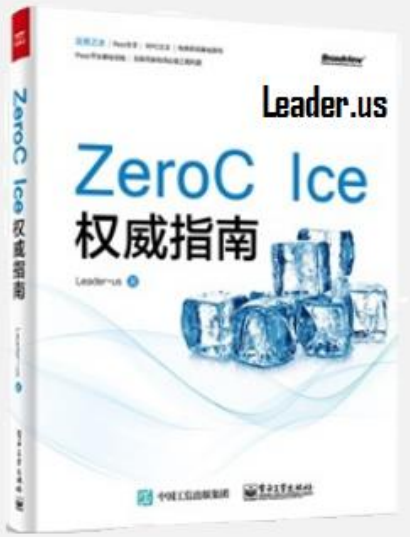
Zeroc Ice微服务架构企业应用实践指南

五：强大的IceGrid



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Leader.us高端架构师精品系列课程

本集视频主要内容

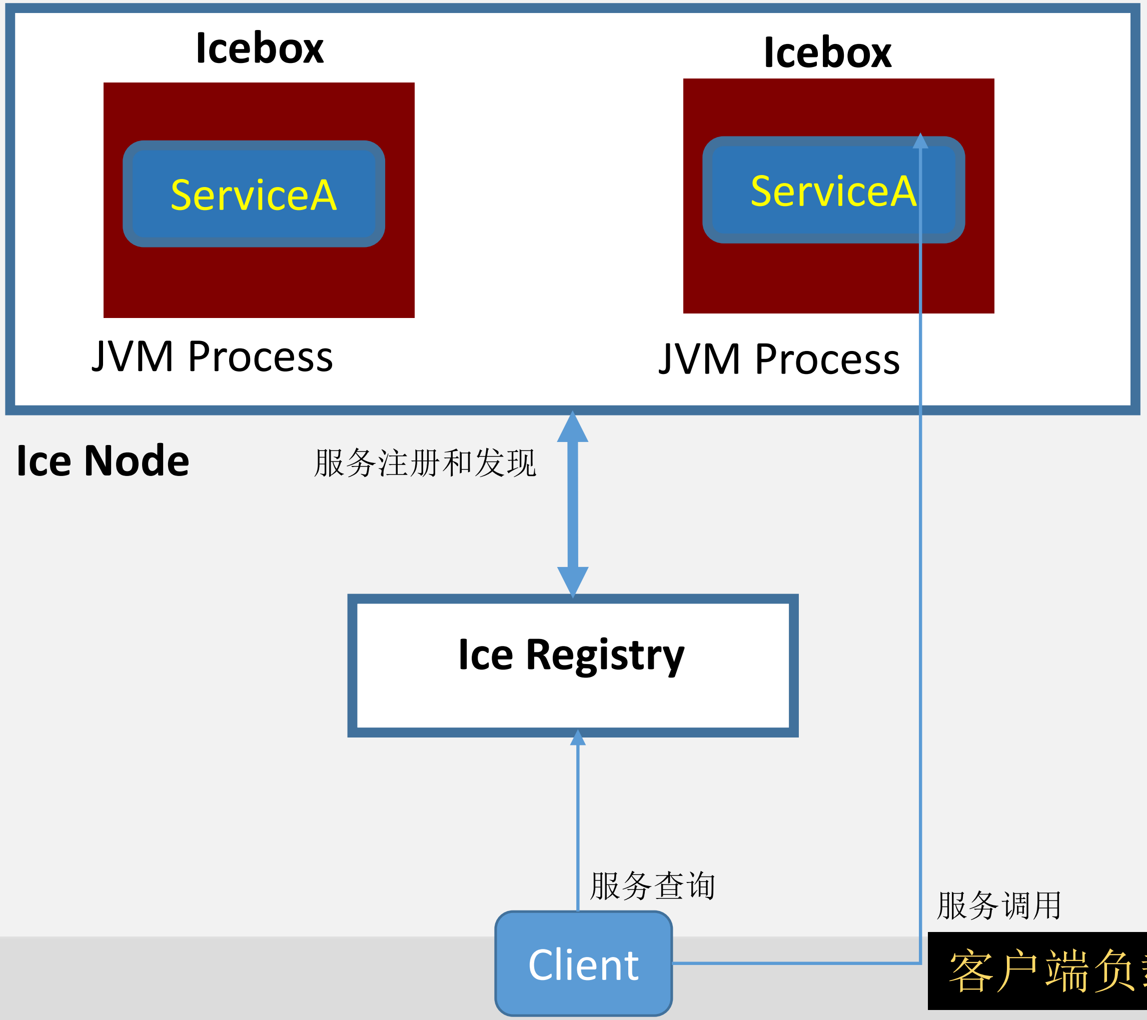
- IceGrid的组成与原理
- IceGrid编程实践

IceGrid所要解决的问题

第一：服务注册与服务发现

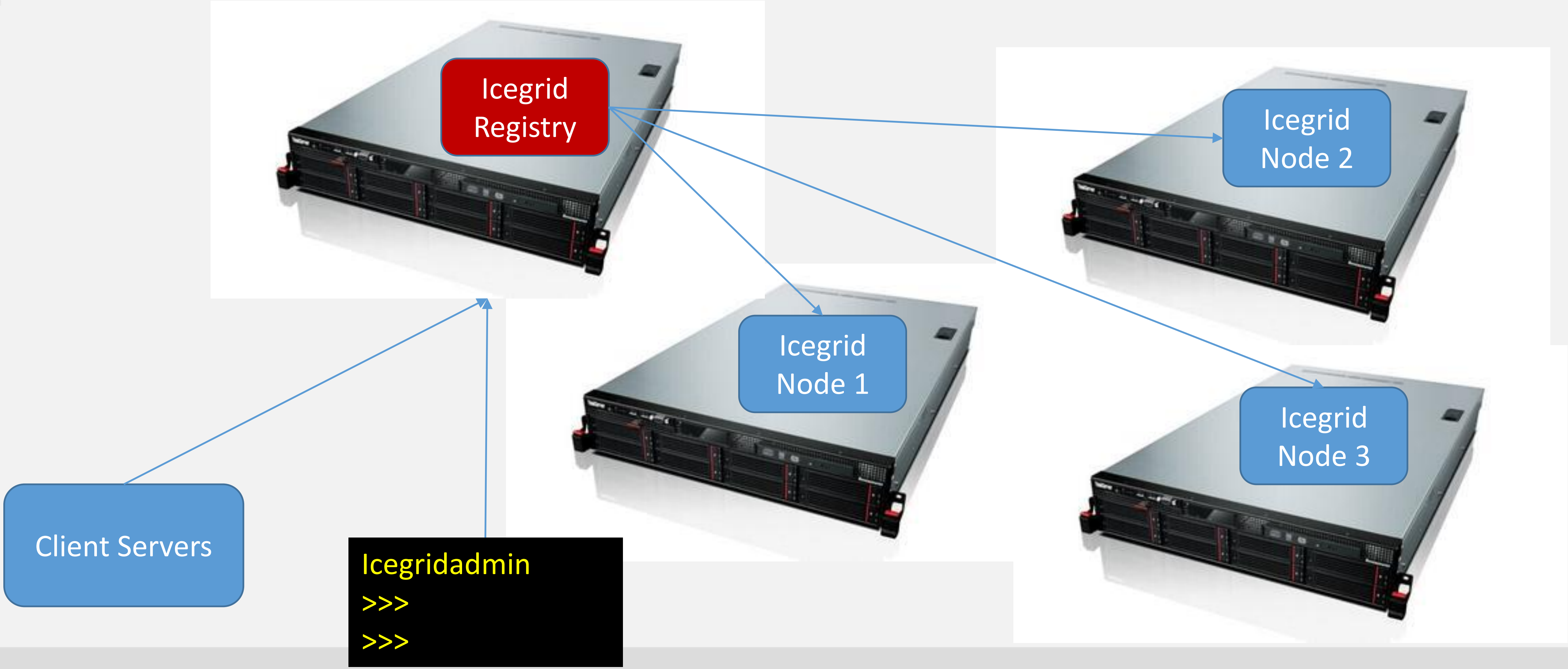
第二：服务部署与系统运维

IceGrid是什么



客户端负载均衡机制

IceGrid部署架构示意图



