

BIG-IP[®] Application Visibility and Reporting (AVR) REST API User Guide

Version 12.0



Table of Contents

Legal Notices.....	5
Legal notices.....	5
Application Visibility and Reporting (AVR) Fundamentals.....	7
Understanding the Application Visibility and Reporting REST API.....	7
About data queries in Application Visibility and Reporting.....	7
Overview: Report states in Application Visibility and Reporting.....	7
Generating a report using the Application Visibility and Reporting REST API.....	8
Application Visibility and Reporting REST parameters.....	10

Legal Notices

Legal notices

Publication Date

This document was published on September 1, 2015.

Publication Number

MAN-0590-00

Copyright

Copyright © 2015, F5 Networks, Inc. All rights reserved.

F5 Networks, Inc. (F5) believes the information it furnishes to be accurate and reliable. However, F5 assumes no responsibility for the use of this information, nor any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent, copyright, or other intellectual property right of F5 except as specifically described by applicable user licenses. F5 reserves the right to change specifications at any time without notice.

Trademarks

AAM, Access Policy Manager, Advanced Client Authentication, Advanced Firewall Manager, Advanced Routing, AFM, APM, Application Acceleration Manager, Application Security Manager, AskF5, ASM, BIG-IP, BIG-IP EDGE GATEWAY, BIG-IQ, Cloud Extender, Cloud Manager, CloudFucious, Clustered Multiprocessing, CMP, COHESION, Data Manager, DDoS Frontline, DDoS SWAT, Defense.Net, defense.net [DESIGN], DevCentral, DevCentral [DESIGN], DNS Express, DSC, DSI, Edge Client, Edge Gateway, Edge Mobile, Edge Mobility, Edge Portal, ELEVATE, EM, ENGAGE, Enterprise Manager, F5, F5 [DESIGN], F5 Agility, F5 Certified [DESIGN], F5 Networks, F5 SalesXchange [DESIGN], F5 Synthesis, f5 Synthesis, F5 Synthesis [DESIGN], F5 TechXchange [DESIGN], Fast Application Proxy, Fast Cache, FCINCO, Global Traffic Manager, GTM, GUARDIAN, iApps, IBR, iCall, iControl, iHealth, Intelligent Browser Referencing, Intelligent Compression, IPv6 Gateway, iQuery, iRules, iRules OnDemand, iSession, L7 Rate Shaping, LC, Link Controller, LineRate, LineRate Point, LineRate Precision, LineRate Systems [DESIGN], Local Traffic Manager, LROS, LTM, Message Security Manager, MobileSafe, MSM, OneConnect, Packet Velocity, PEM, Policy Enforcement Manager, Protocol Security Manager, PSM, Ready Defense, Real Traffic Policy Builder, SalesXchange, ScaleN, SDAS (except in Japan), SDC, Signalling Delivery Controller, Solutions for an application world, Software Designed Application Services, Silverline, SSL Acceleration, SSL Everywhere, StrongBox, SuperVIP, SYN Check, SYNTHESIS, TCP Express, TDR, TechXchange, TMOS, TotALL, TDR, TMOS, Traffic Management Operating System, Traffix, Traffix [DESIGN], Transparent Data Reduction, UNITY, VAULT, vCMP, VE F5 [DESIGN], Versafe, Versafe [DESIGN], VIPRION, Virtual Clustered Multiprocessing, WebSafe, and ZoneRunner, are trademarks or service marks of F5 Networks, Inc., in the U.S. and other countries, and may not be used without F5's express written consent.

All other product and company names herein may be trademarks of their respective owners.

Patents

This product may be protected by one or more patents indicated at: <https://f5.com/about-us/policies/patents>

Export Regulation Notice

This product may include cryptographic software. Under the Export Administration Act, the United States government may consider it a criminal offense to export this product from the United States.

RF Interference Warning

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This unit generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Any modifications to this device, unless expressly approved by the manufacturer, can void the user's authority to operate this equipment under part 15 of the FCC rules.

Canadian Regulatory Compliance

This Class A digital apparatus complies with Canadian ICES-003.

Standards Compliance

This product conforms to the IEC, European Union, ANSI/UL and Canadian CSA standards applicable to Information Technology products at the time of manufacture.

Application Visibility and Reporting (AVR) Fundamentals

Understanding the Application Visibility and Reporting REST API

The Application Visibility and Reporting (AVR) REST API programmatically exposes the statistics that are available by using the `tms` command-line utility or the BIG-IP® system GUI. The AVR REST API defines methods and endpoint to generate a report, as well as retrieve the results of a report, on a device identified by the host name or IP address in a URI. You use AVR in conjunction with the iControl® REST API to identify resource report categories, which appear as links within the iControl REST response data. After you identify a report category of interest, you use the `/example` endpoint in the iControl REST API to identify the entities and metrics for a category. In AVR, dimensions represent resources, such as a virtual server, whereas metrics represent quantities, such as the number of transactions per second or average latency. AVR reports on entities, which are combinations of dimensions, and metrics.

