



60 Million Users and Counting
Azure Survey 2025

Azure Survey Components

OneDrive Surveys

- 3 years of user enumeration
- 63 million users
- Tested for common username formats and popular service accounts

Teams Tracking

- External Access Survey
- Monitoring of 100,000 Microsoft employees
- Out of Office message Analysis

whoami



- hacker at TrustedSec
- research my own
- OSCP, OSCE, various others

Security Research:

- 2015 - Microsoft Lync Time-based User Enumeration,
- CVE-2017-8550 - Microsoft Skype for Business 2016 XSS
- CVE-2018-8474 - Microsoft Lync 2011 for Mac XSS
- CVE-2020-5774 - Tenable Nessus Session Timeout Bypass
- 2023 - GraphNinja (invisible password sprays in Azure), bounty, no CVE
- 2024 - Azure AutoDiscover Basic Auth User Enumeration, no CVE

Twitter: @nyxgeek

Github: <https://github.com/nyxgeek>

TrustedSec

- @HackingDave is awesome!!!
- Research is entirely my own



EFF to the Rescue!



- Great resource for security researchers
- Provided assistance with my DEF CON talk
- THANK YOU EFF!



<https://www.eff.org/>

What is User Enumeration?

- Allows an attacker to identify VALID accounts, and INVALID accounts based on server response

Example: Verbose login response –
"Username is invalid" instead of
"Invalid username or password"

- Enables Attacks:
 - Password sprays
 - Phishing
 - Targeted RCE (when available)

```
Started enumerating onedrive at 2019-03-05 16:32:43.570917
[-] [404] not found acmecomputercompany.com - fakeuser
[-] [404] not found acmecomputercompany.com - fake.user
[-] [404] not found acmecomputercompany.com - westb
[+] [403] VALID ONEDRIVE FOR acmecomputercompany.com - westa
[-] [404] not found acmecomputercompany.com - westc
[+] [403] VALID ONEDRIVE FOR acmecomputercompany.com - lightmand
[-] [404] not found acmecomputercompany.com - admin
[-] [404] not found acmecomputercompany.com - crabapple
[+] [403] VALID ONEDRIVE FOR acmecomputercompany.com - johns
[-] [404] not found acmecomputercompany.com - venturej
[-] [404] not found acmecomputercompany.com - stevens
[-] [404] not found acmecomputercompany.com - stevenf
```

RE: SharePoint - Information Disclosure - OneDrive user enumeration VULN-053489 CRM:0441006204 ➤ Inbox x



Microsoft Security Response Center <secure@microsoft.com>

Fri, Aug 27, 2021, 5:42 PM



to me ▾

Hello,

Thank you for contacting the Microsoft Security Response Center (MSRC). Generally we would not consider user enumeration on its own a security vulnerability. In many cases it is even intentional. While, like many fingerprinting techniques, it can be useful information for an attacker; on its own it wouldn't constitute a vulnerability and would need some other attack to make use of the information. Similar to knowing a website IP address or the type of software being used by that site.

"... we would not consider user enumeration on its own a security vulnerability. In many cases it is even intentional. ...

Similar to knowing a website IP address ..."

