

# Automated self-testing and health check of live CQ instances



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The screenshot shows a web interface for a Sling Health Check. At the top, it says "Sling Health Check". Below that, there are input fields for "Rules definition path" (containing "/apps/hc/"), "Rule tags (comma-separated)", and "Limiting tags (comma-separated)". A "Execute selected rules" button is visible. The main area displays the results of several rules:

- Rule: Expect login as user [admin] to fail**
  - Tags: [admin, security]
  - Info: sling.resource.path:/apps/hc/demo/admin-login
  - Log: **WARN** Login as user [admin] successful, should have failed
- Rule: bundle.state:groovy-all active**
  - Tags: [groovy, bundles]
  - Info: sling.resource.path:/apps/hc/demo/groovy-bundle
  - Log: **ERROR** Bundle not found: groovy-all  
**WARN** Value [] does not match expression [active]
- Rule: bundle.state:non.existent.bundle BUNDLE\_NOT\_FOUND**
  - Tags: [bundles]
  - Info: sling.resource.path:/apps/hc/demo/script-that-fails.jsp
  - Log: **ERROR** Bundle not found: non-existent.bundle  
**WARN** Value [BUNDLE\_NOT\_FOUND] does not match expression [BUNDLE\_NOT\_FOUND]
- Rule: script /apps/hc/demo/script-that-fails.jsp outputs [This script outputs more than just TEST\_PASSED so the corresponding rule will fail.]**
  - Log: **WARN** Value [This script outputs more than just TEST\_PASSED so the corresponding rule will fail.] does not match expression [TEST\_PASSED]



# Agile software needs TESTING

picture: anitapeppers on morguefile.com



The more  
configurable, the  
more breakable....let's  
test it live!

**Sling Health Check**

To execute health check rules, enter the path of a rules definition ( or the root of a subtree of definitions) and an optional list of tags if you want to select a tagged subset of the rules.

Rules definition path

Rule tags (comma-separated)

Omit 'nothing to report' results

Execute selected rules

---

**Rule: InactiveBundlesCount <= 3**

Tags [sling, bundles, osgi]

Info sling.resource.path:/apps/hc/demo/inactive-bundles

Log **Nothing to report**

---

**Rule: org.apache.sling:type=engine,service=RequestProcessor:RequestsCount < 20**

Tags [sling, jmx]

Info sling.resource.path:/apps/hc/demo/jmx-sling-requests

Log DEBUG org.apache.sling:type=engine,service=RequestProcessor RequestsCount returns 27  
WARN Value [27] does not match expression [< 20]

---

**Rule: bundle.state:org.apache.sling.api active**

Tags [sling, bundles]

Info sling.resource.path:/apps/hc/demo/sling-api-bundle

Log **Nothing to report**

---

**Rule: bundle.state:org.apache.sling.startupfilter.disable active**

Tags [sling, bundles]



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# Apache Sling Health Check

~~MULTIPOST~~

Webconsole plugin

Rules configured in content

Tagged rules

Webconsole and servlets

RuleBuilder OSGi services

RuleBuilder OSGi services:

- JMX beans attributes**  
jmxbeans:  
org.apache.sling:  
type=engine,  
service=RequestProcessor  
RequestsCount < 20
- OSGi inactive bundles**  
osgi:  
inactive.bundles.count < 3
- OSGi bundle state**  
osgi:  
bundle.state  
org.apache.sling.startupfilter.disabler  
= active
- JUnit tests**  
junit:  
org.apache.sling.hc.demo.tests.ResourcesExistTest
- Sling scripts**  
/apps/hc/demo/so
- Sling default logins fail**  
sling:  
loginfails  
admin#admin

### Sling Health Check

To execute health check rules, enter the path of a rules definition ( or the root of a subtree of definitions) and an optional list of tags if you want to select a tagged subset of the rules.

Rules definition path: /apps/hc

Rule tags (comma-separated): sling

Omit 'nothing to report' results:

Execute selected rules

---

#### Rule: InactiveBundlesCount <= 3

Tags [sling, bundles, osgi]

Info sling.resource.path:/apps/hc/demo/inactive-bundles

Log **Nothing to report**

---

#### Rule: org.apache.sling:type=engine,service=RequestProcessor:RequestsCount < 20

Tags [sling, jmx]

Info sling.resource.path:/apps/hc/demo/jmx-sling-requests

Log DEBUG org.apache.sling:type=engine,service=RequestProcessor RequestsCount returns 27  
**WARN Value [27] does not match expression [< 20]**

---

#### Rule: bundle.state:org.apache.sling.api active

Tags [sling, bundles]

Info sling.resource.path:/apps/hc/demo/sling-api-bundle

Log **Nothing to report**

---

#### Rule: bundle.state:org.apache.sling.startupfilter...

Tags [sling, bundles]

Info sling.resource.path:/apps/hc/demo/startup-filter...