You should note that AVR reports the data for only the device you specify in a URI. If you specify a single blade in a chassis, AVR reports statistics for all of the blades in the chassis because the chassis is considered to be a single device. However, AVR does not report statistics on multiple devices, even if the devices are part of a BIG-IP network and device topology.

About data queries in Application Visibility and Reporting

The Application Visibility and Reporting (AVR) REST API supports entity and metric filters as properties in a JSON body. The entity and metric filters provide for specification of constraints that are applied to the output data contained in a report. A *dimension* represents a resource, such as a virtual server, a URL, or a pool member, and an *entity*, is combination of dimensions. A metric represents a measurement, such as `average-tps`, `max-tps`, or `transactions`. An entity filter narrows the scope of a generated report to relevant resources, whereas a metric filter limits the result set to data operations that meet a specific condition.

To obtain a listing of all entities and metrics for a resource, use the iControl® REST API `/example` endpoint with a report category URI.

Overview: Report states in Application Visibility and Reporting

Every report that you generate using the Application Visibility and Reporting (AVR) REST API transitions through one or more of the following states:

CREATED

Specifies that a report request was received but the task of generating the report has not yet begun.

STARTED

Specifies that the task of generating a report has begun but has not yet completed. To poll the report process, make a GET request to the link contained in the response, to the initial report generation request.

FAILED

Specifies that a report request did not complete successfully. The response includes an error message that indicates the cause of failure. For example, if you attempt to create a report for a feature that you

have not enabled on a BIG-IP[®] device, AVR sets the task status property to FAILED and generates an appropriate error message.

FINISHED

Specifies that a report generation task completed successfully. You can intermittently poll the request to determine when the report generation task completes, then make a GET request to view the results of a report.

Generating a report using the Application Visibility and Reporting REST API

The Application Visibility and Reporting (AVR) REST API supports the generation of reports from REST requests to a specific URI and endpoint, as achieved through the workflow shown here.

1. To determine a category for a report, use the iControl[®] REST API to make a GET request to retrieve a list of all report categories.

```
GET https://192.168.25.42/mgmt/tm
```

The response to the request shows two of the many report category URIs.

```
{
  items : [...
    {
      link:
      "https://localhost/mgmt/tm/analytics/application-security/generate-report"
    },
    ...
    {
      link: "https://localhost/mgmt/tm/analytics/http/generate-report"
    }
    ...
  ]
}
```

2. To obtain a listing of entities and metrics for a category, use the iControl REST API and make a GET request to a report category URI. On the end of the URI, append the `/example` endpoint. You must replace the `localhost` string with a valid IP address or fully qualified domain name (FQDN).

```
GET https://192.168.25.42/mgmt/tm/analytics/http/generate-report/example
```

This request generate the entities and metrics for the `http` category and the help string text for the resource.

3. To generate a report for a specific category, use the AVR API and specify a reference link in a POST request. Specify any filters or metrics in the JSON body.

```
POST https://192.168.25.42/mgmt/tm/analytics/http/generate-report
```

```
{
  "entityFilters": [
    [
```

```

    {
      "dimensionName": "virtual",
      "predicate": "OPERATOR_TYPE_EQUAL",
      "values": [
        "phpAuction_VS_1"
      ]
    },
    {
      "dimensionName": "response-code",
      "predicate": "OPERATOR_TYPE_EQUAL",
      "values": [
        "200"
      ]
    }
  ],
  "viewDimensions": [
    {
      "dimensionName": "url"
    }
  ],
  "viewMetrics": [
    {
      "metricName": "average-server-latency"
    },
    {
      "metricName": "transactions"
    }
  ]
}

```

This action creates a request to generate a report. The task status property indicates whether a report generation process was created. At some point, the process transitions from the initial state to a running state.

The response to the request generates the data shown here for the report category:

```

{
  "dimensions": [
    {
      "dimensionName": "url",
      "value": "/index_846.php"
    }
  ],
  "metricValues": [
    {
      "metricName": "average-server-latency",
      "value": "0.00"
    },
    {
      "metricName": "transactions",
      "value": "36"
    }
  ]
},
...

