



# Living Off the WAN

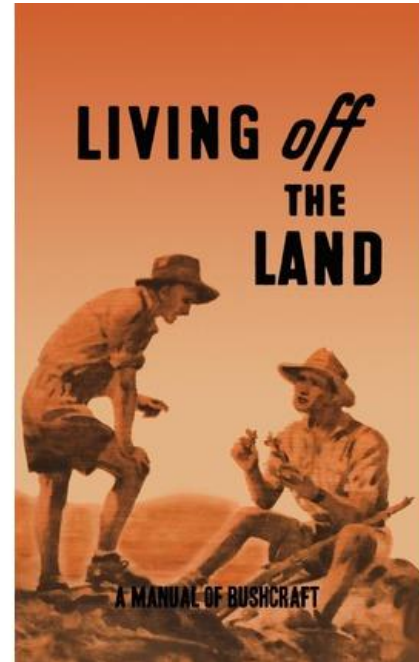
Seattle Bsides, 2019

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# Agenda

- Living Off the Land
- Objective
- C2 infrastructure
- Slack as a C2
- Pushed to innovate
- Issues Arise
- Solution found?
- Demo

# Living Off The Land





# What is this talk? Objective

- Introduce people to Command and Control (C2) infrastructure
- Advantages of public web apps
- Spark curiosity



