Multitenant ActiveMQ

APACHECON
NORTH AMERICA

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@hgz

Intro

Top Level Project since Jan 17th, 2007.

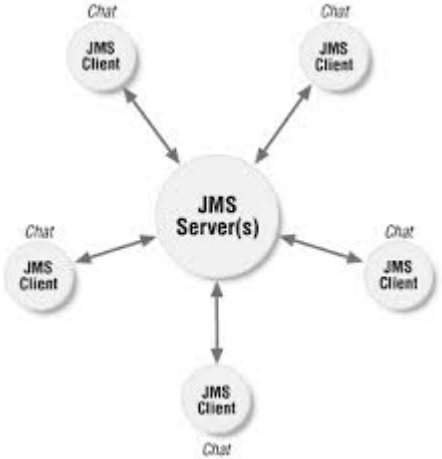
Apache ActiveMQ is fast, supports many Cross Language Clients and Protocols, comes with easy to use Enterprise Integration Patterns and many advanced features while fully supporting JMS 1.1 and J2EE 1.4. Apache ActiveMQ is released under the Apache 2.0 License.

Features

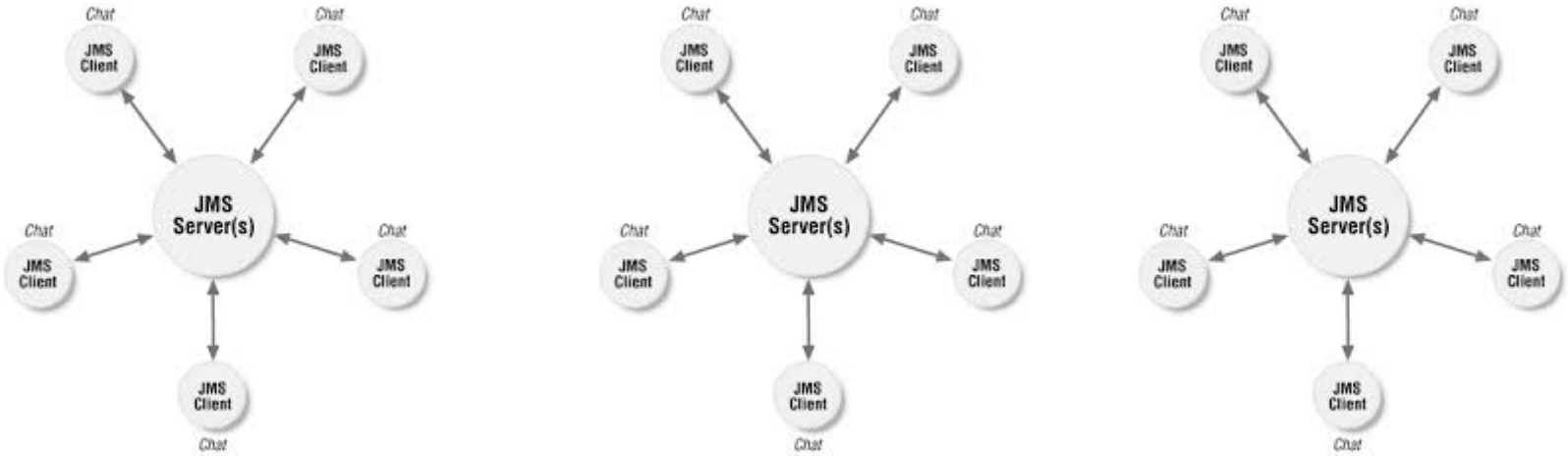
- ✓ Fast
- ✓ Mature
- ✓ Robust
- ✓ Secure
- ✓ Scalable
- ✓ Extensible

Product or Framework?

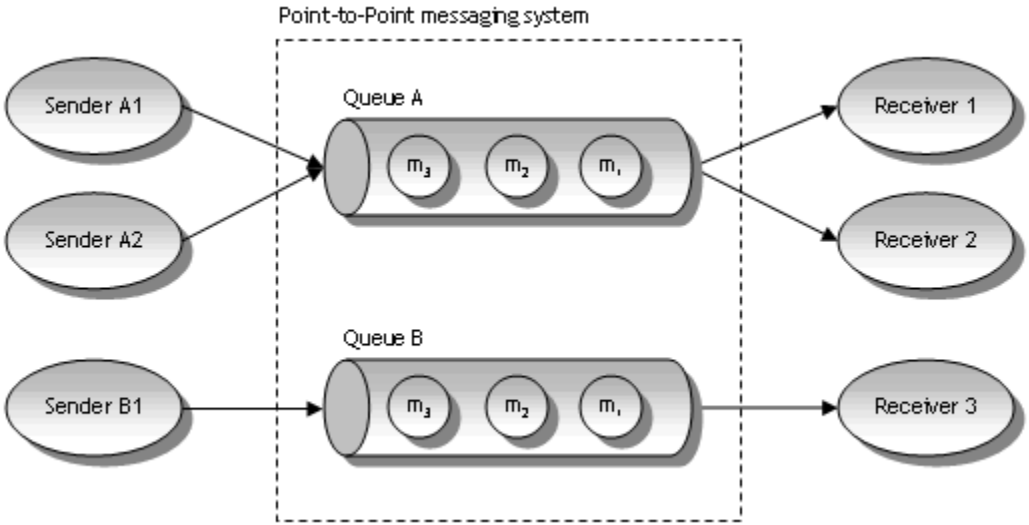
A JMS Application



… and other JMS Applications



The problem


Point-to-Point messaging system
Sender A1
Sender A2
Sender B1
Queue A
Queue B
m3
m2
m1
m3
m2
m1
Receiver 1
Receiver 2
Receiver 3

What we'd like

What we got

What we really need

Options

amazon
web services™

rackspace

IronMQ

Apache ActiveMQ
version 5.x
Enterprise Message Broker
The Apache Software Foundation

