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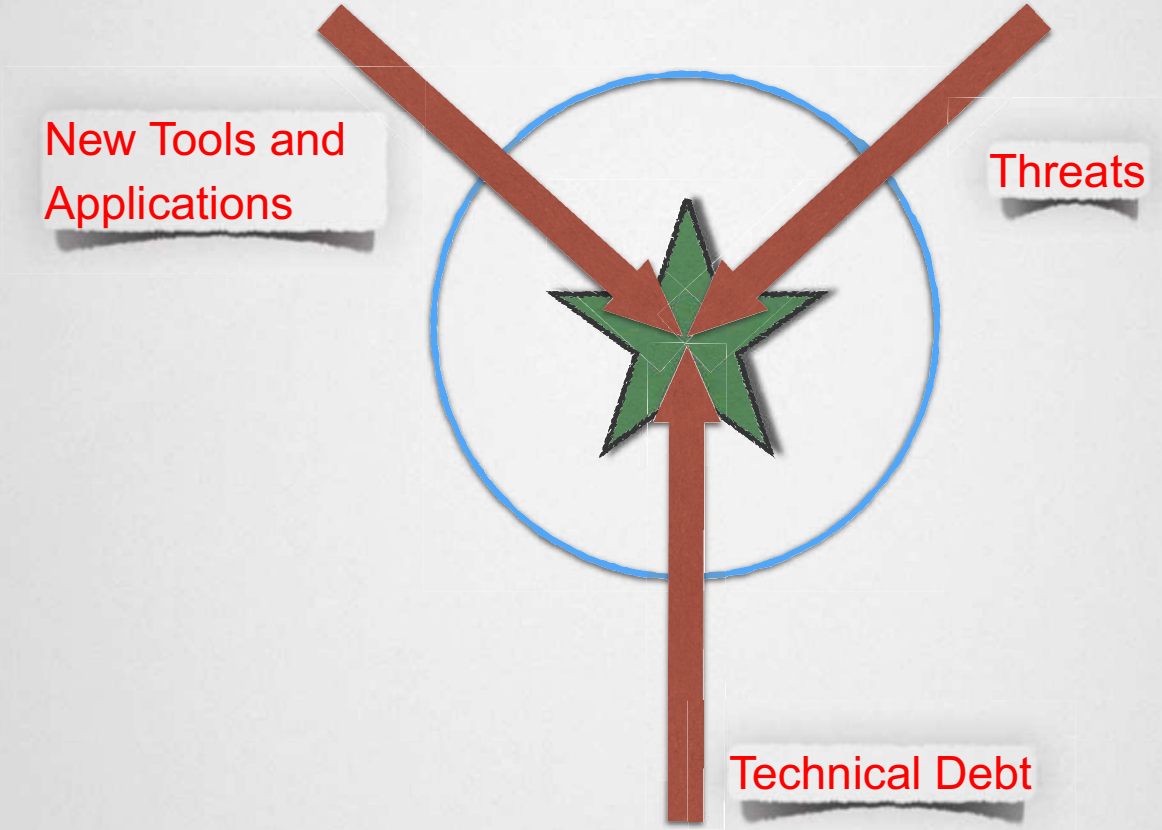
Presents

