Deployment Guide - F5 Integration with RemoteSpark (HTML5 RDP) – DRAFT

Introduction

This document describes the general approach for integration with RemoteSpark HTML5 RDP using Portal Access resource published on APM Webtop. The general approach uses commonly-supported way of passing essential parameters to HTML5 gateways such as user credentials and RDP server address – using URI parameters.

- RemoteSpark:

  https://<RemoteSpark backend address>/rdpdirect.html?server=%{session.assigned.server}&user=%{session.logon.last.username}&pwd=%{session.sso.token.last.password}&domain=%{session.logon.last.domain}

This approach with URI parameters does not look secure, as both user credentials and destination server address are sensitive information and should not be passed to the client.

F5 & RemoteSpark worked closely together to come up with a solution that avoids passing this sensitive information via URI:

- APM passes user credentials to RS GW via HTTP Basic authentication
- APM passes RDP server address to RS GW via special "gw_server" header

This approach provides the following benefits:

- No sensitive information is leaked to the client (like with URI parameters)
- APM can restrict user's access to specific RDP servers. In this integration, RDP server address is specified as a session variable – which is equivalent of RDP resource

About HTML5

Thanks to HTML5 technologies such as Canvas and Websocket, it became possible to create rich applications that run inside a browser and have feature set similar to native applications. Today's HTML5 apps support rendering, audio, printing and file transfer.

Typically, a HTML5 RDP solution would use some rendering protocol on the client (user's browser) and have a server-side component that translates the client-rendering protocol into MS RDP connection to the backend. The client-side part of the solution would communicate with the server-side part typically over WebSocket connection.

Deployment steps

Prerequisites:

- At least one RemoteSpark Servers running on Linux or Windows (more details: http://www.remotespark.com/html5.html)
- At least one BIG-IP APM (VE or HW, tested with 11.6.x, 12.x & 13.0)

Spark gateway(s) – Settings:

- Enable Basic authentication in gateway.conf: authorization = Basic
- Disable RDPWorker in appcfg.js: useWorker:false

BIG-IP APM – Configuration:

Ensure that basic networking settings are configured:

- VLAN:

  a. For single-arm configuration - create a VLAN on the interface that will be both accepting connections and used to communicate to RS GW servers.
  b. For two-arm configuration - create two VLANs, external - for client connections, and internal - for communication with RS GWs.
  c. Specify VLAN tags if needed, otherwise use untagged

- SelfIP (the IP address used to talk to RS GWs)

  a. Specify the correct VLAN - should be internal for two-arm config.
  b. Route (the route BIG-IP will use to reach RS GWs via SelfIP)
  c. Typically, a 0.0.0.0 route via a router on internal VLAN
  d. Now, test the configuration by pinging RS GW server via correct VLAN:
  ping -I <VLAN name> <RS GW IP>

- LB virtual setup
  a. Create a pool with RS GW addresses:
  (i) Go to Local Traffic->Pools, create new.
  (ii) Specify the IP addresses and ports of RS GW servers.
  (i) Use monitoring settings as needed. A simple TCP monitor was used in the test setup.
  (ii) Create a Virtual Server that will be load-balancing RS GW servers:
  (iii) Go to Local Traffic->Virtual Servers, create new.
  (iv) Specify destination IP 1.1.1.1 and port 80.
  (v) Use any other IP/port if desired. Only requirement, from security perspective, is that user should not be able to talk to this IP:port,
  i.e. it should be internal.
  (vi) Specify pool that was created in above step. Set Source Address Translation = Automap.

(vii) Now, tst that you can reach RS GW by doing curl http://1.1.1.1 from BIG-IP SSH console. You should get RS GW web page. DO NOT PROCEED IF THIS STEP FAILS!