# Scenario

Red Teaming Engagement

Post exploitation phase

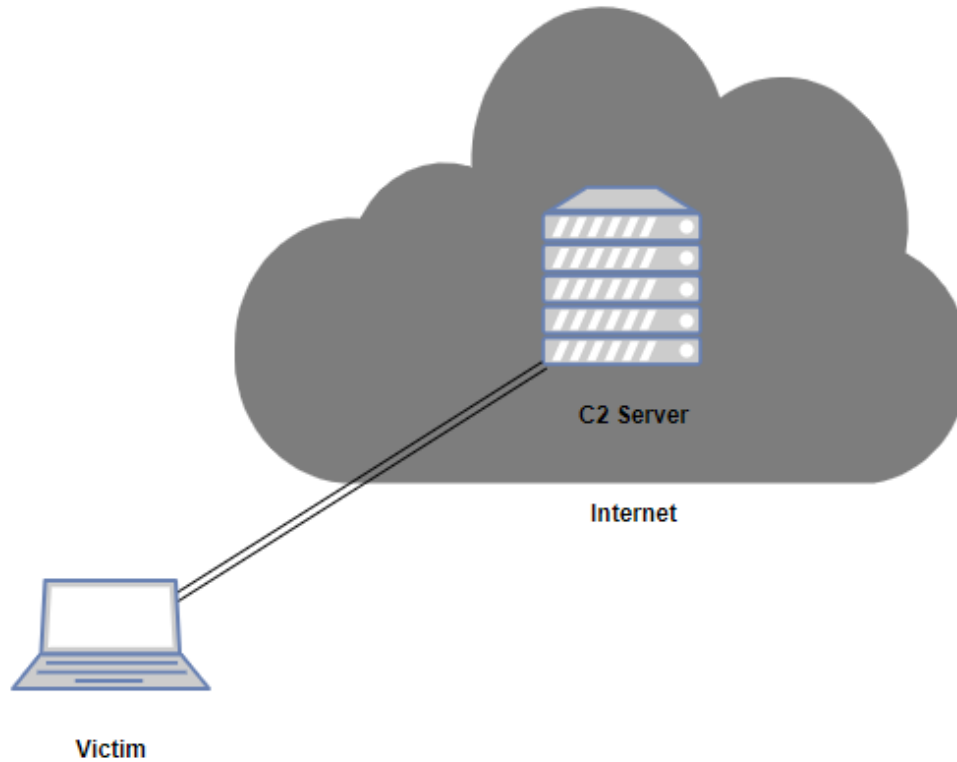
Budget = \$0.00

**\$0.00**

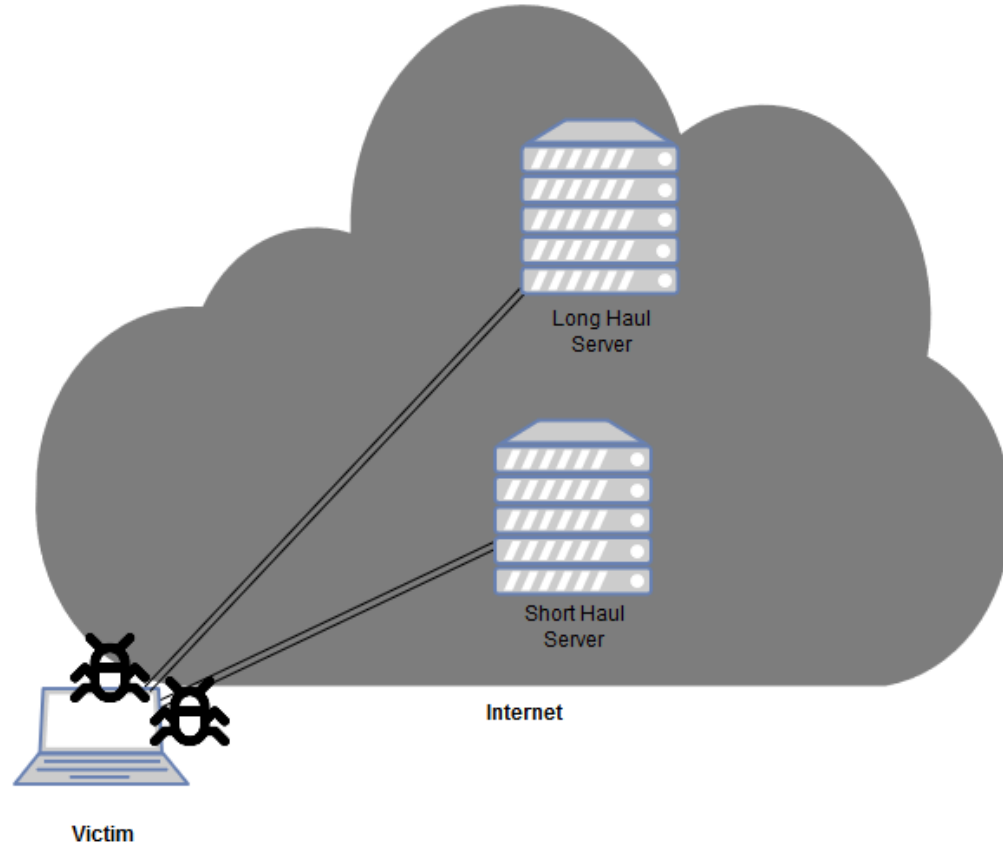
# C2 Basics



# C2 Architecture



# More Advanced





## C2 selection based on environment



# Slack as a C2

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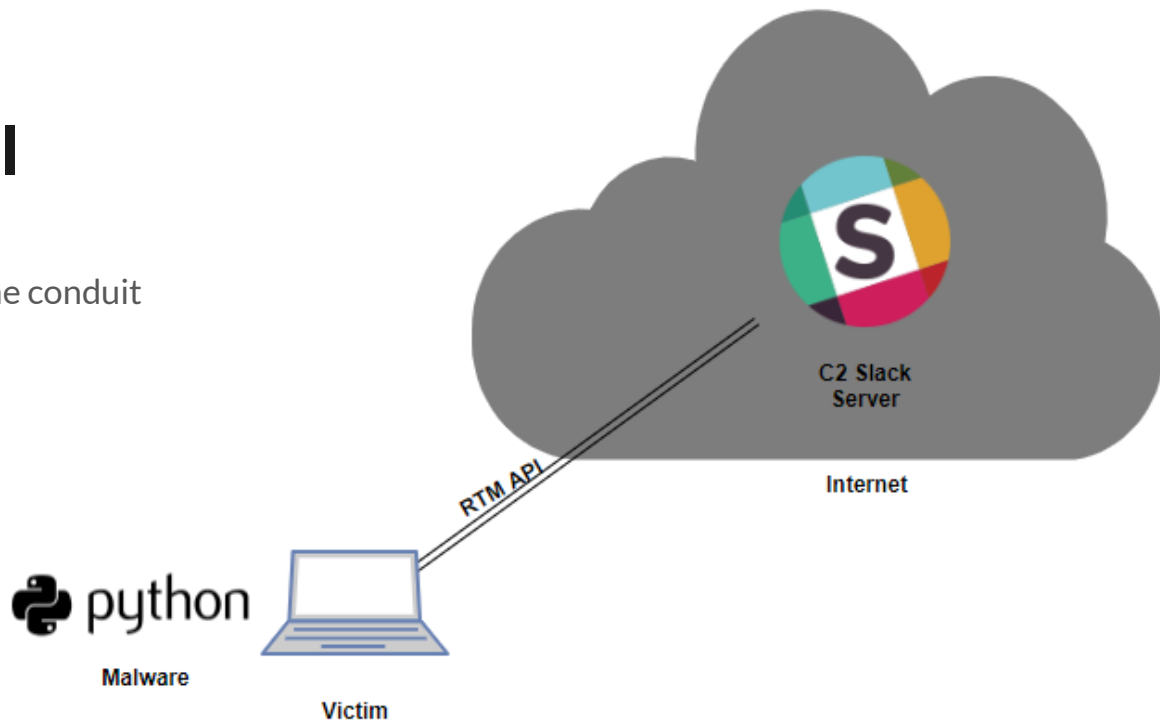
# SlackShell