Building Your SecDevOps Toolkit

Rich Mogull
Analyst and CEO, Securosis LLC
@rmogull

The Problem



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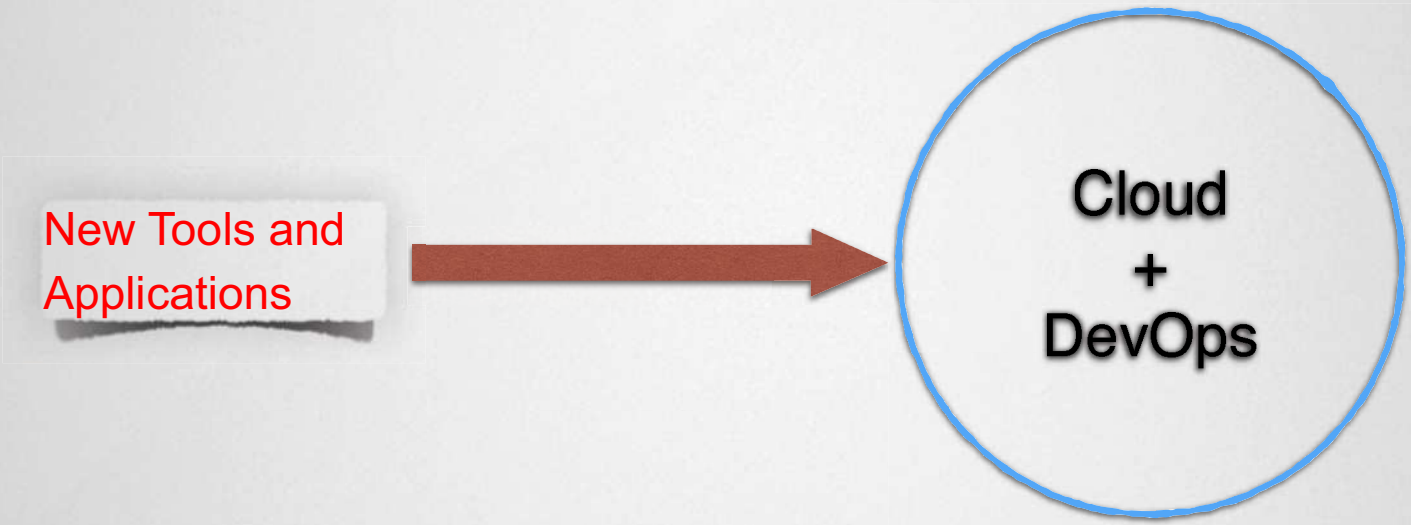
The Problem



Cloud and DevOps

- Cloud is a new operational model.
- It requires a re-thinking of fundamental architectures.
- DevOps is a new operational framework, highly attuned to cloud.
- Both shatter existing security approaches.

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Natives vs. Tourists

- Cloud tourists deploy their existing operational models and frameworks onto a cloud service, losing most of the benefits of cloud.
- Typically due to lack of knowledge, institutional momentum, and arbitrary economic models.