Configuring Brokers

```
activemq  xbean:file:../conf/myConfig.xml
```

```
<beans … >
   <bean class="org.springframework.beans.factory.config.PropertyPlaceholderConfigurer"> ... </bean>

   <broker brokerName="localhost" dataDirectory="${activemq.data}"> ...
      <destinationPolicy>     ...     </destinationPolicy>
      <managementContext>  … </managementContext>
      <persistenceAdapter>   ...   </persistenceAdapter>
      <systemUsage>        ...       </systemUsage>
      <transportConnectors>  ...  </transportConnectors>
      <networkConnectors>  ...  </networkConnectors>
      <shutdownHooks>     ...      </shutdownHooks>
   </broker>
</beans>
```

http://activemq.apache.org/xml-configuration.html

http://activemq.apache.org/user-submitted-configurations.html

Configuring brokers

```
public interface BrokerFactoryHandler {
   // interface used to create a broker from a URI scheme
   BrokerService createBroker(URI brokerURI) throws IOException;
}


public class AcnaFactoryHandler implements BrokerFactoryHandler {
   // ...
}
```

Create: `src/main/resources/META-INF/services/org/apache/activemq/broker/acna`

```
class=org.example.activemq.acna.AcnaBrokerFactory
```

Discovering brokers

```
<broker brokerName="one">
  <transportConnectors>
    <transportConnector uri="tcp://localhost:0" discoveryUri="multicast://default"/>
  </transportConnectors>
</broker>
```

```
<broker brokerName="two">
   <networkConnectors>
      <ldapNetworkConnector uri="ldap://ldap.example.com:389"
                            base="dc=brokers,dc=example,dc=com"
                            anonymousAuthentication="true"
                            searchFilter="(cn=*)"
                            searchScope="SUBTREE_SCOPE" />
   </networkConnectors>
</broker>
```

http://activemq.apache.org/discovery.html

http://activemq.apache.org/discovery-transport-reference.html

http://activemq.apache.org/ldap-broker-discovery-mechanism.html

Discovering brokers

```
public interface DiscoveryAgent extends Service {

   // Sets the discovery listener
   void setDiscoveryListener(DiscoveryListener listener);

   // register a service
   void registerService(String name) throws IOException;

   // A process actively using a service may see it go down before the DiscoveryAgent notices the
   // service's failure.  That process can use this method to notify the DiscoveryAgent of the failure
   // so that other listeners of this DiscoveryAgent can also be made aware of the failure.
   void serviceFailed(DiscoveryEvent event) throws IOException;
}
```

Transports (protocols)

- AMQP
- MQTT
- OpenWire
- REST
- RSS and Atom
- Stomp
- WSIF
- WS Notification
- XMPP

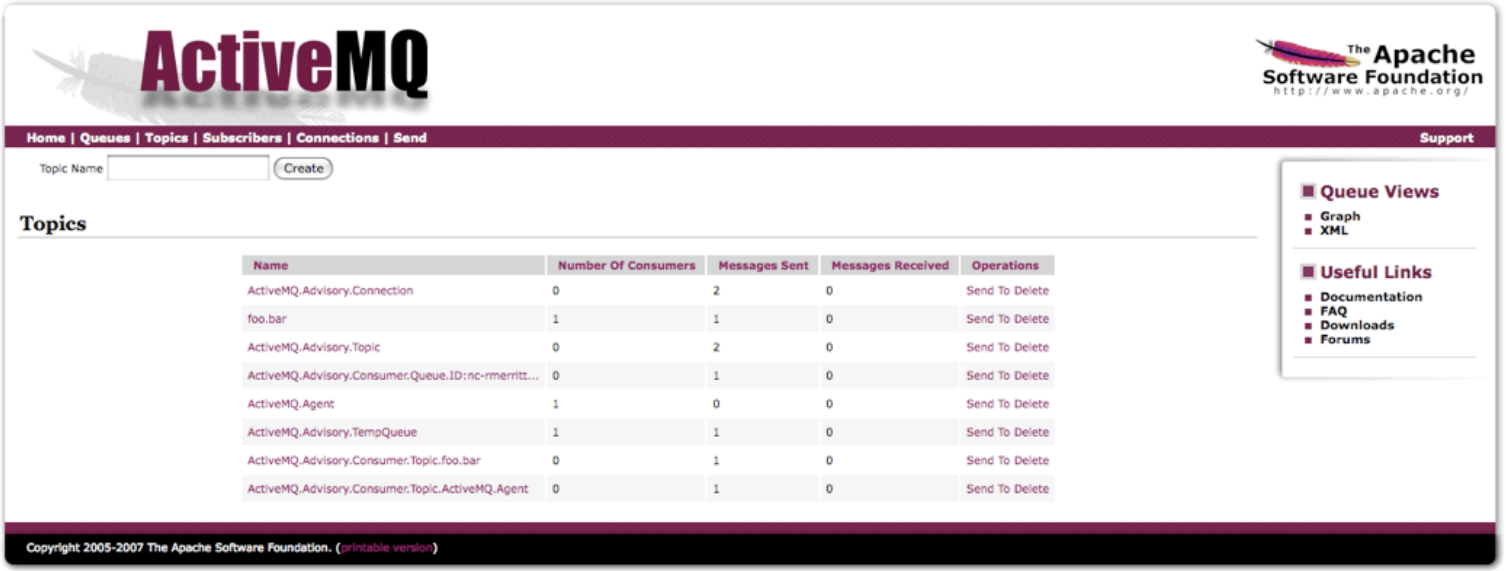
http://activemq.apache.org/configuring-transports.html

