Chef Automate

Azure Partner Quickstart Template

Hands-On Lab User Manual

Introduction

The **Continuous Delivery & Compliance with Chef Automate Azure Partner Quickstart Template** launches a DevOps stack that provides an automated provisioning, configuration and integration of Chef Automate that is needed for continuous delivery & compliance of applications, as well as infrastructure code. This is intended as a pilot solution and not production ready.

What You Will Learn

The goal of this solution stack is to provide a continuous delivery & application compliance experience. By walking through the lab in this Launch & Learn session, attendees will learn how this Quickstart template can be used to build and deploy a powerful DevOps solution using Chef products.

About Chef Automate

Chef Automate gives you a full-stack continuous delivery pipeline, automated testing for compliance and security, and visibility into everything that's happening along the way. It builds on Chef for infrastructure automation, InSpec for compliance automation and Habitat for application automation. You can transform your company into a highly collaborative, software-driven organization with Chef Automate as the engine.

About the Compliance feature of Automate

Automate enables you to scan your entire infrastructure for security risks and compliance issues, get reports on risks and issues classified by severity and impact levels, and build automated testing into your deployment pipelines. Chef Compliance includes pre-built profiles that scan for CIS benchmarks to help you get started quickly.

Solution Summary

The Chef Automate Azure Partner Quickstart solution is a 30 minute long walkthrough of using Automate's Compliance profiles to rapidly scan a series of Ubuntu 14.04 machines and remediate them to STIG (Security Technical Implementation Guide) specifications.

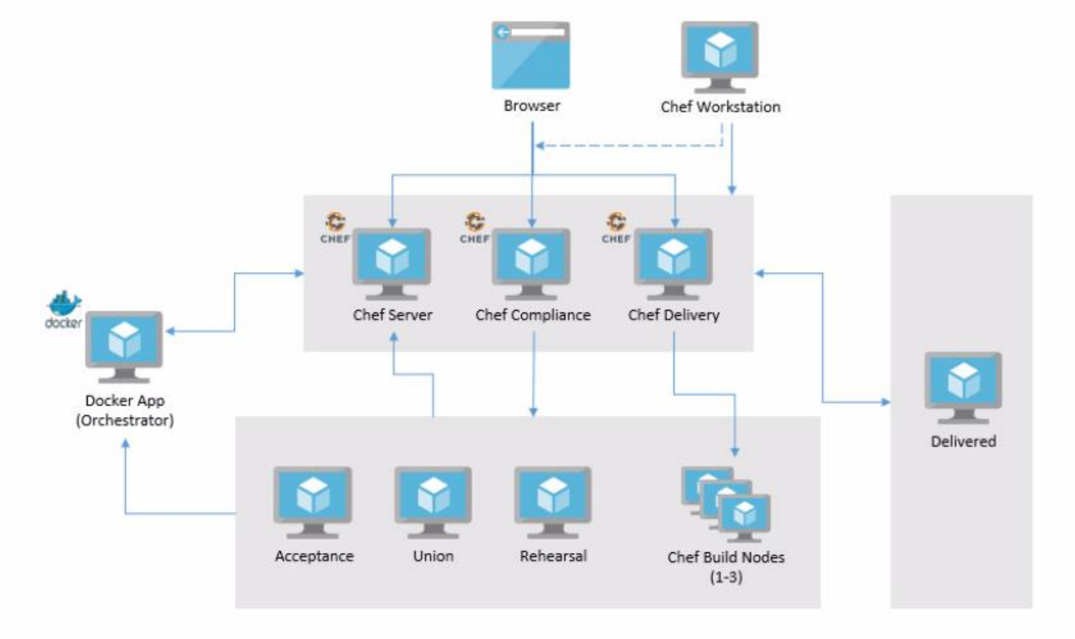
The Quickstart template consists of a Chef Automate cluster, a number of infrastructure nodes and a user's Workstation. The Nodes are managed by Automate, and their policy is configured to scan the node and report scan results back to Automate.

The user will go through the process of triggering a Chef execution on managed machines from the Workstation, using knife-ssh (the remote execution over SSH feature), in the CLI (command-line interface). This simulates the automated periodic Chef execution on nodes in a convergent infrastructure.

Once nodes converge (run chef), they report their status to Automate. The user will examine Automate's visibility dashboards to assess the health and compliance of the node.

The user will then add the STIG hardening cookbook (a configuration policy) to the node's run-list (a list of configuration policies that a node has to process).

Finally, the user will again trigger a Chef execution on the node. The user will observe the STIG policies being applied. Returning back to the Automate dashboard, the user can review the improved state of the node's compliance.