midnight blizzard

- initial entry: password spray on test tenant

Midnight Blizzard's latest credential phishing attack

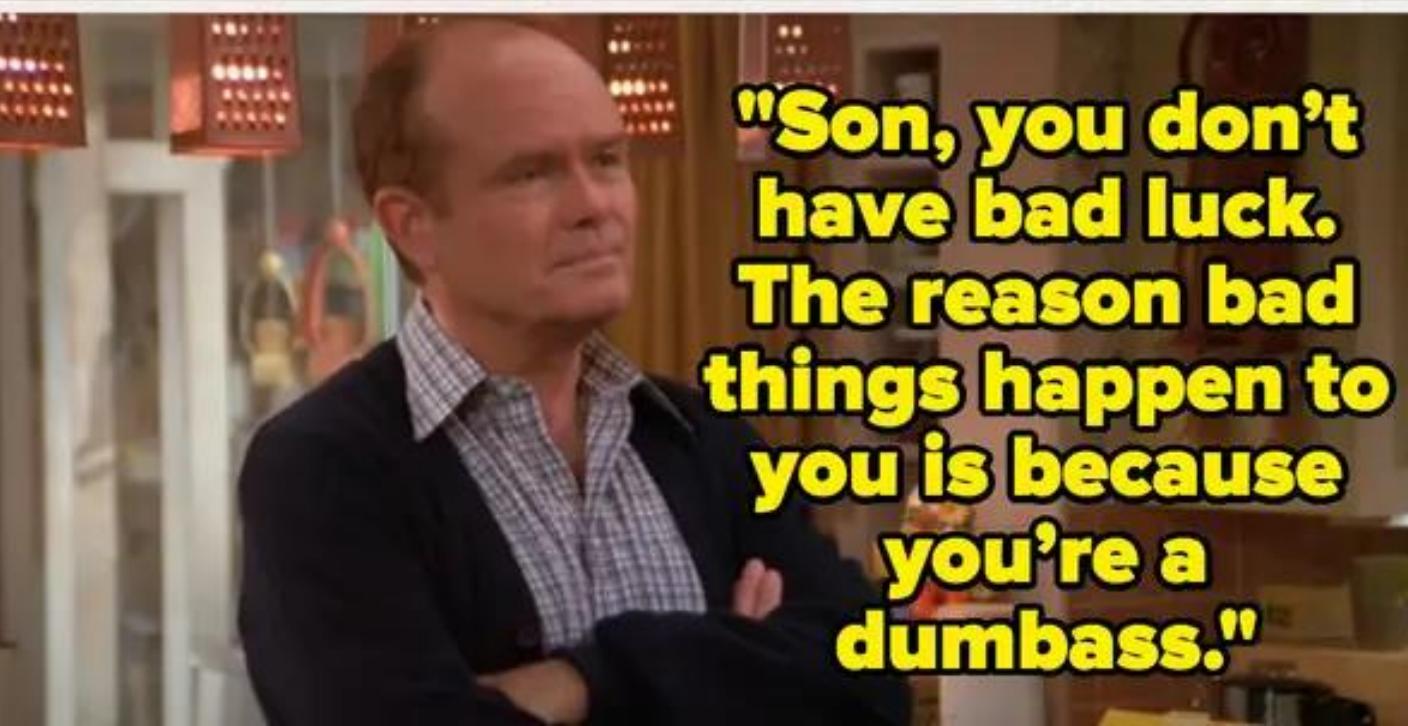
Midnight Blizzard regularly utilizes token theft techniques for initial access into targeted environments, in addition to authentication spear-phishing, password spray, brute force, and other credential attacks. The attack pattern observed in malicious activity since at least late May 2023 has been identified as a subset of broader credential attack campaigns that we attribute to Midnight Blizzard.

