

# DevOps - Module 2: Networking and Cloud for DevOps

DevOps

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## Video: DevOps Introduction

Hello everyone.

Ravi here, and welcome to the DevOps course.

Whether you are a beginner

or someone looking to upskill you, this course is designed to equip with you all the tools

and knowledge you need to thrive in the world of DevOps.

What is DevOps? DevOps is not just a set of tools, it's a culture and a mindset that bridges the gap between development and operations team.

It's about automation, collaboration, and continuous improvement.

In this course, we are going to cover Linux, Git, sonar Queue, Docker and Jenkins, the essential tools that form the backbone of modern DevOps.

So let's dive into what you learn, why it matters, and how it help you in the real world projects.

In this course. We'll start with the basics and gradually move to advanced concepts.

Here is a quick overview of what you'll be learning in the course.

We'll start with Linux, which is the foundation of most DevOps tools.

You'll be learning how to navigate the Linux command line,

manage files,  
and automate tasks using command line interface.

So why is this important?

Because most servers, cloud environments,  
and continuous run on Linux,  
once we have completed Linux basics  
will be moving into git.

GIT is the most widely used version control system.

You'll be learning how to track changes, collaborate  
with teams, and manage code efficiently.

Version control is critical  
for maintaining code repositories  
and enabling streamlined collaboration.

Once we understand about version controlling,  
we'll be moving into SonarCube.

SonarCube is a tool for code quality and security analysis.

In here you learn how to integrate  
with the pipelines to catch the bugs in code.

Also, checking vulnerabilities  
and working with code smells so  
that in the early development process  
you'll have quality codes.

So this ensures that your code is not only functional,  
but is also maintainable and secure.

Over the time we'll move into Docker.

So Docker is the most popular containerization platform.

You learn how to create, deploy,  
and manage containers,  
making your applications portable and scalable.

Containers are the future of application deployment,  
and Docker is a must know tool for any DevOps professional.

Once you understand containerization with Docker,  
we'll move into Jenkins

is a powerful ci CD tool stands for continuous integration

and continuous deployment.

In here you learn how to automate workflows,  
build pipelines, and deploy applications effortlessly.

So automation is the heart of DevOps,  
make it simple and effective.

So by the end of the course, you'll have hands-on experience  
with the tools mentioned about that is Git Sonar queue,  
Docker and Jenkins,  
and understand how they fit into the DevOps lifecycle.

So now the question is, what is the future of DevOps?

So the demand for DevOps professionals is skyrocketing,  
and the reason for this includes automation.

Automation is the future.

Companies are increasingly adopting automation  
to reduce manual errors, speed up delivery,  
and improve efficiency.

Tools like Jenkins

and Docker are at the forefront of this transformation.

Cloud native technologies with the rise of cloud computing,  
DevOps practices are essential  
for managing cloud native applications.

Docker, Kubernetes, CI/CD, pipelines  
and high demand for DevOps skills.

According to the industry reports, DevOps engineers are  
among the highest paid

and most in demand roles in tech by learning the skills  
you are future proofing your career.

Finally, let's discuss

how this course will help you in real world projects.

First, let's start with end-to-end automation.

Imagine you're working on a project where you need  
to deploy an application multiple times a day.

With, with Jenkins,

you can automate the entire process like building, testing

and deploying, saving time and reducing errors.

Collaboration made easier in a team environment  
get ensures that everyone is on the same page.

You can track changes, resolve conflicts,  
and maintain a clean code, base code,  
quality and security.

Using sonar queue, you can catch bugs  
and vulnerabilities in the early stage of development,  
ensuring your code is robust and secure  
before it goes into production.

Portable applications with Docker.

Docker allows you to create containers  
that run consistently across different environments.

No more, it works on my machine issues.

To summarize this, you'll gain hands-on experience  
with Linux, Jenkins, sonar, cube,  
and Docker skills that are in high demand across industries.

Remember, DevOps is not just about tools.

It's about collaboration, automation,  
and continuous improvement.

By the end of this course,  
you'll not only understand these concepts,  
but also be able to apply them in real world projects.

So let's get started on this exciting journey  
and most importantly, have fun learning.

Thank you.

## **Video: Introduction To Server**

We are going to start talking about servers first.

Maybe if you already have an idea, good.

But people have from non-technical backgrounds,  
they don't know like, what's the server, why we use it.

Now you'll get a better clarity.

Let's connect everything from that LMS application point of view so that throughout the course there will be one project on this project from multiple aspects.

We'll look at it, right? Yeah.

So let's see right now, one second.

So here, as you said, right,

a server is where all this data is going to be stored.

Okay? In simple terms, this is how you can define a server.

A server is it

computer system or a device that provides data services, our programs to other computers.

Basically you call them as clients.

And all this communication happens over network, isn't it?

Just open your mobile phone, say the same particular thing.

lms.digital. link.ai.

You'll get that app in your mobile phone.

You do it in your laptop, you'll get that.

Or you go ahead and do it in your, what you say, some iPad or over any particular tablet.

You'll get it. Meaning what?

There are different clients

who are requesting the same server.

They're getting the response.

So here server is acting as what? A service provider.

It can provide data, right? The data can be anything.

It can be documents, it can be videos,

it can be images based upon the application type.

So if I talk something like ra, so

what RA server will provide you products information.

I'm talking about this digital link, LMS server.

Uh, this server is going to provide you video content.

Am I clear everyone? So technically speaking, the main primary purpose of a server is this.

Servers are designed to manage store  
and process that particular data.  
Agree or not, someone needs to store the data there.  
Someone needs to manage.  
When I say manage today, the session is done tomorrow.  
That video should be available for you end of the day today.  
So someone should go ahead and update  
that rate or manage it.  
Our wrong uploading was done, so you need to delete  
and replace a new one.  
So all that will happen where inside it server.  
So technically this is the concept.  
Multiple clients giving a request over the internet  
that will reach out to the server.  
Server will respond back. Good.  
Uh, now simple and straightforward thing.  
If you want to work  
with an application, you need to buy server.  
Simple. If you have server,  
then only the application can be hosted inside the server.  
Agree or not. Now here for my particular course learning,  
I would say I want server now obviously.  
So this is the first step I need to take here.

## Video: Purchase Server

I need to start purchasing a server,  
then I can start my operations.  
So it says what one  
of the significant steps in setting up the infrastructure is  
basically purchasing servers, which is used  
for hosting websites,  
running your applications, storing the data.

Okay, fine, looks good. I want a server right now.

Okay, let's try to buy one.

Yes, this is where I want to buy it.

I just want to buy one server and see the thing guys.

Great. So if I say I want you to, uh, invest around three, four lads to learn this particular course, does it make sense?

Uh, it does really make sense.

If I run a business, think like I have maybe some 5,000 students who are regularly watching those particular videos, and for them I need storage and all of that, then obviously they're going to pay.

Then I can invest a particular amount in the server and I can give it.

But for you to learn to go ahead and implement this much cost, it does not, uh, what is, it seems fair now.

So how can I overcome this simple?

So instead of me going and buying it, see, am I really running it 24 by seven

For me, what to practice and to implement, I need some machine or hardware simply speaking.

So that hardware, instead of buying, I want to rent.

This takes scenario that you want to reach this particular institute and you guys are coming somewhere from let's say, Gago.

And I say for this next three months, as you're regularly coming to this institute,

I want you to buy a buy car.

Car. Does it make sense?

It makes sense If I say like, okay, it'll be like Ma max to max three, to three and a half months.

So invest in an right application.



Like all our, it'll drastically cut the price.  
Isn't it your cost?  
That's the same thing we want to do as we are learning.  
I don't want to go ahead and buy this entire system.  
I want to rent it. When I do the practice, I want it.  
If I'm not practicing, I want to just keep it down.  
That's where actual, in terms of DevOps cloud is connected.  
I make curious everyone, so here, instead of going  
and buying this particular server,  
I'm gonna use this particular approach.

## Video: Cloud Computing

Now comes clouds.  
So I'm saying instead of buying physical infrastructure,  
we want cloud infrastructure.  
What they're saying, cloud, which is referred  
as cloud computing, is what?  
On demand availability.  
So when you need, you want some piece of hardware.  
So that particular hardware can be anything  
that you need for your application.  
So compute power means basically processes, CPUs,  
database storage, client applications,  
or any other IT resources through what  
A platform, like how you have writing platforms.  
Ola, Uber, Rapido, isn't it?  
Similarly what you got Cloud platforms, either a, WS,  
Azure, GCP, Oracle.  
It is your choice where you want to get it.  
That's why I said in this particular course, it's up  
to you wherever you want to create  
because it is not cloud native.

It can be applied wherever you want.

Or simply speaking, if you have a super uh, fast computer, like 32 GB ram, like that, right?

You can do all these things in your laptop also, but again, that becomes an additional investment, right?

Cloud is free for specific time. We are going to use it.

So all this hardware, which I'm going to use for this particular project moving forward, I will get it from where, from the clouds.

This app is there now. Like you just saw the videos and all of it.

So all of that where I'm going to store is technically on cloud.

