

# YARN-10775 design doc

In yarn federation mode, we can not get right web for running applation. I found the critial problem is proxy.

*Note: In below picture, I simulate a yarn client, first getapplicationreport to get tracking url, and get web by tracking url to get more app info.*

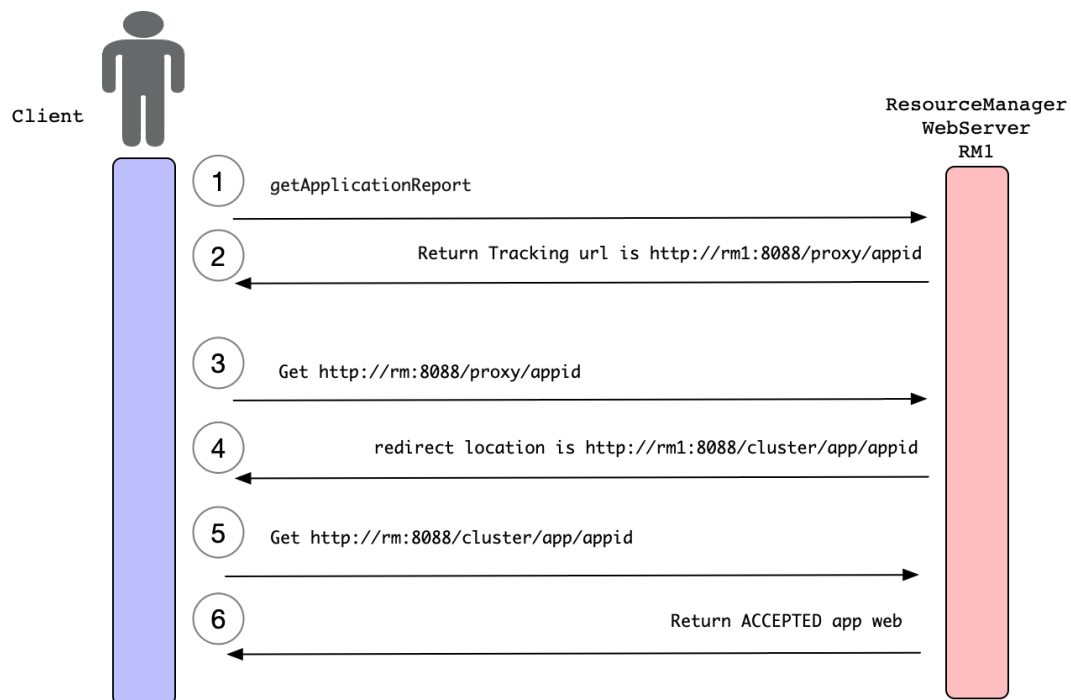
## 1 Use RM as proxyserver

If we do not use standalone proxyserver, rm work as proxyserver.

*Note: In below picture, ignore the process of fetch link, ignore the process of findRedirectUrl which need to ping proxysever.*

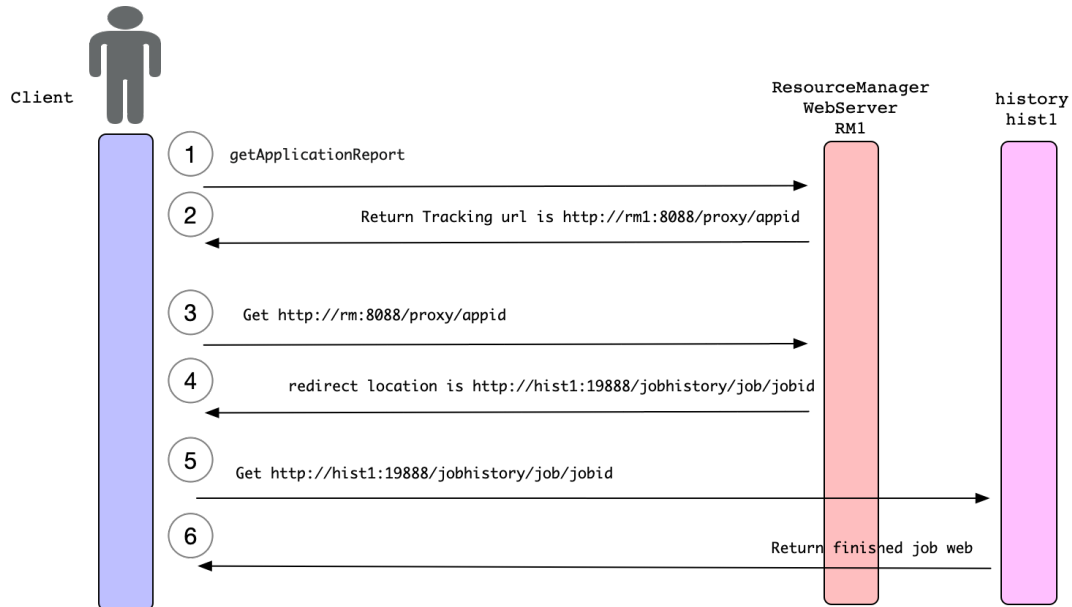
### 1.1 How Proxy work in current version?

