

# Geolocate an IP Address Location: The Definitive Guide

Posted on January 5, 2024



Knowing how to geolocate the IP address of a visitor or customer makes it easier for businesses to plan for strategic and tactical operations (e.g., reaching out to target audiences, setting up new offices and stores, promoting new products, gaining momentum, etc.).

Location is a crucial element when interacting with clients and prospects, and it should not only be considered by brick-and-mortar organizations but also online stores whose buyers are scattered all over the Web.

So, how can businesses geolocate IP addresses and get their hands on critical customer information? They can tap an IP geolocation database, a resource that enables organizations to obtain location-based data quickly and, as a result, get to know where their consumers are.

In this guide, we'll find out how employing IP geolocation can benefit companies and what its most prominent use cases are across industries.

## Table of contents

- [Answers to Common Questions about IP Geolocation](#)
- [Ways to Geolocate IP Addresses](#)
- [Debunking Common IP Geolocation Myths](#)
- [Benefits of Geolocating IP Addresses](#)
- [Impacts of Using Inaccurate IP Geolocation Data](#)

## Answers to Common Questions about IP Geolocation

### What Is IP Geolocation?

Geolocation is the process of estimating or identifying the real-world locations of devices and their users worldwide. These devices can be mobile phones, computers, or radar sources. While geolocation has been around for a while now, it was only after the rise of smartphones and applications like Google Maps that we realized how powerful this data can be.



## What Is an IP Address?

An Internet Protocol (IP) address is a unique numerical label assigned to each device that is part of a computer network that uses the Internet. It serves two primary functions—identifying a device on a network and providing a location for that device.

Two versions of IP addresses are commonly used. These are:

- **Internet Protocol version 4 (IPv4):** It uses a 32-bit address scheme, allowing for a total of  $2^{32}$  addresses to exist. An IPv4 address is typically split into four chunks split by periods, such as 192.168.0.1.
- **Internet Protocol version 6 (IPv6):** Due to the Internet's growth and the depletion of available IPv4 addresses, IPv6 was developed to allow for many more addresses. It uses a 128-bit address scheme. An example of an IPv6 address is 1200:0000:AB00:1234:0000:2552:7777:1313.

## What Is IP Geolocation Data?

IP geolocation data refers to information about the physical location of an Internet-connected device based on its IP address. This data can help determine the country, region, city, and possibly even the ZIP code the device is in.

## What Is an IP Geolocation Database?

An IP geolocation database is a massive repository of IP geolocation data. It's frequently built by third-party providers who consistently retrieve anonymous IP data from various Internet service providers (ISPs) via legal agreements and other sources. The database can hold millions of records, which are regularly updated and made available for download in different formats.

## How Is IP Geolocation Data Collected?

IP geolocation data collection is often done with the help of software that retrieve information from various sources, including:

- **Regional Internet registries (RIRs):** RIRs allocate significant pools of IP addresses to ISPs and manage their corresponding records. These nonprofit organizations include the American Registry for Internet Numbers (ARIN) and the Asia-Pacific Network Information

Centre (APNIC).

- **ISPs:** They provide Internet access in specific regions, generally offering services to companies and individuals. They typically receive a block of IP addresses from an RIR, which they can then assign to customers.
- **City code interpretations:** These are the naming conventions usually assigned to cities, providing clues about where connected devices can be found. They are often used by IP geolocation services to estimate a device's location.
- **Domain data:** Domain data lets organizations keep track of the owner of a selected range of IP addresses along with their corresponding postal addresses. This information can be part of an [IP netblocks database](#) or a [WHOIS database](#) that contains the contact and registration details of a target domain name and its corresponding IP addresses.
- **Browser geolocation:** This data is gathered when users agree to share their location while browsing the Web to receive more targeted digital content.

