



## 8 Key API Performance Indicators for Digital Business

API programs are not new; TIBCO Mashery® has been helping companies manage them for more than a decade. Their popularity continues to grow as more businesses undergo digital transformation and recognize the value of using APIs to expose software and data assets to internal and third-party developers, employees, partners, and customers.

Every API program is different, with unique use cases, varied business objectives, and stakeholders from customers to sales personnel, and the Accounting department to Operations. But even though there may be many people and multiple roles involved in getting an API program up and running, there are a few core metrics (key API performance indicators, or KAPIs) of interest to all. Understanding some of these common KAPIs, what they represent, and their significance for performance, business operations, and/or API consumers, help ensure program effectiveness and good decision-making.

This whitepaper, one in a series on API management and analytics, defines common KAPIs and the types of professionals most likely to appreciate each.

### KAPI #1: REGISTERED API KEYS

Tracking the growth of API keys in your system is one of the most important non API traffic metrics. A registered API key (also often known as a token or client\_id) represents an individual or company that is requesting access to your API. Without this knowledge, you don't know if new developers are on-boarding, if your developer base is growing, or—if you're monetizing your API—if your marketing campaigns or sales efforts are working.

### API OWNERS

Tracking API registration metrics is a bread and butter statistic for an API owner. Continuously increasing registrations helps indicate that you have a service that others find valuable.

## KAPI DELIVERY

Depending on the audience, delivering KAPI metrics through a dashboard that requires little to no configuration may be appropriate. The Mashery Executive Summary (shown at right) is a great way to access many of the KAPIs discussed in this paper. It's accessible through the main navigation of the TIBCO Mashery Control Center under Analyze → Executive Summary.

For executives on the go, delivering a report via email might be the best route: no passwords or URLs to remember, the information is available for them right in their inbox. TIBCO Simplr™ personal automation can be used to connect to the Mashery Reporting API (and other cloud apps), download data, and send out a regularly scheduled report via email.

And when customized charts, graphs, and ad-hoc reports are what you need, TIBCO Spotfire® visual analytics is available as a service or an on premises application. It integrates with Mashery to provide beautiful and intuitive analytics that can be easily refreshed and explored for underlying detail. Spotfire also supplies a Recommendations capability, automatic suggestions for best data presentation. In addition, it lets you run customized, ad-hoc reports on capacity modeling, billing, and predictive analytics, which can be crucial to your program and helpful to many.

## KAPI FREQUENCY

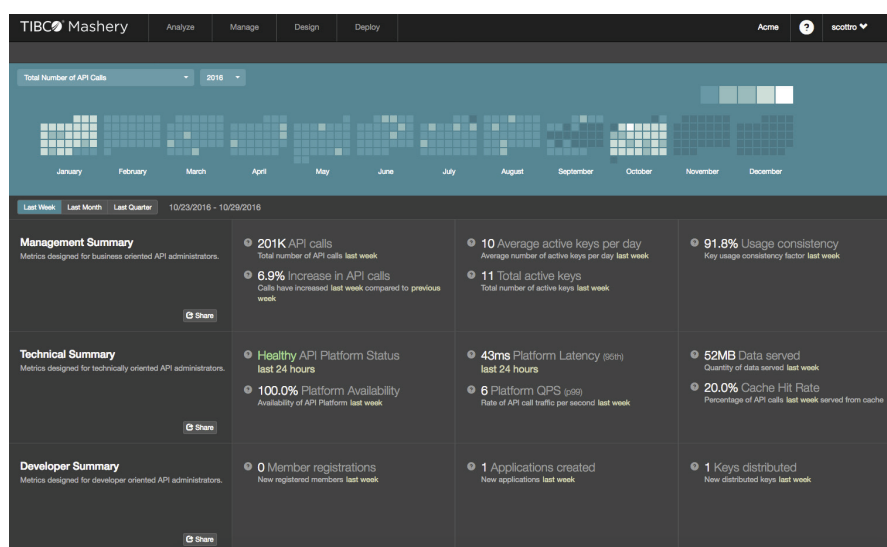
Frequency and demand for data will vary by group. Some groups—Ops, Support, or even Marketing—will need data on an ongoing basis and on-demand, requiring either continuously updated dashboards or some mechanism to trigger an update immediately when needed. Anyone that either needs the KAPI data constantly, or does not have a predictable timetable for it, can't wait for IT to refresh the data.