Slack as a C2 but with powershell

<https://github.com/bkup/SlackShell>

# Slack RTM API

Real Time Messaging API as the conduit



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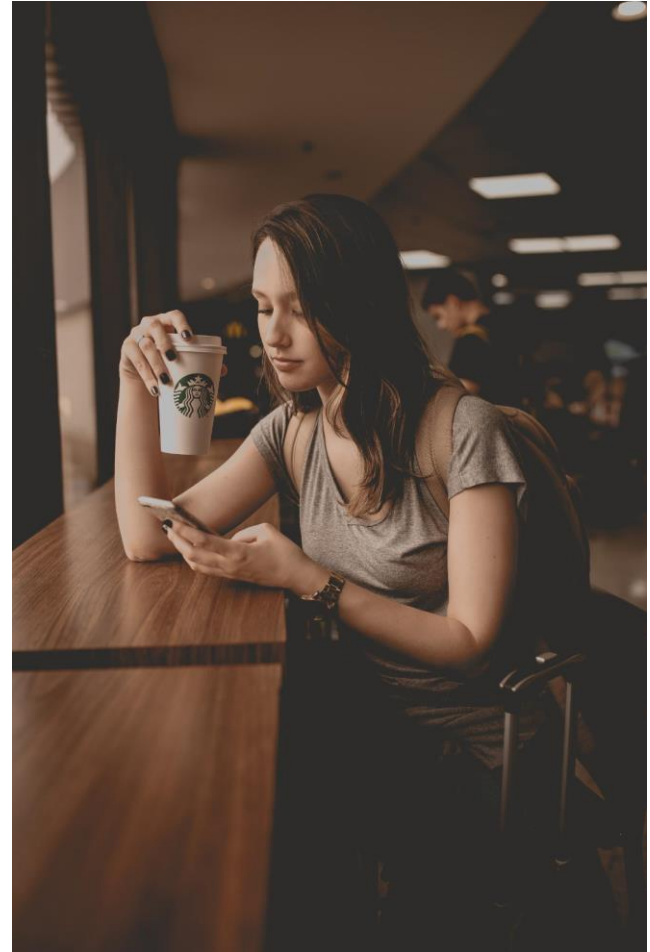
# DEMO TIME!



# Slack Benefits

- Trustworthy slack servers
- TLS connection
- Benefits of using SaaS
- Cross platform experience... Do you know what that means??

  
**PWN on the go  
and...**



  
PWN and go...







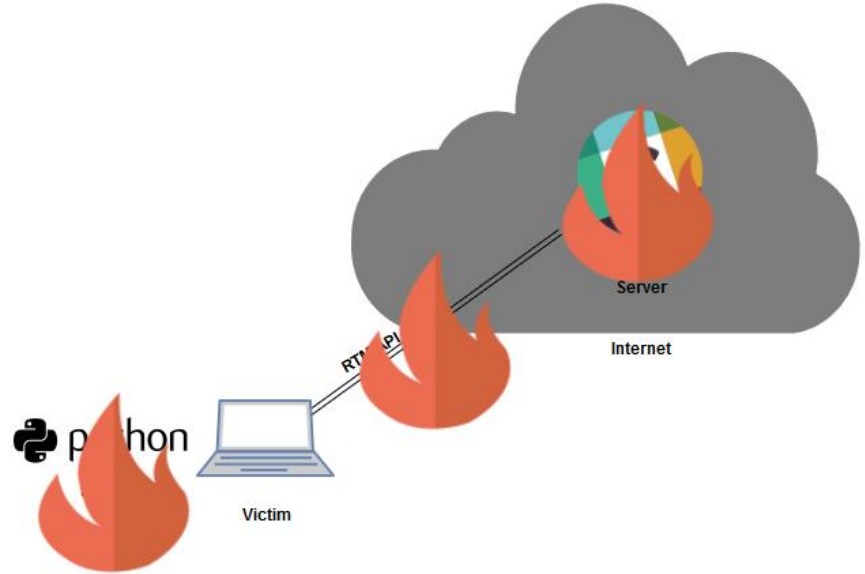
# Challenges to overcome

Scaling

Bot token management

Total of 10 bots per slack workspace

# What happens if Slack gets burned?





# How would this happen?

Detection via the network

- DNS (microoooooooooosoft.slack.com)
- Windows Server doesn't run slack...

Host based detection

Policy can make detection more difficult

# So we want better C2 infrastructure... How?

If slack gets burned we're toast (burned toast)

Diversify so not just slack as the short haul server

Central location for our long haul server to tie in. Either client side program or some central server...





One night in bed...



# Google Search



bsides seattle



All

News

Maps

Images

Shopping

More

Settings

Tools

About 325,000 results (0.57 seconds)

## BSides Seattle - Security BSides

[www.securitybsides.com/w/page/129078930/BSidesSeattle2019](http://www.securitybsides.com/w/page/129078930/BSidesSeattle2019) ▼

When. February 23, 2019. Doors open. 8:30 am - 8:00 pm. Where. The Commons Mixer Building  
15255 NE 40th Street. Redmond, WA 98052. Park in the ...