- Main virtual step
  1) Create an SSO profile that will be used to do Basic auth to RS GW and pass RDP server address:
  2) Go to Access-> Single Sign-On->HTTP Basic, create new.
  3) Go to Advanced settings and add a header "gw_server" with value to "%{session.assigned.server}" (or any other APM session variable name that will hold target RDP server address)
  4) In Username Source specify "session.domain_user" (or any other APM session variable name that will hold DOMAIN\username value)
  5) In Password Source specify "session.domain_pass" (or any other APM session variable name that will hold user's password value)
  6) Create a Portal Access resource whose purpose is to publish a link to the Load-balancing Virtual Server on APM Webtop and activate SSO profile for single sign-on into RS GW
  7) Go to Access->Connectivity/VPN->Portal Access, create new.
     a) Use Patching Type = Full Patching (default)
     b) Check "Publish on Webtop" checkbox (default)
     c) Use Link Type = Application URI and specify URI http://1.1.1.1?server=%{session.assigned.server}
     d) Create a Resource Item with following configuration:
     e) Link Type = Paths
     f) Destination Type = Hostname, Hostname = *
     g) Paths = *
     h) SSO Configuration - specify the SSO profile created above
     i) Create an Access Policy, assign the Portal Access resource
     j) Create a webtop object under Access->Webtops. Use Type = Full (default).
  8) Go to Access->Policies, create new
     a) Click Edit Policy - you'll be brought into a new browser tab where you can edit the policy using F5 Visual Policy Editor
     b) After the Start action, add a Logon Page
     c) Check the "Split Domain From Username" checkbox in Logon Page configuration
     d) Next, add AAA agent that will verify user identity.
     e) Next, add Variable Assign with following variable names / expressions:
     f) session.domain_user = expr { "[mcget session.logon.last.domain]\\[mcget session.logon.last.username]" }
     g) session.domain_pass = expr { "[mcget -secure session.logon.last.password]" }
     h) session.assigned.server = expr { "<IP address of RDP backend>" }
  9) Next, add Advanced Variable Assign
     a) Specify the webtop and Portal Access resource created earlier
  10) Finally, create the main Virtual Server
  11) Go to Local Traffic->Virtual Servers, create new.
     a) Specify destination IP address and port 443.
     b) This is the address users will connect with their browsers
     c) Add HTTP, ClientSSL, Rewrite profiles. You can use default ones.
     d) Add Access Profile created one step above.

e) You'll also be asked to add a Connectivity Profile - click on sign and create one with default values.
f) Set Source Address Translation = Automap.

Now, test the whole setup by going to https://<main Virtual Server IP> from the client device.

Specify DOMAIN\username and password on APM logon page. Click on the Portal Access resource. You should be automatically logged into 0RDP server specified in session.assigned.server APM session variable.

Pre-BIG-IP 13.x (-> v11.5+):