Which cloud? We have two options.

I'll show you both AWS and Azure.

People who are there for AWS continue with AWS.

People who are there for Azure. Continue with Azure.

You want to try it out? Both Try it out, no problem.

It's up to you. I'll show you both so that whatever you feel comfortable or whatever you are looking forward to practice on it.

Because once you start understanding the cloud in a generic way, you'll understand that outcome is same.

Take the platforms like Azure meets a bike ride platform.

Take Ola, Rapido and Uber.

Would you find any difference in the way they function?

Outcome is same end of the day. That's the same for cloud.

You go for AWS Cloud, Azure Cloud, Oracle cloud, right?

The outcome remains same.

That's exactly what we will be doing it.

And in order to do this, do I need like let's assume that I want to go ahead and set up a cloud server.

So I do, do I need to purchase any physical entity or thing means no need.

All you need is a laptop which has internet. Simple.

All our operations will be done over internet  
with simple model called pay as you go.

Pricing model. Same like rides,  
you travel for five kilometers.

Charge will be according to that you travel 20 kilometers.

Charge like that right here.

What are you using for one hour? Are you using for one day?

Are you using for one week, one month, one year?

Based on the pricing changes for you guys,  
what most probably per day you might need  
to invest like three to four hours on that basis.

You'll go ahead and work out.

I make clear as everyone, so here, don't get confused.

I'm not talking about the cloud computing in this course,  
but I'm saying I need lab resources  
and further I'm gonna rely on cloud.

So don't get again mismatched with, okay, is it connected  
with AWS or Azure?

No. In terms of DevOps,  
cloud is basically a lab environment for you.

Rather than doing it in your laptops, you're going  
to perform all these operations on cloud.

Good. Everyone clear? So I hope you understood the  
connectivity between DevOps and cloud.

Now, cloud for you is just a lab.

When you actually talk about cloud  
computing, that's a different story.

You have services, networking services, database services,  
storage services, right?

Compute services. You'll work towards it.

Here, I'm not gonna discuss any of it.

For me, cloud means only lab.

Whenever I want to do some practical thing, I connect

to cloud implement, shut it down, continue.

Am I good everyone? Now any questions on this part is from online also, I hope you understood the concept of cloud and how it is associated with that DevOps part.

Yes. Yes sir. Right. Okay, perfect.

Uh, now let's see how am I going to get, this is the story.

So technically cloud is giving you what hardware only rate the CP you want, how much CPU, how much storage RAM network.

So AWS is saying if you opt for my service, I'll give you one year free access.

Azure is saying for me the free access is only one month.

That's their business model.

We can't do anything about that.

So people are there for Azure.

After one month you need to start paying for AWS after one year.

It's just a promotion model. Simple, regardless of it.

Any way you need to practice out for anything that you opted.

If you're there on Azure, it'll be the free for one month.

After that, you need to start paying for those resources.

But not very drastic thing per one hour.

It hardly cost anywhere from three rupees to eight rupees that after one month.

How the pricing model works.

Once we start slowly doing the labs rate, I'll explain, but max to max, I would say throughout this core, if you go with vigorous practice also it should not go beyond a thousand or 1500 per what Till the end of the course for the next three to four months.

I'm saying or clear is what I'm saying.

So it says free, right? But it's not

Unlimited.

These are like free trial trials.

So what I want to try it out, they'll give you,  
but in certain scenarios you need to extend its capacity.

At that point of time you'll get some additional  
and that if you practice all the best things,  
like I'll tell you like how to  
minimize the blend, all of it.

If you go with that approach now, like for the next two  
to next three to four months, the bill must  
below be like a thousand to 1500.

Only most clear with this part. Yeah. Okay.

So this is the thing that I want to convey guys.

Uh, now how to set up these accounts when pretty  
simple and straightforward.

If you know how to create a Gmail account, right,  
you'll be able to create your CloudOps.

## Video: AWS-Azure Accounts

Just visit the following site,  
get a free account, and it starts asking the information  
like your email ID  
and all of it you need to  
update, okay?

Ah, the things that you need in order to create  
an free account in AWS or Azure is only three.

One is an email, then a unique  
phone number, mobile number,  
and then followed by a card, credit or debit, anything.

Uh, make sure these are not used earlier  
in your account creation.

If you already created an AWS account

or Azure account prior to this session, just to go ahead and research something in that regard, that particular things will not be eligible for free trial.

Okay? So if you're going with this particular part, again, make sure all these emails, phone numbers or cards that you're going with should be unique. It should not be associated with an existing AWS account. Azure record that you read, the practice area, okay? Yeah. And like I said, no coming to the charges, they'll not auto deduct if it's a debit card, credit card based upon how your card was created on the basis, things will be there.

Okay? So try to see, mostly try to go with debit cards. And one more thing that I want to give the clarity is this cards, whatever the banks you're going with, right? Make sure you enable international transactions, okay?

Where you can do it, just your banking application. Like let's say you're in uh, SDFC bank, you'll be having the settings saying, enable international transactions. You need to enable it. Then only these things will work.

No, you need help. Just call your customer support of the bank. They will help you, okay?

If you're not enabling this rate, it'll not help you deduct the things.

So when you're creating the account now it'll deduct to Rupee to make sure that your account is actually working your bank account.

So in order to deduct this to to rupe rate, you need to have this transactions enabled.

If it is not detecting, no,

your account will not get created.

Got the point everyone.

So you need to make sure first try it out if it is working

well and what if it does not work means issue

with this problem or either of this, maybe

that phone number

or email ID might be already tagged with some other account.

Then you might get this issues clear everyone.

So make sure while you going

and working with you have a unique phone number, email card.

And also

you cannot use that.

It'll be, no, it should be all unique.

You can use some of your, some of your phone, uh,

friend's phone number and you can just tag it.

No problem.

Yes. Volume must created

how it was, I have got a

Yes. So, uh, the bill amount, somewhere around uh,

12 since I'm a student, not a student,

but I have said I'm a student

and they ask me to provide the I cards,

not a student all the time.

So have to apply.

Yes. So that is what, how,

That's what I'm saying. Like

basically AWS says like

whatever the free trial they're giving it, right?

There's like for understanding their product.

Lot of people are misusing it.

Like I said, there is one year access now, uh,

earlier it was pretty simple actually three,

four years ago you make lacks of bills also.

Like they're like just discarding it. But now what?

They're very, very strict.

If you're a student, you need  
to definitely provide an ID card if  
you want to revert the bill back.

But if you're not providing, so no.

So that's why I'm saying cautiously use it.

It's not like you can go ahead and create as you vision.

Again, you want to revert

that bill back means now it's not worth,

if you would say like earlier, three, four years ago,

it was not so strict, but now you need to definitely do it.

Now there is only one way around.

So either you need to pay that particular bill

or discard that account and create a new one.

Can we discard the account and create account with email?

You cannot. Every time you go with a new free account,

this thing should be always unique both

for AWS and as well as Azure.

Azure, you already have an existing account discard it.

Or if the bill is very minimal, no problem, like maybe 50

or a hundred rupees, you can pay it.

But if it's beyond like a thousand, 1500, 5,000,

some people got like 20, 30,000 bucks

you can discard at that point of time.

If we discard, that will not bill up.

It'll not bill up unless you pay.

It's not going to take, oh, uh, what happens

if I'm just using, I'm not paying the bill.

You'll get two months buffer max.

So I assume that your account is like in uh, Jan,

it got billed fe it got billed in March.

It'll get uh, what do you say?

Uh, kind of what you say discarded in the sense it will be

more into their uh, recycle bin part of thing



where your account will no longer be active.

You cannot perform operations.

It'll directly redirect you to the billing page.

Unless that particular bill is not cleared.

You cannot go to the next month.

That is two months max

before for a s for Azure, it's like one month straight.

After one month you need to start paying if you're using it.

Got it clear. Every once are created based upon what you're going with.

So either you're there for AWS go with AWS

or in terms of Azure, both same in Azure.

Also it's exactly same thing.

Try out for free and then it'll last your email ID card number, same mobile, the same concept.

Exactly. Go ahead and try to create this accounts.

So once this account creation is done right, you are ready to start with the things now.

Now as I said, both these platforms are cloud only, right?

AWS Azure, you want to do physically also you can,

but like I said, at least 16 to 30

to GB ram machine you did.

And also there is no use

because I said right, most

of the computing power is completely coming from cloud now.

So that's the reason. You'll also get an idea how to use it.

If you want to give a try on the physical mission, you need to know VMware, our virtual box.

If you have knowledge with

that particular platform, continue to do so.

But here I'm going to be exclusively showing in terms of clouds, got the plan.

So it's up to you how you want to use it.

