



Stratusphere™ FIT and Stratusphere™ UX

***Getting Started with
the Stratusphere API***

Introduction

This guide has been authored by experts at Liquidware in order to provide information and guidance concerning the use of the Stratusphere API.

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Stratusphere Overview

Liquidware Labs' Stratusphere™ is a cornerstone desktop transformation and management solution for both physical and virtual environments. The Stratusphere solution is made up of two products—Stratusphere™ FIT and Stratusphere™ UX. As an assessment solution, Stratusphere FIT gathers a wide range of data about your existing infrastructure to give a clear picture about how resources are currently consumed. Stratusphere UX is a unique monitoring and diagnostics desktop management solution that independently defines and collects data metrics about desktop user experience performance as well as the entire desktop infrastructure from endpoints, hosts, network and storage.

When making computing resource decisions, organizations typically do not know what users have on their desktops or where to start from a hardware or software perspective, performance perspective, or from a user experience perspective. Without an assessment, they will either allocate minimal resources to the target environment, leading to performance problems later, or over-provision resources, incurring higher costs. Stratusphere FIT is the solution for the IT Manager or Director who is responsible for transforming the current environment into the next generation of desktops.

Stratusphere FIT provides a sound assessment foundation on which management can make solid planning decisions and will be able to set baselines in order to validate success at the project's end. Stratusphere FIT:

- Assesses and baselines desktops, users, applications and infrastructure resources
- Measures endpoint to datacenter network latency
- Rates user, machine, and application fitness levels for virtualization: Good/Fair/Poor
- Supports capacity planning (CPU, Memory, Storage, IOPS)
- Enables design of optimum shared-image strategy
- Allows creation of remediation plans before migrating desktops to virtual platforms

From the day-to-day operations perspective, Stratusphere UX provides desktop administrators with a single pane-of-glass to monitor ALL desktops—physical and virtual—to ensure they are performing to user expectations and corporate SLAs. Desktop administrators can proactively monitor desktops through inspectors and dashboards. If significant issues arise, Health Checks can be performed to troubleshoot the environment as well as optimize desktop images and infrastructure design for best performance. Stratusphere UX delivers an ongoing and constant rating of enterprise desktop performance—by application, group, or user—and independently tracks hundreds of metrics on all integral layers of the infrastructure to ensure quality and consistent user experience across all desktops. Stratusphere UX:

- Provides end-to-end visibility - desktop to data center
- Proactively monitors and rates user experience: Good/Fair/Poor
- Allows admins to identify, diagnose, and solve the root-cause of issues in the infrastructure
- Validates pilot and production infrastructure changes to ensure optimal performance
- Offers cross-platform support for physical and virtual machines on mixed platforms
- Operates as "read-only" for secure no touch access to critical data center systems
- Supports Hyper-V and XenServer based virtual machines and provides advanced support for VMware vSphere Server, VMware View PCoIP and VMware ThinApp

The Stratusphere solution is designed to save organizations time and money while boosting productivity. It eliminates the guesswork associated with resource planning and allows administrators to proactively monitor performance to keep users productive.

Before You Begin

This document is intended for Administrators who would like to customize reporting or write applications that use Stratusphere's vast collection of data collected from their environment. It provides instructions to setup the Stratusphere API and a brief overview of the key concepts and main operations. It is assumed that the reader is familiar with Stratusphere FIT and UX capabilities, function and architecture. This document does not explain the metrics or values collected in Stratusphere.

Versions Supported

The Stratusphere API is available for use with Stratusphere FIT and UX versions 5.6.1 and higher. Note that future product enhancements may make this document obsolete. Please check our Support site for the latest version of this document.

Using the JSON Data Format

Beginning with version 5.6, Stratusphere implemented the JSON (JavaScript Object Notation) "RESTful" API. JSON is an open standard data exchange format which allows easy access to all the metrics available in Stratusphere without having to learn the Stratusphere database schema. The JSON API can be consumed by many programming languages and management consoles.

For more Information on RESTful APIs:

http://en.wikipedia.org/wiki/Representational_state_transfer

For more information on the JSON API:

<http://www.json.org/>

Granting Client Devices API Access

To be granted secure access to the Stratusphere API, a user must be an Administrator of the Stratusphere Web Interface. Access to the API is controlled by the IP address of the client machine and needs to be added to the Stratusphere Configuration before you can use it.

To enable API access:

1. Open the Stratusphere Web client by entering the Hub IP or DNS name in a web browser. Login to the **Administrative** section using your **User Name** and **Password**.

The default Administration Interface credentials for the Stratusphere Hub web version are:

User name: ssadmin

Password: sspassword

Note: For AWS, use your VM Instance ID for the password.

Product	Valid until	License Details
✓ Stratusphere FIT	Forever	539/unlimited machines, 151/unlimited users
✓ Stratusphere UX	Forever	539/unlimited machines, 151/unlimited users, 8/100 collectors

Contact sales@liquidware.com for additional licensing needs.

2. Go to the **Hub Administration > Configuration** tab and open the **Other Settings** section. Enter the IP of the machine to be used to run the API using either the **API Client IPs** or the **Whitelist** fields. Alternatively, you can enter multiple IP addresses or IP ranges separated by commas.

API Client IPs: Stratusphere provides Database API to access and pull information out of the Stratusphere Database. Enter the specific IP address(es) or subnets that are allowed to access information from the Stratusphere Database using the API without using a username or password. For improved security, it is not recommended to grant access via this Legacy API Client IP list.

Whitelist: Enter the specific IP address(es) that are allowed to access information from the Stratusphere Database using the API through user and password authentication. The default is to leave this field blank for wider access. If any IP addresses are listed, API access is restricted to only those IP addresses in the white list that can authenticate their identity. Liquidware enhanced security around Stratusphere API by disallowing usage of the default **ssadmin** user or any password that contains 'password' in it. Liquidware recommends creating a different set of users that are allowed API access using best practices around password security.

Blacklist: Enter the specific IP address(es) that are blocked from having access to the Stratusphere Database using the API through user and password authentication. To completely turn off API access, enter 0.0.0.0 into this list.

The screenshot shows the 'Appliance Network Configuration' and 'Other Settings' sections of the Stratusphere Administration console. In the 'Other Settings' section, the 'API Client IPs' field is highlighted with a red arrow and contains the value '10.0.0.0/8, 172.0.0.0/8'. Another red arrow points to the 'Whitelist' field which contains '97.93.220.102'. The 'Blacklist' field is currently empty.

Examples:

- Single IP Address: 10.10.10.1
- IP Range using CIDR format: 10.10.10.0/24
- Multiple Addresses: 10.10.10.1, 10.10.10.0/24, 123.245.167.0

3. Click **Save Changes**. The API is now securely enabled for the IP address or range entered.

Tip: If you do not know the machine IP address, launch the API first by following the steps described below. The web page will return an error message that contains the IP of the machine.

