

adaptTo()

APACHE SLING & FRIENDS TECH MEETUP
BERLIN, 22-24 SEPTEMBER 2014

Sling Health Check : : : New und noteworthy
Georg Henzler : : : Netcentric



Health Checks Recap



Geometrixx

CREATING SHAPES FOR CENTURIES

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GO

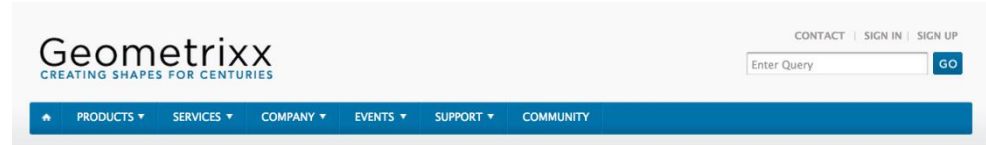
[PRODUCTS](#) [SERVICES](#) [COMPANY](#) [EVENTS](#) [SUPPORT](#) [COMMUNITY](#)



World Leader in Applied Geometry

Geometrixx has been selling and servicing shapes for over 2000 years. From our beginnings as a small vendor of squares and rectangles we have grown our business into a leading global provider of platonic solids and fractals. Join us as we lead geometry into the future.

GET THE GEOMETRIXX APP
All things Geometrixx, anytime, anywhere. Our mobile app is as groundbreaking and remarkably easy-to-use as our shapes.

The header of the Geometrixx website. It features the company name "Geometrixx" in a large, black, sans-serif font, with the tagline "CREATING SHAPES FOR CENTURIES" in a smaller font below it. To the right, there are links for "CONTACT", "SIGN IN", and "SIGN UP". Below these is a search bar with the placeholder text "Enter Query" and a "GO" button. A blue navigation bar contains the following menu items: "PRODUCTS", "SERVICES", "COMPANY", "EVENTS", "SUPPORT", and "COMMUNITY", each with a small downward arrow.A banner for the "Shapes TechSummit". The background is a photograph of a modern glass skyscraper. Overlaid on the image is a dark semi-transparent box containing the text "Shapes TechSummit" in a large, white, sans-serif font, and "Customer and Partner Technology Summit in London" in a smaller, white, sans-serif font below it. In the bottom right corner of the banner, the text "Sold out!" is written in a large, white, sans-serif font. At the bottom center of the banner, there are three small white circles, with the first one being larger than the others, indicating a carousel.

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... not so obvious 😞

Make health of a system quickly transparent to



Operations



External Systems
(Monitoring, Load Balancer, DevOps)



Testers



Users
(Authors, potentially end users)

What makes a system healthy?

Operating System Resources

- Memory
- Disk space
- CPU

Runtime Status

- All bundles started
- Replication Queue not blocked
- Stale Workflow Instances

Interfaces

- Availability of third-party systems

Content

- App-specific Content structures
- Existence of groups
- Geometrix Packages not installed