If you already have experience in VMware or virtual box

or any hypervisor softwares implement on it  
because whatever the labs I'm going to do next, right?  
It will be exactly same in all the platforms you work in,  
Azure, VMware or AWS.  
Your outcome will be same. Good with it.  
Yeah, that's the thing that I want to need, right? Okay.  
Uh, now once these accounts are done, right now, what  
they're providing you the hardware,  
now this hardware is going to be accessible over internet.  
Agree or not? Because what they said,  
you can access all these resources over internet.  
Now think in internet,  
I'm the only one person along with you.  
There are so many other people  
who can access the things over internet, right?  
So there comes one challenge with cloud security.  
If you don't configure the systems properly,  
especially in the cloud, there are very, very, uh,  
what you say, easy to hack or attack  
because everyone knows in the internet,  
if there is a server, it has an IP address,  
there will be some user names they'll keep on trying  
with random usernames and passwords  
or dictionary combinations  
or most widely used passwords,  
we call them something like brute force attack  
techniques are there to hack.  
To avoid that from day one itself, make sure you are going  
with some security standard practices, right?  
So that part you'll be able  
to understand if you know bit on networking site in DevOps,  
one of the prerequisites is networking.  
If you're good with network firewall concepts, right?  
You'll be able to, what do you say,

troubleshoot the things in a better way  
because especially you're working with web servers,  
database servers, application servers,  
communications, firewalls.

These are mandate mandated. I don't want you  
to be like a pro level in the networking,  
but very basic things like what are protocols,  
firewall rules, right?

The basic standard protocols like s, SH, htt, p, https,  
RDP, right?

NFS. These things you should be aware  
of in case you don't know.

I'm gonna take some examples  
and explain and we'll move forward.

Got the point here. Okay?

Now coming to this thing, once you're aware  
of the cloud part where your accounts are ready right now,  
I'm gonna start creating the servers there, right?

So those servers, I wanted to be secure.

See, see the same example

As these people are going and accessing the server.

So now this server will be where in terms of our codes.

Either it'll be there on a w, s or Azure platform  
and this server is accessible over internet.

So basically what,

he can also come over internet

and why not attack this and break this.

So now the thing is I want to have a layer  
of firewall on this particular server so  
that it cannot be attacked from random people  
and it should give access to the only customers I want.

I clear the point is, uh, now for this particular regard,  
you need to understand there's nothing  
but what basically a networking layer.

So what is network networking,  
firewalls, how do they function?  
We need to understand from both the aspects  
because we are trying to do the working both the  
platforms and almost similar.  
You'll see like actually across different,  
different cloud vendors, how the similarities will also be  
there in this lab, correct?  
Okay. Let's see about few  
concepts that I'm going to discuss.  
Now here,  
these are the things we need to.

## Video: Networking and Security

Let's see, technically  
what there and how do they function?  
See this image, I think it will give you a  
very clear understanding.  
See, the primary purpose of a firewall is to allow, uh,  
non-threatening traffic and prevent any kind of malicious  
or unwanted traffic  
protecting your server from viruses and attacks.  
Simple. You see this private network.  
Now this is your cloud network. These are my cloud servers.  
Technically, are you good? What I'm trying to say?  
So these are the missions you created on the cloud,  
which is in a private network.  
You see these are attackers.  
They're all coming from internet.  
And you see all these red lines.  
I placed one wall here, a firewall,  
and you see it is blocking all the red lines,

but it is only a living that green line.

So technically, let's assume right now

this green line is someone like my student.

Now what the point is, I want my students

to access this server, but not some

hackers to go ahead and access it.

Uh, now if I want to block them,

understand in like general terminology,

how can I restrict someone on what basis?

Like take some real life examples.

If I want to restrict someone, how can I do that?

We got some answer. You want

to put some rules to enter someone?

Uh, now how can you define someone?

ID and password? Exactly.

Some access id, uh, some thumbprint, right?

Or maybe some retina to capture their information, right?

Uh, so basically any identity that comes, it needs

to have some uniqueness.

Let's take our scenario. How can I say?

All of us are unique in, in terms of like,

let's assume names are not unique.

Your other IDs are unique, isn't it?

Maybe a mobile number that is tagged might be unique

and names are never unique.

Names can be duplicated, right?

There can be 10 s,

but there cannot be 10 s

with same other id, isn't it?

Now in network, what happens?

Any device that comes or any person who comes, right?

They have an IP address.

How you said mobile number

or an either ID is identity for me there,

an IEP address is identity for every machine,  
clearly is what I'm saying.

This one has an IP address. This one has an IP address.

This one has an IP address.

The students will have IP address.

These hackers will also have what IP addresses?

Every one of them. I can go ahead and define  
or I can identify them over a network using IP address  
or any device in a network has IP address.

It is standard. Uh, now how can I restrict the traffic means  
like see these guys are communicating, agree or not.

Now, simple and straightforward.

If I'm trying to communicate with you,  
you can understand if I follow certain  
guidelines, I'll speak English.

Everyone in this class will be  
able to interpret my thoughts.

If I start speaking in Spanish, you might not be able  
to interpret that thought, right?

Meaning what? I need to set some standards so  
that I can exchange the information, agree or not?

Uh, this exchanging the information happens  
over what In networking.

Any idea  
packets?

Uh, right, this packets will flow through what?

Yes, I'm almost close to the answer.

Uh, they use protocols.

Heard of the term protocols, anytime. Network protocols.

Any idea guys? Anyone from online? Do you?

Yeah, I got an set of rules. Uh, like correct.

So there are protocols which are nothing but set of rules.

Rules for what? Mm-hmm.

Uh, this packet, transmission, the packet is nothing

but a payload which contains data.

Now this packets, in order to flow from one device to another device, there should be some defined rules.

If not everyone will start selling, how would you say, transmitting the information, right?

So there should be some standard rules to pro to follow so that the exchange of the information is done without any packet rules.

Uh, further you need to understand something called like protocols.

Uh, now you might have a question why protocols coming into the firewalls?

Uh, because now I'm transmitting the information rate.

Hacker is transmitting some information.

Student is transmitting some information.

You guys are basically transmitting some information.

So this information all flows through protocols.

So if you want to restrict something based upon the protocol, IEP addresses, you'll go ahead and restrict are clear what I'm trying to say, right?

Maybe you'll understand it practically, but technically speaking protocols will help you go ahead and define the rules.

In firewalls, like I would say simple, I assume that there are 20 people in this class.

Uh, I want you to enter into this particular DevOps room, but not to some other class like Python.

So generally what I'll do,

I will take all the list of 20 people.

I'll say their names, their other id,

and I'll ask some person outside, like maybe an office boy to sit over there and then start verifying if that person who does not match in this particular,

uh, let's say register.

If he is not matched in this register, let's not allow it.

Those are called firewall rules.

A register is like a firewall rule here in

that I'll say this person, this ID here, what?

I'll say this protocol,

this IP address, are you clear right now?

So in a firewall, actually what you have is protocols

and source addresses where they're coming from,

meaning technically where they come from.

It's an IP address zone. So I will go ahead

and I'll write this particular rules in the firewalls.

Am I clear? Uh, very simple example.

I know it might little bit look complicated right now.

So for this only, I just drawn some images to simplify it.

One second.

Generally I use this in my cloud sessions,

but you'll get an idea.

So this is my server. A server has

what you see and IP

address, okay?

You see these are all different identities.

I said that LMS application is there.

Now some admin is there.

He is the guy who uploads the videos.

So this guy also has what IP address students are there.

You people, you also have IP addresses, right?

And there is an hacker.

He also has what all the sources coming to finally where

worldwide web, uh, worldwide web also has an address.

If you guys, which is called 0 0 0 slash zero,

it is called quad zero address.

Meaning any source in the world,

any network will fall under this.



Uh, see all of them coming through internet and where they want to reach.

So what I did, I added a shield there.

You see, uh, this is technically my firewall, uh, now whom to allow is a question right?

Simple and straightforward.

This firewalls will have what you see, the line rules, TCP protocol, port numbers, I addresses.

Uh, you might not know these things, maybe you know, like SSH, htd, but these are all protocols.

You'll get to know like little bit, uh, what you say in a precise way once we start doing the labs.

But any servers that we are going to create in the future, we are going to protect them with the firewalls.

Are you clear what I'm trying to say?

Unless I'm not good with these things, my servers are prone to, that's why you're not creating servers directly.

First. We'll understand how they function, how we secure them.

Once you know about the security concepts, then we'll go ahead and practically start creating the servers.

Are you good with this case? Everyone what I'm saying?

Right? So this thing, I'll give a better clarity.

Once we understand about everything in the networking side, then I'll come back to this image completely.

But technically right now, for me, a firewall is like basically a device which will help.

## Video: Protocols-Ports

And simple in terms of the networking part.

Protocols are basically what? That's it.

Some rules or standards that we follow.

Guidelines you can say that will define

how your data is transmitted

and as well as received over the network.

This protocols will be defined within those particular networks.

Okay? Uh, we have different protocols.

I said now as we move forward, I'll explain.

So for time being, just if you want to have an idea,

I'll just explain you, maybe you might have

heard of it or not, but just have a small glimpse at it.

Different set of protocols, simple different languages,

how you have just assume like that for time being.

Now there is a protocol called SSH.

You see what is the purpose? So

it says, I'm gonna provide a secure,

encrypted remote access to your computer.

You are creating the servers, right?

You want to communicate with them.

