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**CELEBAL TECHNOLOGY INTERNSHIP (CSI)**

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## Topic 1: - Hub to Spoke

What is a network topology?

Network topology is the way a network is arranged, including the physical or logical description of how links and nodes are set up to relate to each other. There are numerous ways a network can be arranged, all with different pros and cons, and some are more useful in certain circumstances than others.

What is called hub?

Hubs. A hub is a physical layer networking device which is used to connect multiple devices in a network. They are generally used to connect computers in a LAN.

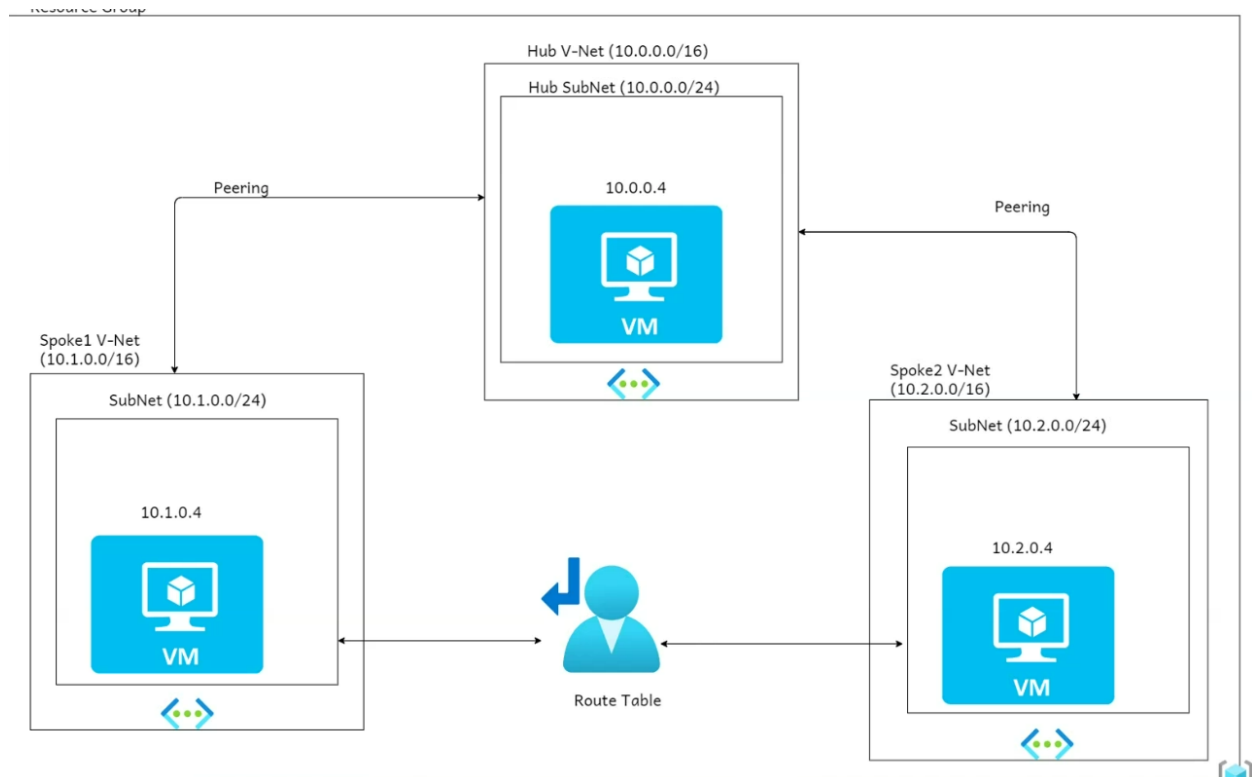
A hub has many ports in it. A computer which intends to be connected to the network is plugged in to one of these ports. When a data frame arrives at a port, it is broadcast to every other port, without considering whether it is destined for a particular destination or not.

What is Azure hub and spoke network?

The hub is a virtual network in Azure that acts as a central point of connectivity to your on-premises network. The spokes are virtual networks that peer with the hub and can be used to isolate workloads. Traffic flows between the on-premises data center(s) and the hub through an ExpressRoute or VPN gateway connection.