## Ways to Geolocate IP Addresses

### Option #1: Geolocate IP Addresses Using an API

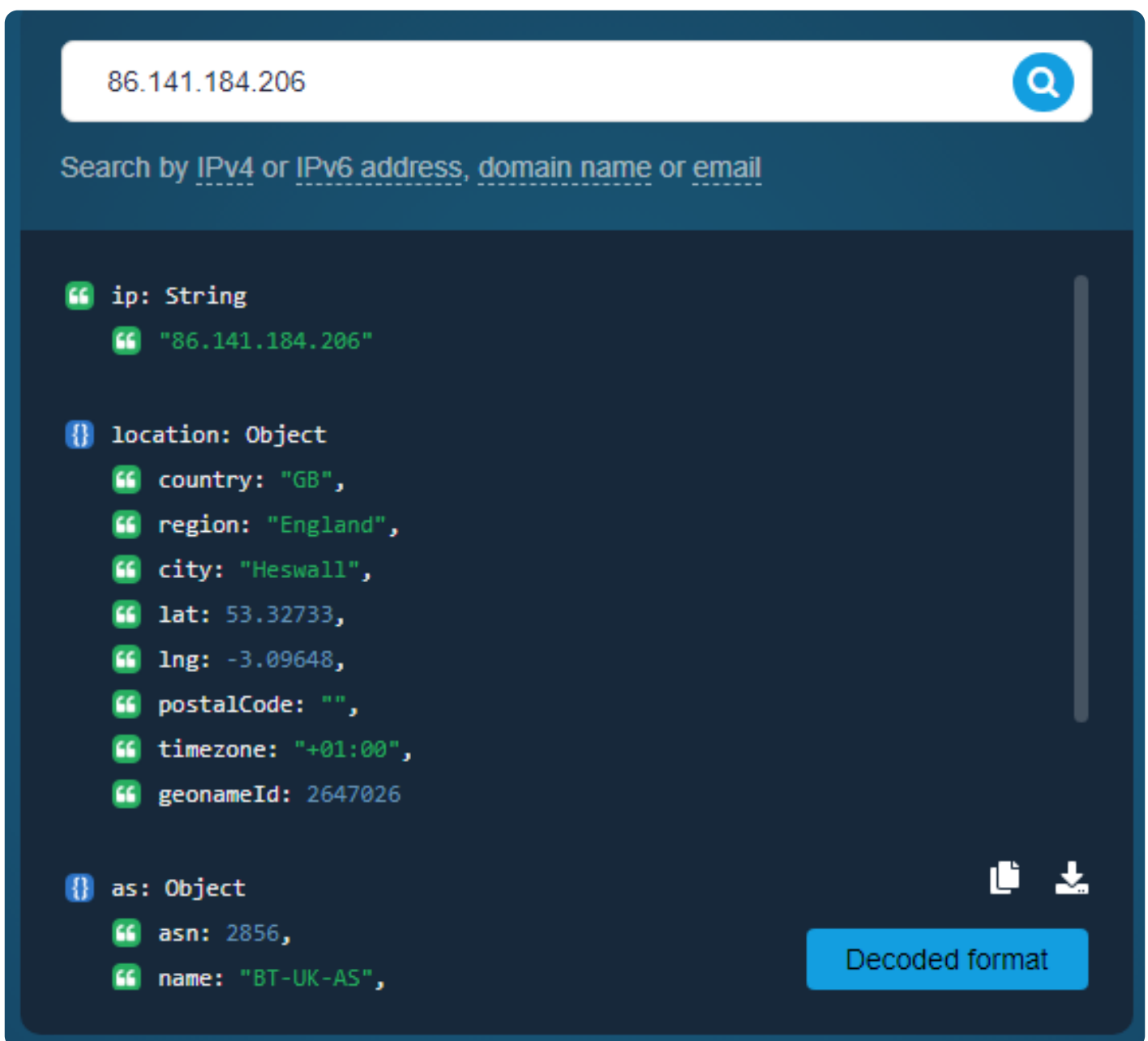
Users can find both paid and free services that will enable them to geolocate IP addresses. While they can rely on free services, they are mostly less accurate than their paid counterparts. Paid services often also come with customer support and more stable and available application programming interfaces (APIs).

