Jenkins

& Continuous Integration

What is it?

- Continuous integration server - **detects** changes in Subversion, **performs** tasks, **repeatedly**. (Build, Test, Deploy, Test, Package)
- Seven years old approx
- 47000+ installations
- 600+ plugins
- A fork of the original Hudson project

Why do we need it?

- To integrate more frequently, detect errors quicker, improve quality and reduce cost

- Co-ordinate the running of tasks as part of workflows.

- Compile, test and package, deploy, script, verify, build vm's

Jenkins Alternatives

TeamCity - allows for personal builds, pre-tested commits

Bamboo - Atlassians CI server, good, but somewhat inflexible

Cruise Control - bleurgh, old, behind the times

Cron and bash...

Terminology

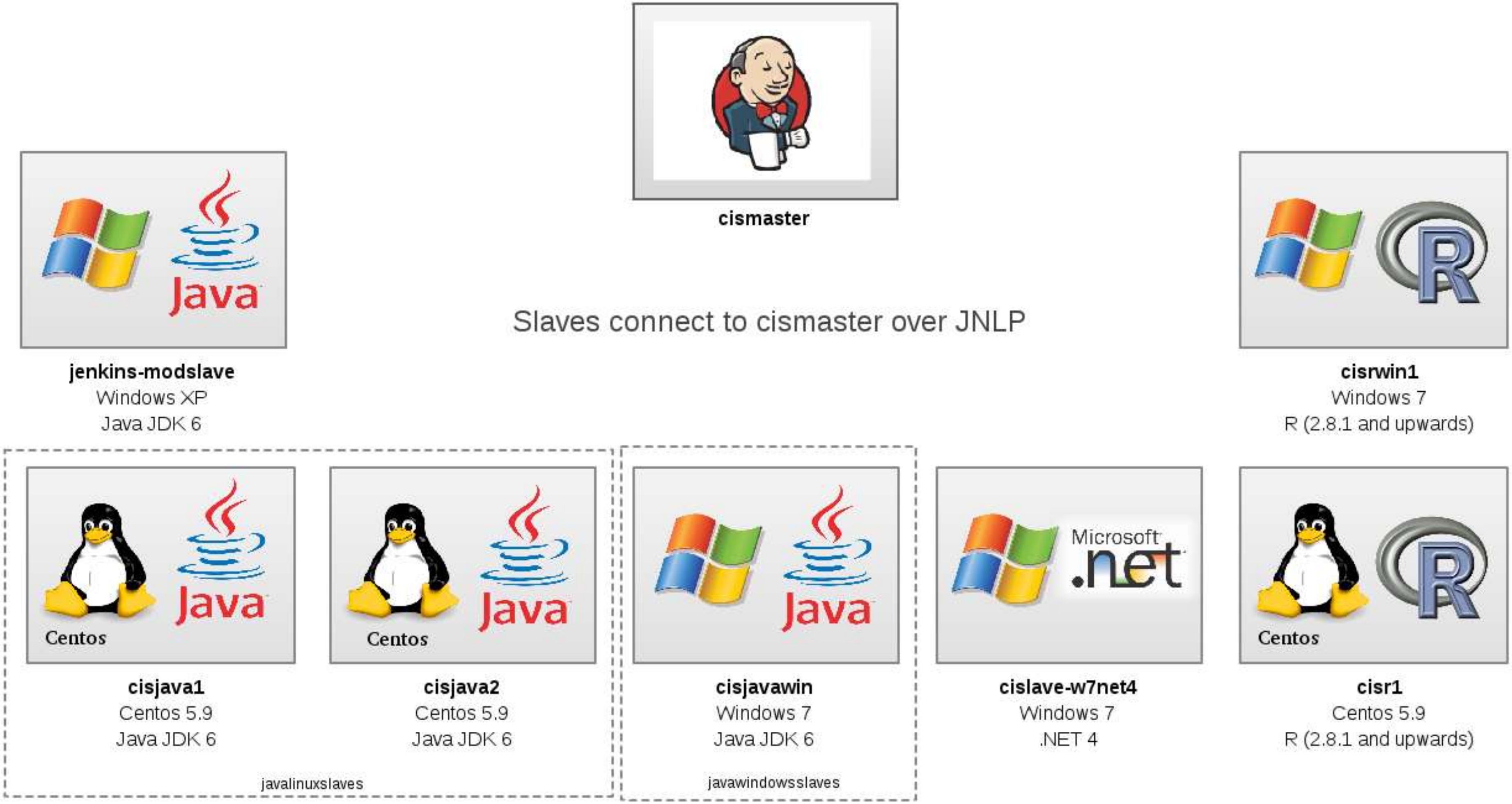
- **Job** - a unit of work for a project
- **View** - user defined collection of jobs or a workflow
- **Master** - the central Jenkins master, does job scheduling
- **Slave** - executes one or more jobs within slots (executors)

