Spring Cloud - Netflix Eureka Server

=>Every MicroService must be registered or published with R & D (Register and Disocovery) server in order to make it discoverable/communicatable from other MicroServices

=> As of now netflix eureka server (best), apache zookeeper are two popular R & D Servers.

=> Every R & D server is spring boot Project having R &D Server dependencies (Do not except seperate installation like Tomcat, wildfly and etc..)

=> The Process of keeping /publishing MicroService details in R &D Server is called registration activity

=> The process of discovering/fetching MicroService details from R & D Server to esstablish communication/interaction from another MicroService is called Discovery Operation.

=> When we publish different instances of different micro services to R & D server like Eureka server .. then the details will look like this...

Service Id	InstanceId	HostName/IPAddrs	LoadFactor [CurrentLoad/ MaxLoad]
Search-Service	SS:566-a367	192.6.8.7 7878	0/200
Search-Service	SS:536-a461	192.6.8.7 7171 IPaddrs port number	0/200
Order-Service	OS: 455-a356	192.6.8.7 8989	0/200
Order-Service	OS: 415-a256	192.6.8.7 8182	0/200

=>Eureka Server is no documents server .. i.e it does not contain any xml files or Json files inside the server (Does not maintain any document having the details of the microservice)

=> Service Id is always Project name (Service Id is called as Service Name)
=> Instance Id is the unique Id .. For every Instance one unique Instance Id will be generated..
=>Providing isntance Id when single instance is there optional .. In that situation it takes ServiceId as the Instance Id
=> The HostName and port details will be auto detected by Eureka server durigng the process of Register/publishment of MicroService
=> LoadFactor = current Load /Max Load.

other R&D Servers in the market

SmartStack, Zookeeper, Etcd, Consul, NSQ, Serf, doozer and netflix eureka server (best)

What is difference b/w web server and R&D Server in microServices?

Ans) Web server is a piece of software that is given to manage and execute the bunch of web applications /websites .. This also can be used deploy and execute Restful provider Apps , microservice Apps (Restful apps) ... eg: Tomcat

note:: we generally take one R&D server in every MicroSErvice Architecture Project

Every MicroService execution happens in web server but it must be registered with R&D server in order to make it disoverable or communicatable for other MicroServices.

R&D server is separate project having R&D Server dependencies in which all the microservices will be registered. eg: Neflix EurekaServer

=>if we add spring web starter to the project then we get Embedded Tomcat server

=>if we add Netflix Eureka starter to the project then we get Embedded Eureka server

=>Every Micro service will have one unique service id (project name)
=> For every Instance (copy of microService) of Micro service one instance id will be generated. (instanace name)

=> Eureka server is InMemory Server that is created becoz of the dependencies added to the sprong boot /spring cloud project

What is difference b/w Restfull WebService (API) and MicorService?

Ans) MicroService = Restful webservice++

=> The Restful web service (API) that is registered with R&D server is called MicroService

SOA's UDDI registry where services will be registered will having wsdl docs
SO UDDI registry is called Document Registry

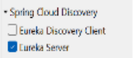
Why the Netflix Eureka server is called R&D SErver?

Ans) We register/publish every microservice in Eureka Server in order to make it disvercoverable and communicatable from other microservices
So we can say Eureka Server as R&D server

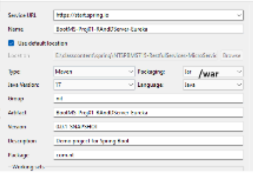
Procedure to create Spring Boot project acting as Eureka server

