

# BLS Public Data API

## Overview

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# BLS Public Data API

- What is it
- Usage history
- What can you do with it
- How to get started
- How to use it
- Lessons Learned
- Questions for the DUAC/Discussion



# BLS API at a Glance

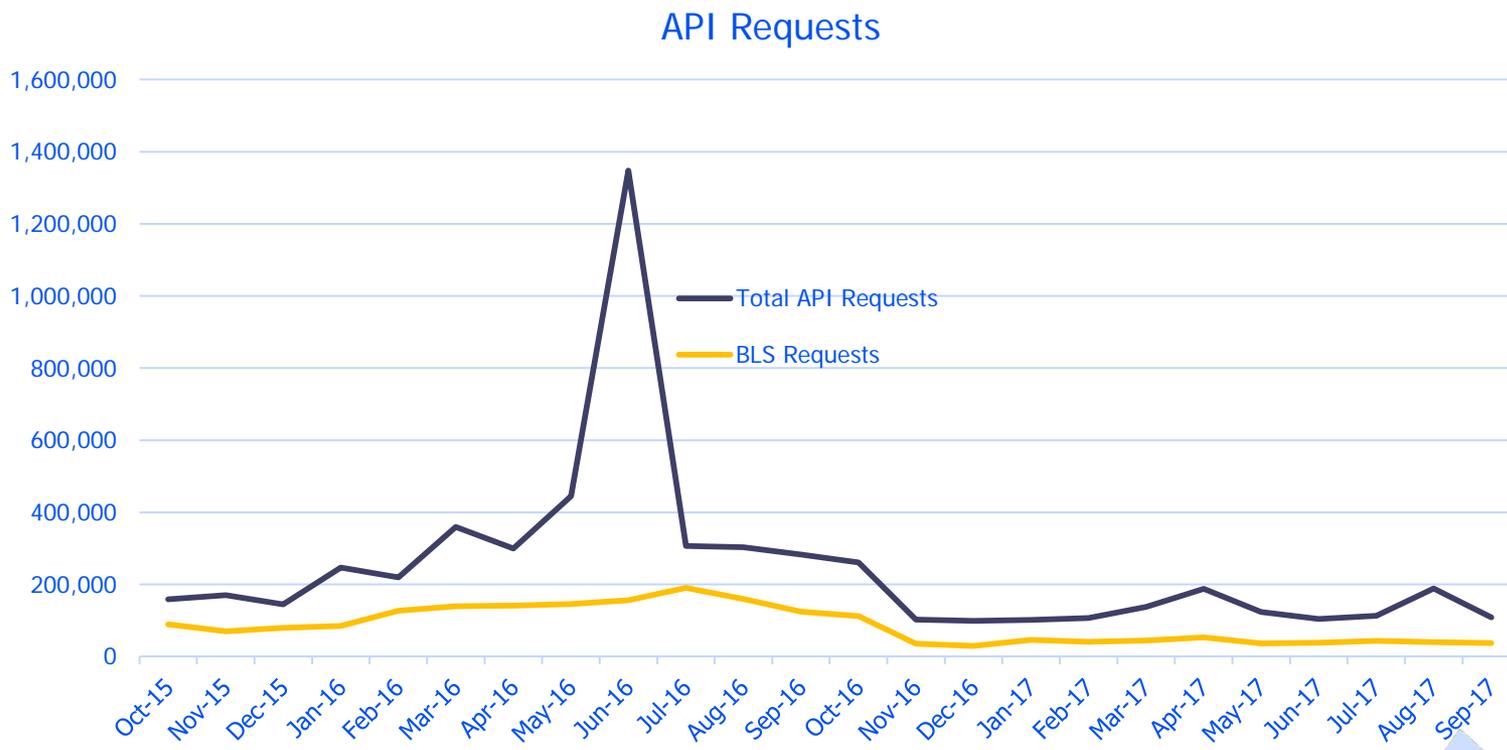
- What is it?
  - ▶ Data retrieval targeted for application developers
  - ▶ Replace Web scraping
- How does it work?
  - ▶ HTTPS-based API
  - ▶ JSON and XLSX outputs



# 2 years of BLS API usage

Lowest # of requests **97K** (June 2015) -- Highest # of requests **23M** (Nov 2013)

Lowest # of unique IPs **748** (June 2014) -- Highest # unique IPs **13093** (Apr 2014)