- Lay out hub and spoke hybrid network reference architecture resources
- Create hub network appliance resources
- Create hub network in Azure to act as common point for all resources
- Create individual workloads as spoke VNets in Azure
- Establish gateways and connections between on premises and Azure networks
- Create VNet peering's to spoke networks

## Hub and spoke model



First, we have to create 3 separate vnets

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo and a search bar. The main header indicates the user is logged in as 'manaf@lpu.in' from 'LOVELY PROFESSIONAL UNIVERSITY'. The page title is 'Virtual networks'. Below the title, there are options to 'Create', 'Manage view', 'Refresh', 'Export to CSV', 'Open query', and 'Assign tags'. A filter bar shows 'Subscription equals all', 'Resource group equals all', and 'Location equals all'. The table below shows 3 records:

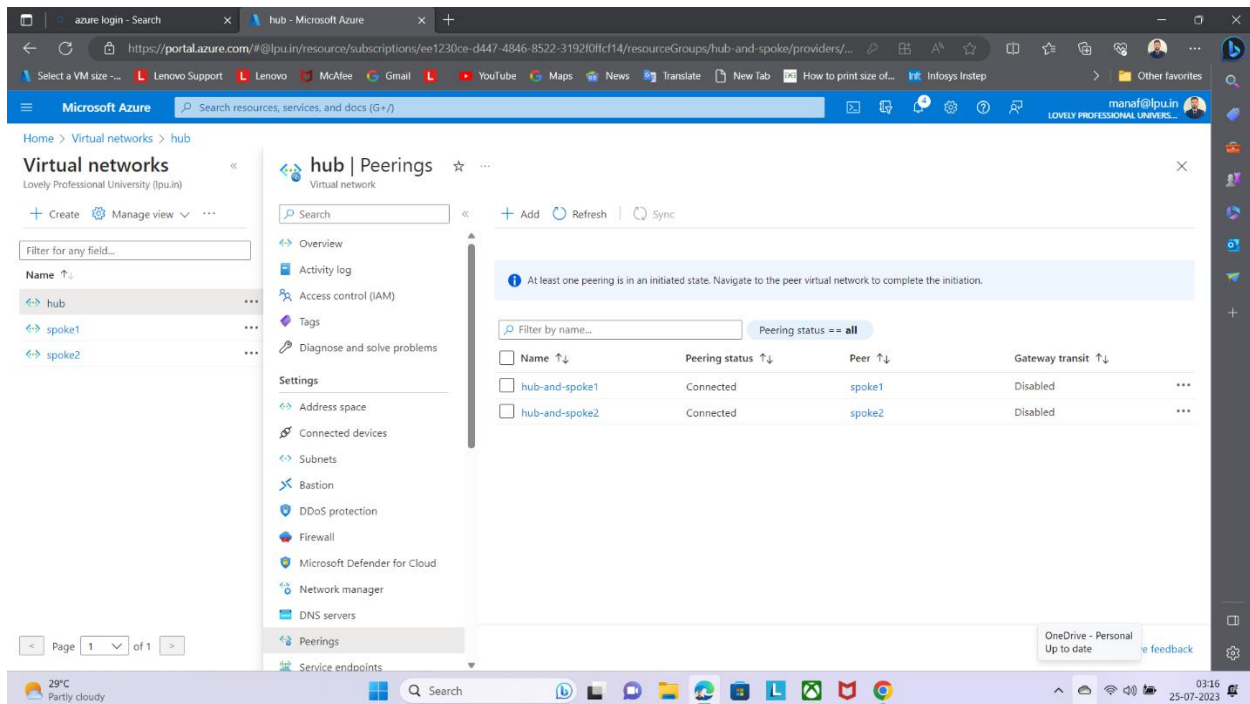
| Name   | Resource group | Location      | Subscription       |
|--------|----------------|---------------|--------------------|
| hub    | hub-and-spoke  | Central India | Azure for Students |
| spoke1 | hub-and-spoke  | Central India | Azure for Students |
| spoke2 | hub-and-spoke  | Central India | Azure for Students |