### Events

23  
FEB

#### Bsides Seattle 2019

Sat, 8:00 AM – 7:30 PM

Microsoft Studios West - The Commons, 15255 NE 40th St  
Redmond, WA

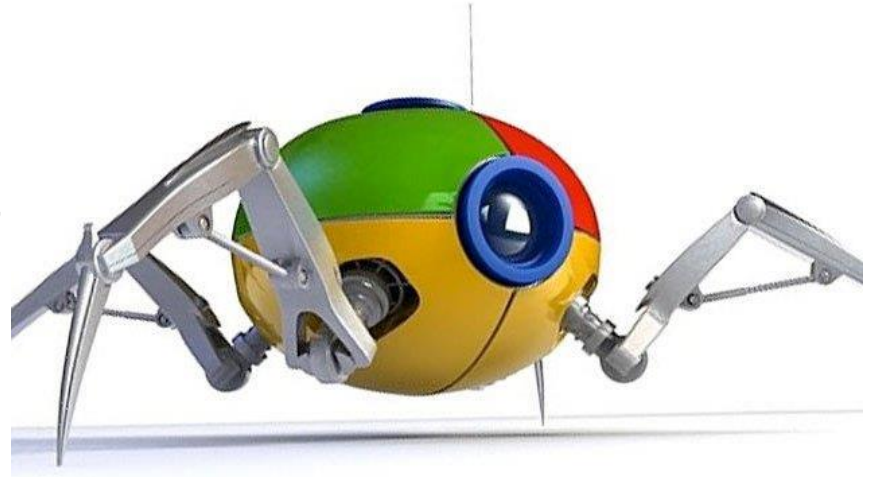


→ [Search more events](#)

# How do we get the data there?

- Google crawls websites
- But how often?
- Can we get it to automatically crawl it?
- Yes?

“[Crawling](#) can take anywhere from a few days to a few weeks.”



# BING to the rescue...

“allows you to submit upto 10,000 URLs per day for immediate crawl”

Hot Damn!

Intelligent approach though







# **A Novel Search Engine-Based Method for Discovering Command and Control Server**

December 16, 2015....

[https://link.springer.com/chapter/10.1007/978-3-319-27137-8\\_24](https://link.springer.com/chapter/10.1007/978-3-319-27137-8_24)



**ONE  
WEEK  
LATER...**

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Reading a bit more: "The Submit URLs feature in Webmaster Tools is currently restricted to **root domains** only and will not accept the submission of subdomains."

AHHHHH!!!!





A wide-angle photograph of a city street at night, covered in a heavy layer of snow. Snow is falling rapidly from the sky, creating a dense, white curtain effect. The street is illuminated by streetlights and the warm glow of building windows. On the left, a storefront with the sign "Indigospirit" is visible. The street recedes into the distance, where a few cars and pedestrians can be seen. The overall atmosphere is cold and wintry.

# SNOWPOCALYPSE 2017/9

# GitHub Pages + free domains



GitHub Pages

bsidesseattle .tk	• FREE	USD 0. <sup>00</sup>	Get it now!
bsidesseattle .ml	• FREE	USD 0. <sup>00</sup>	Get it now!
bsidesseattle .ga	• FREE	USD 0. <sup>00</sup>	Get it now!
bsidesseattle .cf	• FREE	USD 0. <sup>00</sup>	Get it now!
bsidesseattle .gq	• FREE	USD 0. <sup>00</sup>	Get it now!



## SEO for my C2

Got Bing to allow me to enter the domain in for automatic indexing.

But.....

“The URLs are immediately evaluated for search indexation and **when quality criteria are met**, they will begin to surface in Bing search.”

