Automatic setup of Django on EC2 using Bellatrix

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Agenda

1. Installing Django in production
2. Infrastructure as code
3. Automation with Bellatrix
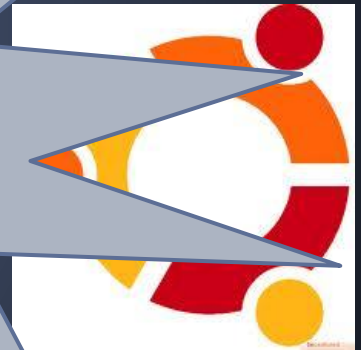4. Bellatrix @ Atlassian

Installing Django in production

Installing Django in production

Far from trivial!

Installing Django in production

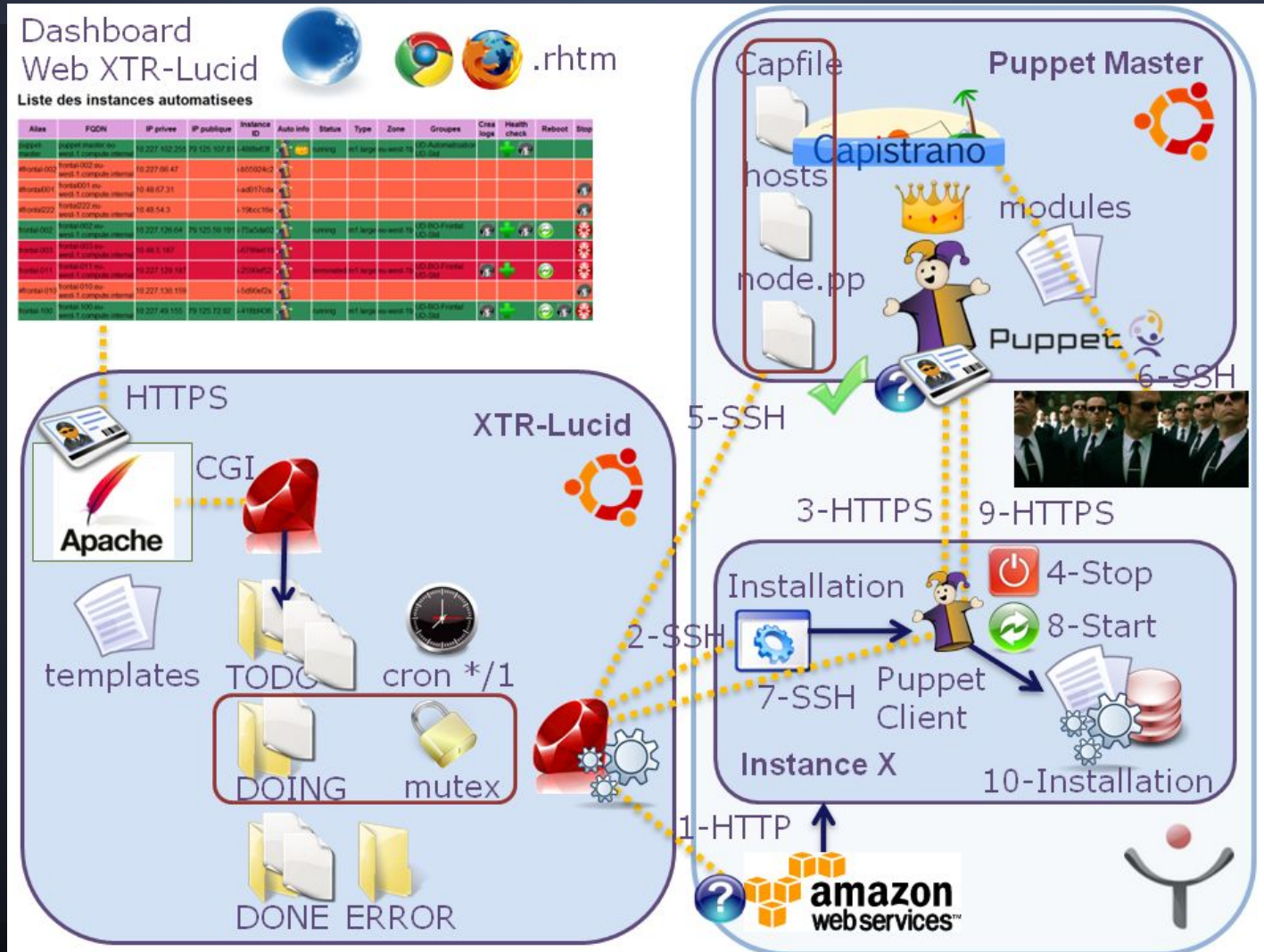twitter.com/newsycombinator/status/151695100282544130

