“We’re avoiding costly and time-consuming application development efforts, and ensuring that access is fast, reliable and secure for everyone.”

Jason Rahm
Network Engineer for Major Global Provider of Transportation Services

Developer for Major Provider of Transportation Services Builds F5 iRule That Provides Persistent Connections to Multiple Data Centers Without Disrupting Data Flow

Industry:
Transportation Services

Challenges:
- Improve end user performance
- Improve security
- Reduce application developments efforts and associated costs

Solution:
BIG-IP Application Delivery Networking, TMOS architecture, iRules

Benefits:
- Secure, fast and reliable access
- Lower development costs and less development hours
- Better visibility and more control

Overview

Jason Rahm is a network engineer for a major global provider of transportation services based in the US. Like most IT staffers in enterprise organizations, Rahm is constantly looking for ways to improve the end-user experience without adding to the IT burden or cost of operation.

Challenge

The company has tens of thousands of users located across the globe who need fast and reliable access to a database application through a Web browser. The database is set up to be synchronized across six data centers with updates copied to all data centers within five minutes. Unfortunately, global persistence between data centers doesn’t work in the company’s environment.

When an end user connects to the application, the load balancing system directs client requests to the data center providing the lowest latency. The database application requires a thick client that was hardcoded to query the Wide IP every 60 seconds. Without a persistent connection, users were often redirected to another data center where the data had not yet been replicated.

“Five minutes is a long time for an end-user to wait to see the correct data,” said Rahm. “Users often re-entered data because they couldn’t ‘see’ their updates even though they existed in the system. This is not only frustrating for the end-user, but it caused numerous database errors.”

The company addressed the issue by contracting with a third-party developer to make changes in the thick client application. This was a costly and time-consuming effort and caused delays in deployment. Furthermore, this solution was problematic during a failure, since the data would be lost when the application restarted.

Solution

The company uses F5’s BIG-IP Application Delivery Networking system for load balancing and traffic management. BIG-IP is based on F5’s unique TMOS architecture, which features iRules, an application-fluent technology that enables organizations to quickly and easily write custom commands to define how F5 products secure, optimize and deliver any bi-direction IP traffic or flow.

To address the global persistence challenge associated with the thick client application, Rahm wrote an iRule that uses powerful array capabilities and cookies to ensure that client connections are always directed to the appropriate datacenter. This provided a much better user experience while overcoming the database replication latency issue.

The iRule uses the BIG-IP system to dynamically choose a pool name and insert a generic outbound cookie containing both pool information and server information. When the client reconnects, an array is evaluated to validate that the pool name is legitimate and lines up with a local server (determined in the *if {catch}* statement). If not, the client is redirected to the correct Virtual IP at another data center.

Specifically, the iRule workflow is:

Inspect HTTP Header for cookie "mycookie" and decrypt it. Does it exist?

NO--> use pool MYPOOL

YES-> Is server returned in cookie in the local BigIP node list?

- YES-> persist to local node node
- NO--> Look in array for vip for the server returned in cookie, reencrypt cookie, send to client and redirect client to that vip in the other data center.

Benefits

"This iRule solved the problem and met my other goals: be seamless to the end-user, easy on the application developer, and easy on me," said Rahm. "It provides more visibility and makes the environment easier to control. Anything that takes the load off the application and the application developers and puts it on the BIG-IP appliance is preferable. We're avoiding costly and time-consuming application development efforts, and ensuring that access is fast, reliable and secure for everyone."

According to Rahm, the new capabilities in version 9.x of the F5 TMOS operating system made developing the iRule a snap. The iRule deploys multiple features, but Rahm used arrays instead of complex conditionals to simplify the script. He worked closely with F5 staff through the F5 DevCentral online community over the course of several days, but wrote the iRule itself in about 45 minutes.

Rahm's "non_local_redirect" iRule was recognized as the first place winner/customer division in the first annual *"iRule, Do You?"* contest sponsored by F5. Entries in the iRule contest were evaluated on a weighted scale for innovation, creativity, and business applicability by a panel of leading industry press and analysts, as well as the F5 DevCentral team of iRule experts.

"This is definitely one of the cooler entries in the contest. Not only does it solve a universal persistence problem, but it uses cookie manipulation in the process without disrupting the data flow," said contest judge Joel Conover, Principal Enterprise Infrastructure Analyst of Current Analysis. "This shows off the power of a complex iRule while also addressing a very specific business problem that is quite likely applicable to a number of customers."

See the following page for the iRule code.

iRule Code

```
when RULE_INIT {
        array set ::CLIENT_SERVERS {
        #SITE B CLIENT SERVERS
        #SERVER IP #SERVER VIP
        10.10.70.128 10.10.69.50
        10.10.70.129 10.10.69.50
        10.10.70.130 10.10.69.50
        10.10.70.131 10.10.69.50
        10.10.70.132 10.10.69.50
        10.10.70.133 10.10.69.50
        10.10.70.134 10.10.69.50
        10.10.70.135 10.10.69.50
        #SITE A CLIENT SERVERS
        #SERVER IP #SERVER VIP
        10.10.22.130 10.10.21.50
        10.10.22.131 10.10.21.50
        10.10.22.132 10.10.21.50
        10.10.22.133 10.10.21.50
        10.10.22.134 10.10.21.50
        10.10.22.135 10.10.21.50
        }
}
when HTTP_REQUEST {
        if { [HTTP::cookie exists "my_cookie"] {
                HTTP::cookie decrypt "my_cookie" "iggus99!"
                set vipid [lindex [HTTP::cookie my_cookie] 0]
                set poolid [lindex [HTTP::cookie my_cookie] 1]
                set serverid [lindex [HTTP::cookie my_cookie] 2]
                set portid [lindex [HTTP::cookie my_cookie] 3]
                if { [catch { use pool $poolid member $serverid $portid }] } {
                        log "$serverid:$portid not local, redirecting to https://$vipid/[HTTP::uri]/"
                        redirect to "https://$vipid/[HTTP::uri]/"
                        #reject
                        return
                        }
                else {
                        use pool $poolid member $serverid $portid
                        }
        }
}
when HTTP_RESPONSE {
        HTTP::cookie insert name my_cookie value [concat [virtual name] [LB::server]]
        HTTP::cookie encrypt "my_cookie" "iggus99!"
}
```

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