## OPERATIONS/SUPPORT

Those responsible for assuring smooth operations may want to know the size of the community they need to support, but they probably won't need to check the users/keys metric on a daily basis. They will likely be more interested in call-related information.

## SALES/MARKETING

Those responsible for campaigns aimed at increasing API consumption will be very interested in the registered keys metric. Depending on the situation, monthly or quarterly program updates might be needed, for which a scheduled report works well. But if an awareness campaign, conference, or hackathon is underway, they might want to track this metric frequently, and on demand. Additionally, if you monetize your API, developers registering for keys become a part of your sales pipeline.



Mashery Executive Summary report.

## KAPI #2: USAGE CONSISTENCY

We define usage consistency as the ratio of the average active keys per day over the total active keys for the particular time period expressed as a percentage; also known as “stickiness.”

## API OWNERS, SUPPORT, MARKETING

Like many things in life, we've found that APIs tend to follow the 80/20 rule; in this case, 80% or more of calls tend to be made by 20% or less of your API consumers (developers) as represented by API keys. If you were looking just at the gross number of calls, you would have a good idea of volume, but not an understanding of whether the user base was growing or shrinking.

**KAPI #3: AVAILABILITY**

Availability typically is represented as a percentage within a time period that your API is available in normal operating mode. You may have service-level agreements (SLAs) with your consumers, and therefore tracking and reporting on availability may be critical. Availability is no less important if you use your API for your own app, website, or other properties.

**OPERATIONS/ENGINEERING**

The primary keepers of availability have a well-established goal and are always striving to exceed it. The line between success and failure of meeting an SLA can be measured in minutes or even seconds; therefore, availability is a crucial KAPI for this group.

**API OWNERS**

Availability is very important to an API owner, though they might not have direct control over it because factors supporting it—infrastructure choices, tech debt, and approaches to incident management and redundancy—usually fall to Engineering/Operations. The API owner should push to ensure that the availability demands of the consumer base and market are met.

**ACCOUNTING/BUSINESS OPERATIONS**

If you monetize your API or have other contractual obligations, you need to know and report on it. If getting the availability information is cumbersome, you risk timely accounting and meeting your contractual obligations. Those responsible should be familiar with obtaining this metric before a service issue occurs.

**KAPI #4: QUERIES PER SECOND**

Queries Per Second (QPS) describes the number of calls received (but not necessarily processed) in a clock second. It is one of the more important metrics for managing API capacity. We talk more about the processing aspect in the next section.

**OPERATIONS/ENGINEERING**

Sometimes resolving capacity is as simple as scaling up; but other times, it can mean a longer running activity, like an API re-architecture, to meet evolving demands. Understanding capacity and knowing when systems are reaching a tipping point is a critical function of this group; keeping an eye on QPS utilization can help prevent capacity problems.

**API OWNERS**

QPS can also be a great way to segment developer tiers and help API owners create different API plans. For example, lower tier developers might get low QPS, and top tier developers, perhaps paying money for API access, might get much higher QPS.

**KAPI #5: CONCURRENCY**

The concurrency KAPI shows the number of calls serviced per second, including calls that originated previously and are still running, along with those that were received during the current second.

**OPERATIONS/ENGINEERING**

Unexpected long running API calls can put significant stress on a system if you are not prepared. For some, multi-second calls may be the norm; but if they are not the norm for your API, then keeping an eye on concurrency can be an early indicator of a stressed system.

**QPS VS CONCURRENCY**

While Queries Per Second (QPS) is a very common concept, understanding Concurrency (total calls being processed in a second, not just new calls received), may be a better indicator of capacity. A multi-second, synchronous API will often have a far different performance and capacity profile than one with sub-second response times.

## KAPI #5: MACRO USAGE TRENDS

Is traffic growing or shrinking? While the 80/20 rule still applies (80% or more of calls tend to be made by 20% or less of consumers), understanding total volume is still very important for capacity and general API program planning.

### OPERATIONS

Operations lives in the details needed to keep the system healthy, however numbers like total calls are still very valuable. Total traffic in combination with other metrics, such as QPS or concurrency numbers, can help flesh out capacity planning.