**"I don't know. You
know, it seems
like bad things
are always
happening to me,
like I have bad
luck or
something."**



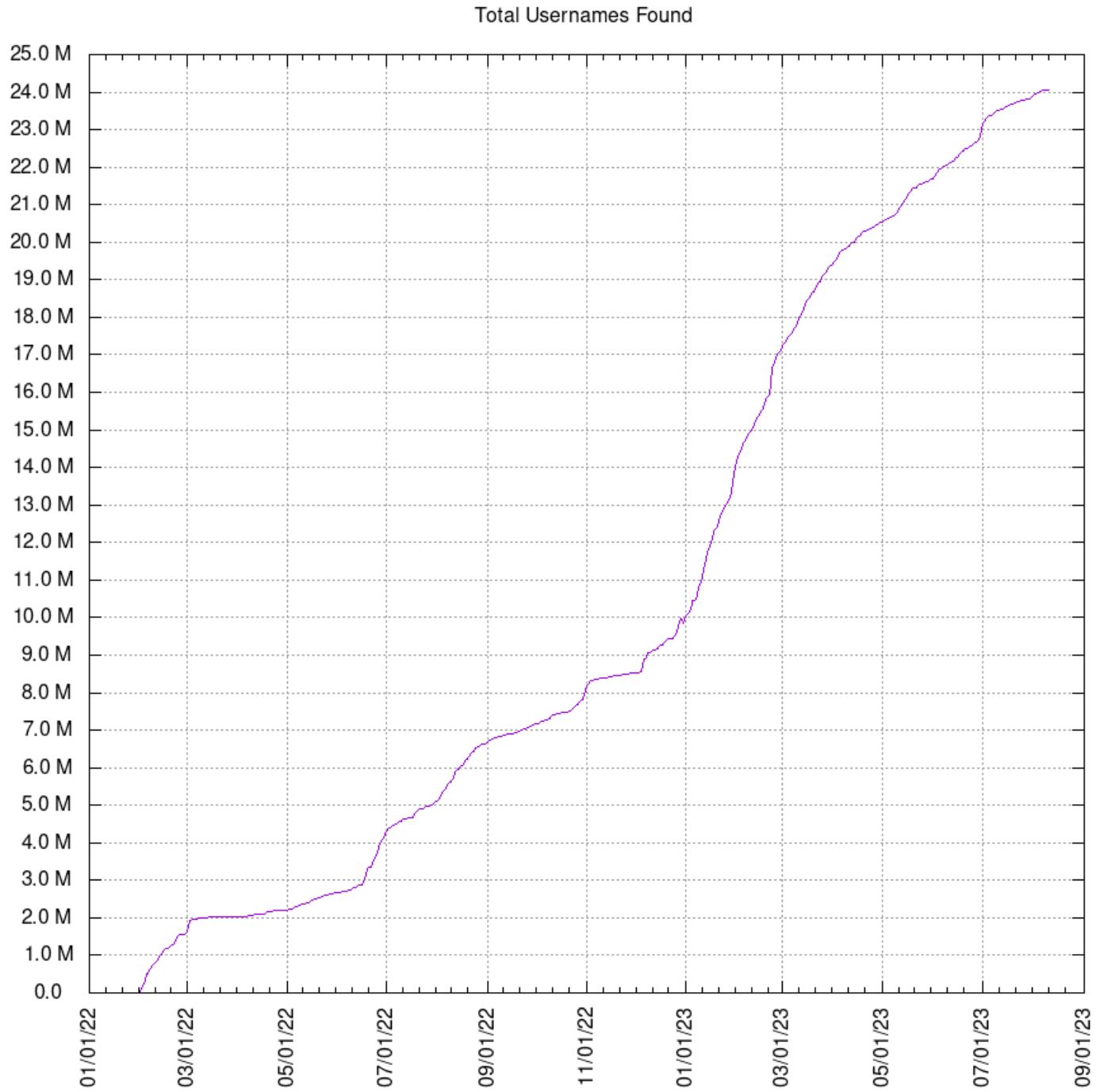
Microsoft

**"Son, you don't
have bad luck.
The reason bad
things happen to
you is because
you're a
dumbass."**