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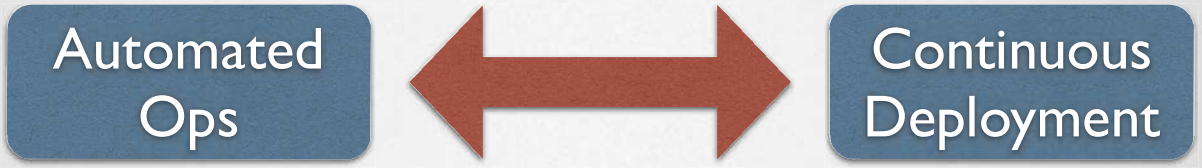
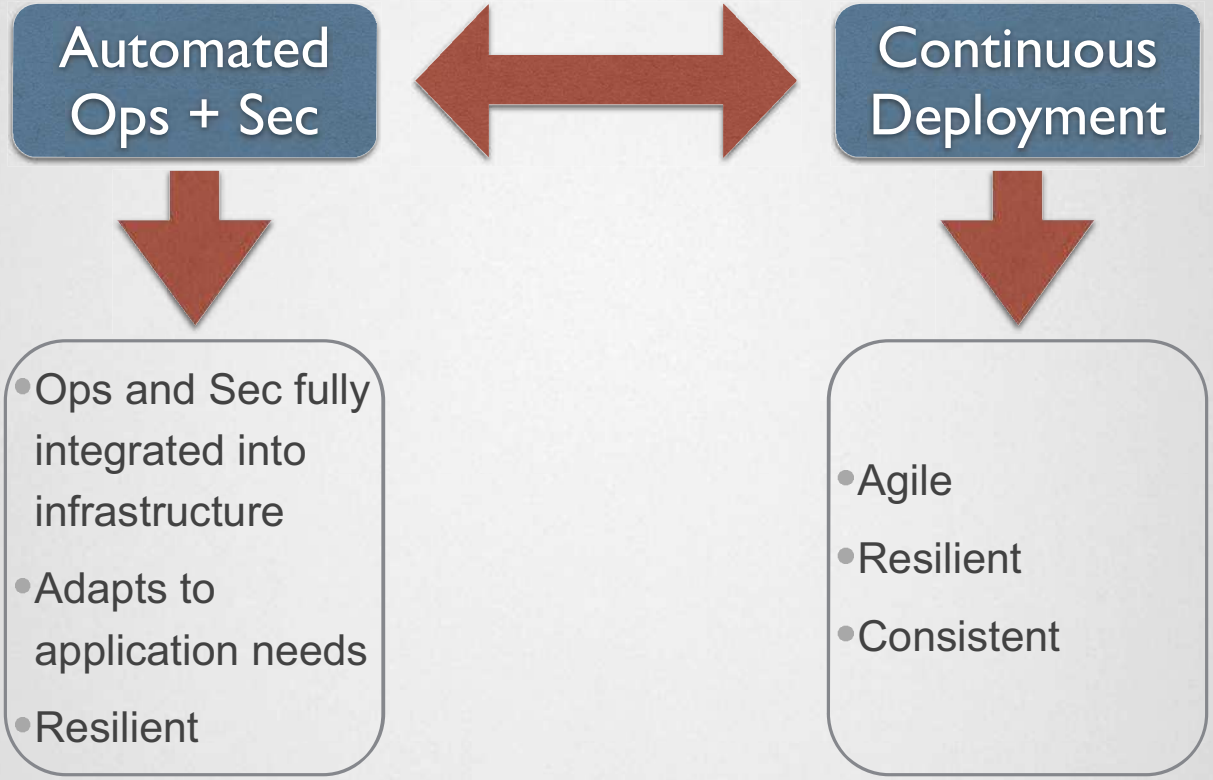
Native Advantages



Native Advantages



The Security Profession Problem

- The discipline that is most resistant to change and least likely to adapt is “Security”
- This resistance is usually excused due to a lack of trust and a reliance on people because we don’t trust security automation.
- “Security” continues to rely on a manual supply chain operated by the “Meat Cloud”
- Trustable automation and an operational model to support it is needed

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The Technical Security Challenge

- The vast majority of information security is really infrastructure-centric security.
- Infrastructure-centric security relies on fixed locations of relatively static resources.
  - Even many of our application security models rely on fixed infrastructure.
- It is context-unaware. DevOps and cloud are all about context.

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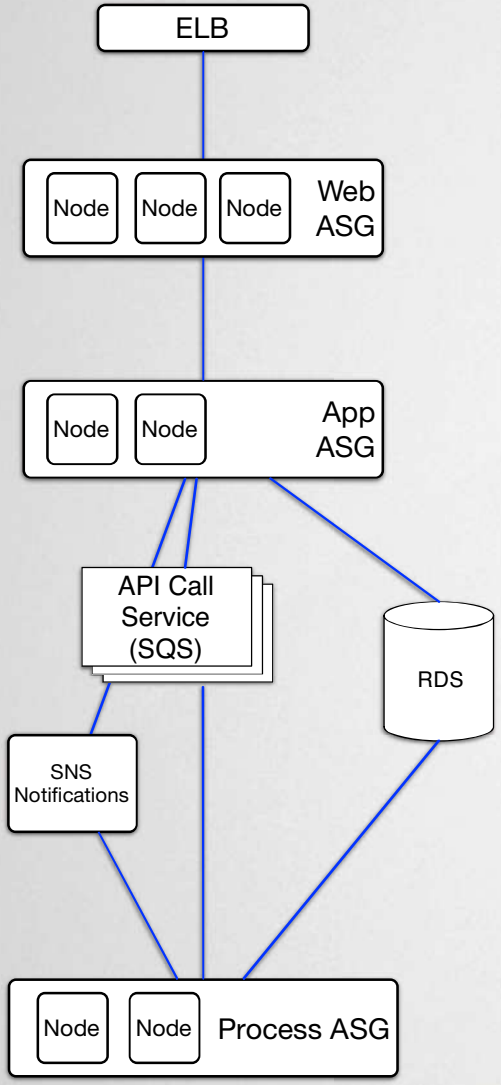

