



Load Balancing

Cybersecurity

Cloud Security Day 3



Class Objectives

By the end of today's class, you will be able to:



Create an Ansible Playbook to configure VMs.

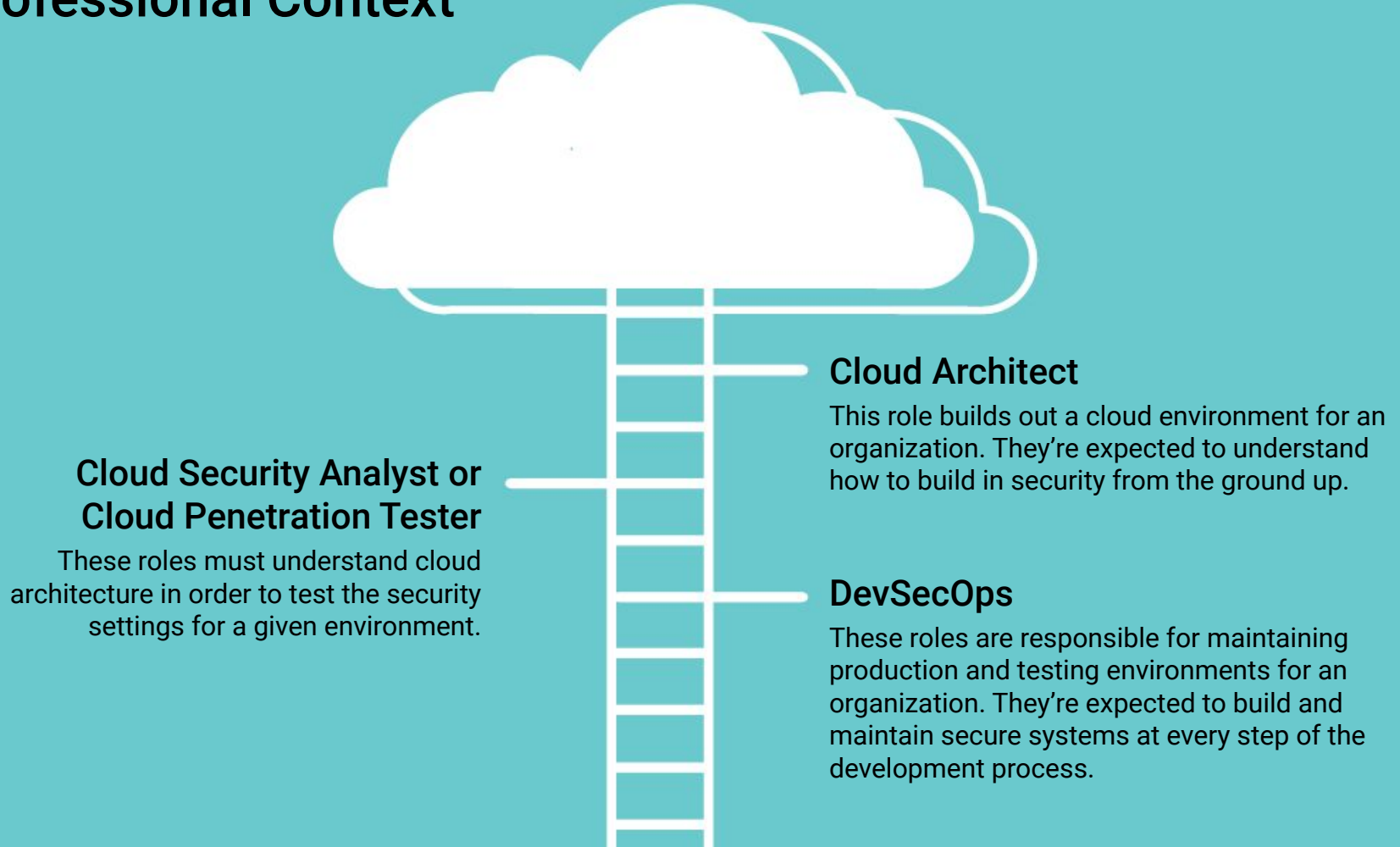


Create a load balancer on the Azure platform.



Create firewall and load balancer rules to allow traffic to the correct VMs.

Professional Context





Ansible Playbooks



We have implemented a jump box
that is running an Ansible container.