## Other ways of getting information in Search

**FAKE**  
**NEWS**



  
**NVM Google come back I love you**







# What does google crawl the most?

Alexa 100 will probably give us a good hint

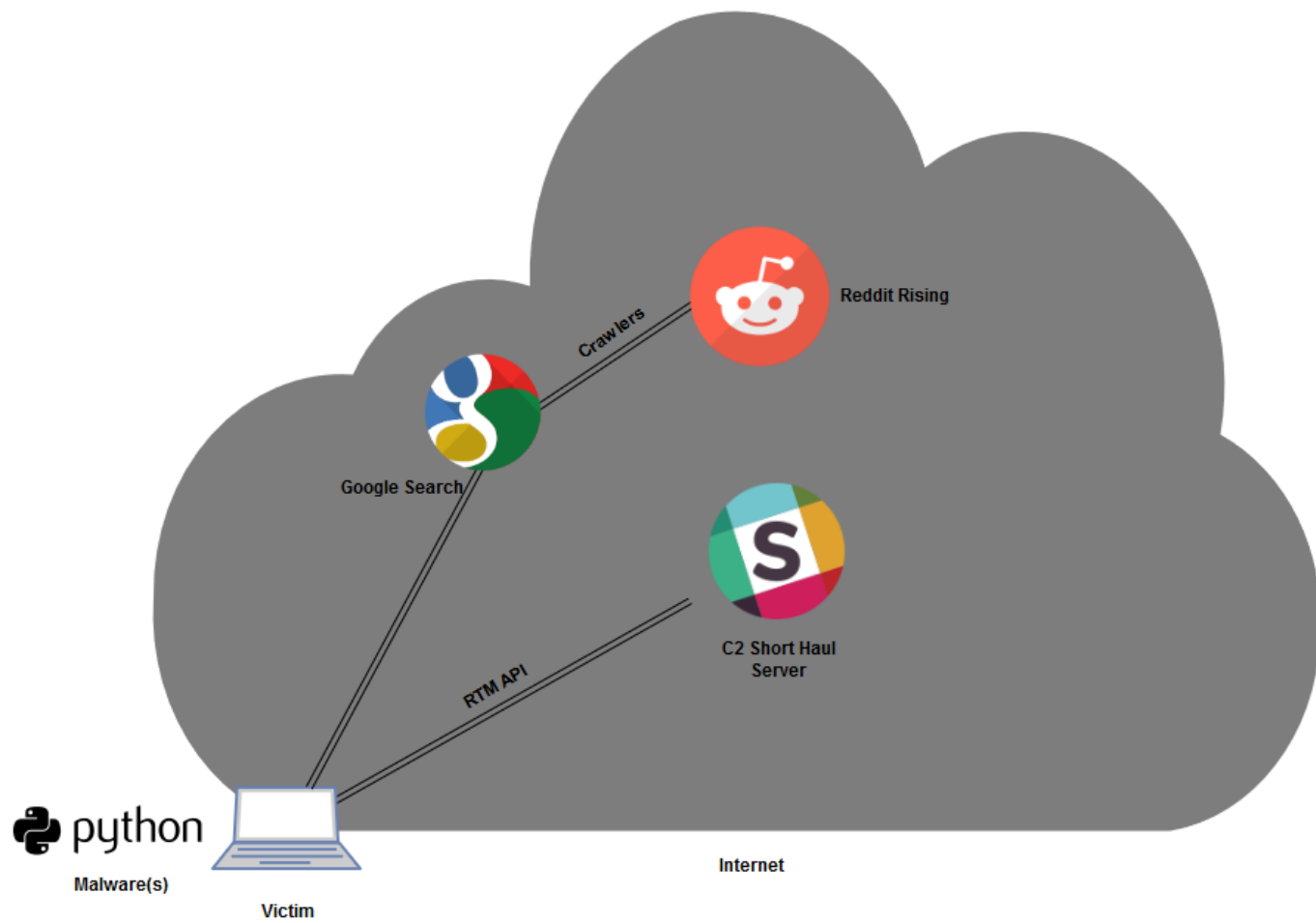
- 1 [Google.com](#)  
Enables users to search the world's information, including webpages, images, and videos. Offers...[More](#)
- 2 [Youtube.com](#)  
YouTube is a way to get your videos to the people who matter to you. Upload, tag and share your...[More](#)
- 3 [Facebook.com](#)  
A social utility that connects people, to keep up with friends, upload photos, share links and ...[More](#)
- 4 [Amazon.com](#)  
Amazon.com seeks to be Earth's most customer-centric company, where customers can find and disc...[More](#)
- 5 [Wikipedia.org](#)  
A free encyclopedia built collaboratively using wiki software. (Creative Commons Attribution-Sh...[More](#)
- 6 [Reddit.com](#)  
User-generated news links. Votes promote stories to the front page.

# Reddit Rising

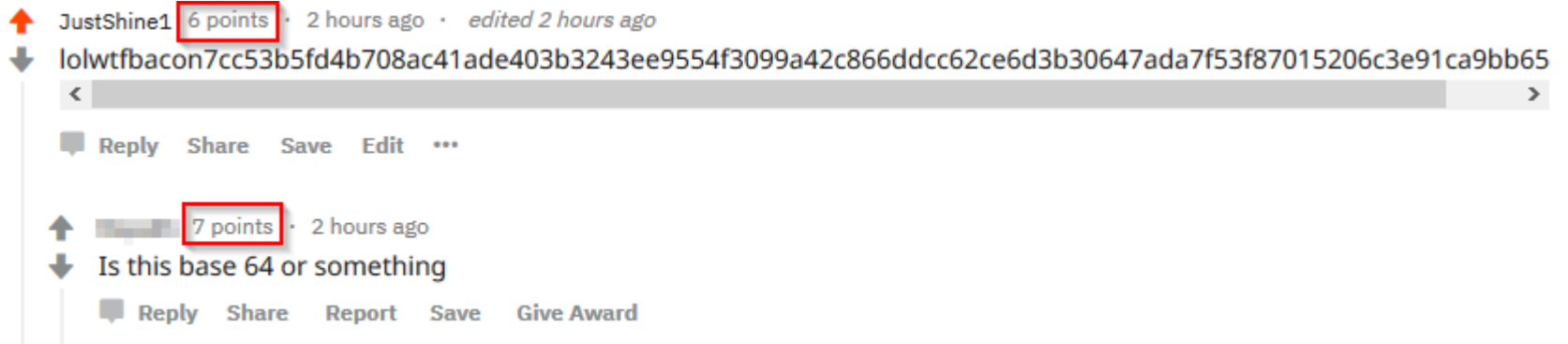
What areas does google crawl the most?