- No fixed servers.
- No fixed connections.
- Workloads scattered across IaaS and PaaS.
- All components elastic.
- Assessment and monitoring break.

If you try to apply the traditional security operational framework to the new operational model!

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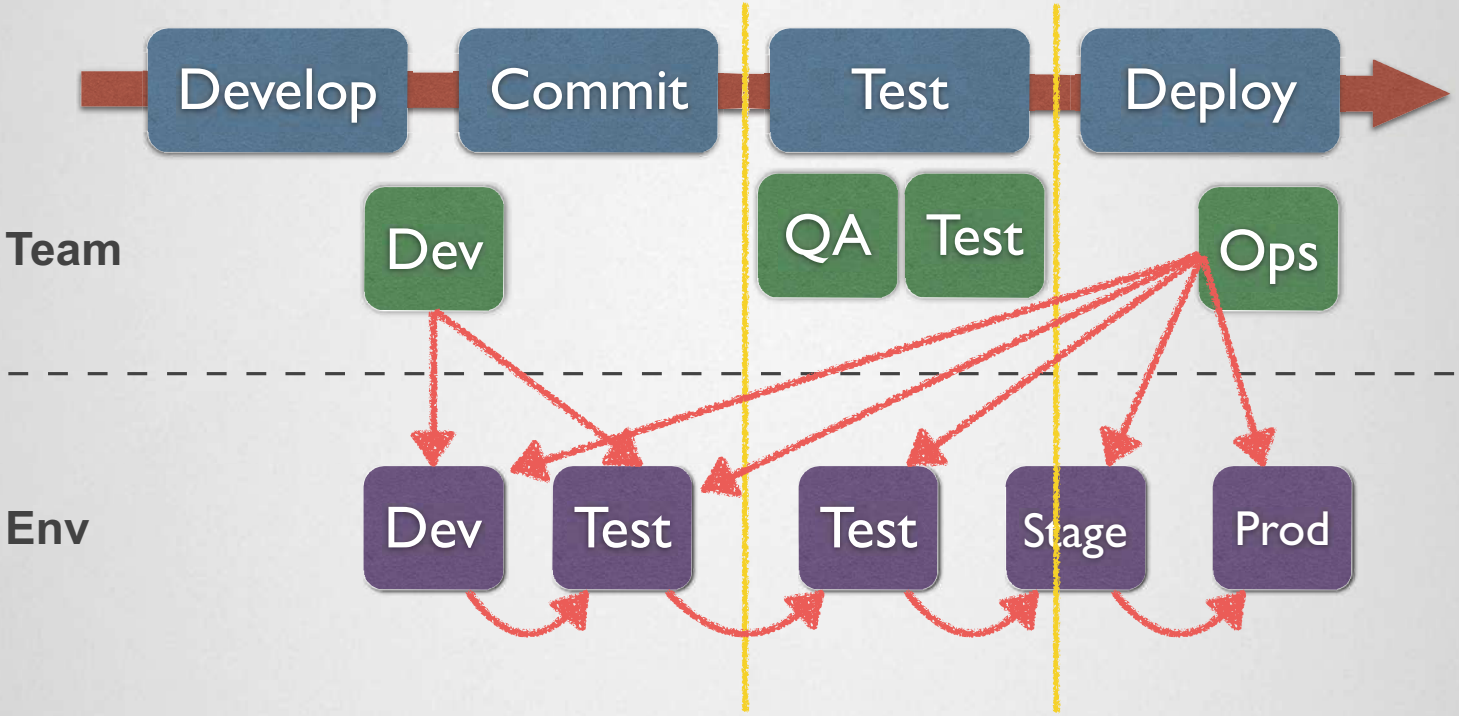
Why DevOps?