Infrastructure as code

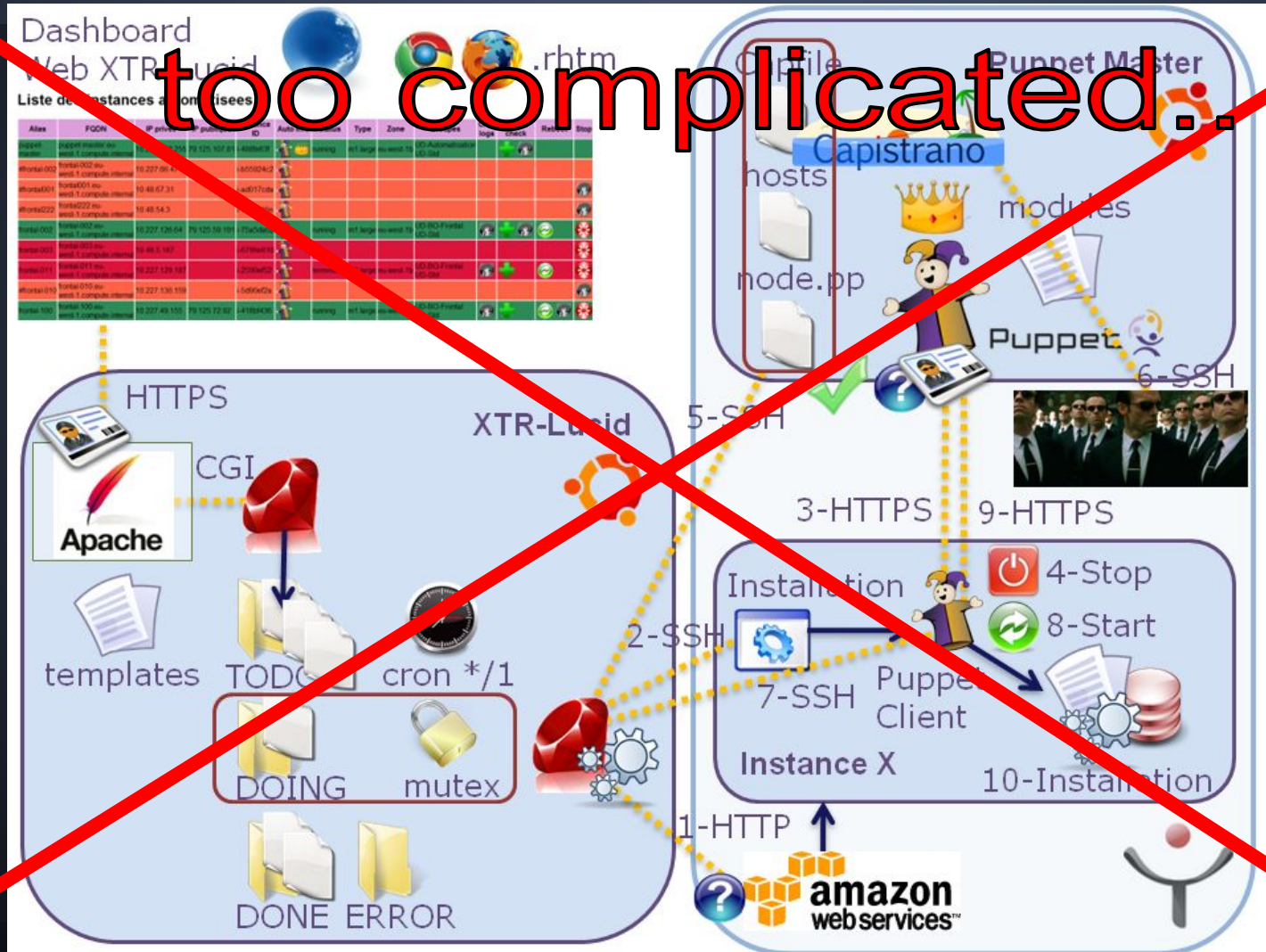Configuration Management. Why?

