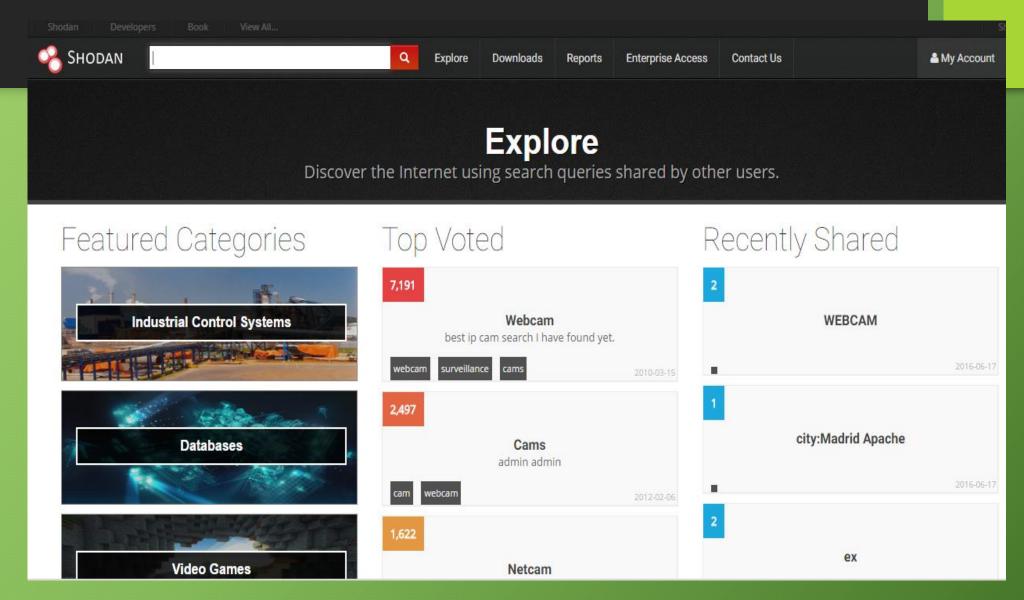
# Shodan

Industrial Control Reconnaissance

# What is Shodan

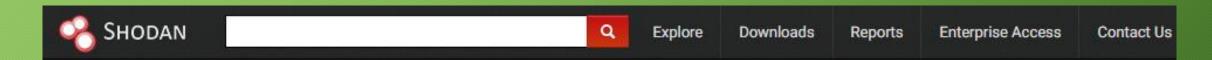
- Shodan (http://www.shodan.io/) -a web based search engine designed by John Matherly
- Different from content search engines (such as Google or Bing)
- Shodan interrogates ports and grabs the resulting banners, then indexes the banners for searching

# What is Shodan



# Shodan Search

- Basic Operations: Search
- Search terms are entered into a text box
- Quotation marks can narrow a search
- Boolean operators + and can be used to include and exclude query terms (+ is implicit default)



# Shodan Search Filters

- country: two letter country code
- hostname: specify hostname or domain
- net: specify IP range or subnet
- os: search for specific operating systems
- port: specify service port



### Shodan Search

Reploits	Maps	Share Search	♣ Download Results	L <u>⊪L</u> Create Report	
TOP COUNTRIES			Total results: 8  146.229.144.113  University of Alabama Added on 2016-06-11 21:05:59 GMT  United States, Huntsville  Details		
					Unit ID: 0 Unit ID: 1
					Slave ID Data: d : (0464ff3afd) Device Identification: Square D 15101 14.190
United States	United States 8  TOP CITIES  Huntsville 2				Unit ID: 2 Slave ID Data: d ;1 (0464ff3b6c) Device Identification: Square D 15212 10.520
					Device Identification: Square D 13212 10.320
Tuscaloosa					Unit ID: 3
Montgomery		1			Slave ID Data: d ;1 (0464ff3b6c)
Horton		1			Device Identification: Square D 15212
Fort Payne		1			
TOP ORGANIZATIONS		12.96.152.234 mail.fleminc.com AT&T Services Added on 2016-08-09 09:17:34 GMT		Unit ID: 0	
Charter Communications 3				Slave ID Data: Illegal Function (Error)	
University of	University of Alabama 2		United States, Montgomery		Device Identification: Illegal Function (Error)
Comcast Cable 1		Details			
Andycable	Andycable 1				Unit ID: 1
AT&T Services 1		1			Slave ID Data: Illegal Function (Error)
					Device Identification: Illegal Function (Error)
					Unit ID: 2
					Slave ID Data: Illegal Function (Error)
					Device Identification: Illeg

# Alternative: Nmap Modbus-discover

- Enumerates SCADA Modbus slave ids (sids) and collects their device information.
- This script does Modbus device information disclosure. It tries to find legal sids (slave ids) of Modbus devices and to get additional information about the vendor and firmware.
- Download the script modbus-discover.nse from

https://nmap.org/nsedoc/scripts/modbus-discover.html

# Alternative: Nmap Modbus-discover

### Example:

```
nmap --script modbus-discover.nse --script-args='modbus-discover.aggressive=true' -p 502 <host>
```

#### Output:

```
PORT STATE SERVICE
502/tcp open modbus
| modbus-discover: | sid 0x64:
| Slave ID data: \xFA\xFFPM710PowerMeter
| Device identification: Schneider Electric PM710 v03.110
| sid 0x96:
| error: GATEWAY TARGET DEVICE FAILED TO RESPONSE
```