Terminology (more)

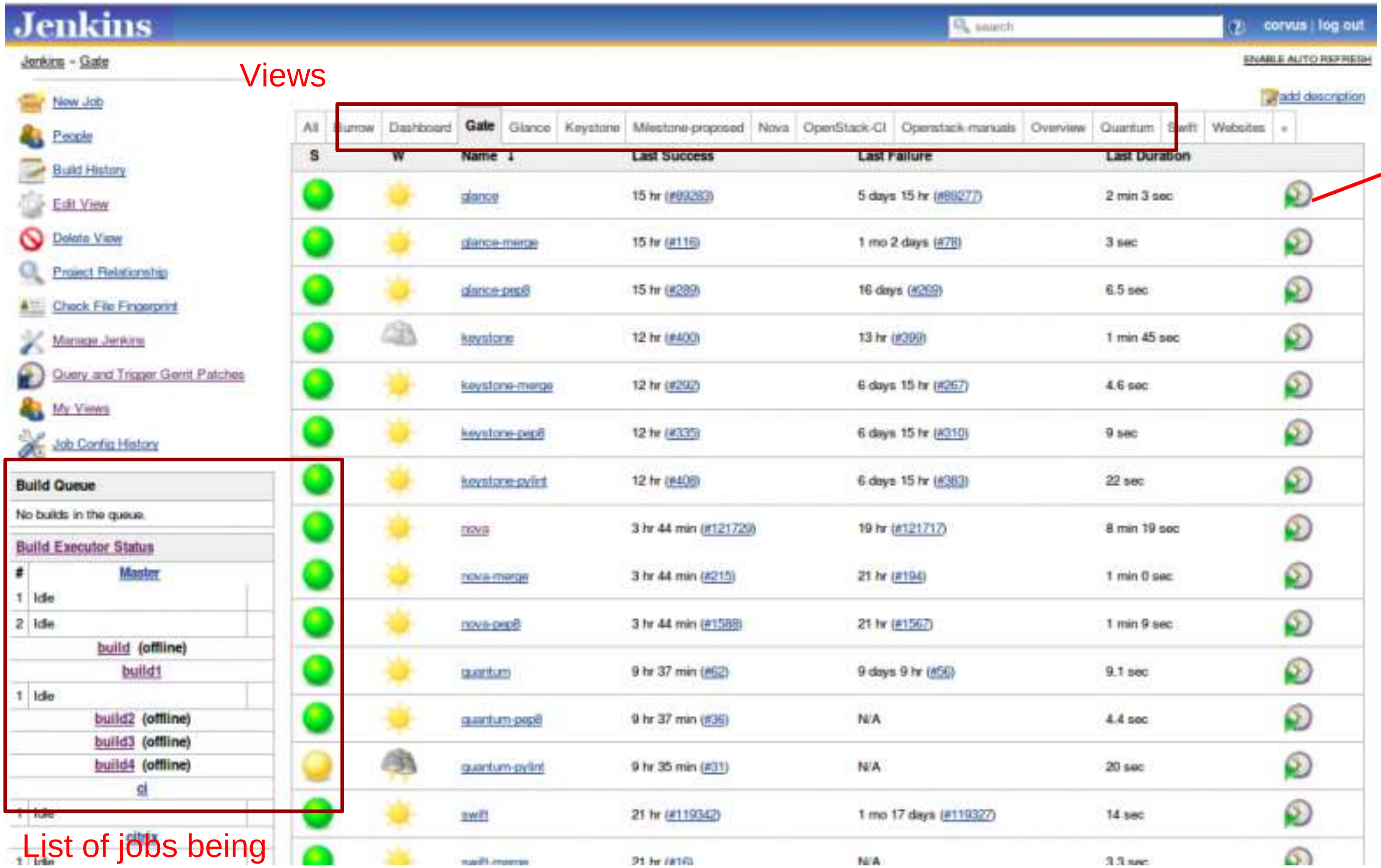
- **Workspace** - the working area where a job is carried out