Accessing the API and the Online Documentation

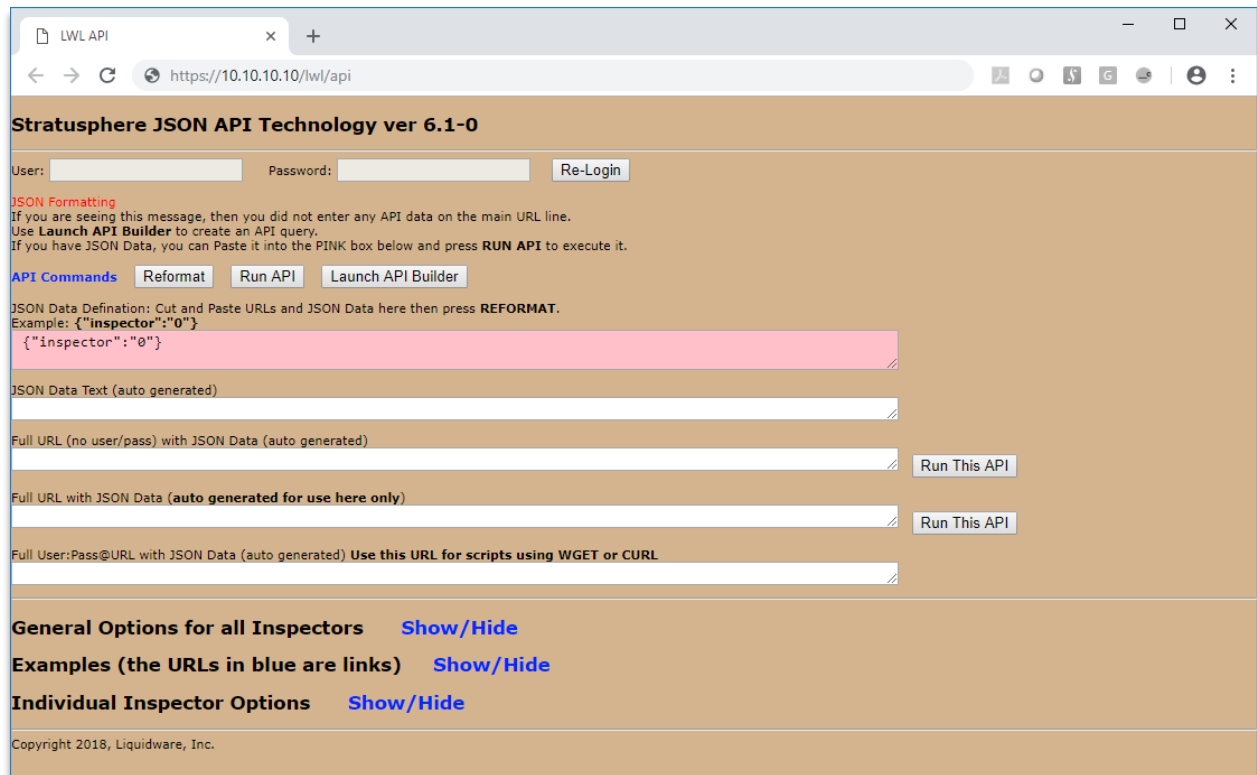
The Stratusphere API is **self-documenting with examples**. Since the API's first release, it has been evolving rapidly due to additional enhancements and requests. Please regularly check the online documentation for changes and new features. You can access the API in a browser by linking to your Stratusphere server with the following URL:

`https://[HUB IP or DNS] /lwl/api`

For example, if your Hub IP is 10.10.10.10, the API main screen URL would be:

`https://10.10.10.10/lwl/api`

API main screen:



The API main screen contains the online documentation, organized in 3 sections:

- General options
- Examples
- Inspectors

Open each section by clicking on the **Show/Hide** hyperlink next to each section.

Tip: We strongly recommend users to read all sections thoroughly, especially the first two sections. The time invested is worthwhile and will avoid a lot of time wasted later.

Using the API

Data can be passed as a **POST** request method or as a variable on the URL such as `json={"field":"value"}`