WhoisXML API, for example, offers [IP Geolocation API](#) that is specifically designed to provide users with IP geolocation services. It covers 99.5% of all IP addresses in use and more than 13.1 million IP blocks across more than 230,000 locations worldwide.



With such coverage, you can get insights about your target market's demographics, including their regions, ZIP codes, browser types, and geographic coordinates. These data points can lead to the discovery of new opportunities and trends without invading each online user's privacy.

To geolocate an IP address using IP Geolocation API, just type your target IP address into the input field and hit **Enter** as shown below.



```
86.141.184.206

Search by IPv4 or IPv6 address, domain name or email

{
  "ip": "86.141.184.206",
  "location": {
    "country": "GB",
    "region": "England",
    "city": "Heswall",
    "lat": 53.32733,
    "lng": -3.09648,
    "postalCode": "",
    "timezone": "+01:00",
    "geonameId": 2647026
  },
  "as": {
    "asn": 2856,
    "name": "BT-UK-AS",
  }
}
```

Decoded format

You can also copy or download the results as a JavaScript Object Notation (JSON) file. The information you'll get includes the IP address's country, region, city, latitude and longitude coordinates, postal code, time zone, domains, and the Autonomous System (AS) details.

You can [register](#) to test the API free of charge.

## Option #2: Geolocate IP Addresses Using a Database

Geolocation data can also be accessed by downloading an IP geolocation database. Data providers like WhoisXML API offer a full database and daily data feed files for download. A prefiltered [data feed for regulatory compliance](#) is also available that provides a list of IP addresses geolocated in restricted areas, along with their location data.

If you are interested, you can download a [free database sample](#) to see what the data looks like.

## Debunking Common IP Geolocation Myths

Here are some erroneous beliefs about IP geolocation.

### Myth

Obtaining IP geolocation information is illegal or immoral.

### Reality

IP address geolocation data on its own doesn't reveal users' personally identifiable information (PII).

### Myth

IP geolocation information lacks useful details.

### Reality

On the contrary, it provides information organizations can use for various applications, such as geographic coordinates, ZIP codes, time zones, regions, and more.