Persistence

```
<persistenceAdapter>
 <mKahaDB directory="${activemq.base}/data/kahadb">
  <filteredPersistenceAdapters>

   <filteredKahaDB queue="namespace.>">
    <persistenceAdapter> <kahaDB journalMaxFileLength="32mb"/> </persistenceAdapter>
   </filteredKahaDB>

   <filteredKahaDB>
    <persistenceAdapter> <kahaDB enableJournalDiskSyncs="false"/> </persistenceAdapter>
   </filteredKahaDB>

  </filteredPersistenceAdapters>
 </mKahaDB>
</persistenceAdapter>
```

http://activemq.apache.org/kahadb.html

Management and Monitoring

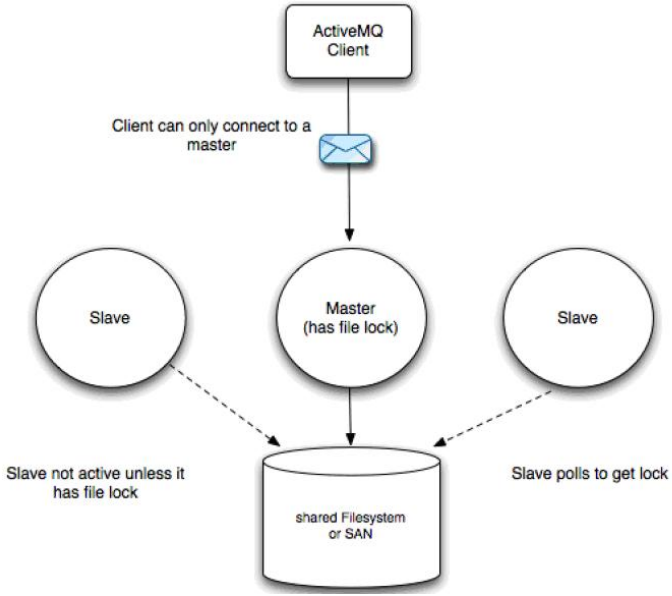


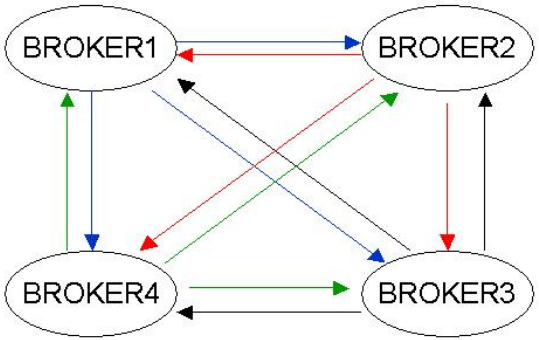
Diagnosis

Intermezzo

https://github.com/hzbarcea/apachecon/tree/master/acna2015

Broker Topologies





http://activemq.apache.org/masterslave.html

http://activemq.apache.org/networks-of-brokers.html

Plugins

```
<broker brokerName="broker">
  <plugins>
    <runtimeConfigurationPlugin checkPeriod="15000" />
    <timeStampingBrokerPlugin zeroExpirationOverride="30000" ttlCeiling="60000" />

    <jaasAuthenticationPlugin configuration="LdapConfiguration" />
    <authorizationPlugin>
      [...]
    </authorizationPlugin>
  </plugins>
</broker>
```

(*) Need to provide the LdapConfiguration in the JAAS login.config
(**) The ootb ldap authn/authz is not sufficient to infer the ‘zone’ (destination namespace)

http://activemq.apache.org/runtime-configuration.html

http://activemq.apache.org/timestampplugin.html

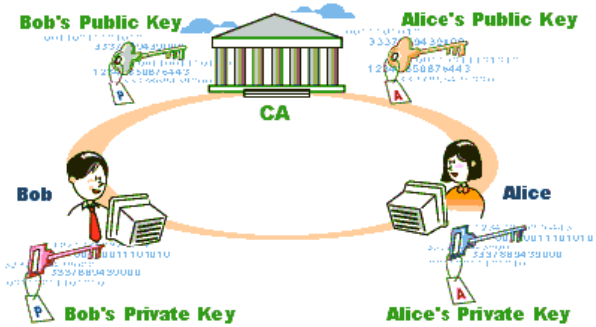
http://activemq.apache.org/security.html

Infrastructure (platform)

Securing Brokers

- ✓ nio+ssl
- ✓ https
- ✓ ldaps (auth)