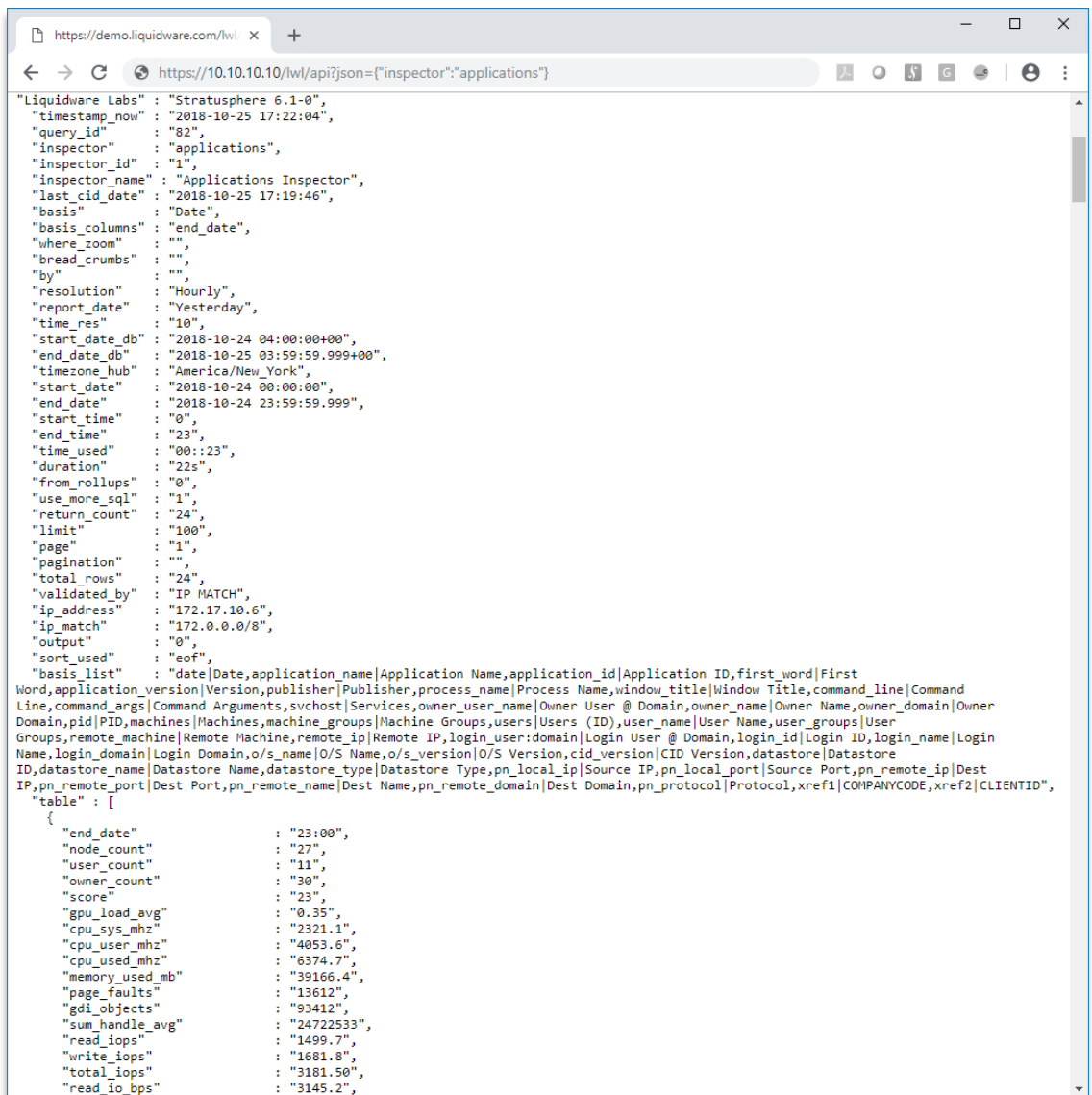
API query format:

```
https://[HUB IP or DNS]/lwl/api?json={"field1":"value1","field2":"value2" ...}
```

