System & Network Engineer Tasks

Important Notes:

- Send us SSH access with non-root user credentials on virtual machines with sudo access.
- You may use any cloud provider and install on Linux virtual machines(like AWS EC2)

TASKS

1. Install Kubernetes with 1 Master and 1 Worker Node serving an HTTP web app which is accessible from the Internet.
   Requirements:
   - Installation should be on Centos or Ubuntu/Debian Linux.
   - Nginx-ingress should accept ingress traffic to the web application.
   - Managed Kubernetes setups like AWS EKS are not accepted.

   Goals:
   - Provide kubectl access to the cluster.
   - Make a web application accessible from the Internet on K8s.

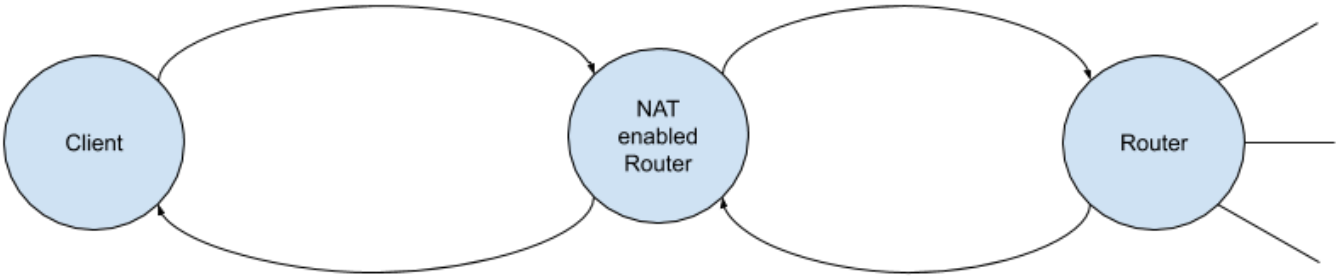
2. After completing Item 1, log actual client IP address of HTTP requests to application output.
   Goals:
   - Application should log source IP of the request as the actual client IP address making the request over the internet (not Load Balancer or Node IP address)

3. Describe how you would implement and load balance a UDP based service on Kubernetes which takes inbound UDP traffic from the internet.

4. Considering a NAT-enabled router between client(source) and destination, what would be the source/destination IP/port information at the following flow on step 3?

1	IP	Port
Source	10.0.0.1	3345
Destination	128.119.40.186	80

2	IP	Port
Source	138.76.29.7	5001
Destination	128.119.40.186	80



4	IP	Port
Source	128.119.40.186	80
Destination	10.0.0.1	3345

3	IP	Port
Source		
Destination		

5. Consider the following firewall rules, what would be the result of firewall actions applied to the packets in the datagram flow table?

Firewall Rules:

Rule	Source	Destination	Action
R1	111.11.0.0 / 16	222.22.22.0 / 24	permit
R2	111.11.11.0 / 24	222.22.0.0 / 16	deny
R3	0.0.0.0 / 0	0.0.0.0 / 0	deny

Datagram Flow:

Datagram Number	Source IP Address	Destination IP Address	Action
P1	111.11.11.1	222.22.6.6	
P2	111.11.11.1	222.22.22.2	
P3	111.11.6.6	222.22.22.2	
P4	111.11.6.6	222.22.6.6	