### API OWNER

Total traffic numbers are definitely interesting for tracking growth in a program. In the early days of the rise of API programs, being a member of the Billionaire's Club (having an API with more than a billion calls a day) was a big deal.

## KAPI #6: TOP USER STATS

If you are monetizing your API, keeping track of your steady top consumers as well as your big movers is critical.

### API OWNER

When a consumer who has been consistently steady in their API use exhibits some major change in traffic volume or pattern, it could mean many different things. Is your data more or less valuable than it has been? Has their application's popularity with end users increased or decreased? If the traffic is consistently down, have they found a better/cheaper source of data? Tracking this information will allow you to dig deeper and perhaps engage the developer to understand their pattern change.

## KAPI #7: ERROR RATES

Errors are anything other than a successful call, and most significant among them are those in the 400 and 500 series. If your error rates are trending up among all consumers, you may have a production issue. If error rates are increasing for a small number of consumers, it is possible that either there is an edge case issue, or it could simply be linked to an issue on the consumer side.

### OPERATIONS/SUPPORT

It's important to understand errors and why you're getting them. Do they indicate a trend or a pattern? Are they increasing, and can they be correlated with a change? If you deploy a new release, and support begins to receive increased tickets the next day, tracking back to when the errors increased can be a valuable exercise.

It is not uncommon to see big swings in error rates due to one bad app; you may not have a production issue at all. It's possible that a major consumer has released a new version of their application that is making bad calls. Having the ability to inspect the detailed changes in this type of scenario is a key capability. Mashery provides the Call Inspector feature, which allows you to capture and view low level details including headers, URL, and payload information in order to troubleshoot.



## API OWNERS

Some API owners are more technical than others, but generally, their main goal is to create something that is valuable to the business and the API's consumers. By inspecting your 404s (Resource Not Found) errors, you may find that people are looking for some piece of data that you don't have. This can be a helpful signal that you might need to expand your API to meet the needs of your consumers. By inspecting other error types, you may find that you have incorrectly setup entitlement rules and/or capacity limits. It could be that you have developers in need of an access upgrade.

## KAPI #8: LATENCY/RESPONSE TIME

Latency, or response time, is the amount of time it takes to receive, prepare, and return a response to a consumer. Every API has a different profile of expected latency. For some, more than 20 milliseconds might be unacceptable. For others with complex processing and large payload delivery, several seconds of latency might be reasonable.

## SUPPORT/OPERATIONS

Understanding the latency baseline and tracking latency over time are very important for understanding the health of a program. Support/operations will be particularly interested in this KAPI when it represents a pattern change. Is a call or a percentage of calls averaging a significantly greater response time versus historical data? While there are several things that could drive changes, the first items your operations team may look at are database load times, network issues, and recent changes in code that might be causing additional latency.

## CONCLUSION

We've provided a cross-section of KAPIs that are generally reflective of API programs:

- Is your program growing or shrinking?
- Is your traffic healthy?
- Are you well prepared to handle an increase in consumption?

We've also touched on the roles and groups within your company that might be interested in each data point.

The KAPIs discussed here are clearly not the entire KAPI universe; Your organization might have its own unique metrics. Visibility into the metrics that reflect the true health and state of your API program is a critical success factor. As a company with consumers relying on your digital assets, you can't afford to assume that the API program is on auto pilot and that it will manage itself, so keep your eyes on those KAPIs!



**Global Headquarters**  
**3307 Hillview Avenue**  
**Palo Alto, CA 94304**  
**+1 650-846-1000 TEL**  
**+1 800-420-8450**  
**+1 650-846-1005 FAX**  
**www.tibco.com**

**TIBCO Software** empowers executives, developers, and business users with Fast Data solutions that make the right data available in real time for faster answers, better decisions, and smarter action. Over the past 15 years, thousands of businesses across the globe have relied on TIBCO technology to integrate their applications and ecosystems, analyze their data, and create real-time solutions. Learn how TIBCO turns data—big or small—into differentiation at [www.tibco.com](http://www.tibco.com).

©2016, TIBCO Software Inc. All rights reserved. TIBCO, the TIBCO logo, Mashery, Spotfire, and TIBCO Simplr are trademarks or registered trademarks of TIBCO Software Inc. or its subsidiaries in the United States and/or other countries. All other product and company names and marks in this document are the property of their respective owners and mentioned for identification purposes only.

11/16/16