

Warp Speed Testing at an Enterprise Level

Scott Mills Andrei Juc



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Agenda

What are we covering in this session?

- 1. About us
- 2. About Rogue Wave
- 3. The problem
- 4. The challenge
- 5. The solution
- 6. AWS Tips
- 7. Jenkins plugins
- 8. What's next
- 9. Closing thoughts



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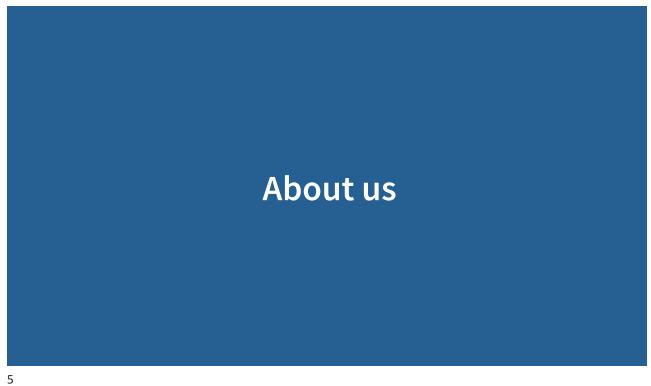
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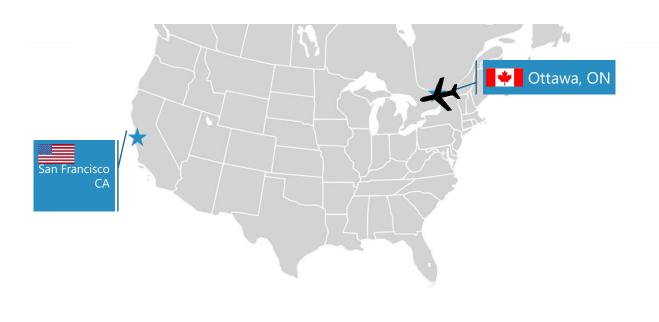
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What will you take away from this session?

- 1. Configuring Jenkins to work with AWS
- 2. Setting up Jenkins jobs to use AWS resources
- 3. Using Docker with AWS
- 4. Useful Jenkins Plugins
- 5. Using on-demand resources
- 6. AWS Tips
- 7. Potential pitfalls & limitations







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Scott Mills

Technical background

- Almost 20 years designing, developing, maintain and supporting automation systems
- Application performance testing
- Application security testing (<u>OWASP Top 10</u>)
- Automated web testing
- Build & test automation framework development and evolution utilizing Python, Jenkins, Docker and Amazon Web Services

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Scott Mills

While not automating...





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Andrei Juc

Technical background

- Automation framework developer
- VM to Docker migration
- Amazon Web Services migration
- Troubleshooting enthusiast
- Innovator

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Andrei Juc

While not problem solving...





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About Rogue Wave Software

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Innovate with Confidence

"We help software eat the world faster"

- Our Mission: We simplify complex software development, improve application quality and security, and shorten cycle times.
- Founded in 1989
- · Global company, headquartered in Louisville, CO.
 - 400 employees, 13 offices worldwide, 53 patents.
- Our customers:
 - Automotive Software Development
 - Military and Aerospace
 - Medical Devices and Software
 - Embedded Software
 - Mobile and Communications
 - Game Development



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Rogue Wave Customers

We ensure the most critical and complex aspects of the entire software lifecycle to support strategic business goals while minimizing risk.





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- Find defects early!
- Web-based portal for reporting and analyzing results
- Ability to be built into your Continuous Integration process
- · Very popular with mission critical industries
- · Allows customers to meet industry standards









The Problem

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Testing at scale

Requirements

• Reliable, repeatable and timely test results 🔼





• Easy to reproduce/verify test results with high level of confidence



Scalable



Highly dynamic



Easy to maintain





The Challenge

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The early beginnings

Let's get physical!

- Test Lab filled with physical machines
- Maintenance nightmare
- · Every machine is slightly different
 - Hard to replicate and pin down test failure causes
- "Dirty" environment
- Long execution time (18 hours per machine per run)



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Evolution started...

Virtually first steps!

