Yonder

Technical Assessment – DevOps Junior

1. The first requirement is to access endpoints and these are the following steps that I have done:

* The first command that I have done in cmd was docker pull yondermakers/yonder-devops-tech-assessment:latest for download that Docker image to my local machine, making it available for local use
* The second command was docker run -d -p 30000:8080 yondermakers/yonder-devops-tech-assessment:latest for create and start a Docker container in detached mode based on that image. Port 30000 on the host machine is mapped to port 8080 inside the container.
* The third command was docker ps to see if the container is running and to see if it is ok the mapping of the ports
* After I assured myself that all was good I opened the browser and accessed <http://localhost:30000/>

Here are the answers to the questions:

1. Exemplify two data structures that you know and describe some situations where you would use them.

* Arrays – collections of elements of the same type stored in memory and accessed by its index (the position of the element within the array)

– I would use them for storing data (ex: store students grades)

* Lists – collection of elements arranged in a linear sequence

– I would use them to make a to-do list application

1. You open a web browser and access http://www.tss-yonder.com. What is the IP address behind this website and how does the browser know how to get the correct IP?

The IP address behind this site is [2606:4700:20::ac43:49b1]:443 and the browser knows that this is the good address because the browser checks its cache to see if it already has a DNS record corresponding to the IP address of the URL and if it has not it performs a full DNS lookup.

1. Exemplify two transport protocols and think of two applications that would use each of them.

Two transport protocols are TCP (Transmission Control Protocol) and UDP (User Datagram Protocol). TCP is a connection-oriented protocol that establish a secure connection between the sender and receiver and provides the delivery of data. UDP is a connectionless transport protocol and it is used in applications where the speed and size of data transmitted is considered more important than the security (better for video streaming). An application example that uses TCP could be Gmail because when you send an email from your account you initiate a TCP connection and that assures that the email messages are delivered accurately and in the correct order. An example of application that uses UDP could be Zoom because it offers real-time communication.

1. You wrote a chat web application in your favorite programming language. You need to host this somewhere and run it so that the entire world can start using it. Describe how you would do that and the tools you would use.

I have never deployed an application but I know there are some steps that are important and depends on the type of application. So the first step is to choose a hosting provider. I know there are different hosting providers but the Google Cloud Platform is the one that I am more familiar with. After that we connect to the account and select the plan that it is suitable for us. We set up the hosting environment, configure the server, set up the server and install necessary runtime environments and frameworks. The next step is to deploy application’s server-side components by upload the backend code of the application (server-side scripts, database files, dependencies). After that we should configure the database, set up domain and security certificate and test the deployment.

1. Now your application is famous but unfortunately it has a lot of bugs. You want only you and a couple of your friends to be able to access it until you patch it. Describe two ways you can achieve this.

To solve this problem I could use a private server instance that is not accessible to the public internet. I can set up a VPN to connect to the server and authorize users (me and my friends) to have access to the application. Another way to solve this problem is by implementing authentication mechanisms in the app that allow only my type of account and my friend’s type to have access to the app.

1. Your application is ready for the public once again. You realize that you forgot about security and any network administrator can see the messages that a user sends or receives. How would you improve your application to prevent this? Is there any way to do this so that not even the application owner (you) can see the messages between two random users?

I honestly did not have a real experience with this but I have heard about end-to-end encryption in chat applications. So we can implement strong encryption using cryptographic algorithms and protocols for messages exchange between users. It is better to generate and manage encryption keys by client-side application. We should use secure methods for key to ensure that only the intended receiver can decrypt messages.

1. What are cookies and what are they used for? Find a cookie used by http://www.tss-yonder.com and copy its name and value. What do you think is its purpose?

Cookies are small pieces of data that are stored on an user’s device such as web browser by websites that are visit by that user. They help the website to remember the user preferences after closing the browser (language choice, theme selection, items added to shopping cart). The cookie that I found on the website has this name PHPSESSID and this value i232pbmfb8ke328plmfiqfg2b8. From my point of view this cookie stores data related to PHP sessions. It contains the Session ID which is an unique identifier assigned to each user session by the PHP server.

1. While writing your application you need to create more worker processes for processing some data. How can you create child processes in your favorite language? What are the possible states of a process?

I am honestly not that familiar with these concepts but in java we can create child processes by using ProcessBuilder class which is specifically designed to create and manage child processes. The possible states of a process are new, ready, run, terminate, block or wait, suspend.

1. Your application is running but it still has a few problems. Occasionally, it returns an error page. How can you find the PID of your application? What would you do to debug it?

I understand that PID it is an unique numerical identifier assigned to each running process in an operating system. In Windows we can open Task Manager and navigate to the “Processes” tab. There we can find our application process, right-click on it and select “Go to details” and then the PID will be displayed in its column. For debugging we need to use the debugger depending on our programming language (ex: Eclipse debugger for java). We need to attach the debugger to the process using it PID and then the debugger will start monitoring the process. We can run the application normally and set breakpoint where we suspect the issues.

1. What DBMS would you use to store your application data and why? How would you store the passwords of each user?

To store my application data I would use MongoDB because it is flexible and I can store messages in different ways without worrying too much about how they are structured. Even if there are a lots of messages MongoDB can keep up with it and make sure everyone gets their messages. Regarding the storage of password I would use hash password.