The Ansible container has full access to our
VNet and can connect with our new VM. Now
we will write code that will be “infrastructure as
code” for this vulnerable web server.

Ansible reads YAML code.



stands for

YAML **A**in't **M**arkup **L**anguage

and is designed to be readable and simple to use.

YAML

Today, we'll start with a guided tour of YAML.

```
---
```

```
- name: My first playbook
```

```
  hosts: webservers
```

```
  become: true
```

```
  tasks:
```

```
- name: Install apache httpd (state=present is optional)
```

```
  apt:
```

```
    name: apache2
```

```
    state: present
```



Instructor Demonstration

YAML Guided Tour



Activity: Ansible Playbooks

In this activity, you will create an Ansible playbook that installs Docker and configures a VM with the DVWA web app.

Suggested Time:

25 Minutes



Time's Up! Let's Review.

Questions?



Load Balancing

Load Balancing

So far, we have:



Created a virtual network.



Deployed a jump box running an Ansible Docker container.



Used that container to configure another VM running a DVWA container.

Load Balancing

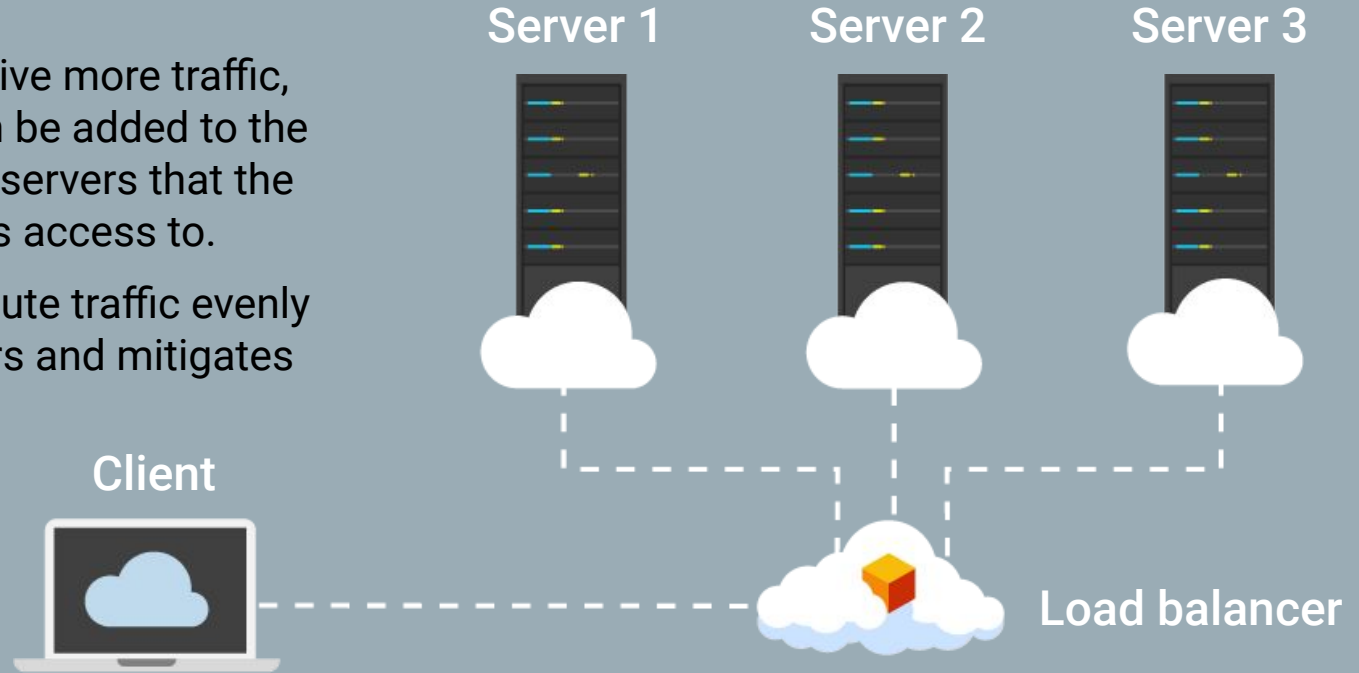
If the Red Team attacks this DVWA container with enough traffic, they may be able to trigger a Denial of Service on the machine.



Load Balancers

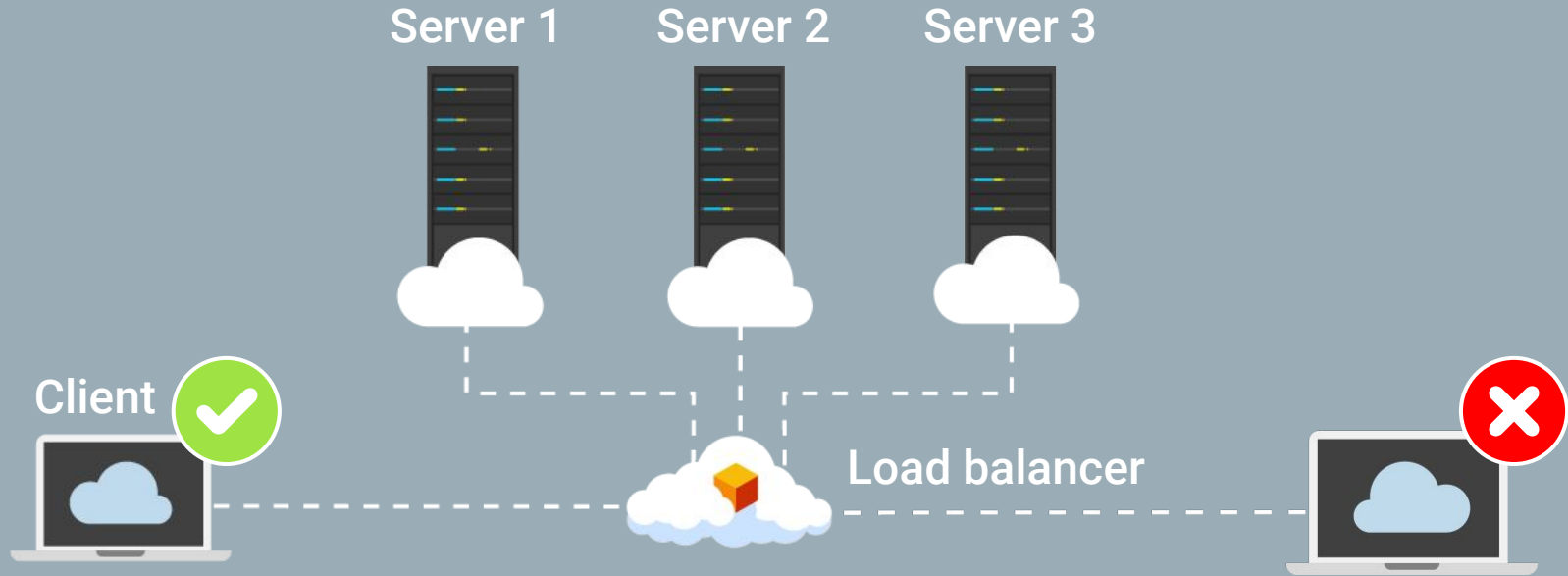
A **load balancer** provides the external IP address that the rest of the internet can access. Then, it receives traffic that comes into the website and distributes it across multiple servers.

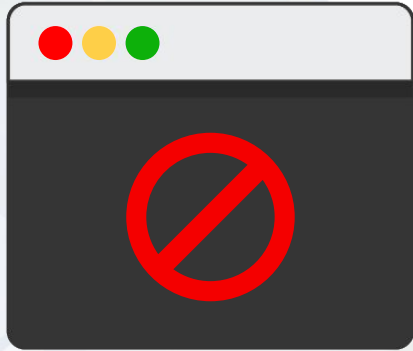
- As websites receive more traffic, more servers can be added to the group (“pool”) of servers that the load balancer has access to.
- This helps distribute traffic evenly across the servers and mitigates DoS attacks.



Load Balancers

Load balancers offer a **health probe** function to regularly check all the machines behind the load balancer. Machines with issues are reported, and the load balancers stop sending traffic to those machines.





The DVWA VM we set up is not accessible from the internet at this time. This is intentional.

The next step is to set up a load balancer that has an external IP, and point it to the VM.



Instructor Demonstration

Setting Up a Load Balancer



Activity: Load Balancing

In this activity, you will install a load balancer in front of the VM to distribute the traffic across more than one VM.