Example:

```
https://10.10.10.10/lwl/api?json={"inspector":"applications"}
```

This will return the Applications Inspector for Yesterday.



```
https://demo.liquidware.com/lwl/ x +
https://10.10.10.10/lwl/api?json={"inspector":"applications"}

"Liquidware Labs" : "Stratusphere 6.1-0",
"timestamp_now" : "2018-10-25 17:22:04",
"query_id" : "82",
"inspector" : "applications",
"inspector_id" : "1",
"inspector_name" : "Applications Inspector",
"last_cid_date" : "2018-10-25 17:19:46",
"basis" : "Date",
"basis_columns" : "end_date",
"where_zoom" : "",
"bread_crumbs" : "",
"by" : "",
"resolution" : "Hourly",
"report_date" : "Yesterday",
"time_res" : "10",
"start_date_db" : "2018-10-24 04:00:00+00",
"end_date_db" : "2018-10-25 03:59:59.999+00",
"timezone_hub" : "America/New_York",
"start_date" : "2018-10-24 00:00:00",
"end_date" : "2018-10-24 23:59:59.999",
"start_time" : "0",
"end_time" : "23",
"time_used" : "00:23",
"duration" : "22s",
"from_rollups" : "0",
"use_more_sql" : "1",
"return_count" : "24",
"limit" : "100",
"page" : "1",
"pagination" : "",
"total_rows" : "24",
"validated_by" : "IP MATCH",
"ip_address" : "172.17.10.6",
"ip_match" : "172.0.0.0/8",
"output" : "0",
"sort_used" : "eof",
"basis_list" : "date|Date,application_name|Application Name,application_id|Application ID,first_word|First
Word,application_version|Version,publisher|Publisher,process_name|Process Name>window_title|Window Title,command_line|Command
Line,command_args|Command Arguments,svchost|Services,owner_user_name|Owner User @ Domain,owner_name|Owner Name,owner_domain|Owner
Domain,pid|PID,machines|Machines,machine_groups|Machine Groups,users|Users (ID),user_name|User Name,user_groups|User
Groups,remote_machine|Remote Machine,remote_ip|Remote IP,login_user:domain|Login User @ Domain,login_id|Login ID,login_name|Login
Name,login_domain|Login Domain,o/s_name|O/S Name,o/s_version|O/S Version,cid_version|CID Version,datastore|Datastore
ID,datastore_name|Datastore Name,datastore_type|Datastore Type,pn_local_ip|Source IP,pn_local_port|Source Port,pn_remote_ip|Dest
IP,pn_remote_port|Dest Port,pn_remote_name|Dest Name,pn_remote_domain|Dest Domain,pn_protocol|Protocol,xref1|COMPANYCODE,xref2|CLIENTID",
"table" : [
{
"end_date" : "23:00",
"node_count" : "27",
"user_count" : "11",
"owner_count" : "30",
"score" : "23",
"gpu_load_avg" : "0.35",
"cpu_sys_mhz" : "2321.1",
"cpu_user_mhz" : "4053.6",
"cpu_used_mhz" : "6374.7",
"memory_used_mb" : "39166.4",
"page_faults" : "13612",
"gdi_objects" : "93412",
"sum_handle_avg" : "24722533",
"read_iops" : "1499.7",
"write_iops" : "1681.8",
"total_iops" : "3181.50",
"read_io_bps" : "3145.2",
```

You must pass the Inspector type. The Inspector determines which type of table your data comes from. Everything else is optional. As seen above the following example will return the Applications Inspector for Yesterday.

```
/lwl/api?json={"inspector":"applications"}
```

Next you want to add a Basis. The basis is a column that is included in the 'group by' of the SQL query. A sample BASIS could be 'users', 'machines', 'application_name'. The basis columns would be 'user_id', 'user_name', 'node_id', 'node_name', 'application_name'. This example will return the User Inspector for Yesterday. You get column for the basis 'users' which are 'user_name' and 'user_id'. This will be a total for each user, for the time period.

```
/lwl/api?json={"inspector":"0","basis":"users"}
```

This example will return the Applications Inspector for Yesterday. You get column for the basis 'application_name' which is 'application_name'. This will be a total for each application for the time period.

```
/lwl/api?json={"inspector":"1","basis":"application_name"}
```

You can add additional basis by adding them as a comma separated list or as an array.

This will return the User Inspector for Yesterday but include the 'users' and the 'machines' basis columns: 'user_id', 'user_name', 'node_id', 'node_name'.

```
/lwl/api?json={"inspector":"0","basis":"users,machines"}
```

Or

```
/lwl/api?json={"inspector":"0","basis":["users","machines"]}
```

Please refer to the online API documentation for more options, examples, and current updates.

Key Concepts

Here are a few of the key concepts to keep in mind while utilizing the Stratusphere API. However, this is not a comprehensive list. Please refer to the online API documentation for more options, examples, and current updates.

Inspectors

Inspectors are the starting point for building all API queries in Stratusphere. The Stratusphere Inspectors contain over 300 fields and many types of objects such as Applications, Hosts, Machines, Users, Network, Datastore, etc. Inspectors have been created to structure and simplify the data query process. Consider an inspector as a preset query associated with a number of tables in the database. Inspectors are designed to focus on a specific component in the VDI environment. For example, the Network Inspector will include all the fields related to network traffic (Latency, Ports, Dropped Connections, etc.).

The main and most used inspector is the Summary Inspector, or Inspector 0. It includes bases for Machine, Users, Dates and Groups.

Some bases, like Date or Machine, can be found in multiple inspectors. For example, if you want to see the list of processes, and the resources used by User, you would select the Application Inspector and add Users and Processes to the bases.

Please refer to the Inspector section of the API main page for a detailed description of each inspector.

