title: 精尽 Dubbo 源码分析 —— 调试环境搭建 date: 2018-01-01 tags: categories: Dubbo permalink: Dubbo/build-debugging-environment

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摘要: 原创出处 http://www.iocoder.cn/Dubbo/build-debugging-environment/ 「芋道源码」欢迎转载，保留摘要，谢谢！

🙂🙂🙂关注微信公众号：【芋道源码】有福利：

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1. 依赖工具

- Maven
- Git
- JDK
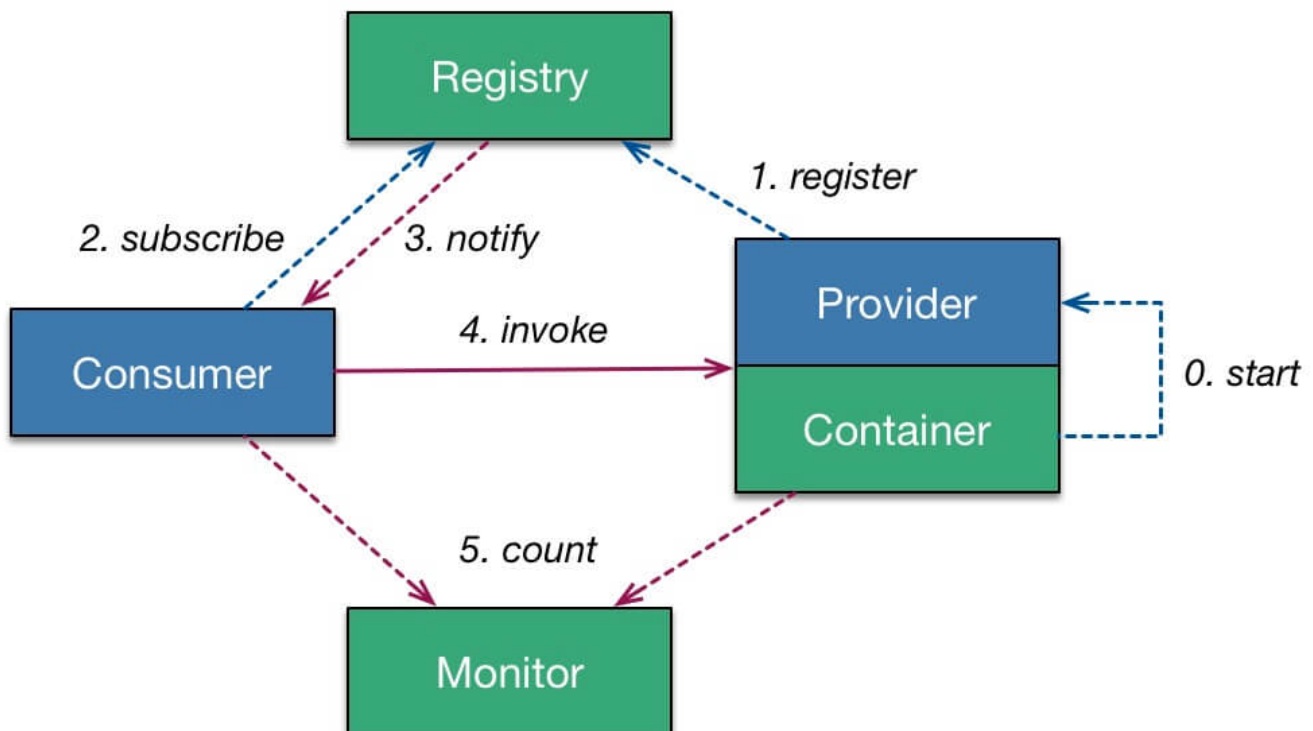- IntelliJ IDEA

2. 源码拉取

从官方仓库 https://github.com/alibaba/dubbo `Fork` 出属于自己的仓库。为什么要 `Fork`？既然开始阅读、调试源码，我们可能会写一些注释，有了自己的仓库，可以进行自由的提交。😈

