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Using FusionReactor Enterprise Scripting

Doc. Rev. 17, 17 January 2008

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Published in Germany

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1 Introduction

1.1 Introducing FusionReactor Enterprise Scripting

New for FusionReactor 3 (Enterprise Edition), **FusionReactor Enterprise Scripting** enhances FusionReactor's Enterprise Monitoring to trigger configurable scripts when a server's responsiveness status changes.

This feature can be used to perform any task which can be launched from a platform script. Examples might include:

- Interacting with SNMP or enterprise monitoring/reporting systems
- Performing automated restarts of affected instances
- Sending custom email messages
- Writing custom log messages

Since FusionReactor Enterprise Scripting is able to launch any platform executable (shell script, executable binary etc.), it may be tailored to virtually any environment.

1.2 Intended Audience

This technical document is targeted at FusionReactor administrators who are responsible for monitoring one or more FusionReactor servers using the FusionReactor Enterprise Dashboard.

This document will guide the administrator through the new functionality, illustrating how and when FusionReactor runs scripts, and the best practices and caveats involved with automated scripting.

2 FusionReactor Enterprise Scripting in a Nutshell

2.1 What Are Enterprise Scripts?

FusionReactor 3 (Enterprise Edition) can trigger a script when a server becomes unresponsive, and when it becomes responsive again. This mechanism might allow you to pro-actively attempt to restart a failed server or instance, integrate FusionReactor into an existing monitoring environment or provide custom logging or reporting. Any program which is runnable on your FusionReactor monitoring system may be used as an Enterprise Script target.

On **Unix** and **Unix-based** systems, this includes everything you can start from a command line, for instance:

- Binary programs

- Shell scripts (including Bash, Ruby, Python and Perl)¹

- Java programs (when launched from an appropriate shell script)

On **Windows** systems, anything that is runnable as a binary, or can be run from the command prompt, for instance:

- Binary programs

- Batch files

2.2 How Do I Configure an Enterprise Script?

Enterprise scripts are configured by editing the **Script** of the server's property page, accessible in the **Enterprise -> Manage Servers** page, then clicking on the **Modify** icon of the required server.

The screenshot shows a web-based configuration interface titled 'Enterprise | Modify Server'. It contains a form with several fields: 'Name' with the value 'cfusion.jrun4.myrtle', 'URL' with the value 'http://127.0.0.1:8088/fusionreactor', 'Password' with masked characters '*****', and 'Script' with the value '/Users/jhawksley/tmp/test.sh'. The 'Script' field is highlighted with a red rectangular border. To the right of the 'Script' field, there is a small text box containing the text 'This script will be run when the server is down, or network is down'.

You should take care to ensure the full path and filename to the script are correct.

2.3 When Does FusionReactor Run Enterprise Scripts?

Enterprise Scripts are run whenever the Enterprise Monitor detects that a monitored instance has changed state:

- an instance which was previously available is no longer providing Enterprise data

- an instance which was previously unavailable has begun to provide Enterprise data

Scripts are run only if an instance changes state while it is being observed.

Additionally, scripts are only run if:

- The Enterprise Server Alerting system is running

This is configured in **Enterprise Settings -> Server Shutdown/Start Up Alerts**

At least "On Shutdown" must be selected. If you wish to run scripts when an instance becomes available, "On Shutdown and Start Up" must be selected.

¹ Launching of shell scripts requires that the appropriate interpreters are installed on the platform.

If you do not wish to additionally receive email for these events, disable notification in **FusionReactor -> Settings -> Email Server -> Notification**.

2.4 How Does FusionReactor Run These Scripts?

Launch Mechanism

FusionReactor runs these scripts by spawning them using Java system commands. The scripts will be run in the context of the user under which your J2EE (ColdFusion) server runs. This user must have at least **read + execute** access to these scripts. Any files or other executables called by the script must also be accessible by this user.

The script will be run with the **current working directory** (CWD) of the J2EE application server. Because of the variety of platforms available, this may be unpredictable. Any scripts you write should therefore **not** use the current directory notation (usually a single dot) to address files. If you plan to access files within the script, their paths should be specified completely.

Script Arguments

FusionReactor supplies several command-line arguments to the script. These arguments may be used by the script to perform logging or restart operations. The supplied arguments are (in order):

UP or DOWN	reflecting the instance status
instance name	as registered in the Manage Servers screen
IP Address	as returned from a DNS lookup of the machine name part of the URL used to monitor this instance
Process ID	If available, the process ID of the J2EE application server on the remote machine. If the FusionReactor native library is not available, or FusionReactor could not read this value, this field will be -1
Last Seen Time	The time, measured in milliseconds from midnight on January 1st 1970, which the server was last successfully polled for Enterprise data. If the server has not been observed as running during this session, this field will be -1

2.5 Logging

When FusionReactor fires a script, an appropriate message is written to the Crash Protection log, located in `FusionReactor/instance/<instance_name>/log/crashprotection-0.log`. This log is shared with other CrashProtection messages, and not all fields are used by Enterprise scripting.

Date	Formatted date
Time	Formatted time, to millisecond precision
Time (Epoch)	Absolute time, measured in milliseconds from midnight on January 1st 1970
ServerUP or ServerDOWN	The triggering state for this script invocation
One of:	
RUNSCRIPT	Script successfully called
SCRIPTREADFAILED	Script not found, or not readable
SCRIPTEXCEPTION	Script found and readable, but an exception occurred during run

6 Unused Fields

Server ID	Server ID of the affected instance, configured within Server Manager
Script	Full command and arguments launched by FusionReactor
Unused Fields	The remainder of the log string is unused.