Log **Nothing to report**

Apache Sling module, runs in CQ 5.5 and later



# JSON output

selectors map to tags

```
localhost:4502/apps/hc/demo.healthcheck.bundles.json
Projects Projects Tools Services TinyURL! Weather adobe current QRCode
1 {
2   "results": [{
3     "rule": "Rule: bundle.state:groovy-all active", rule 1
4     "info": [{
5       "sling.resource.path": "/apps/hc/demo/groovy-bundle"
6     }
7   ],
8   "tags": [
9     "groovy",
10    "bundles"
11  ],
12  "log": [{
13    "ERROR": "Bundle not found: groovy-all"
14  }, {
15    "WARN": "Value [] does not match expression [active]"
16  }
17  ]
18  }, {
19    "rule": "Rule: InactiveBundlesCount <= 3", rule 2
20    "info": [{
21      "sling.resource.path": "/apps/hc/demo/inactive-bundles"
22    }
23  ],
24  "tags": [
25    "sling",
26    "bundles",
27    "osgi"
28  ]
29  }, {
```

Rule uses a Logger to complain

no news (log) is good news!

rules

# Rule defined in content

```
$ curl -u admin:admin
http://localhost:4502/apps/hc/demo/inactive-bundles.tidy.json
{
  "sling:resourceType": "sling/healthcheck/rules",
  "namespace": "osgi",
  "ruleName": "inactive.bundles.count",
  "expression": "<= 3",
  "tags": [
    "bundles",
    "osgi",
    "sling"
  ],
  "jcr:primaryType": "nt:unstructured"
}
```

Execute the **osgi:inactive.bundles.count** rule  
and verify that its output is **<= 3**

The rules engine executes a tree of such definitions, optionally taking tags into account.

# HTTP rule execution

```
$ curl -u admin:admin
http://localhost:4502/apps/hc/demo/inactive-bundles.healthcheck.json
{
  "results": [{
    "rule": "Rule: InactiveBundlesCount <= 3",
    "info": [{
      "sling.resource.path": "/apps/hc/demo/inactive-bundles"
    }
  ],
  "tags": [
    "sling",
    "bundles",
    "osgi"
  ]
}
]
}
```

← no news (log) is good news!

Rule path with *.healthcheck* selector  
Works with single rules or trees

# Rule scripts

```
$ curl -u admin:admin
http://localhost:4502/apps/hc/demo/script-that-passes.esp

# A rule script must output only TEST_PASSED,
# comments like this one and white space.
# Anything else is considered failure
# (as with the Sling testing tools)
TEST_PASSED
```

Currently executable only from a  
*sling/healthcheck/rules* container resource.



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out  
of the  
box

# Out of the box rules

as of revision 1490454

JMX  
beans attributes

```
jmxbeans:  
org.apache.sling:  
type=engine,  
service=RequestProcessor  
RequestsCount < 20
```

JUnit  
tests

```
junit:  
org.apache.sling.hc.demo.tests.ResourcesExistTest  
(can use @TestReference for services)
```

OSGi  
inactive  
bundles

```
osgi:  
inactive.bundles.count < 3
```

OSGi  
bundle  
state

```
osgi:  
bundle.state  
org.apache.sling.startupfilter.disable  
= active
```

Sling  
scripts

```
/apps/hc/demo/somescript.esp
```

Sling default  
logins fail

```
sling:  
loginfails  
admin#admin
```



picture: mconnors on morguefile.com

G05  
HEALTH CHECK

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**extensibility**

# Rule evaluates a SystemAttribute

```
static class ConstantSystemAttribute  
implements SystemAttribute {
```

```
    private final int value;
```

```
    ConstantSystemAttribute(int val) {  
        this.value = val;  
    }
```

```
    @Override
```

```
    public Object getValue(Logger logger) {  
        logger.debug("Constant value of {} is {}",  
            this, value);  
        return value;  
    }
```

```
}
```