===

step1) create Spring Boot Project adding Eureka Server as depedencies



- Spring Cloud Discovery
- □ Eureka Discovery Client
- ☑ Eureka Server



Service URL: https://start.spring.io
Type: Maven
Packaging: Jar /war
Java Version: 17
Language: Java

step2) add @EnableEurekaServer on the top of main class

```java
@SpringBootApplication
@EnableEurekaServer
public class SpringBootMsProj01EurekaServerApplication {

	public static void main(String[] args) {
		SpringApplication.run(SpringBootMsProj01EurekaServerApplication.class, args);
	}

}
```

enables the eureka R&D Server related Autoconfiguration activities

(Annotation to activate Eureka Server related configuration. EurekaServerAutoConfiguration)

step3) Add the following entries in application.properties

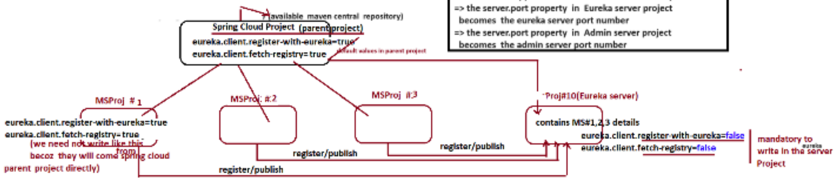
To disable the process of making this project as MicroService and to present this project as R & D Server

appplication.properties

```
server.port= 8761        (recomanded number to use)
eureka.client.register-with-eureka=false
eureka.client.fetch-registry=false
```

=>In spring boot project we get Eureka server as the Embedded Server..

=> the server.port property in in web applications/rest apps/ microservice apps becomes the embedded server port number
=> the server.port property in Eureka server project becomes the eureka server port number
=> the server.port property in Admin server project becomes the admin server port number


(available maven central repository)
Spring Cloud Project (parent project)
eureka.client.register-with-eureka=true
eureka.client.fetch-registry=true
default values in parent project
MSProj #1
eureka.client.register-with-eureka=true
eureka.client.fetch-registry=true
(we need not write like this becoz they will come from spring cloud parent project directly)
MSProj: #2
MSProj #3
Proj#10(Eureka server)
contains MS#1,2,3 details
eureka.client.register-with-eureka=false
eureka.client.fetch-registry=false
mandatory to write in the eureka server Project
register/publish
register/publish
register/publish

=> Every Ms Project should be kept ready to register with Eureka Server .. Since we can not register Eureke server Project itself with Eureka server , So we need to make the default value "true" inherited from the spring cloud project for "eureka.client.register-with-eureka" property as "false" in Eureka server Project.

```
eureka.client.register-with-eureka=false
```

=>Every MS project should be kept ready for discovery/fetching for communincation while registering with Eureka server .. Since Eureka Server Project itself can not be kept ready for fetching/discovery so we need make the default "true" inhreited from the spring cloud project for "eureka.client.fetch-registry" as "false" in Eureka server Project

```
eureka.client.fetch-registry=false
```

step4) Run the application...

Right click on Project -->run as --> Java app/spring boot app

(always run as as the java app/ spring boot app)

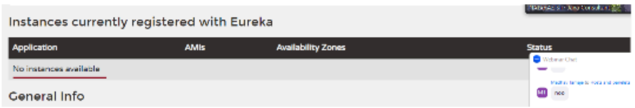
step5) Test the SErver App

http://localhost: 8761

The recomanded port number for eureka server is :: 8761

(If eureka server is running on this 8761 port number then we need not to mention the port number of eureka server in microservice project)

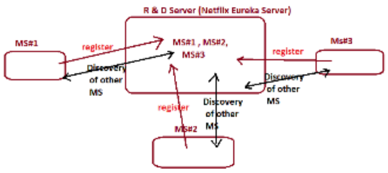
=> If we add spring web starter to the Project then we get tomcat server as the embedded server
=>if we add eureka server starter to the Project then we get eureka server as the embedded server.