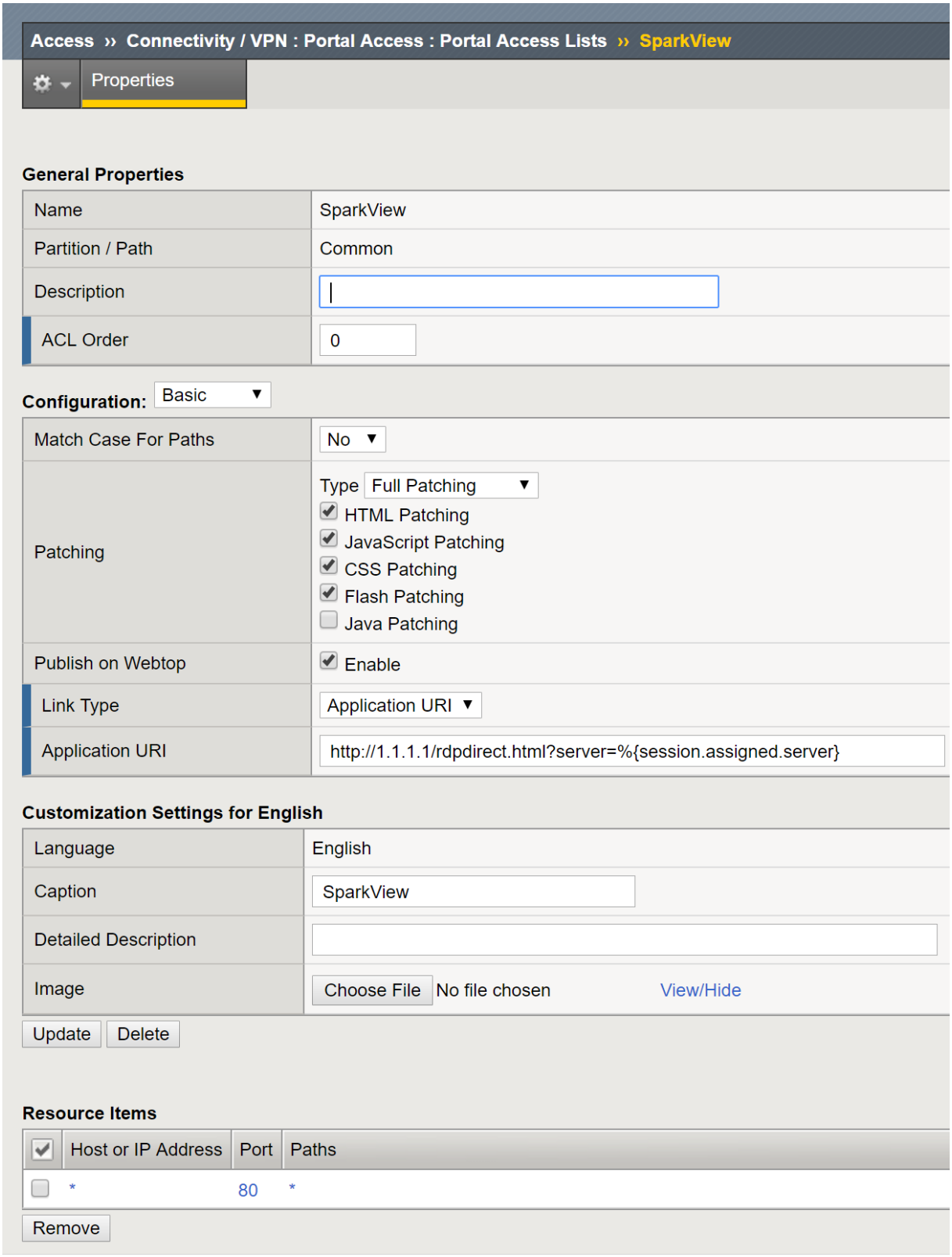
Portal Access resources do not support WebSocket connections before v13.x release. This can be fixed with the following iRule that should be assigned on the main Virtual Server:

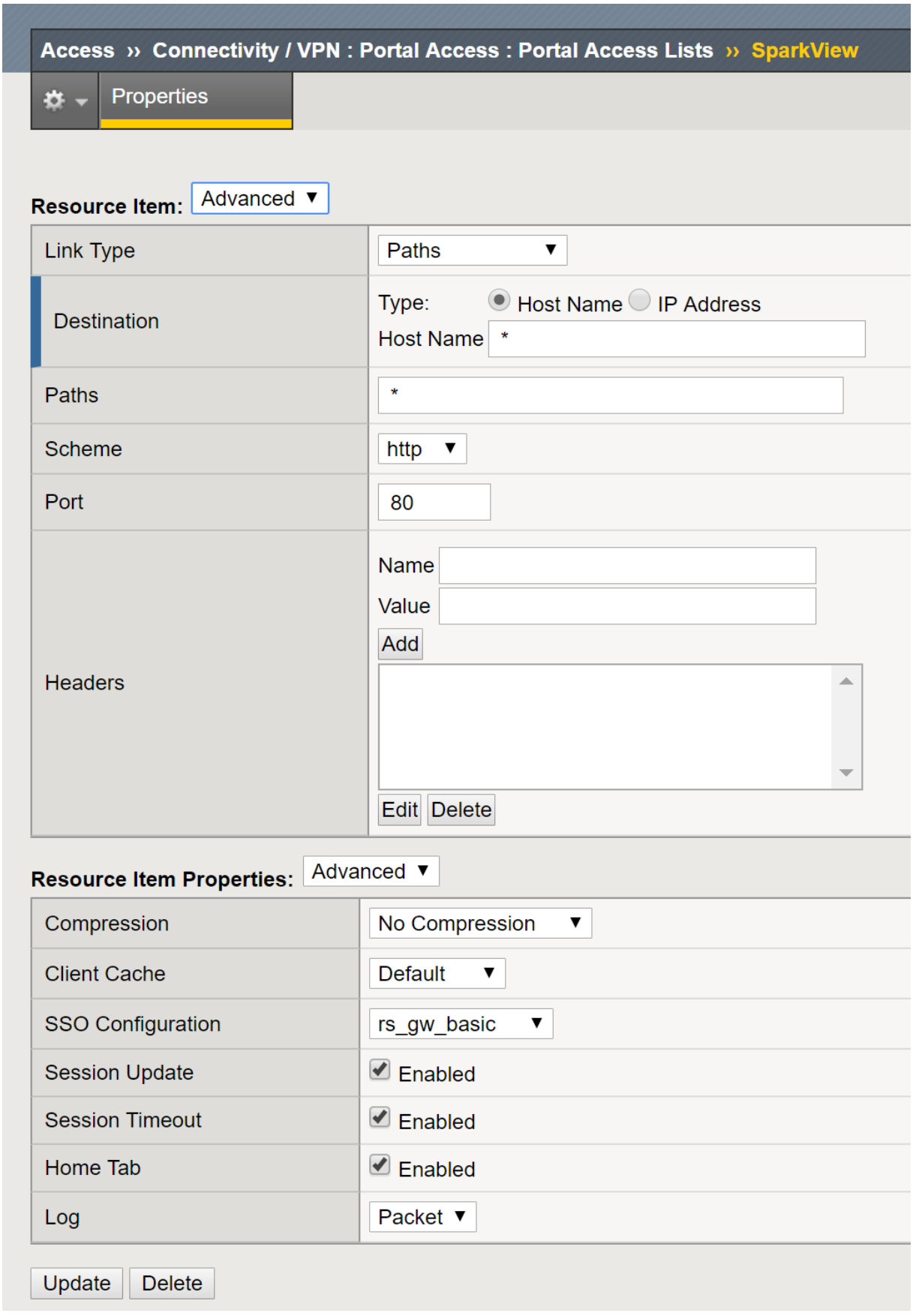
```
when HTTP_REQUEST {
set tmm_apm_rewrite_request 0
}
when REWRITE_REQUEST_DONE {
set tmm_apm_rewrite_request 1
if { [HTTP::header exists Upgrade] && \
[string tolower [HTTP::header Upgrade]] contains "websocket" } {
# Replace Origin header with backend's address
HTTP::header replace Origin "https://[HTTP::host]"
# Disable rewrite plugin, otherwise request may be stuck
REWRITE::disable
}
}
when HTTP_RESPONSE {
if { !$tmm_apm_rewrite_request } { return }
set tmm_apm_chunked 0
if { [HTTP::header Content-Type] contains "javascript" } {
if { [HTTP::header Transfer-Encoding] == "chunked" } {
set tmm_apm_chunked 1
} elseif { [HTTP::header Content-Length] == 0 } {
return
```

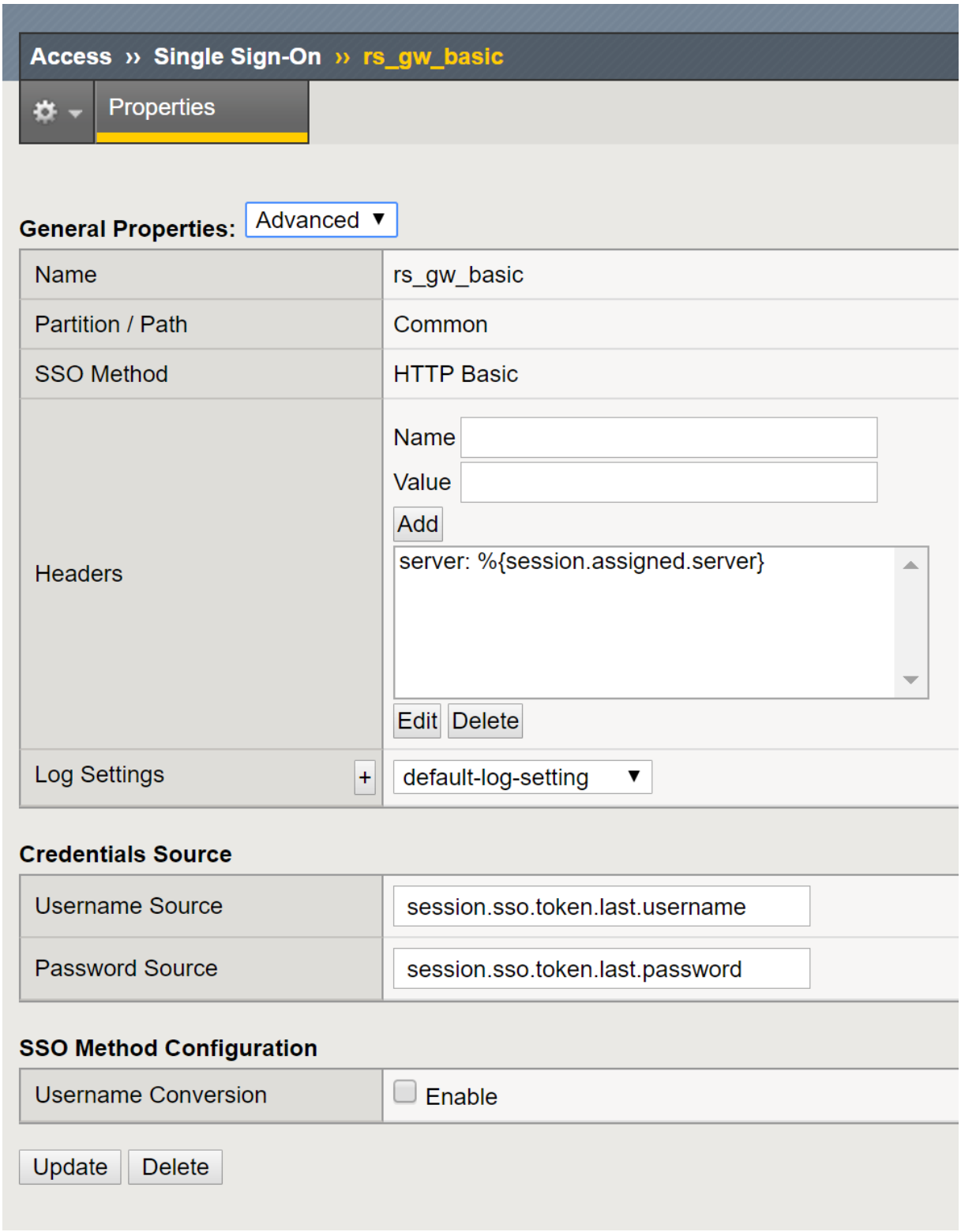
```
}
HTTP::collect 1
}
}
when HTTP_RESPONSE_DATA {
if { !$tmm_apm_rewrite_request } { return }
set tmm_apm_patch {
function wsWrapper(F5_orig) {
var wrapper = function WebSocket() {
if (typeof(arguments[0]) === 'string') {
arguments[0] = F5_WrapURL(
arguments[0].replace(/^ws/,'http'))
.replace(/^http/,'ws');
}
var socket = new F5_orig(arguments[0], arguments[1]);
socket.constructor = wrapper;
return socket;
};
if (Object.setPrototypeOf) {
Object.setPrototypeOf(wrapper, F5_orig);
} else { // IE10
Object.keys(F5_orig).forEach(function (key) {
wrapper[key] = F5_orig[key];
});
}
wrapper.F5_original = F5_orig;
wrapper.prototype = F5_orig.prototype;
wrapper.toString = function toString() { return F5_orig.toString();};
return wrapper;
};
if ((typeof(window.MozWebSocket) !== 'undefined') &&
!window.MozWebSocket.F5_original) {
```

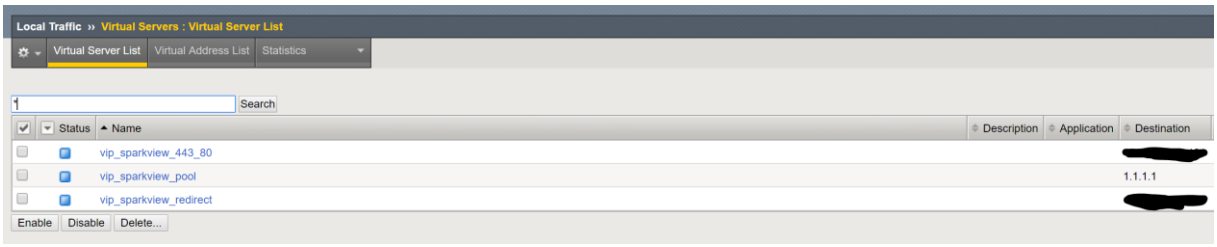
```
window.MozWebSocket = wsWrapper(window.MozWebSocket)
}
if ((typeof(window.WebSocket) !== 'undefined') &&
!window.WebSocket.F5_original) {
window.WebSocket = wsWrapper(window.WebSocket)
}
}
if { $tmm_apm_chunked } {
set tmm_apm_patch "[format %x [string length $tmm_apm_patch]]\r\n$tmm_apm_patch"
}
HTTP::payload replace 0 0 $tmm_apm_patch
HTTP::release
}
when HTTP_RESPONSE_RELEASE {
if { [HTTP::header exists Content-Security-Policy] } {
HTTP::header replace Content-Security-Policy \
[string map {"data:" "data: blob:"} [HTTP::header Content-Security-Policy]]
}
}
```

Screenshots:

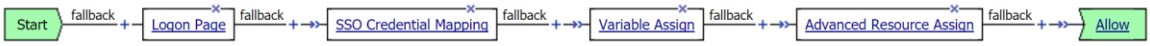



Access ›› Connectivity / VPN : Portal Access : Portal Access Lists ›› SparkView
Properties
Resource Item: Advanced
Link Type
Paths
Destination
Type: Host Name IP Address
Host Name *
Paths
*
Scheme
http
Port
80
Headers
Name
Value
Add
Edit Delete
Resource Item Properties: Advanced
Compression
No Compression
Client Cache
Default
SSO Configuration
rs_gw_basic
Session Update
Enabled
Session Timeout
Enabled
Home Tab
Enabled
Log
Packet
Update Delete


Access ›› Single Sign-On ›› rs_gw_basic
Properties
General Properties:
Advanced
Name
rs_gw_basic
Partition / Path
Common
SSO Method
HTTP Basic
Headers
Name
Value
Add
server: %{session.assigned.server}
Edit
Delete
Log Settings
default-log-setting
Credentials Source
Username Source
session.sso.token.last.username
Password Source
session.sso.token.last.password
SSO Method Configuration
Username Conversion
Enable
Update
Delete



Access Policy: /Common/sparkview_rdp Edit Endings (Endings: Allow, Deny [default])



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