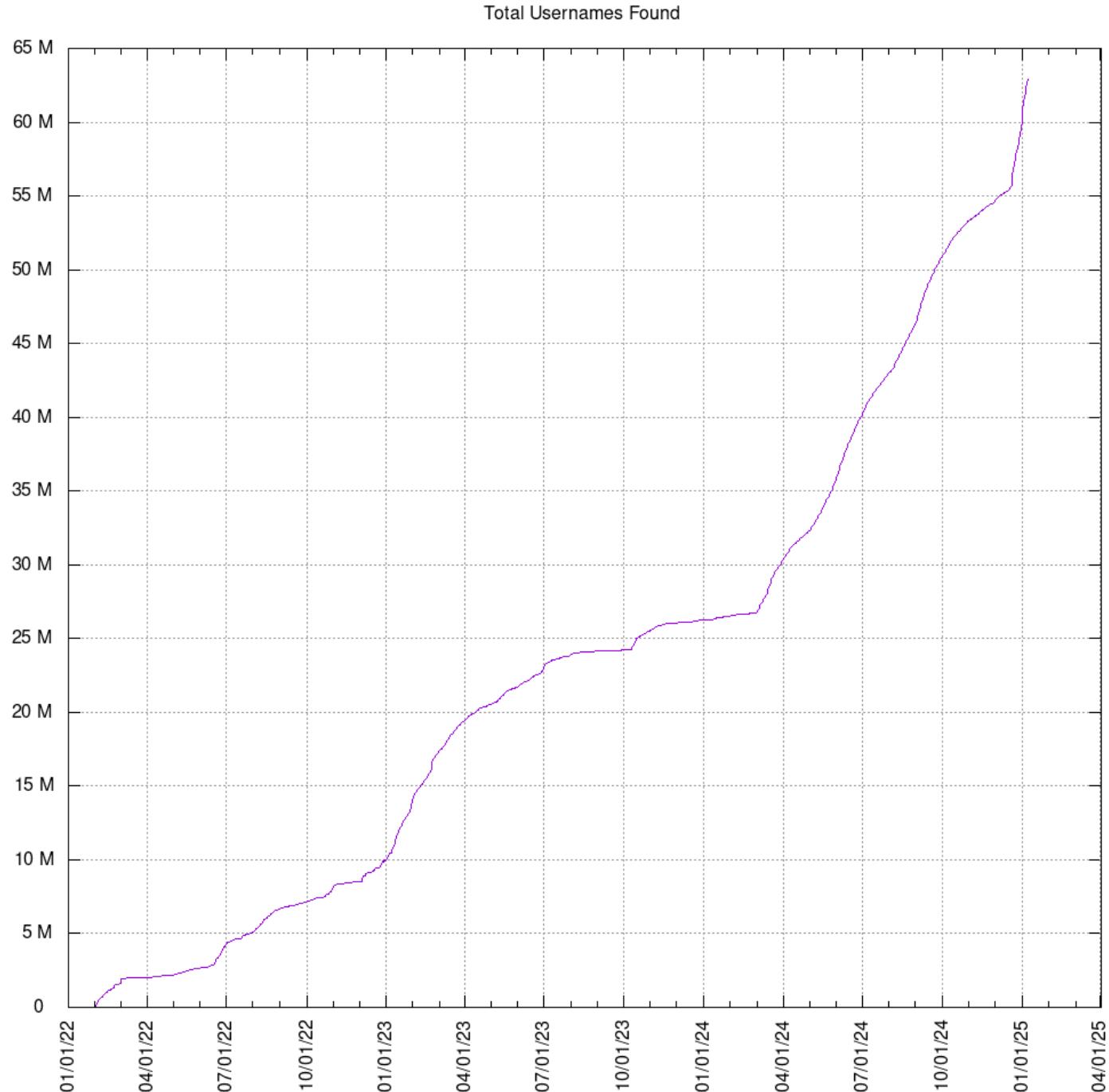
OneDrive Enumeration 2023

- Used OneDrive enumeration method because no login attempt – web scraping
- 24 million users enumerated (as of August 2023)
- Project had lasted approximately 1.5 years
- Focused on Fortune 500 and Fortune 1000 companies