- ✓ CA
- ✓ Logging
- ✓ Non Repudiation
- ✓ IDC
- ✓ Malware Analysis



splunk>

ClamAV

Networking

The network is reliable

Latency isn't a problem

Bandwidth isn't a problem

The network is secure

Topology won't change

The administrator will know what to do

Transport cost isn't a problem

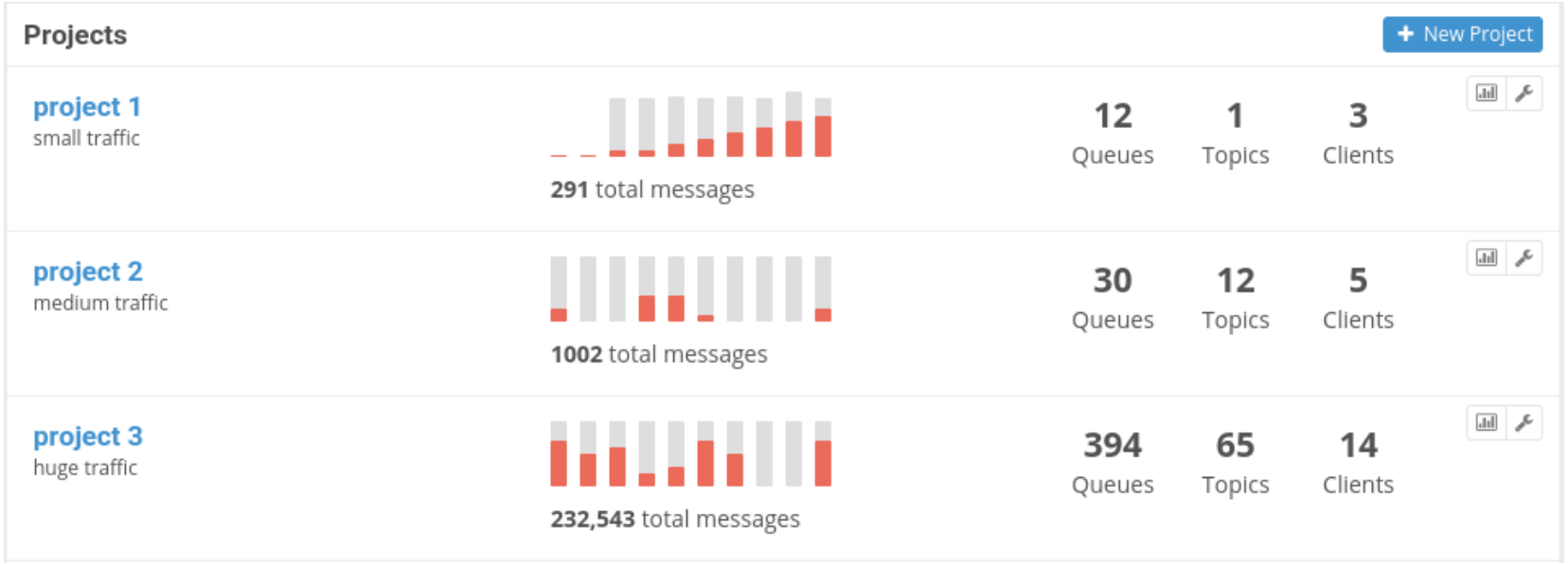
The network is homogeneous

The system is atomic/monolithic

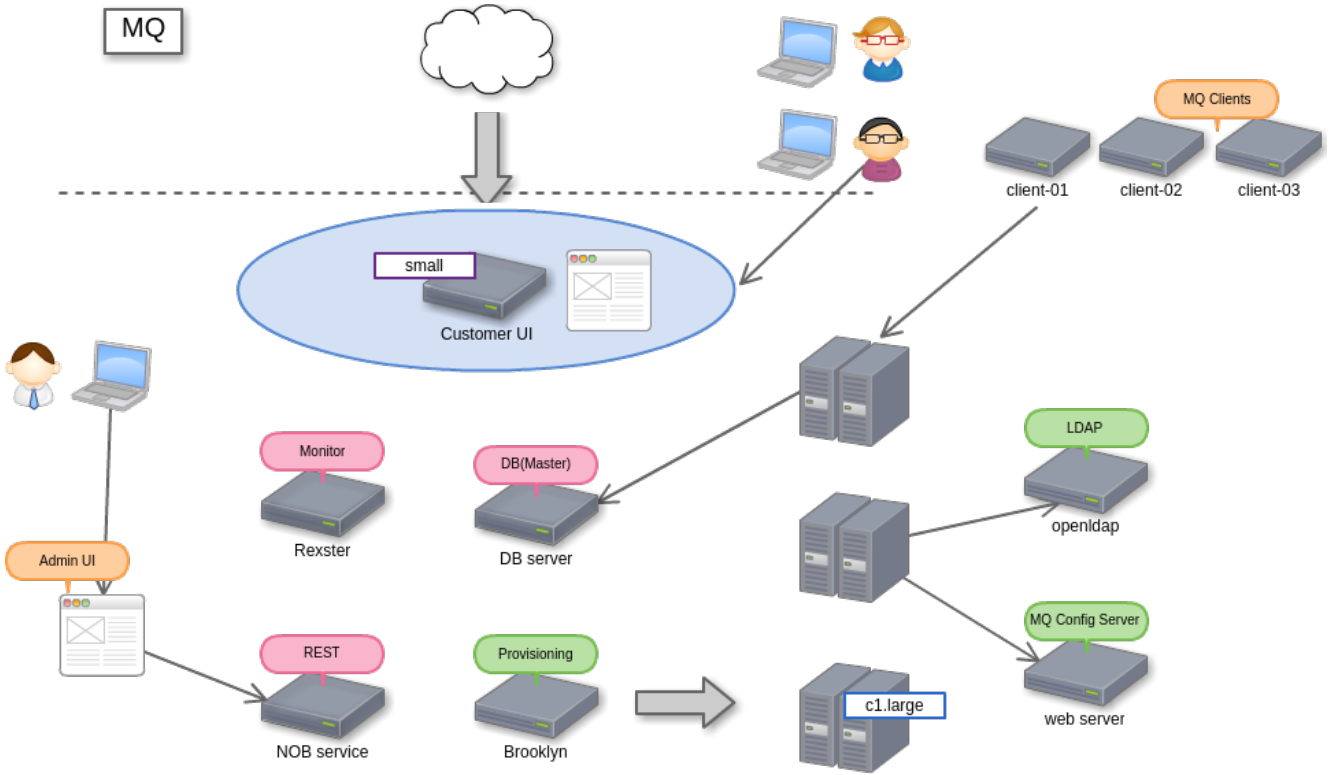
The system is finished

Business logic can and should be centralized

SilkMQ


Projects
+ New Project
project 1
small traffic
291 total messages
12
Queues
1
Topics
3
Clients
project 2
medium traffic
1002 total messages
30
Queues
12
Topics
5
Clients
project 3
huge traffic
232,543 total messages
394
Queues
65
Topics
14
Clients

