

Cloud Computing
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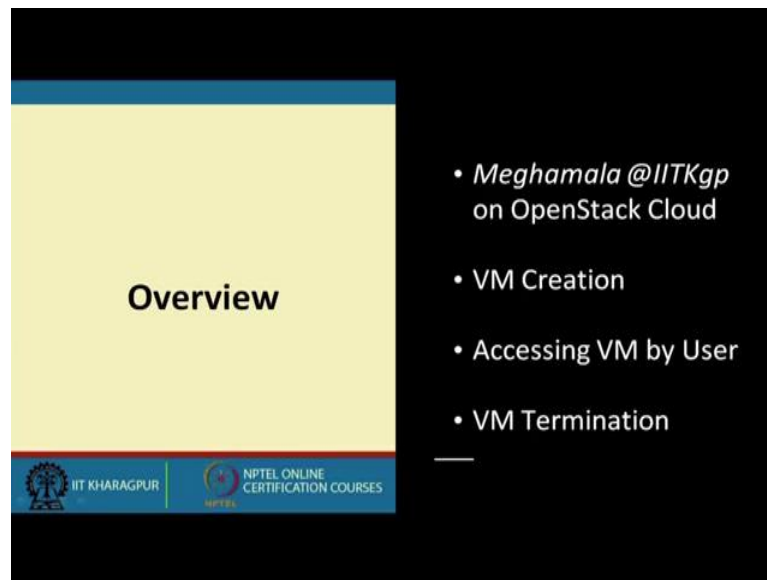
Lecture – 16
Open Source Cloud: Openstack Demo

Hi, so we will we will continue our discussion on open stack cloud a open source cloud. And we will so, a sort demo how the open stack work. The primary objective is a open source cloud you can easily download those this open stack in your local systems we if you have couple of systems. And realize this cloud and see it is different aspect. As we have discussed the different type of services like compute storage image and other services that we will see that how these are realized, right.

So, as I mentioned that in IIT Kharagpur we have install a experimental cloud using open source platform open stack. So, a so a demo on that which is in our cloud we called it Meghamala. So, we will so, a demo on that it is primarily a open stack based cloud. So, with me Rajesh is there. So, Rajesh is primarily a administrator of Meghamala. So, he will so the how AVMS is created allocated how to run a particular job in that VM, how to diallocate and type of things as simple or the some of the operations on Meghamala.

So, before we I hand it over to Rajesh for the demonstration on live demonstration on open stack that is Meghamala, I will just go through couple of slide to just give you a overview.

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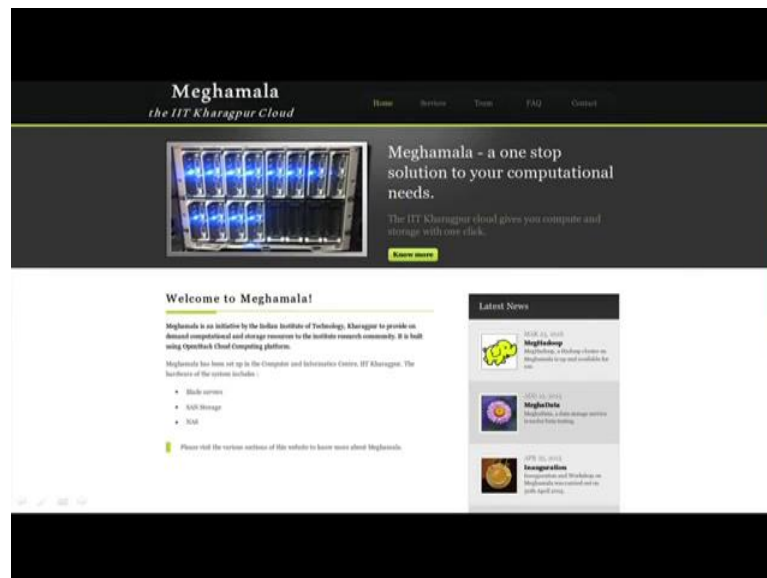
Overview

- *Meghamala @IITKgp* on OpenStack Cloud
- VM Creation
- Accessing VM by User
- VM Termination

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So, it is say open stack base cloud which we called that Meghamala. So, what we have VM creation what will.

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Meghamala
the IIT Kharagpur Cloud

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Meghamala - a one stop solution to your computational needs.

The IIT Kharagpur cloud gives you compute and storage with one click. [Know more](#)

Welcome to Meghamala!

Meghamala is an initiative by the Indian Institute of Technology, Kharagpur to provide on demand computational and storage resources to the institute research community. It is built using Openstack Cloud computing platform.

Meghamala has been set up in the Computer and Information Center, IIT Kharagpur. The hardware of the system includes:

- Elastic server
- S3B Storage
- NFS

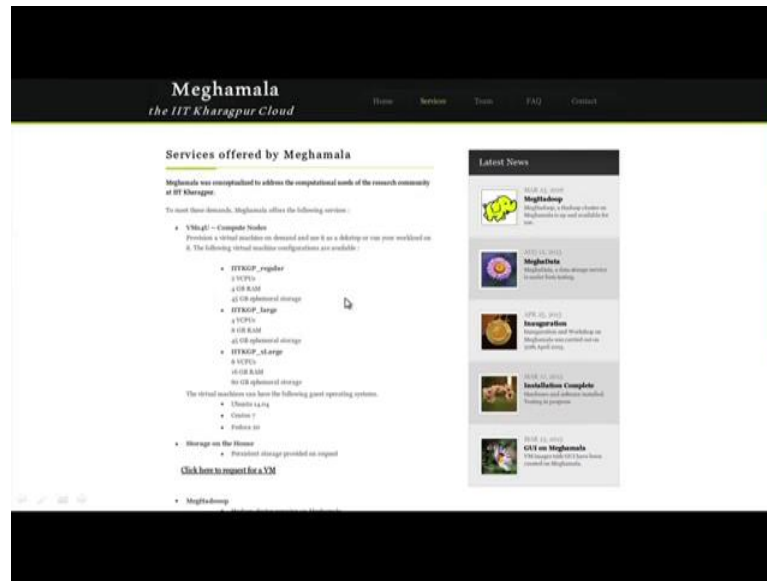
Please visit the various sections of this website to learn more about Meghamala.