Application Deployment

Complexity Breeds Error



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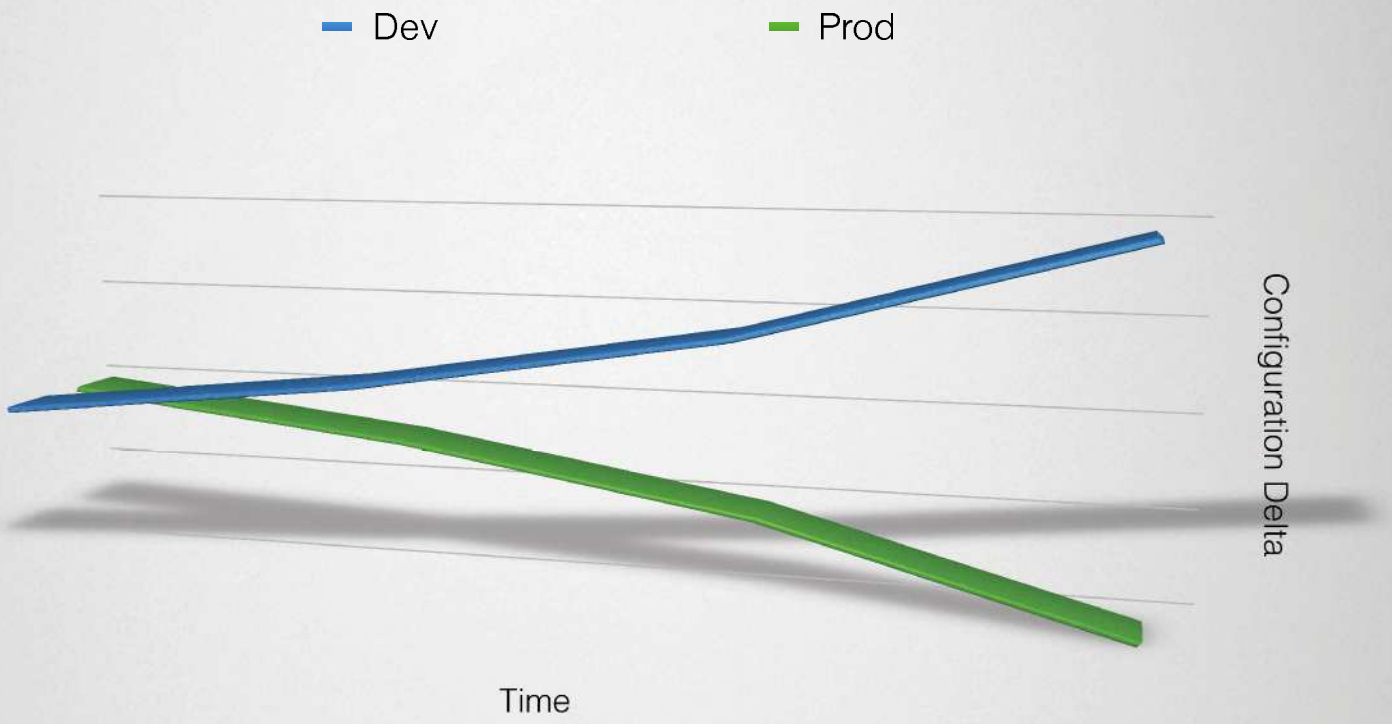
Environments, Requirements, and Configurations Drift



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Cycle Times Matter

Agile? Waterfall?

All the same…

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The Dev and Ops Problem

- Configuratio
- The less aut
- Manual inter on.
- Environments become de-synced.
- Different teams work in different environments.

No standards

=

More complexity

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Enter DevOps

- DevOps is an *operational framework* that increases standardization, agility, and reliability.
- It relies heavily on virtualization, cloud, and automation.
- The principles come direct from Denning and Lean Manufacturing.

https://workingsmartercafe.files.wordpress.com/2012/09/kool-aid-man.jpeg

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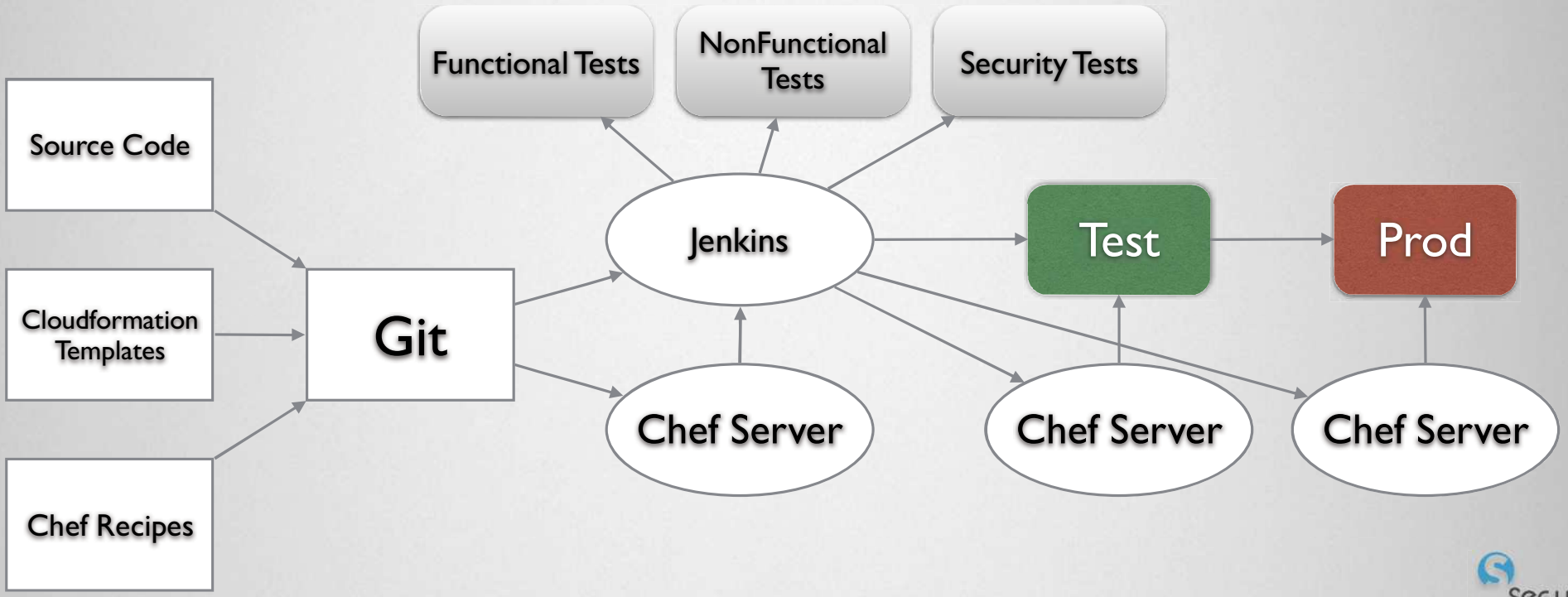
Development Pipelines and Continuous Deployment



Why DevOps Works

- All environments, including supporting third-party applications, are consistent.
- The deployment pipeline is automated, for code, configurations, and toolsets.
- There is no drift.There are no human-induced errors.
- Faster deployment cycles reduce error and improve business agility.
- Version control and consistency support instant rollback.

[Sec]DevOps

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DevOps  Dream!

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Trustable Security Automation!

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DevOps + Security = ♡

- DevOps provides a **consistency** and **control** impossible with manual application deployments.
- Security can easily **embed** and **automate**.
- Security can steal DevOps techniques to apply to diverse workloads and infrastructure requirements.

Building Your Toolkit

- Integrate security tests into the deployment pipeline
- Build resilient server configurations
- Embrace Stateless Security
- Automate with Code and APIs

Yes, you need to learn some new skills, but you don't need to become a programmer.

Tooling the CI Server

GAUNTLT

BE MEAN TO YOUR CODE AND LIKE IT

README.txt

```
Mittn
=====

"For that warm and fluffy feeling"
```

Introduction to BDD-Security

(Need cooler logos)

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Build a Secure Config Library

```
if node[:mod_security][:crs][:bundled]
  # Bundled install
  remote_directory "owasp-modsecurity-crs-#{node[:mod_security][:crs][:version]}" do
    path  node[:mod_security][:crs][:rules_root_dir]
    owner "root"
    group "root"
    mode  "0755"
    action :create
    notifies :restart, 'service[apache2]', :delayed
  end
```

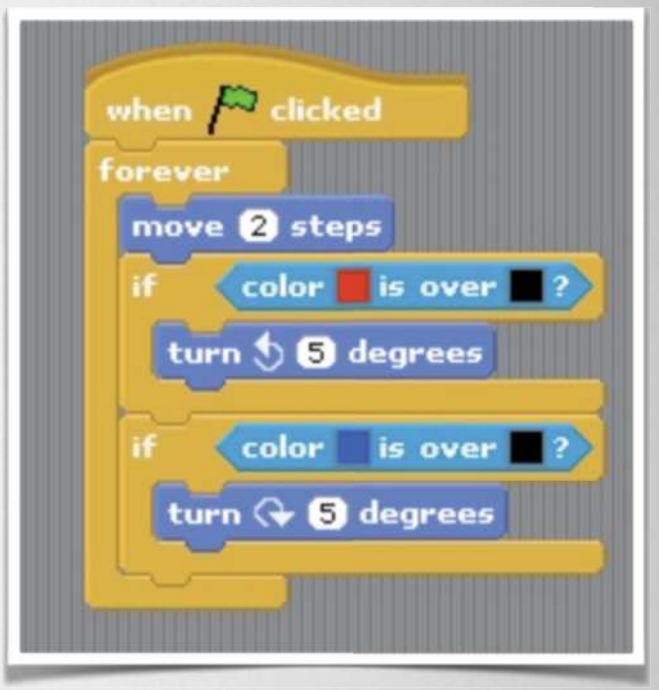
```
class Puppet::Provider::Firewall < Puppet::Provider

  # Prefetch our rule list. This is ran once every time before any other
  # action (besides initialization of each object).
  def self.prefetch(resources)
    debug("[prefetch(resources)]")
    instances.each do |prov|
      if resource = resources[prov.name] || resources[prov.name.downcase]
        resource.provider = prov
      end
    end
  end
```

Embrace Stateless Security

- AWS CloudTrail + CloudWatch
- AWS Lambda
- Automate with CloudFormation or scripts
  - Allows you to replicate across multiple accounts without having to create it from scratch.