使用 `IntelliJ IDEA` 从 `Fork` 出来的仓库拉取代码。拉取完成后，`Maven` 会下载依赖包，可能会花费一些时间，耐心等待下。

在等待的过程中，我们可以来看一张 Dubbo 的架构图

在图中，本文会涉及到的有三个角色：

- Registry 注册中心，用于服务的注册与发现。

- Provider 服务提供者，通过向 Registry 注册服务。
- Consumer 服务消费者，通过从 Registry 发现服务。

另外，Consumer 对 Provider 的调用，**直接发起**，无需经过 Registry 。

Dubbo 提供了 `dubbo-demo` 项目，用于开发者快速入门。
本文也使用该项目，搭建调试环境。

3. Registry

Dubbo 提供了多种 Registry 的实现，参见 《注册中心参考手册》 。

在 `dubbo-demo` 项目中，使用 Multicast Registry 。
实际**生产环境**中，使用 Zookeeper Registry 。

> 友情提示：「3.1 Multicast Registry」 和 「3.2 Zookeeper Registry」 二选一，建议先使用
> 前者搭建调试环境，因为简单方便。

3.1 Multicast Registry

Multicast Registry 基于 组播协议 实现，详细参见文档 《Multicast 注册中心》 。

> Multicast 注册中心不需要启动任何中心节点，只要广播地址一样，就可以互相发现。

注意，不需要启动！！！ 简单的说，本小节的内容可以直接跳过。

3.2 Zookeeper Registry

Zookeeper Registry 基于 Zookeeper 实现，详细参见文档 《zookeeper 注册中心》 。

搭建步骤如下：

1、启动 Zookeeper 服务。

```
$ pwd
/Users/yunai/百度云同步盘/Programs/Zookeeper/zookeeper-3.4.8

$ bin/zkServer.sh start
ZooKeeper JMX enabled by default
```

```
Using config: /Users/yunai/百度云同步盘/Programs/Zookeeper/zookeeper-3.4.8/bin/../co
nf/zoo.cfg
Starting zookeeper ... STARTED
```

2、修改 `dubbo-demo-provider.xml` ，启动 Provider 。

```
<!--<dubbo:registry address="multicast://224.5.6.7:1234"/>-->
<dubbo:registry address="zookeeper://127.0.0.1:2181"/>
```

3、修改 `dubbo-demo-consumer.xml` ，启动 Consumer 。

```
<!--<dubbo:registry address="multicast://224.5.6.7:1234"/>-->
<dubbo:registry address="zookeeper://127.0.0.1:2181"/>
```

4. Provider

在 IDEA 中，右键 **Debug** 运行 `com.alibaba.dubbo.demo.provider.Provider` 。

当输出如下日志，表示成功：

```
[18/02/18 10:04:42:042 CST] main  INFO support.ClassPathXmlApplicationContext: Refr
eshing org.springframework.context.support.ClassPathXmlApplicationContext@cd2dae5:
startup date [Sun Feb 18 10:04:42 CST 2018]; root of context hierarchy
[18/02/18 10:04:42:042 CST] main  INFO xml.XmlBeanDefinitionReader: Loading XML bea
n definitions from class path resource [META-INF/spring/dubbo-demo-provider.xml]
[18/02/18 10:04:42:042 CST] main  INFO logger.LoggerFactory: using logger: com.alib
aba.dubbo.common.logger.log4j.Log4jLoggerAdapter
[18/02/18 10:04:53:053 CST] main  INFO config.AbstractConfig:  [DUBBO] The service
ready on spring started. service: com.alibaba.dubbo.demo.DemoService, dubbo version
: 2.0.0, current host: 192.168.1.116
[18/02/18 10:05:13:013 CST] main  INFO config.AbstractConfig:  [DUBBO] Export dubbo
 service com.alibaba.dubbo.demo.DemoService to local registry, dubbo version: 2.0.0
, current host: 192.168.1.116
[18/02/18 10:05:13:013 CST] main  INFO config.AbstractConfig:  [DUBBO] Export dubbo
 service com.alibaba.dubbo.demo.DemoService to url dubbo://192.168.1.116:20880/com.
alibaba.dubbo.demo.DemoService?anyhost=true&application=demo-provider&bind.ip=192.1
68.1.116&bind.port=20880&dubbo=2.0.0&generic=false&interface=com.alibaba.dubbo.demo
.DemoService&methods=sayHello&pid=43392&qos.port=22222&side=provider&timestamp=1518
919503284, dubbo version: 2.0.0, current host: 192.168.1.116
[18/02/18 10:05:13:013 CST] main  INFO config.AbstractConfig:  [DUBBO] Register dub
bo service com.alibaba.dubbo.demo.DemoService url dubbo://192.168.1.116:20880/com.a
```