Lab Steps: Scan a Server with Chef Compliance for Registry values

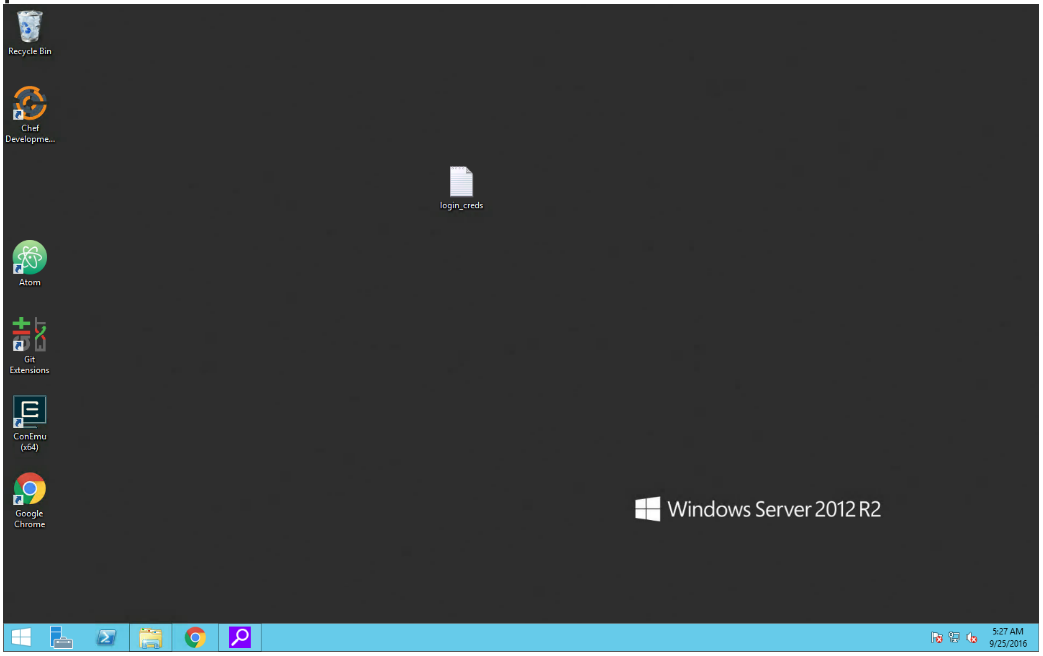
OBJECTIVE

- Connect to the Workstation
- Remotely trigger chef execution on one, or many nodes
- Log in to Automate
- Review the nodes' compliance state in Automate
- Modify the node's run-list to also run the **stig** cookbook
- Remotely trigger chef execution, again
- Review the improved state of the node's compliance

1.1 Connect to the Workstation

Use your preferred Microsoft Remote Desktop client to connect to the Workstation with the following credentials:

username : adminuser
password : adminuser@123

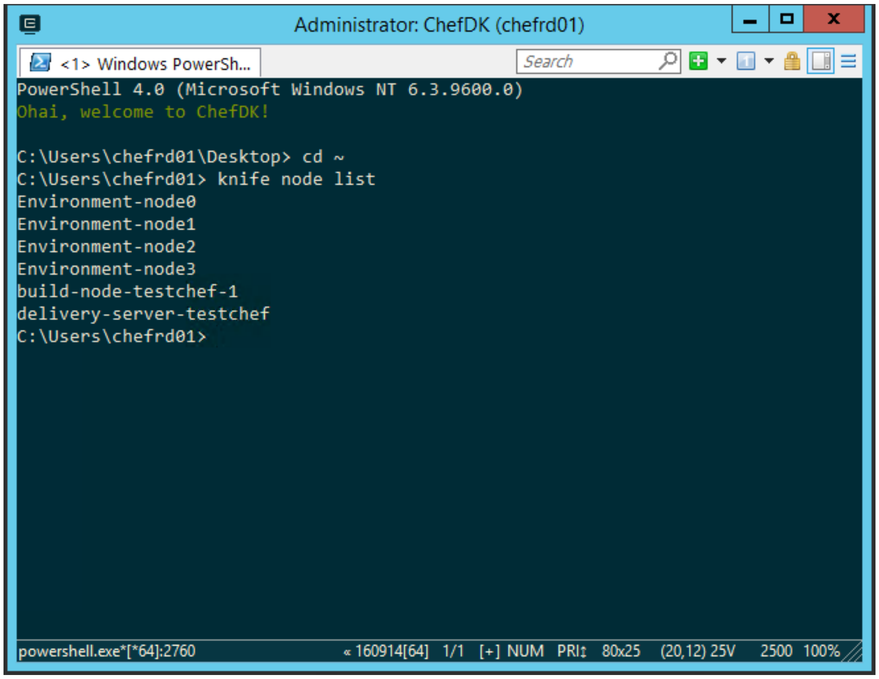


Once logged in, double-click the Chef Development Kit shortcut on the Desktop. Press OK on the ConEmu prompt.

Let's change to our home directory and run a test:

```
cd ~
```

```
knife node list
```


Administrator: ChefDK (chefrd01)
<1> Windows PowerSh...
Search
powershell.exe*[*64]:2760
« 160914[64] 1/1 [+] NUM PRI↕ 80x25 (20,12) 25V 2500 100%

```
PowerShell 4.0 (Microsoft Windows NT 6.3.9600.0)
Ohai, welcome to ChefDK!

C:\Users\chefrd01\Desktop> cd ~
C:\Users\chefrd01> knife node list
Environment-node0
Environment-node1
Environment-node2
Environment-node3
build-node-testchef-1
delivery-server-testchef
C:\Users\chefrd01>
```