If I'm trying to communicate, passing some information,

there is a chance that someone can intercept that data.

If I talk in plain language.

So what I want to do, um, exactly, I want

to encrypt whatever the information, I want to pass

that server so that even someone tries to intercept

that data should be unreadable at that point of time.

SSH is something that we use.

Http P, you see, what is the purpose?

Uh, any content that you're transferring over the internet,

any website you access now, technically that is all http,

uh, http also a bit insecure.

You want to get it more secure than there is another version called s hst.

TPS. They use SSL certificates.

Uh, we learn all of the things Similarly, SMTP, simple mail transfer Protocol.

You know, generally this is useful though.

Mails, you're opening Gmail.

These applications not behind the scenes.

The protocol is used is S mt P.

Uh, same with DNS. You're using domain names, right?

thw.google.com.

So when I run some particular domain name, it uses some protocol called DNS.

Like that. There are different, different protocols associated with different sort of works you do.

I, I clear everyone.

So in our applications we'll see all these sort of things.

Now you might not understand anything,

but we, once I said no,

once we start typing about applications,

setting up the servers, networking,

all these things are going to connect it.

Good everyone. So this is the basic thing that you need to be aware guys.

When you're going and working with networking insight, what do you say?

Your DevOps session, you'll get this more insights when you go to the clouds and your cloud.

Networking is a big domain actually.

You have separate sessions for that network services only at the time you'll get better clarity.

But right now what I don't want you

to be a network administrator here, I want you to understand what is networking, how the communication happens and how you protect your servers.

That's the only primary thing that you need to do here.

And for that, these concepts you need to be aware of  
networking, firewalls, protocols.

And there is also something called ports.

Every protocol is associated with a port number. Simple.

Assume that every language has a code number E in US E  
and uk, correct?

Similarly, assume every protocol has  
some ports to go ahead with.

And the ports are like what? Anina.

I want to communicate from one mobile to another mobile.

How the transmission happens.

Actually you have anina in your mobile technically  
that anina what is sending

and receiving the signals now, exactly same way.

Every protocol is associated with what? A port number.

I'll discuss it. What are port numbers?

So I was talking about DN sna, you know,  
it has a port number called 53 s Mt P.

It has a port number called 25 s JT PS.

It has a port number called 4 43 http.

It has a port called 80 SSH. It has a port code 22.

Uh, you might ask like,

how do I know it's already predefined?

I learned it, I got to know it. You can just check.

I just said it. Most commonly used ports you see there, it  
says red port 80 TP 4 43

TTPs 21 ftp 22 SSH

53 DNS one 10 POP three, right?

3 3 89 RDP, 25 s, Mt P.

So these are already preed.

So we use this particular ports also in firewalls.

Am I clear everyone? So this is the information which is  
already predefined based upon which type

of application you're working with in your firewalls.

You open all these things, uh,  
where these firewalls will be there.

Now, technically in a server now  
where this servers are there for US cloud, which is going  
to be either AWS or Azure.

So there will be two different types  
of firewalls we are going to work with.

One is specific to AWS, the other one is specific to Azure.

Sure, concept is same. These things will never change.

These are universal.

You go for AWS, Azure, Google Cloud,  
your own on-premise servers.

Also, this is same, but the look and feel will be different.

See, you are booking a ride and all of the look  
and feel is different in rapid, the look  
and feel is different, but concept is same again,  
the last source address.

Destination address, that's it, right?

Like pick up and drop location.

That's the same thing over here.

AWS will have one way of creating the firewall.

Azure will have one way of creating the firewall,  
but outcome is now you got the point is  
regarding this, everyone.

So these are the things that you're going to work in terms  
of server setup, right?

So what is my goal next?

Uh, that's why I'm saying by next upcoming classes,  
make sure that you're going  
and creating your cloud, CloudOps, whatever you are there.

If you're there in AWS session,  
create an AWS account and keep it ready.

If you're there in Azure session,

create your Azure account and keep it ready.

Next, I'm going to demonstrate how to create what, how to create a server, how to configure a firewall and how we can connect with the service.

All these things. What we discuss theoretically in the next sessions, we are going to see them practically.

So what is our goal In simple for time being, all this thing, if I conclude this particular class moving forward, I want to work with applications.

Why applications? Because DevOps is saying what?

Build, test, deploy applications in a faster and a reliable way.

So if I want to build, I want to test, I want to deploy what I need to do in a server, I need some hardware.

That hardware is what we are discussing right now.

That hardware we are renting.

In order to work with it, you need to know all these particular concepts in order to create a server.

These are all mandated steps and that I'm gonna discuss.

Next, I'll show you practically when I create right what I was discussing, protocol codes, source address, destination addresses, everything you'll see on the screen next class.

Got it? So make sure for the next class, I want you people to get your accounts straight based upon whatever the cloud you're opting for.

You want to try both? No problem. Try it on both.

I just curious. I want to see in AWS and Azure also, right?

Try out in same tomorrow I'll show in terms of AWS, the next class I'll show in terms of Azure later on.

It's up to you how you want to follow up with, okay? Yeah.

Clearest today's session everyone.

I hope you got an idea right now

how this all things are connected  
and moving forward just like this.  
I'll have some particular session  
where we'll understand the concept,  
then we'll perform the lab.  
Uh, lab will do it. You'll get the video, try it out  
whenever you get the time when I'm doing the lab,  
if you do the lab, you might miss the context.  
Just observe it. You'll get the video, try it out, repeat,  
you'll be more comfortable and.

## Video: AWS-Azure Network Flow

We have a concept called as AWS Security.  
Now, whatever the firewall concept I discussed in the last  
session,  
this particular one in terms of AWS language, you're going  
to call it as AWS security,  
the same concept, the firewall.  
If you're going and working with Azure Art, right?  
Then we are going to call it as  
Azure network security group.  
So basically we are both are one  
and the same with different naming conventions.  
If you're working in AWS, just remember we call it as  
what security group.  
It basically acts as what a firewall server, right?  
So that particular server, in terms of AWS language,  
you're going to call it as EC2 servers are easy.  
Two instances, I'll tell you like the is the terms  
that we use in terms of AWS, whereas in Azure,  
the same component is also called as what networks security.  
Right? Exactly. Same. There is no difference.

It is also a virtual firewall,  
but again, language in Azure you call your servers  
as virtual machines.

Okay? So in generic way, what we simply call it as a server,  
but the same server in terms of AWS, you call it as easy  
to instance in terms of Azure, you call it  
as a virtual machine.

So you have a server. That server has a firewall.

So that firewall name in terms of AWS you call it as what?

Security. Security. And in terms  
of Azure network security group, that's Yes.

The terms I want you to remember, okay,  
now you have a server, you have a firewall.

Now this server is going to be part  
of network, agree or not.

So network should be there, right?

Then only a server will be able to connect  
because you're talking about internet-based connections.

So now when I'm talking about the network part, let's come  
to this particular image.

You see here, this red color cloud I kept,  
no, that is network.

This is your server. I make clear everyone.

This red color thing. What I kept here, like a cloud symbol  
that is your network and this black  
or blue box, what you're seeing  
on the screen, it is your server.

So if it is AWS, it's called as easy two server.

If the same server is in Azure, you call it as what?

Virtual mission easy two instance or virtual mission.

Now this network, what I just discussed in terms  
of AWS language, this network is called as VPC,  
virtual Private Cloud.

The same network in Azure language, you call it as word,



a virtual network.

See concept is same again I said right?

You go across any different particular clouds.

Also the naming conventions

Will change, but the concept underlying is always same.

So now you've got a network.

In that network, you've got a server

and that server is protected by a firewall.

And I said no, the firewall is this one a shield,

which will help you restrict the traffic.

If something is trying to attack us, steal the information.

Great, good. Uh, I said language, AWS security group.

And in Azure you call it US network. Network security group.

Okay, one more thing.

Now the server is there, firewall is there.

Firewall will work. It'll restrict whether

someone is allowed or not.

If someone is allowed, our multiple people are allowed.

They should have their own unique identity. Correct?

Uh, now assume like your server is like a room

and that room needs some kind of protection.

So basically you go ahead and have lock in keys, right?

The concept of lock in case in terms of server,

no server side, right?

We call them as key pairs.

## Video: Key Pairs

Log in.

So you use what? Usernames and passwords, isn't it?

Now if I go with usernames

and passwords in cloud servers, like I said,

there is a chance of going in misusing them

because passwords can be predicted with common words or dictionary based words.

To avoid that, we are no longer going to use password based logs.

The password based logins, right?

We are going to replace them with something called a keys.

And I don't get confused Q Keys, nothing.

But technically speaking it's a file.

We are going to have a file.

That file is going to have some random text and you need to input that text as a password.

So how it's going to be created as a name, suggestion, it's called as a pair.

So in this you'll be having one public key and one private.

These two things together make up a key pair.

Uh, now the concept goes like this.

Public key is like log private keys, this key.

See, when you buy a lock, you'll obviously get a key, right?

Uh, so where do you keep the lock to your door?

And key you will take it with same concept.

Lock is kept server side key is there with the person who wants to log in.