Multitenant Deployment



Apache Brooklyn

OASIS

CAMP
Cloud Applications Management
for Platforms

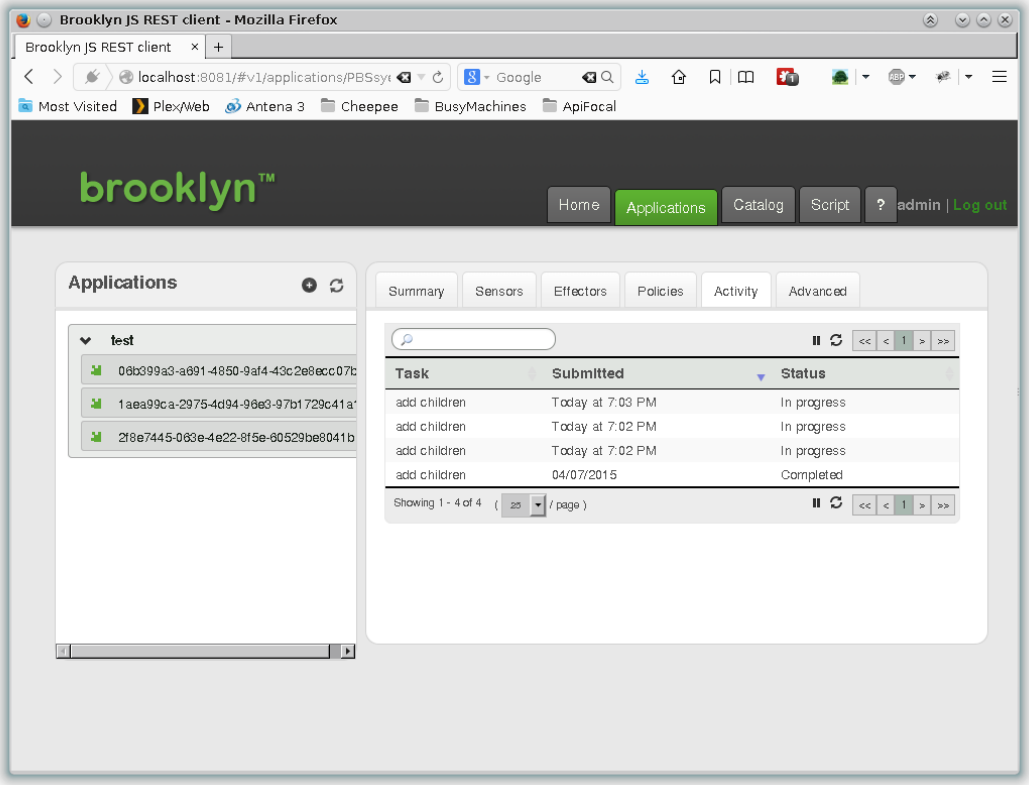
TOSCA
Topology and Orchestration
Specification for Cloud Applications

apache brooklyn

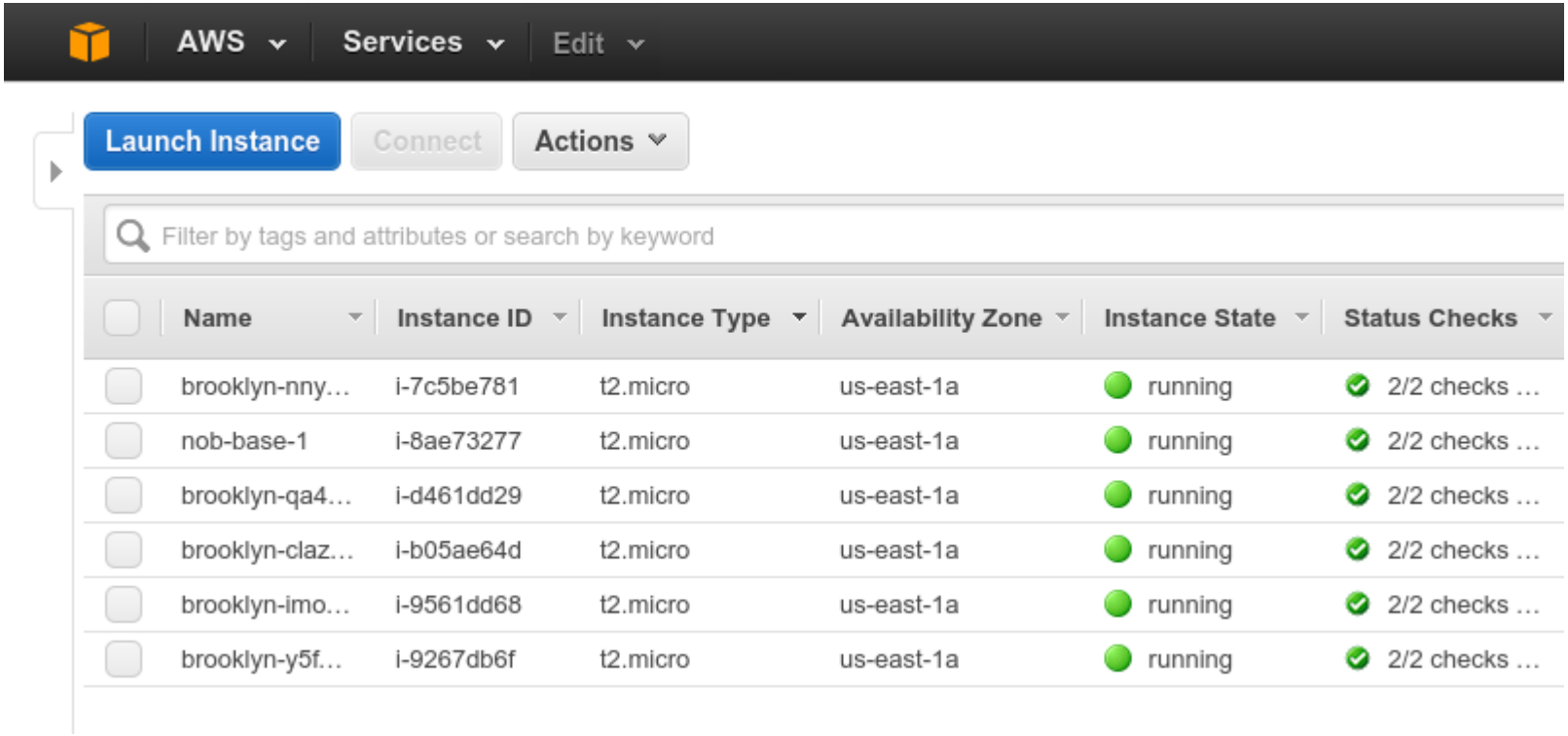
Brooklyn Blueprint

```
services:
  - name: 06b399a3-a691-4850-9af4-43c2e8ecc07b
    type: brooklyn.entity.messaging.activemq.ActiveMQBroker
    brooklyn.config:
      version: 5.11.1
      activemq.brokerName: 06b399a3-a691-4850-9af4-43c2e8ecc07b
      activemq.customConfigurationUrl: >
http://ec2-52-1-249-64.compute-1.amazonaws.com/nob/06b399a3-a691-4850-9af4-43c2e8ecc07b.xbean
```