Suggested Time:

20 Minutes



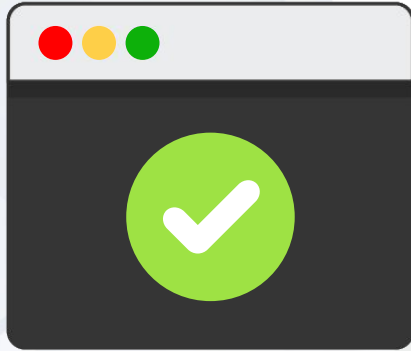
Time's Up! Let's Review.

Questions?





Firewall Configuration

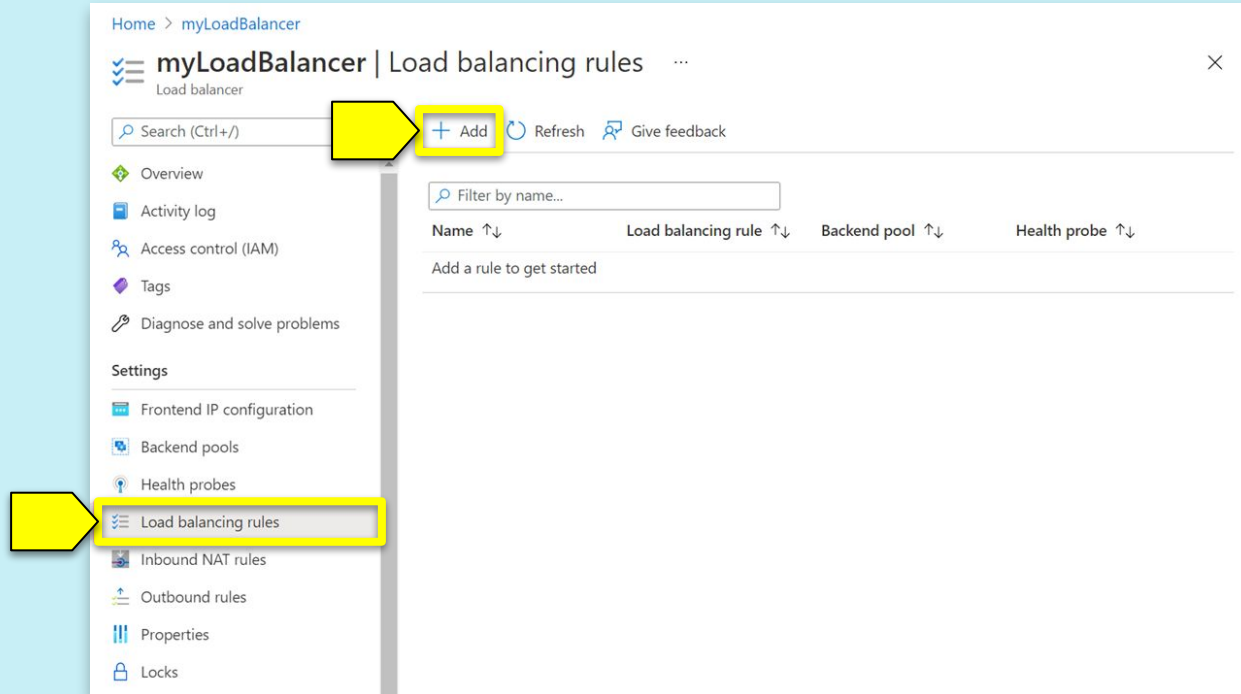


Now that we have a load balancer running, we want to make sure it is configured properly to allow traffic to the VM back-end pool.

By the end of the next activity, we will be able to reach the DVWA website from the internet.

Firewall Configuration

We need to configure a security group to allow web traffic into the VNet from the load balancer. In the following guided tour, we'll create a load balancing rule.





Instructor Demonstration

Load Balancing Rule



Activity: Security Configuration

In this activity, you will configure the load balancer and security group to work together to expose port **80** of the VM to the internet.

Suggested Time:

20 Minutes



Time's Up! Let's Review.

Questions?



Daily Checklist

By the end of today, you should have completed the following critical tasks:



An Ansible playbook has been created that configures Docker and downloads a container.



The Ansible playbook is able to be run on the Web VMs.



The Web VMs are running a DVWA Docker container.



A load balancer has been created and at least two Web VMs placed behind it.



The DVWA site is able to be accessed through the load balancer from the internet.



Shut Down Your Machines



Don't forget to power off your machine!

*The
End*