```

4. To view the status of the report generation request, poll for the results of the task.

```

GET
https://192.168.25.42/mgmt/tm/analytics/http/generate-report/304075b3-7c7e-4645-a7e0-b7f728079be5

```

The task status property values are CREATED, STARTED, FINISHED, and FAILED. You can retrieve the status of all report generation requests by specifying the URI in the example without the GUID string.

```
{
  "entityFilters": [
    [
      {
        "dimensionName": "virtual",
        "predicate": "OPERATOR_TYPE_EQUAL",
        "values": [
          "phpAuction_VS_1"
        ]
      },
      ...
    ]
  ],
  "status": "FINISHED",
}
```

5. To view the report, make a GET request to the report results endpoint.

```
GET
https://192.168.25.42/mgmt/tm/analytics/report-results/304075b3-7c7e-4645-a7e0-b7f728079be6
```

The completed report is available to the user who created the report, or to users assigned to the administrator role. If you want to view all report generation requests, you can retrieve those results by specifying the URI in the example minus the GUID string.

```
GET https://192.168.25.42/mgmt/tm/analytics/report-results
```

6. To delete a report task, make a DELETE request to the endpoint used to generate a report and append the GUID string for the task. In a similar manner, you can delete the report results.

```
DELETE
https://192.168.25.42/mgmt/tm/analytics/http/generate-report/304075b3-7c7e-4645-a7e0-b7f728079be5
```

AVR automatically deletes any report task not deleted within an hour of creation. Corresponding report results are also automatically deleted but you should delete a report immediately if you have no further use for the report. You can delete an individual report, or a collection of reports, but you cannot delete a report task that is running.

After completing these tasks, you should understand the steps to generate a report using the AVR API. Additionally, you should also understand how to use iControl REST to identify report categories, metrics, and entities.

Application Visibility and Reporting REST parameters

The Application Visibility and Reporting (AVR) REST API properties consist of entities and metrics to filter the results of a report.

Field Name	Description
reportFeatures	<p>Specifies the kind of information that appears in a response from AVR. You may specify one or more of the following values:</p> <ul style="list-style-type: none"> existing-entities time-aggregated time-series entities-count
viewDimensions	<p>Specifies the dimensions for which to calculate a report, such as:</p> <pre>["url"]</pre> <p>You may only specify a single dimension. You may omit this field in a report generation request.</p>
viewMetrics	<p>Specifies the list of metrics by which to sort results, such as:</p> <pre>{ "metricName": "average-tps" }, { "metricName": "transactions" }</pre> <p>If you specify either <code>time-aggregated</code> or <code>time-series</code> features, you must specify one metric in a report generation request.</p>
sortByMetrics	<p>Specifies the list of metrics to sort by, such as:</p> <pre>[{ metricName: "average-tps", order: "descending" }]</pre> <p>Valid values are <code>ascending</code> and <code>descending</code>. Sorting only applies to the <code>time-aggregated</code> feature. You do not need to specify this field in a report generation request.</p>
timeRange	<p>Specifies the time range, in microseconds, for which to calculate a report, such as:</p> <pre>{ "from": 1410420888000000, "to": 1410424488000000 }</pre> <p>You do not need to specify this field in a report generation request.</p>
entityFilters	<p>Specifies the entities and values for which to calculate a report. You can specify a single entity with a second level of dimension filters that describe an aspect of the entity. If you specify multiple entity types, the results include only the entities that match all of the criteria. You do not need to specify this field in a report generation request.</p>

Field Name	Description
	<p>The following snippet contains two entities with corresponding values:</p> <pre>[[{ "dimensionName" : "virtual", "predicate": "OPERATOR_TYPE_EQUAL", "values" : ["phpAuction_VS_1"] }, { "dimensionName" : "response-code", "predicate": "OPERATOR_TYPE_EQUAL", "values" : ["200"] }]]</pre>
metricFilters	<p>Specifies the metric filters for which to calculate a report, such as:</p> <pre>[{"metricName": "transactions", "predicate" : "OPERATOR_TYPE_GREATER_THAN" "value": 100 }]</pre> <p>You do not need to specify this field in a report generation request. For the existing-entities feature, AVR supports the OPERATOR_TYPE_LIKE predicate. AVR also supports the following predicates:</p> <ul style="list-style-type: none"> • OPERATOR_TYPE_EQUAL • OPERATOR_TYPE_NOT_EQUAL • OPERATOR_TYPE_GREATER_THAN • OPERATOR_TYPE_LOWER_THAN • OPERATOR_TYPE_GREATER_THAN_OR_EQUAL • OPERATOR_TYPE_LOWER_THAN_OR_EQUAL
pagination	<p>Specifies the number of results to return, and the number of results to skip, such as:</p> <pre>{ numberOfResults : 10, skipResults : 10 }</pre> <p>To see the second set of ten results, use the example shown here. AVR does not implement the OData query parameters <code>top</code> or <code>skip</code>. In order to see a specific set of results, you must set the number of results to return and then determine how many results to skip. You do not need to specify this field in a report generation request.</p>

Index

A

- AVR REST API
 - understanding [7](#)
- AVR REST API properties, metrics
 - filtering [10](#)
- AVR REST API report results
 - about specifying [7](#)

- AVR REST API reports
 - generating [8](#)

R

- report states
 - Overview [7](#)