Data Types

In Stratusphere queries there are two types of data: bases and metrics.

The basis is the object or main component that provides the structure for grouping the data: Machine, User, Host, Application, Groups, Network Port, Date, etc. A query **MUST** have at least one basis, but it can also have multiple bases.

Metrics are measurements associated with the objects: CPU Usage, Memory, Uptime, Login Time, etc. Most of the metrics are environmental information captured by Stratusphere. However, a few metrics are calculated values such as User Count, VDI UX, Ranking, etc.

Metrics Available

One of the main benefits of the Stratusphere API is to give flexible, open access to the data without requiring knowledge of SQL or even database schema. However, users still need to know what data is available to create queries.

Adding the setting "table_id": "0" to an API query will return ALL fields available for the specific query.

PLEASE NOTE: The fields available depend on both the inspector AND basis selected in the query. For example the Summary Inspector with a User basis will return different fields than the same inspector with a Machine basis.

Tip: the Preview tab in Stratusphere Web client uses the API engine too. So getting familiar with the web client will help you when making API queries and vice versa.

Time

All captured metrics in Stratusphere are time stamped, so time will be factor in EVERY query made and will impact the results. If no date is specified, the API will use yesterday as the default.

Output Format

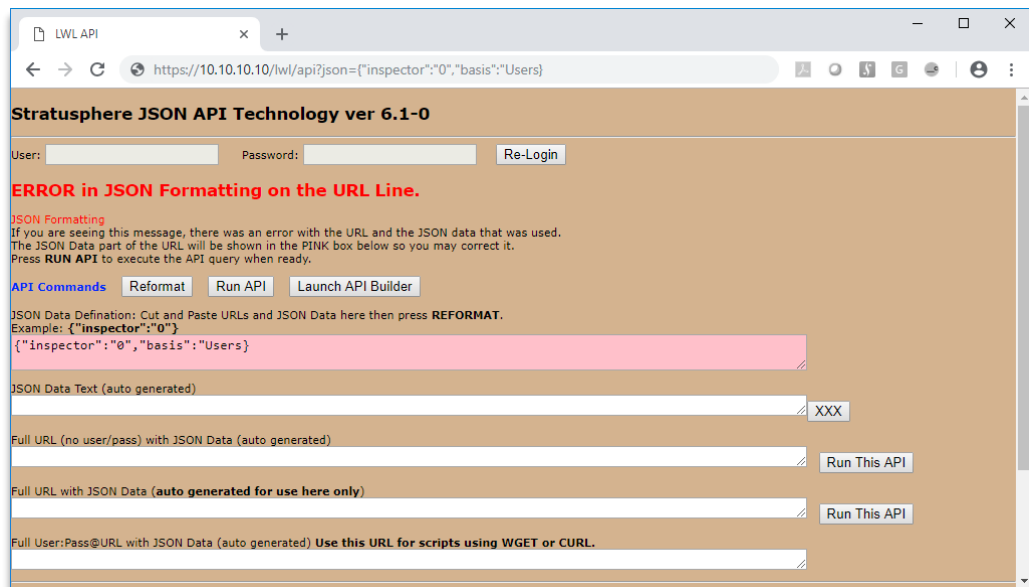
By default, data is returned in a JSON format but can be changed to CSV or HTML formats.

Error/Ignore

If the syntax of an API request is incorrect, the API will return an error message. However, if a value is incorrect, the API will simply ignore it.