Then we have to create 3 separate vms

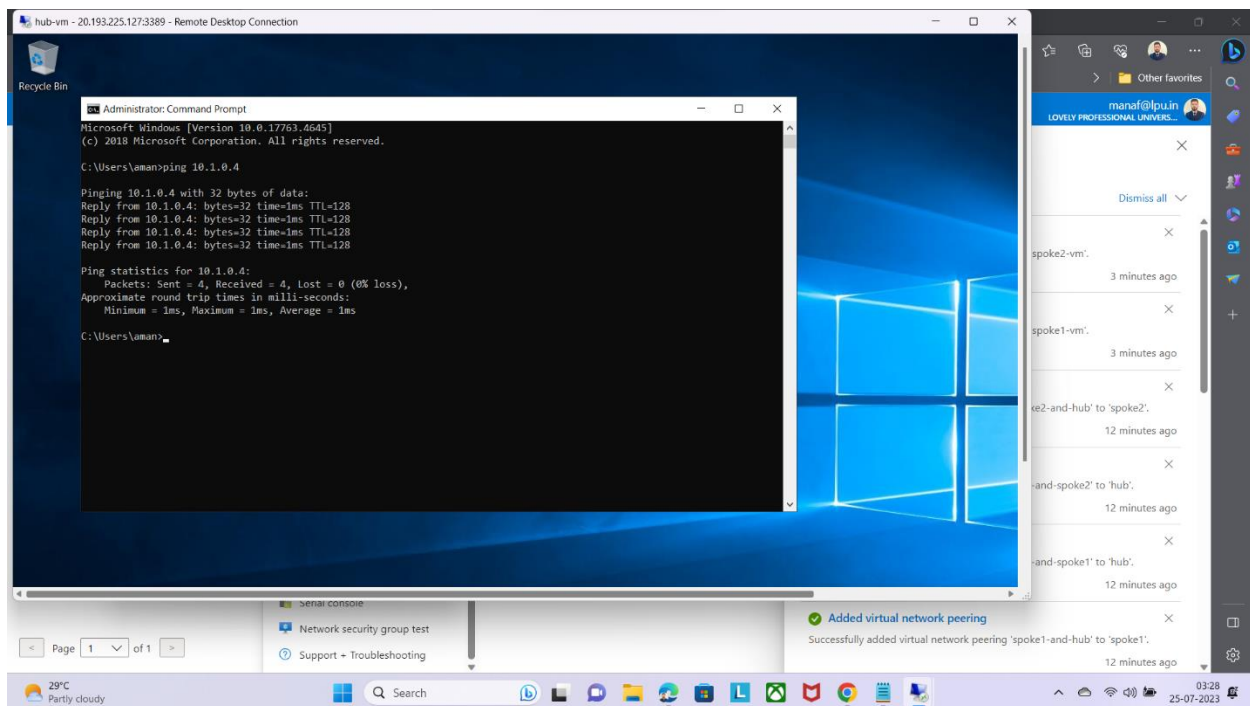
The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo and a search bar. The main header indicates the user is logged in as 'manaf@lpu.in' from 'LOVELY PROFESSIONAL UNIVERSITY'. The page title is 'Virtual machines'. Below the title, there are options to 'Create', 'Switch to classic', 'Reservations', 'Manage view', 'Refresh', 'Export to CSV', 'Open query', 'Assign tags', 'Start', 'Restart', 'Stop', 'Delete', and 'Services'. A filter bar shows 'Subscription equals all', 'Type equals all', 'Resource group equals all', and 'Location equals all'. The table below shows 3 records:

| Name      | Type            | Subscription       | Resource group | Location      | Status  | Operating system | Size            | Public IP address |
|-----------|-----------------|--------------------|----------------|---------------|---------|------------------|-----------------|-------------------|
| hub-vm    | Virtual machine | Azure for Students | hub-and-spoke  | Central India | Running | Windows          | Standard_DS1_v2 | 20.193.225.127    |
| spoke1-vm | Virtual machine | Azure for Students | hub-and-spoke  | Central India | Running | Windows          | Standard_DS1_v2 | 20.193.227.164    |
| spoke2-vm | Virtual machine | Azure for Students | hub-and-spoke  | Central India | Running | Windows          | Standard_DS1_v2 | 20.193.230.200    |