# RuleBuilder service builds Rules

```
public Rule buildRule(final String namespace, test:constant:5 = 5  
    final String ruleName, namespace:ruleName:qualifier expr  
    final String qualifier, final String expression) {  
    if(!"test".equals(namespace)) {  
        return null;  
    }  
}
```

check namespace

```
SystemAttribute attr = null;  
if("constant".equals(ruleName)) {  
    attr = new ConstantSystemAttribute(  
        Integer.valueOf(qualifier));  
} else if("invert".equals(ruleName)) {  
    attr = new ConstantSystemAttribute(  
        Integer.valueOf("-" + qualifier));  
} else {  
    return null;  
}
```

map ruleName to SystemAttribute

```
return new Rule(attr, expression, new DefaultEvaluator()) {  
    @Override  
    public String toString() {  
        // specific toString() value used in our tests  
        return "" + namespace + "_" + ruleName + "_" + qualifier + "_" + expression;  
    }  
};  
}
```

build Rule

# DefaultEvaluator expressions

can use custom Evaluator as well

“Some string”

< 5

> 5

<= 5

>= 5

between 5 and 12

```
public interface Evaluator {  
    void evaluate(  
        SystemAttribute a,  
        String expression,  
        Logger logger);  
}
```

# Extensibility summary

Implement a **SystemAttribute**  
`getValue(Logger)`

Register a **RuleBuilder** service  
check names  
build SystemAttribute + Rule

That's it.

(optionally supply custom **Evaluator**)

**similar  
ideas**



# Joerg Hoh's cq5-healthcheck

MBean attribute value ranges or custom StatusProvider services

CQ:Page for status

Based on OSGi configs:

```
PID = de.joerghoh.cq5.healthcheck.MBeanStatusProvider.b9cb0c91-972b
mbean.name = com.adobe.granite.replication:type=agent,id="publish"
mbean.property = QueueNumEntries.warn.>.100
mbean.providerHint = Warn Queue length
```

MBean	Message	Status
de.joerghoh.cq5.jmx:id=bundles (No bundle in resolved state)	Cannot resolve property or MBean	WARN
de.joerghoh.cq5.jmx:id=bundles (no bundle in installed state)	Cannot resolve property or MBean	WARN
com.adobe.granite.replication:type=agent,id="publish" (Warn Queue length)		OK
com.adobe.granite.replication:type=agent,id="publish" (Critical queue length)		OK

<https://github.com/joerghoh/cq5-healthcheck>



# Davide Giannella's sanitycheck

Servlets as sanity check services.

CQ page components for options, forms.

Checks **remote** CQ instances via HTTP.

CQ pages to assemble sanity check pages.

The screenshot shows the 'SanityCheck Test' web application. At the top, there is a green header with the 'CQ5' logo. Below the header, the title 'SanityCheck Test' is displayed. The main content area contains several input fields and text instructions:

- Instance:** A text input field containing 'http://localhost:4503'. To its right, a note reads: 'The instance to check in the format http://host[:port]'
- Admin Password:** A text input field with masked characters '.....'. To its right, a note reads: 'The **actual remote** admin password. Used by some tests.'
- A note below the password field: 'Please refresh the page to run another test'
- A note below that: 'If you're running against a CQ5.5+ instance, ensure to enable the current host in the ReferrerFilter on the remote host.'

---

The results section shows three checks, all with a status of 'FAIL':

- Geometrix users/groups Check**  
Status: FAIL  
Errors:
  - /home/groups/geometrix could still there. Delete it. HTTP Code: HTTP/1.1 200 OK
  - /home/users/geometrix could still there. Delete it. HTTP Code: HTTP/1.1 200 OK
- Admin Password check**  
Status: FAIL  
Errors:
  - Admin password not changed. Please consult and follow the Security Checklist at <http://dev.day.com>
- WCM Debug Filter Check**  
Status: FAIL  
Errors:

Adobe Internal github for now: [dgiannel/sanitycheck](https://github.com/dgiannel/sanitycheck)



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**future**

# Future?

Implement CQ security checklist rules

Execute rules via JMX?

Scheduling of rules execution + reporting

Scheduling and time-based range checks, sampling periods (thx Radu Cotescu)

Execute rules tagged "startup" at startup and report or lock instance if WARN.

<YOUR IDEA HERE> or on the Apache Sling mailing lists

<http://sling.apache.org/documentation/bundles/sling-health-check-tool.html>

I'm @bdelacretaz - thanks for attending!

What are your use cases?