- **Plugin** - user defined collection of jobs or a workflow

Jenkins Architecture



Jenkins Main User Interface



Jenkins

search

corvus | log out

Jenkins » Gate

ENABLE AUTO REFRESH

- New Job
- People
- Build History
- Edit View
- Delete View
- Project Relationship
- Check File Fingerprint
- Manage Jenkins
- Query and Trigger Gerrit Patches
- My Views
- Job Config History

Build Queue

No builds in the queue.

Build Executor Status

#	Master
1	Idle
2	Idle
	build (offline)
	build1
1	Idle
	build2 (offline)
	build3 (offline)
	build4 (offline)
	ci
1	Idle
	citrix
1	Idle

add description

All | Burrow | Dashboard | Gate | Glance | Keystone | Milestone-proposed | Nova | OpenStack-CI | Openstack-manuals | Overview | Quantum | Swift | Websites | +

S	W	Name ↓	Last Success	Last Failure	Last Duration
●	☀	glance	15 hr (#89283)	5 days 15 hr (#89277)	2 min 3 sec
●	☀	glance-merge	15 hr (#116)	1 mo 2 days (#78)	3 sec
●	☀	glance-pep8	15 hr (#289)	16 days (#269)	6.5 sec
●	☁	keystone	12 hr (#400)	13 hr (#399)	1 min 45 sec
●	☀	keystone-merge	12 hr (#292)	6 days 15 hr (#267)	4.6 sec
●	☀	keystone-pep8	12 hr (#335)	6 days 15 hr (#310)	9 sec
●	☀	keystone-pylint	12 hr (#408)	6 days 15 hr (#383)	22 sec
●	☀	nova	3 hr 44 min (#121729)	19 hr (#121717)	8 min 19 sec
●	☀	nova-merge	3 hr 44 min (#215)	21 hr (#194)	1 min 0 sec
●	☀	nova-pep8	3 hr 44 min (#1588)	21 hr (#1567)	1 min 9 sec
●	☀	quantum	9 hr 37 min (#62)	9 days 9 hr (#56)	9.1 sec
●	☀	quantum-pep8	9 hr 37 min (#36)	N/A	4.4 sec
●	☁	quantum-pylint	9 hr 35 min (#31)	N/A	20 sec
●	☀	swift	21 hr (#119342)	1 mo 17 days (#119327)	14 sec
●	☀	swift-merge	21 hr (#16)	N/A	3.3 sec

Views

Start job

List of available jobs

List of jobs being executed

Job Creation

- Let's create a job to compile and test a project...

[Walkthrough]

Jenkins Job Types

We have:

- Java (Maven) jobs
- Java (Ant) jobs
- R (Ant) jobs
- R (batch) jobs
- Bash scripts (almost)

plus:

- Server Deployment jobs
- Formal Software Release jobs

Workflows - Job Pipelines

You can chain jobs together in a pipeline.

Promotion occurs when a job succeeds

Then the next job in the pipeline executes (based on some conditions)

[Walkthrough]