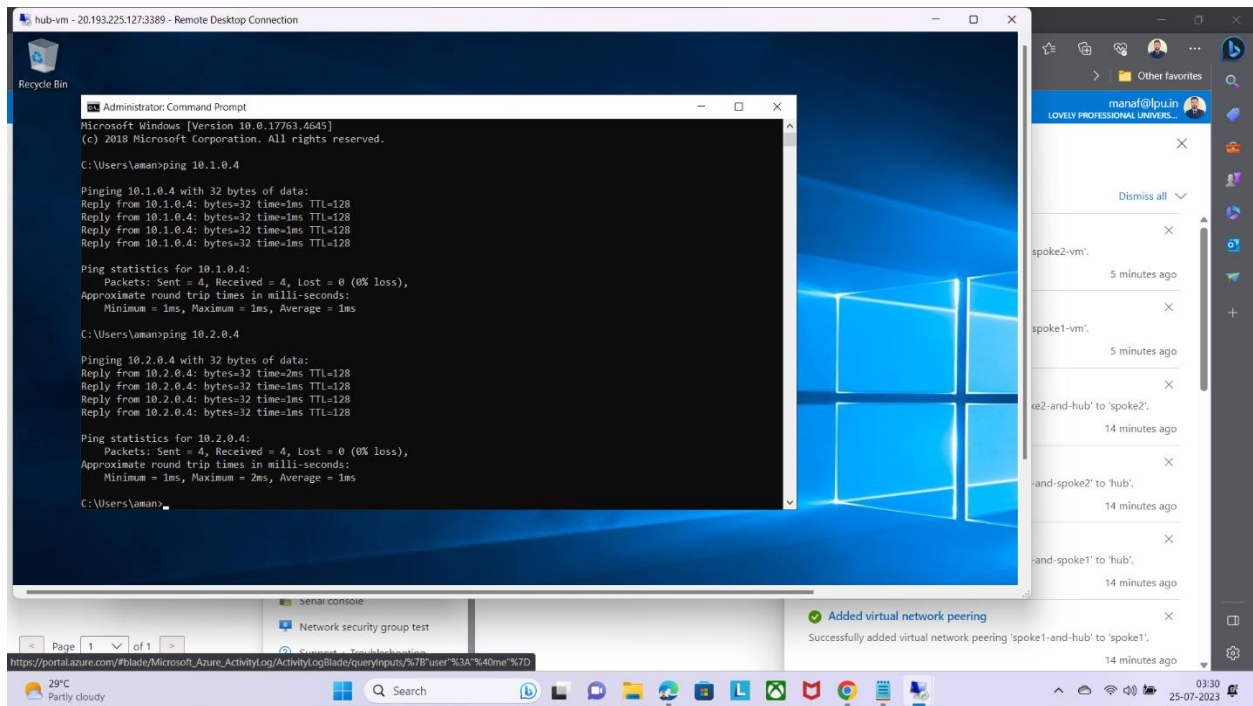
Then we have to create the peering



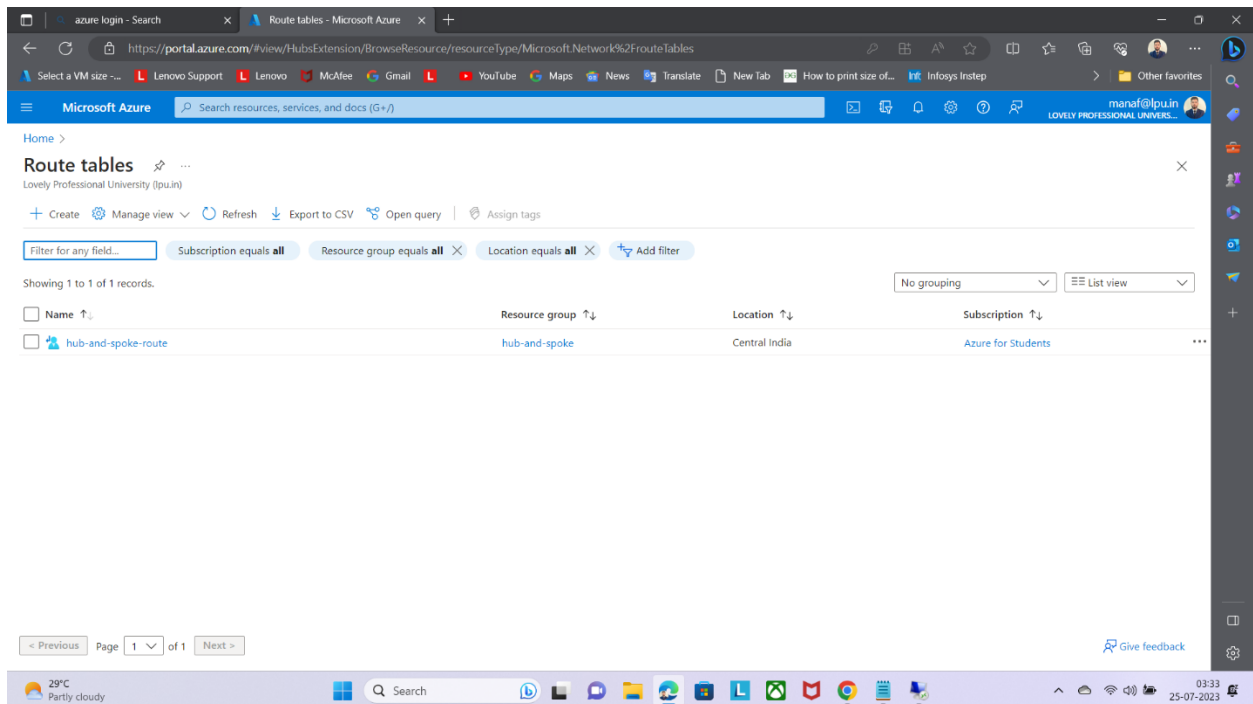
Then we will ping from hub to spoke 1



Then we will ping from hub to spoke 2



Then we will create routing to make it transitive in nature



Home > Route tables > hub-and-spoke-route

### Route tables

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+ Create Manage view ...

Filter for any field...

Name ↑

hub-and-spoke-route ...

Page 1 of 1

### hub-and-spoke-route | Routes

Route table

Search

+ Add Refresh Give feedback

Search routes

| Name ↑↓       | Address prefix ↑↓ | Next hop type ↑↓ | Next hop IP address ↑↓ |
|---------------|-------------------|------------------|------------------------|
| hub-to-spoke1 | 10.1.0.0/16       | VirtualAppliance | 10.0.0.4 ...           |
| hub-to-spoke2 | 10.2.0.0/16       | VirtualAppliance | 10.0.0.4 ...           |

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Home > Route tables > hub-and-spoke-route

### Route tables

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+ Create Manage view ...

Filter for any field...

Name ↑

hub-and-spoke-route ...

Page 1 of 1

### hub-and-spoke-route | Subnets

Route table

Search

+ Associate

Search subnets

| Name ↑↓ | Address range ↑↓ | Virtual network ↑↓ | Security group ↑↓ |
|---------|------------------|--------------------|-------------------|
| default | 10.1.0.0/24      | spoke1             | - ...             |