Code without Coding

- Work with your devs to build a library of building blocks
- Learn just enough to glue it together
- Build some core scrips
- Mix and match the blocks
- Pull in the dev when you have new requirements



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Examples

- Snapshot all volumes attached to an instance
- Quarantine on the network
- Collect metadata
- Assess and change security group rules

```
487   def store_metadata
488     # Method collects the instance metadata and stores as a JSON variable
489     # TODO send data to Dynamo, with incident ID
490     # TODO update the incident_id to reflect the workflow id
491
492     data = @@ec2.describe_instances(instance_ids: ["#{@instance_id}"])
493     timestamp = Time.new
494     incident_id = {:timestamp => timestamp, :incident_id => "placeholder"}
495     # metadata = data.reservations.first.instances.to_h
496     metadata = data.to_json
497     puts "Instance metadata recorded"
498   end
```

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Demo Time

Software Defined Security

- Meet SecuritySquirrel, the first warrior in the Rodent Army (apologies to Netflix).
- The following tools are written by an analyst with a Ruby-for-Dummies book.
- Automated security workflows spanning products and services.

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Problem: Identify Unmanaged Servers

1. Scan the network
2. Scan again and again for all the parts you missed
3. Identify all the servers as best you can
4. Pull a config mgmt report
5. Manually compare results

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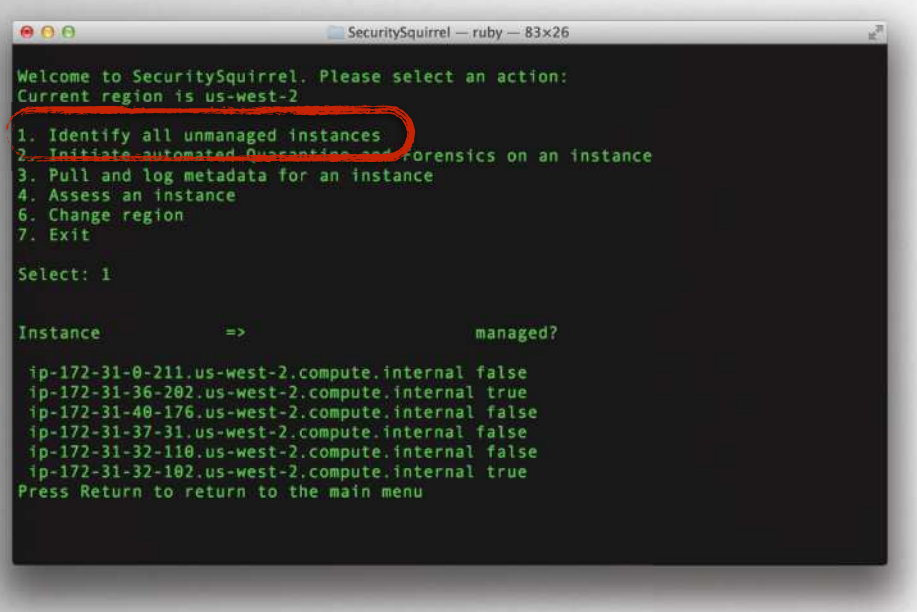
DEMO



1. Get list of all servers from cloud controller (can filter on tags/OS/etc).
   - Single API call
2. Get list of all servers from Chef
   - Single API call
3. Compare in code

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Problem: Incident Response

1. Detect Compromise
2. Pull server information (If you have it)
3. Quarantine
4. Image 
5. Analyze = Hours!
6. Recover

Each step is manual, and uses a different set of disconnected tools

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1. Pull metadata
2. Quarantine
3. Swap control to security team
4. Identify and image all storage
5. Launch and configure analysis server
6. Can re-launch

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DEMO

How do you do this without automation?

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Automagic WAF

Winning SecDevOps

- Add security to deployment pipelines and automate testing.
  - New tools are here, but we need more…
- Build a library of server hardening scrips and inject into config management.
- Integrate directly into your cloud service for alerting/ monitoring.
- Create a library of automation code you can mix and match for different security needs.

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Rich Mogull
rmogull@securosis.com
@rmogull
http://securosis.com

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Building Your SecDevOps Toolkit

Rich Mogull
Adrian Lane
Mike Rothman

http://securosis.com

@rmogull
@adrianlane
@securityincite