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- 2017-10-20**
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Openstack and Meghamala on Meghamala... is now available for...

So, the VM creation accessing VM by user and VM Termination. Meghamala gives different type of flavors of VM that to what Rajesh, we will show and this is a typical our Meghamala portal which has different aspects.

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An overview of the thing and these are the different type of flavors which Meghamala gives like IIT KGP regular with 2 vCPU, 4 GB RAM for different 45 GB ephemeral storage. If you remember that a few ephemeral storage and also we have a provision for persistent storage. Typically we give 20 GB persistent storage 20 GB or 60 GB different on the requirement IIT KGP large and IIT KGP extra large

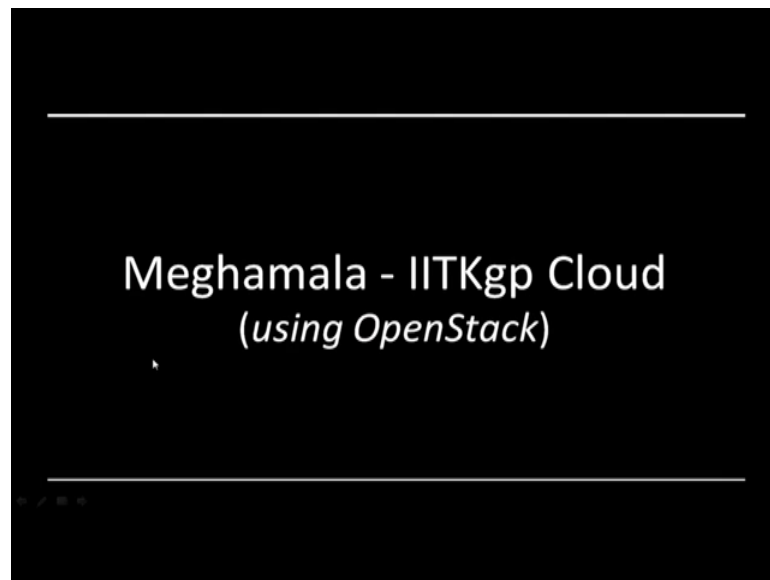
So, these are the 3 flavors and these are 3 operating systems which are they are in Meghamala. Along with that we give we are started giving some other services like meghadata of data services Meghadrop which is running over Meghamala, but primarily we will be hovering around these VM creation And so on and so forth.

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The screenshot shows a web form titled "VMs4U - Request form". The form includes several input fields: "Name of faculty", "Department", "Registration", "Phone (Mobile no)", "E-mail", "Program", and "Requested VM Name". Below these are radio buttons for "VM type" with options "attached_image", "attached_image", and "attached_image". There is a "Number of VMs" field with a dropdown menu showing "1". A "Operating system" field contains "Ubuntu 14.04". A "Requested storage of each VM requested" field has radio buttons for "Yes" and "No". A "VM requested for course for" field is present. At the bottom, there is a "Submit Query" button. To the right of the form, there is a "Steps to follow" section with three steps: "Fill out this form", "Get hard copy signed", and "Submit signed hard copy".

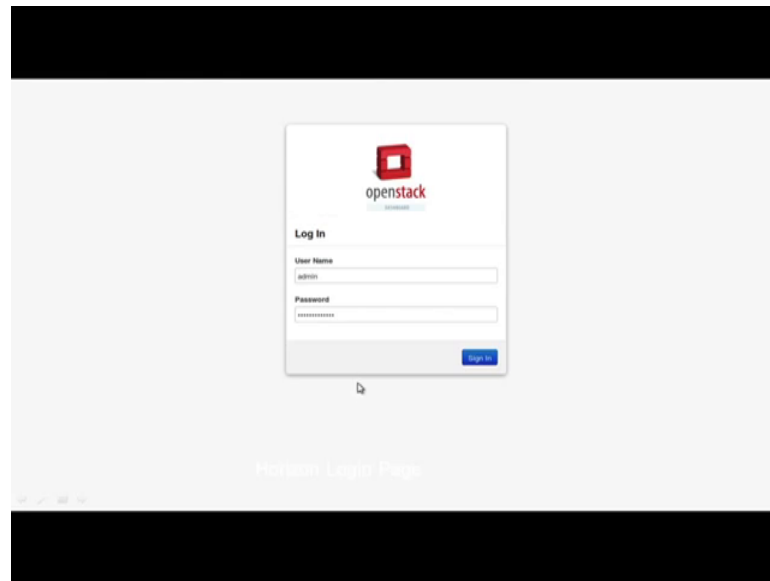
And this whole thing is based on open stack, and this is a typical request form by which a user can request for AVM.

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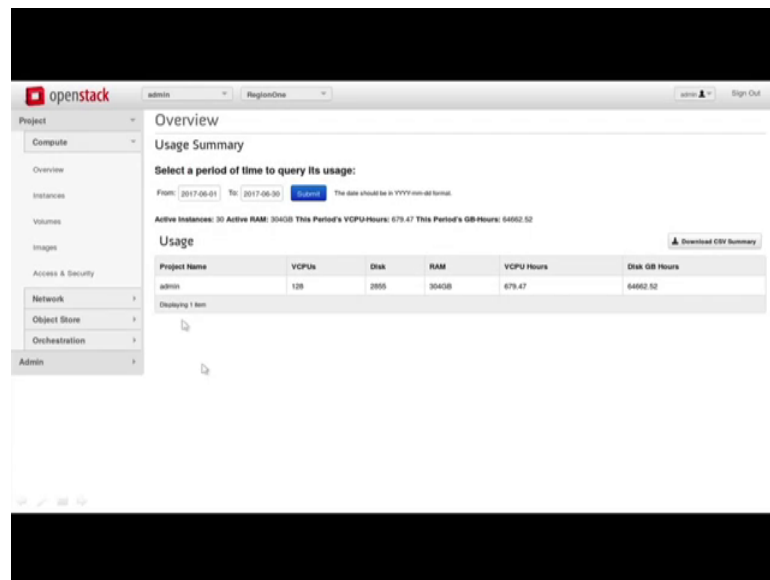
And these are the different people who are involved in this Meghamala. So, so, if we look at.

