

Integrating Real-Time Contact Information into Your Application with API411[®]

A Technical White Paper

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Introduction

API411® from W3 Data® is a web-based service that delivers comprehensive residential and business contact information in an XML format. It gives your applications access to W3 Data's industry-leading contact data and search/matching technologies.

API411 delivers real-time access to contact information for businesses and residences throughout the U.S. and Canada. It enables a wide variety of applications, including:

- Call center pop-up screens
- Customer order entry applications
- Point-of-sale customer verification
- Automated verification of leads from toll-free calls and Web forms

Two key characteristics differentiate the API411 service:

- **High-quality, comprehensive data:** API411 provides a wide range of contact data, including: name, address, phone, detailed business category and keywords, geographic data, and extensive demographic data. Applications using API411 can query multiple data sources for extensive coverage and high match rates.
- **Advanced and flexible matching logic:** API411's technology has been proven effective through a decade of powering the searching and matching on WhitePages.com. For example, API411 delivers high match rates by cross-referencing nicknames and providing flexible search expansion options.

This paper describes the technology and data provided by the API411 service. For information about how to implement API411, please reference the *API411 Implementation Guide*, which offers a detailed description of available parameters and the XML response Document Type Definition (DTD).

How It Works

As a web-based service accessed with an XML interface, API411 integrates easily into applications, regardless of the programming language or model used.

An application initiates the API411 service with an HTTP GET request, using an IP address that is authenticated for access with W3 Data. The URL access consists of the server name, servlet path, and a list of parameters. You control the types of searches you want to perform with the parameter set specified on the HTTP request. You can specify which data sets you want to search, and request optional demographic information about a residence or business.

For example, the following query initiates a Reverse ZIP Code search, requesting the city and state for a specific ZIP code (parameter field titles are listed in bold):

```
http://enterprise.w3data.com/directaccess?ver=2.0&type=rz&z=98101
```

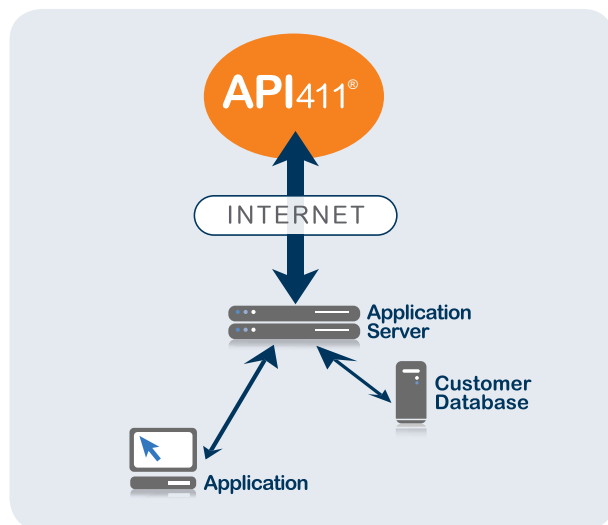
The Reverse ZIP Code search request above returns the following data:

```
<RESULTS>
  <INFO>
    <VERSION>2.0</VERSION>
    <STATUS>OK</STATUS>
    <SEARCH_ID>10250570219559771683</SEARCH_ID>
    <SEARCH_TYPE>Reverse_ZIP</SEARCH_TYPE>
    <COUNT>1</COUNT>
  </INFO>
  <LISTINGS>
    <LISTING>
      <ADDRESS>
        <CITY>Seattle</CITY>
        <STATE>WA</STATE>
        <COUNTRY>United States</COUNTRY>
      </ADDRESS>
      <LISTING_ID>1</LISTING_ID>
    </LISTING>
  </LISTINGS>
</RESULTS>
```

In another example, the diagram below shows a sample data flow for a residential Reverse Phone search. Note that you can easily combine the use of API411 with other, internal data sources.

SAMPLE DATA FLOW

1. Application passes a phone number.
2. Application checks the customer database and does not find the number.
3. Application sends a request to the API411 service.
4. API411 returns name, address, latitude/longitude, carrier information, phone type and optional demographics.



If a search returns many listings, a pagination option controls how many listings are displayed per page.

API411 provides ways to extend the search if no match is found on the first pass. (See the section *Advanced, Flexible Search Technology*.) Even if complete information isn't available, API411 returns useful information. For example, a Reverse Phone search can return information about the carrier, phone type and the city associated with the number, even if complete information isn't available.

Because API411 uses HTTP and XML data, implementation is rapid and requires no application infrastructure changes. Most customers find that the actual integration/implementation of API411 within their application is completed within a single day. Once the integration is complete, there is little ongoing administration or effort in maintaining the API411 integration.