- VMWare and Jenkins
- Easier to maintain
- Pooled resources
- Template functionality helps with machine continuity



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Stunted growth...

The terrible twos

- Limited scalability with VMs
 - "We're giving her all she's got!"
- "Dirty" machines
- Test all the things!!





What about this Docker thing?

Docker 101

- Containerization software
- Uses resource isolation features of Linux in order to allow isolated OS's to run on a single machine at once.
- Unlike VMs, Docker containers share the host OS kernel. (Lightweight)
- Capture, store and replicate OS state
- Images and containers and Dockerfiles! Oh, my!



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What about this Docker thing?

The good!

- Images to share with testers and developers
- Clean machine image for every test execution
- Reliable, repeatable results
- More scalability

What about this Docker thing?

The not so good 🙁

- Scalable to a point, limited # of hosts
 - CPU thermal throttling
 - Hardware degradation
- Environment overhead (Mesos)



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What about this Docker thing?

But this Docker shows a LOT of promise!

- How can we reap the benefits of the system and make it scalable?
- And remember, TEST ALL THE THINGS!!!

The Solution Future!

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Introducing AWS

Resources as far as the eye can see...

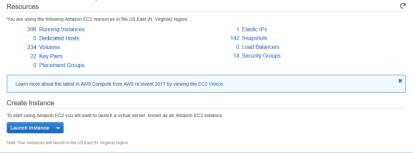
- Essentially unlimited resources
- Very scalable
- No more hardware woes
- On-demand resources
- Tools
 - So many tools...



Amazon Elastic Compute

Turning dreams into reality!

- Amazon Machine Images
- Preconfigured services, service optimized images or a blank canvas
- Elastic Container Service optimized AMIs





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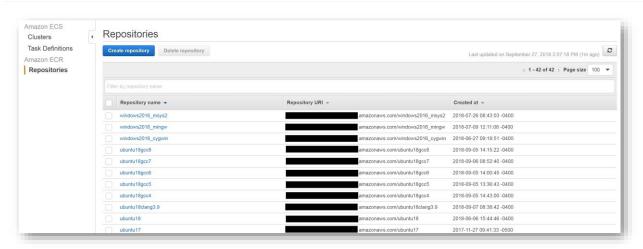
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Amazon Elastic Container Registry (ECR)

Essential part of our infrastructure!

- Docker container registry for storage and deployment
- Used everywhere in our build and test automation
- Images updated nightly with latest build
- Allows developers and testers to use the same images used in building and testing

Amazon Elastic Container Registry (ECR)



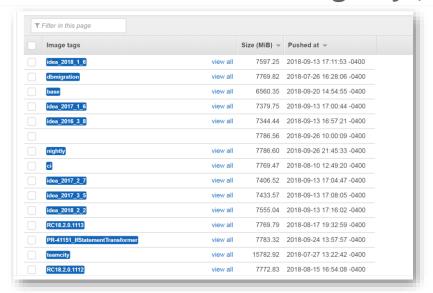
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Amazon Elastic Container Registry (ECR)



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Amazon Elastic Container Registry (ECR)

Accessing ECR images from our Jenkins test jobs

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AWS Tips

Mind the firehose!

AWS Offers many services

- Start small and work your way up.
- Sometimes it's better to stay lightweight
- AWS offers a lot of tools, all great under the right application, but some more cumbersome than needed



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Keep a good balance of AMIs

Don't spend more time than necessary

- Avoid homebrew AMIs as much as possible
- Use out-of-the-box solutions for parts of the framework you don't want to maintain
- Instance snapshots are an acceptable substitute for docker

Instance type selection is important

Cheaper is not always cheaper

- Use appropriate application types
- Conduct experiments to find the best size for you
- Process intensive applications benefit from higher core count



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Cattle not pets

What's good for one is good for all

- Use portable initialize scripts as much as possible to keep agile
- Always think in terms of scale

Shepherd your flock

Management of your resources

- What goes up must come down
- Minimize idle uptime but maximize usage of AWS hourly cycle
- Mistakes can be costly



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Be prepared to maintain two systems

Some tasks are just not possible...