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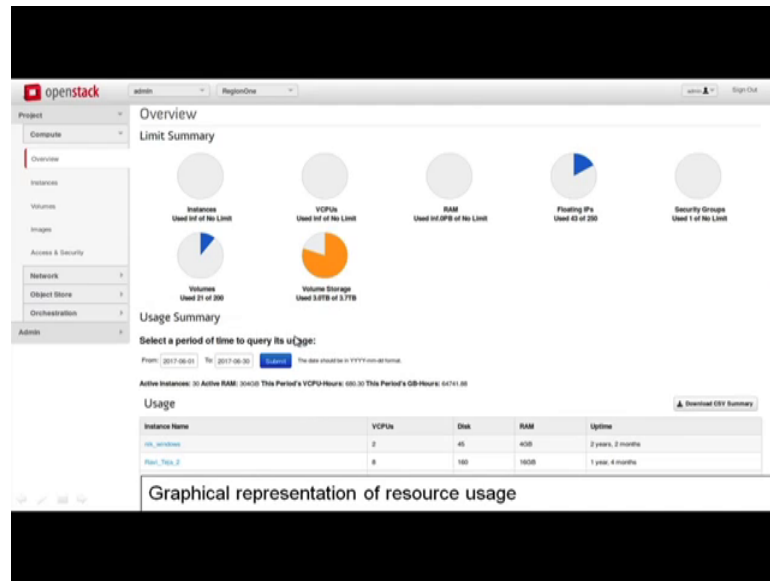
It is a this is the log in screen or the open stack by which you can enter the open stack dashboard for management.

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And these are different aspects of the things like giving a overall summarization of the users summary.

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Giving a overall representation of the resource uses in terms of different graph by graphs.

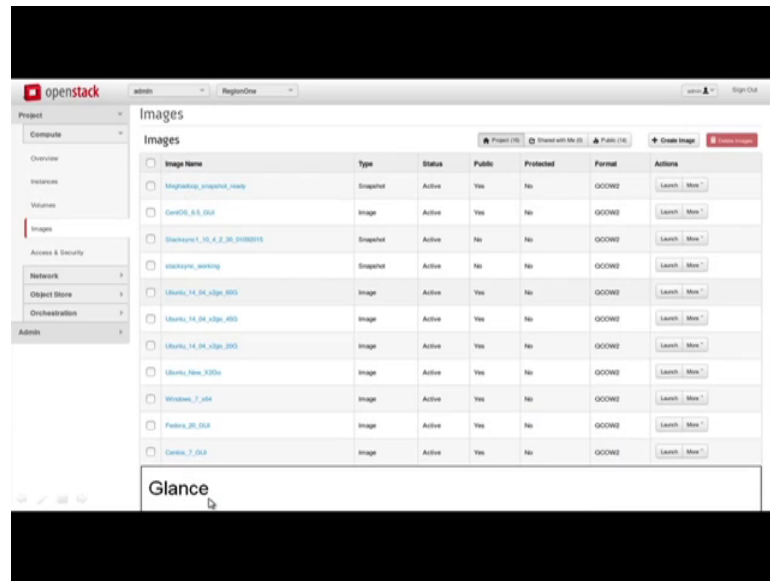
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The screenshot shows the 'Instances' page in the OpenStack dashboard. It contains a table with the following columns: Instance Name, Image Name, IP Address, Size, Key Pair, Status, Availability Zone, Power State, Uptime, and Actions. The table lists several instances, including 'os_test', 'TestDiskPartition', 'ubuntuFactory', 'GLI_1_3310V001', 'Health_Ubuntu_LAMP02', 'os_10_test', 'MagnumtestInstance', and 'Magnumtest_10'. Each instance entry includes details like image name, IP address, size, key pair, status, availability zone, power state, and uptime.

Instance Name	Image Name	IP Address	Size	Key Pair	Status	Availability Zone	Power State	Uptime	Actions
os_test	CentOS_7_014	192.168.0.2	ETNOSP_ubuntu (4GB RAM 2 VCPU) 45.0GB Disk	-	Active	nova	None	Running	2 months, 2 weeks
TestDiskPartition	Ubuntu_14_04_43gn_450	192.168.0.2	ETNOSP_ubuntu (4GB RAM 2 VCPU) 45.0GB Disk	-	Active	nova	None	Running	3 months, 2 weeks
ubuntuFactory	CentOS_6_5_014	192.168.0.3	ETNOSP_ubuntu (4GB RAM 2 VCPU) 45.0GB Disk	-	Shutoff	nova	None	Shutoff	7 months, 2 weeks
GLI_1_3310V001	Ubuntu_New_X20x	192.168.0.1	ETNOSP_ubuntu (8GB RAM 8 VCPU) 90.0GB Disk	-	Active	nova	None	Running	9 months, 1 week
Health_Ubuntu_LAMP02	Ubuntu_14_04_43gn_450	192.168.0.6	ETNOSP_ubuntu (4GB RAM 2 VCPU) 45.0GB Disk	-	Active	nova	None	Running	1 year, 2 months
os_10_test	Ubuntu_14_04_43gn_450	192.168.0.8	ETNOSP_ubuntu (4GB RAM 2 VCPU) 45.0GB Disk	-	Shutoff	nova	None	Shutoff	1 year, 4 months
MagnumtestInstance	CentOS_6_5_014	192.168.0.7	ETNOSP_Magnumtest_Bigger (4GB RAM 8 VCPU) 90.0GB Disk	-	Active	nova	None	Running	1 year, 4 months
Magnumtest_10	CentOS_6_5_014	192.168.0.3	Magnumtest_min (8GB RAM 4 VCPU) 90.0GB Disk	-	Active	nova	None	Running	1 year, 5 months