(a) app is ACCEPTED state



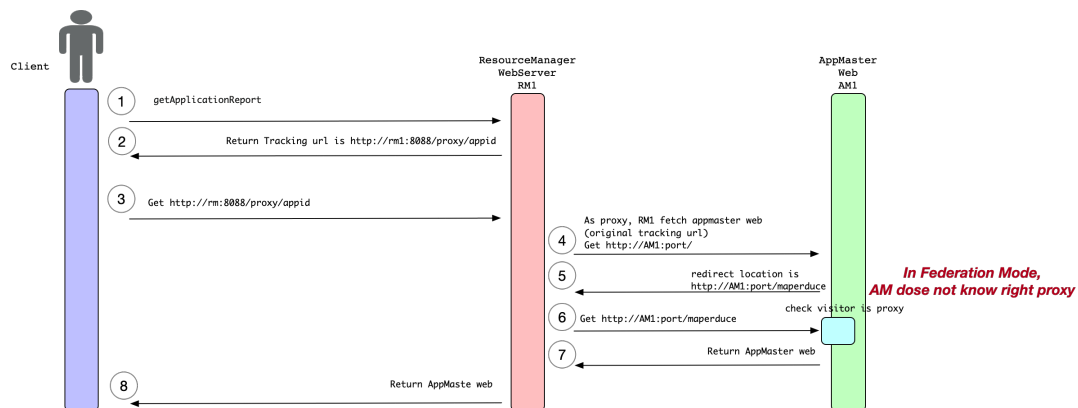
There are no problem for accepted application.

### (b) app is finished state



There are no problem for done application.

### (c) app is running state



As Proxy, RM will get AppMaster web then return webapp to client. There are some problem, discuss in below.

## 1.2 What's the problem of running application when yarn federation is enable?

If someone visit appmaster web(For example Step6), appmaster will check if the visitor is webproxyservice. If visitor is proxyservice, appmaster regard it's

safe visitor, just return web. If visitor is not proxyserver, just return a redirect link so that visitor could visit web by proxyserver. (logical see: `AmlpFilter.java#doFilter`)

The critical problem is where is the proxy which AppMaster regard as. In the code, the member variable `proxyAddresses` of class `AmlpFilter` is the proxy in AM. The proxy is set by client configuration. If proxyserver is disabled, proxy is all the rm webapps, it is set by `yarn.resourcemanager.webapp.address.{rmid}`.

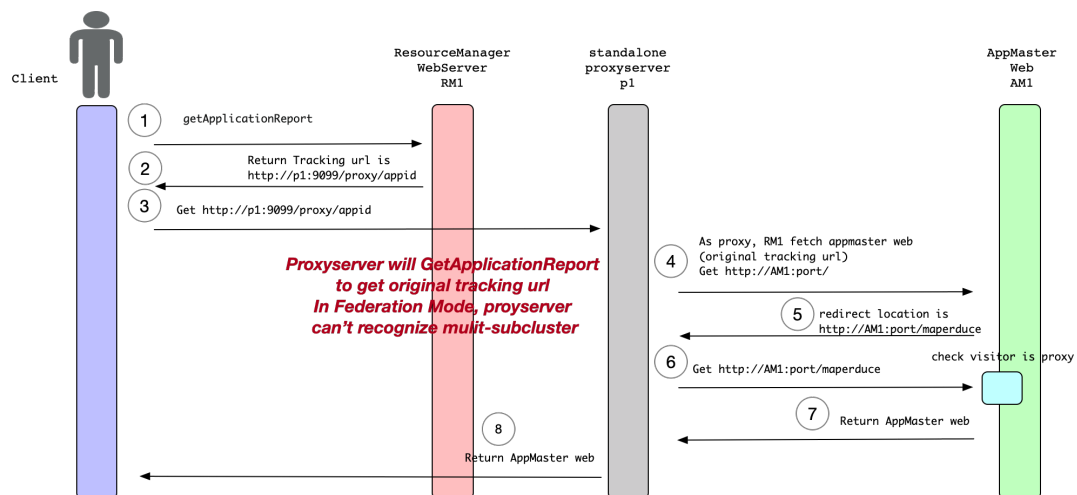
Let's simulate the problem, If we have two yarn subcluster with ha (means four rm webapp, the id are `rm1,rm2,rm3,rm4`), two router(the id are `r1,r2`). We have client configuration like this:

<code>yarn.resourcemanager.ha.enabled</code>	<code>true</code>
<code>yarn.resourcemanager.ha.rm-ids</code>	<code>r1,r2</code>

problem is how to set `yarn.resourcemanager.webapp.address.r1`, `yarn.resourcemanager.webapp.address.r2`? We can't set all four AppMaster. If the value of the `yarn.resourcemanager.webapp.address.{id}` are not rm address. We may get exception appendix A. If we `yarn.resourcemanager.webapp.address.r1` set to `http://rm1:8088/` and `yarn.resourcemanager.webapp.address.r2` set to `http://rm2:8088/`, but application's homecluster are not `rm1` and `rm2`'s subcluster, `rm1` and `rm2` can't get application report, then get a web app show in Appendix B, can't redirect to appmaster webapp.

## 2 Use standalone proxyserver

As we know there is no problem for application which state is not `RUNNING`. Here I only show the process of running application.



What's the problem?

In current version, proxyserver can not recognize multi-subcluster, means can only get one subcluster information. So proxyserver can't get some application's report, so fail.

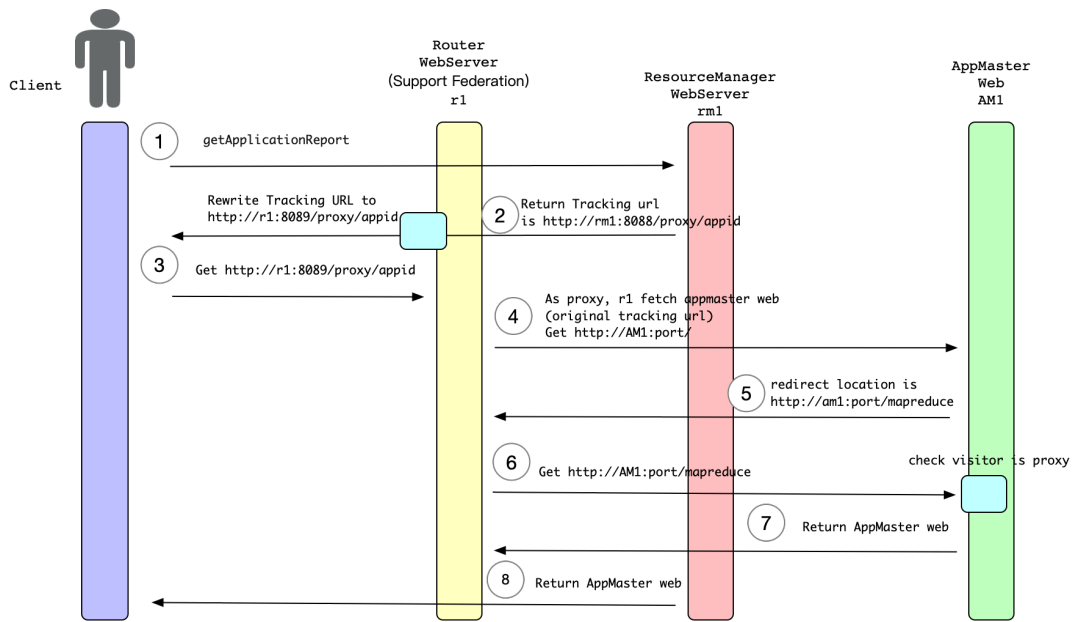
### 3 How to fix?

I think we should regard router webapp as proxyserver, and let proxyserver support federation mode. We need two steps:

- (a) make proxyserver support federation mode
- (b) make router webserver support proxy

After step a, we could solve the problem with standalone proxyserver in federation mode. That's easy, so I ignore explain.

After step a and b, we could solve the problem without standalone proxyserver in federation mode. The new solution will show in below picture.