Icegrid Registry

Icegrid Node 1

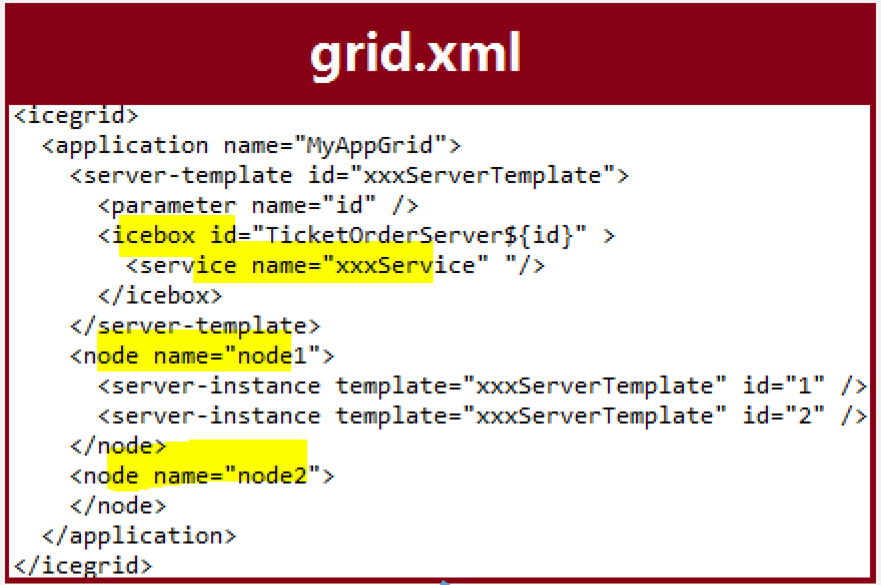
Icegrid Node 2

Icegrid Node 3

Client Servers

```
Icegridadmin
>>>
>>>
```

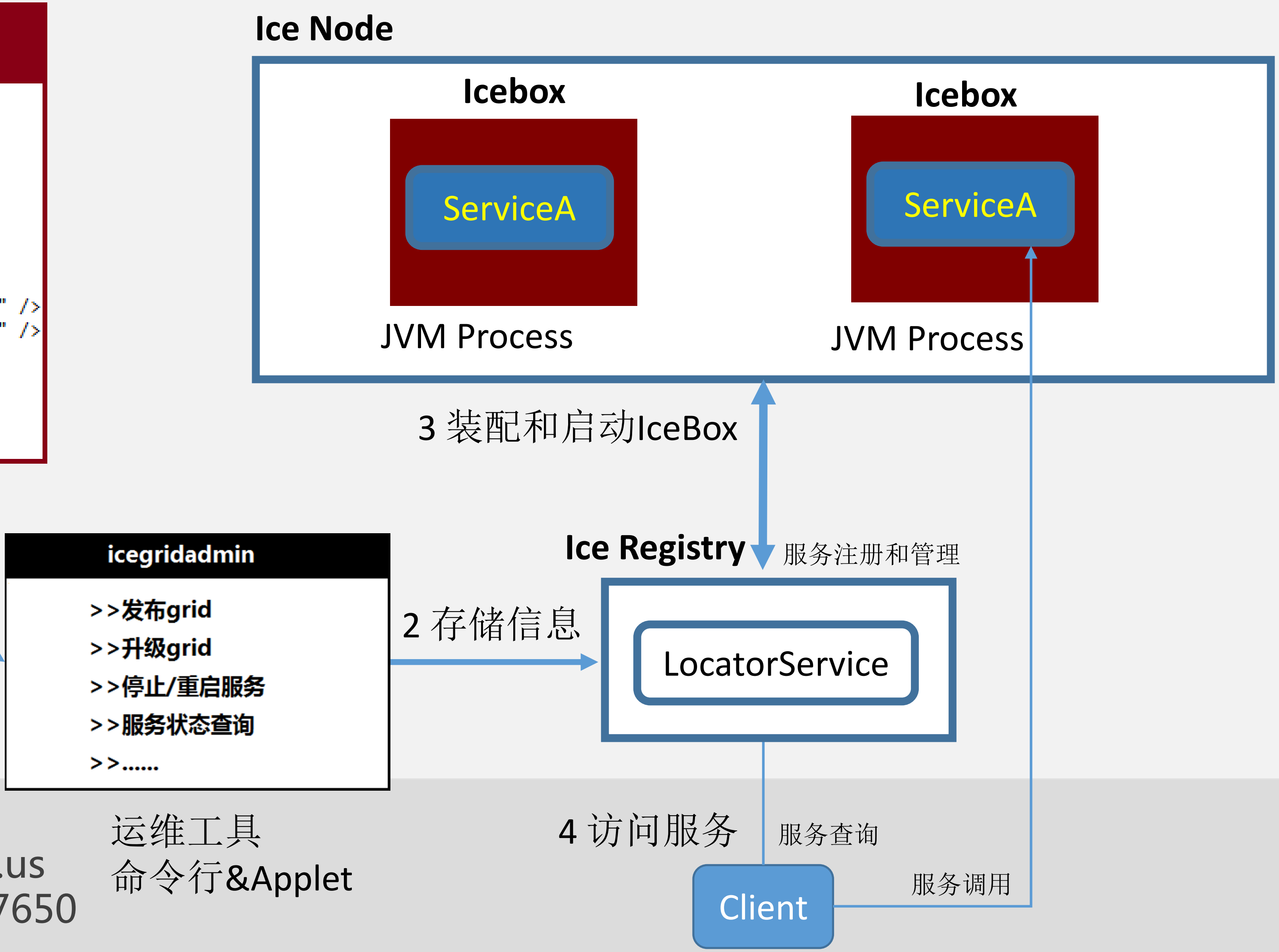
IceGrid服务发布流程



grid.xml

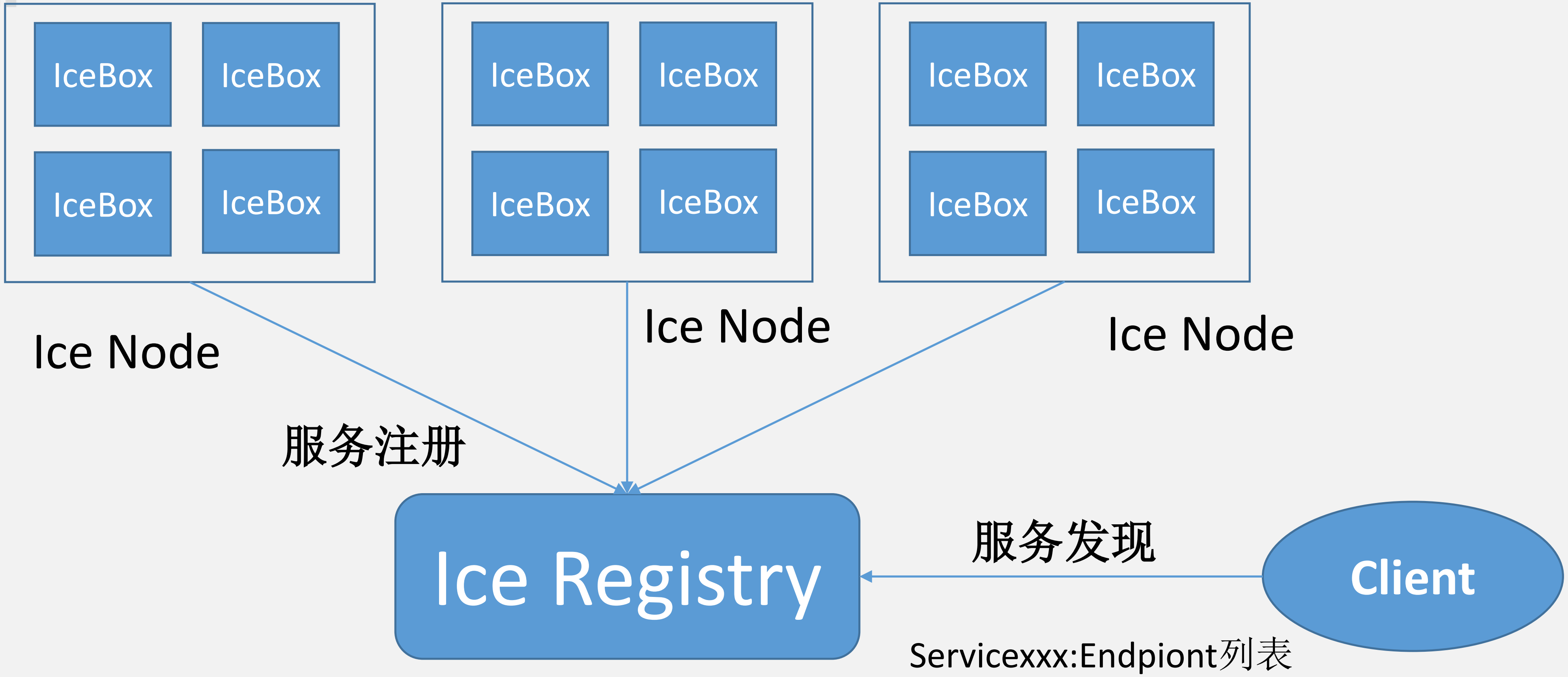
```
<icegrid>
  <application name="MyAppGrid">
    <server-template id="xxxServerTemplate">
      <parameter name="id" />
      <icebox id="TicketOrderServer${id}" >
        <service name="xxxService" "/>
      </icebox>
    </server-template>
    <node name="node1">
      <server-instance template="xxxServerTemplate" id="1" />
      <server-instance template="xxxServerTemplate" id="2" />
    </node>
    <node name="node2">
    </node>
  </application>
</icegrid>
```

