Lecture 7

Roles of Virtualization in Cloud Computing

Merits of Virtualization

Demerits of Virtualization

Roles of Virtualization in Cloud Computing

Role of Virtualization

In cloud computing technology, virtualization plays a very crucial role.

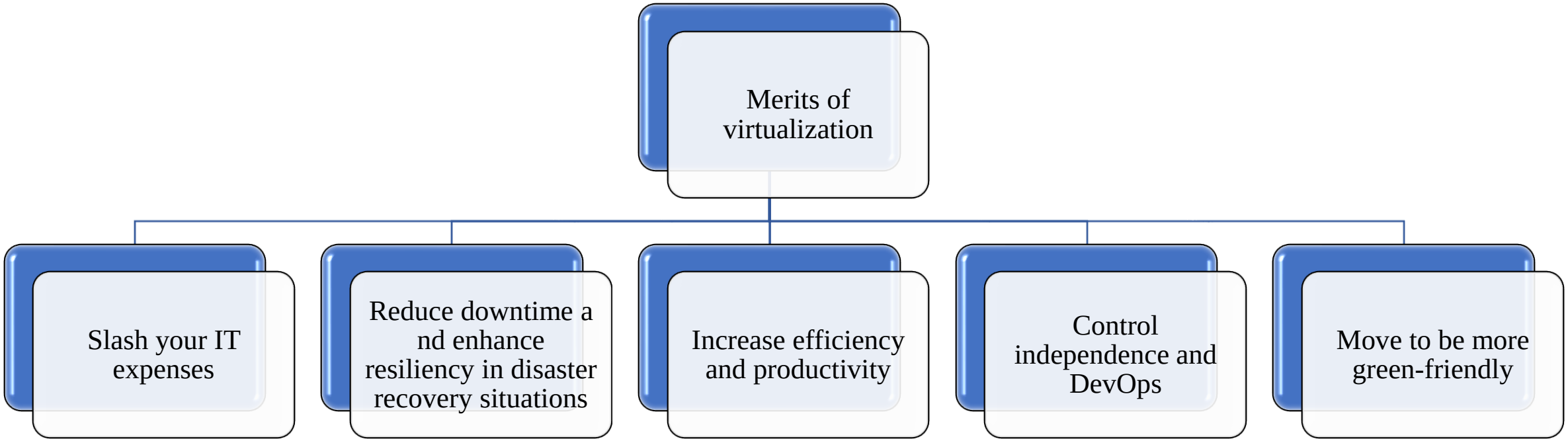
- Typically, users share the data in the clouds, such as applications, but with virtualization, users **share the Infrastructure**.
- A single user of a personal computer can access all of the data and computing power of the device. In contrast, cloud computing involves many users engaging with resources that may be found on a single physical server.
- The primary function of virtualization technology is to give standard versions of applications to cloud users; if the next version of that application is released, the cloud provider must give those users the most recent version, which is technically feasible because it is more expensive.

Role of Virtualization

- To solve this issue, virtualization technology is being used. With virtualization, all servers and software programs needed by other cloud providers are maintained by outside parties, who are paid monthly or annually by the cloud providers.
- Cloud providers employ virtualization to create environments that can fulfill each user's unique needs. Cloud providers can spin up more virtual instances to meet demand as more users come in. Virtualization is an efficient way of managing computing resources, maximizing utilization, and minimizing downtime.

Merits of Virtualization

Merits of Virtualization



Slash your IT expenses

Utilizing a non-virtualized environment can be inefficient because when you are not consuming the application on the server, the compute is sitting idle and can't be used for other applications. When you virtualize an environment, that single physical server transforms into many virtual machines. These virtual machines can have different operating systems and run different applications while still all being hosted on the single physical server.

The consolidation of the applications onto virtualized environments is a more **cost-effective approach** because you'll be able to consume fewer physical customers, helping you spend significantly less money on servers and bring cost savings to your organization.

Reduce downtime and enhance resiliency in disaster recovery situations

When a disaster affects a physical server, someone is responsible for replacing or fixing it—this could take hours or even days. With a virtualized environment, it's easy to provision and deploy, allowing you to replicate or clone the virtual machine that's been affected. The recovery process would take mere minutes—as opposed to the hours it would take to provision and set up a new physical server—significantly enhancing the resiliency of the environment and improving business continuity.

Increase efficiency and productivity

With fewer servers, your IT teams will be able to spend less time maintaining the physical hardware and IT infrastructure. You'll be able to install, update, and maintain the environment across all the VMs in the virtual environment on the server instead of going through the laborious and tedious process of applying the updates server-by-server. Less time dedicated to maintaining the environment increases your team's efficiency and productivity.

