

Monitoring large scale Java/JEE with RHQ

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About me...

Romain PELISSE

- ▶ **Middleware Consultant** at **Red Hat** (2011)
 - ▶ Architect Middleware JBoss
 - ▶ Red Hat Enterprise Linux Expert
- ▶ Committer **PMD** and **XRadar**
- ▶ Translation for **HgBook**
- ▶ Teacher at
 - ▶ Build and OPP @**ESME Sudria**, Paris
 - ▶ Basic programming @**Humboldt University**, Berlin
 - ▶ Introduction to Middleware @**ISEP**, Paris
- ▶ Technical author for **GNU/Linux Magazine France**
- ▶ Clearly, I don't sleep enough...



What is RHQ ?

- ▶ **RHQ Project** :
 - ▶ formerly known as Hyperic
 - ▶ became then Jopr
 - ▶ and now RHQ
 - ▶ Open Source version of JBoss Operation Network (JON)
- ▶ licensed under GPL
- ▶ sponsored by Red Hat, but, as all Red Hat project, Open Source :
 - ▶ source code, build, releases - all available
 - ▶ community driven - mailing list, public tracker, ...
 - ▶ subscription for supports and consulting available for JON



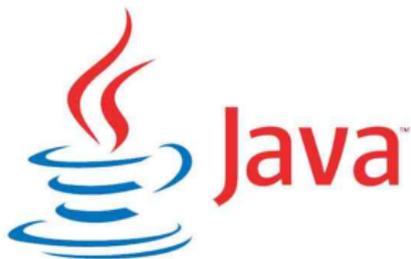
RHQ and JBoss ON

- ▶ RHQ - an Open Source Project
 - ▶ <http://rhq-project.org/>
 - ▶ Current Version 3.0
- ▶ JBoss Operations Network
 - ▶ Downstream from RHQ
 - ▶ [JBoss Operation Network](#)
 - ▶ Current Version 3.x



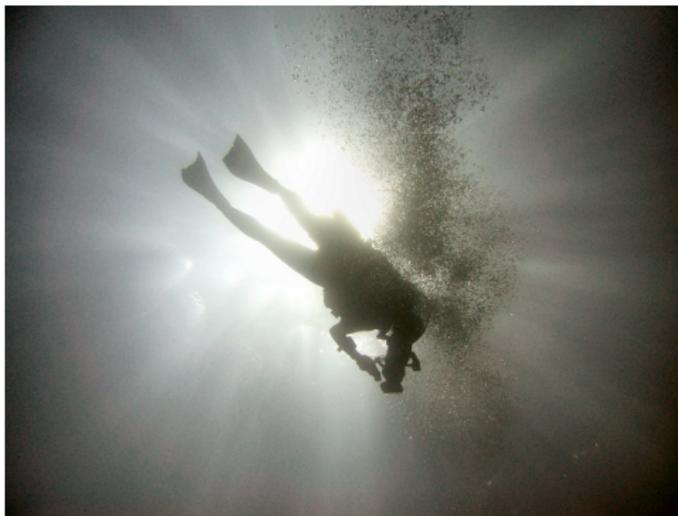
What does RHQ do ?

- ▶ Operations management software for Java/JEE applications
 - ▶ Monitoring
 - ▶ Provisioning
 - ▶ Drift control
- ▶ provides in-depth support for Java applications - seldom lacking in other tools.

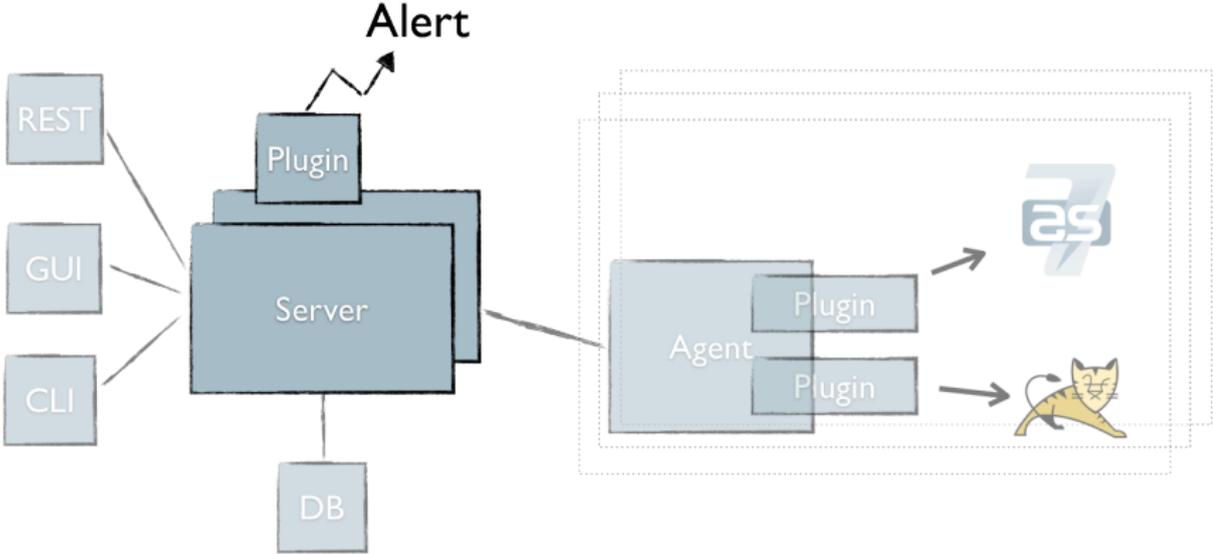


Why Java/JEE again requires a specific tool?

- ▶ JVM are **black box** for the system
- ▶ Java Apps are build on top of it, so even more "hidden"
- ▶ tools seldom have proper support to monitor discuss with JVM...
- ▶ ... while there is a lot of metrics and operations available !



RHQ Overall Architecture



RHQ Dashboard

The screenshot displays the RHQ Dashboard interface. At the top, there is a navigation bar with tabs for Dashboard, Inventar, Berichte, Bundles, Verwaltung, and Hilfe. A user profile for 'rhqadmin' is visible in the top right corner. A green notification bar at the top center states: 'Das Dashboard Standard wurde auf dem Server geichert'. Below this, the main content area is divided into several sections:

- Standard**: A dropdown menu.
- Nachricht**: A section titled 'Welcome to RHQ' with a brief description of the project. Below it is an 'Inventarübersicht' section showing system statistics:
 - Anzahl Plattformen : 1
 - Anzahl Server : 8
 - Anzahl Dienste : 545
 - Anzahl kompatible Gruppen : 0
 - Anzahl gemischter Gruppen : 0
- Favorite Resources**: A search bar and a table of resources. The table has columns for Name, Vorfi, and Beschreibung. One resource is listed: 'EAP (snert:9990)' with type 'pintaia' and description 'Enterprise JBossAS7 Standa Application Server Platform 6 server'.
- Kürzlich ausgelöste Alarmer**: A table with columns for Erstellungszeitpunkt, Name, Bedingung(en), Priorität, Status, Ressource, and Vorfahren. It shows 'No results found using specified criteria.' and buttons for 'Löschen' and 'Bestätigen'.
- Nicht verfügbare Ressourcen oder mit Alarmen**: A table with columns for Ressource, Vorfahren, Alarme, and Verfügbar. It shows 'Keine Einträge vorhanden' and a 'Gesamt: 0' summary.
- Kürzlich ausgeführte Operationen**: A table with columns for Absenzeitpunkt, Operation, Anforde, Status, Ressource, and Vorfahren. It lists several operations:
 - 23.05.2012 18:05:23: Restart rhqadmin on EAP (127.0.0.1:9j) pintsize.
 - 23.05.2012 18:02:08: Install RHQ user rhqadmin on EAP (127.0.0.1:9j) pintsize.
 - 26.04.2012 17:06:42: Manual Autodiscovery rhqadmin on pintsize.
 - 26.04.2012 16:58:40: Manual rhqadmin on nint-size.



RHQ Resource Summary

The screenshot shows the RHQ (Red Hat Quiescent) interface for a resource named "pintsize.home.pilhuhn.de:2099 RHQ Server JBossAS SERVER". The interface is in German and includes a navigation menu on the left, a top navigation bar, and several data panels.

Navigation: Dashboard, Inventar, Berichte, Bundles, Verwaltung, Hilfe. User: rhqadmin | Ausloggen.