1 微服务描述及部署文件

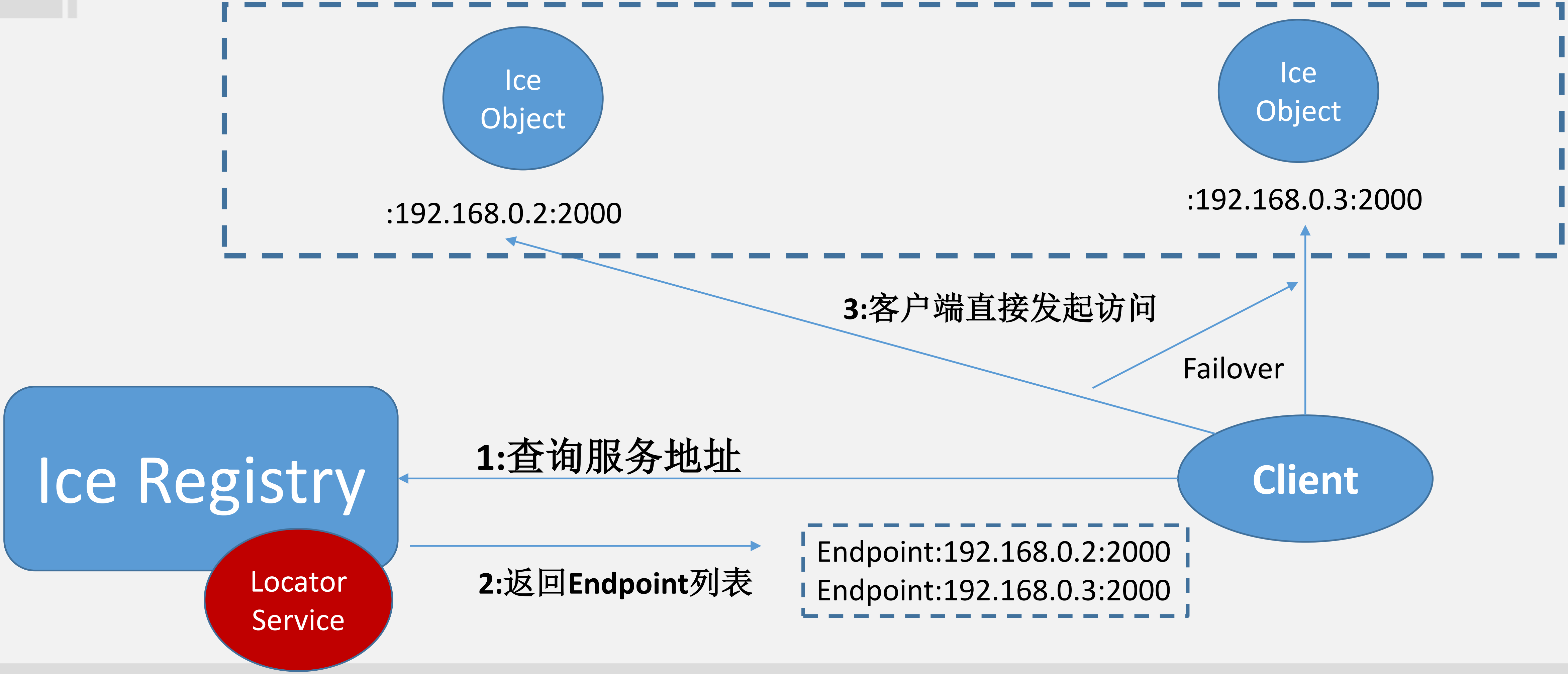


运维工具
命令行&Applet

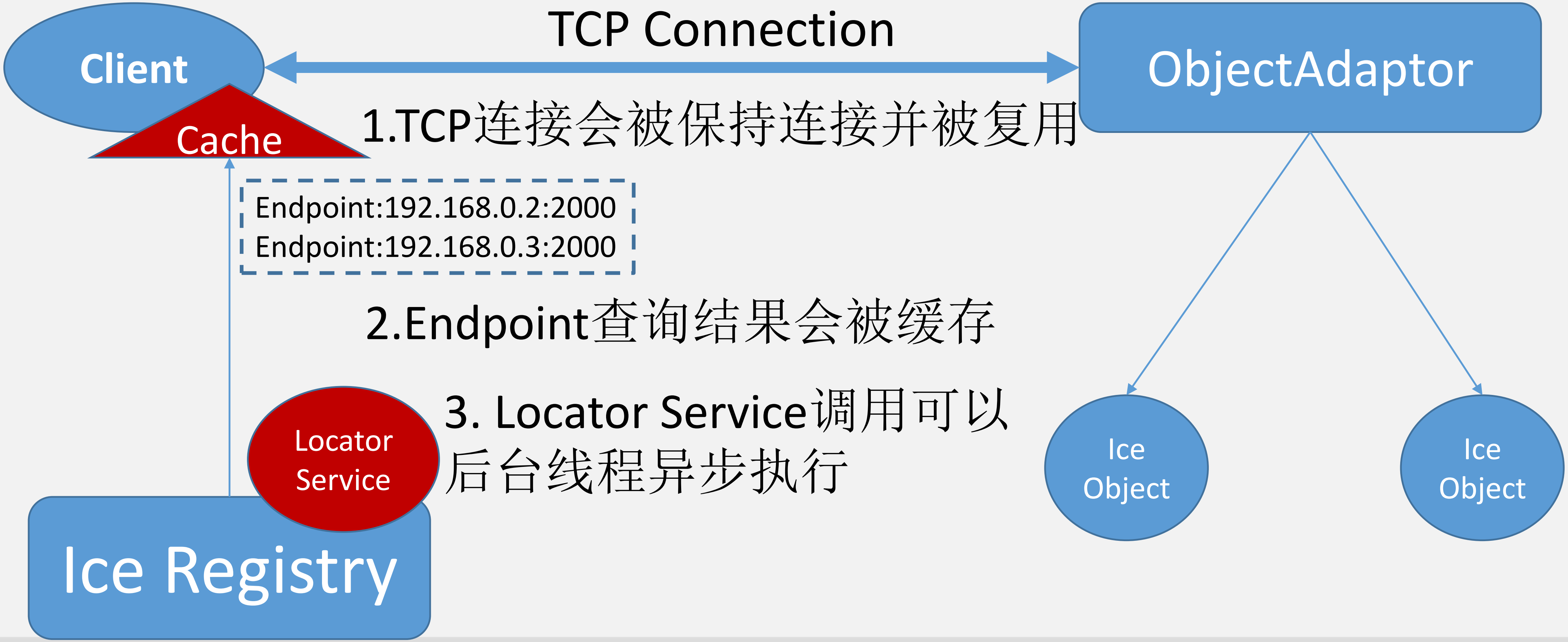
IceGrid服务注册与服务发现机制



IceGrid负载均衡和容错机制



IceGrid负载均衡的高级特性

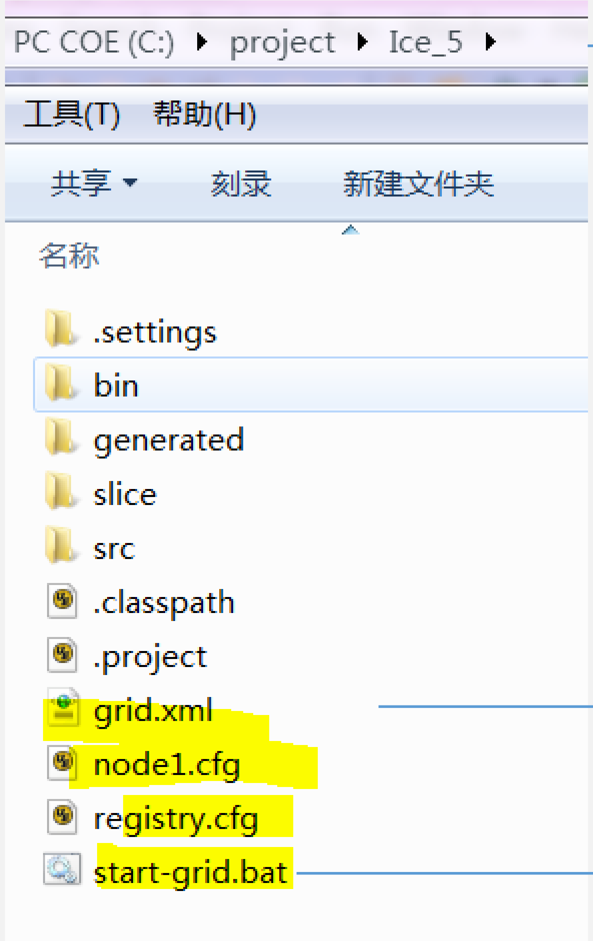


1.TCP连接会被保持连接并被复用

2.Endpoint查询结果会被缓存

3. Locator Service调用可以后台线程异步执行

工程项目说明



PC COE (C:) ▸ project ▸ Ice_5 ▸

.settings
bin
generated
slice
src
.classpath
.project
grid.xml
node1.cfg
registry.cfg
start-grid.bat

C:\project\ice_5

Grid描述文件

启动grid的命令

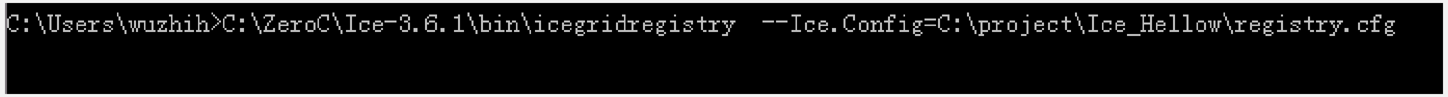
Ice Registry配置文件

建立配置文件 registry.cfg (C:\project\Ice_Hellow)