Instances currently registered with Eureka

Application	AMIs	Availability Zones	Status
No instances available			

General Info



=>8761 is not the default port number for Eureka server
=> 8080 is the defailt port number of EurekaServer
=>8761 is the recomanded port number for eureka server becoz we need not to specify the 8761 port number in Ms projects while registering them with EurekaSErver only when the port number is 8761

=> Tomcat is a webserver/Application server where we deploy and manage the web applications
=> Eureka server is R & D Server where the Microservices will be registered and discovered

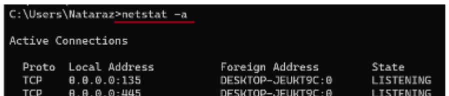
note: Eureaka Server intenrally uses Tomcat Platform to be have like server.. but it is different Server. for different purpose

Q) Can we run spring boot with out application.properites/yml file?

Ans) yes possible .. only basic Applications.

note:: In all advanced module apps .. we need the support of application.properties/yml file

In windows OS , how can u find out the busy port numbers?



```
C:\Users\Nataraz>netstat -a

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    0.0.0.0:135            DESKTOP-JEUKT9C:0      LISTENING
  TCP    0.0.0.0:445            DESKTOP-JEUKT9C:0      LISTENING
```

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(Do not except seperate installation like Tomcat, wildfly and etc..)

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eg: Tomcat

Every MicroService execution happens in web server but

be

it must registered with R&D server in ordertake it disoverable or communicatable for other MicroServices.

eg: Neflix EurekaServer

note:: we generally take one R&D server in every MicroService Architecture Project

R&D server is separate project having R&D Server dependencies

in which all the microservices will be registered.

=>if we add spring web starter to the project then we get Embedded Tomcat server

=>if we add Netflix Eureka starter to the project then we get Embedded Eureka server

What is difference b/w Restfull WebService (API) and MicorService?

MicroService Restful webservice++

=> The Restful web service (API) that is registered with R&D server is called MicroService

Service Id

Search-Service

Search-Service

InstanceId

HostName/IPAddrs

LoadFactor [CurrentLoad/ MaxLoad]

=>Every Micro service will have one unique service id (project name) => For every instance (copy of microService) of Micro

SS:566-a367

192.6.8.7 7878

0/200

service one instance id will be generated. (instanace name)

Ans)

SS:536-a461

Order-Service

OS: 455-a356

192.6.8.7 7171 IPaddrs 192.6.8.7 8989

0/200

Server

port number

0/200

Order-Service

OS: 415-a256

192.6.8.7 8182

0/200

=>Eureka Server is no documents server.. i.e it does not contain any xml files or Json files inside the server (Does not maintain any document having the details of the microservice)

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SOA's UDDI registry where services will be registered will having wsdl docs

SO UDDI registry is called Document Registry

=> The HostName and port details will be auto detected by Eureka server during the proces1Register/publishment of MicroService

=> LoadFactor = current Load /Max Load.

Procedure to create Spring Boot project acting as Eureka server

============

step1) create Spring Boot Project adding Eureka Server as depedencies

step 2) add @Enable EurekaServer on the top of main class

@SpringBootApplication

@EnableEurekaServer

▾ Spring Cloud Discovery

Why the Netflix Eureka server is called R&D SErver?

Ans) We register/publish every microservice in Eureka Server in order to make it disvercoverable and

communicatable from other microservices So we can say Eureka Server R&D server

E:\classcontent\spring\NTSPBMS715-RestfulServices-MicroServic Browse

Service URL Name

https://start.spring.io

BootMS-Proj01-RAndDServer-Eureka

Eureka Discovery Client Eureka Server

✔Use default location Location

Type:

Maven

✓ Packaging:

Jar /war

Java Version:

17

✓ Language:

Java

✓

t]

Group

nit

bo

Artifact

:[b

Version

0.0.1-SNAPSHOT

Description

Demo project for Spring Boot

Package Working sets

com.nt

enables the eureka R&D Server

related Autoconfiguration activities

public class SpringBootMsProj01EurekaServerApplication { (Annotation to activate Eureka Server related

configuration. EurekaServerAutoConfiguration)

public static void main(String[] args) {

SpringApplication.run(SpringBootMsProj01EurekaServerApplication.class, args);