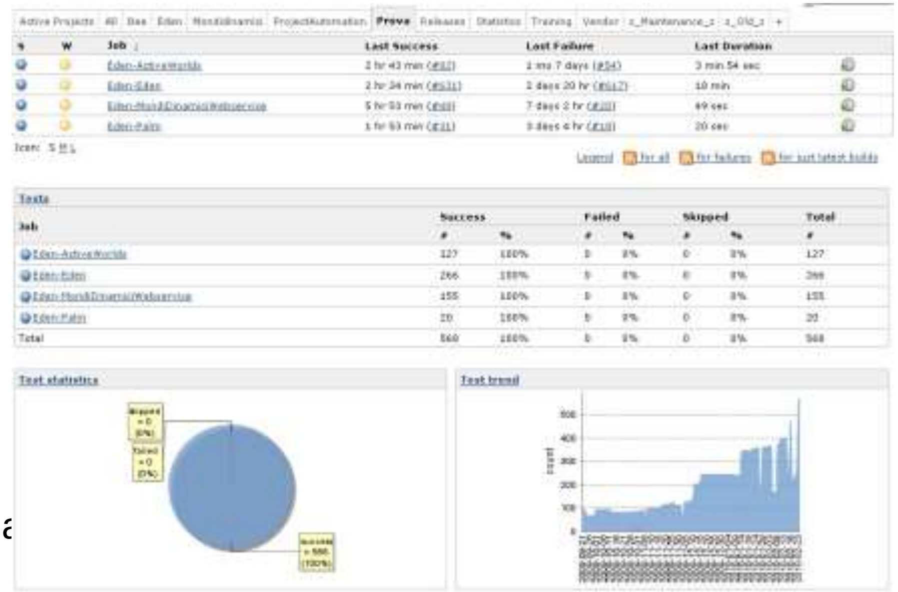
Custom Jenkins Views

You can build your own views of Jenkins jobs

Jobs of interest that you're working on

You can also build custom views with the dashboard plugin

- https://wiki.jenkins-ci.org/display/JENKINS/Da



Active Projects | All | Dee | Eden | Mondialisamst | ProjectAutomation | Prove | Releases | Statistics | Training | Vendor | z_Maintenance_z | z_Old_z | +

S	W	Job ↓	Last Success	Last Failure	Last Duration
●	●	Eden-ActiveWorlds	2 hr 43 min (#82)	1 mo 7 days (#54)	3 min 54 sec
●	●	Eden-Eden	2 hr 34 min (#531)	2 days 20 hr (#517)	10 min
●	●	Eden-MonkDynamicWebservice	5 hr 53 min (#60)	7 days 2 hr (#20)	49 sec
●	●	Eden-Palm	1 hr 53 min (#11)	3 days 4 hr (#10)	20 sec

Icon: S M L
Legend
for all
for failures
for just latest builds

Tests

Job	Success		Failed		Skipped		Total
	#	%	#	%	#	%	#
Eden-ActiveWorlds	127	100%	0	0%	0	0%	127
Eden-Eden	266	100%	0	0%	0	0%	266
Eden-MonkDynamicWebservice	155	100%	0	0%	0	0%	155
Eden-Palm	20	100%	0	0%	0	0%	20
Total	568	100%	0	0%	0	0%	568

Investigating a Failure

Look at the build log in detail

Try executing the job on the slave (via SSH)

Permissions are a common issue

[Walkthrough]

Jenkins Plugins

- Subversion - polls for changes to build
- Sonar - publishes metrics on builds
- Parameterised triggers - trigger builds on conditions
- Copy Artifact - copy artifact for completed builds
- Workflow - setup build workflows
- JClouds - provisions environments

Jenkins Tips

When a job fails - **claim the failure** so people know what's going on. Send an email out

Use parameterised builds - **don't hardcode paths** to R, Java etc... think generic

Don't install dependencies on Jenkins build servers. Build your own environment!

Where Next With Jenkins?

1. **Information Radiators** (build wall) plugin and some hardware to display project stats