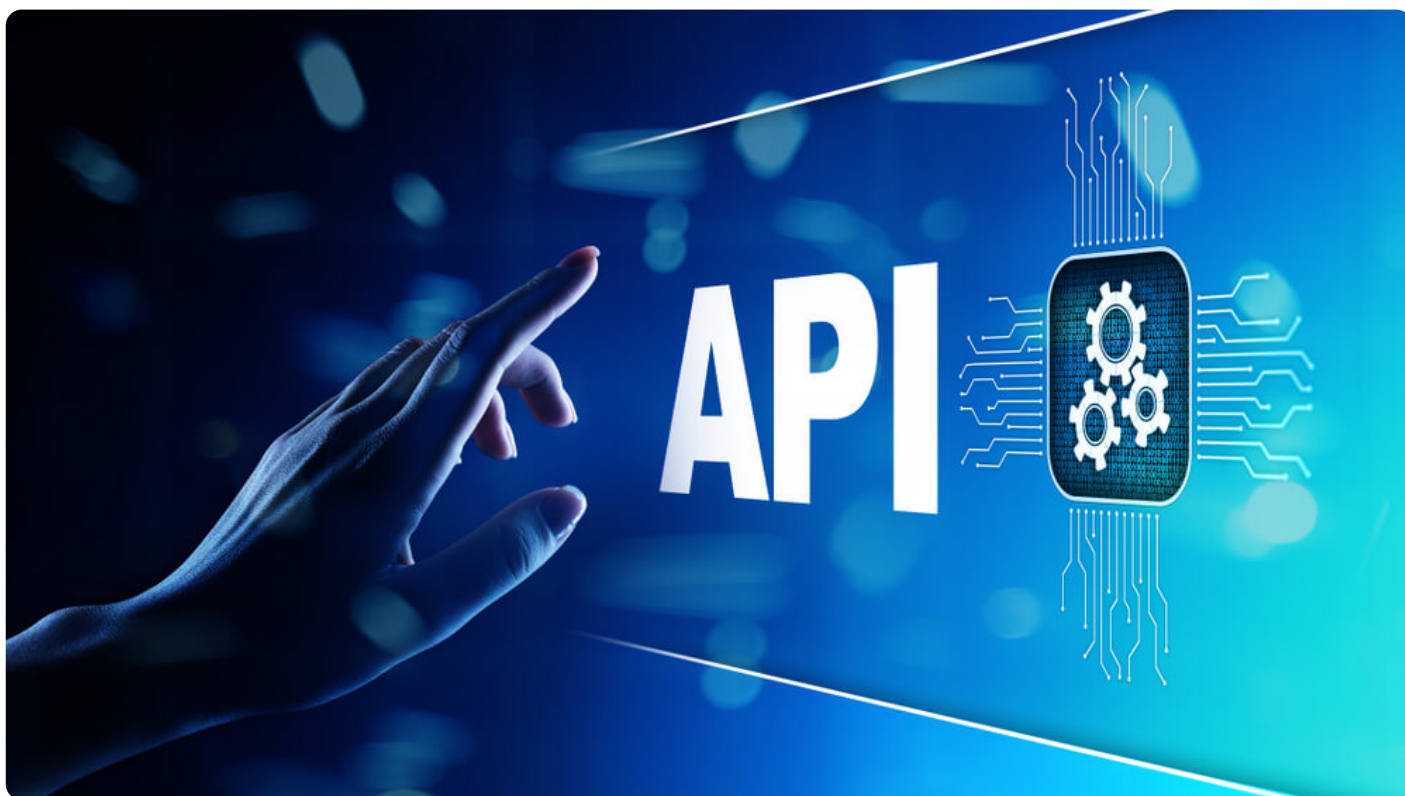
### Myth

You can only obtain users' IP geolocation details if they agreed to reveal it.

### Reality

No, IP addresses are generally public and tracked by websites and IT systems. As such, it's possible for you to target users based on their IP addresses.

## Benefits of Geolocating IP Addresses



Now that we have established the fundamentals of IP geolocation, let's review the types of organizations and users who can benefit when they geolocate IP addresses as part of their operations and why.

### What Benefits Can Businesses Gain from Obtaining IP Geolocation Data?



The Internet is the go-to place to sell all kinds of goods and services. Access to reliable and accurate data has thus become crucial for online enterprises and brick-and-mortar companies alike to succeed.

Use Case	How IP Geolocation Can Help
Content personalization	Online businesses can use IP geolocation data to create region-specific landing pages. Companies can make relevant offers to customers in certain locations. Websites can be configured so buyers can easily choose the nearest stores for convenient pickup. Online retailers can set their product and service prices by region.
Checkout acceleration and simplification	Businesses can make checkout easier by prepopulating some form fields based on users' geolocation data. Companies can automate shipping and tax computation and accept payments without asking users to reenter their ZIP codes.
Experience optimization	The information organizations obtain from users' IP addresses can provide details regarding their Internet connectivity. Subsequently, it lets business owners optimize customers' site experience and their online store websites based on the users' connection type.
Currency and language setting automation	Websites can detect visitors' browser languages and redirect them to local pages. Sites can automatically display visitors' local currencies depending on their locations.
User experience personalization	Companies can make users' shopping experience more personal. They can welcome new customers with specialized offers, gift loyal ones with discounts for repeat purchases, or urge disengaged ones by giving them good reasons to come back. Businesses with multiple stores or websites can automatically redirect users to location-specific landing pages with applicable currencies and languages.
Price optimization	IP geolocation <a href="#">databases</a> can help businesses optimize their pricing structures and become more competitive.

## What Benefits Does IP Geolocation Provide in Cybersecurity?

Security professionals who geolocate IP addresses can intensify critical cybersecurity defense strategies. IP geolocation data can identify potential threat sources, giving cybersecurity teams more insights about system vulnerabilities. It can help strengthen a company's network security while minimizing the damage threats can cause.