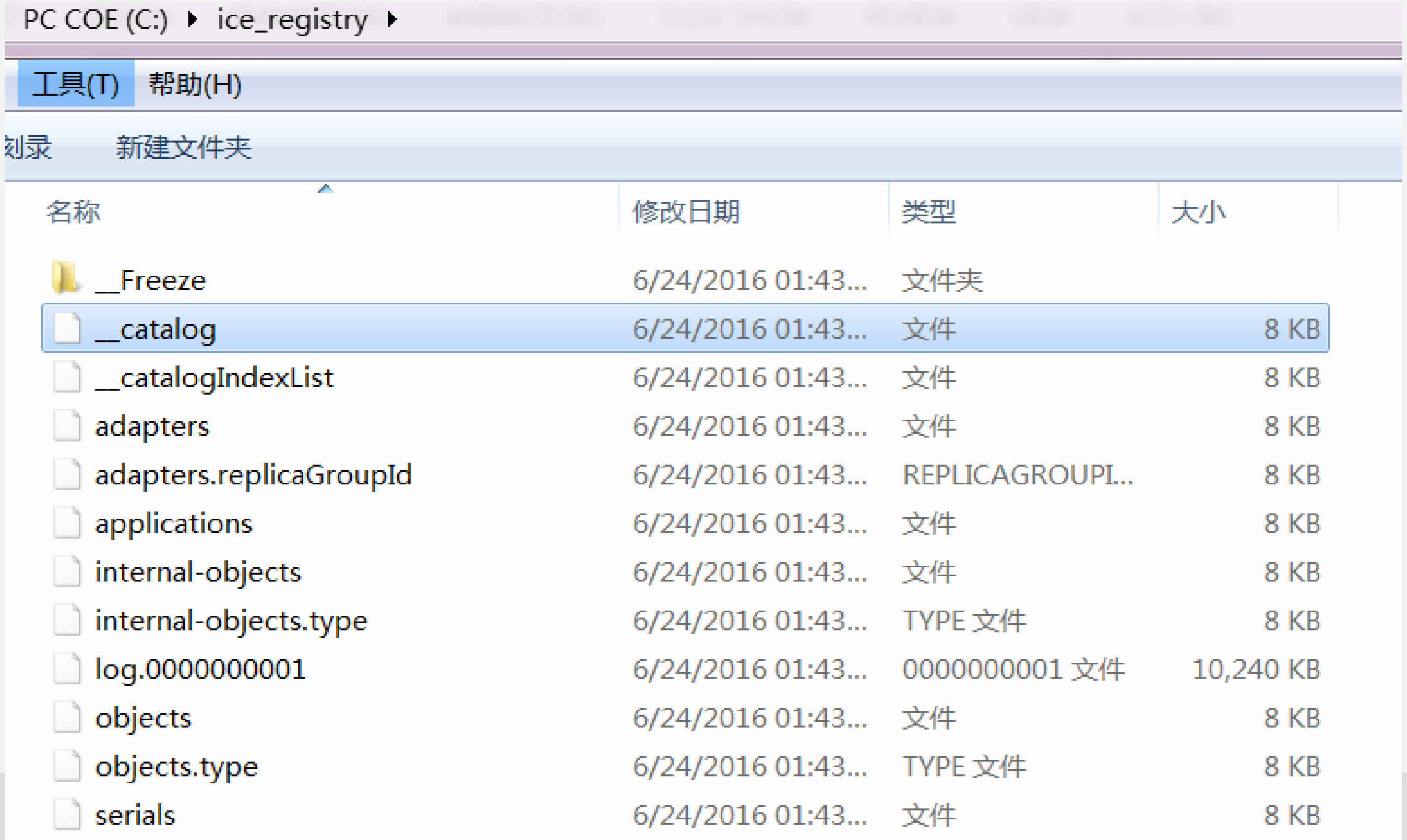
```
#registry config for icegrid
IceGrid.Registry.Client.Endpoints=tcp -p 4061
IceGrid.Registry.Server.Endpoints=tcp
IceGrid.Registry.Internal.Endpoints=tcp
IceGrid.Registry.AdminPermissionsVerifier=IceGrid/NullPermissionsVerifier
IceGrid.Registry.Data=c:\ice_registry
IceGrid.Registry.DynamicRegistration=1
Ice.LogFile=c:\ice.log
```

Ice Registry启动命令

```
C:\ZeroC\Ice-3.6.1\bin\icegridregistry  --Ice.Config=C:\project\Ice_Hellow\registry.cfg
```



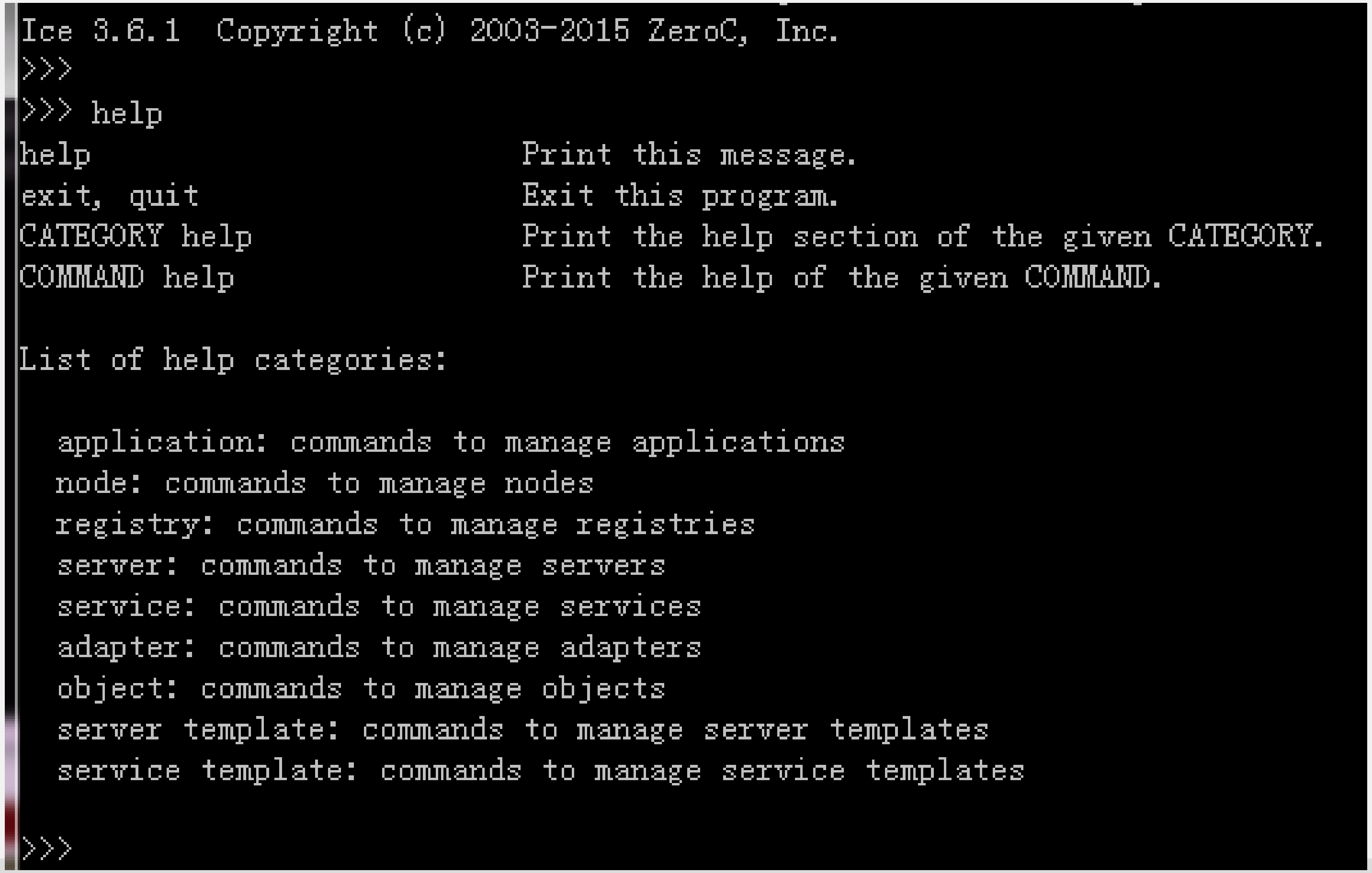
```
C:\Users\wuzhih>C:\ZeroC\Ice-3.6.1\bin\icegridregistry  --Ice.Config=C:\project\Ice_Hellow\registry.cfg
```



名称	修改日期	类型	大小
__Freeze	6/24/2016 01:43...	文件夹	
__catalog	6/24/2016 01:43...	文件	8 KB
__catalogIndexList	6/24/2016 01:43...	文件	8 KB
adapters	6/24/2016 01:43...	文件	8 KB
adapters.replicaGroupId	6/24/2016 01:43...	REPLICAGROUPI...	8 KB
applications	6/24/2016 01:43...	文件	8 KB
internal-objects	6/24/2016 01:43...	文件	8 KB
internal-objects.type	6/24/2016 01:43...	TYPE 文件	8 KB
log.0000000001	6/24/2016 01:43...	0000000001 文件	10,240 KB
objects	6/24/2016 01:43...	文件	8 KB
objects.type	6/24/2016 01:43...	TYPE 文件	8 KB
serials	6/24/2016 01:43...	文件	8 KB

启动icegridadmin

```
C:\ZeroC\Ice-3.6.1\bin\icegridadmin  -u test -p test --Ice.Default.Locator="IceGrid/Locator:tcp -h localhost -p 4061"
```



```
Ice 3.6.1  Copyright (c) 2003-2015 ZeroC, Inc.
>>>
>>> help
help                          Print this message.
exit, quit                    Exit this program.
CATEGORY help                 Print the help section of the given CATEGORY.
COMMAND help                  Print the help of the given COMMAND.

List of help categories:

  application: commands to manage applications
  node: commands to manage nodes
  registry: commands to manage registries
  server: commands to manage servers
  service: commands to manage services
  adapter: commands to manage adapters
  object: commands to manage objects
  server template: commands to manage server templates
  service template: commands to manage service templates

>>>
```

Ice Node配置文件

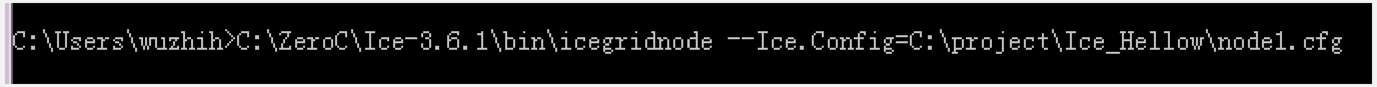
建立配置文件 node1.cfg (C:\project\Ice_Hellow)

```
#指定主注册节点的位置
Ice.Default.Locator=IceGrid/Locator:tcp -h localhost -p 4061
#指定节点1的名称
IceGrid.Node.Name=node1
#设置节点1相关数据的存储目录
IceGrid.Node.Data=c:\ice_node1\data
#指定节点1用于监听客户端连接的端口号
IceGrid.Node.Endpoints=tcp -p 5062
Ice.StdErr=c:\ice_node1\node.stderr.log
#指定错误日志文件
Ice.StdOut=c:\ice_node1\node.stdout.log
```

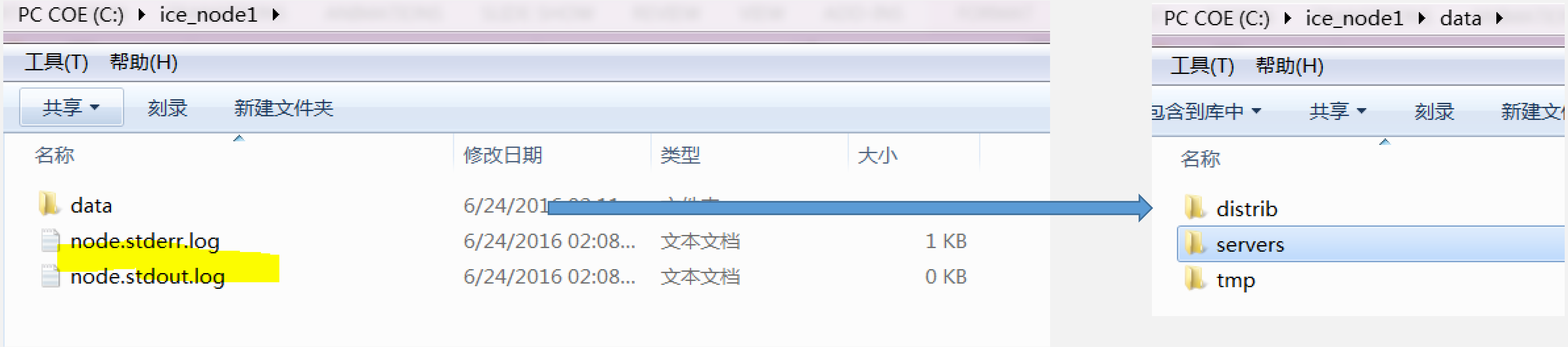
目录必须提前创建好！！！

日志文件要配置！！！

启动Ice Node



```
C:\Users\wuzhih>C:\ZeroC\Ice-3.6.1\bin\icegridnode --Ice.Config=C:\project\Ice_Hellow\node1.cfg
```