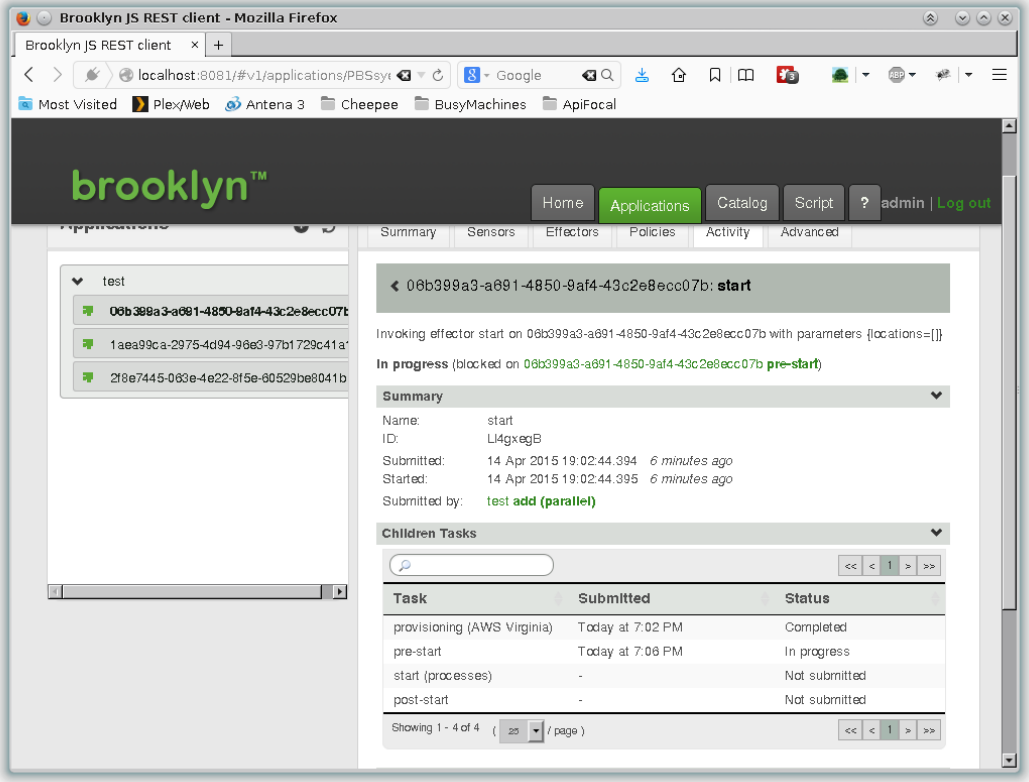
1


Brooklyn JS REST client - Mozilla Firefox
Brooklyn JS REST client
localhost:8081/#v1/applications/PBSsy
Google
Most Visited
Plex/Web
Antena 3
Cheepee
BusyMachines
ApiFocal
brooklyn™
Home
Applications
Catalog
Script
?
admin | Log out
Applications
test
06b399a3-a691-4850-9af4-43c2e8ecc07b
1aea99ca-2975-4d94-96e3-97b1729c41a1
2f8e7445-063e-4e22-8f5e-60529be8041b
Summary
Sensors
Effectors
Policies
Activity
Advanced
Task
Submitted
Status
add children
Today at 7:03 PM
In progress
add children
Today at 7:02 PM
In progress
add children
Today at 7:02 PM
In progress
add children
04/07/2015
Completed
Showing 1 - 4 of 4
25
/ page

Deploying Brokers



02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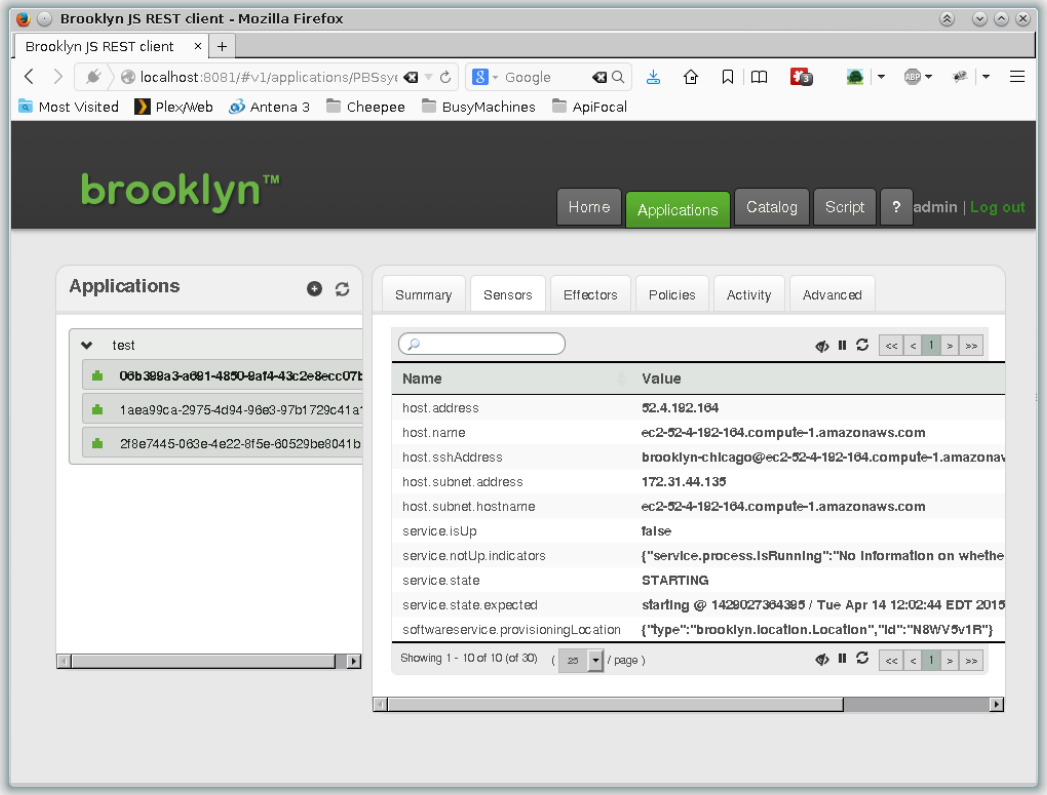
Catalog
Script
?
admin | Log out
Summary
Sensors
Effectors
Policies
Activity
Advanced
test
06b399a3-a691-4850-9af4-43c2e8ecc07b
1aea99ca-2975-4d94-96e3-97b1729c41a
2f8e7445-063e-4e22-8f5e-60529be8041b
06b399a3-a691-4850-9af4-43c2e8ecc07b: start
Invoking effector start on 06b399a3-a691-4850-9af4-43c2e8ecc07b with parameters {locations=[]}
In progress (blocked on 06b399a3-a691-4850-9af4-43c2e8ecc07b pre-start)
Summary
Name: start
ID: LI4gxegB
Submitted: 14 Apr 2015 19:02:44.394 6 minutes ago
Started: 14 Apr 2015 19:02:44.395 6 minutes ago
Submitted by: test add (parallel)
Children Tasks
Task
Submitted
Status
provisioning (AWS Virginia)
Today at 7:02 PM
Completed
pre-start
Today at 7:06 PM
In progress
start (processes)
-
Not submitted
post-start
-
Not submitted
Showing 1 - 4 of 4
/ page