Configuration

- Security Checklist
- Maintenance jobs
- App-specific configuration required

Performance

- Request throughput
- Average response time
- Query Performance



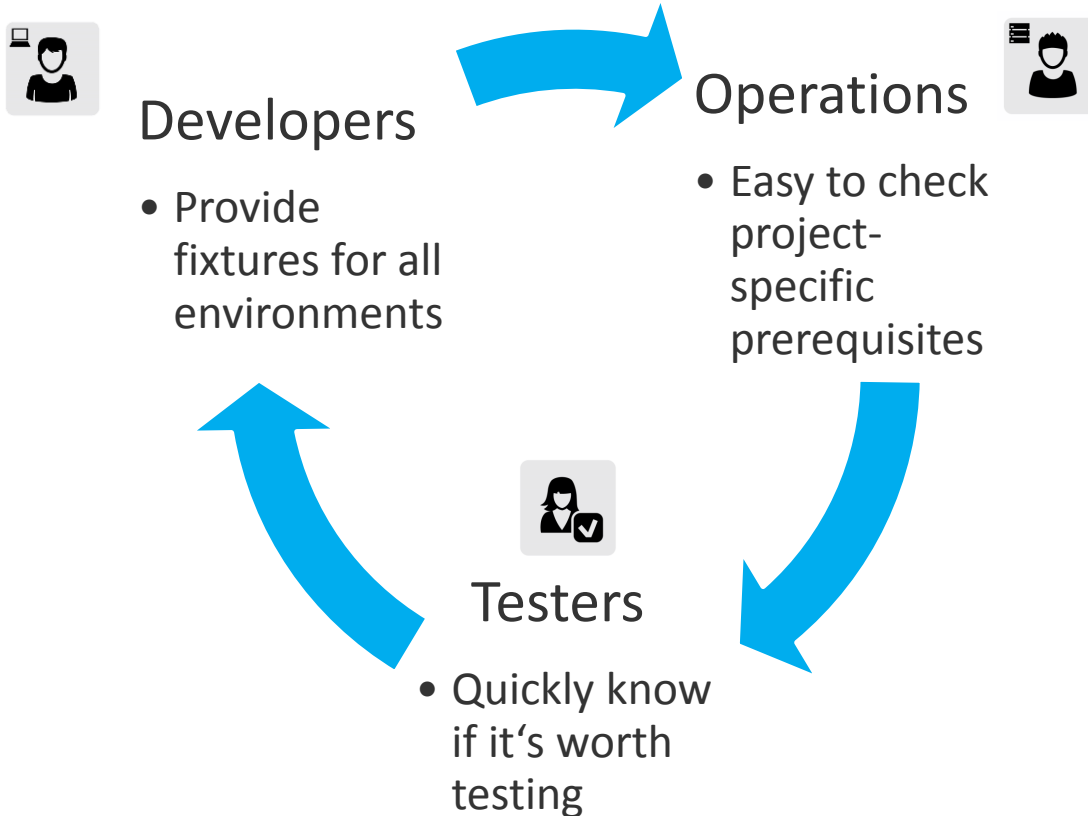
Developers

- Checks for any system condition the software requires
- In Java using HC API as part of the software delivery
- Potentially deliver default configurations for checks



Operations

- Checks for any system condition
- Using ScriptableHealthCheck (no deployment necessary, purely configurable)
- Configure all checks (out-of-the-box, from software & own)





Running Health Checks

Adobe Experience Manager Web Console Sling Health Check



Main OSGi Sling Status Web Console

Sling Health Check

To execute health check services, enter an optional list of tags, to select specific health checks, or no tags for all checks. Prefix a tag with a minus sign (-) to omit checks having that tag.

Health Check tags (comma-separated)

Show DEBUG logs

Show failed checks only

Execute selected health checks

No 1: Minimal check

Tags: [playground] Finished: Sun Sep 21 21:12:48 CEST 2014 after 1ms
Result: **OK**

[INFO Ok](#)

No 2: Check for geometrixx translation cloud config

Tags: [playground, content] Finished: Sun Sep 21 21:12:48 CEST 2014 after 5ms
Result: **OK**

[INFO Geometrixx Site is configured correctly for translation](#)

No 3: Simple Async Check

Tags: [playground, async] Finished: Sun Sep 21 21:12:40 CEST 2014 after 0ms
Result: **OK**

[INFO I was ran at Sun Sep 21 21:12:40 CEST 2014](#)

Adobe Experience Manager Web Console Sling Health Check



Main OSGi Sling Status Web Console

Sling Health Check

To execute health check services, enter an optional list of tags, to select specific health checks, or no tags for all checks. Prefix a tag with a minus sign (-) to omit checks having that tag.

Health Check tags (comma-separated)

Show DEBUG logs

Show failed checks only

Execute selected health checks

CQ Dispatcher Configuration

Tags: [dispatcher, production, security] Finished: Sun Sep 21 21:23:17 CEST 2014 after 0ms

Result: **WARN**

WARN The Dispatcher's address is not configured. Can't check the dispatcher's basic configuration.

CQ HTML Library Manager Config

Tags: [cq, security, production] Finished: Sun Sep 21 21:23:17 CEST 2014 after 0ms

Result: **WARN**

WARN The CQ HTML Library Manager configuration has not been changed. You might want to change the configuration for a production environment.

CRXDE Support

Tags: [bundles, security, production] Finished: Sun Sep 21 21:23:17 CEST 2014 after 1ms

Result: **WARN**

WARN CRXDE Support bundle is active.