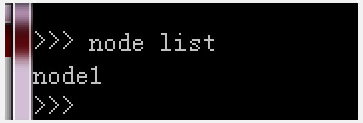
PC COE (C:) ▸ ice_node1 ▸
工具(T) 帮助(H)
共享 ▾ 刻录 新建文件夹

名称	修改日期	类型	大小
data	6/24/201		
node.stderr.log	6/24/2016 02:08...	文本文档	1 KB
node.stdout.log	6/24/2016 02:08...	文本文档	0 KB

PC COE (C:) ▸ ice_node1 ▸ data ▸
工具(T) 帮助(H)
包含到库中 ▾ 共享 ▾ 刻录 新建文

名称
distrib
servers
tmp

icegridadmin



```
>>> node list
node1
>>>
```

验证节点已经加入Grid中

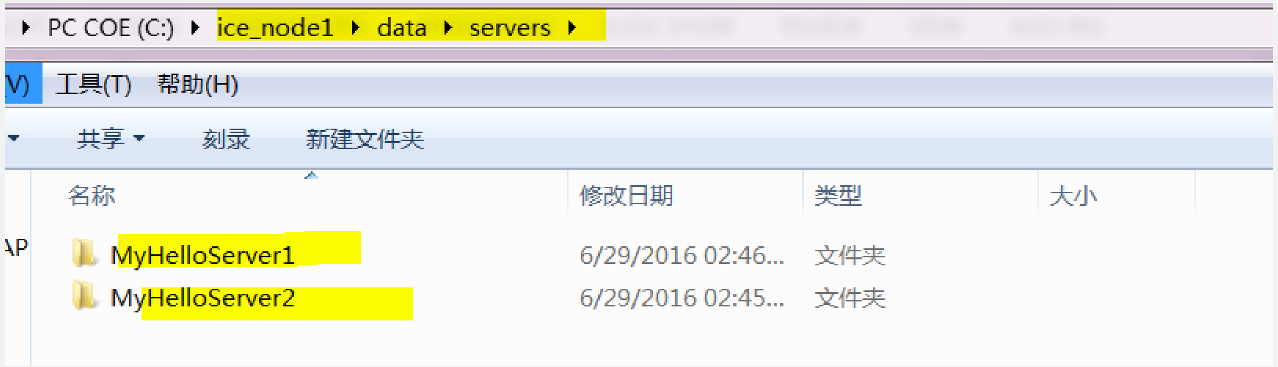
定义Ice Grid XML

grid.xml

```
<icegrid>
<application name="MyApp">
<properties id="props">
</properties>
<server-template id="MyHelloServerTemplate">
<parameter name="id" />
<icebox id="MyHelloServer${id}" exe="java“ user=“ice”>
<properties>
<properties refid="props" />
</properties>
<option>IceBox.Server</option>
<env>CLASSPATH=C:\ZeroC\Ice-3.6.1\lib\*;C:\project\Ice_Hellow\bin</env>
<service name="MyService" entry="com.my.demo.MyHelloBoxService">
<adapter name="MyService" id="MyService${id}" endpoints="default“ replica-group="MyServiceRep">
</adapter>
</service>
</icebox>
</server-template>
<replica-group id="MyServiceRep">
<load-balancing type="round-robin" n-replicas="0" />
<object identity="MyService" type="::demo::MyService" />
</replica-group>
<node name="node1">
<server-instance template="MyHelloServerTemplate" id="1" />
<server-instance template="MyHelloServerTemplate" id="2" />
</node>
<node name="node2">
</node>
</application>
</icegrid>
```

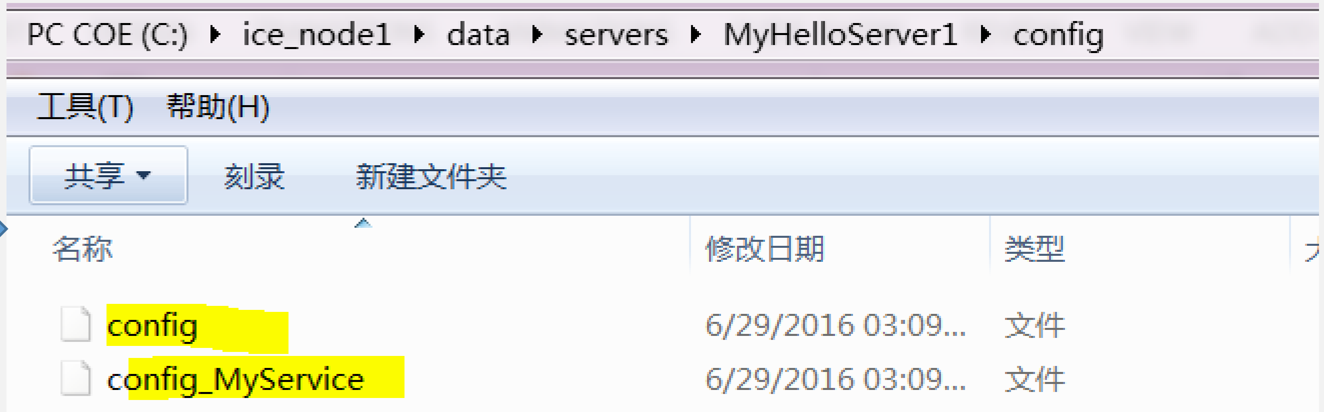
发布Grid应用

```
>>> application add C:\project\Ice_Hellow\grid.xml
>>> server list
MyHelloServer1
MyHelloServer2
>>> service list MyHelloServer1
MyService
>>> adapter list
MyService1
MyService2
MyServiceRep
>>> adapter endpoints MyServiceRep
MyService1: <inactive>
MyService2: <inactive>
>>> adapter endpoints MyService1
<inactive>
>>> server state MyHelloServer1
inactive (enabled)
>>> server start MyHelloServer1
error: the server didn't start successfully:
The server activation timed out.
>>> server state MyHelloServer1
active (pid = 10184, enabled)
```



PC COE (C:) ▸ ice_node1 ▸ data ▸ servers ▸

名称	修改日期	类型	大小
MyHelloServer1	6/29/2016 02:46...	文件夹	
MyHelloServer2	6/29/2016 02:45...	文件夹	



