Q12. What is the difference between a replica set and replication controller?

Replica Set and Replication Controller do almost the same thing. Both of them ensure that a specified number of pod replicas are running at any given time. The difference comes with the usage of selectors to replicate pods. Replica Set use Set-Based selectors while replication controllers use Equity-Based selectors.

- **Equity-Based Selectors:** This type of selector allows filtering by label key and values. So, in layman terms, the equity-based selector will only look for the pods which will have the exact same phrase as that of the label.
  Example: Suppose your label key says app=nginx, then, with this selector, you can only look for those pods with label app equal to nginx.
- **Selector-Based Selectors:** This type of selector allows filtering keys according to a set of values. So, in other words, the selector based selector will look for pods whose label has been mentioned in the set.
  Example: Say your label key says app in (nginx, NPS, Apache). Then, with this selector, if your app is equal to any of nginx, NPS, or Apache, then the selector will take it as a true result.

Q13. What is a Headless Service?

Headless Service is similar to that of a 'Normal' services but does not have a Cluster IP. This service enables you to directly reach the pods without the need of accessing it through a proxy.

Q14. What are the best security measures that you can take while using Kubernetes?

The following are the best security measures that you can follow while using Kubernetes:

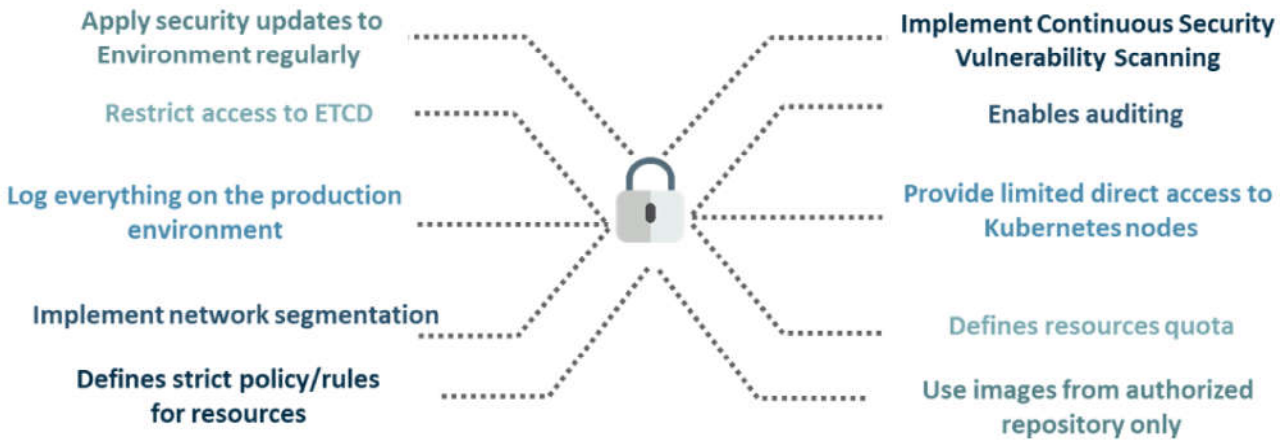

Fig 14: Best Security Measures – Kubernetes Interview Questions

Q15. What are federated clusters?

Multiple Kubernetes clusters can be managed as a single cluster with the help of federated clusters. So, you can create multiple Kubernetes clusters within a data center/cloud and use federation to control/manage them all at one place.

The federated clusters can achieve this by doing the following two things. Refer to the below diagram.

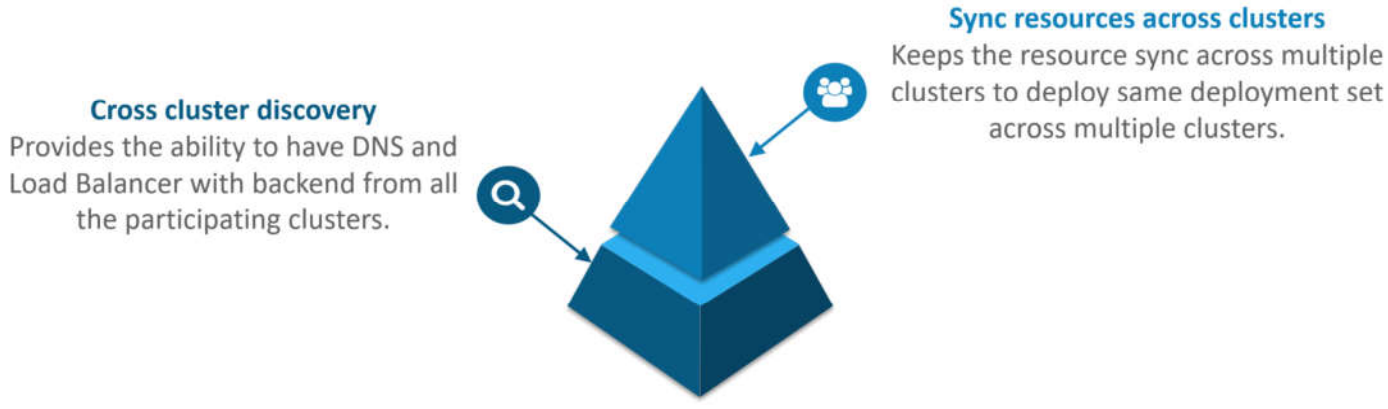

Fig 15: Federated Clusters – Kubernetes Interview Questions

Scenario-Based Interview Questions

This section of questions will consist of various scenario based questions that you may face in your interviews.

Scenario 1: Suppose a company built on monolithic architecture handles numerous products. Now, as the company expands in today's scaling industry, their monolithic architecture started causing problems.

How do you think the company shifted from monolithic to microservices and deploy their services containers?

Solution:

As the company's goal is to shift from their monolithic application to microservices, they can end up building piece by piece, in parallel and just switch configurations in the background. Then they can put each of these built-in microservices on the Kubernetes platform. So, they can start by migrating their services once or twice and monitor them to make sure everything is running stable. Once they feel everything is going good, then they can migrate the rest of the application into their Kubernetes cluster.

Scenario 2: Consider a multinational company with a very much distributed system, with a large number of data centers, virtual machines, and many employees working on various tasks.

How do you think can such a company manage all the tasks in a consistent way with Kubernetes?

Solution:

As all of us know that I.T. departments launch thousands of containers, with tasks running across a numerous number of nodes across the world in a distributed system.

In such a situation the company can use something that offers them agility, scale-out capability, and DevOps practice to the cloud-based applications.

So, the company can, therefore, use Kubernetes to customize their scheduling architecture and support multiple container formats. This makes it possible for the affinity between container tasks that gives greater efficiency with an extensive support for various container networking solutions and container storage.

Scenario 3: Consider a situation, where a company wants to increase its efficiency and the speed of its technical operations by maintaining minimal costs.

How do you think the company will try to achieve this?

Solution:

The company can implement the DevOps methodology, by building a CI/CD pipeline, but one problem that may occur here is the configurations may take time to go up and running. So, after implementing the CI/CD pipeline the company's next step should be to work in the cloud environment. Once they start working on the cloud environment, they can schedule containers on a cluster and can orchestrate with the help of Kubernetes. This kind of approach will help the company reduce their deployment time, and also get faster across various environments.

Scenario 4: Suppose a company wants to revise it's deployment methods and wants to build a platform which is much more scalable and responsive.

How do you think this company can achieve this to satisfy their customers?

Solution:

In order to give millions of clients the digital experience they would expect, the company needs a platform that is scalable, and responsive, so that they could quickly get data to the client website. Now, to do this the company should move from their private data centers (if they are using any) to any cloud environment such as AWS. Not only this, but they should also implement the microservice architecture so that they can start using Docker containers. Once they have the base framework ready, then they can start using the best orchestration platform available i.e. Kubernetes. This would enable the teams to be autonomous in building applications and delivering them very quickly.

Scenario 5: Consider a multinational company with a very much distributed system, looking forward to solving the monolithic code base problem.

How do you think the company can solve their problem?

Solution

Well, to solve the problem, they can shift their monolithic code base to a microservice design and then each and every microservices can be considered as a container. So, all these containers can be deployed and orchestrated with the help of Kubernetes.

Scenario 6: All of us know that the shift from monolithic to microservices solves the problem from the development side, but increases the problem at the deployment side.

How can the company solve the problem on the deployment side?

Solution

The team can experiment with container orchestration platforms, such as Kubernetes and run it in data centers. So, with this, the company can generate a templated application, deploy it within five minutes, and have actual instances containerized in the staging environment at that point. This kind of Kubernetes project will have dozens of microservices running in parallel to improve the production rate as even if a node goes down, then it can be rescheduled immediately without performance impact.

Scenario 7: Suppose a company wants to optimize the distribution of its workloads, by adopting new technologies.

How can the company achieve this distribution of resources efficiently?

Solution

The solution to this problem is none other than Kubernetes. Kubernetes makes sure that the resources are optimized efficiently, and only those resources are used which are needed by that particular application. So, with the usage of the best container orchestration tool, the company can achieve the distribution of resources efficiently.

Scenario 8: Consider a carpooling company wants to increase their number of servers by simultaneously scaling their platform.

How do you think will the company deal with the servers and their installation?

Solution

The company can adopt the concept of containerization. Once they deploy all their application into containers, they can use Kubernetes for orchestration and use container monitoring tools like Prometheus to monitor the actions in containers. So, with such usage of containers, giving them better capacity planning in the data center because they will now have fewer constraints due to this abstraction between the services and the hardware they run on.

Scenario 9: Consider a scenario where a company wants to provide all the required hand-outs to its customers having various environments.

How do you think they can achieve this critical target in a dynamic manner?

Solution

The company can use Docker environments, to put together a cross-sectional team to build a web application using Kubernetes. This kind of framework will help the company achieve the goal of getting the required things into production within the shortest time frame. So, with such a machine running, the company can give the hands-outs to all the customers having various environments.

Scenario 10: Suppose a company wants to run various workloads on different cloud infrastructure from bare metal to a public cloud.

How will the company achieve this in the presence of different interfaces?

Solution

The company can decompose its infrastructure into microservices and then adopt Kubernetes. This will let the company run various workloads on different cloud infrastructures.