

龙芯部署edgex全过程及问题

edgex官网部署流程: <https://docs.edgexfoundry.org/3.0/getting-started/quick-start/>

整体上为两步操作:

1. 获得edgex官方提供的docker-compose.yaml, 并确保其中的镜像名称正确
2. 执行docker-compose up -d。

但是在loongnix上并不能这样简单的部署, 需要做以下的流程及修改:

1. 重编docker-compose V2

龙芯镜像仓提供了edgex3.0.0的大部分组件, 但是edgex3.0的部署需要docker-compose V2版本, 而原生的docker-compose是V1的, 并不兼容。所以第一步是重编, 获得一个能够在龙芯上运行的docker-composeV2版本的程序。

步骤:

1. 安装go-1.19, 并配置gomod镜像源, 我配置的是: <https://goproxy.cn>
2. 获取docker-compose V2的源码:

```
git clone https://github.com/docker/compose.git
```

3. clone并切换tag为v2.10.2。而非默认分支

```
git checkout v2.10.2
```

```
user@loongnix:~/compose-src$ git branch
0a
v2
* (头指针分离于 v2.10.2)
```

4. 在源码目录执行make

不报错即编译成功(报错可能是go版本或gomod源问题)。最终会得到源码目录相对路径下: ./bin/build/docker-compose这个可执行文件。使用version查看版本, 应当为V2.10.2。(如果原本安装了docker-compose, 需要卸载, 再把这个V2塞到/usr/bin里, 使用方便一些)

```
user@loongnix:~/compose-src/bin/build$ ./docker-compose version
Docker Compose version v2.10.2
```

2. 构建core-common-config-bootstrapper镜像

core-common-config-bootstrapper是edgex必备组件, 但是目前龙芯的镜像仓并没有提供, 所以缺少这个组件, 需要我们重构一下:

1. 获取源码<https://github.com/edgexfoundry/edgex-go>

```
git clone https://github.com/edgexfoundry/edgex-go
```

2. 切换分支为v3.0.0

```
git checkout v3.0.0
```

3. 对源码进行修改

bootstrapper的dockerfile中有一些命令有问题，不修改是不能在龙芯上直接build的。

已将修改打为patch，在edgex-go目录中直接应用即可。

具体打patch方法：将下文的patch内容复制出来，写入到一个新建的bootstrapper.patch中。将这个.patch文件放入edgex-go目录，在edgex-go目录中执行：`git apply bootstrapper.patch` 即可
patch内容如下：

```
diff --git a/cmd/core-common-config-bootstrapper/Dockerfile b/cmd/core-
common-config-bootstrapper/Dockerfile
index 34b4bfa2..260de657 100644
--- a/cmd/core-common-config-bootstrapper/Dockerfile
+++ b/cmd/core-common-config-bootstrapper/Dockerfile
@@ -17,23 +17,25 @@
# -----
-----

# Docker image for Golang Core common config bootstrapper service
-ARG BUILDER_BASE=golang:1.20-alpine3.17
+ARG BUILDER_BASE=golang:1.19-alpine
FROM ${BUILDER_BASE} AS builder

ARG ADD_BUILD_TAGS=""

WORKDIR /edgex-go

-RUN apk add --update --no-cache make git
+RUN apk add --update --no-cache make git musl-dev gcc
+
+RUN go env -w GOPROXY=https://goproxy.cn

COPY go.mod vendor* ./
-RUN [ ! -d "vendor" ] && go mod download all || echo "skipping..."
+#RUN [ ! -d "vendor" ] && go mod download all || echo "skipping..."

COPY . .
RUN make -e ADD_BUILD_TAGS=$ADD_BUILD_TAGS cmd/core-common-config-
bootstrapper/core-common-config-bootstrapper

#Next image - Copy built Go binary into new workspace
-FROM alpine:3.17
+FROM alpine:3.11

LABEL license='SPDX-License-Identifier: Apache-2.0' \
      copyright='Copyright (c) 2023: Intel Corporation'
diff --git a/cmd/core-common-config-bootstrapper/res/configuration.yaml
b/cmd/core-common-config-bootstrapper/res/configuration.yaml
index 70092fc6..9b9657a0 100644
--- a/cmd/core-common-config-bootstrapper/res/configuration.yaml
+++ b/cmd/core-common-config-bootstrapper/res/configuration.yaml
```

```

@@ -40,19 +40,19 @@ all-services:
    CORSMaxAge: 3600

    Registry:
-    Host: "localhost"
+    Host: "edgex-core-consul"
    Port: 8500
    Type: "consul"

    Database:
-    Host: "localhost"
+    Host: "edgex-redis"
    Port: 6379
    Timeout: "5s"
    Type: "redisdb"

    MessageBus:
    Protocol: "redis"
-    Host: "localhost"
+    Host: "edgex-redis"
    Port: 6379
    Type: "redis"
    AuthMode: "usernamepassword" # required for redis MessageBus (secure or
insecure).
@@ -94,7 +94,7 @@ app-services:
    Clients:
    core-metadata:
    Protocol: "http"
-    Host: "localhost"
+    Host: "edgex-core-metadata"
    Port: 59881
    Trigger:
    Type: "edgex-messagebus"
@@ -112,7 +112,7 @@ device-services:
    Clients:
    core-metadata:
    Protocol: "http"
-    Host: "localhost"
+    Host: "edgex-core-metadata"
    Port: 59881
    Device:
    DataTransform: true