Performance

In general, across all submitted searches, API411 returns responses in less than a third of a second (0.30 seconds on average). The service uses a high-volume architecture designed to handle over 1,000 searches per second.

Your exact performance will vary according to the type of search your application performs and the amount of data you provide. For example, Reverse Phone searches are the quickest, while doing a Find Person search for a last name of Smith in California would take longer because the system needs to process and deliver more data.

The best way to determine your exact performance is to test API411 with your application. W3 Data provides free test accounts to qualified customers, so you can evaluate performance with live data.

Types of Searches

A residential search typically returns the following information:

- Name (first and last)
- Full address
- Phone number
- Phone carrier
- Latitude/longitude
- Optional demographic data

A business search typically returns the following information:

- Name
- Full address
- Phone
- SIC code
- Business category information
- FIPS code (county code) and Metropolitan Statistical Area (MSA) code
- Optional demographic data

The API411 service supports nine different search types:

SEARCH	DESCRIPTION
Reverse Phone	Returns contact information associated with a phone number (business or residential)
Find Person	Returns contact information for a person (residential data only)
Find Business	Returns information about a business (business data only)
Reverse Address	Provides information for the person or business at a specific address (business or residential)
Find Neighbor	Finds closest neighbors on same street as address provided (up to 30 results) (business or residential)
Find ZIP/Postal Code	Returns the ZIP/postal code for a given city and state/province
Reverse ZIP/Postal Code	Returns the city and state/province information for a ZIP/postal code
Find Area Code	Returns area code for given city and state/province.
Reverse Area Code	Returns the city and state/province for a given area code.

Each search type is described in more detail below.

REVERSE PHONE SEARCH

The Reverse Phone search is the most popular search type. For a telephone number you provide, it returns contact information, including: name, address, carrier information, phone type and latitude/longitude. It can also return optional demographic data.

With the wide range of data returned, there are many possible applications for a Reverse Phone search. For example:

- Use the latitude/longitude data to determine a caller's location and direct him/her to nearby branch offices or service locations.
- Auto-populate fields for customers filling out a form using a mobile device.
- Automatically generate call-back/detailed lead information about ad responders.

FIND PERSON SEARCH

The Find Person search returns address, phone number and latitude/longitude data based on a name (and optional city/state/postal code information) you provide. It can return demographic information for the individual, if available. The Find Person search only queries residential listings, not business listings.

FIND BUSINESS SEARCH

The Find Business search returns the address, latitude/longitude, phone number and optional demographic information for a business. You can search by a business name, keyword or category, and refine the search by providing an address or city/state/postal code. A Find Business search does not query residential listings.

There are many ways to use the Find Business search:

- Provide the name and city of a business to get a detailed listing for the business.
- Search by business category and location – for example, searching for pizza restaurants in a specific city or on a given street.
- Use the optional demographic information to discover a contact name, phone number or annual revenue information for the business.

REVERSE ADDRESS SEARCH

The Reverse Address search can deliver detailed contact, geographical data, and optional demographic data for the individual or business at the address provided.

FIND NEIGHBOR SEARCH

The Find Neighbor search returns the closest neighbors on the same street as a provided address. You can define the number of results to return, between 5 and 30. A Find Neighbor search queries both business and residential data.

FIND ZIP/POSTAL CODE AND REVERSE ZIP/POSTAL CODE SEARCHES

The Find ZIP/Postal Code search returns the ZIP or postal code for a specific city or province, while the Reverse ZIP/Postal Code search returns the city and state/province for a specified ZIP or postal code.

FIND AREA CODE AND REVERSE AREA CODE SEARCHES

The Find Area Code search returns the area code for a specific city and state/province, while the Reverse Area Code search returns the city and state/province for a provided area code. A single area code may return multiple city listings.

Data Sources

API411 offers fast, accurate query response with telco-qualified residential and business data. The API411 service integrates data from a variety of sources. For example, phone listing information originates from public phone records, providing accuracy while protecting consumer privacy. Likewise, address information is generated from permission-based and public information sources. Business and government listings are provided by a number of partners. Extensive cleansing and verification processes enable W3 Data to offer one of the most complete and accurate contact information APIs.

API411 customers can access two data sets with different levels of data currency. One is updated on a monthly basis, and the other on a daily basis. Simply select the data set that best meets your business and application requirements. In addition, W3 Data offers a proprietary search mechanism by which unsuccessful searches of one data set automatically roll over to the other.

The data sources are both accurate and comprehensive. Data includes more than 140 million people and over 14 million businesses.