I make clear everyone. So

whenever you're creating the server, either in AWS Azure, anywhere you go with, they are going to give you one log, but you're not going to get that log.

It'll be placed at the server site, the place where you're launching the server.

So once that key there, it for a matched, uh, sorry for the lock, A matched key is going to be generated.

That key will be there with you.

So whenever you want to log in, you need to input that particular key.

Then only the login will be successful.

So this way, what happens?

Only people who has the key can  
go ahead and log in into the machine.

Am I clearance the concept?

So moving forward, we are no longer going to use  
usernames and passwords.

It's going to be replaced with keys.

So that's the reason why this kind  
of authentication is also called as key.

Key based authentication.

Earlier the authentication you did right, it's called  
as password based authentication where you input username  
and password, but now you're replacing that usernames  
and passwords with what keys.

So if you input incorrect key  
or your key is not properly uh, updated, right?

It's always going  
to throw you an error saying permission denied, unable  
to connect with the server.

We'll see that, right? So concept based, clear everyone.

So you got a server, that server is part of one network  
and server has a firewall along with it, a server also has  
what key pair are you clear with these four things?

Chris, I'll show you that key pair right now in  
that image you see.

So it's also called US password list R

Key based authentication.

You see here we have one lock, one key.

So lock is placed where you see right now  
the server on the server side  
and you see there is one key given to an administrator.

That key will have an extinction called dot  
p extension file.

So whenever an administrator wants to connect

with your server, he needs to pass the key.  
If the key is valid, then only it can unlock  
and you can get access to this server.  
Am I clear as everyone? So moving forward, any kind  
of server you want to go with it,  
there will be one network for sure.  
Okay. You'll be having a firewall and keeper.

## Video: Server Components in AWS

You need to have your AWS pre account created  
and then we are going to launch something called  
as Amazon EC2 instances.  
These are technically nothing  
but service Now to launch a server.  
Obviously it's a piece of hardware, isn't it?  
Now to interact with that hardware,  
what is the primary thing means an operating system.  
Without operating system you'll not be able to go ahead  
and allocate the hardware.  
So that operating system, in terms of AWS language,  
this is a term we use  
Amazon machine image,  
a MI in short we call it are blindly.  
You can say it's an operating system.  
Uh, we are going to work  
with an operating system called S Open Loop.  
And one thing to remember this operating system,  
we are going to work with it.  
It does not have any graphical interface.  
These are backend server, so they're going  
to be completely in the command line mode.  
So we are going to interact

with this service using certain commands

and that is what Linux is all about.

Later on, we'll discuss that, okay?

Uh, now this operating system,

it needs to be installed, right?

Where generally if you take your system, uh,

where do you install operating system?

No, no, your system. I'm talking about your laptop.

Which, which component? Oh, exactly.

In your hard descrip, you'll have in hard disk.

That hard disk in terms of AWS language, we call it as what?

EBS, what you already know about the general terms,

but in terms of cloud, they will be different.

So in AWS language, that hard disk is simply called as what?

EBS volume. Uh, we are going to get a volume

of eight GB for free.

Whenever you're going and creating the maximum free in your AWS account is 30 gb.

So technically what you can launch up to three servers

for free beyond three, even if you're going

and stopping the server, also it'll be charged.

So that's the reason why I'm saying it.

Whenever I say like create, only create that one.

If you're not using it, stop or delete. Okay?

So remember the maximum you can go is 30 GB free,

but for one instance it is up

to eight GB clear with the spot.

So technically speaking, the hard disk

of this server is going to be a GB, everyone good, right?

So now you've got hard disk.

So obviously I need to do some processing. So I need what?

CPN ram, that CPN Ram in terms of AWS language,

what you call means instance types.

Uh, same like how you have uh, laptop models.

Let's take Dell.

You have 3000 series,

5,000 series Alienware series, isn't it?

Similarly, in AWS language, we call them as instance types, which will be a combination of CPU and ram.

They have names. A T two Micro is

basically a model which will give you one CPU one GB ram, which is free.

If you want to go beyond that, you need to pick, am I clear everyone?

So whatever the free trial you're going with AWS rate, it says we are going

to offer you one CPU one GB ram that is completely free.

You don't even need to pay anything.

If you want to go beyond that.

So let's say there is a model called T two Medium,

which will offer two CPUs, four GB ram,

which is going to cost four rupees per one hour.

I make clear everyone. Similarly, there is something called

T two Large two CPUs, 8 GB,

which is going to cost seven and a half rupees per one hour.

Like that, you can check it out.

But for timing, we don't need that bigger machines

as we are initially going

and understanding the basic concept, right?

T two micro is more than sufficient,

which is completely free.

You don't need to pay anything for this particular machine.

Got the point. Yeah. Uh,

and along with that I said no key pair for

what authentication are simply saying like what login.

So we need to create a key pair.

So technically when I create a key pair, what is the meaning for this server, which I'm about to launch.

I'm creating the log for that log  
and appropriate key will be generated  
and it is going to be downloaded in your laptop.  
Now, who is creating an admin rate?  
So in his admin laptop, this key is going to be present.  
Am I good everyone? Yeah.  
And then followed by you see VPC, which is basically what  
not security VP C is what?  
And network in terms of AWS language. I said, right?  
Once again, I'll just zoom out.  
Inside AWS, the network is called US VPC,  
which is called US Virtual Private Cloud.  
Hmm? Under VPC, you'll have what Security group,  
which is basically called us.  
And you see now what it is saying,  
I said right in the last session,  
you'll be having protocols, codes,  
and source, source means who from where, technically.  
I'll show you that part. Uh,  
and we are going to talk about something called SSSH  
protocol, or I'm gonna say in the firewall.  
I'm going to allow what protocol, SSH protocol,  
the purpose of this protocol.  
You see what we're saying? See,  
you are launching this server somewhere on the internet  
technically, and I'm hired,  
I'm available right now in Hydrovac.  
So from Hyderabad, I want to connect to that server in  
that particular regard, the communication,  
which is going to happen, right?  
It should be securely, uh, what you say, encrypted that  
thinks what I'm talking to the server.  
So further, the protocol name is SSH.  
This SSH protocol works on port number 22 SRI,

cetera, some commonly used protocols and their port numbers.

Okay? So SSH works on port number 22.

Clear everyone so far that say this.

Literally, if you have this knowledge, you are done

with the cloud, which is required for DevOps.

I only need a server, which is going  
to provide me hardware operating system.

I'm done. I'll just go ahead and connect  
and I'll start doing my work moving forward.

Okay? Clear everyone. Okay?

## Video: Server Setup in AWS

Server creation.

Okay, so if you want to login into aws, right,  
you need to have the address rate.

So this is the address base  
[aws.amazon.com/console](https://aws.amazon.com/console).

Go to this place

Here.

You see there is something called like my account.

Oh, here you can see management console. Click on it.

It'll take you to the sign in page.

You'll not get this page because I was working  
with some other thing by default.

You'll see like this sign in with route user email  
like this, you'll get this.

Now yesterday you have created one account, right? Yeah.

That account email ID you need to provide here.

There's no concept of Im just discarded.

As of you don't know. People who knows AWS cloud thoroughly,  
they'll understand this, but as of now,  
let's not bother about it.



Go and select root user, whatever the email ID you have used to login into the account, go ahead with it.

So for me, that email ID is right now this

One second

And then it is prompting me to go with the password.

Uh, it'll not ask MFA code for you.

Basically, I just went with two. Uh, what do you say?

Uh, two step verification so that it'll be more secure,

but for you, it'll not ask

unless next time it's going to ask you.

I

logged in this right now.

This is called console home.

Basically this is like your AWS dashboard.

I can say, uh, here I wanted to work with what servers.

EC2 is what I said.

Look, you search here,

EC2, you see what it is saying?

Exactly. That's what I want. A server inside the cloud.

So I'll go ahead and click on E two.

Uh, now this server, which I'm going to create, right show,

it should be present in some location, isn't it?

Yes. Uh, that location here, you see

these are called as regions.

Technically these are the data center locations of the prospective cloud.

So I have selected something called US Ohio, which is in the location called uss.

You can select anything. Your choice, it's up to you.

I just went with this location called Ohio.

So I have selected Ohio, it's up to you.

You can select Ohio, whatever the other location you.

And you see on the left side you see a thing called as instances, which are technically service.

When I click on it, you see what it is saying, no instances.

So currently you have no instances in this region.

Region is nothing but technically location.

What is the region? Ohio.

Uh, I don't have servers right now. I want to launch.

Go ahead. You can say launch over here or here.

Anything is fine. Now it's asking me name  
of that server, your choice you can give.

So generally what I do is like I have habit of going  
with the batch ID so that I don't have any confusion.

USS is 2 5 0 1, right?

Just for my identification. You can name whatever you want.

It's up to you. Uh, next it is asking me  
what O-S-A-M-I.

Uh, I said right? These are  
different, different operating systems.

I want to work with what tu I selected Ubuntu.

Uh, in Ubuntu again versions.

So by default it selected something called us 24.