```

5. 在edge-go目录中执行构建命令（并非在core-common-config-bootstrapper目录中执行）

```

docker build -f cmd/core-common-config-bootstrapper/Dockerfile -t
edgexfoundry/core-common-config-bootstrapper:3.0.0 .

```

正常构建时会下载一堆gomod，之后进行编译，编译无误会正常的产出edgexfoundry/core-common-config-bootstrapper:3.0.0这个镜像。

edgexfoundry/core-common-config-bootstrapper 3.0.0 2ccb3fa28880 6 hours ago 14.8MB

3. 修改docker-compose文件

1. 新建一个edgex-compose目录，进入该目录中下载compose文件：

```
curl https://raw.githubusercontent.com/edgexfoundry/edgex-  
compose/v3.0/docker-compose-no-secty.yml -o docker-compose.yml
```

2. 修改compose文件：

docker-compose中的一些配置项和镜像名称需要修改，以适配龙芯下的镜像名称，修改项如下：

具体打patch方法：将下文的patch内容复制出来，写入到一个新建的compose.patch中。将这个.patch文件放入下载docker-compose.yml的目录，在该目录中执行：`git apply compose.patch` 即可。

```
diff --git a/docker-compose.yml b/docker-compose.yml  
index 0b42e0d..dea3f04 100644  
--- a/docker-compose.yml  
+++ b/docker-compose.yml  
@@ -55,6 +55,10 @@ services:  
    consul:  
      command:  
        - agent  
+      - -data-dir  
+      - /consul/data  
+      - -config-dir  
+      - /consul/config  
        - -ui  
        - -bootstrap  
        - -server  
@@ -62,7 +66,7 @@ services:  
    - 0.0.0.0  
    container_name: edgex-core-consul  
    hostname: edgex-core-consul  
-    image: hashicorp/consul:1.15.2  
+    image: library/consul:v1.5.1  
    networks:  
      edgex-network: null  
    ports:  
@@ -188,7 +192,7 @@ services:  
    database:  
      container_name: edgex-redis  
      hostname: edgex-redis  
-    image: redis:7.0.11-alpine  
+    image: library/redis:7.0-alpine  
    networks:  
      edgex-network: null  
    ports:  
@@ -279,7 +283,7 @@ services:  
      KUIPER__BASIC__CONSOLELOG: "true"  
      KUIPER__BASIC__RESTPORT: "59720"  
      hostname: edgex-kuiper  
-    image: lfedge/ekuiper:1.9.2-alpine  
+    image: lfedge/ekuiper:1.6-alpine  
    networks:  
      edgex-network: null
```

```
ports:
```

修改原因：

1. 部分镜像名需要配套龙芯提供的镜像
2. 推测consul的DOCKERFILE中的配置有问题。因此需要在docker-compose文件中额外添加配置项：- data-dir和-config-dir。否则会报错-data-dir not found。表现为consul容器启动失败。

4. 通过docker-compose部署edgex

1. 配置docker镜像源为loongnix

新建/etc/docker/daemon.json，添加以下内容。重启docker服务

```
{
  "registry-mirrors": [
    "https://cr.loongnix.cn/"
  ]
}
```

2. 在docker-compose.yml的目录中执行：

```
docker-compose up -d
```

需要注意：此处的docker-compose是第一步编译出来的docker-composeV2，如果将其放入PATH中就可以直接执行。如果执行报错，请使用 `docker-compose version` 查看目前的版本是否是第一步编译出来的V2.10.2

