

Riverbed Stingray TrafficScript

What is Riverbed Stingray TrafficScript?

Riverbed® Stingray™ TrafficScript is the customization language in Riverbed Stingray Traffic Manager. It makes it easy to create powerful traffic management rules that define how Stingray Traffic Manager manages application traffic.

For example, Stingray TrafficScript can be configured with Stingray Traffic Manager to:

- Recognize different types of requests and load-balance them to different servers
- Inspect outgoing responses and rewrite them if necessary
- Apply different Stingray Traffic Manager features (e.g., bandwidth management, session persistence, etc.) to different requests or types of traffic

In essence, Stingray TrafficScript frees from having an inflexible load-balancing solution that can only be configured one way. Stingray TrafficScript can specify exactly how each transaction is handled; it's a little like being able to configure the traffic manager especially for each transaction it manages.

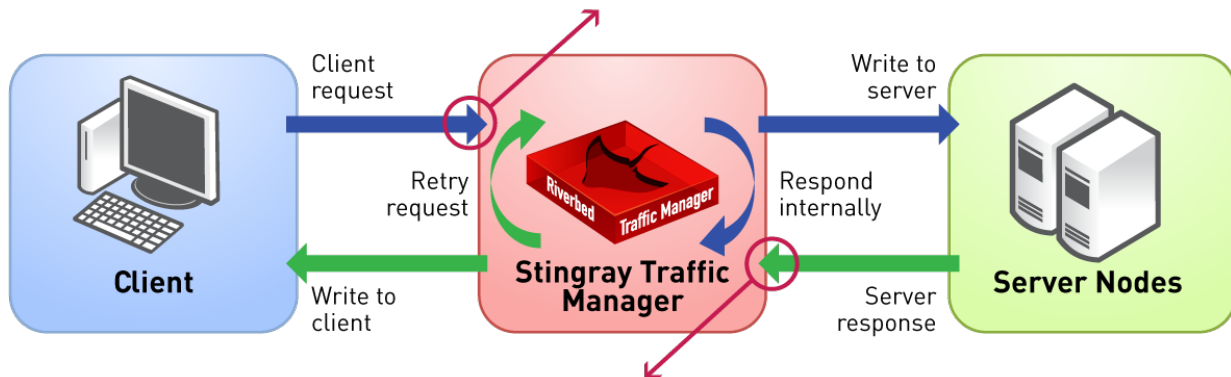
Stingray TrafficScript is quick and easy for network and application staff to use, so it is often used to rapidly fix complex problems such as security vulnerabilities, application bugs, or application incompatibilities.

How does it work?

Stingray TrafficScript is a programming language used to create rules. A Stingray TrafficScript rule can inspect and modify traffic, and activate and control Stingray Traffic Manager. It can also:

- Inspect all aspects of a request or response
- Modify any aspect of a request or response
- Activate (or deactivate) features of Stingray Traffic Manager specifically for that request or response
- Control how Stingray Traffic Manager handles the transaction, sending it to a particular set of servers, answering directly, or retrying the transaction if an error is detected

1. Stingray Traffic Manager receives request – runs *Request Rules*



2. Stingray Traffic Manager receives response – runs *Response Rules*

Example of how Stingray Traffic Manager uses Rules before and after load-balancing traffic to server nodes.

Stingray TrafficScript is not just for HTTP (web) traffic; can be used to inspect, manipulate, and manage any TCP or UDP protocol. There are helper functions to get and set raw data streams, and functions to inspect and process binary data as well as ASCII.

For example, organizations like Spamhaus publish lists of known spam and exploit sources using DNS. The following rule can be used to manage SMTP (email) traffic, checking each remote client against the Spamhaus black list¹:

```
$ip = request.getRemoteIP();

# Reverse the IP, and append ".sbl-xbl.spamhaus.org".
$bytes = string.dottedToBytes( $ip );
$bytes = string.reverse( $bytes );
$query = string.bytesToDotted( $bytes ).".sbl-xbl.spamhaus.org";

if( net.dns.resolveHost( $query ) ) {
    log.warn( "Connection from IP ".$ip.".": known Spam; dropping" );
    connection.sleep( 10 );
    connection.discard();
}
```

If the connection comes from a known Spam source, this Stingray TrafficScript rule records a message, pauses the connection for 10 seconds, and then discards it. Pausing the connection prevents the remote mail server from continually retrying to connect – a technique known as a ‘Tar Pit’.

What can be controlled with Stingray TrafficScript?

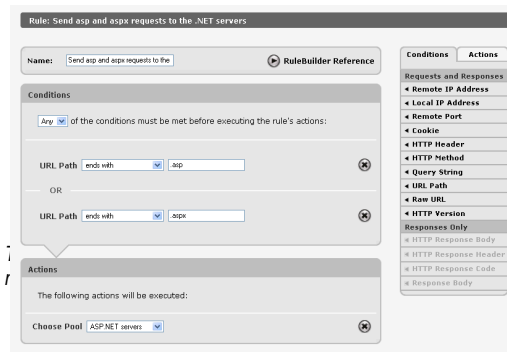
Stingray TrafficScript can inspect each request and response, and then precisely define how the transaction is managed. Stingray TrafficScript can control:

- Which server(s) should process the request
- How the request or response should be rewritten (if desired)
- If the request should be retried if it fails
- What sort of session persistence should be used for each request
- How much bandwidth the request and response should use
- If the HTTP content cache should be used
- How many of each type of request should be admitted per second (or per minute)
- How performance should be monitored (using SLM)
- What information about the transaction should be logged

Stingray Traffic Manager creates adaptive rules that only take effect when traffic levels are high, servers are overloaded, or during particular times of the day. Stingray TrafficScript can be implemented in order to achieve the desired traffic management policy.

Stingray TrafficScript can be used to generate application responses directly. On the Riverbed

¹ www.spamhaus.org: To check IP 10.11.12.13, perform a DNS request for 13.12.11.10.sbl-xbl.spamhaus.org. A non-empty response indicates the IP is a known Spam source. For testing, refer to Latest 25 Listings for known Spam IP addresses. See Spamhaus Datafeed Service for commercial or high-volume usage.



Stingray TrafficScript is easy to use

Riverbed Stingray RuleBuilder makes it very easy to get started with Stingray TrafficScript; it's a powerful user interface tool that can be used to create a wide range of Stingray TrafficScript rules without needing any programming experience.

After the first rules have been created by Stingray RuleBuilder, then they are connected into the Stingray TrafficScript language and processed to becoming a fully-fledged Stingray TrafficScript user.

Why not use a programming language like TCL?

An embedded language for traffic management application must be fast and extremely efficient when managing memory. Because traffic management rules are executed on every single connection:

- The traffic management rule must be compiled into an efficient, internal form rather than interpreted each time; run-time checks (e.g., types, function overloading, etc.) should be minimized
- Start-up time must be very low, because each rule is run thousands of times each second
- The language implementation must not copy memory unnecessarily, rather it should use reference counting for memory buffers to minimize the number of times request and response data is copied

General-purpose scripting languages have features like complex data types, objects, function overloading, and run-time evaluation. These add unnecessary overhead, reducing the language's performance and efficiency.

The design of Stingray TrafficScript is optimized for the task of managing network traffic data, and Stingray TrafficScript is very tightly integrated into Stingray Traffic Manager. It uses Stingray Traffic Manager to do all of the complex protocol handling, empowering the Stingray TrafficScript administrator to write simple rules that run efficiently.

Third-party languages require complex, event-driven programming models

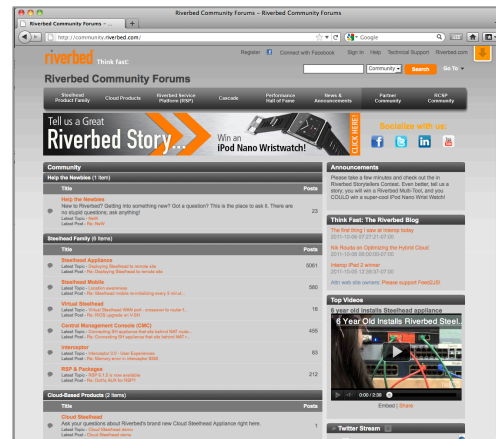
Environments that use languages like TCL cannot do anything that might pause or wait, because that would block the entire Stingray Traffic Manager. Each rule has to be broken into tiny parts and assigned to different events. This is a difficult, inefficient programming model, and makes simple tasks like reading an HTTP response or processing an XML stream extremely awkward.

The Stingray Traffic Manager TrafficScript environment handles blocking operations seamlessly. For example, a rule is suspended when it asks for more data and is seamlessly restarted when the data is available. Stingray Traffic Manager has two simple events that can trigger rules (start of request, start of response), making it extremely easy and intuitive to write concise, simple Stingray TrafficScript rules.

How can I find out more?

Visit the Riverbed Community Forums at <http://community.riverbed.com/>. There are hundreds of code samples and articles showing how to use Stingray TrafficScript to solve a wide range of traffic management problems.

Try out the training materials in the Stingray Traffic Manager Virtual Machine, which step through several different uses of Stingray TrafficScript. Find out more by reading the white papers on http://www.riverbed.com/us/media/documents/white_papers/.



About Riverbed

Riverbed delivers performance for the globally connected enterprise. With Riverbed, enterprises can successfully and intelligently implement strategic initiatives such as virtualization, consolidation, cloud computing, and disaster recovery without fear of compromising performance. By giving enterprises the platform they need to understand, optimize, and consolidate their IT, Riverbed helps enterprises to build a fast, fluid and dynamic IT architecture that aligns with the business needs of the organization. Additional information about Riverbed (NASDAQ: RVBD) is available at www.riverbed.com.



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