I'll uncheck that or I'll click on the dropdown  
and you see I'm going for 22.04 a version.

Prior to the latest,

I'll say confirm.

Can you both have three? Both are free. Yes.

You see here it says red free.

So I'm going with aversion prior to this  
because generally it's always better  
to have rather than the latest version aversion before that.  
And any version that says LTS, you'll not have any issues  
because it has long-term fire support,  
long-term support LS.

So anything that says LDS we are good with.

So I'm going with version 22.

So like this word based upon different,

different OS is different versions,  
but for particular part R code, we are going with Ubuntu 22.  
Uh, no, it depends because macro OS is different.  
Windows OS is different. Linux is different.  
Yes, Amazon also has their own ways.  
Uh, depends upon the software  
because sometimes what happens, uh, based upon the os,  
the type of package managers,  
the way you install the things will change.  
But 80% of the regular commands will be  
except installations.  
One of the easiest operating systems.  
When it comes to lenux  
and it's completely free, you don't have any restrictions.  
You can go ahead and play around  
with anything you want in open.  
That's the reason why we select it now.  
Now I'll go ahead and select the OS, which is open 2 22.  
Uh, now you see it is asking me instance type.  
You see by default what it selected T two micro,  
which is giving you one CPU one GB memory,  
which is basically ram.  
And you can see it says free tire eligible.  
You want others, right? What you can say,  
just click on this dropdown select.  
You see there is something like T two large, which  
is not eligible for free.  
So you'll be paying the demo 0.0928  
US dollars per ha.  
But as of now, we don't need all of this.  
We are good enough to go with T two micro itself.  
Later on, I'll tell you when to change.  
We have scenarios where you can go up  
to T two X large and all of it.

At that point of time, we uh, now further mission  
what it is asking me.

Key pair. I already said no. A key pair is used for what?

Passwordless login. Right? Exactly.

I'm not gonna use any password moving forward.

I'm gonna give this key pair and that's why it's saying  
what required.

Required. Oh, as

of now you'll not have any key pair by default.

So you need to create one.

Just click on create a key pair

and name the key pair and same strategy.

Go with the default option

and I'll say create

oh two options.

Okay? Don't forget like just go with the default one.

Why two options? Huh?

This is like the one which is downloading, right?

This is the key. The one which is there in the  
cloud is lock.

Let's say I'll show you like I'll say save it right now.

You see one file got downloaded into my laptop.

That is key, which is also called private key.

The one which you're seeing inside AWS.

Now that is called public

that you learn in your cloud.

As of now, I just want a mention with key.

What are the different things means?

Those are called algorithms.

Types of algorithms will be there.

We use RSA, which is the most secure one.

Now I have this key here.

This is public key

and technically this is my private key, okay?

And you see now here what it is saying,  
what is the network called us?  
VPC. Like I said, uh, in this VPC,  
you see there is one concept called us.  
We just called as what? Oh, and you see what it is saying?  
I said read rules. Uh, now I'll just go ahead.  
Uh, if you want thoroughly, you can check.  
You see what it is saying right now.  
I said OSSH, right?  
If you want to see more thorough information, click on edit  
SSH code number  
22 and see the source.  
I said right in the last session,  
zero.zero zero slash zero indicates  
any source on internet.  
So technically what you're saying, you know right now,  
anywhere from the world, if you come, I'll give you access.  
Provided you have that 2, 5, 0, 1 key, that's the meaning,  
no, you want to restrict it.  
You can instead of anywhere, say custom  
and give the ips.  
Mm-hmm.  
Now is using  
can we forward that key?  
And she can use that key.  
Just like your house, you have  
your house, you have the key.  
You want your friend to go there, give him the key, he can.  
So one key, anyone can use it. How?  
Uh, how many people we can share  
Can just like how you share the password, right?  
If you share the key, they can get access to your system.  
Simple. Yes. Okay.  
Anyone who has that private key,

like the one which you downloaded right now, yes,  
I'll send it to someone else and I want them to log in.  
They can log in no problem.  
Because you're only saying take the key.  
If the key is not there, they'll never be able to log.  
Yes, that's true.  
Create on your name,  
like create some given access  
So the same  
Different permissions.  
Permissions are a separate concept  
that does not have any significance over here in Linux.  
You'll learn it.  
You both can log in. You can log it. Yes.  
Same. Same permission, yes.  
You okay? Oh, so I got the point here. Yes.  
So here I sit, I can go ahead  
and restrict from where I want,  
but as of now, I'm not sure, right?  
Because you guys are practicing.  
Sometimes you might be in Stuart sometimes at your office  
place, sometimes at your home  
or somewhere, sometimes at a cafe.  
So based upon your choice, you want  
to connect wherever you want.  
So I don't going here and this is like what I said, storage,  
A, G, B, and I'll say, then that's it.  
Those were the options we discussed, right?  
Storage followed by firewall, followed by key pair,  
followed by instance type A M1 five options,  
the same five options.  
Also there in Azure with different names.  
Literally that's it in Azure also, right? Right.  
Now you understood, right? In Azure it's almost same

with different names, same concept.

Tomorrow I'm gonna show you in Azure, right? Okay.

I would say launch this instance. Now that it is, I'm ready.

Successfully launch the instance.

Scroll down here, save you all stances.

Here you can click or here also you can say instances.

Anything is fine. Just refresh.

See now I have a Linux server up and running and it hardly, like I explain the things.

If I just directly went step by step, right?

It hardly has like two or three minutes to complete this.

Now if I do the same thing in a physical machine, right?

Like by creating a virtualization layer like VMware, our virtual box, downloading this open to a MI, installing it, going through all the procedure, it'll take at least 45 minutes.

There's the purpose of cloud.

You can fast up your process giving all these heavy workloads to vendor itself.

Right now I have the system ready.

Now I can go ahead and start working with this system.

How means every server you create, I set it what it has.

If you select that server,

A public IP address, there are two types of IP addresses, public and private.

Later on I'll discuss the differences, but for timing, you need is public because it's going to work over internet.

Private ips are generally for intranet, local connections.

Later on we'll discuss why we might need private ip.

But for timing, what I need public.

So this is the unique number given for our system.

Now I need to connect another question.

How should I connect? Simple.

I want to control this machine. From where? From my laptop.

You have your laptop. This is my laptop technically, which I show you right now for easier understanding, right?

I kept one laptop here. See, this is Windows, right?

A regular Windows laptop.

Technically speaking from this laptop, I want to go ahead and connect with this.

2, 5, 0, 1. Sir, what is that connection called?

As SSH to use SSH, we need a software by SSH client.

Am I good guys? Everyone to connect with this server from this particular laptop, what you need SSH client that is already there in your image.

Now you'll get the clarity. This is your admin laptop.

He'll install one software called us, SSH client.

Using this client, he will run one syntax.

SSH technically do SSH using the key.

What you have downloaded, the PM file username of that machine at the rate I

where you need to run it in your laptop

by using a software called SSH Client.

By default, it might not be installed. We'll install it.

Did you get the point? Everyone installing it?

Ravi, I don't understand. Can you please repeat it?

Uh, I'm saying that you got a laptop.

So simple thing, uh, let's assume that you bought a brand new laptop.

You want to browse websites.

What you'll do, tell me Chrome will install Chrome.

You'll install some browser, right?

Like Chrome, Firefox Edge, correct? The same way.

Now you want to browse your server, isn't it or not?

You created a server, you want to browse it.



So further, you need a software called SSSH client.

How did you use browser? Now I need a SSH client. Is it?

Uh, now you don't consider laptop as server.

Server is different. I'm considering this laptop is what?

Minus This is an administrator laptop.

Uh, in this we need to install the SSH client.

Uh, so how I'm going to install simple.

You see I'm going to my browser. I'll download the software.

I'll show you pretty simple.

Just say download GI Bash.

That is called SSH Client file. It has multiple users.

Later on you'll understand, but just say, download GI Bash.

Go to this site, downloads of Git,

download for windows and downloading 64 bit EXE file.

Simple.

You see there I downloaded one EXE file.

I'll just install this

just like how you install a regular EXE file.

And next, next, next finish. Nothing to change.

Then this finished. I'll not see any notes. I'll say finish.

Uh, now just go to your search

and look for the software called GI Bash.

Okay, search for that and open this application.

It looks like what?

Command prompt isn't it?

Yes, Technical. It's a command prompt.

From here we are going to connect with the server

because our server does not have any menus or graphics.

It's just a bare bone system.

You talk with commands going forward,

how dos works if you guys know something similar.

Now, in order to do this, we need few things in our hand

before connecting with the server.

I said there is a syntax map that syntax requires.

Three things. One is the key  
username, IPS.

If you have these three pieces of information,  
you can go ahead and invoke the connections.

Now we already have the keynote now,  
so let me get that key here.

I'll go to my, so generally it'll be there in the downloads.

You see that key 2, 5, 0 1, that's the private key.

Now I'm going to use this key and get to connection.

Uh, this key is present in which location downloads.

So you need to say cd, download,  
CD transfer, change directly.

Now I in the downloads. So from here I need to invoke it.