Least noticeable by users?





# Sometimes they're nice



A screenshot of a GitHub comment thread. The first comment is by user 'JustShine1' with a score of 6 points (highlighted with a red box), posted 2 hours ago and edited 2 hours ago. The comment text is a long alphanumeric string: 'lolwtfbacon7cc53b5fd4b708ac41ade403b3243ee9554f3099a42c866ddcc62ce6d3b30647ada7f53f87015206c3e91ca9bb65'. Below the comment is a horizontal scrollbar. The second comment is by a user with a greyed-out profile picture and a score of 7 points (highlighted with a red box), posted 2 hours ago. The comment text is 'Is this base 64 or something'. Below the second comment are the interaction buttons: 'Reply', 'Share', 'Report', 'Save', and 'Give Award'.

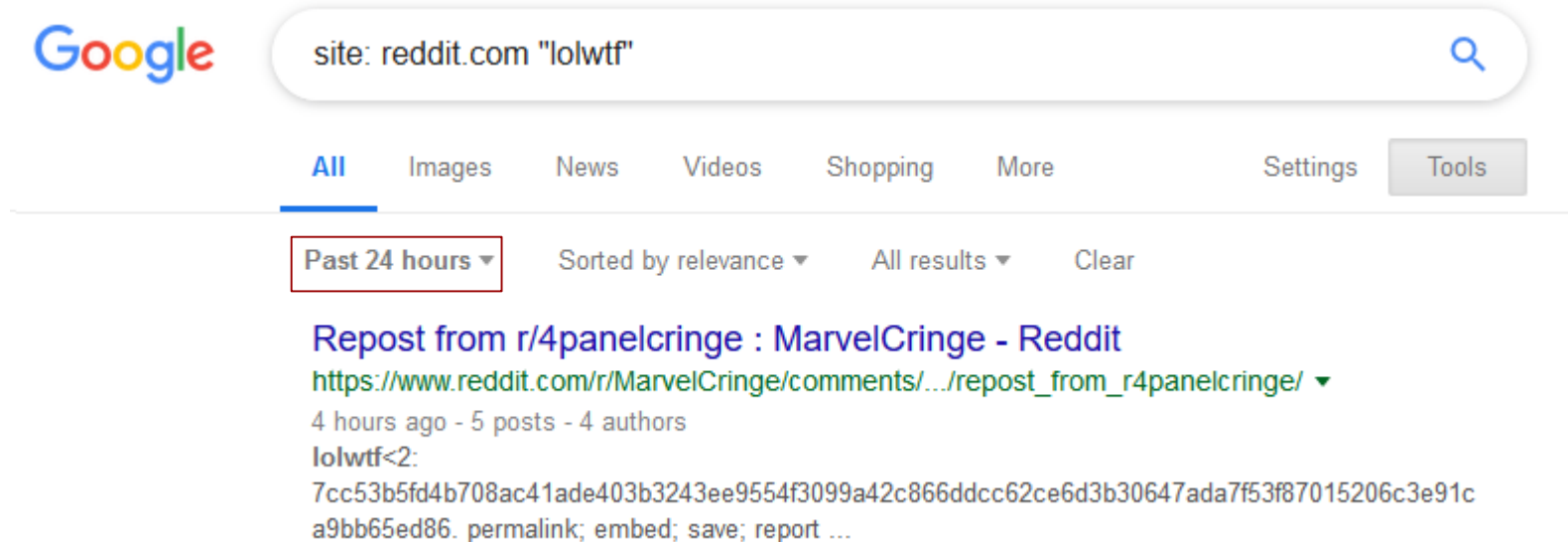
↑ JustShine1 6 points · 2 hours ago · edited 2 hours ago  
↓ lolwtfbacon7cc53b5fd4b708ac41ade403b3243ee9554f3099a42c866ddcc62ce6d3b30647ada7f53f87015206c3e91ca9bb65  
< >  
Reply Share Save Edit ...