# Web scraping

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```



# API equivalent

**[-] Request**

Method  URL

**Body**

Request Body

**[-] Response**

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      }
    ]
  }
}
```



# BLS API Use Case 1

Business

## How the economy is doing this month

These job and unemployment figures, based on data from the Bureau of Labor Statistics, update on the first Friday of each month. Last updated July 2016. Story: U.S. employment rebounds strongly in June, calming fears of economic slowdown

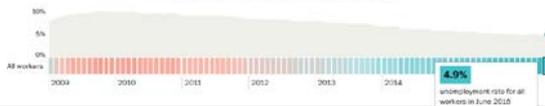


### The unemployment rate varies widely across demographic groups



#### Overall unemployment rate

4.9 percent of all workers were unemployed in June 2016.



#### By race

The unemployment rate for black workers ages 16 and up is generally twice as high as the rate for white workers, and the recession reinforced the gap.



#### By education level

Workers without a high school diploma still face a tough job market. Their unemployment rate is still nearly high as the national unemployment rate in 2012. Rates are for workers ages 25 and up.



#### By gender

Men were hit slightly harder than women during the recession. Rates are for workers ages 16 and up.



Source: Bureau of Labor Statistics  
Note: Percent figures are preliminary and will be revised in coming months.  
GRAPHIC SOURCE: THE WASHINGTON POST / THE ECONOMIST INC.



■ Washington Post Jobs Report

■ <https://www.washingtonpost.com/graphics/business/jobs-report/>

Source: The Washington Post



# BLS API Use Case 2

Tell us a little  
about yourself!

Are you more curious about...

How things are made

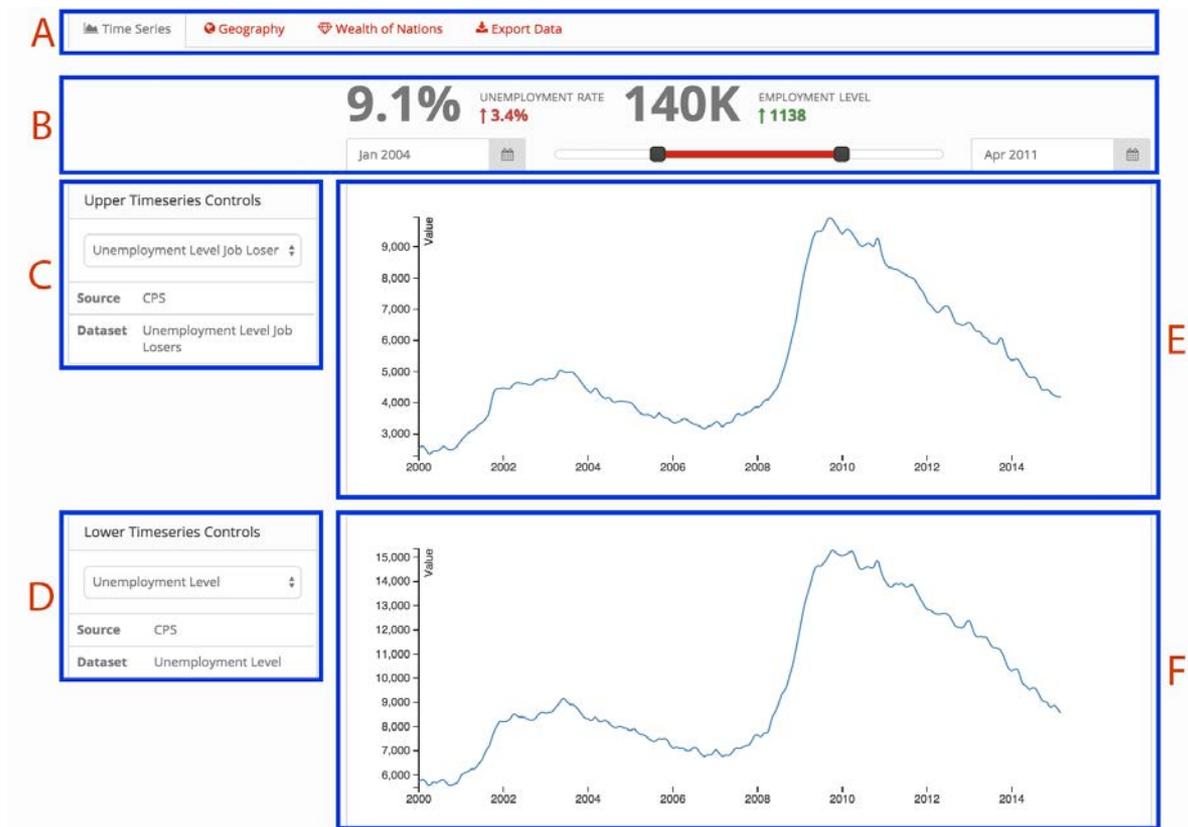
How people think

- Flatiron School  
<https://flatironschool.com/>
- Students developed CareerSpark  
an iOS application that uses  
employment and occupational  
data from the BLS for career  
exploration as part of the  
Opportunity project  
<https://opportunity.census.gov/>

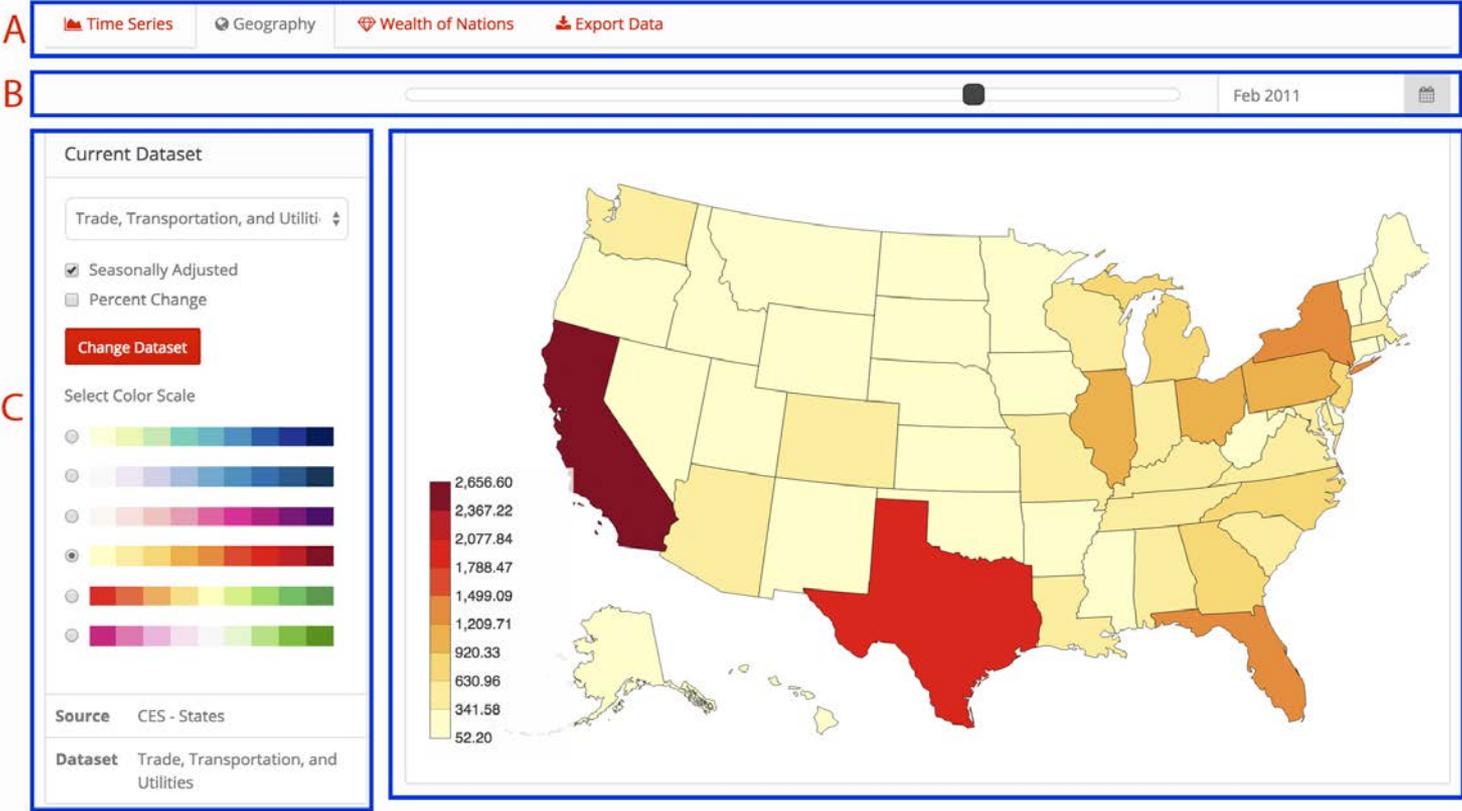
# BLS API Use Case 3

- UMd's CS department built several prototypes ingesting data using the BLS API <https://arxiv.org/pdf/1608.03569.pdf>
  - ▶ Time Series explorer to compare and contrast multiple time series through a stacked overlay.
  - ▶ Geographic Choropleth map to investigate changes in employment according to demographics or industry
  - ▶ BLSVisualizer to interactively navigate through the employment data, which is organized in a hierarchical format

# Time Series Explorer



# Geographic Chloropleth Map



# BLSVisualizer

Quick Start - Gender    Quick Start - Race    Clear All

### Tree View

- Population Level
- Civilian Labor Force Level
- Labor Force Participation Rate...
- Employment Level
- Employment-Population Ratio
- Employed, Usually Work Full Time...
- Employed, Usually Work Part Time...
- Unemployment Level
- Unemployment Rate
- Not in Labor Force
- Labor Force Flows Employed to Employed...
- Labor Force Flows Unemployed to... Men
- Labor Force Flows Not in Labor... Women
- Marginal Inflows to Employed
