Monitoring uPortal - First Steps to Heartbeat and Usage Statistics

JA-SIG 2009 Conference, Dallas
Wednesday, March 4, 2009, 8:30AM-9:30AM

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with Special Guest Eric Dalquist UW-Madison

Our JA-SIG Background

- Working with uPortal for 4+ years

- First Production Implementation 1 year ago

- Rolled out to Incoming Students Fall 2008

- Recently Opened Portal to All Students
  - my.illinois (Urbana-Champaign Campus)
  - my.uic (Chicago Campus)
  - my.uis (Springfield Campus – in progress)

WOW! It's 8:30 am.

- This is traditionally been a motivational and enlightenment slot
- How am I suppose to keep these folks awake with a discussion on monitoring?

Truth be known…

- This economy is a bummer

- Illinois is not fully represented here today
- I'm no expert on monitoring

Tough Times call for Heavy Lifting

- like many of you, this is what i have felt lately

Opportunity for Community Source

- JASIG has always relied on heavy lifters
- But, over the past year I've seen a lot of people come together
- Seems that community source is inversely affected by the economy
- There are less people at the conference than last year, but the group of contributors is growing
- And, the collaborations with JASIG and within JASIG are growing as well
- Interest from Colleges at Illinois is on the rise

Opportunity for Community Source

- JASIG is positioned to help people and organizations achieve goals
- Current products are going through revolutionary changes
- There are new interesting projects on the horizon
- JASIG is proving it's sustainability

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Motivation

- When the money dries up, vended applications go away
- But, the community source mission remains

- That cannot be taken away…

How was that for motivation?

- What about monitoring?
- Okay…
- First, this is not a lecture
- Questions and Comments Encouraged Throughout
- Please share your experiences

Framework for Discussion

- Heartbeat Monitoring

- Resource Inspection

- Health Monitoring

- Usage Statistics

Heartbeat Monitoring

- automation that observes a URL or port to ensure that the application is responding to requests

- failures could be attributed to the application itself (uPortal in this case); however,

- this mechanism is mostly externally focused

Heartbeat Monitoring

many times, it signifies a failure of one or
more dependencies that enable the application
to run…

– network

– web server (apache)

– application server (tomcat)

Heartbeat Monitoring

- we use a product called SiteScope

- this product supports of number of monitoring scenarios

- things like scripting logins and scraping the resulting pages to determine outcome

- it will report any unexpected outcomes via email etc.

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Heartbeat Monitoring

- like to use this to ping individual nodes to make sure they are responding correctly

- challenges that we cannot currently overcome caused by our aging homegrown SSO

- right now, our SiteScope monitors are subject to load balancing, so we cannot truly monitor every node to ensure availability

Heartbeat Monitoring

- Illinois is investing minimal dollars into enhancements to the in-house SSO, and the resources available to work on this have other priorities

- this is a bad situation, which led us to implement some of the following health monitoring measures…

Heartbeat Monitoring

- before we move on to resource inspection…

- what are other folks doing?

Resource Inspection

- tools that provide on-demand information on aspects of the running application to help determine state of JVM resources

  – open sessions

  – memory levels

  – thread counts

  – etc.

Resource Inspection

- we use JMX and JCONSOLE

- JMX uses Remote Method Invocation (RMI) to communicate to JConsole

- JMX uses agents to negotiate communication between the JMX client and server

- We had to develop a custom agent to prevent opening a large range of ports in the firewall
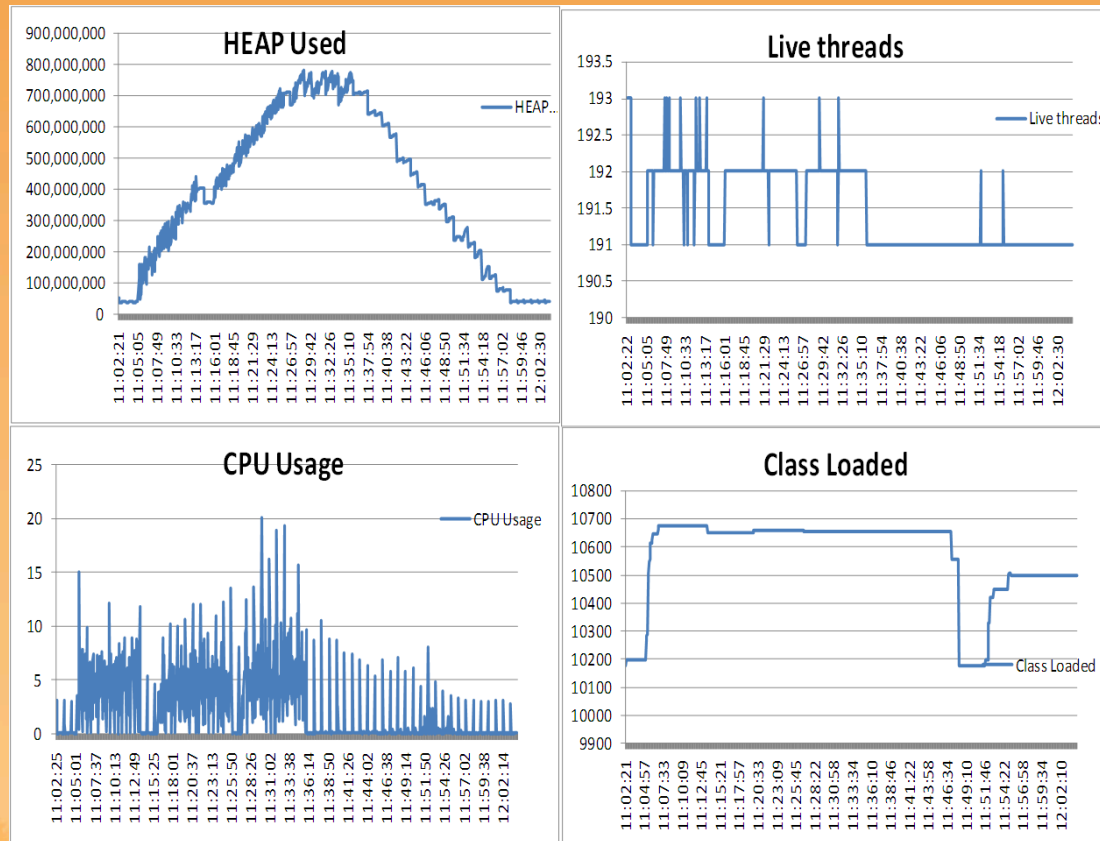
Resource Inspection