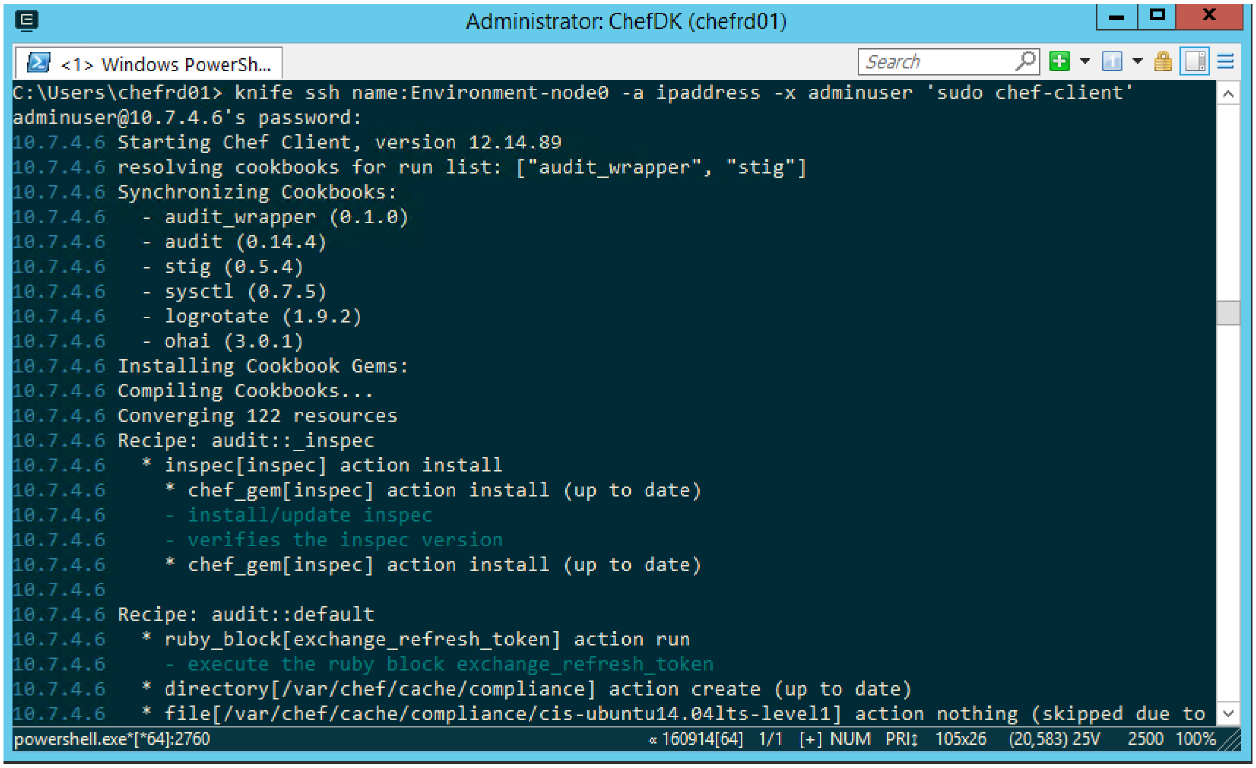
1.2 Remotely trigger Chef execution on one or many nodes

Run this command:

knife ssh name:Environment-node0 -a ipaddress -x adminuser 'sudo chef-client'

and enter **adminuser@123** when prompted for the password.

This establishes an ssh connection to the node named Environment-node0, over its IP address, as the user adminuser, to run the command sudo chef-client.


Administrator: ChefDK (chefrd01)
<1> Windows PowerSh...
Search
powershell.exe*[*64]:2760
« 160914[64] 1/1 [+] NUM PRI↕ 105x26 (20,583) 25V 2500 100%

```
C:\Users\chefrd01> knife ssh name:Environment-node0 -a ipaddress -x adminuser 'sudo chef-client'
adminuser@10.7.4.6's password:
10.7.4.6 Starting Chef Client, version 12.14.89
10.7.4.6 resolving cookbooks for run list: ["audit_wrapper", "stig"]
10.7.4.6 Synchronizing Cookbooks:
10.7.4.6   - audit_wrapper (0.1.0)
10.7.4.6   - audit (0.14.4)
10.7.4.6   - stig (0.5.4)
10.7.4.6   - sysctl (0.7.5)
10.7.4.6   - logrotate (1.9.2)
10.7.4.6   - ohai (3.0.1)
10.7.4.6 Installing Cookbook Gems:
10.7.4.6 Compiling Cookbooks...
10.7.4.6 Converging 122 resources
10.7.4.6 Recipe: audit::_inspec
10.7.4.6   * inspec[inspec] action install
10.7.4.6     * chef_gem[inspec] action install (up to date)
10.7.4.6     - install/update inspec
10.7.4.6     - verifies the inspec version
10.7.4.6     * chef_gem[inspec] action install (up to date)
10.7.4.6
10.7.4.6 Recipe: audit::default
10.7.4.6   * ruby_block[exchange_refresh_token] action run
10.7.4.6     - execute the ruby block exchange_refresh_token
10.7.4.6   * directory[/var/chef/cache/compliance] action create (up to date)
10.7.4.6   * file[/var/chef/cache/compliance/cis-ubuntu14.04lts-level1] action nothing (skipped due to
```

This simulates the automated periodic Chef execution on nodes in a convergent infrastructure.