- Labor Force Flows Employed to Unemployed...
- Labor Force Flows Unemployed to...
- Labor Force Flows Not in Labor...
- Marginal Inflows to Unemployed...
- Labor Force Flows Employed to Not...
- Labor Force Flows Unemployed to...
- Labor Force Flows Not in Labor...
- Marginal Inflows to Not in Labor...
- Employed to other Marginal Outflows...
- Unemployed to other Marginal Outflows...

: Rate (0~100%)  
  : Count (>100)

### Plot 1

Clear

Employed, Usually Work Part Time, Women  
 Employed, Usually Work Part Time, Men



### Plot 2

Clear

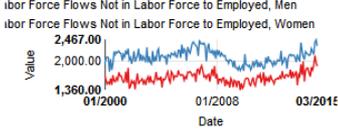
Labor Force Flows Unemployed to Unemployed, Women  
 Labor Force Flows Unemployed to Unemployed, Men  
 Labor Force Flows Unemployed to Employed, Men  
 Labor Force Flows Unemployed to Employed, Women



### Plot 3

Clear

Labor Force Flows Not in Labor Force to Employed, Men  
 Labor Force Flows Not in Labor Force to Employed, Women



# BLS API Use Case 4

- Major Sector Productivity in BLS
  - ▶ Using Excel macro to pull about 100 series from APIs - industrial production index from the Fed, sales and inventories from Census, and BLS prices to get a preliminary growth rate of manufacturing industries.
  - ▶ Helps to validate the statistics produced by the office.
  - ▶ Gives an early idea of stories to focus on to inform the public.

# Excel Macro

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Fed Variable	BEA Data										BLS Variable														
IPMAN	Industrial Production	Manufacturing																							
IPOMAN	Industrial Production	Durable Manufacturing																							
IPG321SQ	Durable -N	Wood products																							
IPG327SQ	Durable -N	Nonmetallic mineral products																							
IPG331SQ	Durable -N	Primary metals																							
IPG332SQ	Durable -N	Fabricated metal products																							
IPG333SQ	Durable -N	Machinery																							
IPG334SQ	Durable -N	Computer and electronic products																							
IPG335SQ	Durable -N	Electrical equipment, appliances, and components																							
IPG3361T3SQ	Durable-A	Motor vehicles, bodies and trailers, and parts																							
IPG3364T3SQ	Durable-A	Parts Other transportation equipment																							
IPG337SQ	Durable -N	Furniture and related products																							
IPG338SQ	Durable -N	Miscellaneous manufacturing																							
IPRMAN	Industrial F	Non NonDurable Manufacturing																							
IPG311A2SQ	NonDurable	Food and beverage and tobacco products																							
IPG313A4SQ	NonDurable	Textile mills and textile product mills																							
IPG315A6SQ	NonDurable	Apparel and leather and allied products																							
IPG322SQ	NonDurable	Paper products																							
IPG323SQ	NonDurable	Printing and related support activities																							
IPG324SQ	NonDurable	Petroleum and coal products																							
IPG325SQ	NonDurable	Chemical products																							
IPG326SQ	NonDurable	Plastics and rubber products																							
RWG321S	Importance Weight	NAICS 321																							