Use Case	How IP Geolocation Can Help
Spot suspicious users interacting with connected systems	IP geolocation data can determine where a user is currently located as part of verification and authentication processes. Companies can restrict visitors from selected countries from accessing specific web resources.
Track and defend against known threats	IP geolocation data can point to the physical locations of suspects, allowing security professionals to plan protective measures. Specialists can use IP geolocation data to correlate known intrusions with actual traffic.
Stay protected from spam and suspicious and disturbing mail	IP geolocation information enables the tracking of potentially harmful IP addresses, resulting in enhanced security for users. The technology makes it possible to reduce spam messages by geo-blocking specific IP addresses from locations considered dangerous.
Prevent online fraud and identity theft	Businesses can spot Identity theft by comparing buyers' IP addresses to existing credit card billing information. Mismatches can be flagged for manual review. IP geolocation data is useful in rejecting orders coming from questionable locations automatically.

## What Benefits Does IP Geolocation Provide in Intellectual Property Management?

Internet piracy has been a global scourge for decades now, and piracy websites receive billions of visits yearly. In addition, producers find it difficult to protect content against plagiarism and ensure

their digital rights aren't violated. Manufacturers and distributors, on the other hand, must avoid the illegal selling of their physical products overseas.

Organizations can gain clarity when they geolocate IP addresses. The technology helps businesses manage and restrict audiences from consuming content not intended for them, easing digital content distribution, compliance with licensing agreements and regulations, and market research and analysis.

Use Case	How IP Geolocation Can Help
Access blocking	Companies can control who can access their content, depending on visitors' locations and their countries' licensing agreements.
Digital rights management (DRM)	Companies can use IP geolocation details to adhere to new rules in distributing and managing content. Businesses can enforce licensing rights and copyright agreements to minimize content abuse. Content downloads can be granted or restricted, depending on users' regions.

## What Benefits Does Geolocating IP Addresses Provide in Marketing?

Targeted marketing is a must for companies seeking to drive engagement and increase retention. In fact, businesses are ramping up investments in this area, with experts predicting that the targeted mobile ad spending will exceed [US\\$750.21 billion by 2030](#). They can learn more about their customers and deliver the appropriate content based on their online behaviors and locations.

When businesses geolocate IP addresses, they can learn if their buyers are more inclined to use mobile devices or prefer to purchase at specific locations. That can be very helpful in creating strategies and plans, optimizing their real-time marketing efforts.

Use Case	How IP Geolocation Can Help
----------	-----------------------------

Marketplace insights	Leveraging customer locations allows ad targeting in specific areas. IP geolocation data can be combined with access data from web server logs and analytics tools to gain more relevant customer insights.
Enhanced customer experience	Messages can be customized according to visitors' locations. Marketing ads and offers can be made to automatically use a visitor's local language. Predictive algorithms based on historical IP geolocation details can be used to send out just-in-time offers.
Accurate digital advertising	Targeting consumers based on their geolocation can enhance offers' and ads' relevance. Advertisements can be displayed in certain regions at the most relevant times.
Market research and trend identification	Companies can understand users' needs better by keeping track of their locations and purchases, contributing to building more diverse customer profiles.

## What Benefits Does IP Geolocation Provide in Digital Advertising?

Businesses around the globe recognize the power of digital advertising, with the total worldwide investment expected to reach [US\\$300 billion by 2025](#). Companies can tap this massive opportunity by using IP geolocation to grab consumers' attention and show them highly engaging and relevant ads.

When marketers geolocate IP addresses, they can gain insights into potential consumers, including their current and estimated future locations. This information may lead to opportunities and set the path for relevant purchases while boosting returns on investment (ROIs). For example, advertisers can send customized messages to promote products customers may be interested in but only when they are near a particular business location.