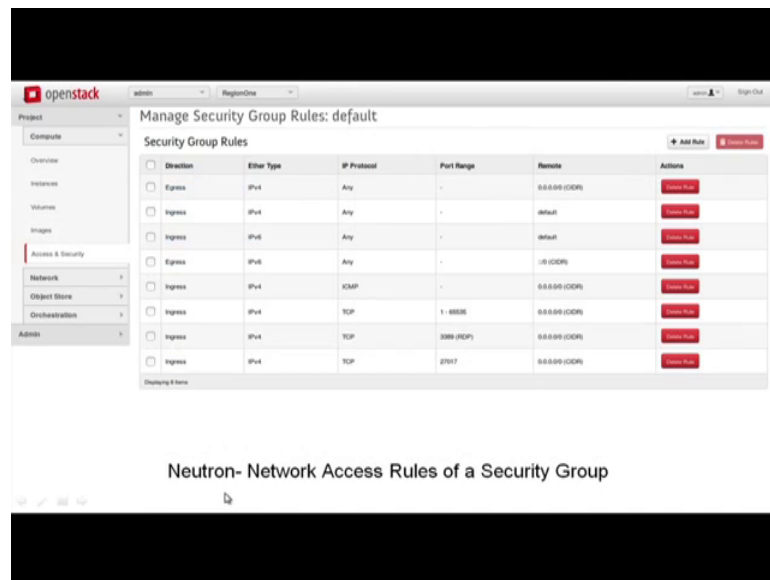
And what are the different instance running at any point of time, volumes and snapshots of things which are maintained by cinder as we as we are discuss some time back.

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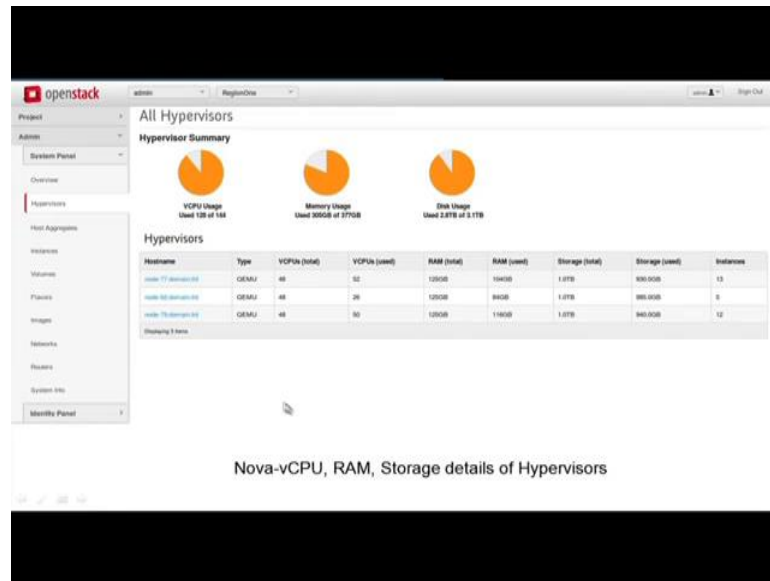
This is the different images which is managed by the glance service, neutron is the networking aspects of the things.

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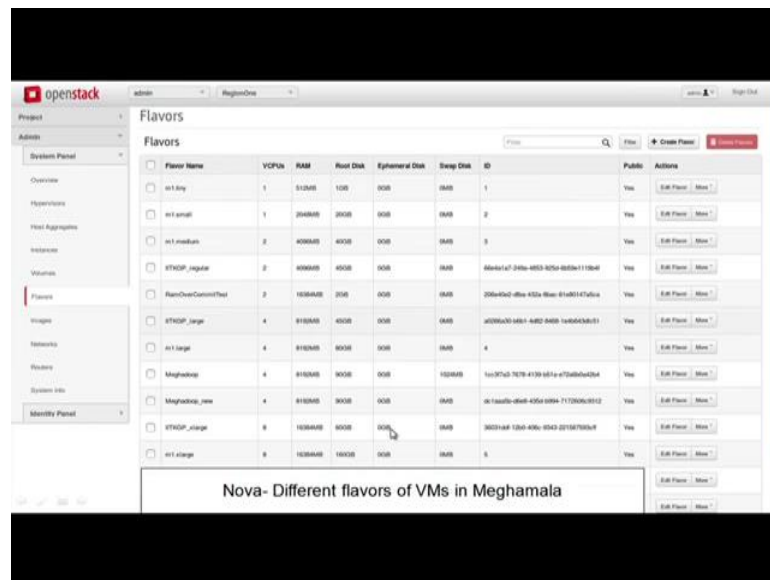
We are using all IPv4 structure.

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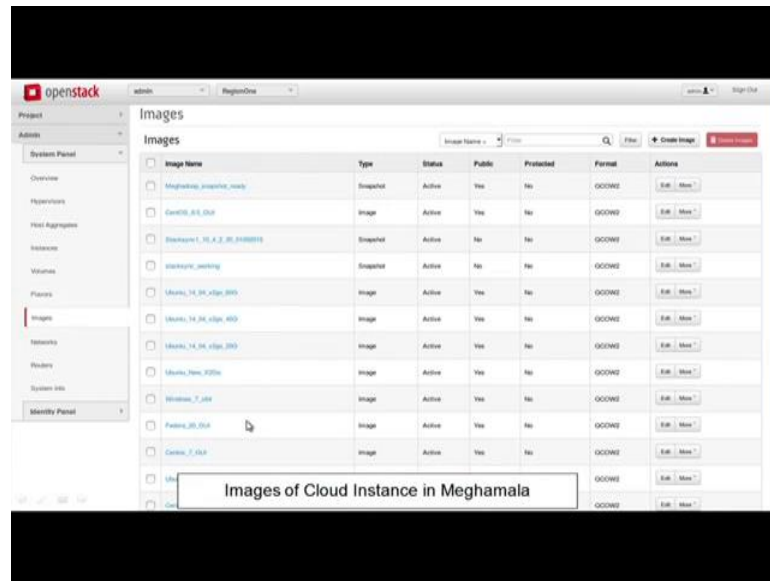
And the hypervisors, nova vCPU is RAM storage details other hypervisors. Different flavors of compute server.