For the exceptional cases **SCRIPTREADFAILED** and **SCRIPTEXCEPTION**, FusionReactor will log the message associated with the exception to the FusionReactor log.

2.6 Operational Impacts of Scripting

There are a few points which should be borne in mind when configuring scripting.

System Restarts and Self-Monitoring

If FusionReactor is configured to monitor itself, i.e. is monitoring the same instance in which it is configured, scripting should **not** be used for operations which affect this instance. Because the order in which FusionReactor's subsystems start up, FusionReactor may prematurely fire a script while the 'self' instance is still starting up.

In these circumstances, we recommend transitioning your environment to a **High Availability** monitoring solution. This entails installing a new J2EE server (Tomcat, for instance), and installing FusionReactor into that. This container will be used purely as a FusionReactor host, and will be used to monitor other containers.

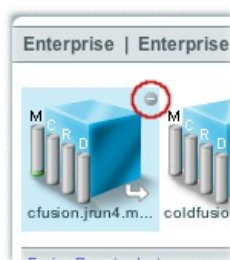
It may be necessary to create scripts which perform system reboots. Again, we recommend a careful evaluation of the impacts of this type of script before implementation. A script which restarts a system should not attempt to restart the system on which the monitoring solution runs.

Manual Restarts

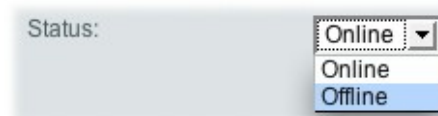
If a script is configured for a given instance, it will be fired when that instance becomes unavailable. FusionReactor does not differentiate between overloaded (or failing) instances, and instances which have been deliberately stopped.

Therefore, if you stop an instance manually, through Windows' Services panel for instance, FusionReactor will fire the configured script.

As an operational matter, the affected instances should be **offlined** from FusionReactor **before** being shut down. This can be done within the Enterprise Dashboard, by clicking the **+/-** button on the server icon:



... or from within **Manage Servers** by selecting the **Modify** icon for the affected server, then changing its **Status** to **Offline**.



FusionReactor will not monitor these systems. When maintenance is complete, the servers should be onlined again by reversing the process.

3 Using the Example Scripts

We have provided several restart scripts to get you started. This section will help you understand how to install and configure them.

3.1 Installation

The example scripts are provided in `/FusionReactor/etc/cp/`, thereafter the structure is split into scripts which will run on Unix platforms, and those which will run on Windows platforms.

You are free to run these scripts from this location, but we would recommend you copy these templates before editing them. You will then always have a pristine copy available for new scripts.

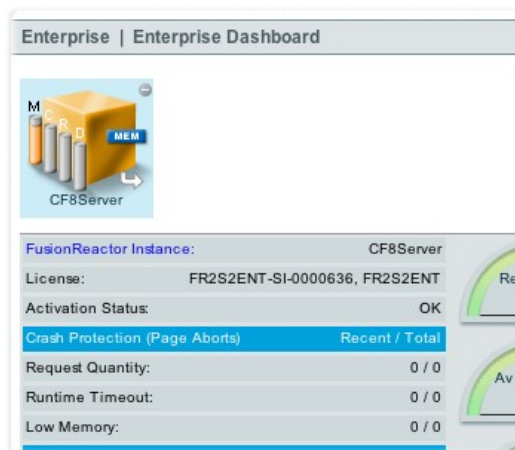
3.2 Worked Example: Controlling Windows ColdFusion 8 from Windows

In order to get you started, we've provided you with a worked example. In our example scenario, we will use a FusionReactor Enterprise Edition instance on a ColdFusionMX 7 instance to monitor a ColdFusion 8 installation, also on Windows, also running FusionReactor Enterprise Edition.

Enterprise Dashboard

The first stage in preparing the environments is to ensure that both systems are running smoothly, and the monitor is able to poll the target system for enterprise data. We add the remote system to the monitor:

... and check that Enterprise Dashboard is retrieving information from it:



Script Preparation

For this example, we'll be using the `restart-Coldfusion8-OnWindows.bat` script from the `FusionReactor/etc/cp/windows` folder.

For our example, we copy the example script to a temporary folder, from where we can work on it:

```
copy restart-Coldfusion8-OnWindows.bat c:\tmp
```

In order to customize the script, we open it in an editor. All provided example scripts are commented extensively.

There are a couple of variables we must customize in the script:

We set the LOGFILE (line 43) to `c:\tmp\script.log`

We change the USER and PWD (lines 53 and 54 respectively) to reflect the Windows user with permissions to restart ColdFusion.

Adding the Script to Manage Servers

The final step in the configuration is to add the script to the monitored server's configuration. We edit the server's Enterprise Dashboard configuration by clicking on **Manage Servers**, then clicking the **edit** icon of the monitored server. We enter the script location in the **Script** field.



Script: `c:\tmp\Restart-Coldfusion8-OnWin`

Testing the Script

The script can be tested by simply using the Windows Service control panel to stop the monitored ColdFusion 8 service. Observing the script log file `c:\tmp\script.log` file shows the output of the script. The ColdFusion 8 service can be observed restarting in the control panel.



3.3 Conclusion

We've shown you how to configure Enterprise Scripting to restart a ColdFusion 8 server. The scope for what scripts can do is immense, since there are no restrictions on what they may call. It would be a simple task, for example, to integrate FusionReactor into an SNMP monitoring solution, write custom log messages or send SMS text messages.