↑ [Profile Picture] 7 points · 2 hours ago  
↓ Is this base 64 or something  
Reply Share Report Save Give Award

# Sometimes people just don't get it

↑ JustShine1 **-5 points** · 12 hours ago  
↓ hahalol<3:7cc53b5fd4b708ac41ade403b3243ee9554f3099a42c866ddcc62ce6d3b30647ada7f53f87015206c3e91ca9bb65e  
< [Progress Bar] >  
Reply Share Save Edit ...

# It actually worked!



A screenshot of a Google search interface. The search bar contains the text "site: reddit.com lolwtf". Below the search bar, the "All" tab is selected. The "Past 24 hours" filter is highlighted with a red box. The search results show a link to a Reddit post titled "Repost from r/4panelcringe : MarvelCringe - Reddit". The link is followed by the URL "https://www.reddit.com/r/MarvelCringe/comments/.../repost\_from\_r4panelcringe/" and a dropdown arrow. Below the link, it says "4 hours ago - 5 posts - 4 authors". The post content starts with "lolwtf<2:" followed by a long alphanumeric string: "7cc53b5fd4b708ac41ade403b3243ee9554f3099a42c866ddcc62ce6d3b30647ada7f53f87015206c3e91ca9bb65ed86". The text "permalink; embed; save; report ..." is partially visible at the end of the line.

Google

site: reddit.com "lolwtf"

All Images News Videos Shopping More Settings Tools

Past 24 hours ▾ Sorted by relevance ▾ All results ▾ Clear

Repost from r/4panelcringe : MarvelCringe - Reddit

[https://www.reddit.com/r/MarvelCringe/comments/.../repost\\_from\\_r4panelcringe/](https://www.reddit.com/r/MarvelCringe/comments/.../repost_from_r4panelcringe/) ▾

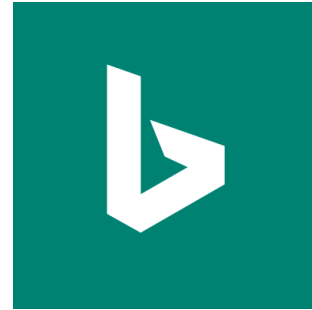
4 hours ago - 5 posts - 4 authors

lolwtf<2:

7cc53b5fd4b708ac41ade403b3243ee9554f3099a42c866ddcc62ce6d3b30647ada7f53f87015206c3e91ca9bb65ed86. permalink; embed; save; report ...