- Some legacy hardware may remain
- AWS only offers Linux and Windows Server AMIs
- AWS OVA to AMI Service
- AWS File Syncs



Jenkins Plugins

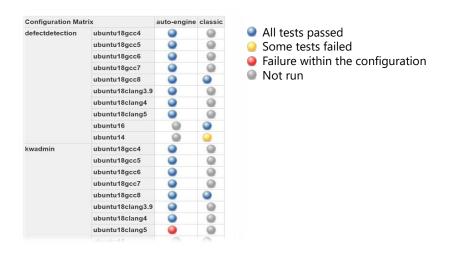
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Jenkins Matrix Project Plugin

Makes our testing possible

- The Configuration Matrix allows users create a multipleaxis graph of the configurations to run
- In other words, "Run each of these test suites on each of these platforms with each of these modes"
- Filters can be set to prevent some configs from running

Jenkins Matrix Project Plugin





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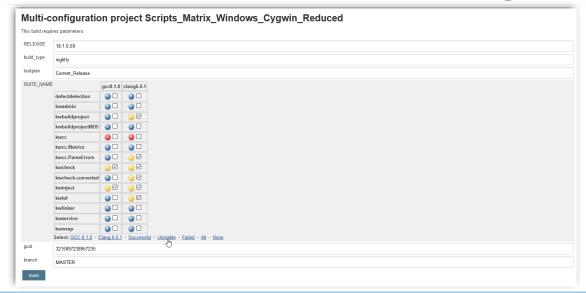
Jenkins Matrix Project Plugin





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Matrix Combinations Parameter Plugin



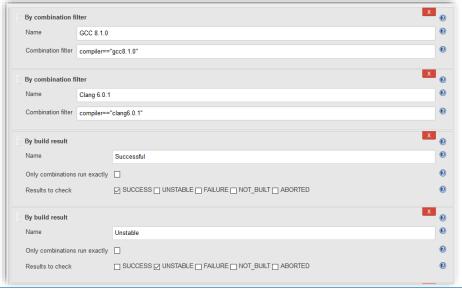
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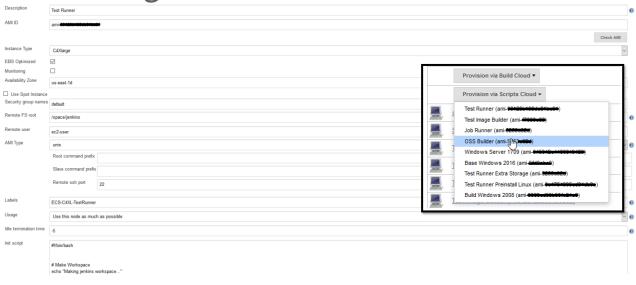
Matrix Combinations Parameter Plugin



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EC2 Plugin

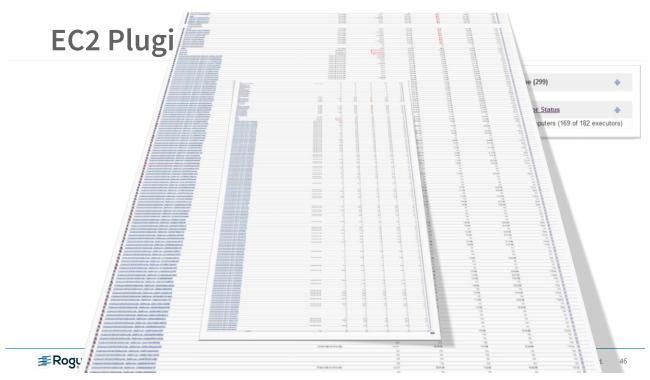


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What's Next

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AWS is much more

This is just the tip of the iceberg

- AWS offers enough services to allow for full system migration
- Can be used for more than just development and R&D
- Marketing, customer services, support and interactions

More OS Support?

The selection is great, but could be better

- OSX Support
- AIX and Solaris
- "Delayed" Windows releases

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Closing Thoughts

Closing Thoughts

Always be improving

- Invest in your automation infrastructure
- Look for opportunities to evolve
- "There's a plugin for that"
- AWS does cost \$\$\$



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Questions?

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