libaba.dubbo.demo.DemoService?anyhost=true&application=demo-provider&bind.ip=192.16
8.1.116&bind.port=20880&dubbo=2.0.0&generic=false&interface=com.alibaba.dubbo.demo.
DemoService&methods=sayHello&pid=43392&qos.port=22222&side=provider&timestamp=15189
19503284 to registry registry://224.5.6.7:1234/com.alibaba.dubbo.registry.RegistryS
ervice?application=demo-provider&dubbo=2.0.0&pid=43392&qos.port=22222&registry=mult
icast&timestamp=1518919493265, dubbo version: 2.0.0, current host: 192.168.1.116
[18/02/18 10:05:13:013 CST] main INFO transport.AbstractServer: [DUBBO] Start Net
tyServer bind /0.0.0.0:20880, export /192.168.1.116:20880, dubbo version: 2.0.0, cu
rrent host: 192.168.1.116
[18/02/18 10:05:20:020 CST] main INFO multicast.MulticastRegistry: [DUBBO] Regist
er: dubbo://192.168.1.116:20880/com.alibaba.dubbo.demo.DemoService?anyhost=true&app
lication=demo-provider&dubbo=2.0.0&generic=false&interface=com.alibaba.dubbo.demo.D
emoService&methods=sayHello&pid=43392&side=provider&timestamp=1518919503284, dubbo
version: 2.0.0, current host: 192.168.1.116
[18/02/18 10:05:20:020 CST] main INFO multicast.MulticastRegistry: [DUBBO] Send b
roadcast message: register dubbo://192.168.1.116:20880/com.alibaba.dubbo.demo.DemoS
ervice?anyhost=true&application=demo-provider&dubbo=2.0.0&generic=false&interface=c
om.alibaba.dubbo.demo.DemoService&methods=sayHello&pid=43392&side=provider&timestam
p=1518919503284 to /224.5.6.7:1234, dubbo version: 2.0.0, current host: 192.168.1.1
16
[18/02/18 10:05:20:020 CST] DubboMulticastRegistryReceiver INFO multicast.Multicas
tRegistry: [DUBBO] Receive multicast message: register dubbo://192.168.1.116:20880
/com.alibaba.dubbo.demo.DemoService?anyhost=true&application=demo-provider&dubbo=2.
0.0&generic=false&interface=com.alibaba.dubbo.demo.DemoService&methods=sayHello&pid
=43392&side=provider&timestamp=1518919503284 from /192.168.1.116:1234, dubbo versio
n: 2.0.0, current host: 192.168.1.116
[18/02/18 10:05:20:020 CST] main INFO multicast.MulticastRegistry: [DUBBO] Subscr
ibe: provider://192.168.1.116:20880/com.alibaba.dubbo.demo.DemoService?anyhost=true
&application=demo-provider&category=configurators&check=false&dubbo=2.0.0&generic=f
alse&interface=com.alibaba.dubbo.demo.DemoService&methods=sayHello&pid=43392&side=p
rovider&timestamp=1518919503284, dubbo version: 2.0.0, current host: 192.168.1.116
[18/02/18 10:05:20:020 CST] main INFO multicast.MulticastRegistry: [DUBBO] Send b
roadcast message: subscribe provider://192.168.1.116:20880/com.alibaba.dubbo.demo.D
emoService?anyhost=true&application=demo-provider&category=configurators&check=fals
e&dubbo=2.0.0&generic=false&interface=com.alibaba.dubbo.demo.DemoService&methods=sa
yHello&pid=43392&side=provider&timestamp=1518919503284 to /224.5.6.7:1234, dubbo ve
rsion: 2.0.0, current host: 192.168.1.116
[18/02/18 10:05:20:020 CST] DubboMulticastRegistryReceiver INFO multicast.Multicas
tRegistry: [DUBBO] Receive multicast message: subscribe provider://192.168.1.116:2
0880/com.alibaba.dubbo.demo.DemoService?anyhost=true&application=demo-provider&cate
gory=configurators&check=false&dubbo=2.0.0&generic=false&interface=com.alibaba.dubb
o.demo.DemoService&methods=sayHello&pid=43392&side=provider&timestamp=1518919503284
 from /192.168.1.116:1234, dubbo version: 2.0.0, current host: 192.168.1.116
[18/02/18 10:05:21:021 CST] main WARN multicast.MulticastRegistry: [DUBBO] Ignore
 empty notify urls for subscribe url provider://192.168.1.116:20880/com.alibaba.dub
bo.demo.DemoService?anyhost=true&application=demo-provider&category=configurators&c
heck=false&dubbo=2.0.0&generic=false&interface=com.alibaba.dubbo.demo.DemoService&m
ethods=sayHello&pid=43392&side=provider&timestamp=1518919503284, dubbo version: 2.0

```
.0, current host: 192.168.1.116
```