Control independence and DevOps

Since the virtualized environment is segmented into virtual machines, your developers can quickly spin up a virtual machine without impacting a production environment. This is ideal for Dev/Test, as the developer can quickly clone the virtual machine and run a test on the environment.

For example, if a new software patch has been released, someone can clone the virtual machine and apply the latest software update, test the environment, and then pull it into their production application. This increases the speed and agility of an application.

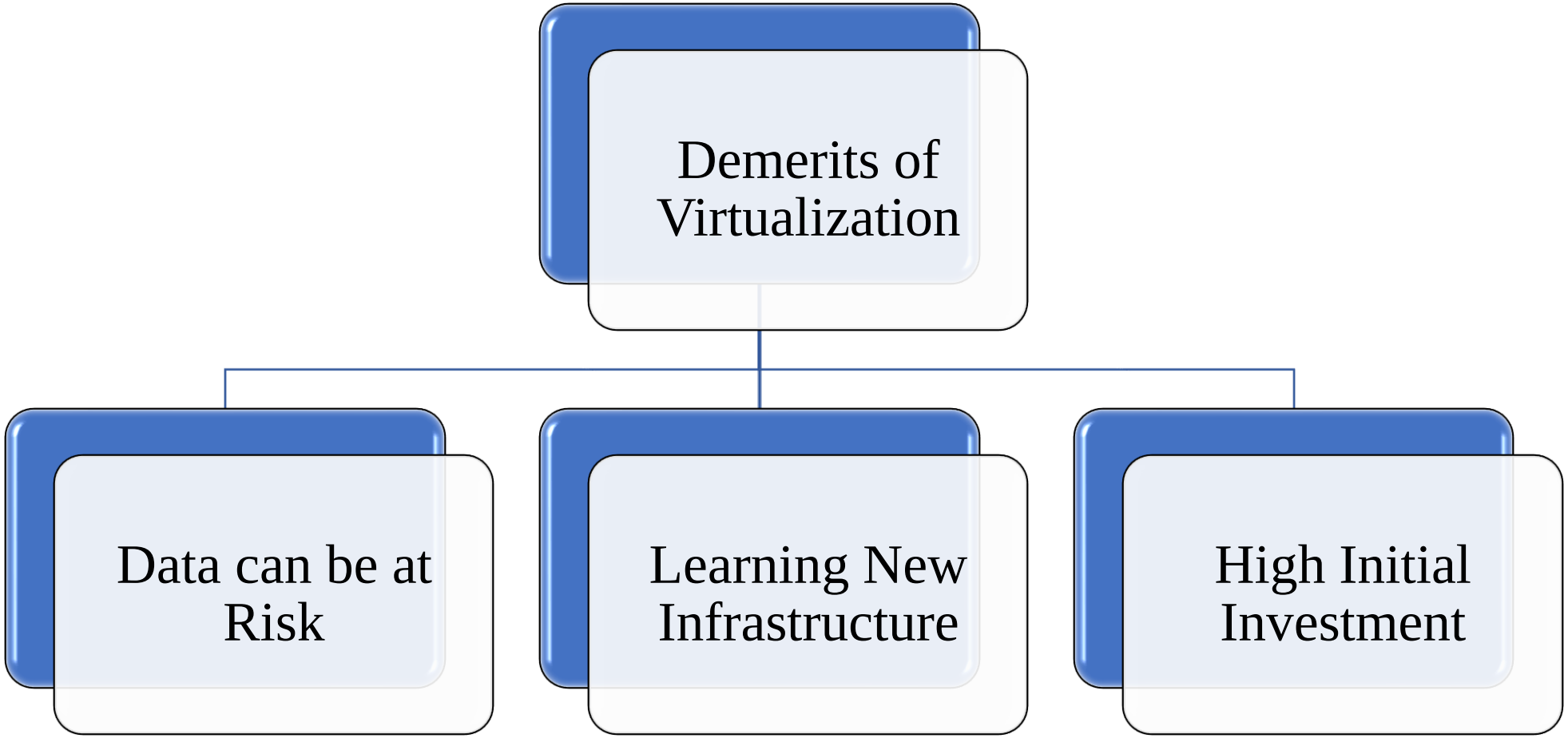
Move to be more green-friendly

When you are able to cut down on the number of physical servers you're using, it'll lead to a reduction in the amount of power being consumed. This has two green benefits:

- It reduces expenses for the business, and that money can be reinvested elsewhere.
- It reduces the carbon footprint of the data center.

Demerits of Virtualization

Demerits of Virtualization



Thanks