-Establish and maintain consistency of a system.

-Seamlessly handling software changes
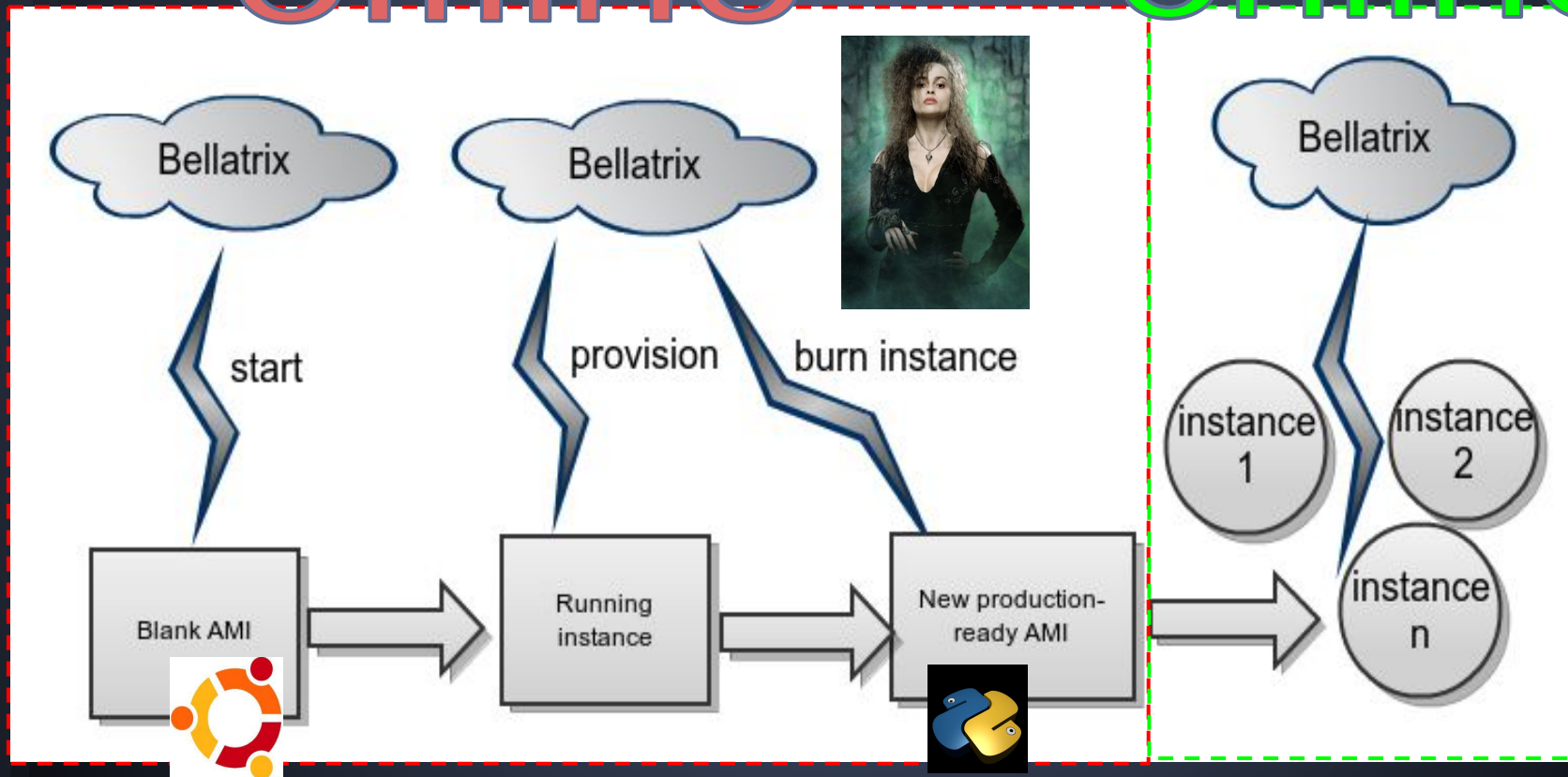
Infrastructure as code in the cloud

Infrastructure as code in the cloud

Infrastructure as code simplified

Automation with Bellatrix

in only four steps!

- pip install bellatrix
- bellatrix start ami
- bellatrix provision ubuntu_django_ngnix.py
- bellatrix burn

Automation with Bellatrix

- pip install bellatrix

Pip = Python Install package.
Similar to apt-get, yum or ruby gem.

Bellatrix = Open Source set of (magic)utilities developed in Atlassian.

Automation with Bellatrix

- pip install bellatrix
- bellatrix start ami

Starts a new virtual machine based on your ami.

Bellatrix – Starting a new instance

```
1    bellatrix start ami-baba68d3 ec2-keypair
2  + bellatrix start ami-baba68d3 key
3    2012-04-01 15:06:15,848 INFO starting EC2 instance...
4    2012-04-01 15:06:15,848 INFO ami:ami-baba68d3 type:t1.micro key_name:key se
5    2012-04-01 15:06:17,017 INFO starting image: ami-baba68d3 key key type t1.m
6    2012-04-01 15:06:17,709 INFO we got 1 instance (should be only one).
7    2012-04-01 15:06:17,709 INFO tagging instance:i-864c56e2 key:Name value:Bel
8    2012-04-01 15:06:21,252 INFO instance:i-864c56e2 was successfully tagged wi
9    2012-04-01 15:06:21,252 INFO getting the dns name for instance: i-864c56e2
10   2012-04-01 15:06:41,216 INFO DNS name for i-864c56e2 is ec2-23-20-206-220.c
11   2012-04-01 15:06:41,217 INFO waiting until instance: i-864c56e2 is ready. T
12   2012-04-01 15:06:41,217 INFO Instance i-864c56e2 is running
```

Automation with Bellatrix

- pip install bellatrix
- bellatrix start ami
- bellatrix provision ubuntu_django_ngnix.py

Applies a configuration to any host
(EC2 or not)

Bellatrix - Provisioning your instance

```python
from bellatrix.lib import cmds

#list of cmds to execute
commands = []
commands = cmds.install_pip()
commands += cmds.pip_install("virtualenv")
commands += cmds.install_nginx()
commands += cmds.createVirtualEnv(env)
commands += cmds.installPackageInVirtualEnv(env, package="django", verification_command="django-admin.py --version")
commands += cmds.installPackageInVirtualEnv(env, package="gunicorn")

commands += cmds.executeInVirtualEnv(env, cmds.create_django_project(project_name, dir_name=env + os.path.sep))
commands += configureNginx()

#setting up Django app
commands += appendTemplateDir(django_app_dir + "/app/app/settings.py")
commands += cmds.wget("https://bitbucket.org/deccico/django_gunicorn/raw/tip/django_app/urls.py", django_app_dir + "/app/app/urls.py")
commands += cmds.wget("https://bitbucket.org/deccico/django_gunicorn/raw/1587f68db41e/templates/test_static.html", \
                django_app_dir + "/templates/test_static.html")
commands += cmds.wget("https://bitbucket.org/deccico/django_gunicorn/raw/tip/static/django.png", \
                django_app_dir + "/static/django.png")

##setting up Upstart to automatically launch Django application
commands += cmds.wget("https://bitbucket.org/deccico/django_gunicorn/raw/tip/run.sh", django_app_dir + "/run.sh")
commands += cmds.chmod("a+x", django_app_dir + "/run.sh")
commands += cmds.sudo(cmds.wget("https://bitbucket.org/deccico/django_gunicorn/raw/tip/server/etc/init/django_app.conf", \
                "/etc/init/django_app.conf"))

logging.info("commands generated: %s" % commands)
```

Automation with Bellatrix

- pip install bellatrix
- bellatrix start ami
- bellatrix provision ubuntu_django_ngnix.py
- bellatrix burn