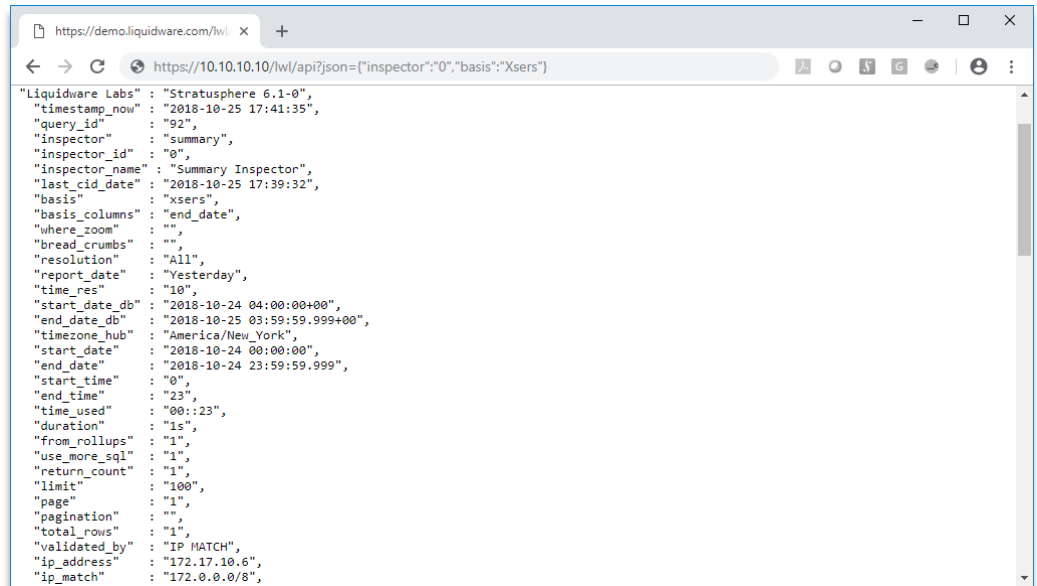
Example 1:

The last quote (") after **Users** is missing, and API returns an error.



Example 2:

“Users” is misspelled as “Xsers”, so the API ignores the basis setting and uses the default (end_date) instead.

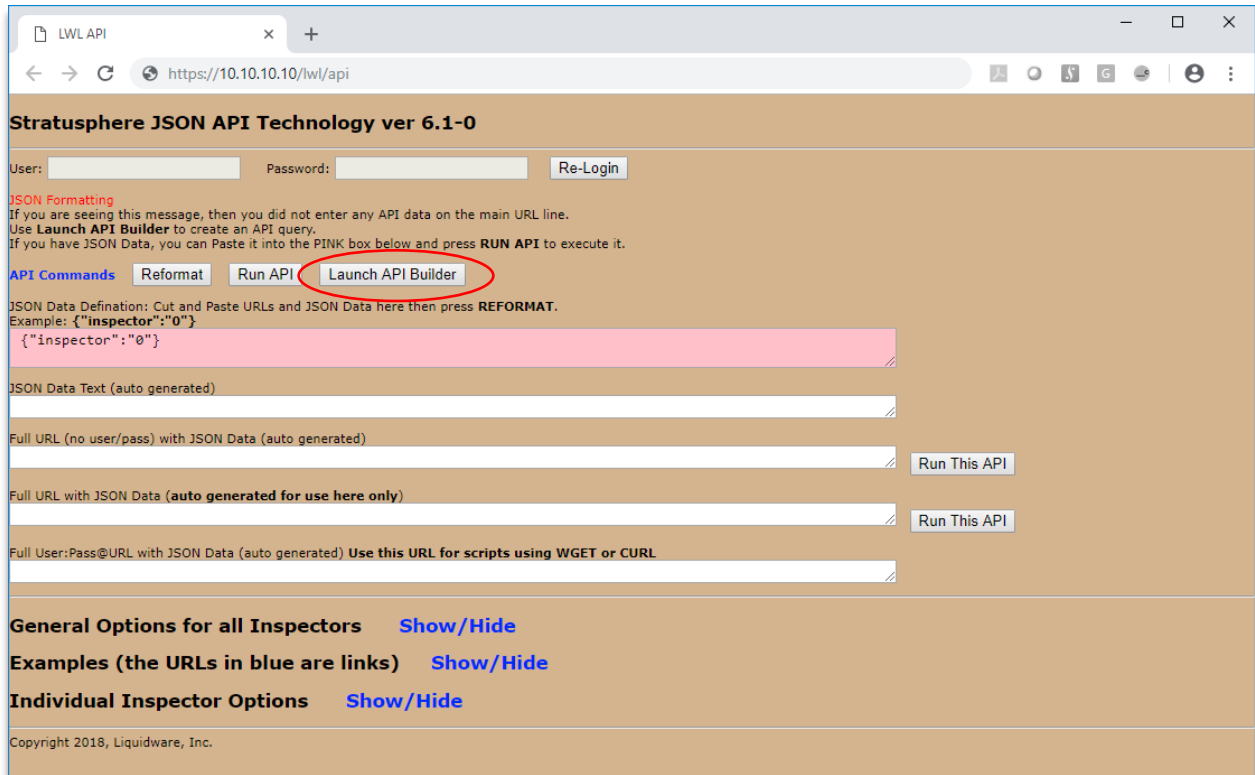


```
https://10.10.10.10/lwl/api?json={"inspector":0,"basis":"Xsers"}
{"Liquidware Labs": "Stratusphere 6.1-0",
"timestamp_now": "2018-10-25 17:41:35",
"query_id": "92",
"inspector": "summary",
"inspector_id": "0",
"inspector_name": "Summary Inspector",
"last_cid_date": "2018-10-25 17:39:32",
"basis": "xsers",
"basis_columns": "end_date",
"where_zoom": "",
"bread_crumbs": "",
"resolution": "All",
"report_date": "Yesterday",
"time_res": "10",
"start_date_db": "2018-10-24 04:00:00+00",
"end_date_db": "2018-10-25 03:59:59.999+00",
"timezone_hub": "America/New_York",
"start_date": "2018-10-24 00:00:00",
"end_date": "2018-10-24 23:59:59.999",
"start_time": "0",
"end_time": "23",
"time_used": "00:23",
"duration": "1s",
"from_rollups": "1",
"use_more_sql": "1",
"return_count": "1",
"limit": "100",
"page": "1",
"pagination": "",
"total_rows": "1",
"validated_by": "IP MATCH",
"ip_address": "172.17.10.6",
"ip_match": "172.0.0.0/8",
```

