Does NOT require start memory tracking
  - Can also kill requests from here, discussed later
Request Monitoring (cont.)

- Slowest tags or function calls in a request
  - when viewing request details
    - Requires “start profiling”
  - Will see new info: “Top 10 Slowest Tags & Functions”
    - Tag/function name, template path and line number, time in milliseconds
  - And can drill down on line of code to see stack trace
Request Monitoring (cont.)

- Slowest requests and slowest CF Threads
  - Statistics > Request Statistics > Slowest Requests
  - Statistics > Request Statistics > Slowest ColdFusion Threads
  - These show those requests/threads from the recent past that were slowest
    - Sadly, no easy way to see ALL recent requests
Request Monitoring (cont.)

- Finding heavy hitter requests
  - From two more different perspectives
  - Both require “start monitoring”
  - Highest average response time
    - Statistics > Request Statistics > Cumulative Server Usage report
    - displays requests using most avg response time over all executions of that page
  - Highest number of executions
    - Statistics > Request Statistics > Highest Hit count
    - “Request size” column populated with mem tracking
Request Monitoring (cont.)

- Largest variables used across requests
  - Requires “start memory tracking”
  - Statistics > Memory Usage > Requests by Memory Usage
  - Drill down to see top 10 largest variables in the request
    - by name, scope, type, template, and average/last size
Query Monitoring
Query Monitoring

- Tracking Active Queries
  - Requires “start profiling”
  - Statistics > Database > Active Queries

- Tracking large, slow, and frequent queries
  - Statistics > Memory Usage > Queries by Memory Usage
    - Requires memory tracking
  - Statistics > Database > Slowest Queries
  - Statistics > Database > Most Frequently Run Queries
    - Both require monitoring and profiling
  - Remember threshold value, to help see data
Query Monitoring (cont.)

- Tracking cached queries
  - Never had insight into this memory space
    - CFQuery tags that use the CachedWithin or CachedAfter attribute
  - Statistics > Database > Query Cache Status
  - Total in cache and ratio shown at top
  - “Free report”: no start buttons required
  - If “start profiling” enabled, can see more detail
    - Statistics > Database > Cached Queries
    - Show how often each cached query is requested vs executed
      - Drill down on each for template and line number and SQL that’s cached (and size, if “start memory tracking”)
Query Monitoring (cont.)

- **Database Pool Status**
  - Statistics > Database > Pool Status
  - requires no "start" buttons
  - Tracks info on Datasources and the pooling of their database connections
Environmental Monitoring
Environmental Monitoring

- Shared scope (session, app, server) use
  - Statistics > Request Statistics > Active Sessions
  - Statistics > Memory Usage > Application Scope Memory Usage
  - Statistics > Memory Usage > Server Scope Memory Usage
  - Can view vars in all these scopes, even without “Start” buttons enabled!
    - Size will be “0”, unless start monitoring/mem track
    - But can see all the data regardless. Useful!
Tracking JVM Memory Usage

- Statistics > Memory Usage > Memory Usage Summary
- Graphical depiction of JVM memory usage
- “Free report”: no start buttons required
- Note available “Run GC” button
Monitoring the Template Cache

- Statistics > Request Statistics > Template Cache Status
- Another “free” report (no start buttons required)
- Finally can see how many files are in cache
- Can help with setting the template cache size, as well as to spot problems
  - More on this in “hidden gems talk”
Environmental Monitoring (cont.)

- Monitoring application errors
  - Statistics > Errors > Requests with Errors
  - Useful in production, otherwise may not notice errors happening
  - Better still, if “start profiling”, can see:
    - more about the line of code in error
    - how often the error has occurred
    - the full CFML stack trace that led to the error
  - Also feeds the overview page “last error” pod
Other Features
More than just a monitor

- The CF8 monitor (like FusionReactor and SeeFusion as well) is more than just a monitor
  - Can control requests (terminate them)
    - Both manually and automatically
  - Alert mechanism can notify you troublesome of conditions, and respond to them
  - Snapshot feature provides useful environmental status information
  - Multiserver monitor watches other CF8 servers
  - Admin API
Terminating threads

- From Active Requests report, can kill running requests
  - Such as if they’re hung or causing trouble
    - Tying up valuable simultaneous request threads
  - No longer need to just “restart the server”
    - Caution: with power comes responsibility
  - User presented whatever portion of request generated prior to termination
- Don’t want to have to always be baby-sitting the server though…
Alerts

- Alerts watch your server for you, stepping in for given trouble conditions
  - Can terminate request
  - Can just send email with notification
  - Can execute CFC to do any sort of processing
    - write data to a log file or database, etc.
  - Can also trigger snapshot
  - Can even force garbage collection (with JVM memory alert)
- Four kinds of alerts
  - Unresponsive Server (too many requests taking too long)
  - Slow Server (average response time too high)
  - JVM Memory (too much memory used)
  - Timeouts (too many requests timing out)
Alerts (cont.)

- Alerts tab at top of monitor, shows two links on left nav bar
  - Alerts: recent, triggered alerts, view snapshots
  - Alert Configuration: create/update alerts
    - Four tabs for the 4 kinds of alerts
    - Last tab for email settings
    - Changes take affect immediately (no restart needed)
Alerts (cont.)

- Viewing alerts
  - Alerts page
    - They remain until server restart
    - You can delete them
  - Log files
    - Monitor.log in traditional CF logs directory
      - And -out log in CF runtime logs directory
  - Emails
    - Can list multiple addresses, with commas
    - Emails trigger entry in monitor log file also
  - If alert kills request, notification lists requests
  - Note they will report a recovered state when alert condition is lifted
Snapshots

- Detailed status information on state of the server
  - Can be triggered manually or in an alert
  - Help with off-line monitoring, analysis
  - Also supplements notification emails
    - They don’t list what requests are running at time of alert, but snapshot does show that and more
    - If selected, will be included as attachment to email
  - Also available in own Snapshots tab at top of monitor
    - Provides means to trigger snapshots manually and view them (does not show those triggered by alerts)
  - Also accessible in files at [ColdFusion8]\logs\snapshots
MultiServer monitor

- Watches other CF8 servers (Enterprise or Developer Editions)
  - Separate interface from Server Monitor
Admin API

- CFIDE/Adminapi/ServerMonitoring.cfc
- Only available on Enterprise
- Several methods for getting data shown in Server monitor
FAQs

- What about the overhead?
  - Some features have zero overhead. Just presenting data already being gathered by CF
  - Some features are a little (Start Profiling) or a lot (Start Memory Tracking) resource-intensive
    - Perhaps best used only in development, or in emergencies

- Supported systems
  - Runs on all environments CF runs on
  - CF8 only (can’t monitor 6 or 7)
  - Again, only on Enterprise or Developer editions

- What about FusionReactor, SeeFusion?
  - Still valuable for 6 and 7
  - And each offers things that CF8 monitor does not
    - So can still be valuable in CF8
FAQs (cont.)

- What’s missing? Have noticed a few things, including:
  - No obvious report showing all requests over recent time period
    - Can set slow requests to 0 and a high number of requests to show
  - No tracking of CPU use (overall or per request)
  - No logging of data
    - You can create your own logs with Alert CFCs
  - Email comes from cfadmin@servername domain (in my case, charlied620), can’t change to a real domain
FAQs (cont.)

- Does the Alert mechanism require any start buttons be enabled?
  - No

- If I open the monitor and turn on start buttons, does their effect remain when Monitor is closed?
  - Yes, because Admin API code would need to rely on it
  - Be careful, then, about leaving it on
Learning More

- Covered in “Configuring and Administering ColdFusion”
- Also online help within the monitor
- My articles:
  - ColdFusion 8 server monitoring – Part 1: Using the Server Monitor in development
  - ColdFusion 8 server monitoring – Part 2: Using the Server Monitor in production
  - ColdFusion 8 server monitoring – Part 3: Automated monitoring and request management with Alerts, Snapshots
  - ColdFusion 8 Server Monitoring – Part 4: Multiserver Monitor, Admin API Monitoring, and More
Summary

- Great to have monitoring built-into CF
- Just be aware that it’s CF8-only, Enterprise and Development
  - Consider other tools for other versions
- More than just a monitor
  - Alerts, profiling, memory tracking, snapshots, multiserver monitoring
- Some features have zero overhead
- Useful in development as well as prod
Questions On Presentation

- Charlie Arehart
  - charlie@carehart.org
- I’d really appreciate your feedback
  - http://carehart.org/feedback/
- Also available for troubleshooting, training, consulting
  - Also other developer productivity coaching, system admin and tuning support, and more
  - Remote or on-site
- New Per-minute Phone/Web support
  - http://carehart.org/askcharlie/