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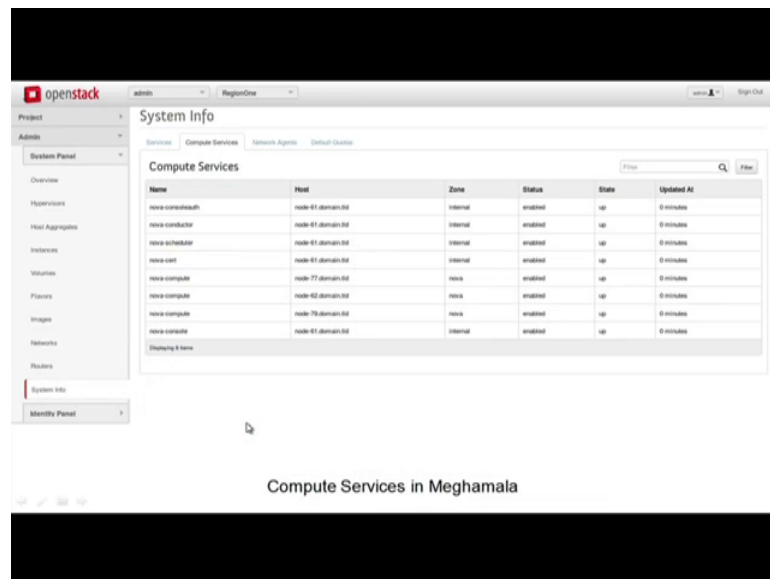
That is a nova compute servers, like you can see that different category of nova.

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Compute server imaging, instances and overall compute services in Meghamala.

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So, with this what I will do I will switch over the control over to Rajesh to So write like directly a demo on Meghamala, which will you a idea that if you install your a open stack on your system. So, how it is likely to behave. So now, it is over to Rajesh. So, we will now start the demo on this open stack cloud what we have install which is installed in our institute that is Meghamala. So, it is basically open stack cloud and Rajesh is with me to show the demo. So, Rajesh will be showing making a walk through these

Meghamala the open stack cloud. So, primarily looking at the more on the VM creation, termination on other type of aspects. So, it is over to Rajesh to he will start with that Meghamala web portal to go to that dash dashboard a open stack and going inside the VM case and etcetera.

So, over to Rajesh, rajesh thank you sir happen.

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So, I will continue from here. So, this is the homepage of our institute cloud which is Meghamala. So, as you can see the services we offer is not only the infrastructure cloud which is provided by Meghamala, but also some other services which is built on top of Meghamala. Like on top of open stack like Meghadooop which is a Hadoop cluster, Meghadata which is a personal cloud. This is a kind of a drop box like thing. So now, come back to coming back to Meghamala which is the open stack implementation of open stack cloud. So, you can see here we are offering 3 types of virtual machines. So, one is IIT KGP regulator, IIT KGP large and IIT KGP extra large.

So, these are the specifications of this 3 type of virtual machines that we provide. And apart from that we currently provide 3 types of operating systems to be loaded in the virtual machines, which are Ubuntu, CentOS and Fedora.

So now,

So we will now go to our open stack installation and see how does it look like, from an administration power point of view. So, this is the dashboard of open stack. So, I am logging into it. So, this is the overview that you get when you login to log in as an administrator to the open stack cloud.

So, you can see total we have total 134 vCPUs is use, 2945 GB of disk, 316 GB of RAM and this much time of vCPU hour that is currently being used. So, this is an overall description of the cloud which is running. So now, we coming to instances which is where we will find what are the VM's that are currently running. So, see,

So, these are the different VM's running as of now.

Now, as you have seen in the previous video that this volume will provide you this is actually the cinder part of the cloud, which will list the number of volumes that are currently being used, images is actually the glance. So, these are the images that we currently have, but as you as you have seen you only provide 3 types of VM.

So, most of them we are not using we are not giving the public, these are for internal purposes. So, in access and security here you will have security groups. So, this is firewall kind of concept in respect to the cloud. So, what will have is that, there will be rules in a defined in each security group. Kind of the rules of the network I mean this means which type of traffic is allowed in a VM and which type of traffic is not allowed so.

Both we will respect to I mean incoming and outgoing traffic.

Yeah both incoming and outgoing based on.

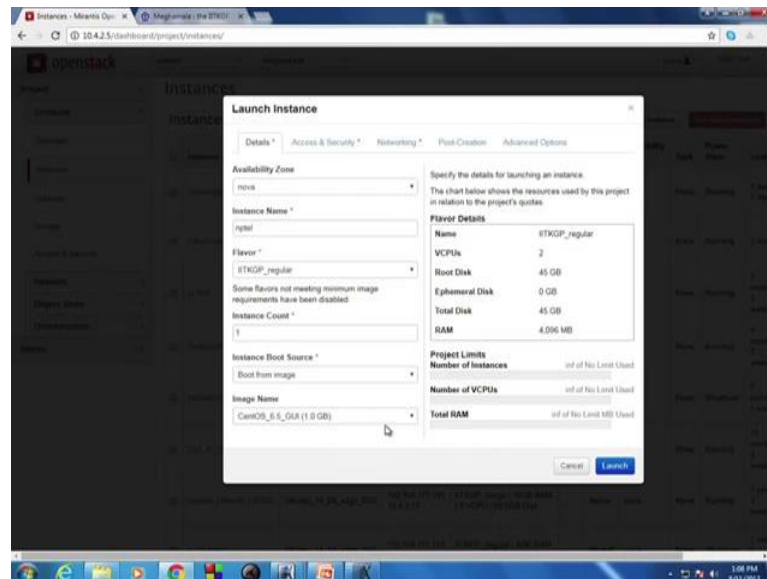
So, different port yeah type of services, right.

So, how with these helps is that when you create a VM a new VM you do not have to configure it is firewall independently. So, you can just assign the security group to it and automatically the firewall rules will apply. So now, if you come to the administration page. So, this was the user page as of the project page. So, admin user is also a tenent or a tenent of the open stack cloud and also it is an administrator. So, we got 2 components in the dashboard to one is project and one is admin. So, kind most of the things will be

same here, but the things which will differ I will show you that is hypervisors. So, here you will get the number of physical machines that are installed in our open stack cloud.

So, we have 3 physical machines each with 48 vCPUs, 20 GB of 25 GB of RAM. And 100 and one and currently 101 GB is used for the first one. Have you can see and 14 instances such running in the first compute node. So now we will try to create a VM, new virtual machine in our open stack cloud. So, coming to instances, and you will see here and there is a tab called launch instance. So, I am clicking that. So, currently we have only one availability zone which is nova.

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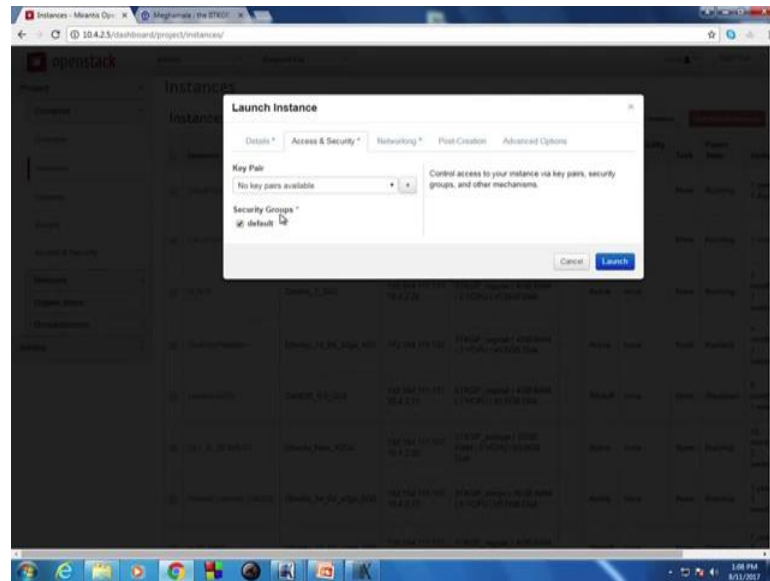
And just in typing a. NPTEL.

Typing the NPTEL.

VM name and the flavor. So, as small whatever yeah regular. So, I am giving IIT KGP regular.

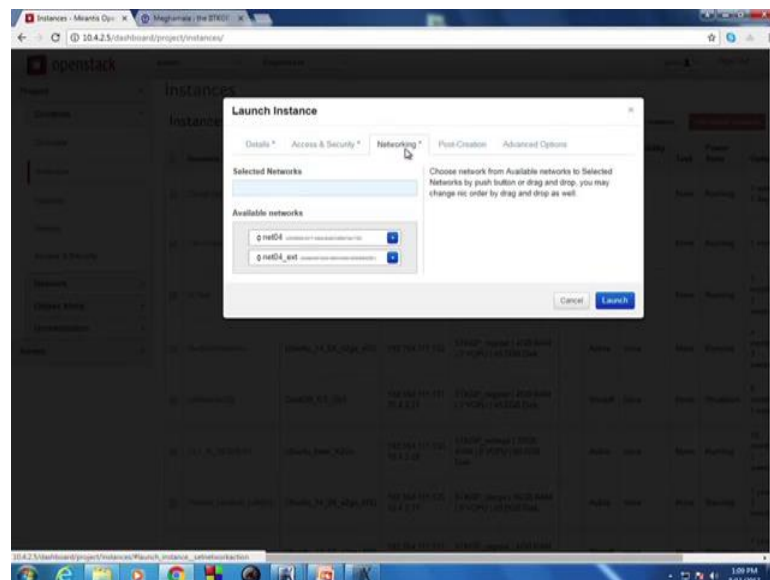
So, number of inst number of VM's that we want of this flavor you have putting one. So, instance boot source is where I am selecting image and pointing to the waste image that will be loaded in this VM.

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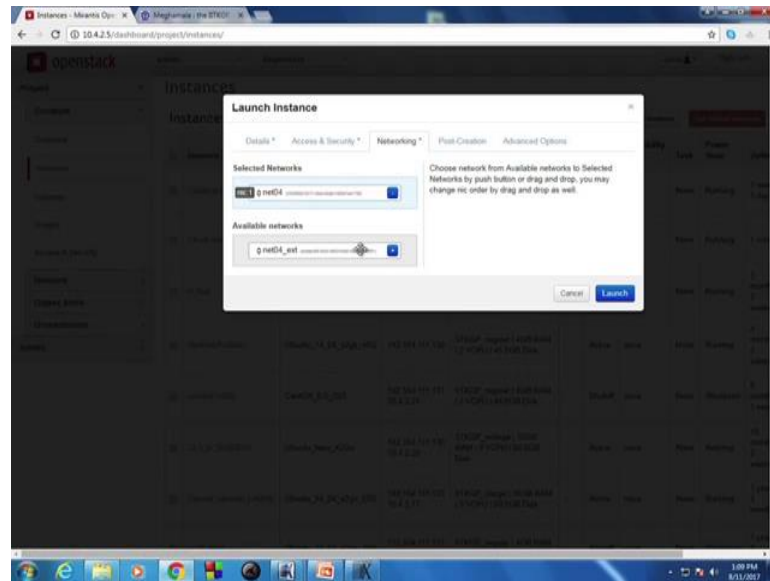
So, say I put CentOS. Now in access and security there is nothing to do you will can see as we have only one security group. So, it is currently selected. In networking part there are 2 networks one is external and one is internal to the cloud.