| default | 10.2.0.0/24      | spoke2             | - ...             |

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Home > Virtual machines > hub-vm > Networking > hub-vm89

### hub-vm89 | IP configurations

Network interface

Search

- Overview
- Activity log
- Access control (IAM)
- Tags
- Settings
  - IP configurations**
  - DNS servers
  - Network security group
  - Properties
  - Locks
- Monitoring
  - Insights
  - Alerts
  - Metrics
  - Diagnostic settings
- Automation

Enable IP forwarding ☒

Virtual network: hub

Gateway load balancer: None

Subnet: default (10.0.0.0/24) 250 free IP addresses

Private and public IP addresses can be assigned to a virtual machine's network interface controller. You can add as many private and public IPv4 addresses as necessary to a network interface, within the limits listed in the Azure limits article. [Learn more](#)

+ Add Make primary Delete

| Name                               | IP Version | Type    | Private IP Address | Public IP Address          |
|------------------------------------|------------|---------|--------------------|----------------------------|
| <input type="checkbox"/> ipconfig1 | IPv4       | Primary | 10.0.0.4 (Dynamic) | 20.193.225.127 (hub-vm-ip) |

Apply Discard changes

Updated network interface  
Successfully updated network interface 'hub-vm89'.

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After that will ping again from spoke 1 to spoke 2