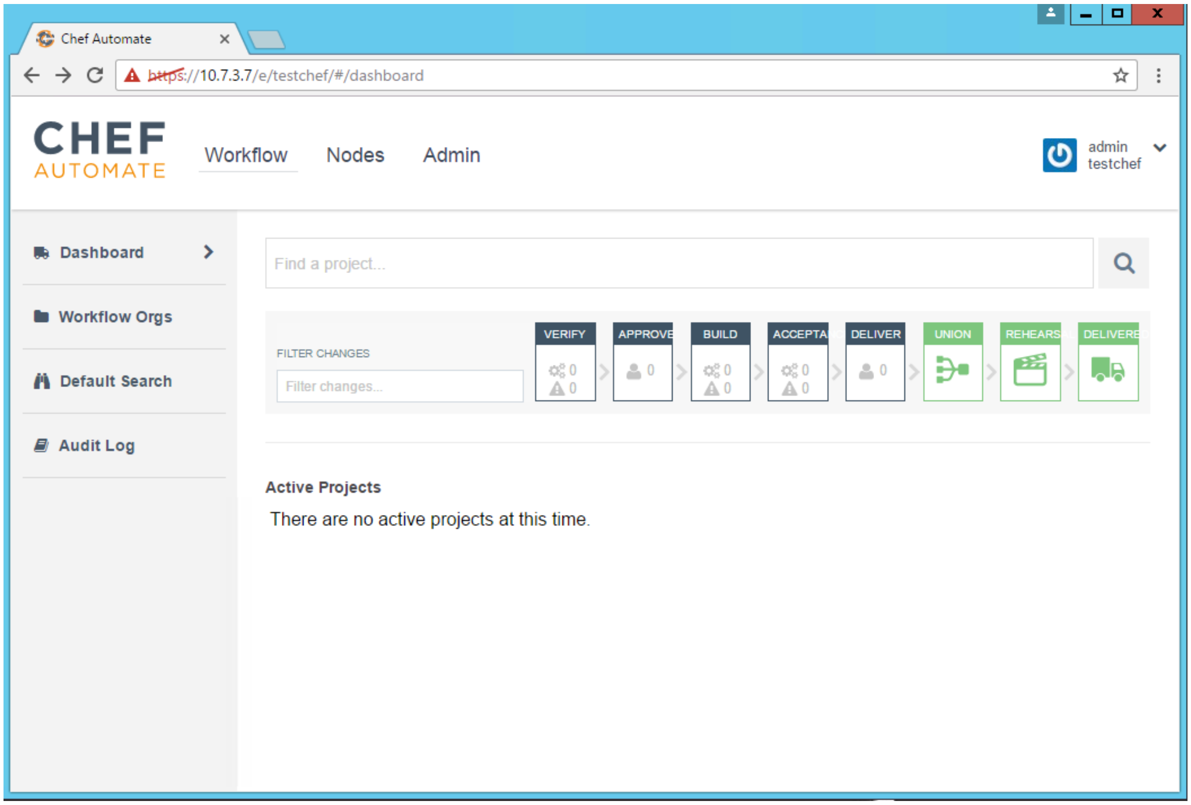
1.3 Log in to Automate

Double-click the Chrome shortcut on the Desktop to open a web browser.

In its address bar enter the following address:

10.7.3.7

This should automatically log you in and open the Workflow dashboard:

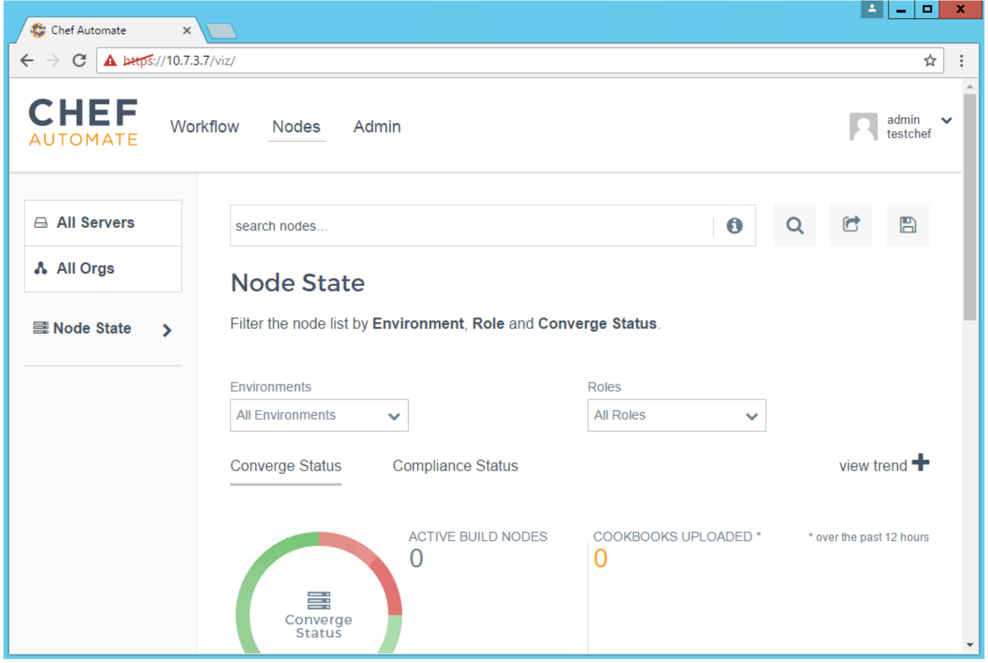


Active Projects

There are no active projects at this time.

1.4 Review the nodes’ compliance state in Automate

Click the Nodes tab to examine the state of your infrastructure fleet.



