Department of Computing

Bachelor of Science (Hons) in Software Development

Cloud Data Centres - Y4

Lab 7 – all three parts

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Introduction:

This report documents journey through the Knative Quickstart tutorial, aiming to construct a comprehensive overview of the installation process and exploration of Knative's core functionalities. By following this tutorial, I will undertake the task of setting up a simplified Knative deployment using the Knative quickstart plugin, facilitating a local environment conducive to experimentation. Throughout this tutorial, I anticipate gaining insights into the fundamental features of Knative Serving and Knative Eventing, which are pivotal components of Knative's serverless platform. Furthermore, I aim to elucidate the significance of Knative in modern application development, highlighting its role in enabling seamless deployment, scaling, and management of containerized workloads.

Getting Started with Knative

Installing Knative CLI plugin:

```
C:\Users\s3bas\KNative>kn-func.exe version
v0.41.0
```

Create a Knative function

```
C:\Users\s3bas\KNative>kn-func create -l go hello
Created go function in C:\Users\s3bas\KNative\hello
```

Running Function on Local Registry:

```
C:\Users\s3bas\KNative\hello>kn-func run --registry local
Building function image
Still building
Still building
Yes, still building
Don't give up on me
Still building
This is taking a while
Still building
Still building
Yes, still building
Don't give up on me
Still building
This is taking a while
Still building
Still building
Yes, still building
Don't give up on me
Still building
This is taking a while
Still building
Still building
Yes, still building
Don't give up on me
Still building
This is taking a while
Still building
Still building
Yes, still building
Don't give up on me
Still building
This is taking a while
Still building
Still building
Yes, still building
Don't give up on me
Still building
This is taking a while
Still building
Function built: index.docker.io/local/hello:latest
Initializing HTTP function
listening on http port 8080
Running on host port 8080
```

Invoking function:

```
C:\Users\s3bas\KNative\hello>func invoke
"POST / HTTP/1.1\r\nHost: localhost:8080\r\nAccept-Encoding: gzip\r\nContent-Length: 25\r\nContent-Type: application/jso
n\r\nUser-Agent: Go-http-client/1.1\r\n\r\n{\"message\":\"Hello World\"}"
C:\Users\s3bas\KNative\hello>
```

```
Running on host port 8080
Received request
"POST / HTTP/1.1\r\nHost: localhost:8080\r\nAccept-Encoding: gzip\r\nContent-Length: 25\r\nContent-Type: application/jso
n\r\nUser-Agent: Go-http-client/1.1\r\n\r\n{\"message\":\"Hello World\"}"
```

KNative Service

Creating service using hello.yaml

```
service.serving.knative.dev/hello created

C:\Users\s3bas\KNative>
```

Viewing Kn service list

```
C:\Users\s3bas\KNative>Kn service list
NAME    URL                                      LATEST        AGE   CONDITIONS   READY   REASON
hello   http://hello.default.svc.cluster.local   hello-00001   19m   3 OK / 3     True
```

Traffic splitting

Creating a new Revision:

```
C:\Users\s3bas\KNative>kubectl apply -f hello.yaml
Warning: Kubernetes default value is insecure, Knative may default this to secure in a future release: spec.template.spec.containers[0
].securityContext.allowPrivilegeEscalation, spec.template.spec.containers[0].securityContext.capabilities, spec.template.spec.containe
rs[0].securityContext.runAsNonRoot, spec.template.spec.containers[0].securityContext.seccompProfile
service.serving.knative.dev/hello configured
```

View existing Revisions:

```
C:\Users\s3bas\KNative>kn revisions list
NAME          SERVICE   TRAFFIC   TAGS   GENERATION   AGE     CONDITIONS   READY   REASON
hello-00002   hello     100%             2            3m39s   3 OK / 4     True
hello-00001   hello                      1            14h     3 OK / 4     True
```

Splitting traffic between Revisions:

```
C:\Users\s3bas\KNative>kubectl apply -f hello.yaml
Warning: Kubernetes default value is insecure, Knative may default this to secure in a future release: spec.template.s
pec.containers[0].securityContext.allowPrivilegeEscalation, spec.template.spec.containers[0].securityContext.capabilit
ies, spec.template.spec.containers[0].securityContext.runAsNonRoot, spec.template.spec.containers[0].securityContext.s
eccompProfile
service.serving.knative.dev/hello configured
```

Verify the traffic split:

```
C:\Users\s3bas\KNative>kn revisions list
NAME          SERVICE   TRAFFIC   TAGS   GENERATION   AGE     CONDITIONS   READY   REASON
hello-00002   hello     50%              2            6m45s   3 OK / 4     True
hello-00001   hello     50%              1            14h     3 OK / 4     True
```

Knative Eventing

Verifing Broker is installed:

```
C:\Users\s3bas\KNative>kn broker list
NAME            URL                                                                      AGE    CONDITIONS
 READY   REASON
example-broker  http://broker-ingress.knative-eventing.svc.cluster.local/default/example-broker  3m8s   6 OK / 6
 True

C:\Users\s3bas\KNative>
```
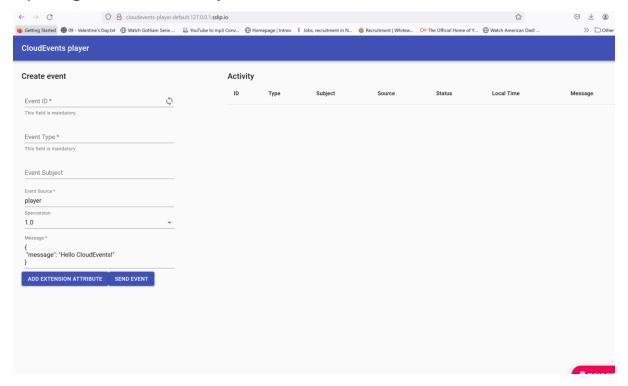
Creating CloudEvents Player Service:

```
service.serving.knative.dev/cloudevents-player created

C:\Users\s3bas\KNative>
```
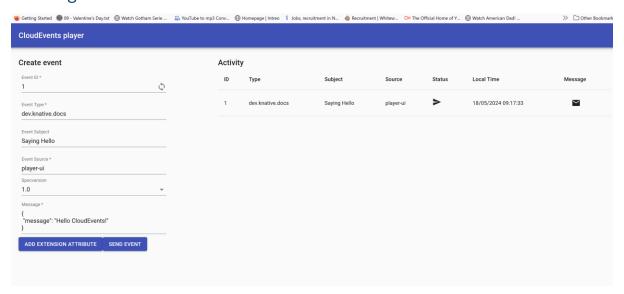
Creating a SinkBinding between the service and the broker:

```
C:\Users\s3bas\KNative>kn source binding create ce-player-binding --subject "Service:serving.knative.dev/v1:cloudevents-player" --sink broker:example-broker
Sink binding 'ce-player-binding' created in namespace 'default'.

C:\Users\s3bas\KNative>
```

Opening CloudEvents Player in Browser:

Sending Event:

Creating Trigger:

```
C:\Users\s3bas\KNative>kn trigger create cloudevents-trigger --sink cloudevents-player  --broker example-broker
Trigger 'cloudevents-trigger' successfully created in namespace 'default'.

C:\Users\s3bas\KNative>
```

Events are sent and received: