第 4 章 案例实操

4.1 监控端口数据

目标：Flume 监控一端 Console，另一端 Console 发送消息，使被监控端实时显示。

分步实现：

1）先将 rpm 软件包(xinetd-2.3.14-40.el6.x86_64.rpm、telnet-0.17-48.el6.x86_64.rpm 和 telnet-server-0.17-48.el6.x86_64.rpm)拷入 Linux 系统。执行 RPM 软件包安装命令：

```
[atguigu@hadoop102 software]$ sudo rpm -ivh xinetd-2.3.14-40.el6.x86_64.rpm
[atguigu@hadoop102 software]$ sudo rpm -ivh telnet-0.17-48.el6.x86_64.rpm
[atguigu@hadoop102 software]$ sudo rpm -ivh telnet-server-0.17-48.el6.x86_64.rpm
```

2）在 flume 目录下创建 job 文件夹，并在 job 文件夹下创建 Flume Agent 配置文件 flume_telnet.conf

```
# Name the components on this agent
a1.sources = r1
a1.sinks = k1
a1.channels = c1

# Describe/configure the source
a1.sources.r1.type = netcat
a1.sources.r1.bind = localhost
a1.sources.r1.port = 44444

# Describe the sink
a1.sinks.k1.type = logger

# Use a channel which buffers events in memory
a1.channels.c1.type = memory
a1.channels.c1.capacity = 1000
a1.channels.c1.transactionCapacity = 100

# Bind the source and sink to the channel
a1.sources.r1.channels = c1
a1.sinks.k1.channel = c1
```

3）判断 44444 端口是否被占用

```
[atguigu@hadoop102 software]$ sudo netstat -tunlp | grep 44444
```

4）先开启 flume 先听端口

[atguigu@hadoop102 flume]$ bin/flume-ng agent --conf conf/ --name a1 --conf-file job/flume_telnet.conf -Dflume.root.logger==INFO,console

5）使用 telnet 工具向本机的 44444 端口发送内容

[atguigu@hadoop102 software]$ telnet localhost 44444

4.2 实时读取本地文件到 HDFS

目标：实时监控 hive 日志，并上传到 HDFS 中

分步实现：

1）拷贝 Hadoop 相关 jar 到 Flume 的 lib 目录下（要学会根据自己的目录和版本查找 jar 包）

hadoop-auth-2.7.2.jar

commons-configuration-1.6.jar

hadoop-hdfs-2.7.2.jar

hadoop-common-2.7.2.jar

htrace-core-3.1.0-incubating.jar

commons-io-2.4.jar

提示：标红的 jar 为 1.99 版本 flume 必须引用的 jar

2）创建 flume_hdfs.conf 文件

```
# Name the components on this agent
a2.sources = r2
a2.sinks = k2
a2.channels = c2
# Describe/configure the source
a2.sources.r2.type = exec
a2.sources.r2.command = tail -F /opt/module/hive/hive.log
a2.sources.r2.shell = /bin/bash -c

# Describe the sink
a2.sinks.k2.type = hdfs
a2.sinks.k2.hdfs.path = hdfs://hadoop102:9000/flume/%Y%m%d/%H
#上传文件的前缀
a2.sinks.k2.hdfs.filePrefix = logs-
#是否按照时间滚动文件夹
a2.sinks.k2.hdfs.round = true
#多少时间单位创建一个新的文件夹
a2.sinks.k2.hdfs.roundValue = 1
#重新定义时间单位
```

```
a2.sinks.k2.hdfs.roundUnit = hour
#是否使用本地时间戳
a2.sinks.k2.hdfs.useLocalTimeStamp = true
#积攒多少个 Event 才 flush 到 HDFS 一次
a2.sinks.k2.hdfs.batchSize = 1000
#设置文件类型，可支持压缩
a2.sinks.k2.hdfs.fileType = DataStream
#多久生成一个新的文件
a2.sinks.k2.hdfs.rollInterval = 600
#设置每个文件的滚动大小
a2.sinks.k2.hdfs.rollSize = 134217700
#文件的滚动与 Event 数量无关
a2.sinks.k2.hdfs.rollCount = 0
#最小冗余数
a2.sinks.k2.hdfs.minBlockReplicas = 1

# Use a channel which buffers events in memory
a2.channels.c2.type = memory
a2.channels.c2.capacity = 1000
a2.channels.c2.transactionCapacity = 100

# Bind the source and sink to the channel
a2.sources.r2.channels = c2
a2.sinks.k2.channel = c2
```

3）执行监控配置

[atguigu@hadoop102 flume]$ bin/flume-ng agent --conf conf/ --name a2 --conf-file job/flume_hdfs.conf

4）开启 hive 或者操作 hive 使其产生日志

4.3 实时读取目录文件到 HDFS

目标：使用 flume 监听整个目录的文件

分步实现：

1）创建配置文件 flume-dir.conf

```
a3.sources = r3
a3.sinks = k3
a3.channels = c3

# Describe/configure the source
a3.sources.r3.type = spooldir
```

```
a3.sources.r3.spoolDir =    tail -F /opt/module/flume/upload
a3.sources.r3.fileSuffix = .COMPLETED
a3.sources.r3.fileHeader = true
#忽略所有以.tmp 结尾的文件，不上传
a3.sources.r3.ignorePattern = ([^ ]*\.tmp)

# Describe the sink
a3.sinks.k3.type = hdfs
a3.sinks.k3.hdfs.path = hdfs://hadoop102:9000/flume/upload/%Y%m%d/%H
#上传文件的前缀
a3.sinks.k3.hdfs.filePrefix = upload-
#是否按照时间滚动文件夹
a3.sinks.k3.hdfs.round = true
#多少时间单位创建一个新的文件夹
a3.sinks.k3.hdfs.roundValue = 1
#重新定义时间单位
a3.sinks.k3.hdfs.roundUnit = hour
#是否使用本地时间戳
a3.sinks.k3.hdfs.useLocalTimeStamp = true
#积攒多少个 Event 才 flush 到 HDFS 一次
a3.sinks.k3.hdfs.batchSize = 100
#设置文件类型，可支持压缩
a3.sinks.k3.hdfs.fileType = DataStream
#多久生成一个新的文件
a3.sinks.k3.hdfs.rollInterval = 600
#设置每个文件的滚动大小大概是 128M
a3.sinks.k3.hdfs.rollSize = 134217700
#文件的滚动与 Event 数量无关
a3.sinks.k3.hdfs.rollCount = 0
#最小冗余数
a3.sinks.k3.hdfs.minBlockReplicas = 1

# Use a channel which buffers events in memory
a3.channels.c3.type = memory
a3.channels.c3.capacity = 1000
a3.channels.c3.transactionCapacity = 100

# Bind the source and sink to the channel
a3.sources.r3.channels = c3
a3.sinks.k3.channel = c3
```

2）执行测试：执行如下脚本后，请向 upload 文件夹中添加文件

```
[atguigu@hadoop102 flume]$ bin/flume-ng agent --conf conf/ --name a3 --conf-file
```

job/flume-dir.conf

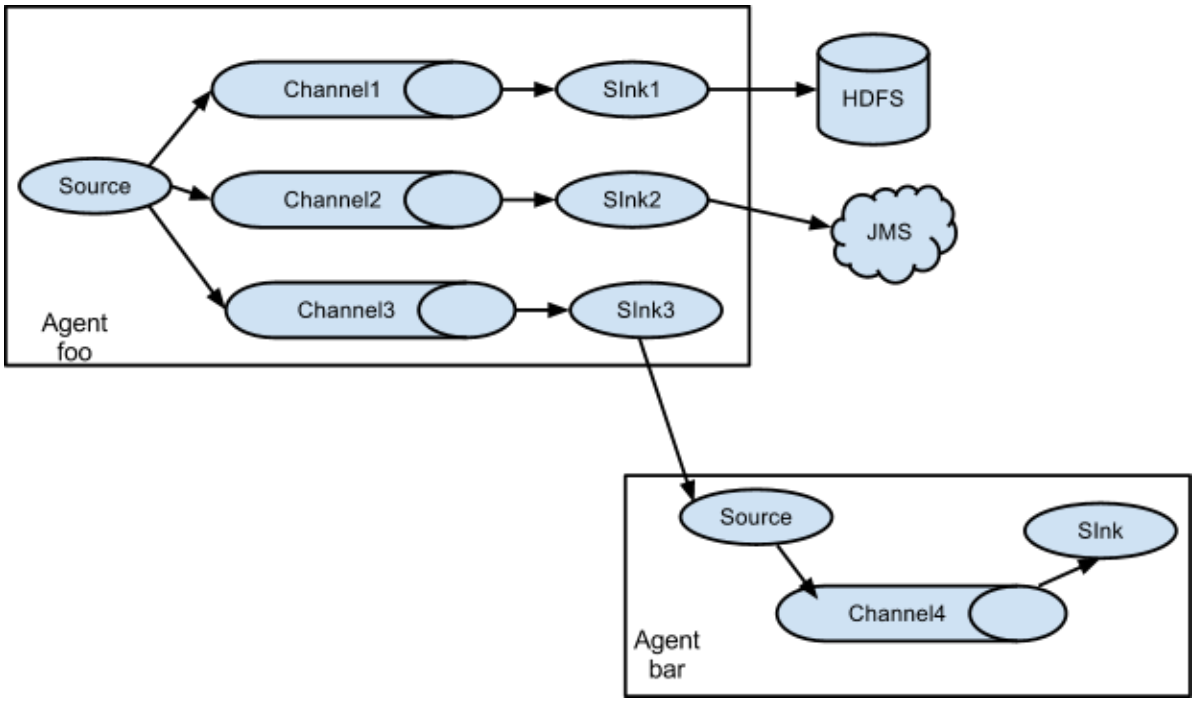
说明： 在使用 Spooling Directory Source 时

a.不要在监控目录中创建并持续修改文件

b.上传完成的文件会以.COMPLETED 结尾

c.被监控文件夹每 600 毫秒扫描一次文件变动

4.4 单 Flume 多 Channel、Sink



目标：使用 flume-1 监控文件变动，flume-1 将变动内容传递给 flume-2，flume-2 负责存储到 HDFS。同时 flume-1 将变动内容传递给 flume-3，flume-3 负责输出到 local filesystem。

分步实现：

1）创建 flume-1.conf，用于监控 hive.log 文件的变动，同时产生两个 channel 和两个 sink 分别输送给 flume-2 和 flume3：

```
# Name the components on this agent
a1.sources = r1
a1.sinks = k1 k2
a1.channels = c1 c2
# 将数据流复制给多个 channel
a1.sources.r1.selector.type = replicating

# Describe/configure the source
a1.sources.r1.type = exec
a1.sources.r1.command = tail -F /opt/module/hive/hive.log
```

```
a1.sources.r1.shell = /bin/bash -c

# Describe the sink
a1.sinks.k1.type = avro
a1.sinks.k1.hostname = hadoop102
a1.sinks.k1.port = 4141

a1.sinks.k2.type = avro
a1.sinks.k2.hostname = hadoop102
a1.sinks.k2.port = 4142

# Describe the channel
a1.channels.c1.type = memory
a1.channels.c1.capacity = 1000
a1.channels.c1.transactionCapacity = 100

a1.channels.c2.type = memory
a1.channels.c2.capacity = 1000
a1.channels.c2.transactionCapacity = 100

# Bind the source and sink to the channel
a1.sources.r1.channels = c1 c2
a1.sinks.k1.channel = c1
a1.sinks.k2.channel = c2
```

2）创建 flume-2.conf，用于接收 flume-1 的 event，同时产生 1 个 channel 和 1 个 sink，将数据输送给 hdfs：

```
# Name the components on this agent
a2.sources = r1
a2.sinks = k1
a2.channels = c1

# Describe/configure the source
a2.sources.r1.type = avro
a2.sources.r1.bind = hadoop102
a2.sources.r1.port = 4141

# Describe the sink
a2.sinks.k1.type = hdfs
a2.sinks.k1.hdfs.path = hdfs://hadoop102:9000/flume2/%Y%m%d/%H
#上传文件的前缀
a2.sinks.k1.hdfs.filePrefix = flume2-
#是否按照时间滚动文件夹
```

```
a2.sinks.k1.hdfs.round = true
#多少时间单位创建一个新的文件夹
a2.sinks.k1.hdfs.roundValue = 1
#重新定义时间单位
a2.sinks.k1.hdfs.roundUnit = hour
#是否使用本地时间戳
a2.sinks.k1.hdfs.useLocalTimeStamp = true
#积攒多少个 Event 才 flush 到 HDFS 一次
a2.sinks.k1.hdfs.batchSize = 100
#设置文件类型，可支持压缩
a2.sinks.k1.hdfs.fileType = DataStream
#多久生成一个新的文件
a2.sinks.k1.hdfs.rollInterval = 600
#设置每个文件的滚动大小大概是 128M
a2.sinks.k1.hdfs.rollSize = 134217700
#文件的滚动与 Event 数量无关
a2.sinks.k1.hdfs.rollCount = 0
#最小冗余数
a2.sinks.k1.hdfs.minBlockReplicas = 1

# Describe the channel
a2.channels.c1.type = memory
a2.channels.c1.capacity = 1000
a2.channels.c1.transactionCapacity = 100

# Bind the source and sink to the channel
a2.sources.r1.channels = c1
a2.sinks.k1.channel = c1
```

3）创建 flume-3.conf，用于接收 flume-1 的 event，同时产生 1 个 channel 和 1 个 sink，将数据输送给本地目录：

```
# Name the components on this agent
a3.sources = r1
a3.sinks = k1
a3.channels = c1

# Describe/configure the source
a3.sources.r1.type = avro
a3.sources.r1.bind = hadoop102
a3.sources.r1.port = 4142

# Describe the sink
```

```
a3.sinks.k1.type = file_roll
a3.sinks.k1.sink.directory = /home/atguigu/flume3

# Describe the channel
a3.channels.c1.type = memory
a3.channels.c1.capacity = 1000
a3.channels.c1.transactionCapacity = 100

# Bind the source and sink to the channel
a3.sources.r1.channels = c1
a3.sinks.k1.channel = c1
```