Node State

Filter the node list by **Environment**, **Role** and **Converge Status**.

Environments: All Environments

Roles: All Roles

Converge Status | Compliance Status | view trend

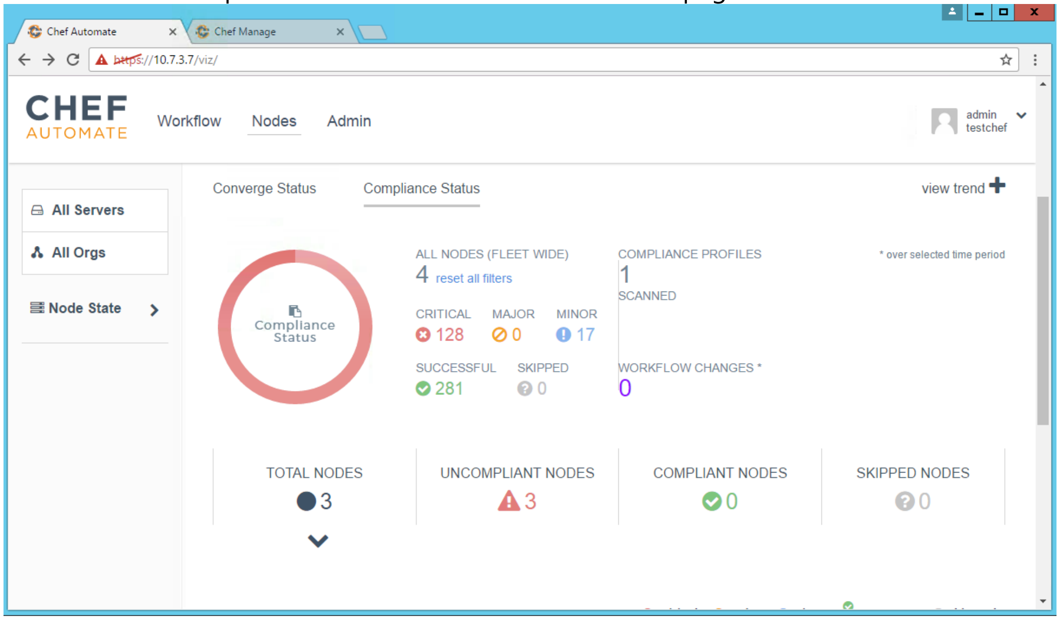
ACTIVE BUILD NODES 0

COOKBOOKS UPLOADED * 0

* over the past 12 hours

You should see the state of your node.

Now click the Compliance Status link in the middle of the page:



Converge Status | Compliance Status | view trend

ALL NODES (FLEET WIDE) 4 reset all filters

COMPLIANCE PROFILES 1 SCANNED

* over selected time period

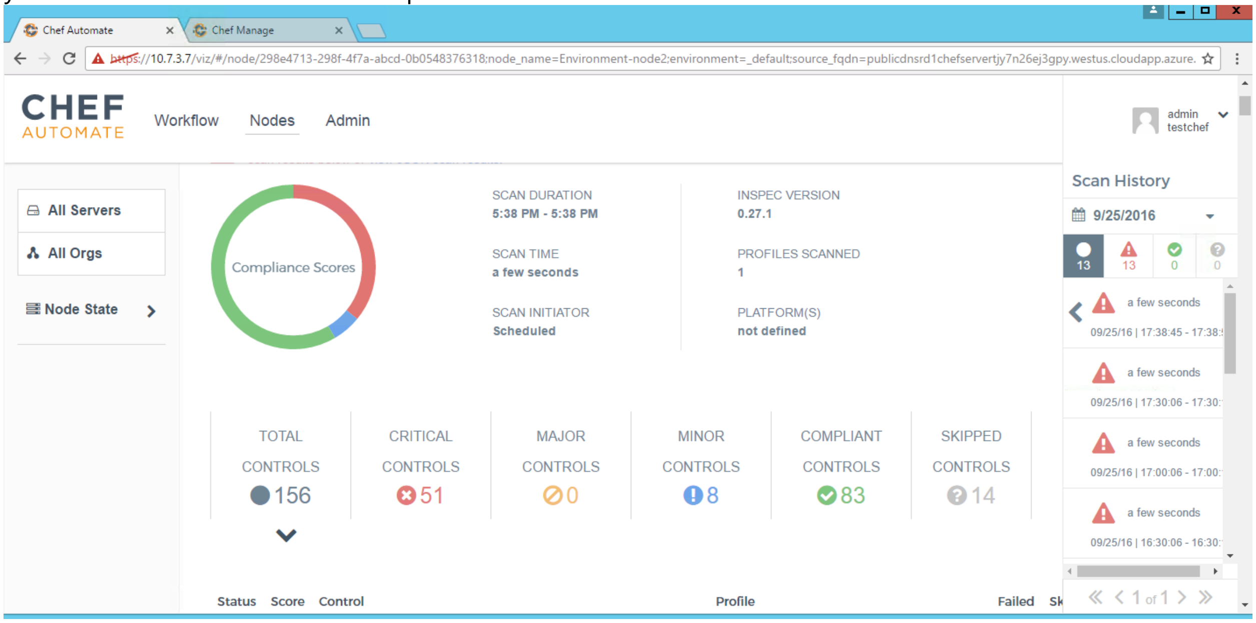
CRITICAL 128 | MAJOR 0 | MINOR 17

SUCCESSFUL 281 | SKIPPED 0

WORKFLOW CHANGES * 0

TOTAL NODES 3 | UNCOMPLIANT NODES 3 | COMPLIANT NODES 0 | SKIPPED NODES 0

Scroll down and find your node in the list. Notice the number of Critical failures on your node. Click on your node to be able to examine specific audit controls that failed:



Chef Automate
Chef Manage
https://10.7.3.7/viz/#/node/298e4713-298f-4f7a-abcd-0b0548376318;node_name=Environment-node2;environment=_default;source_fqdn=publicdnsrd1chefservertjy7n26ej3gpy.westus.cloudapp.azure.
CHEF AUTOMATE
Workflow
Nodes
Admin
admin
testchef
All Servers
All Orgs
Node State
Compliance Scores
Scan History

SCAN DURATION
5:38 PM - 5:38 PM

SCAN TIME
a few seconds

SCAN INITIATOR
Scheduled

INSPEC VERSION
0.27.1

PROFILES SCANNED
1

PLATFORM(S)
not defined

TOTAL CONTROLS	CRITICAL CONTROLS	MAJOR CONTROLS	MINOR CONTROLS	COMPLIANT CONTROLS	SKIPPED CONTROLS
156	51	0	8	83	14

Status | Score | Control | Profile | Failed | Sk

9/25/2016

●	⚠	✓	?
13	13	0	0

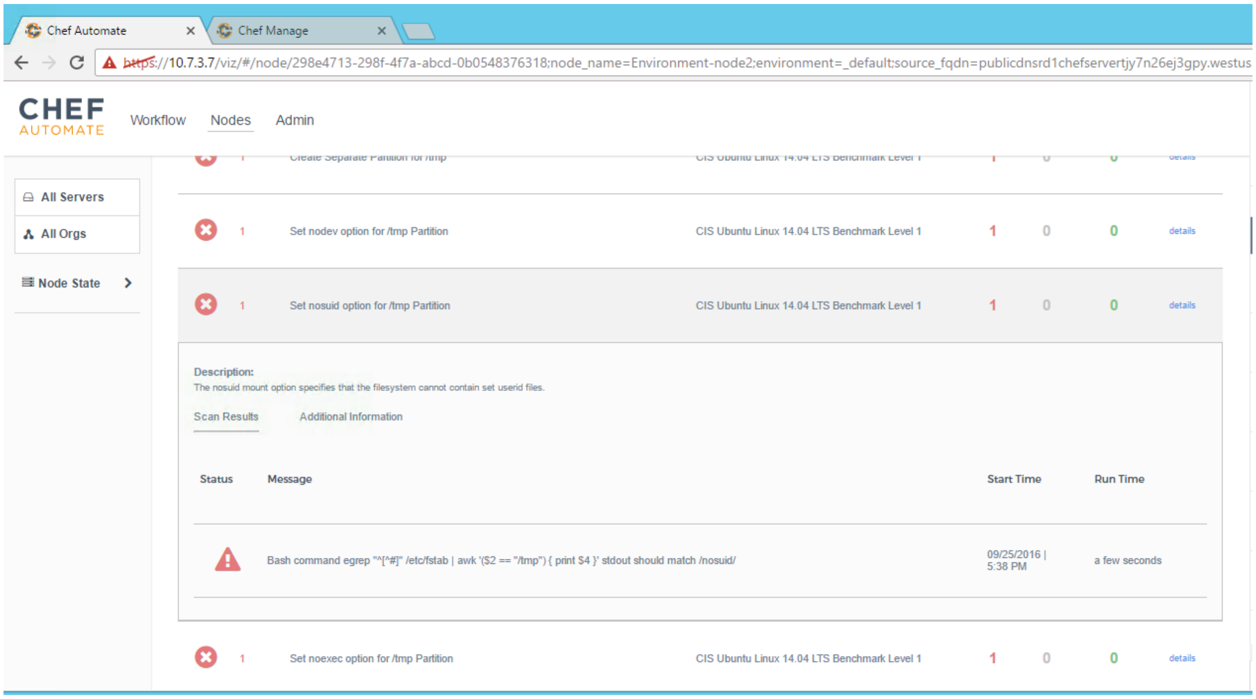
⚠ a few seconds
09/25/16 | 17:38:45 - 17:38:

⚠ a few seconds
09/25/16 | 17:30:06 - 17:30:

⚠ a few seconds
09/25/16 | 17:00:06 - 17:00:

⚠ a few seconds
09/25/16 | 16:30:06 - 16:30:

1 of 1



Chef Automate
Chef Manage
https://10.7.3.7/viz/#/node/298e4713-298f-4f7a-abcd-0b0548376318;node_name=Environment-node2;environment=_default;source_fqdn=publicdnsrd1chefservertjy7n26ej3gpy.westus
CHEF AUTOMATE
Workflow
Nodes
Admin
All Servers
All Orgs
Node State

☒	1	Create Separate Partition for /tmp	CIS Ubuntu Linux 14.04 LTS Benchmark Level 1	1	0	0	details
☒	1	Set nodev option for /tmp Partition	CIS Ubuntu Linux 14.04 LTS Benchmark Level 1	1	0	0	details
☒	1	Set nosuid option for /tmp Partition	CIS Ubuntu Linux 14.04 LTS Benchmark Level 1	1	0	0	details

Description:
The nosuid mount option specifies that the filesystem cannot contain set userid files.