2. **Validated Merge** - ensure changes are good

3. Continuous **Automation** - automate other tasks

1. Information Radiators

RedAnt's Ultimate Wallboard

Projects

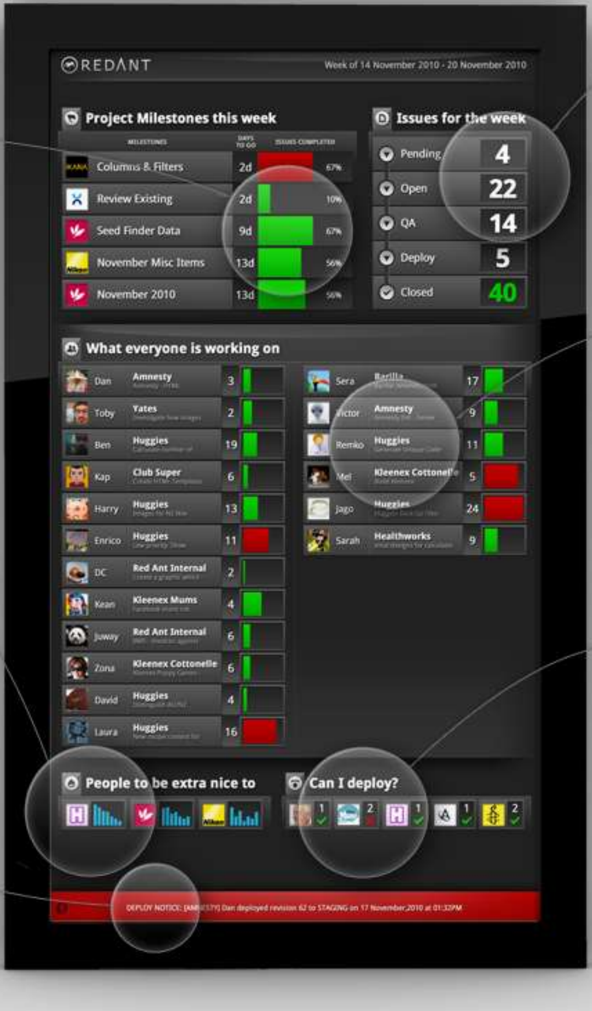
These are milestones that are coming up – so how many days to go and how many issues are outstanding. We compare the information we have in Jira (our issue tracker) to Harvest (our time sheet system). If there are more issues than we have time left in the budget, the project goes red.

Be nice

This pulls information from a tool we've made to track interactions. We look at lots of different things to measure how well a project is going - number of issues, whether it is on budget, etc. One thing we weren't looking at is how well customer interactions were going- how well did that meeting or phone call go? So we built a tool to measure this- hopefully it will provide some interesting data.

Alert message - calling all cars

We have various alerts popping up down the bottom - this one is from Capistrano letting us know that Dan has just deployed to Staging (really helpful if you just happen to be walking the client through the site at the same time). These also pop up in Campfire. Other alerts include ones from Hoptoad and New Relic RPM.



REDANT

Week of 14 November 2010 - 20 November 2010

Project Milestones this week

MILESTONES	DAYS TO GO	ISSUES COMPLETED
Columns & Filters	2d	67%
Review Existing	2d	10%
Seed Finder Data	9d	67%
November Misc Items	13d	56%
November 2010	13d	56%

Issues for the week

Pending	4
Open	22
QA	14
Deploy	5
Closed	40

What everyone is working on

Dan	Amnesty	3
Toby	Yates	2
Ben	Huggies	19
Kap	Club Super	6
Harry	Huggies	13
Enrico	Huggies	11
DC	Red Ant Internal	2
Kean	Kleenex Mums	4
Juway	Red Ant Internal	6
Zona	Kleenex Cottonelle	6
David	Huggies	4
Laura	Huggies	16
Sera	Barilla	17
Victor	Amnesty	9
Remko	Huggies	11
Mel	Kleenex Cottonelle	5
Jago	Huggies	24
Sarah	Healthworks	9

People to be extra nice to

Can I deploy?

DEPLOY NOTICE: [AMNESTY] Dan deployed revision 62 to STAGING on 17 November,2010 at 01:32PM

Issues for the week

We wanted to create an overall list of issues for the week. On some projects we have sprints or deadlines where we are trying to close off a certain number of issues. But we wanted to have something that would give the overall numbers at a glance. The point being to get as many closed this week as we can.

Who is working on what

This is a list of what everyone is working on- the project name and the specific task. Next to that is the number of issues they have this week. Since not all issues are created equal (one might take 10min, another might take 10h), the graph shows the amount of time. This goes red if a person has more time than everyone else (a hint to PMs to reschedule something)

Can I deploy?

This was designed to answer one of our most common Campfire questions - "Am I OK to deploy Project X?" Our PMs had an issue where work was being done, but then it was unclear whether it had been done and committed, or also moved onto staging or production. There was a separate problem where some tasks were "deploy blockers", and had to get completed before the next deploy. This answers those - it tells everyone how many issues are ready to deploy, and whether there is anything lurking around that they should be aware of.

2. Validated Merge

- Dev **commits** to branch
- Jenkins **tests** branch and **merges** into trunk (if successful)
- Mistake doesn't impact other people
- Slower (in terms of admin), but not in terms of team productivity

3. Continuous Automation

- Automate more **tests**
- Automate our **Infrastructure**
- Automate **VM creation/"The Cloud"**

Questions?