注意，如果使用 Multicast Registry 作为注册中心，在 IDEA 中需要使用 **Debug** 模式运行，原因
参见：dubbo-demo set "java.net.preferIPv4Stack" not work 。

5. Consumer

在 IDEA 中，右键 **Debug** 运行 `com.alibaba.dubbo.demo.consumer.Consumer` 。

当输出如下日志，表示成功：

```
[18/02/18 09:45:22:022 CST] main  INFO support.ClassPathXmlApplicationContext: Refr
eshing org.springframework.context.support.ClassPathXmlApplicationContext@cd2dae5:
startup date [Sun Feb 18 09:45:22 CST 2018]; root of context hierarchy
[18/02/18 09:45:22:022 CST] main  INFO xml.XmlBeanDefinitionReader: Loading XML bea
n definitions from class path resource [META-INF/spring/dubbo-demo-consumer.xml]
[18/02/18 09:45:22:022 CST] main  INFO logger.LoggerFactory: using logger: com.alib
aba.dubbo.common.logger.log4j.Log4jLoggerAdapter
[18/02/18 09:45:45:045 CST] main  INFO multicast.MulticastRegistry:  [DUBBO] Regist
er: consumer://192.168.1.116/com.alibaba.dubbo.demo.DemoService?application=demo-co
nsumer&category=consumers&check=false&dubbo=2.0.0&interface=com.alibaba.dubbo.demo.
DemoService&methods=sayHello&pid=43363&qos.port=33333&side=consumer&timestamp=15189
18323457, dubbo version: 2.0.0, current host: 192.168.1.116
[18/02/18 09:45:45:045 CST] main  INFO multicast.MulticastRegistry:  [DUBBO] Send b
roadcast message: register consumer://192.168.1.116/com.alibaba.dubbo.demo.DemoServ
ice?application=demo-consumer&category=consumers&check=false&dubbo=2.0.0&interface=
com.alibaba.dubbo.demo.DemoService&methods=sayHello&pid=43363&qos.port=33333&side=c
onsumer&timestamp=1518918323457 to /224.5.6.7:1234, dubbo version: 2.0.0, current h
ost: 192.168.1.116
[18/02/18 09:45:45:045 CST] main  INFO multicast.MulticastRegistry:  [DUBBO] Subscr
ibe: consumer://192.168.1.116/com.alibaba.dubbo.demo.DemoService?application=demo-c
onsumer&category=providers,configurators,routers&check=false&dubbo=2.0.0&interface=
com.alibaba.dubbo.demo.DemoService&methods=sayHello&pid=43363&qos.port=33333&side=c
onsumer&timestamp=1518918323457, dubbo version: 2.0.0, current host: 192.168.1.116
[18/02/18 09:45:45:045 CST] DubboMulticastRegistryReceiver  INFO multicast.Multicas
tRegistry:  [DUBBO] Receive multicast message: register consumer://192.168.1.116/co
m.alibaba.dubbo.demo.DemoService?application=demo-consumer&category=consumers&check
=false&dubbo=2.0.0&interface=com.alibaba.dubbo.demo.DemoService&methods=sayHello&pi
d=43363&qos.port=33333&side=consumer&timestamp=1518918323457 from /192.168.1.116:12
34, dubbo version: 2.0.0, current host: 192.168.1.116
[18/02/18 09:45:45:045 CST] main  INFO multicast.MulticastRegistry:  [DUBBO] Send b
roadcast message: subscribe consumer://192.168.1.116/com.alibaba.dubbo.demo.DemoSer
vice?application=demo-consumer&category=providers,configurators,routers&check=false
&dubbo=2.0.0&interface=com.alibaba.dubbo.demo.DemoService&methods=sayHello&pid=4336
```

```
3&qos.port=33333&side=consumer&timestamp=1518918323457 to /224.5.6.7:1234, dubbo ve
rsion: 2.0.0, current host: 192.168.1.116
[18/02/18 09:45:45:045 CST] DubboMulticastRegistryReceiver  INFO multicast.Multicas
tRegistry:  [DUBBO] Receive multicast message: subscribe consumer://192.168.1.116/c
om.alibaba.dubbo.demo.DemoService?application=demo-consumer&category=providers,conf
igurators,routers&check=false&dubbo=2.0.0&interface=com.alibaba.dubbo.demo.DemoServ
ice&methods=sayHello&pid=43363&qos.port=33333&side=consumer&timestamp=1518918323457
 from /192.168.1.116:1234, dubbo version: 2.0.0, current host: 192.168.1.116
[18/02/18 09:45:45:045 CST] DubboMulticastRegistryReceiver  INFO multicast.Multicas