**Let's take a moment... and see why this is possible...**



**When you're living off the WAN sometimes...**

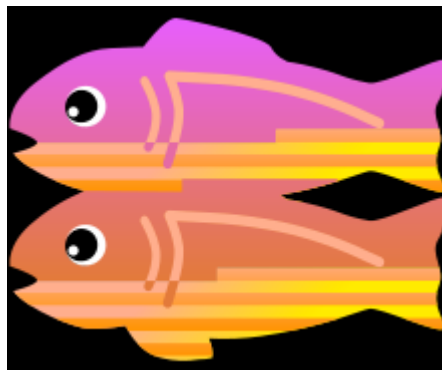






# Glitch.com

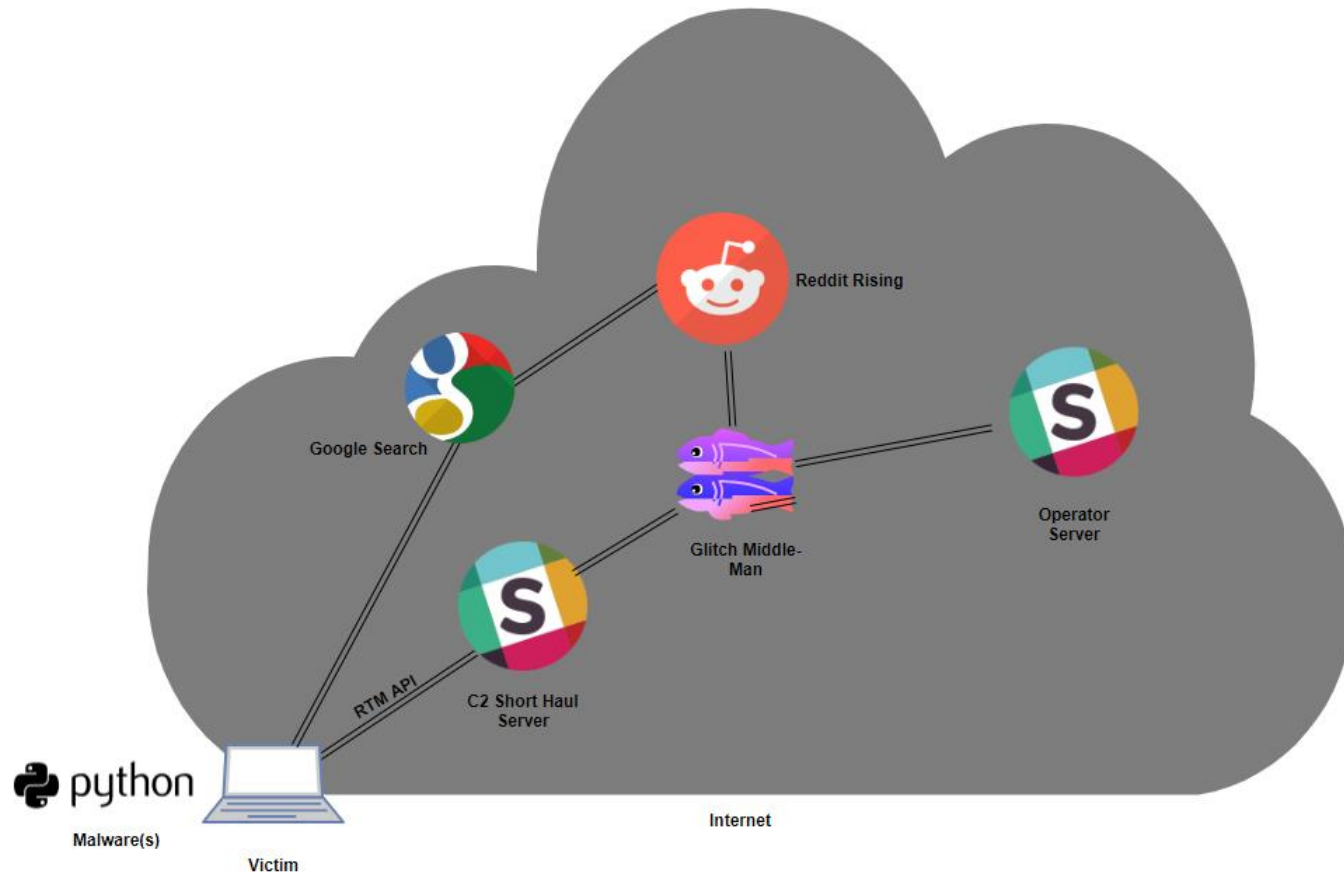
- Free serverless platform without login
- Lock functionality (Makes it private)
- Gives you a subdomain at **weird-name.glitch.me**
- CLI access to your own container (Not as root)





## Now we have a docker container

- Don't have to use nodejs
- Engage in programmatic behaviour



**Sooo... That  
actually didn't  
work**





# Slack Events API and Web Hooks

Web hooks receive the data to slack channel

Events API send data

We can now create a bi-directional channel



# Summary

We can create advanced C2 infrastructure for free

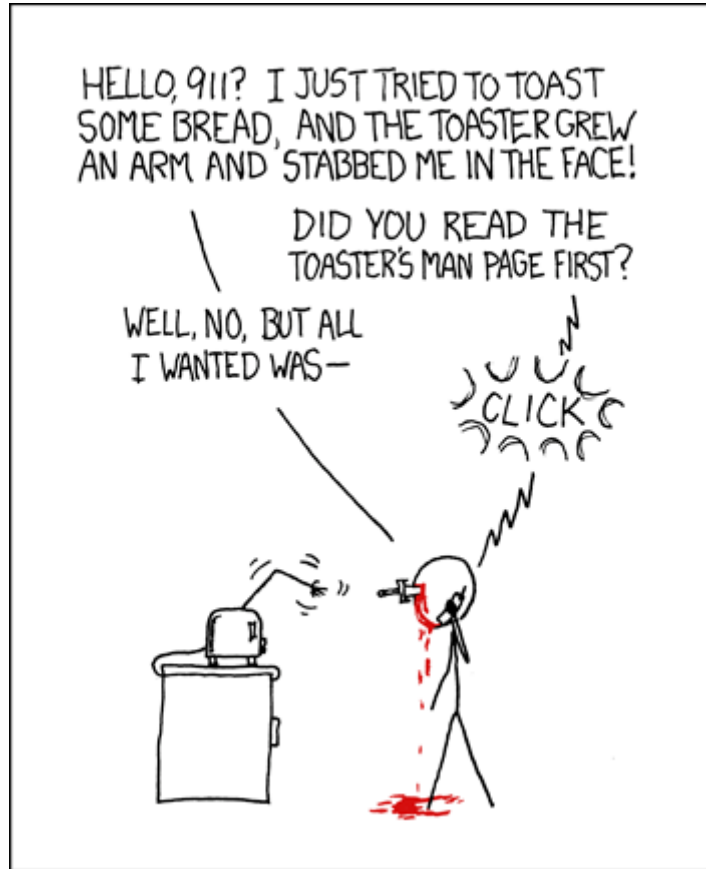
We can masquerade as legitimate sites to evade detection

Curious what other more advanced C2 infrastructure can be emulated?

# What did I learn

TBH... RTFM, all of it! Closely!

Services shift





## Additional resources

<https://bluescreenofjeff.com/>

<https://github.com/bluescreenofjeff/Red-Team-Infrastructure-Wiki>



# Questions?

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