Using the Stratusphere API Builder

Starting with version 5.7, a new graphical tool was added to the Stratusphere API called the Stratusphere API Builder. This tool allows you to quickly build API URL calls by making point and click selections in the graphical user interface.

You can get to the API Builder by clicking on the Launch API Builder button on the Stratusphere API main screen.



You can also access the API Builder with the following URL:

`https://[HUB IP or DNS] /apibuilder`

The first thing we want to do on the Main Tab is set our inspector. This focuses the API query on exactly what type of data we want to extract. Then we can use the default Basis or select one or more options from the Basis list. This application-related data will be summarized and grouped by the Basis.

The Preview Pane at the bottom of the API Builder interface shows the first 10 rows of data for the API query we are building. The initial Preview Pane contains the default columns for the Inspector chosen. However, the Preview Pane updates in real-time displaying changes as we make them.

Use the other tabs such as Search, Columns, and Date to further customize your query.

On the right hand side of the API builder you will see the JSON query and full API URL that your selections built. This can be copied and used in your tool of choice to extract your Stratusphere data.

Read more about using this tool our [Stratusphere API Builder](#) article on the Liquidware Blog.

Getting Help with Stratusphere

If you have questions or run into issues while using Stratusphere, Liquidware Labs is here to help. Our goal is to provide you with the knowledge, tools, and support you need to be productive.

Using Online Resources

Liquidware Labs maintains various kinds of helpful resources on our [Customer Support Portal](#). If you have questions about your product, please use these online resources to your full advantage. The Support Portal includes product forums, a searchable Knowledge Base, documentation, and best practices among other items. You can visit our website at <https://www.liquidware.com>.

Contacting Support

If you wish to contact our Support staff for technical assistance, please either log a request on the [Liquidware Labs Customer Support Portal](#) or give us a call. Prior to Logging a Case you may want to review these helpful tips:

- Check the Product Documentation included with your Liquidware Labs Product.
- Try to see if the problem is reproducible.
- Check to see if the problem is isolated to one machine or more.
- Note any recent changes to your system and environment.
- Note the version of your Liquidware Labs product and environment details such as operating system, virtualization platform version, etc.

To speak directly with Support, please use the following numbers:

Main Line:	1-678-397-0460
Toll Free in US & Canada:	1-866-914-9665
Europe/Middle East/Africa:	+44 800 014 8097
Toll Free in Europe	
UK:	0800 014 8097
Netherlands:	0800 022 5973
Switzerland:	0800 561 271