## Appendix A

### HTTP ERROR 500

Problem accessing /mapreduce. Reason:

Server Error

Caused by:

```

javax.servlet.ServletException: Could not determine the proxy server for redirection
    at org.apache.hadoop.yarn.server.webproxy.amfilter.AmIpFilter.findRedirectUrl(AmIpFilter.java:214)
    at org.apache.hadoop.yarn.server.webproxy.amfilter.AmIpFilter.doFilter(AmIpFilter.java:148)
    at org.eclipse.jetty.servlet.ServletHandler$CachedChain.doFilter(ServletHandler.java:1759)
    at org.apache.hadoop.http.HttpServer2$QuotingInputFilter.doFilter(HttpServer2.java:1657)
    at org.eclipse.jetty.servlet.ServletHandler$CachedChain.doFilter(ServletHandler.java:1759)
    at org.apache.hadoop.http.NoCacheFilter.doFilter(NoCacheFilter.java:45)
    at org.eclipse.jetty.servlet.ServletHandler$CachedChain.doFilter(ServletHandler.java:1759)
    at org.eclipse.jetty.servlet.ServletHandler.doHandle(ServletHandler.java:582)
    at org.eclipse.jetty.server.handler.ScopedHandler.handle(ScopedHandler.java:143)
    at org.eclipse.jetty.security.SecurityHandler.handle(SecurityHandler.java:548)
    at org.eclipse.jetty.server.session.SessionHandler.doHandle(SessionHandler.java:226)
    at org.eclipse.jetty.server.handler.ContextHandler.doHandle(ContextHandler.java:1180)
    at org.eclipse.jetty.servlet.ServletHandler.doScope(ServletHandler.java:512)
    at org.eclipse.jetty.server.session.SessionHandler.doScope(SessionHandler.java:185)
    at org.eclipse.jetty.server.handler.ContextHandler.doScope(ContextHandler.java:1112)
    at org.eclipse.jetty.server.handler.ScopedHandler.handle(ScopedHandler.java:141)
    at org.eclipse.jetty.server.handler.HandlerCollection.handle(HandlerCollection.java:119)
    at org.eclipse.jetty.server.handler.HandlerWrapper.handle(HandlerWrapper.java:134)
    at org.eclipse.jetty.server.Server.handle(Server.java:539)
    at org.eclipse.jetty.server.HttpChannel.handle(HttpChannel.java:333)
    at org.eclipse.jetty.server.HttpConnection.onFillable(HttpConnection.java:251)
    at org.eclipse.jetty.io.AbstractConnection$ReadCallback.succeeded(AbstractConnection.java:283)
    at org.eclipse.jetty.io.FillInterest.fillable(FillInterest.java:108)
    at org.eclipse.jetty.io.SelectChannelEndPoint$2.run(SelectChannelEndPoint.java:93)
    at org.eclipse.jetty.util.thread.strategy.ExecuteProduceConsume.executeProduceConsume(ExecuteProduceConsume.java:303)
    at org.eclipse.jetty.util.thread.strategy.ExecuteProduceConsume.produceConsume(ExecuteProduceConsume.java:148)
    at org.eclipse.jetty.util.thread.strategy.ExecuteProduceConsume.run(ExecuteProduceConsume.java:136)
    at org.eclipse.jetty.util.thread.QueuedThreadPool.runJob(QueuedThreadPool.java:671)
    at org.eclipse.jetty.util.thread.QueuedThreadPool$2.run(QueuedThreadPool.java:589)
    at java.lang.Thread.run(Thread.java:748)
  
```

## Appendix B

A webApp without tracking url



## Application application\_1652332202080\_0007

Logged in as: admin

Application Overview			
User:	bigdata		
Name:	QuasiMonteCarlo		
Application Type:	MAPREDUCE		
Application Tags:			
Application Priority:	0 (Higher Integer value indicates higher priority)		
YarnApplicationState:	RUNNING: AM has registered with RM and started running.		
Queue:	bigdata		
FinalStatus Reported by AM:	Application has not completed yet.		
Started:	Thu May 12 15:32:37 +0800 2022		
Launched:	N/A		
Finished:	N/A		
Elapsed:	31sec		
Tracking URL:	Unassigned		
Diagnostics:			
Unmanaged Application:	false		
Application Node Label expression:	<Not set>		
AM container Node Label expression:	<DEFAULT_PARTITION>		

Show: 20 ▾ entries	Search:		
Attempt ID	Started		Logs
appattempt_1652332202080_0007_000001	Thu May 12 15:32:38 +0800 2022		Logs
Showing 1 to 1 of 1 entries			
First Previous 1 Next Last			