Scan Results | Additional Information

Status	Message	Start Time	Run Time
⚠	Bash command egrep "^[^#]" /etc/fstab | awk '($2 == "/tmp") { print $4 }' stdout should match /nosuid/	09/25/2016 | 5:38 PM	a few seconds

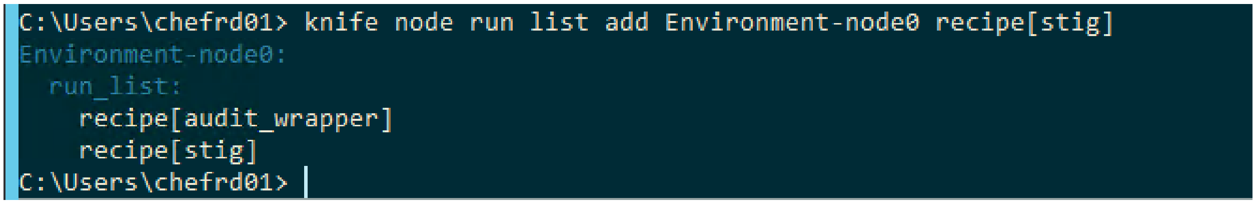
☒	1	Set noexec option for /tmp Partition	CIS Ubuntu Linux 14.04 LTS Benchmark Level 1	1	0	0	details

1.5 Modify the node’s run-list to also run the stig cookbook

Let’s go back to your command prompt and issue a Chef API command to add the **stig** recipe to the node’s run list:

knife node run list add Environment-node0 recipe[stig]

The command should confirm to you that the recipe is now in the list:



```
C:\Users\chefrd01> knife node run list add Environment-node0 recipe[stig]
Environment-node0:
  run_list:
    recipe[audit_wrapper]
    recipe[stig]
C:\Users\chefrd01>
```

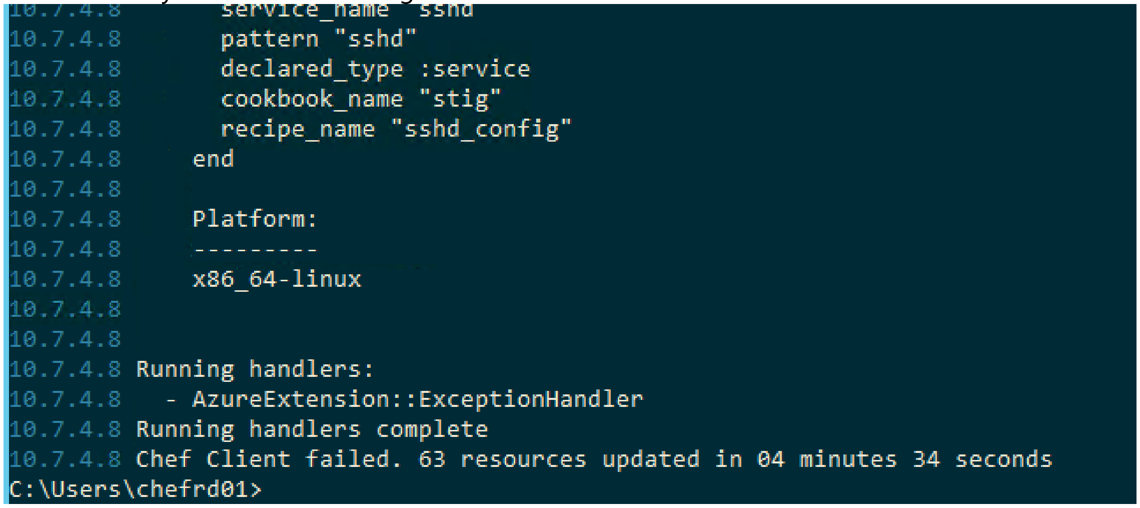
1.6 Remotely trigger chef execution, again

Now that we modified the configuration policy for our node, let’s once again simulate what a convergent node would do automatically in production – execute Chef:

knife ssh name:Environment-node0 -a ipaddress -x adminuser sudo chef-client

and enter **adminuser@123** when prompted for the password.

Watch as the chef execution hardens the node to stig specifications. It will take a few minutes. Your chef execution may fail with the message below:



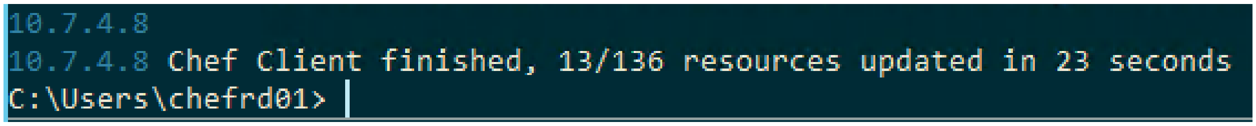
```
10.7.4.8        service_name "sshd"
10.7.4.8        pattern "sshd"
10.7.4.8        declared_type :service
10.7.4.8        cookbook_name "stig"
10.7.4.8        recipe_name "sshd_config"
10.7.4.8      end
10.7.4.8
10.7.4.8      Platform:
10.7.4.8      ---------
10.7.4.8      x86_64-linux
10.7.4.8
10.7.4.8
10.7.4.8 Running handlers:
10.7.4.8   - AzureExtension::ExceptionHandler
10.7.4.8 Running handlers complete
10.7.4.8 Chef Client failed. 63 resources updated in 04 minutes 34 seconds
C:\Users\chefrd01>
```

Fear not. Simply hit the Up arrow key on your keyboard to show the previous command and hit Enter to run it again:

knife ssh name:Environment-node0 -a ipaddress -x adminuser sudo chef-client

and enter **adminuser@123** when prompted for the password.