RWG327S	Importance Weight	NAICS 327																							
RWG331S	Importance Weight	NAICS 331																							
RWG332S	Importance Weight	NAICS 332																							
RWG333S	Importance Weight	NAICS 333																							
RWG334S	Importance Weight	NAICS 334																							
RWG335S	Importance Weight	NAICS 335																							
RWG3361T3S	Importance Weight	NAICS 3361T3																							
RWG3364T3S	Importance Weight	NAICS 3364T3																							
RWG337S	Importance Weight	NAICS 337																							
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RWG322S	Importance Weight	NAICS 322																							
RWG323S	Importance Weight	NAICS 323																							
RWG324S	Importance Weight	NAICS 324																							
RWG325S	Importance Weight	NAICS 325																							

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		Fed Relative Importance Weights	2014Q3	2015Q4	Fed Real Growth	Contribution to Growth		Price Growth	M3 Growth	Estimated Real M3 Growth	M3 Share	Contribution to Growth	Fed Share				
2																	
3		Total manufacturing	74.5	103.8	104.2	1.6%	1.6%	Manufacturing	0.7%	7.5%	6.8%	100.0%	6.8%	100.0%			
4		Durable	43.3	106.6	107.0	1.4%	0.8%	Durable	1.4%	4.3%	2.9%	50.3%	1.4%	58.1%			
5		Non-Durable	31.2	100.8	101.2	1.7%	0.7%	Non-Durable	0.0%	10.8%	10.8%	49.7%	5.4%	41.9%			
6																	
7																	
8																	
9	NAICS 311	Wood products	1.3	108.9	113.6	18.7%	0.57	NAICS 321	-0.7%	19.3%	20.2%	3.7%	0.75	3.1%	0.69	0.62	
10	NAICS 327	Nonmetallic mineral products	2.3	114.1	115.6	5.2%	0.28	NAICS 327	0.9%	6.2%	5.3%	4.3%	0.22	5.4%	0.22	0.28	
11	NAICS 891	Primary metals	2.2	92.7	98.1	1.7%	0.09	NAICS 891	2.3%	8.4%	6.0%	7.7%	0.46	5.2%	0.13	0.31	
12	NAICS 892	Fabricated metal products	6.1	100.3	100.9	2.5%	0.36	NAICS 892	0.2%	7.8%	7.8%	15.0%	0.98	14.2%	0.83	1.07	
13	NAICS 893	Machinery	6.5	93.4	92.1	-5.2%	-0.78	NAICS 893	0.2%	6.4%	6.2%	12.9%	0.79	15.1%	-0.67	0.93	
14	NAICS 334	Computer and electronic products	6.1	114.1	117.2	11.3%	1.58	NAICS 334	-0.6%	6.5%	7.2%	11.8%	0.84	14.0%	1.33	1.01	
15	NAICS 335	Electrical equipment, appls & comp	2.0	102.0	101.2	-3.4%	-0.16	NAICS 335	-0.3%	1.0%	1.3%	4.1%	0.05	4.6%	-0.14	0.06	
16	NAICS 8961	Motor vehicles, bodies and tra	6.4	130.6	131.3	2.0%	0.29	NAICS 8961	6.2%	4.8%	-1.4%	23.7%	-0.33	14.7%	0.46	-0.21	
17	NAICS 3364	Parts Other transportation equi	5.5	105.5	105.0	-2.0%	-0.25	NAICS 3364	4.7%	-9.1%	-13.1%	10.7%	-1.40	12.7%	-0.21	1.67	
18	NAICS 337	Furniture and related products	1.3	103.3	104.7	5.3%	0.15	NAICS 337	0.0%	4.4%	4.4%	2.7%	0.12	2.9%	0.14	0.13	
19	NAICS 339	Miscellaneous manufacturing	2.5	107.3	105.3	-7.2%	-0.57	NAICS 339	-0.3%	-0.2%	0.1%	5.5%	0.01	8.0%	-0.39	0.01	
20		NonDurable Manufacturing	31.2	100.8	101.2	1.7%	1.94	NonDurable M	0.0%	10.8%	10.8%	100.0%	11.42	100.0%	1.88	4.90	
21	NAICS 311	Food and beverage and tobacco	8.8	103.3	103.3	0.0%	-0.01	NAICS 311	-3.5%	-0.6%	3.1%	33.2%	1.02	28.2%	-0.01	0.86	
22	NAICS 313	Textile mills and textile product	0.4	105.6	105.5	-0.2%	0.00	NAICS 313	0.3%	10.6%	10.3%	2.0%	0.20	1.3%	0.00	0.13	