Left Sidebar (Tree View):

- pintsize
 - Aliases File
 - Bundle Handler - Ant
 - Bundle Handler - File Template
 - CPUs
 - File Systems
 - Hosts File
 - JBossAS Servers
 - pintsize.home.pilhuhn.de:2099 RHQ Server**
 - Alert Subsystem
 - Applications
 - Communications Subsystem
 - Group Definition Subsystem
 - Hibernate Statistics
 - JBoss Cache subsystem
 - JVM
 - Measurement Subsystem
 - Plugin Subsystem
 - Remote API Subsystem
 - Resources
 - Network Adapters
 - Postgres Servers
 - RHQ Agent
 - Sudoers

Main Content Area:

Tags: +

Navigation: Zusammenfassung, Inventar, Alarme, Monitoring, Ereignisse, Operationen, Drift, Inhalte.

Aktivität Zeitstrahl

- Resource: Measurements**

Metric	Value
Active Thread Count	64
JVM Free Memory	597,63M
JVM Total Memory	964,25M
- Resource: Alerts**

Erstellungszeitpunkt	Name	Bedingung(en)	Priorität	Status
07.05.2012 15:23:03	test	Metrik überschreitet Schwellwert [Active Thread Count < 100,0]	Unbest.	Unbest.
- Resource: Operations**

Absendezeitpunkt	Operation	Anforderer	Status
07.05.2012 15:12:01	Shutdown	rhqadmin	⊘
- Resource: Package History**
 - jboss-remoting.jar: 03.03.nachm. +0200
 - jboss-serialization.jar: 03.03.nachm. +0200
 - saxon.jar: 03.03.nachm. +0200
 - mail-plugin.jar: 03.03.nachm. +0200
 - scheduler-plugin.jar: 03.03.nachm. +0200

Buttons: Bearbeitungsmodus, Zurücksetzen



Key points to remember



- ▶ Agent do the actual monitoring work
- ▶ Plugin does the **heavy-lifting**
- ▶ RHQ is a framework to help you implements and design **monitoring strategy**
- ▶ it's **Open Source!**



"Gravy"

Current status

- ▶ top of the art infrastructure :
 - ▶ Nagios
 - ▶ Puppet
 - ▶ RPM
- ▶ Why would I need RHQ ? :-)



RHQ or not RHQ ?

- ▶ still bring deeper monitoring/capacities for Java App
- ▶ added value if many Java/JEE components (AS, Portal, JMS Stack...)



"Cup'o' Joe"

Current status

- ▶ all application are Java based
- ▶ infrastructure is a commodity - basic monitoring there is enough
- ▶ databases are out of scope



RHQ or not RHQ?

- ▶ one tool ("*...to bind them all*")
- ▶ leverage Java knowledge
- ▶ custom specific alerts or metrics for deployed Java apps



"Cupcake"

Current status

- ▶ *small IT* :
 - ▶ 2 Apache
 - ▶ 1 JBoss Server running the apps
 - ▶ a database



RHQ or not RHQ?

- ▶ one tool ("*...to bind them all*")
- ▶ leverage java knowledge
- ▶ custom specific alerts or metrics for deployed Java apps



How does RHQ scale?

- ▶ **stateless** architecture :
 - ▶ no session replication needed
 - ▶ no need for clustering
- ▶ good performances achieved with supported database
 - ▶ Postgresql
 - ▶ Oracle

What to look for to increase scalability

- ▶ tweak down metrics collection interval
- ▶ reduce amount of data collected



How do cope with a HUGE number of instances ?

- ▶ at some point, database will become a **bottleneck**
- ▶ no real cluster, share state in database, and no distributed model



A Strategy to scale to the "infinite" (or at least "a lot")

- ▶ monitoring data does **not** need to be centralized
- ▶ configuration and templating (alerts, metrics) needs to be the same everywhere
- ▶ run several RHQ setup, not sharing database but with configuration synchronized!



We need you !

- ▶ synchronization features from RHQ incomplete
- ▶ server side Java API lacking the proper methods to do it
- ▶ somewhat complex coding challenge to implement



Any Questions?



Annexes

Photo Credits

- ▶ Diver picture by Tim Sheerman-Chase
- ▶ Keys picture by Linus Bohman
- ▶ Gravy picture by thebittenworld
- ▶ Cup'of'joe picture by Steve Snodgrass
- ▶ Cupcake picture by lamantin
- ▶ Ladder picture by BFS Man
- ▶ Crazy stuffed board picture by Jorge Frangilo
- ▶ Infinite Coke picture by Eric Kilby
- ▶ I Want You picture by V&A Steamworks
- ▶ Question Mark picture by Bilal Kamoon