Saves the configuration into a new ami

Bellatrix - Burning a new ami


```
cleaning up...
+ bellatrix --version
Bellatrix 1.1.0
[workspace] $ python /tmp/hudson6967931463482475124.py
2012-04-01 15:11:32,809 INFO burning...
2012-04-01 15:11:32,825 INFO burning instance: i-864c56e2 name: ubuntu_django_nginx_gunicorn_x64-2012-04-01T15-11-
2012-04-01 15:11:33,996 INFO ami: ami-3b79a752 is being generated. Name: ubuntu_django_nginx_gunicorn_x64-2012-04-
2012-04-01 15:11:34,428 INFO ami
2012-04-01 15:11:34,428 INFO AMI:ami-3b79a752 is not ready yet. Retrying in 30 seconds....
2012-04-01 15:12:04,748 INFO ami state pending
2012-04-01 15:12:04,748 INFO AMI:ami-3b79a752 is not ready yet. Retrying in 30 seconds....
2012-04-01 15:12:35,140 INFO ami state pending
2012-04-01 15:12:35,140 INFO AMI:ami-3b79a752 is not ready yet. Retrying in 30 seconds....
2012-04-01 15:13:05,472 INFO ami state pending
2012-04-01 15:13:05,473 INFO AMI:ami-3b79a752 is not ready yet. Retrying in 30 seconds....
2012-04-01 15:13:35,837 INFO ami state pending
2012-04-01 15:13:35,837 INFO AMI:ami-3b79a752 is not ready yet. Retrying in 30 seconds....
2012-04-01 15:14:06,326 INFO ami state pending
2012-04-01 15:14:06,326 INFO AMI:ami-3b79a752 is not ready yet. Retrying in 30 seconds....
2012-04-01 15:14:36,643 INFO ami state available
2012-04-01 15:14:36,643 INFO AMI: ami-3b79a752 is ready to use!
executing . env/bin/activate&& bellatrix burn i-864c56e2 ubuntu_django_nginx_gunicorn_x64 --wait=true
exit code: 0
Triggering a new build of 04-terminate_instance #20
Finished: SUCCESS
```

Jenkins pipeline (normal UI)

Jenkins pipeline

Bellatrix at Atlassian - AMI Factory

Java Version	
Oracle JRE / JDK	✓ 1.6.0_4+ (Note: Java 6 update 18+ have known issues.) Re...
	✓ 1.7
Operating Systems	
Microsoft Windows (including 64-bit)[1]	✓ (Microsoft Supported Versions only)
Linux / Solaris [1, 2]	✓
Apple Mac OS X	✗ Not supported as server. ✓ Supported as client platform.
Application Servers	
Apache Tomcat	✓ 5.5.20 - 6.0.x
Databases	
PostgreSQL	✓ 8.2, 8.3, 8.4, 9.0
MySQL [3]	✓ 5.1, 5.5
Oracle	✓ 11.1, 11.2
Microsoft SQL Server	✓ 2005, 2008, 2008 R2
DB2	✓ 9.7
HSQLDB [4]	✓ (for evaluation purposes only)
Web Browsers	
Microsoft Internet Explorer (Windows)	✓ 8, 9 [5, 9]
Mozilla Firefox (all platforms)	✓ Latest stable version supported

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Bellatrix at Atlassian - AMI Factory