如果docker-compose配置文件正确。正常情况下会开始拉取所需镜像，并开始部署。

```
user@loongnix:~/docker/edgex-loongnix$ docker-compose up -d
[+] Running 21/21
:: Network edgex-edgex-network          Created
:: Volume "edgex_consul-config"          Created
:: Volume "edgex_consul-data"            Created
:: Volume "edgex_kuiper-data"            Created
:: Volume "edgex_kuiper-etc"             Created
:: Volume "edgex_kuiper-log"             Created
:: Volume "edgex_kuiper-plugins"         Created
:: Volume "edgex_db-data"                Created
:: Container edgex-redis                  Started
:: Container edgex-ui-go                  Started
:: Container edgex-core-consul            Started
:: Container edgex-core-common-config-bootstrapper Started
:: Container edgex-support-notifications Started
:: Container edgex-support-scheduler     Started
:: Container edgex-kuiper                 Started
:: Container edgex-core-metadata          Started
:: Container edgex-core-command           Started
:: Container edgex-core-data              Started
:: Container edgex-device-rest            Started
:: Container edgex-device-virtual         Started
:: Container edgex-app-rules-engine       Started
```

5. 当前停滞问题

在通过docker-compose部署后，出现dgex-core-metadata等多个核心组件重启的现象。

检查log后发现报错如下，多个容器重启原因log皆为此报错：

```
level=WARN ts=2023-07-13T10:14:19.424078297Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:20.424581026Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:21.424905842Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:22.425807777Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:23.427220679Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:24.428967469Z app=device-rest source=registry.go:118 msg="registry is not available"
level=ERROR ts=2023-07-13T10:14:25.429226885Z app=device-rest source=bootstrap.go:46 msg="unable to register with Registry in allotted time"
level=INFO ts=2023-07-13T10:14:26.640092505Z app=device-rest source=config.go:391 msg="Loaded service configuration from /res/configuration.yaml"
level=INFO ts=2023-07-13T10:14:26.64254828Z app=device-rest source=variables.go:377 msg="Variables override of 'Service.Host' by environment variable: SERVICE_HOST=edgex-device-rest"
level=INFO ts=2023-07-13T10:14:26.6427965Z app=device-rest source=config.go:168 msg="Using Configuration Provider access token of length 0"
level=INFO ts=2023-07-13T10:14:26.64281677Z app=device-rest source=config.go:366 msg="Using Configuration Provider (consul) from: http://edgex-core-consul:8500 with base path of edgex/v3/device-rest"
level=INFO ts=2023-07-13T10:14:26.65191773Z app=device-rest source=variables.go:377 msg="Variables override of 'Service.Host' by environment variable: SERVICE_HOST=edgex-device-rest"
level=INFO ts=2023-07-13T10:14:26.65226264Z app=device-rest source=config.go:533 msg="Configuration has been pulled from Configuration provider (1 envVars overrides applied)"
level=INFO ts=2023-07-13T10:14:26.652333854Z app=device-rest source=registry.go:61 msg="Using Registry access token of length 0"
level=INFO ts=2023-07-13T10:14:26.652354534Z app=device-rest source=registry.go:85 msg="Using Registry (consul) from http://localhost:8500"
level=WARN ts=2023-07-13T10:14:26.65322875Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:27.654089926Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:28.654535685Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:29.655087581Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:30.656317124Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:31.656910114Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:32.658258823Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:33.65867295Z app=device-rest source=registry.go:118 msg="registry is not available"
level=WARN ts=2023-07-13T10:14:34.659094307Z app=device-rest source=registry.go:118 msg="registry is not available"
```