03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Brooklyn JS REST client
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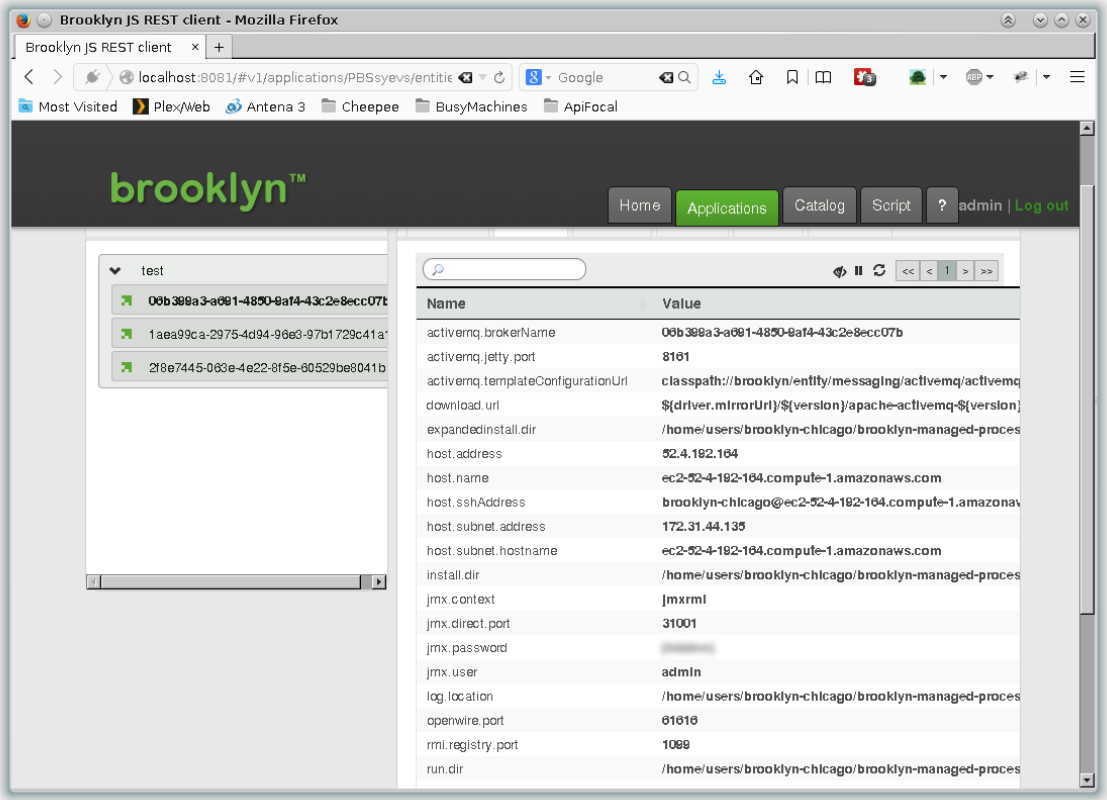
admin | Log out
Applications
test
06b398a3-a691-4850-8af4-43c2e8ecc07b
1aea99ca-2975-4d94-96e3-97b1729c41a7
2f8e7445-063e-4e22-8f5e-60529be8041b
Summary
Sensors
Effectors
Policies
Activity
Advanced
Name
Value
host.address
52.4.182.164
host.name
ec2-52-4-182-164.compute-1.amazonaws.com
host.sshAddress
brooklyn-chicago@ec2-52-4-182-164.compute-1.amazonav
host.subnet.address
172.31.44.135
host.subnet.hostname
ec2-52-4-182-164.compute-1.amazonaws.com
service.isUp
false
service.notUp.indicators
{"service.process.isRunning":"No information on whethe
service.state
STARTING
service.state.expected
starting @ 1428027364385 / Tue Apr 14 12:02:44 EDT 2015
softwareservice.provisioningLocation
{"type":"brooklyn.location.Location","id":"N8WV5v1R"}
Showing 1 - 10 of 10 (of 30)
/ page)

04


Brooklyn JS REST client - Mozilla Firefox
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localhost:8081/#v1/applications/PBSsyevs/entitie
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Script
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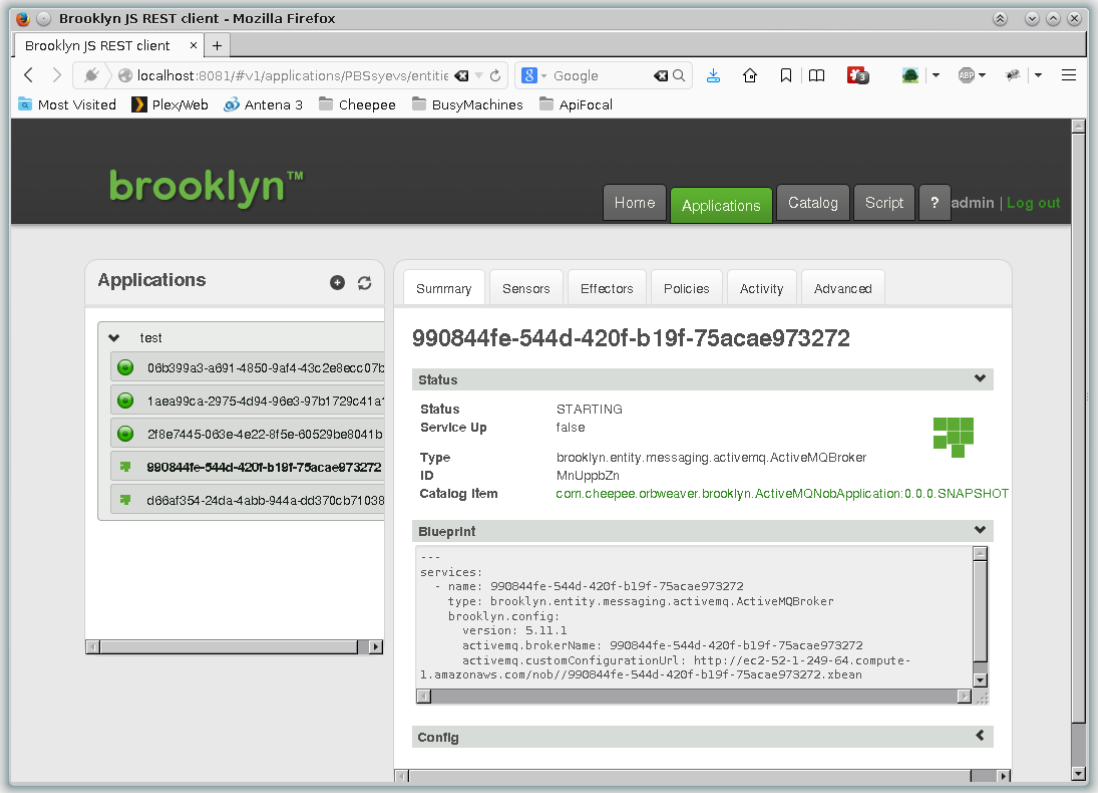
06b398a3-a681-4850-8af4-43c2e8ecc07b
1aea99ca-2975-4d94-96e3-97b1729c41a
2f8e7445-063e-4e22-8f5e-60529be8041b
Name
Value
activemq.brokerName
06b398a3-a681-4850-8af4-43c2e8ecc07b
activemq.jetty.port
8161
activemq.templateConfigurationUrl
classpath://brooklyn/entity/messaging/activemq/activemq
download.url
${driver.mirrorUrl}/${version}/apache-activemq-${version}
expandedinstall.dir
/home/users/brooklyn-chicago/brooklyn-managed-proces
host.address
52.4.192.164
host.name
ec2-52-4-192-164.compute-1.amazonaws.com
host.sshAddress
brooklyn-chicago@ec2-52-4-192-164.compute-1.amazonav
host.subnet.address
172.31.44.135
host.subnet.hostname
ec2-52-4-192-164.compute-1.amazonaws.com
install.dir
/home/users/brooklyn-chicago/brooklyn-managed-proces
jmx.context
jmxrmi
jmx.direct.port
31001
jmx.password
jmx.user
admin
log.location
/home/users/brooklyn-chicago/brooklyn-managed-proces
openwire.port
61616
rmi.registry.port
1099
run.dir
/home/users/brooklyn-chicago/brooklyn-managed-proces

05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localhost:8081/#v1/applications/PBSsyevs/entitie
Google
Most Visited
PlexWeb
Antena 3
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Home
Applications
Catalog
Script
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admin | Log out
Applications
test
06b399a3-a691-4850-9af4-43c2e8ecc07b
1aea99ca-2975-4d94-96e3-97b1729c41a7
2f8e7445-063e-4e22-8f5e-60529be8041b
990844fe-544d-420f-b19f-75acae973272
d66af354-24da-4abb-944a-dd370cb71038
Summary
Sensors
Effectors
Policies
Activity
Advanced
990844fe-544d-420f-b19f-75acae973272
Status
Status
STARTING
Service Up
false
Type
brooklyn.entity.messaging.activemq.ActiveMQBroker
ID
MnUppbZn
Catalog Item
com.cheepee.orbweaver.brooklyn.ActiveMQNobApplication:0.0.0.SNAPSHOT
Blueprint
---
services:
- name: 990844fe-544d-420f-b19f-75acae973272
type: brooklyn.entity.messaging.activemq.ActiveMQBroker
brooklyn.config:
version: 5.11.1
activemq.brokerName: 990844fe-544d-420f-b19f-75acae973272
activemq.customConfigurationUrl: http://ec2-52-1-249-64.compute-1.amazonaws.com/nob//990844fe-544d-420f-b19f-75acae973272.xbean
Config

Q&A

Thanks!

APACHECON NORTH AMERICA

Ciprian Ciubotariu CMoH

Alexandru Zbarcea azbarcea

cloudsoft
Bringing Business to the Cloud

http://www.cloudsoftcorp.com/

http://busymachines.com/

spectrum systems

http://spectrsys.com