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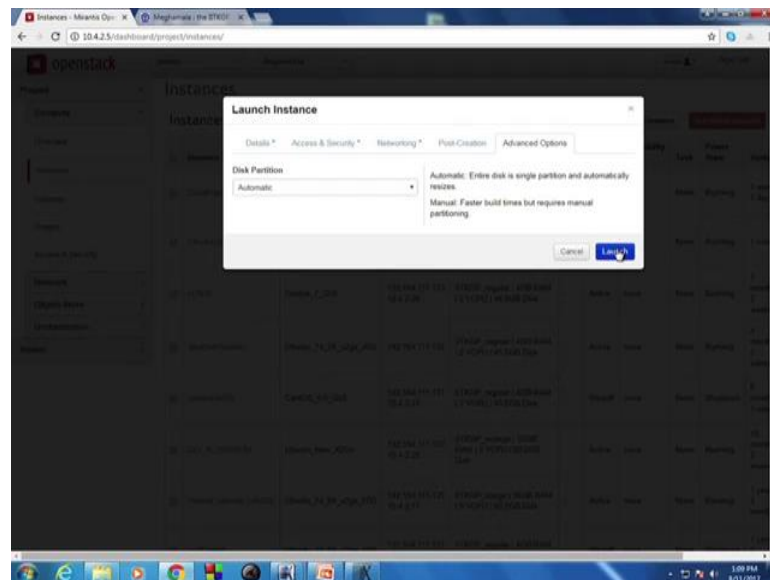
So, currently I will select the internal network and I will come back to this external network later.

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So, post creation script you can give I am not getting anything here and this partition is automatic.

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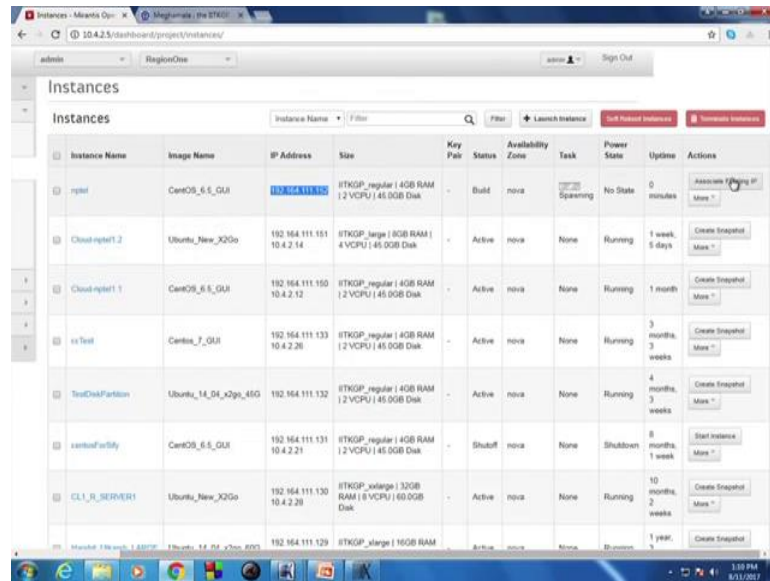


So, I will now press launch to launch the VM.

So, as you can see new VM came up here and its current status is build.

So, it is building it will take some time.

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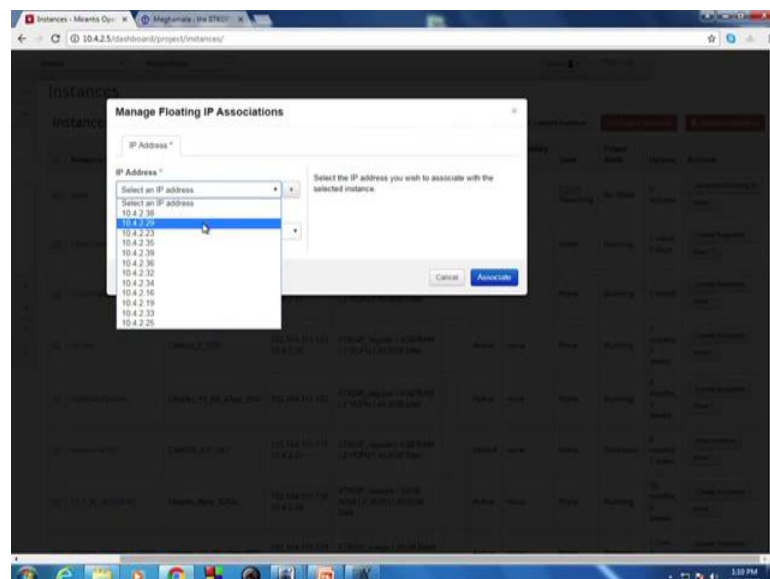


So,

Rajesh has created 2 more VM's earlier. So, that the time can be the NPTEL 1 and 2 NPTEL already there you continue.

So, as I was saying that there is there are 2 networks one is internal and one is external. So now, you can assign the see now here. The internal network from internal network it has got the IP address. So, I will now allocate and external network IP address. So, that it can be accessed from outside the cloud.

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So, we have some allocated IP address, we have some IP address see if we are finished with this list we can add this and new IP address from the pool will be generated.

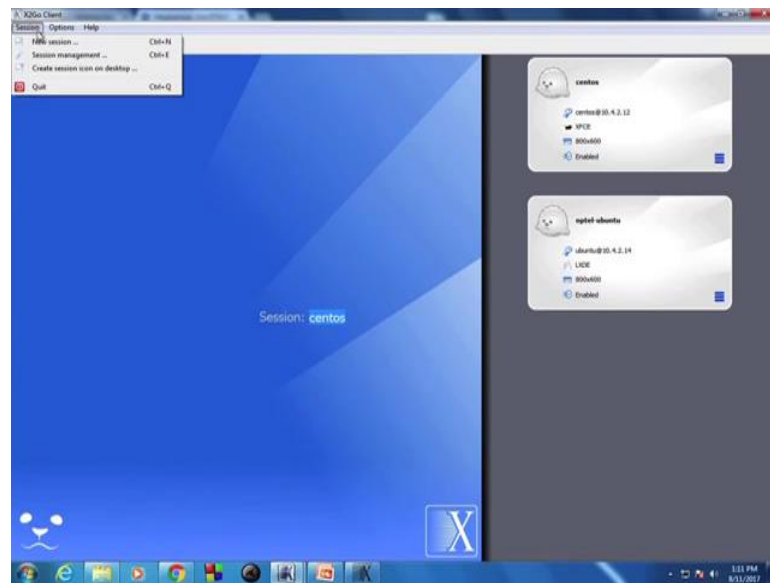
So, let us say this and I click on associate. So, as you can see, this new IP address yeah. So, this new external IP address is also associated with the VM. So now, I will show you how to connect to this VM from GUI frontend. So, for that I am using a software called x2go.