Adobe Marketing Cloud Health Reports Help

< Dashboard

Health Reports

Diagnosis

Maintenance

 <p>System Checks Status: CRITICAL</p>	 <p>Replication Queue Status: OK</p>	 <p>Log Errors Status: OK</p>
 <p></p>	 <p></p>	 <p></p>

Java Monitoring & Management Console

Connection Window Help

pid: 19681 aem-6.0.0.20140515.jar -use-control-port -p 4502 -gui -nobrowser -verbose -nofork -r author,local

Overview Memory Threads Classes VM Summary **MBeans**

- org.apache.jackrabbit.oak
 - org.apache.sling
 - org.apache.sling.healthcheck
 - HealthCheck
 - AllPlaygroundChecks
 - AsyncHealthCheckSample
 - CQ content packages
 - CompositeHealthCheck/script
 - EnsureOaksUsed
 - JMX LoadedClassCount
 - LoadedClassCount and ManagementSpecVersion
 - MaintenanceTaskRevisionCleanupTask
 - MaintenanceTaskWorkflowPurgeTask
 - NoInactiveBundles
 - SlowHealthCheckSample
 - annotatedHC
 - crxdeSupportBundle
 - defaultLogins
 - Attributes**
 - defaultSlingGetServletConfig
 - dispatcherConfig
 - exampleContent
 - htmlLibraryMangerConfig
 - inactiveBundles
 - logErrorHealthCheck
 - productionReadyPackageHealthCheck
 - queriesStatus
 - replicationQueue
 - replicationTransportUsers
 - requestsStatus
 - securitychecks
 - slingJavaScriptHandler
 - slingJspScriptHandler

Attribute values

Name	Value
elapsedTime	27
finishedAt	Sun Sep 21 21:52:45 CEST 2014
hc.name	Default Login Accounts
hc.tags	[login, security, production]

Tabular Navigation 1/8

Composite Navigation

log


Name	Value
index	1
level	WARN
message	Login as [admin] succeeded, was expecting it to fail.

ok false

service.pid com.adobe.granite.repository.hc.impl.DefaultLoginsHealthCheck




status **WARN**

timedOut false





(Recently simplified) Programming Model

- Health Checks
 - implement interface org.apache.sling.hc.api.HealthCheck
 - are registered as OSGi Services
 - Annotation [@SlingHealthCheck](#) simplifies declaration of properties 
 - One check can be reused multiple times with different configs using configuration factory pattern
 - Can be provided by any bundle (and share the lifecycle of it)
 - Checks can be configured to run asynchronously 
 - HealthCheck Result can include exception if things went wrong 

```
import org.apache.sling hc.annotations.SlingHealthCheck;  
import org.apache.sling hc.api.HealthCheck;  
import org.apache.sling hc.api.Result;
```

```
@SlingHealthCheck
```

```
public class MinimalHealthCheck implements HealthCheck {  
    public Result execute() {  
        return new Result(Result.Status.INFO, "Ok");  
    }  
}
```



```
@SlingHealthCheck(name="Xyz", tags={"dashboard"}, mbeanName="//Xyz")
public class XyzHealthCheck implements HealthCheck {
    public Result execute() {
        boolean stateOfXyzOk = isStateOfXyzOk();
        if(stateOfXyzOk) {
            return new Result(Result.Status.INFO, "Xyz is ok");
        } else {
            return new Result(Result.Status.WARN, "Xyz has a problem");
        }
    }
}
```

```
@SlingHealthCheck(..., asyncCronExpression="0 30 18 * * ?")
public class XyzHealthCheck implements HealthCheck {
    public Result execute() {
        boolean stateOfXyzOk = isStateOfXyzOk();
        if(stateOfXyzOk) {
            return new Result(Result.Status.INFO, "Xyz is ok");
        } else {
            return new Result(Result.Status.WARN, "Xyz has a problem");
        }
    }
}
```

```
@SlingHealthCheck(..., configurationPolicy=ConfigurationPolicy.REQUIRE)
public class TestThresholdHealthCheck implements HealthCheck {

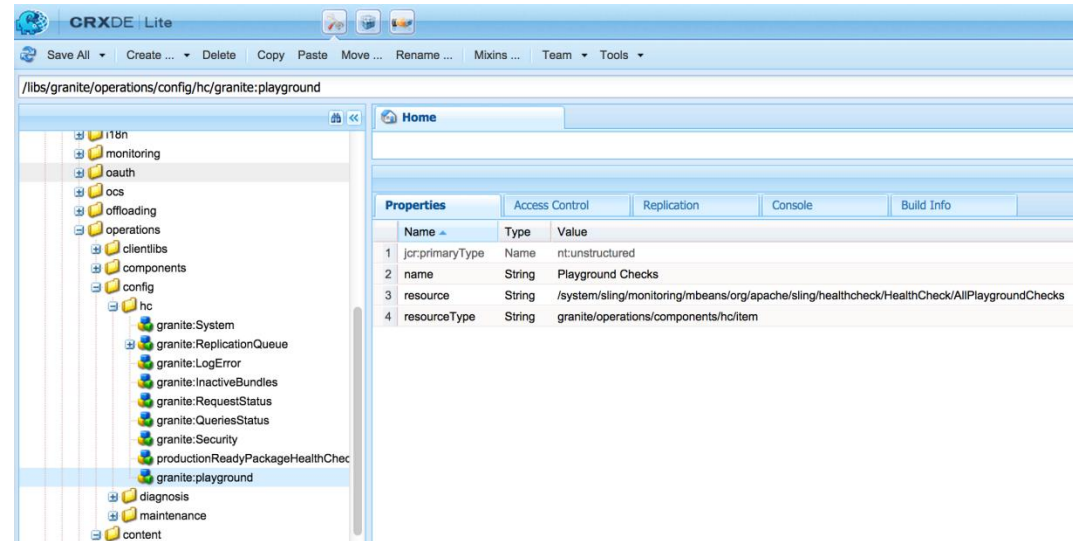
    @Property(label = "Threshold for WARN") private Long thresholdForWarn;
    @Activate protected final void activate(...) ...

    public Result execute() {
        long longValue = getValue();
        if(longValue>thresholdForWarn) {
            return new Result(Result.Status.WARN, "Value "+longValue
                +" exceeds configured threshold of "+thresholdForWarn);
        } else {
            return new Result(Result.Status.INFO, "Ok");
        }
    }
}
```