23	NAICS 315	Apparel and leather and allied	0.2	82.2	83.0	3.9%	0.03	NAICS 315	-0.3%	-2.7%	-1.9%	0.6%	-0.01	0.6%	0.02	-0.01	
24	NAICS 322	Paper products	2.7	95.5	97.4	8.3%	0.71	NAICS 322	1.6%	6.5%	4.8%	6.6%	0.32	8.6%	0.55	0.41	
25	NAICS 323	Printing and related support ac	1.6	99.6	101.1	6.3%	0.32	NAICS 323	0.2%	-8.2%	-8.4%	3.0%	-0.25	5.1%	0.19	-0.43	
26	NAICS 324	Petroleum and coal products	1.5	105.0	106.0	3.5%	0.17	NAICS 324	8.5%	65.1%	52.2%	17.5%	9.11	4.8%	0.61	2.49	
27	NAICS 325	Chemical products	12.5	97.1	97.7	2.5%	0.98	NAICS 325	2.8%	6.9%	4.0%	28.9%	1.16	40.0%	0.71	1.61	
28	NAICS 326	Plastics and rubber products	3.6	107.1	106.5	-2.2%	-0.25	NAICS 326	-0.1%	-1.5%	-1.4%	8.7%	-0.12	11.4%	-0.18	-0.17	
29																	
30																	
31																	
32																	
33																	
34																	



# BLS DataFinder 1.0

- BLS DataFinder (text based time series search tool)
  - ▶ Extracts time series details using API.

**BLS Data Finder 1.0** [Start over](#) [Comment](#)

Search:

Sort By: Relevance Showing Results 1 - 20 of 250497 Show: 20 per page

SEARCH: arlington virginia X

**MEASURES**  
Measure Attributes (221777)  
Measure Category (225484)  
Measure Published By (225484)

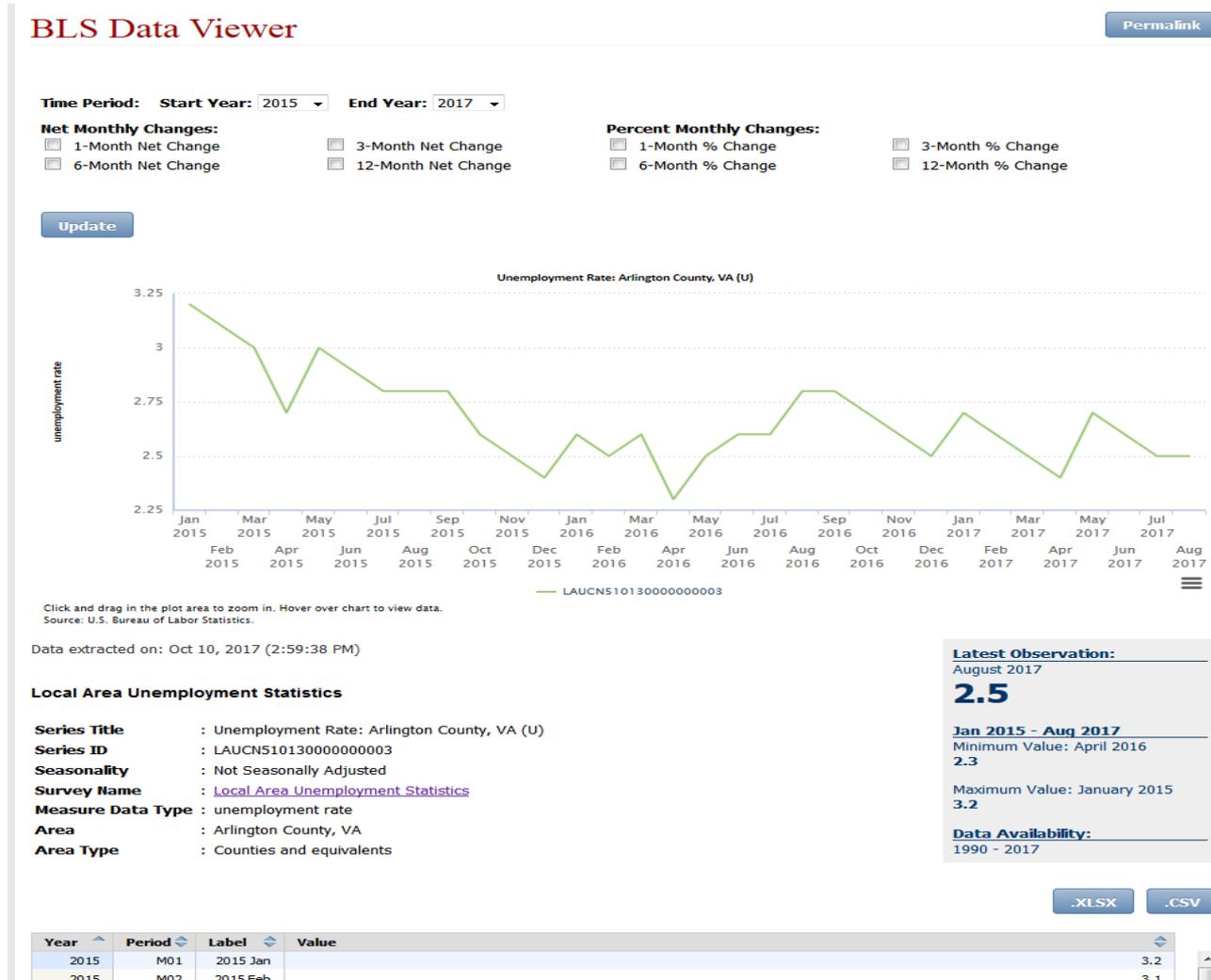
**CHARACTERISTICS**  
Demographics - Characteristics of People (42)  
Establishments/Businesses/Firms (248431)  
Geography (238816)  
Industry (36858)  
Occupation (217774)  
Time (32)  
Unemployment and Labor Force Status (32)  
Worker Characteristics (6007)

**SURVEY**  
Business Employment Dynamics (1136)  
Occupational injuries and illnesses industry data (28720)  
Local Area Unemployment Statistics (1224)  
Labor Force Statistics from the

- Unemployment Rate: Arlington County, VA (U) +
- Unemployment: Arlington County, VA (U) +
- Employment: Arlington County, VA (U) +
- Labor Force: Arlington County, VA (U) +
- Unemployment Rate: Washington-Baltimore-Arlington, DC-MD-VA-WV-PA Combined Statistical Area (U) +
- Unemployment: Washington-Baltimore-Arlington, DC-MD-VA-WV-PA Combined Statistical Area (U) +
- Employment: Washington-Baltimore-Arlington, DC-MD-VA-WV-PA Combined Statistical Area (U) +
- Labor Force: Washington-Baltimore-Arlington, DC-MD-VA-WV-PA Combined Statistical Area (U) +
- Unemployment Rate: Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Division, VA part (U) +
- Unemployment: Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Division, VA part (U) +
- Employment: Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Division, VA part (U) +
- Labor Force: Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Division, VA part +



# BLS DataFinder



# Resources

## ■ API Getting Started Page

▶ <https://www.bls.gov/developers>

▶ Documentation of API signatures (parameters)

- Sample Code: Java, Python, PHP, R, SAS, MATLAB, etc...
- FAQs



# Request a Single Series

- Requesting data about a single time series:  
LAUCN040010000000005 (Employment: Apache County, AZ)

<https://api.bls.gov/publicAPI/v2/timeseries/data/LAUCN040010000000005>



# Single Series Results