- JConsole sends a request to the JMX server

- out of the box, the response will be negotiated and returned on one of a wide-range of ports

- the custom agent that we implemented sees that the response is returned on the same port that the request came in on

- so, only one port is opened via firewall

Resource Inspection

- some samples of the pretty graphs

Resource Inspection

- JMX setup is not trivial

- we can provide you with a getting started doc

  – correct catalina.sh for proper tomcat shutdown

  – update setenv.sh to enable JMX monitoring

  – trust store and key store setup to allow SSL
    communication

  – implementing the custom JMX agent described
    previously

Resource Inspection

- before we move on to health monitoring…

- what are other folks doing?

Health Monitoring

- automation that inspects application reactions to ensure that individual applications are behaving and functioning properly.

- failures could be caused by a number of forces; however,

- this mechanism is inward focused on the application

Health Monitoring

many times, it signifies a coding defect or

communication failure…

– memory issues

– data source communication exceptions

– data format/value exceptions

Health Monitoring

- use log4j utilities via log4j.xml (uPortal uses log4j.properties by default

- configure log4j apps self report issues via emailappender

```
<appender name="EMAIL"  class="org.apache.log4j.net.SMTPAppender">
    <param name="BufferSize" value="512" />
    <param name="SMTPHost" value=smtp.xxxx.edu" />
    <param name="From" value="monitor@xxxx.edu" />
    <param name="To" value="monitor@xxxx.edu" />
    <param name="Subject" value="[my.xxxx.edu] Problem" />
    <layout class="org.apache.log4j.PatternLayout">
       <param name="ConversionPattern" value="%d{ISO8601} : %-5p : [%t] : %c : %m%n"/>
    </layout>
</appender>
```

Health Monitoring

- use log4j filters – not baked into uPortal
  (requires apache-log4j-extras-1.0.jar)

- configure log4j to ignore some exceptions

```xml
<filter class="org.apache.log4j.varia.LevelRangeFilter">
  <param name="LevelMin" value="ERROR"/>
  <param name="LevelMax" value="FATAL"/>
</filter>
<filter class="org.apache.log4j.filter.ExpressionFilter">
  <param name="Expression" value="MSG LIKE \\properties\\ldap\\.xml\\)"/>
  <param name="AcceptOnMatch" value="false"/>
  <param name="ConvertInFixToPostFix" value="true"/>
</filter>
```

Health Monitoring

- before we move on to usage statistics…

- what are other folks doing?

Usage Statistics

- automation that reveals the who, what, when, where, why, and how facts on the application effectiveness

Usage Statistics

- we use homegrown Perl scripts

- the scripts harvest the uPortal logs daily looking for some key phrases

- collect some very rudimentary data points

- populate a database table

- use database to produce pretty graphs reports using spreadsheet software

Usage Statistics

NETID	NODEID	LOGGED_IN	LOGGED_OUT	FRAGMENTS
pal2	myillinois1	02.24.2009 12:03 AM	02.24.2009 12:03 AM	frg-home-00,frg-acad-00,...
koester3	myillinois1	02.24.2009 12:08 AM		frg-home-00,frg-acad-00,...
nosek1	myillinois1	02.24.2009 3:55 AM		frg-home-00,frg-acad-00,...
trnelson	myillinois1	02.24.2009 8:41 AM		frg-wlcm-00,frg-home-00...
jdixon	myillinois1	02.24.2009 10:55 AM		frg-home-00,frg-acad-00,...
koester3	myillinois1	02.24.2009 9:00 AM		frg-home-00,frg-acad-00,...
jmhamltn	myillinois1	02.24.2009 11:38 AM		frg-wlcm-00,frg-itpro-00,
wilkin10	myillinois1	02.24.2009 12:32 PM		frg-nsp-00,
trnelson	myillinois1	02.24.2009 10:34 AM		frg-wlcm-00,frg-home-00...
rkahn	myillinois1	02.24.2009 1:32 PM	02.24.2009 1:55 PM	frg-wlcm-00,frg-itpro-00,
cannizz1	myillinois1	02.24.2009 2:09 PM	02.24.2009 2:24 PM	frg-home-00,frg-acad-00,...

Usage Statistics

- currently extracting…

  - total logins and unique logins

  - total logouts and percentage of logins that have logouts

  - access by audiences (visa-vi DLM tabs)

  - totals for new students, continuing students, engineering students, ITPro staff

Usage Statistics

- we are interested in finding out more about the built-in capabilities of uPortal 3.x

- what are other folks doing?

Closing

Q & A