}

}

BootMS-Proj01-RAndDServer-Eureka

as

step3) Add the following entries in application.properties

making

To disable the process of this project as MicroService and to present this project as R & D Server

appplication.properties

server.port= 8761

(recomanded number to use)

eureka.client.register-with-eureka=false

eureka.client.fetch-registry=false

In

=>spring boot project we get Eureka server as the Embedded Server..

available maven central repository) Spring Cloud Project (parent project) eureka.client.register-with-eureka=true eureka.client.fetch-registry=true default values in parent project

=> the server.port property in in web applications/rest apps/ microservice apps becomes the embedded server port number

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-Proj#10(Eureka server)

contains MS#1,2,3 details

register/publish

eureka.client.register-with-eureka=false eureka.client.fetch-registry=false

MSProj #1

eureka.client.register-with-eureka=true

eureka.client.fetch-registry-true (we need not write like this

from

becoz they will come spring cloud

parent project directly)

be

MSProj: #2

register/publish

register/publish

MSProj #3

=> Every Ms Project should kept ready to register with Eureka Server .. Since we can not register Eureke server Project itself with Eureka server, So we need to make the default value "true"

Inherited from the spring cloud project for "eureka.client.register-with-eureka" property as "false" in Eureka server Project.

eureka.client.register-with-eureka=false

itself

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(always run as as the java app/ spring boot app)

step5) Test the Server App

http://localhost:8761

Instances currently registered with Eureka

Application

No instances available

General Info

MS#1

register Discovery of other MS

AMIS

The recomanded

port number for eureka server is :: 8761

(if eureka server is running on this 8761 port number then we need not to mention the port number of eureka server in microservice project)

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Availability Zones

R & D Server (Netflix Eureka Server)

MS#1, MS#2, MS#3

register

Discovery

E

register MS#2 M$

Discovery of other

of other MS

NATARAZ Sir- Java Consultant*****

Status

Webinar Chat

Madhav Tamaje to Hosts and panelists

MT

noo

mandatory to write in the server Project

eureka

Ms#3

=>8761 is not the default port number for Eureka server => 8080 is the defailt port number of EurekaServer =>8761 is the recomanded port number for eureka server becoz we need not to specify the 8761 port number in Ms projects while registering them with EurekaSErver only when the port number is 8761

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Active Connections

Proto Local Address
```

for different purpose

```
Foreign Address

TCP

0.0.0.0:135

DESKTOP-JEUKT9C:0

State LISTENING

TCP

0.0.0.0:445

DESKTOP-JEUKT9C:0

LISTENING

TCP

0.0.0.0:1521

DESKTOP-JEUKT9C:0

LISTENING

TCP

0.0.0.0:3306

DESKTOP-JEUKT9C:0

LISTENING

TCP

0.0.0.0:5040
```

```
DESKTOP-JEUKT9C:0
LISTENING
TCP
0.0.0.0:8080
DESKTOP-JEUKT9C:0
LISTENING
TCP
0.0.0.0:33060
DESKTOP-JEUKT9C:0
LISTENING
TCP
0.0.0.0:49664
DESKTOP-JEUKT9C:0
LISTENING
TCP
0.0.0.0:49665
DESKTOP-JEUKT9C:0
LISTENING
TCP
0.0.0.0:49666
DESKTOP-JEUKT9C:0
LISTENING
TCP
0.0.0.0:49669
DESKTOP-JEUKT9C:0
LISTENING
TCP
0.0.0.0:49672
DESKTOP-JEUKT9C:0
LISTENING
```

Why the 8761 is the recomanded port number for Netflix Eureka R&D server?

in

Ans) if the port of eureka server is 8761, we need to specify the port number MicroService projects registration url in order to register them to R&D server (Eureka server)

note:: JAva stable versions are (LTS) :: 8, 11, 17, 21

LTS :: Long Time Support