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Bamboo

Dashboard   Authors   Reports   Administration
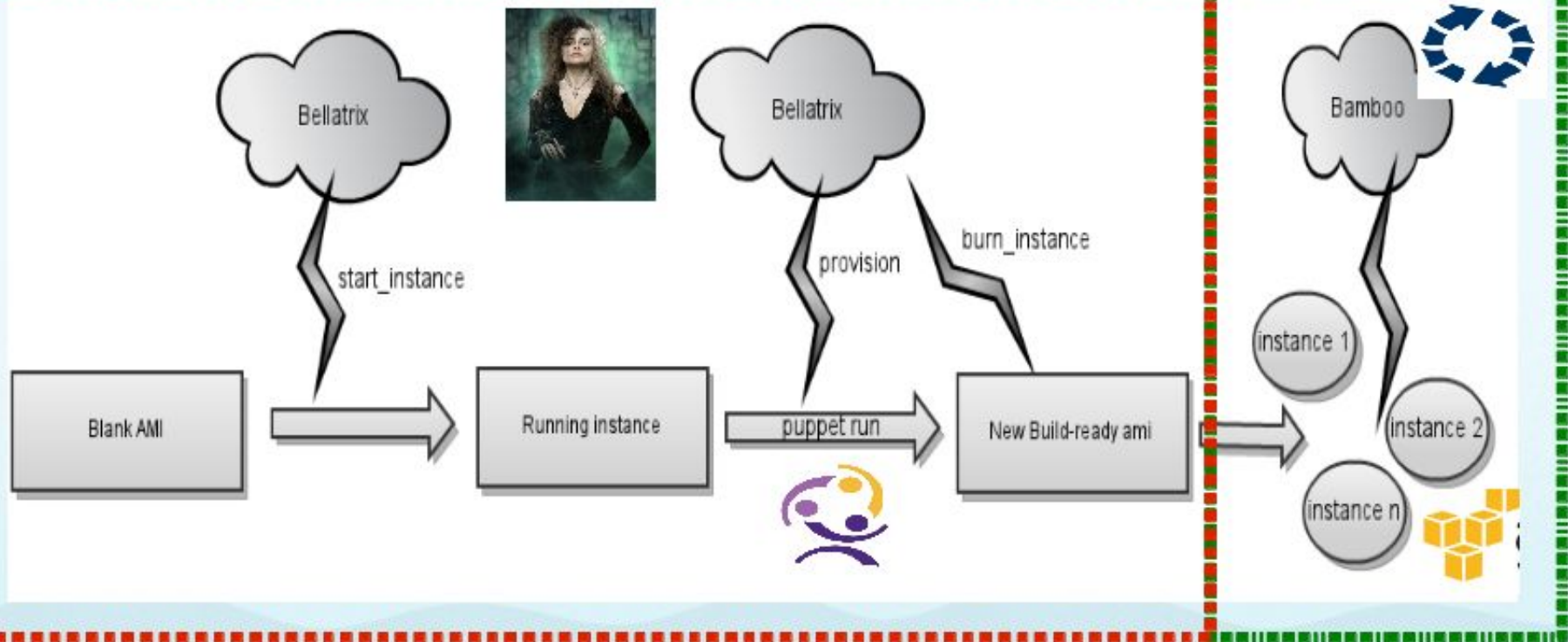
AMI factory › Ubuntu1104-FF-x64 › **#227**

| ✓ #227 | Job: **provision** was successful |

Stages & Jobs

start_instance
✓ start instance

provision
✓ provision

burn
✓ burn

set_permissions
✓ set_permissions

Job Summary   Tests   Changes   Artifacts   Logs   Metadata

Job Result Summary

Details

Trigger	This build was manually triggered by Adrian Deccico.
Revision	8aafc1b90c6ed943...
Agent	bamboo-agent-1122.private.atlassian.com (2)
Completed	06 Mar 2012, 9:28:56 PM – 1 day ago
Duration	18 minutes
Successful since	#225 (5 days before)
Labels	None 🖉

Code Changes

Adrián Deccico <adeccico@atlassian.com>
adding mercurial...

Comments

No comments on this Job.

Comment

🔴 Report Infrastructure Problem (?)

Error Summary

⚠ The build generated some errors. See the full build log for more details.

```
Bellatrix 0.4.3
2012-03-06 21:10:28,122 INFO provisioning...
2012-03-06 21:10:28,144 INFO processing: ec2configs/ubuntuff in: /opt/bamboo-agent/xml-data/build-dir/AMYFACTORY-UBUNTU1004FF36MYSQL51X64-PROVISION
2012-03-06 21:10:28,146 INFO waiting until host: ec2-107-22-0-95.compute-1.amazonaws.com is ready to receive ssh connections. Time out is: 300 seconds...
2012-03-06 21:10:31,149 INFO executing:ssh -o StrictHostKeyChecking=no -i /opt/bamboo-agent/.bellatrix/ec2.pk ubuntu@ec2-107-22-0-95.compute-1.amazonaws.com 'echo CONNECTION READY' > t
ssh: connect to host ec2-107-22-0-95.compute-1.amazonaws.com port 22: Connection refused
2012-03-06 21:10:34,269 INFO executing:ssh -o StrictHostKeyChecking=no -i /opt/bamboo-agent/.bellatrix/ec2.pk ubuntu@ec2-107-22-0-95.compute-1.amazonaws.com 'echo CONNECTION READY' > t
ssh: connect to host ec2-107-22-0-95.compute-1.amazonaws.com port 22: Connection refused
2012-03-06 21:10:37,321 INFO executing:ssh -o StrictHostKeyChecking=no -i /opt/bamboo-agent/.bellatrix/ec2.pk ubuntu@ec2-107-22-0-95.compute-1.amazonaws.com 'echo CONNECTION READY' > t
```

Bellatrix at Atlassian - AMI Factory

Manage Elastic Image Configurations

You can manage the configurations of elastic images that you have associated with Bamboo on this page. Yo...

Name	AMI ID	EBS Snapshot ID
Default Image EBS i386 (linux) (stock image) (disabled)	ami-1d1ad074	No EBS
Default Image EBS x86_64 (linux) (stock image) (disabled)	ami-bb1ad0d2	No EBS
Default Image EBS x86_64 (windows) (stock image) (disabled)	ami-01ca1f68	No EBS
Default Image S3 x86_64 (linux) (stock image) (disabled)	ami-b91ad0d0	No EBS
Default Image S3 x86_64 (windows) (stock image) (disabled)	ami-65529a0c	No EBS
Default S3 i386 (stock image) (disabled)	ami-951ad0fc	snap-1285517a
Oracle_11_2_x64	ami-75b96a1c	No EBS
SqlServer 2008 - x64	ami-4535fc2c	No EBS
Ubuntu08.04_MySQL5_0_Postgresql82_x64	ami-8739f4ee	No EBS
Ubuntu08.04_MySQL5_0_Postgresql83_x64	ami-9539f4fc	No EBS
Ubuntu10.04-FF36-x64	ami-3d35ff54	No EBS
Ubuntu10.04-Postgresql90-x64	ami-dba76ab2	No EBS
Ubuntu10.04_Postgresql84_x64	ami-6d509204	No EBS
Ubuntu10_04_DB2_Express-C_9_7_1_x32	ami-abac67c2	No EBS
Ubuntu10_04_MySQL51_x64	ami-1ba76a72	No EBS
ubuntu1104-ff36-x64	ami-e1a27188	No EBS

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Manage Elastic Image Configurations > SqlServer 2008 - x64 > Running Elastic Instances

This page lists the elastic instances currently running which use the elastic image configruation "SqlServer 2008 - x64". For a full list of all running instances see the Manage El

Start New Elastic Instances | Shut Down All Instances

Instance ⋯▸ Agent	Attached Volumes	Image Config	Status
Instance i-bbc76cdf	vol-eb641f87	SqlServer 2008 - x64	⚡ Running
⤷ Elastic Agent on i-bbc76cdf			◌ Building - CONFSTABTPM-TRKTOM6SQL08-UPG-171
Instance i-b9c76cdd	vol-e9641f85	SqlServer 2008 - x64	⚡ Running
⤷ Elastic Agent on i-b9c76cdd			◌ Building - CONFFUNC2-TRKTOM6SQL08-UPG-405
Instance i-9dc56ef9	vol-f75b209b	SqlServer 2008 - x64	⚡ Running
⤷ Elastic Agent on i-9dc56ef9			🔌 Idle

More information

Bellatrix

- Installation and help:
  - pip install bellatrix; bellatrix -h
- Package home:
  - http://pypi.python.org/pypi/bellatrix
- Source code:
  - https://bitbucket.org/adeccico/bellatrix
- Documentation:
  - http://bellatrix.readthedocs.org

More information

Bellatrix

- Original blog post:
  - http://adrian.org.ar/python/automatic-setup-of-django-nginx-and-gunicorn-on-ec2
- Atlassian blog
  - http://blogs.atlassian.com/2012/04/automate-ec2-image-bamboo-puppet/
- Bellatrix and Jenkins configuration:
  - https://bitbucket.org/deccico/bellatrix_configs/src/tip/bellatrix_configs/ubuntu_django_nginx_gunicorn.py
- Ubuntu ami's:
  - http://cloud.ubuntu.com/ami/

Notes

-Python logo from
http://bluex-pl.deviantart.com/art/Python-logo-149980105

-Benchmarks of wsgi servers:
http://nichol.as/benchmark-of-python-web-servers