...

```
public Result execute() {  
    FormattingResultLog resultLog = new FormattingResultLog();  
    List<Resource> resources = getResourcesToCheck();  
    for (Resource resource : resources) {  
        if(isResourceOk(resource)) {  
            resultLog.debug("Resource {} is ok", resource);  
        } else {  
            resultLog.critical("Resource {} has a problem", resource);  
        }  
    }  
    return new Result(resultLog);  
}
```

- Configuration is located at `/libs/granite/operations/config/hc`, add yours at </apps/granite/operations/config/hc>
- Property resource holds link to MBean path as provided by JMX Resource Provider
- Typically on top level a CompositeHealthCheck is used
- All checks to be shown in the dashboard need to have a `mbeanName` set



The screenshot shows the CRXDE Lite interface with the path `/libs/granite/operations/config/hc/granite:playground` selected. The left pane shows a tree view of the repository structure, including folders like `monitoring`, `operations`, and `config`. The right pane shows the 'Properties' tab for the selected resource, displaying a table of properties:

Name	Type	Value
1 jcr:primaryType	Name	nt:unstructured
2 name	String	Playground Checks
3 resource	String	/system/sling/monitoring/mbeans/org/apache/sling/healthcheck/HealthCheck/AllPlaygroundChecks
4 resourceType	String	granite/operations/components/hc/item



(Mostly operational) Challenges

- **Scalability & Time to result**
 - Total execution time grows linearly with number of checks if executed sequentially
 - Stuck checks may block execution
 - Third-party systems don't have reliable response times
- **Parallel Requests**
 - ... exist for certain usage scenarios
 - Parallel execution of same check to be avoided
 - Initial JMX implementation ran check for each attribute again

- **Robustness**
 - There are many sources of health checks (with potentially varying quality)
 - Health checks must never worsen overall system stability
- **Synchronous vs. Asynchronous execution**
 - Best strategy is not always clear at implementation time
 - For different environments, the ideal way might differ



LSOU 107737 9
JP 4300

MAXGW 67200LB
30480KG
TARE 8510LB
3860KG
MAXCW 58690LB
26620KG
CU.CAP 2389CU.F.
67.7CU.M

J ACEP
W-8404



Health Check Executor ... a container for Health Checks

- **Parallel Execution**
 - Scales well for large systems
 - Using Sling ThreadPoolManager under the hood
- **Timeout Handling**
 - Configurable global timeout (guaranteed to return after that period)
 - Return generic WARN or CRITICAL for checks that could not finish, depending on how long a check is overdue
- **Caching**
 - Results are cached (2 sec default, configurable)

- Thread Handling
 - One check is guaranteed to only use one thread at a time (timeout is shown for “hanging” checks)
 - A running thread of a running health check will never be killed
- Used by
 - Web Console plugin
 - CompositeHealthCheck
 - JMX (AEM Dashboard)
 - Potentially your own custom health check results servlet



Questions?