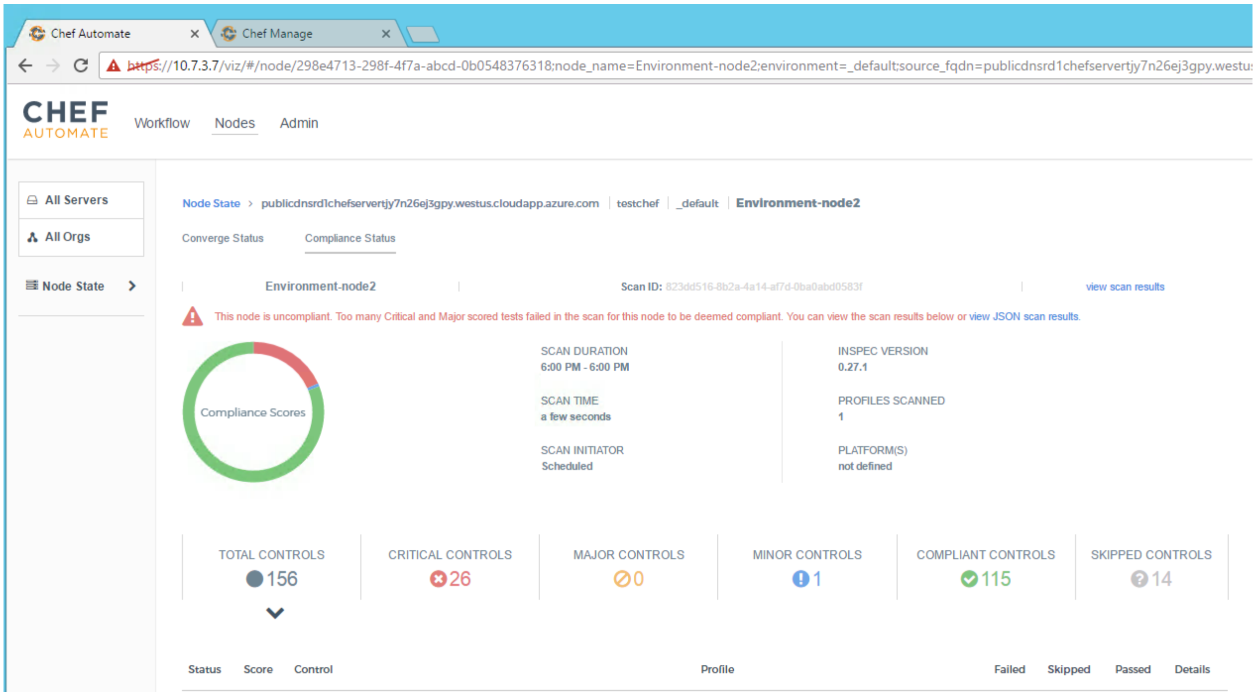
You will notice that the second execution is significantly faster. When Chef runs, it only configures the items that have not been properly configured yet:



```
10.7.4.8
10.7.4.8 Chef Client finished, 13/136 resources updated in 23 seconds
C:\Users\chefrd01>
```

1.7 Review the improved state of the node’s compliance

Alright, let’s go back to our browser. Refresh the Automate page, hit the Nodes tab, click on Compliance Status. We should now be able to see our node with an improved compliance profile:



~~https~~://10.7.3.7/viz/#/node/298e4713-298f-4f7a-abcd-0b0548376318;node_name=Environment-node2;environment=_default;source_fqdn=publicdnsrd1chefservertjy7n26ej3gpy.westu

Node State > publicdnsrd1chefservertjy7n26ej3gpy.westus.cloudapp.azure.com | testchef | _default | **Environment-node2**

Converge Status Compliance Status

Environment-node2 | Scan ID: 823dd516-8b2a-4a14-af7d-0ba0abd0583f | view scan results

This node is uncompliant. Too many Critical and Major scored tests failed in the scan for this node to be deemed compliant. You can view the scan results below or view JSON scan results.

SCAN DURATION
6:00 PM - 6:00 PM

SCAN TIME
a few seconds

SCAN INITIATOR
Scheduled

INSPEC VERSION
0.27.1

PROFILES SCANNED
1

PLATFORM(S)
not defined

TOTAL CONTROLS	CRITICAL CONTROLS	MAJOR CONTROLS	MINOR CONTROLS	COMPLIANT CONTROLS	SKIPPED CONTROLS
● 156	✖ 26	⊘ 0	! 1	✓ 115	? 14

Status	Score	Control	Profile	Failed	Skipped	Passed	Details

Key Takeaways

With Chef Automate, it’s easy to maintain the integrity of your infrastructure and keep track of any security or compliance issues. The platform enables automatic remediation and continuous audit capabilities for any vulnerabilities that the system detects.