```
{ "status": "REQUEST_SUCCEEDED", "responseTime": 34, "message": [],  
  "Results": {  
    "series": [{  
      "seriesID": "LAUCN040010000000005",  
      "data": [  
        { "year": "2017",  
          "period": "M07",  
          "periodName": "July",  
          "value": "17216",  
          "footnotes": [  
            { "code": "P",  
              "text": "Preliminary." } ]  
          }  
        },  
        { "year": "2017",  
          "period": "M06",  
          "periodName": "June",  
          "value": "17728",  
          "footnotes": [ {} ]  
        }  
      ]  
    }  
  ]  
}
```

...



# Request Excel Output

- Requesting data about a single time series:  
LAUCN040010000000005 (Employment: Apache County, AZ)

<https://api.bls.gov/publicAPI/v2/timeseries/data/LAUCN040010000000005.xlsx>

# Excel Results

PublicAPI-20170914153809 [Read-Only] - Excel

Kohli, Amrit - BLS

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW

Clipboard Font Alignment Number Styles Cells Editing

A1: =SORRY! No Title/Catalog Data found for this Series!!

Year	Period	Label	Observation Value
2015	M01	2015 Jan	17918
2015	M02	2015 Feb	17883
2015	M03	2015 Mar	17863
2015	M04	2015 Apr	17701
2015	M05	2015 May	18063
2015	M06	2015 Jun	18098
2015	M07	2015 Jul	17276
2015	M08	2015 Aug	18332
2015	M09	2015 Sep	18204
2015	M10	2015 Oct	17644
2015	M11	2015 Nov	17616
2015	M12	2015 Dec	17757
2016	M01	2016 Jan	17990
2016	M02	2016 Feb	17855
2016	M03	2016 Mar	17798
2016	M04	2016 Apr	17874
2016	M05	2016 May	18176
2016	M06	2016 Jun	18122
2016	M07	2016 Jul	17257
2016	M08	2016 Aug	17976
2016	M09	2016 Sep	17894
2016	M10	2016 Oct	17466
2016	M11	2016 Nov	17543
2016	M12	2016 Dec	17538
2017	M01	2017 Jan	17806

LAUCN04001000000005

READY 100%



# Request Catalog Metadata

- Requesting data about a single time series for a given year, including metadata:

LAUCN040010000000005 (Employment: Apache County, AZ)

<https://api.bls.gov/publicAPI/v2/timeseries/data/LAUCN040010000000005?registrationKey=000f4e000f204473bb565256e8eee73e&catalog=true&startYear=2010&endYear=2010>

# Catalog Results