OPTIONAL DEMOGRAPHIC/FIRMOGRAPHIC DATA

To supplement contact information, API411 can deliver optional residential or business demographic data.

Residential demographic information contains publicly available data developed from a large number of sources, including telcos and Census data. Demographic data is available for approximately 100 million U.S. households. Data available includes:

- Age (for individuals associated with the household)
- Presence of children
- Dwelling type
- Gender
- Known owner/renter status
- Median home value
- Income
- Marital status
- Length of residence

Sample output: Residential Demographic variables

```
<DEMOGRAPHICS>
  <AGE>50</AGE>
  <PRESENCE_OF_CHILDREN>Y</PRESENCE_OF_CHILDREN>
  <DWELLING_TYPE>SFDU</DWELLING_TYPE>
  <GENDER>M</GENDER>
  <HOMEOWNER_RENTER>Owner</HOMEOWNER_RENTER>
  <MEDIAN_HOME_VALUE>$137,000-$137,999</MEDIAN_HOME_VALUE>
  <INCOME>$135,000-$139,999</INCOME>
  <MARITAL_STATUS>Married</MARITAL_STATUS>
  <LENGTH_OF_RESIDENCE>In the 15th Year</LENGTH_OF_RESIDENCE>
</DEMOGRAPHICS>
```

Business data covers approximately 15 million U.S. businesses, and includes:

- Contact name and title
- Annual sales volume
- Number of employees
- Years in business

Demographic data is optional, and must be specifically requested. To simplify the process of requesting these fields, W3 Data offers a number of prepackaged demographic data bundles. Simply include the bundle request as a parameter within the search request.

Note that demographic data is available only for searches against the data that is updated monthly.

Advanced, Flexible Search Technology

API411 leverages the same sophisticated searching technologies that deliver millions of directory assistance searches each day for WhitePages.com. Smart matching technology eliminates common mistakes or errors. For example, even when requested to make an exact match, API411 will automatically:

- Include nicknames for first names
- Correct city name misspellings
- Remove extraneous punctuation

Customized levels of search expansion deliver results, even when the data available is incomplete. You can select which level to use and the program searches iteratively through the selected levels until it finds a match or is unsuccessful.

The search expansion levels are:

Exact (0)	Searches on exact query input (with corrections as outlined above).
Flexible (1)	Selectively removes extraneous address elements. This is the best choice for many searches.
City/area (2)	If no (1) results are found, it expands the search radius to include the entire city and then the surrounding area (typically a county).
State (3)	If no results are found in (0)-(2), it expands to a state/province level.
Nation (4)	If no (0)-(3) results are found, it expands the search to a national level. This is not available for Reverse Address or Reverse Phone searches.

API411 offers flexibility in how to match names for both residents and businesses. For first name, last name or business name, you can specify whether you want to use an exact match or a 'begins with' match. The 'begins with' match, set by default, is useful if spelling is uncertain or you are not sure of the complete business name.

Geographic Precision

When delivering latitude and longitude information with search results, API411 returns a field that indicates the degree of precision of the results. This precision data is helpful when using the returned latitude/longitude to deliver location-based information. The possible values are:

PRECISION VALUE	DESCRIPTION
0	Rooftop centroid (address)
1	Center of the ZIP+4 centroid
2	Center of the ZIP sector (ZIP+2) centroid
3	Center of population of the block group (200-500 households)
4	Center of population of the census tract (typically 850-2000 households)
5	Area center of the ZIP code input
6	Latitude/longitude could not be determined

Note: More than 85% of listings have a rooftop precision value — the best precision rating available.

Managing the Solution

API411 customers can manage and maintain their integration with API411 using a web-based interface. From this site, customers can:

- Identify or change the authorized IP addresses for accessing the service
- View usage reports by day, user, and activity.
- Access technical support

W3 Data aims to provide 24x7 availability of the API411 service – shown by the monthly average uptime which is better than 99.5%.

Summary

API411 supports a wide range of applications with flexible search technologies and comprehensive, accurate data sources. With minimal development effort, API411 is an easy and risk-free way to integrate contact data in applications. W3 Data continues to enhance and expand the offering based on customer demand and evolving application requirements.

About W3 Data

W3 Data, a division of WhitePages.com, Inc. provides high-quality customer data solutions for businesses of all sizes. Our powerful, easy-to-use products and services provide businesses with real-time access to the most accurate name, address and telephone information available. Our self-serve and enterprise products are designed and priced for accessibility, and work with a variety of leading programs. W3 Data products include Create Mailing Lists, Update Mailing Lists, Profile Your List, API411, New Mover Lists, Large Volume List Generation, Data Cleansing and Enhancement Services, and EnterpriseDA.