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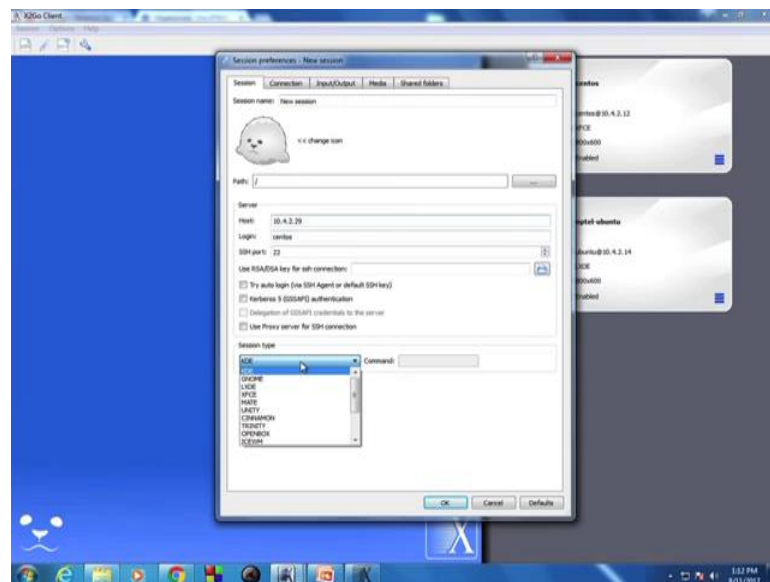
So, in our website in our cloud website, we have we have put the link and how to use it for the users. So, I have installed VM it and I am just showing you how do I connect with.

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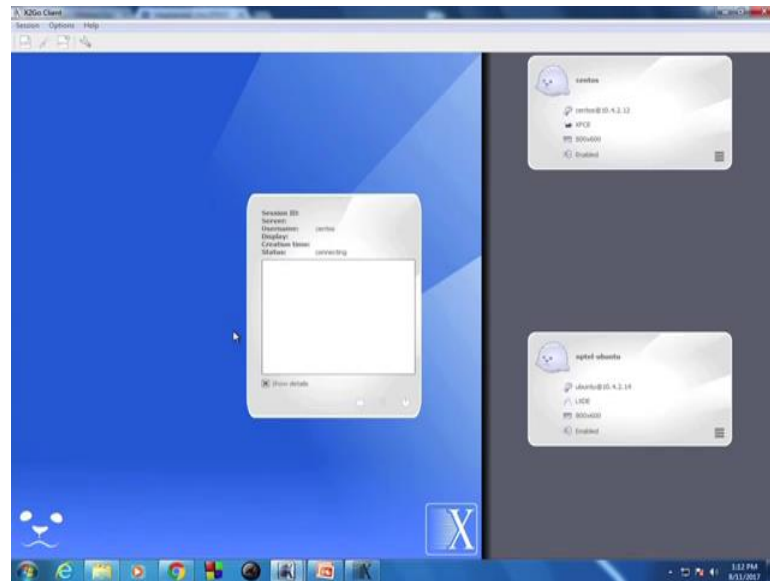
So, this is the x2go client. So, the server part is installed already installed again the VM. So, here what we have to do is or you have to create a new session and we have to put the credentials and the host ID and login ID of the VM.

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For example our new VM was 10 4 2 29. So, this was the public IP address of the VM. So, and the login ID was CentOS and the session type for CentOS type of VM, we are we are having xfc installed as that desktop. So, I am selecting it.

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So now, so entering the password and this will land us to the VM desktop. So, let us see. So, this is the VM that we have just created. And you can see the as usual options which you getting a CentOS machine are there. So, we are say opening at terminal and let say we want to check the internet connection why.

So, you know your enter that VM.

Yeah now you are using the VM yeah, yeah now I am inside the VM yeah.

So, from the x2go yeah from the go claim you like the enter the meghamala that is sent wise VM right say.

So, let us check whether internet. So, inside the VM. So, as you can see the from inside the VM we can access internet and it is as usual like any other machine. So, this is no different from any other machine running CentOS or whatever operating system you have chosen so.

So, it when it come comes up you can show some other aspects of the now what I am seeing that from the this you know open stack dashboard that. So, tangential will come that before that like it is running down it is same way yeah that NPTEL. So, it is any character yeah more characterizations are there yeah, yeah.

So, when you build it we saw that the status first build. So now, that it has been it has been build and built. So now, the status changed to active and the power state is running. So, here are other few options from here which are useful when you are administrating for example, shut down, but that logging itself yeah was So that yeah activities of the VM yeah and terminate the instance we will actually delete the VM and will I mean delete the VM from the cloud.

So, it releases that yeah. So, it will releases the all the resources that that was the allocated do it. So, just check that whether that your youtube and alright this is alright. So, as you can see youtube is running in this VM that is the introductory yeah this is also the introductory. So, it is running over the VM I mean using the VM that going to truth.

So, you can do other computing and etcetera yeah everything is same. So now, as we have used VM. So now, let us see how to terminate the VM and release all the resources. So, here I am clicking on the terminating step, step. And the option is straight forward terminating. So, this will terminate the our instance and release the resources as you can see this will be no longer available here ok.

So, schedule termination of instance NPTEL it may takes sometime, but it is deleting yeah it is deleting. So, that is resource will be released yeah. So, that is one. So, that is a overall I mean quick demo on the things again what we wanted to show you that you can have your own small scale a open source like in this is case of open stack installation. And you can do lot of experiment. So, you can have a field of as a administrator how things are work also you can have a feel that as a user how people can work.

So, it will it is it will be nice that if you have couple of systems and install the open stack. And there are lot of nitty-gritty you need to follow the open stack installation thing which is true for any installation, but it is a good exercise to have a open source cloud of you.

Thank you, thank you.