PC COE (C:) ▸ ice_node1 ▸ data ▸ servers ▸ MyHelloServer1 ▸ config

名称	修改日期	类型
config	6/29/2016 03:09...	文件
config_MyService	6/29/2016 03:09...	文件

Ice服务负载均衡配置与验证

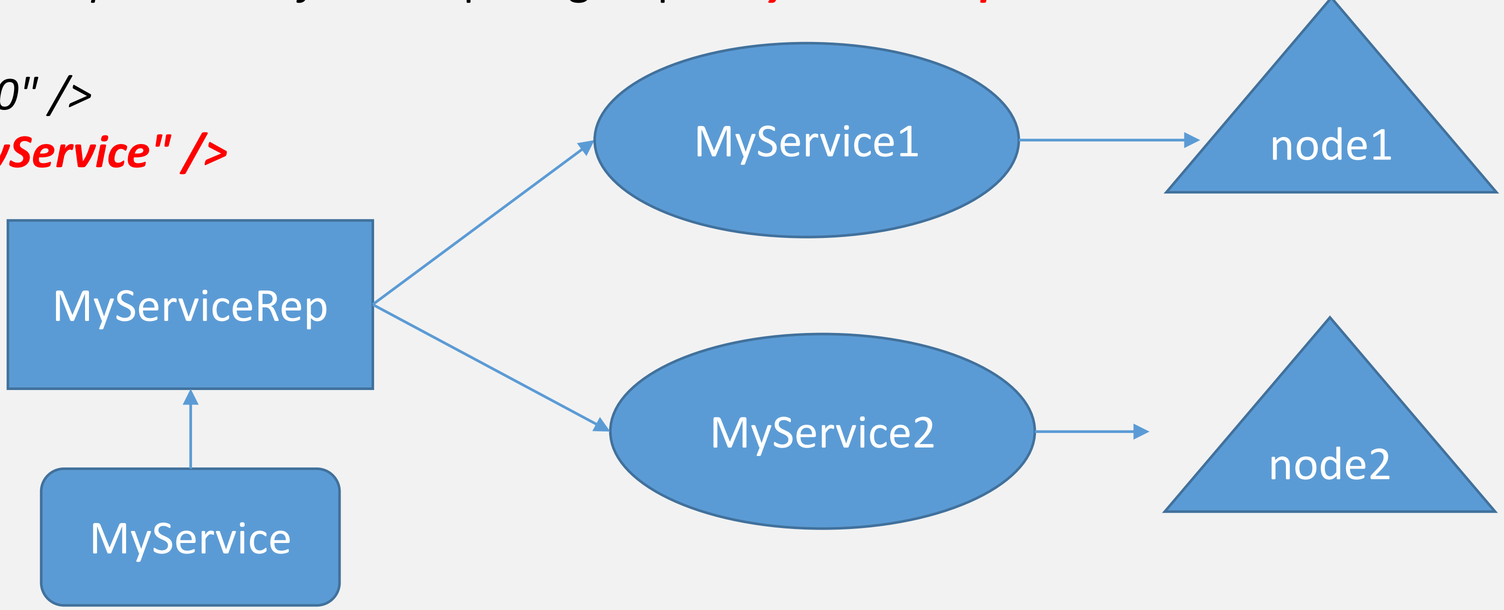
<adapter name="*MyService*" id="*MyService${id}*" endpoints="*default*“ replica-group="***MyServiceRep***">

<replica-group id="***MyServiceRep***">

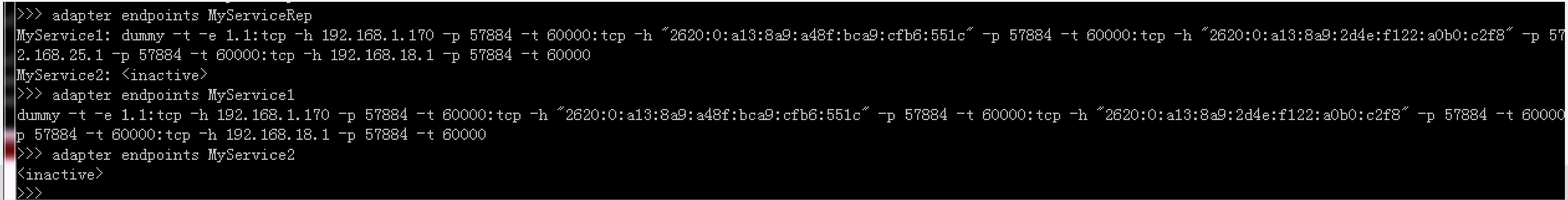
<load-balancing type="*round-robin*" *n-replicas*="*0*" />

<object identity="*MyService*" *type*="*::demo::MyService*" />

</replica-group>



Well-Known Ice Object



```
>>> adapter endpoints MyServiceRep
MyService1: dummy -t -e 1.1:tcp -h 192.168.1.170 -p 57884 -t 60000:tcp -h "2620:0:a13:8a9:a48f:bca9:cfb6:551c" -p 57884 -t 60000:tcp -h "2620:0:a13:8a9:2d4e:f122:a0b0:c2f8" -p 57
2.168.25.1 -p 57884 -t 60000:tcp -h 192.168.18.1 -p 57884 -t 60000
MyService2: <inactive>
>>> adapter endpoints MyService1
dummy -t -e 1.1:tcp -h 192.168.1.170 -p 57884 -t 60000:tcp -h "2620:0:a13:8a9:a48f:bca9:cfb6:551c" -p 57884 -t 60000:tcp -h "2620:0:a13:8a9:2d4e:f122:a0b0:c2f8" -p 57884 -t 60000
p 57884 -t 60000:tcp -h 192.168.18.1 -p 57884 -t 60000
>>> adapter endpoints MyService2
<inactive>
>>>
```

客户端访问验证

```
>>> object list
MyService
IceGrid/Query
IceGrid/Locator
IceGrid/Registry
IceGrid/LocatorRegistry
IceGrid/InternalRegistry-Master
```

```java
public class GridClient {

public static void main(String[] args) {
int status = 0;
Ice.Communicator ic = null;
try {
// 初始化通信器
String reg = "--Ice.Default.Locator=IceGrid/Locator:tcp -h localhost -p 4061";
String[] parms=new String[]{reg};
ic = Ice.Util.initialize(parms);
Ice.ObjectPrx base = ic.stringToProxy("MyService");
// 通过checkedCast向下转型，获取MyService接口的远程，并同时检测根据传入的名称获取服务单元是否OnlineBook的代理接口，如果不是则返回null对象
MyServicePrx prxy = MyServicePrxHelper.uncheckedCast(base);
```

IceGrid常见问题

回车换行或者类库不全导致类找不到

```
<env>CLASSPATH=C:\ZeroC\Ice-3.6.1\lib\*;C:\project\Ice_Hellow\bin</env>
```

Icenode 配置文件中缺乏日志的配置，导致没有日志输出

```
Ice.StdErr=c:\ice_node1\node.stderr.log
#指定错误日志文件
Ice.StdOut=c:\ice_node1\node.stdout.log
```

提供了Server无法启动故障的重要信息

JDK版本问题

Linux下，如果类库存在但报错找不到，可能需要增加user=ice这个属性

```
<icebox id="MyHelloServer${id}" exe="java" user="ice">
```

按需启动Server，无需提前启动

```
<icebox id="MyHelloServer${id}" exe="java"  activation="on-demand">
```

下一集：IcePatch+Grid实战

谢谢

THANK YOU

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