Syntax, I said right now syntax goes like this  
central route and thread.

SSH space, hyen,

I in identity.

Our identity key. You can call what is the identity?

Key Thumb.

That's it, right? That's the key

You have downloaded, isn't it?

Yeah, Followed by space, username.

And now how do I know the username? Root, not root.

You need to go back to your console, like AWS page.

You see there is a button called? Mm-hmm Click on connect.

See here? What's the username? Oh, good, okay.

It's not root. Root will not work.

I'll tell you that story in a section called Linux.

There's a default username.

You cannot, it has some rules. We'll see.

So what's the username? So it is fixed.

Guys, you cannot change if you go

with other name also, it'll not work.

It'll be always open to

Like uploading the same name.

So everyone's username will be,

But everyone has unique key that keys only accessible by.

Got it. So keys are always specific to usernames, right?

Yeah. At the rate followed by the IP address,

which I showed you right earlier.

You can copy it. Sorry, not here. You can copy it from here.

The, the same ip or you can say cancel.

And once again, you can check from here.

It's once you check the server, that's your public ip.

I can copy this. Sorry, go back.

Uh, one thing, remember here, control V will not work.

Right? Click and paste.

Okay, no control V, right click paste. R shift plus insert.

Is there shortcut for pasting?

Uh, now I'm technically saying I want to go ahead

and connect with the server, with this ip,

with this username and this.

Are you clear everyone? And this is universal.

You work with Azure, you work with Google Cloud, you work with your physical machines anywhere in the world.

This is how we connect it. The syntax is common. Okay?

Now, once you go with this case hidden,

it's asking do you want to connect?

Say yes. Now you see here,

now we have successfully logged into a server.

We to server. Now you see I'm not in the laptop technically, now I'm connected to AWS server.

How to confirm that you're in the correct place, right?

You have one command. Actually Clear the screen once and say you name,

you go with this command called you name.

If you see this word called Linux popping,

when you say you name, your connection is success.

If something went wrong in your connection,  
then if you say your name, it'll not, uh,  
how I, I'll show you, right?

Right. You say I'm logging out from the server. One second.  
Just for helping you understand.  
See, I'm in the downloads rate right now.  
Earlier it was not the same case.  
I'll say something else.  
And also you can verify like this, who am I?  
Meaning I'm not in Ubuntu user.  
If I want to connect back again, repeat.  
Now, you can use up and down arrow keys  
to check the history.  
Now again, I'm saying what? SSH. Same thing. It entered.  
Now I'm here. Now you can confirm. Say your name.  
Say who am I?  
Ubuntu, because you logged in with Ubuntu user, right?  
This is the confirmation that you need  
to take if you are successfully logged into the machine,  
but keep the server running.  
If you are not using it now, I'm done. Right?  
So if I keep it, what till next day,  
24 hours unnecessarily, it's running.  
So what you do, go back to your server place again, sorry.  
Uh, the AWS console. See it is still running.  
Select that server. Instant  
state stop.  
Terminate means delete. Reboot means it'll reboot.  
But I want to stop  
once I shut down here, right?  
Obviously what happens, you know,  
here the connection is closed automatically.  
Now you cannot connect with that server  
because technically it is down.

Uh, when I'm going to start next class,  
when I come back again, when I'm going  
to perform the labs every day, right?  
This is what I'm going to do. Moving  
forward, will, will create.  
Then when you're not using it, you'll stop.  
If you're done with the entire implementation, you'll delete  
When you need new servers, again, we'll create again,  
we'll start, stop.  
These are the regular operations.

## Video: Server Setup in Azure

As easy to instance A-M-I-E-B-S volume instance.  
Uh, types keeper and security group.  
Now the same terms in Azure, this is  
how we go.  
And so same you start  
with an Azure free account people are going with,  
then you launch an Azure virtual machine.  
Like how we go launch EC2 instance here we call it  
as Azure virtual machine  
and same A MI is called US images.  
So we are gonna use same open 2 22 0.04.  
In the last session we discussed EBS volumes.  
Here we call as Azure disks. Same concept.  
The hard disk is called US Azure disk.  
Then in the last part in AWS we had instance types.  
Right here we have sizes, pretty straightforward terms.  
And here the same thing CPU and ram.  
If you want to have a similar configuration like one CPU  
and one gigabyte of ram, now it is called US B one s like  
that you have B two s, D two like that.

There are different, different what you say,  
size parameters available in the Azure.  
A concept of K pair is as usual. There is no difference.  
And that network here, we call it  
as vnet in AWS we call it SVPC.  
There we call it a security group in AWS here we are gonna  
call it as Azure network security group.  
And same concept, it's a firewall.  
You're gonna add the protocol code and the source address  
and then followed by same thing as it's Alin server.  
We are gonna allow SSH traffic  
not much different If you compare this one,  
what we discussed in the last session, same points just  
with different naming conventions.  
Got it everyone. So now people are going with Azure,  
just follow this particular approach  
and your server is going to be ready.  
Same thing, I'm just gonna launch the server  
and let's see how we are going to connect  
with you.  
See guys, I log, I logged into my Azure portal. Same thing.  
All you need to do is I showed you in the last session.  
Now this is the UL [portal.azure.com](https://portal.azure.com).  
You need to go with and put your email.  
Id go ahead and sign in. Simple how you did for a Ws.  
So once you sign in you'll get something  
called like Azure portal.  
How we got AWS console here we call it as Azure portal.  
How did you search for EC2 in the last session here we call  
them as virtual missions.  
So just go to the search bar and look for virtual missions.  
I already have few servers so it's displaying,  
but in your account you might not see  
any service over there.

Okay? And pretty simple.

You see here create Azure virtual machine,

they're creating that machine and same thing you see subscription.

It is asking now here technically that subscription is nothing but this.

Uh, sorry, the subscription is nothing but what account you're going with.

So free account will be having free subscription but minus a paid account you'll say free subscription.

That's the only difference. What the point?

So minus paid account.

So it's going with some subscription, but generally what you'll be having a free subscription that will be converted

to paid subscription later on after one month.

Okay? You just select what you're getting there.

Uh, now this is something that new will be there in Azure, which you don't have inside a ws, there's a concept called US resource groups.

So technically in the last session when I created a server directly, it came up right in Azure.

How they designate the things means uh, let's assume that you're working on uh,

five different projects for one project.

There are 10 servers for another project.

There are two servers. So I want to logically group them in simple terms how you use folders to go ahead and keep the relevant data.

Here they use a concept called resource groups.

Every resource is going to be part of resource group

here resource is nothing

but technically for us a server

got the point is if you're getting confused, simple,  
let's assume I'm teaching for your batch  
and the other batch has, well, so your batch ID is what?  
2 5 0 1. So I'm gonna create few servers for your batch.  
I have a got batch called 2 5 0 2.  
I need to create the servers for them.  
I don't want them to be clash, right?  
So I'm gonna keep this class resources in that group,  
that class resource group in that group.  
So now what I'm going to do,  
I'll create one new resource group saying  
and your class related things I can keep  
in this particular patch.  
You can create a resource group called practice  
and you can keep all your practice servers in that case.  
That's the only thing. It's basically logically going  
to group the things so that it is easier  
for organizing and manage.  
Got the point, okay? So I'm gonna say  
create this resource group  
and in this I'm gonna create one server.  
Just like how I created in AWS last class  
2 5 0, 1 linux server.  
Same way, I'm gonna do almost same thing here.  
Understood the logic. Same thing like  
what I did, I'm doing it here.  
Uh, region. You see location in the last session in AWS it  
was there somewhere here, here,  
this is same thing I'm going with central US like that.  
Um, these are like optional things.  
You can just discuss  
how this is the important image.  
So in which, sorry, which operating system you want to apply  
for this instance, you see I selected what open 2 22 0.04.



If you just click on that part, it'll show you other things or you can also see, see all images.

It'll show you other things. Also see open to 22, 20, 24 different versions are there.

I selected what? Open 2 22.

That's the same thing right now you're seeing, uh, then followed by size.

You see by default it has selected something like B two s, which is going with two CPUs and four GB ra.

I don't want click on see all sizes.

Uh, this is what I want

B one s, which is basically one CPU one GB ram.

I'm gonna select this option

and I'll say select going with that option then followed by, same thing is key pairs.

Your username is in a select SSH public key username is what it's up to.

You can change here but to match, I'm going with the username as Google here always you can queue with anything but there you need to replacing them Syntax.

Uh, here I see the same thing. I'm generating a new keeper.

The name of that particular keeper I will call it as two five zero one hyphen az.

If I go with again 2 5 0 1,

it might replace the one which is there in my system.

So I'm just giving an additional parameter like AZ over there now then you see what traffic I'm having.

SSH port number 22.

If you want others also you can go ahead and add it later on.

I'll show you if you want to add other things for timing.

SSH is sufficient for us. Okay?

And then I'm gonna simply say disk.

So default you're getting over 30 gigabyte

of storage over here, right?

So earlier in AWS we got eight GV.

Now in Azure you're getting around 30 GB free disk.

Okay, I'll go with that. Next networking.