提示：输出的本地目录必须是已经存在的目录，如果该目录不存在，并不会创建新的目录。

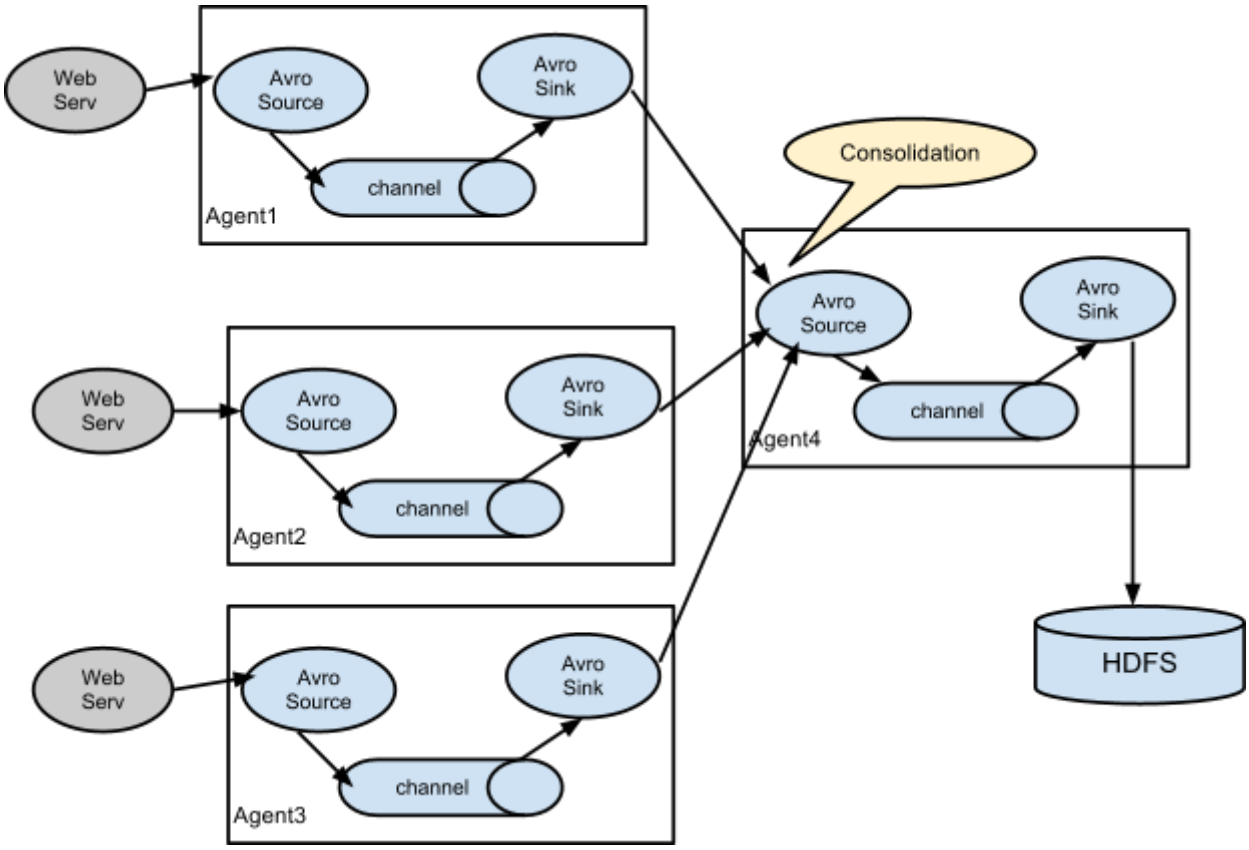
4）执行测试：分别开启对应 flume-job（依次启动 flume-3，flume-2，flume-1），同时产生文件变动并观察结果：

[atguigu@hadoop102 flume]$ bin/flume-ng agent --conf conf/ --name a3 --conf-file job/group-job1/flume-3.conf

[atguigu@hadoop102 flume]$ bin/flume-ng agent --conf conf/ --name a2 --conf-file job/group-job1/flume-2.conf

[atguigu@hadoop102 flume]$ bin/flume-ng agent --conf conf/ --name a1 --conf-file job/group-job1/flume-1.conf

4.5 多 Flume 汇总数据到单 Flume



目标：flume-1 监控文件 hive.log，flume-2 监控某一个端口的数据流，flume-1 与 flume-2 将数据发送给 flume-3，flume3 将最终数据写入到 HDFS。

分步实现：

1）创建 flume-1.conf，用于监控 hive.log 文件，同时 sink 数据到 flume-3：

```
# Name the components on this agent
a1.sources = r1
a1.sinks = k1
a1.channels = c1

# Describe/configure the source
a1.sources.r1.type = exec
a1.sources.r1.command = tail -F /opt/module/hive/hive.log
a1.sources.r1.shell = /bin/bash -c

# Describe the sink
a1.sinks.k1.type = avro
a1.sinks.k1.hostname = hadoop102
a1.sinks.k1.port = 4141
```

```
# Describe the channel
a1.channels.c1.type = memory
a1.channels.c1.capacity = 1000
a1.channels.c1.transactionCapacity = 100

# Bind the source and sink to the channel
a1.sources.r1.channels = c1
a1.sinks.k1.channel = c1
```