tRegistry:  [DUBBO] Receive multicast message: register dubbo://192.168.1.116:20880
/com.alibaba.dubbo.demo.DemoService?anyhost=true&application=demo-provider&dubbo=2.
0.0&generic=false&interface=com.alibaba.dubbo.demo.DemoService&methods=sayHello&pid
=43355&side=provider&timestamp=1518918226970 from /192.168.1.116:1234, dubbo versio
n: 2.0.0, current host: 192.168.1.116
[18/02/18 09:45:45:045 CST] DubboMulticastRegistryReceiver  INFO multicast.Multicas
tRegistry:  [DUBBO] Notify urls for subscribe url consumer://192.168.1.116/com.alib
aba.dubbo.demo.DemoService?application=demo-consumer&category=providers,configurato
rs,routers&check=false&dubbo=2.0.0&interface=com.alibaba.dubbo.demo.DemoService&met
hods=sayHello&pid=43363&qos.port=33333&side=consumer&timestamp=1518918323457, urls:
 [dubbo://192.168.1.116:20880/com.alibaba.dubbo.demo.DemoService?anyhost=true&appli
cation=demo-provider&dubbo=2.0.0&generic=false&interface=com.alibaba.dubbo.demo.Dem
oService&methods=sayHello&pid=43355&side=provider&timestamp=1518918226970], dubbo v
ersion: 2.0.0, current host: 192.168.1.116
[18/02/18 09:45:45:045 CST] DubboMulticastRegistryReceiver  INFO transport.Abstract
Client:  [DUBBO] Successed connect to server /192.168.1.116:20880 from NettyClient
192.168.1.116 using dubbo version 2.0.0, channel is NettyChannel [channel=[id: 0x1b
7bac12, /192.168.1.116:63856 => /192.168.1.116:20880]], dubbo version: 2.0.0, curre
nt host: 192.168.1.116
[18/02/18 09:45:45:045 CST] DubboMulticastRegistryReceiver  INFO transport.Abstract
Client:  [DUBBO] Start NettyClient 123312.local/192.168.1.116 connect to the server
 /192.168.1.116:20880, dubbo version: 2.0.0, current host: 192.168.1.116
[18/02/18 09:45:45:045 CST] main  INFO multicast.MulticastRegistry:  [DUBBO] Notify
 urls for subscribe url consumer://192.168.1.116/com.alibaba.dubbo.demo.DemoService
?application=demo-consumer&category=providers,configurators,routers&check=false&dub
bo=2.0.0&interface=com.alibaba.dubbo.demo.DemoService&methods=sayHello&pid=43363&qo
s.port=33333&side=consumer&timestamp=1518918323457, urls: [dubbo://192.168.1.116:20
880/com.alibaba.dubbo.demo.DemoService?anyhost=true&application=demo-provider&dubbo
=2.0.0&generic=false&interface=com.alibaba.dubbo.demo.DemoService&methods=sayHello&
pid=43355&side=provider&timestamp=1518918226970], dubbo version: 2.0.0, current hos
t: 192.168.1.116
[18/02/18 09:45:45:045 CST] main  INFO config.AbstractConfig:  [DUBBO] Refer dubbo
service com.alibaba.dubbo.demo.DemoService from url multicast://224.5.6.7:1234/com.
alibaba.dubbo.registry.RegistryService?anyhost=true&application=demo-consumer&check
=false&dubbo=2.0.0&generic=false&interface=com.alibaba.dubbo.demo.DemoService&metho
ds=sayHello&pid=43363&qos.port=33333&register.ip=192.168.1.116&remote.timestamp=151
8918226970&side=consumer&timestamp=1518918323457, dubbo version: 2.0.0, current hos
t: 192.168.1.116
Hello world, response form provider: 192.168.1.116:20880
```

```
Hello world, response form provider: 192.168.1.116:20880
Hello world, response form provider: 192.168.1.116:20880
Hello world, response form provider: 192.168.1.116:20880
Hello world, response form provider: 192.168.1.116:20880
Hello world, response form provider: 192.168.1.116:20880
Hello world, response form provider: 192.168.1.116:20880
Hello world, response form provider: 192.168.1.116:20880
Hello world, response form provider: 192.168.1.116:20880
Hello world, response form provider: 192.168.1.116:20880
Hello world, response form provider: 192.168.1.116:20880
```

666. 彩蛋

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