See your virtual network? I said no.

There will be a vnet like VPC in the last session.

You see some public IP will be

generated like in the last session.

Mm. And you see here that SSH traffic what we added now

that is being added over in this particular firewall,

which is basically part of

what a network security group you can see here.

And then that's it. Yes. Pretty much the same.

Earlier what we had it in one page in AWS.

Here it is there in different tab.

That's the only difference.

And I'll just say rev and create.

When I start creating this

now it is asking the same thing.

Download the key

Like in the last session how 2 5 0 1:00 PM came.

Now I got 2 5 0 1 AZ pm and once this is ready, right?

Same thing. You're going to get a public IP

and exactly how we use GI Bash in the last

session we are going to connect.

That's it. Nothing much. So you want to use Azure.

This is the approach you want to go

with AWS last class approach.

But any differences in the outcome, nothing.

We'll also verify that once I have successfully launched this instance when we connect, right?

I'll also go ahead and start our AWS server.

We worked in the last session.

We compare both then you'll get in properly.

Now done this, it says right, your deployment is complete, meaning successfully the server has been created.

Click on go to resource.

Now you can see our server is successfully running and you see the server has what?

A public IP address.

So that is the address that we are going to use in order to connect with this machine.

From there, same from your admin laptop.

Yesterday we have one laptop prerecorded in which we installed one software called GI Bash.

From there itself, I can go ahead and communicate with this same.

Now let's get back to this system.

This is what we have set up in the last session, right?

And we need that key. One second, I'll get that key here.

That's the key. We just have in this particular part, same thing stated downloads.

See by what I do, you know I'm giving wrong.

This is the key of what AWS server.

I'll say one two at the rate the IP address, I copy it, right Click paste, which I did not.

One second.

But thing is it's technically speaking incorrect.

The key that was generated for Azure mission is different, but I'm using a different key.

It says you want to connect.

You say I'm not able to log in.

If login was successful, what should I see?

Sorry,

I should see Linux.

And when I say who am I, I should open to, but it still says administrator meaning login was not

successful because you have given what incorrectly.

Now let's correct the key.

I'll use my app arrow once again and

and the correct key name is what?

2 5 0 1 PZ P.

Now you see I just scroll a little bit up here.

It says the same message

how you got a Ws last session.

Welcome to buntu when it wrote zero four

and same thing if I just check you name,

that's what I was saying is literally you use AWS Azure

or anything in the part moving forward the commands

what you is exactly same throughout the course.

Now you got the thing I want to say here. So it's up to you.

Now if what, what I can do, you know this is Azure, right?

I'll go back to AWS.

This was a server we created in the last session.

Instance state. I'm starting this,

the last class I shut down.

While we are done with the things, I'm starting it

once it starts now,

now you can use your works workstation is nothing

but the laptop that you're using from that workstation,

you can go ahead and initiate multiple connections

to multiple servers.

How do you open multiple browsers?

One browser, I'll do some work, another browser,

some other work, another browser, some other work.

Same way I can open multiple GIBA sessions.

I can simultaneously connect to all the servers

and work it parallel.

Got the point here I can do the same thing.

So right now how I open these browsers

in a similar way, I'll go back.

This is already connected to its server, Azure server.

I will go to my GI Bash once again from the start menu open one more session.

So whenever you open it'll be in the local locally in the since laptop.

Same. You see you need, no, I want this session to connect with my AWS server.

Same thing. SSH hyen

I two five.

Oh, sorry, I'm not in the downloads, right?

Uh, you can also do like this if you don't want to give the path every time, you can use full path like this.

Downloads slash 2 5 0

1:00 AM username

at R IB address.

Let stretch it like this. Okay?

I'll just go ahead and connect. Same. You wanna connect?

Yes. And there you go. Right?

Maybe I can stretch it bit down here.

That's why Here also if I say it, clear the screen

here also, I'll clear the screen.

So not two different missions.

One is AWS one is Azure and everything I do right?

I'm going to get almost similar outcomes.

Don't worry, I'll tell these commands

and all this stuff later

are clear is what I want to convey.

If you go ahead and do it in Azure Cloud, AWS Cloud,

Google Cloud are you have your own VM created in your system by using Virtual Box or VMware.

If you are having open 2 22 with that hardware, you're ready to start.

I hope you understood the point.

Now literally I'm done with cloud.  
I don't need any cloud moving forward. Nothing else.  
I need hardware. I got it. I can play around with it.  
Thanks. Okay,  
from online everyone, I hope you're in sync.  
What I want to just say, yes sir.

## Video: Putty Setup

It's called Puti.  
Like a lot of people who are used to Windows system, most  
of the time they're going to get the connectivity  
with a software called puti.  
Only difference is Puti look  
and feel the interface will be right.  
That is a little bit different  
and it uses a different format for connecting.  
When I say connecting, what was the thing?  
What was the thing that we have was uh,  
PM file is a private gate.  
Putti does not support the private case which you get  
from normal way.  
They have a special extinction called dot, PPK, Putti,  
private key, you call it.  
We have P. Same way PPK,  
Putti only understands PPK.  
So what? Whatever the PM file you have earlier, we need  
to convert that into PPK and use Puty to correct.  
You might say what is the difference means nothing.  
See what is this browser I'm  
using, right?  
It's like basically uh, not Google.  
It's basically like Edge, Microsoft Edge, right?

We are going with the Edge browser. You can see that.  
Now if I say one second,  
I got this site, you see guys,  
this one is Chrome, right?  
I'm in Chrome right now.  
I got the same thing uh, for you.  
I'll also open one more browser.  
Safari is like Mac browser.  
Is there any difference? These are all what?  
Different browser softwares, right?  
Generally we call them as HDP clients.  
These are all different clients.  
It's my choice what I want use isn't it?  
Same way  
for  
this is one client, which is GI Bash.  
Similarly, we have other clients, boutique, terminal,  
mobile, external, so many softwares.  
Whatever you like, use it. Outcome is same.  
I opened display, define across all the different browsers.  
Did I got any difference there? Same thing. So here what?  
Put it by default, it'll not be there.  
So I'll download first.  
You can go to this first put org,  
download 64 bit file.  
I'm downloading  
and just how did you install GI Bash?  
Next till finish.  
I don't want to see any of these files.  
I'll say finish done this.  
You see I'm searching for Puty, right?  
And you see there are two things. One is put  
and another one is put Egen.  
So put Egen is for conversion. Putti is for logging.

Two different utilities.

When you install putti, you'll get both.

So when I say putti right now, you see how it looks.

Same interface is changed but there is no difference.

End of the day what he'll pass?

Same username, same IP address, same key.

There is no difference in that part. Uh, appearance.

I'll change the fonts because it'll be very small to view.

I'll change to something like 16, maybe regular.

Now I'll click on logging in again.

Sorry, session, login session. You see what it's saying?

Host namer, IP address.

Ubuntu at rate, same server, ip, anything AWS,

Azure, whatever you, your choices.

You can connect. Maybe final take the Azure server only here is a public IP rate popping in.

Then you see here on the left side menu you've got an option called SSH

authentication credentials.

And in here you got what?

Private key file for authentication.

I'm gonna say browse it downloads.

You see it's not showing me anything.

See the format it is trying to go with, put it private.

It does not be fine.

If you say all it still shows,

but uh, Azure server, right?

Which is this one? You see what it says?

Now I say open, it's asking do you want to connect?

Yes, accept the the message.

It says us as you guys not see

no supported authentication methods available.

See we have in the correct key,

but this thing does not understand.



So that's when we need to convert this.

So I'm gonna say, okay, it's not gonna work out.

You see what it is saying? Old PM format, you're using something.

It is saying, hmm, okay fine I will close this session.

Now let's jump back and again, let's look for puti.

And like I said, now what we need open the software.

You see it is asking one thing, load an existing private key.

Click on the load. Hmm, you have your keys right?

And same thing. Change the format to all.

And then once the filter is applied, take your key.

Okay, now it has the existing key.

Now we are going to save it as a new private key.

When I say save private key, it will be saved in the PPK format.

The same file, but only the format is going to be according to PPK.

Yes, it's asking a name.

I'll keep it in the downloads only, but uh, aki, I'll call it.

But aki, ppp, k save. Done.

That's it. Close it.

And now if you go to the folder structure also, can you see this aki, which is under the puti private key file format. PPK format. Now same thing. Go back, check out puti.

Same connecting with it.

SSH, authentication credentials, browse.

And now we are seeing what, now we are selecting the proper format.

Um, because I did not change the size number one, seven.

See, same thing. 2, 5, 0, 1 at server.

Then you see right now if I say you name

And already we created the easy data, now you can see it.

So literally, like I said, you're using a different software  
to connect to the same patient.

There are lots of tools. I'm not gonna discuss those tools.

It does not make sense.

But technically this is the outcome of it.

Like the terminal is there mobile, um,  
it's just your convenience, what you like.

If you don't know, use either of it.

If you already know something,  
which I'm not showing, continue with it.

No issues. Got the point is end of the day,  
the thing is I want you to connect with the server.

We are good to go.