对比正常情况下日志应当为：

```
harry@harry:~/project/edgex$ docker logs -f edgex-core-data
level=INFO ts=2023-07-12T03:25:42.609187101Z app=core-data source=config.go:629 msg="Using Configuration provider (consul) from: http://edgex-core-consul:8500 with base path of edgex/v3/core-common-config-bootstrap/all-services"
level=WARN ts=2023-07-12T03:25:51.569612659Z app=core-data source=config.go:954 msg="did not get boolean from config provider for edgex/v3/core-common-config-bootstrap/IsCommonConfigReady: strconv.ParseBool: parsing \"\": invalid syntax"
level=WARN ts=2023-07-12T03:25:51.569641665Z app=core-data source=config.go:962 msg="waiting for Common Configuration to be available from config provider"
level=WARN ts=2023-07-12T03:25:52.570462156Z app=core-data source=config.go:954 msg="did not get boolean from config provider for edgex/v3/core-common-config-bootstrap/IsCommonConfigReady: strconv.ParseBool: parsing \"\": invalid syntax"
level=WARN ts=2023-07-12T03:25:52.570490409Z app=core-data source=config.go:962 msg="waiting for Common Configuration to be available from config provider"
level=INFO ts=2023-07-12T03:25:53.571971725Z app=core-data source=config.go:148 msg="Common Configuration loaded from the Configuration Provider: No overrides applied"
level=INFO ts=2023-07-12T03:25:53.571992543Z app=core-data source=config.go:629 msg="Using Configuration provider (consul) from: http://edgex-core-consul:8500 with base path of edgex/v3/core-data"
level=INFO ts=2023-07-12T03:25:53.572488575Z app=core-data source=config.go:640 msg="Loading configuration file from res/config.yaml"
level=INFO ts=2023-07-12T03:25:53.572629309Z app=core-data source=variables.go:457 msg="Variables override of 'Service.Host' by environment variable: SERVICE_HOST=edgex-core-data"
level=INFO ts=2023-07-12T03:25:53.572640591Z app=core-data source=config.go:226 msg="Private configuration loaded from file with 1 overrides applied"
level=INFO ts=2023-07-12T03:25:53.58027897Z app=core-data source=config.go:237 msg="Private configuration has been pushed to into Configuration Provider with overrides applied"
level=INFO ts=2023-07-12T03:25:53.580292857Z app=core-data source=config.go:244 msg="Listening for private config changes"
level=INFO ts=2023-07-12T03:25:53.58029857Z app=core-data source=config.go:246 msg="Listening for all services common config changes"
level=INFO ts=2023-07-12T03:25:53.580309641Z app=core-data source=registry.go:61 msg="Using Registry access token of length 0"
level=INFO ts=2023-07-12T03:25:53.580314875Z app=core-data source=registry.go:85 msg="Using Registry (consul) from http://edgex-core-consul:8500"
level=INFO ts=2023-07-12T03:25:53.584654475Z app=core-data source=databases.go:120 msg="Database connected"
level=INFO ts=2023-07-12T03:25:53.584671359Z app=core-data source=messaging.go:66 msg="Setting options for secure MessageBus with AuthMode=usernamepassword' and SecretName=redisdb"
level=INFO ts=2023-07-12T03:25:53.584701896Z app=core-data source=messaging.go:104 msg="Connected to redis Message Bus @ redis://edgex-redis:6379 with AuthMode=usernamepassword'"
level=INFO ts=2023-07-12T03:25:53.584712101Z app=core-data source=manager.go:128 msg="Metrics Manager started with a report interval of 30s"
level=INFO ts=2023-07-12T03:25:53.584718867Z app=core-data source=app.go:59 msg="Registered metrics counter EventsPersisted"
level=INFO ts=2023-07-12T03:25:53.584723275Z app=core-data source=app.go:65 msg="Registered metrics counter ReadingsPersisted"
level=INFO ts=2023-07-12T03:25:53.585768665Z app=core-data source=httpserver.go:133 msg="Web server starting (edgex-core-data:59880)"
level=INFO ts=2023-07-12T03:25:53.585787374Z app=core-data source=message.go:50 msg="Service dependencies resolved..."
level=INFO ts=2023-07-12T03:25:53.585792945Z app=core-data source=message.go:51 msg="Starting core-data 3.0.0"
level=INFO ts=2023-07-12T03:25:53.585796001Z app=core-data source=message.go:55 msg="This is the Core Data Microservice"
level=INFO ts=2023-07-12T03:25:53.585800366Z app=core-data source=message.go:58 msg="Service started in: 10.97665699s"
level=INFO ts=2023-07-12T03:25:53.58580586Z app=core-data source=bootstrap.go:251 msg="SecuritySecretsRequested metric registered and will be reported (if enabled)"
level=INFO ts=2023-07-12T03:25:53.58580951Z app=core-data source=bootstrap.go:251 msg="SecuritySecretsStored metric registered and will be reported (if enabled)"
```

目前不确定问题原因在哪，是consul的问题？还是bootstrapper的问题？还是其余edgex组件均有问题？