Use Case	How IP Geolocation Can Help
----------	-----------------------------

Targeted display advertising	IP geolocation data can be combined with other local information, such as the weather. For instance, companies can promote warm outfits or affordable beach vacations when it gets cold at a customer's home.
Optimize pay-per-click (PPC) campaigns	Advertisers can analyze customers' IP geolocation data to ensure their PPC campaigns are seen only by those in their target locations.

## What Benefits Does IP Geolocation Provide in Law Enforcement?

Several countries [like the U.K.](#) have started establishing special courts dedicated to litigating cybercriminal cases. Despite these measures, though, prosecuting cybercriminals remains difficult. Law enforcement agencies must go deeper into analytics and work with unconventional tools to counteract threats.

Law enforcement agencies can use IP geolocation to identify and track malicious entities. For instance, they can gather and analyze a list of suspicious IP addresses to discover who their owners are and where they are operating from. They can also monitor individuals likely to conduct attacks and, if necessary, take action to catch them.

Use Case	How IP Geolocation Can Help
Prevent phishing	Professionals can use geolocation data and compare it with other details from a questionable website or email sender to intercept phishing.
Combat copyright infringement	Users that share copyrighted digital materials online can be identified with the help of local ISPs.
Combat and prevent criminal activities	Agencies can monitor illegal activities and learn more about the criminals' whereabouts. Illegitimate online financial transactions can be tracked down to stop money laundering. Agents can gather insights about a fraudulent entity's country, city, and domain name to apprehend dangerous individuals and organizations.



## Impacts of Using Inaccurate IP Geolocation Data

Obtaining accurate IP geolocation data can be tricky, as there isn't always a way to double-check if IP addresses have been verified location-wise. Invalid registry data, for example, is a concern that can lead to inconsistencies and incorrect information. Moreover, some people use virtual private network (VPN) services and proxies to hide their real IP addresses.

### Consequence of Using

#### Inaccurate IP Geolocation Data

#### Explanation

Inability to access content	Inaccurate IP geolocation data may restrict subscriber access to geography-specific content even if they are in the correct physical location.
Inferior user experience	Incorrect insights based on flawed IP geolocation details can result in irrelevant offerings or the use of the wrong language or currency on sites.
Poorly targeted marketing efforts	Offers pushed to the wrong people due to inaccurate IP geolocation details can lead to wasted marketing resources and lost conversion opportunities.
Bad decision-making	Some organizations work with IP geolocation data to decide where to put up their server infrastructure or which providers to use. Unreliable information may cause bad decision-making, which can then result in substandard performance.
Erroneous attribution	Services that keep track of online events may fail to correctly attribute user locations, resulting in misleading assumptions and observations.

## Considerations When Looking for the Right IP Geolocation Data Sources

In light of the prevalence of data inaccuracy, here are some aspects to pay attention to when choosing a data source to geolocate IP addresses.

- **Accuracy claims:** Accuracy varies between IP geolocation providers and databases, so it's critical to check on claims made and see how services compare at a country, state, or city level. As a rule of thumb, accuracy on the city level is usually lower than the state or country level since the former requires much higher precision.
- **Coverage:** It's also important to look at the IP address space for a given location and check the percentage of routable addresses different providers cover.
- **Update frequency:** Some data sources are updated daily, while others less frequently. Choose a source that updates data as frequently as needed.
- **Pricing:** IP geolocation data sources can come free of charge or cost hundreds or thousands of dollars a month. Choose a data source that fits your budget and needs.

## Conclusion

IP geolocation offers various benefits for companies in different industries. Websites can create tailor-made content based on where their users are. Marketers will be able to gain deeper insights for their strategies. With geolocation intelligence's help, cybersecurity teams can quickly learn more about threat sources and network traffic. Keeping tabs on malicious entities may also be easier for law enforcement authorities. Finally, branding professionals can safeguard their intellectual property better and protect against piracy. All of these use cases are made possible by IP geolocation.

*If we piqued your curiosity and you would like to know more about our IP geolocation services, [contact us](#) today. You may also [download samples](#) or [register](#) to use the API.*