2）创建 flume-2.conf，用于监控端口 44444 数据流，同时 sink 数据到 flume-3：

```
# Name the components on this agent
a2.sources = r1
a2.sinks = k1
a2.channels = c1

# Describe/configure the source
a2.sources.r1.type = netcat
a2.sources.r1.bind = hadoop102
a2.sources.r1.port = 44444

# Describe the sink
a2.sinks.k1.type = avro
a2.sinks.k1.hostname = hadoop102
a2.sinks.k1.port = 4141

# Use a channel which buffers events in memory
a2.channels.c1.type = memory
a2.channels.c1.capacity = 1000
a2.channels.c1.transactionCapacity = 100

# Bind the source and sink to the channel
a2.sources.r1.channels = c1
a2.sinks.k1.channel = c1
```

3）创建 flume-3.conf，用于接收 flume-1 与 flume-2 发送过来的数据流，最终合并后 sink 到 HDFS：

```
# Name the components on this agent
a3.sources = r1
a3.sinks = k1
a3.channels = c1

# Describe/configure the source
```

```
a3.sources.r1.type = avro
a3.sources.r1.bind = hadoop102
a3.sources.r1.port = 4141

# Describe the sink
a3.sinks.k1.type = hdfs
a3.sinks.k1.hdfs.path = hdfs://hadoop102:9000/flume3/%Y%m%d/%H
#上传文件的前缀
a3.sinks.k1.hdfs.filePrefix = flume3-
#是否按照时间滚动文件夹
a3.sinks.k1.hdfs.round = true
#多少时间单位创建一个新的文件夹
a3.sinks.k1.hdfs.roundValue = 1
#重新定义时间单位
a3.sinks.k1.hdfs.roundUnit = hour
#是否使用本地时间戳
a3.sinks.k1.hdfs.useLocalTimeStamp = true
#积攒多少个 Event 才 flush 到 HDFS 一次
a3.sinks.k1.hdfs.batchSize = 100
#设置文件类型，可支持压缩
a3.sinks.k1.hdfs.fileType = DataStream
#多久生成一个新的文件
a3.sinks.k1.hdfs.rollInterval = 600
#设置每个文件的滚动大小大概是 128M
a3.sinks.k1.hdfs.rollSize = 134217700
#文件的滚动与 Event 数量无关
a3.sinks.k1.hdfs.rollCount = 0
#最小冗余数
a3.sinks.k1.hdfs.minBlockReplicas = 1

# Describe the channel
a3.channels.c1.type = memory
a3.channels.c1.capacity = 1000
a3.channels.c1.transactionCapacity = 100

# Bind the source and sink to the channel
a3.sources.r1.channels = c1
a3.sinks.k1.channel = c1
```

4）执行测试：分别开启对应 flume-job（依次启动 flume-3，flume-2，flume-1），同时产生文件变动并观察结果：

```
[atguigu@hadoop102 flume]$ bin/flume-ng agent --conf conf/ --name a3 --conf-file job/group-job2/flume-3.conf
```

[atguigu@hadoop102 flume]$ bin/flume-ng agent --conf conf/ --name a2 --conf-file job/group-job2/flume-2.conf

[atguigu@hadoop102 flume]$ bin/flume-ng agent --conf conf/ --name a1 --conf-file job/group-job2/flume-1.conf

提示：测试时记得启动 hive 产生一些日志，同时使用 telnet 向 44444 端口发送内容，如：

[atguigu@hadoop102 hive]$ bin/hive

[atguigu@hadoop102 flume]$ telnet hadoop102 44444