```
{ "status":"REQUEST_SUCCEEDED", "responseTime":55, "message":[],  
  "Results": {  
    "series": [{  
      "seriesID":"LAUCN040010000000005",  
      "catalog":{  
        "series_title":"Employment: Apache County, AZ (U)",  
        "series_id":"LAUCN040010000000005",  
        "seasonality":"Not Seasonally Adjusted",  
        "survey_name":"Local Area Unemployment Statistics",  
        "measure_data_type":"employment",  
        "area":"Apache County, AZ",  
        "area_type":"Counties and equivalents"  
      }  
    }  
    "data":[  
      {  
        "year":"2010",  
        "period":"M12",  
        "periodName":"December",  
        "value":"19170",  
        "footnotes":[  
          {  
            "code":"R",  
            "text":"Data were subject to revision on April 15, 2016."  
          }  
        ]  
      }  
    ]  
  }  
  ....
```



# Request Calculations

The screenshot shows the RESTClient web application interface. The browser's address bar displays the URL `chrome://restclient/content/restclient.html`. The application has a navigation menu with options: File, Authentication, Headers, View, Favorite Requests, and Setting. The main section is titled "[-] Request" and contains a form for configuring a request. The Method is set to "POST" and the URL is `https://api.bls.gov/publicAPI/v2/timeseries/data/`. A red "SEND" button is located to the right of the URL field. Below the form is a "Body" section with a text area containing a JSON payload:

```
{
  "seriesid": ["LAUCN040010000000005", "LAUCN040010000000006"],
  "startyear": "2010",
  "endyear": "2012",
  "catalog": "false",
  "calculations": "true",
  "annualaverage": "true",
  "registrationkey": "b45d2b53c2b7489fb9b40cb3d065604"
}
```

At the bottom of the page, there is a "[+] Response" section with links for "Home | Github | Issues | Donate" and a "Back to top" link.

# Net and Percent Changes

```
"data": [  
  {"year": "2010",  
   "period": "M13",  
   "periodName": "Annual",  
   "value": "23438",  
   "footnotes": [{  
     "code": "R",  
     "text": "Data were subject to revision on April 15, 2016."}],  
   "calculations": {  
     "net_changes": {  
       "1": "747",  
       "3": "413",  
       "6": "-632",  
       "12": "500" },  
     "pct_changes": {  
       "1": "3.3",  
       "3": "1.8",  
       "6": "-2.6",  
       "12": "2.2"}  
     }  
  }  
]
```



# API: Lessons Learned

- Performance, Scaling and Caching
- Limiting and Throttling (victim of its own success)
- Usability (documentation, output & input formats)
- Providing tiered-technical support to your users (Why doesn't my code work?)



# Questions for the DUAC

- How many DUAC members use or have tried to use the BLS Data API? Use other agencies API? Which agencies?
- One of the prerequisites to effectively use the BLS Data API is to know the BLS series identifiers (Series IDs). How do or did you discover the Series IDs to use for the API?



# Questions for the DUAC

- Are the current daily API use limitations reasonable?

	Registered	Unregistered
Daily query limit	500	25
Series per query limit	50	25
Years per query limit	20	10

# Questions for the DUAC

- Is the API documentation sufficient—any gaps that would greatly help or would be helped in your use of the API?
- From your experience of using other agencies' APIs, what key feature made it easier to use that you'd like to see in the BLS Data API?



# Questions for the DUAC

- We implemented human friendly features (e.g., XLSX file) into the API as Chrome and Firefox browsers allow GET and POST calls using add-ons. Should we develop more such features or primarily focus to improve automated systems interactions (machine to machine) with the API?

# Contact Information

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