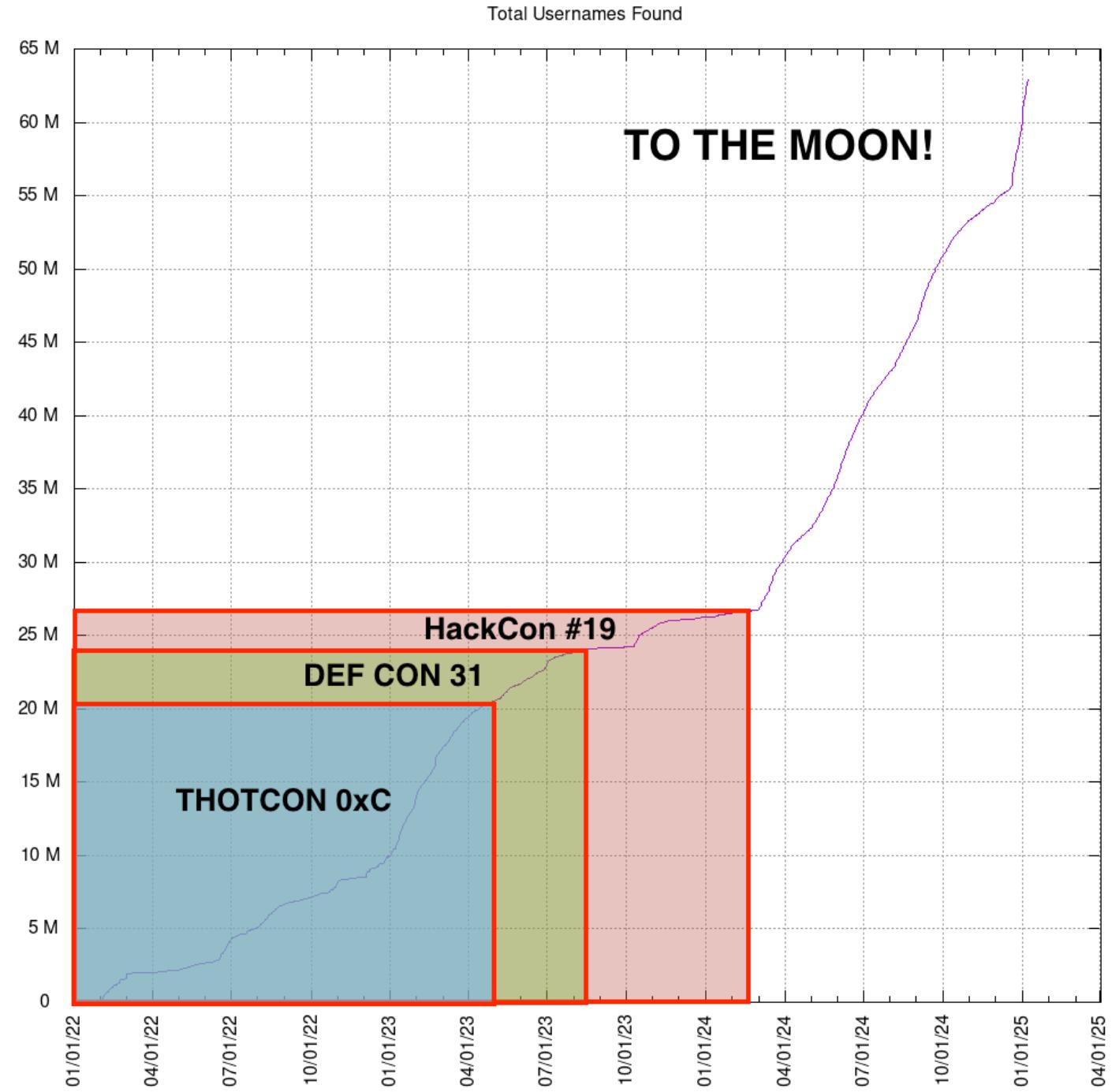
OneDrive Enumeration 2025

- 63 million users enumerated (as of January 2025)
- Project has lasted approx 3 years
- Expanded to ALL Azure tenants and domains



OneDrive Enumeration Timeline

- THOTCON: 20 million
- DEF CON: 24 million
- HackCon: 26 million
- ShmooCon: 63 million



Project Data & Methods

2022 - 2025

Scraping Methods & Limitations

- Usernames identified via OneDrive enumeration
 - Web scraping – no login attempt
 - Only identifies UPNs (usernames), not email aliases
 - Many actions can cause OneDrive URL creation
 - Using any MS app with option to save to OneDrive
 - See "Track the Planet" from DEF CON 31
- Limitations
 - Real accounts, must have been logged into at least once
 - Must have had a license
 - No differentiation between 'john.smith' and 'john_smith'
 - OneDrive url swaps out periods for underscore

Data Sources & Usernames

- Domain lists – Fortune 500/1000, ICANN, GitHub
- Username lists – Generated from census data, public dump data
- Survey lists containing common names in multiple formats used to identify live tenant/domain combinations
- Service account lists of popular accounts were sprayed (admin, noreply, helpdesk, etc)
- Specific username formats were tied to domains by examining public dump data (e.g., numeric 6-digit: grep '[0-9]{6}@')

The CLU CORP (40 hosts - standard)



Microsoft APIs - GetUserRealm

<https://login.microsoftonline.com/getuserrealm.srf?login=nyxgeek@microsoft.com&xml=1>

- **NameSpaceType**
 - Federated (ADFS)
 - Managed (Synced or Standalone)
- **Federation Brand Name**
 - company name as entered by company

Managed

```
▼<RealmInfo Success="true">
  <State>4</State>
  <UserState>1</UserState>
  <Login>nyxgeek@trustedsec.com</Login>
  <NameSpaceType>Managed</NameSpaceType>
  <DomainName>trustedsec.com</DomainName>
  <IsFederatedNS>false</IsFederatedNS>
  <FederationBrandName>TrustedSec</FederationBrandName>
  <CloudInstanceName>microsoftonline.com</CloudInstanceName>
  <CloudInstanceIssuerUri>urn:federation:MicrosoftOnline</CloudInstanceIssuerUri>
</RealmInfo>
```

ADFS

```
▼<RealmInfo Success="true">
  <State>3</State>
  <UserState>2</UserState>
  <Login>nyxgeek@microsoft.com</Login>
  <NameSpaceType>Federated</NameSpaceType>
  <DomainName>microsoft.com</DomainName>
  <FederationGlobalVersion>-1</FederationGlobalVersion>
  <AuthURL>https://msft.sts.microsoft.com/adfs/ls/?username=nyxgeek@microsoft.com</AuthURL>
  <IsFederatedNS>true</IsFederatedNS>
  <STSAuthURL>https://msft.sts.microsoft.com/adfs/services/trust</STSAuthURL>
  <FederationTier>0</FederationTier>
  <FederationBrandName>Microsoft</FederationBrandName>
  <AllowFedUsersWLIDSgin>false</AllowFedUsersWLIDSgin>
</RealmInfo>
```

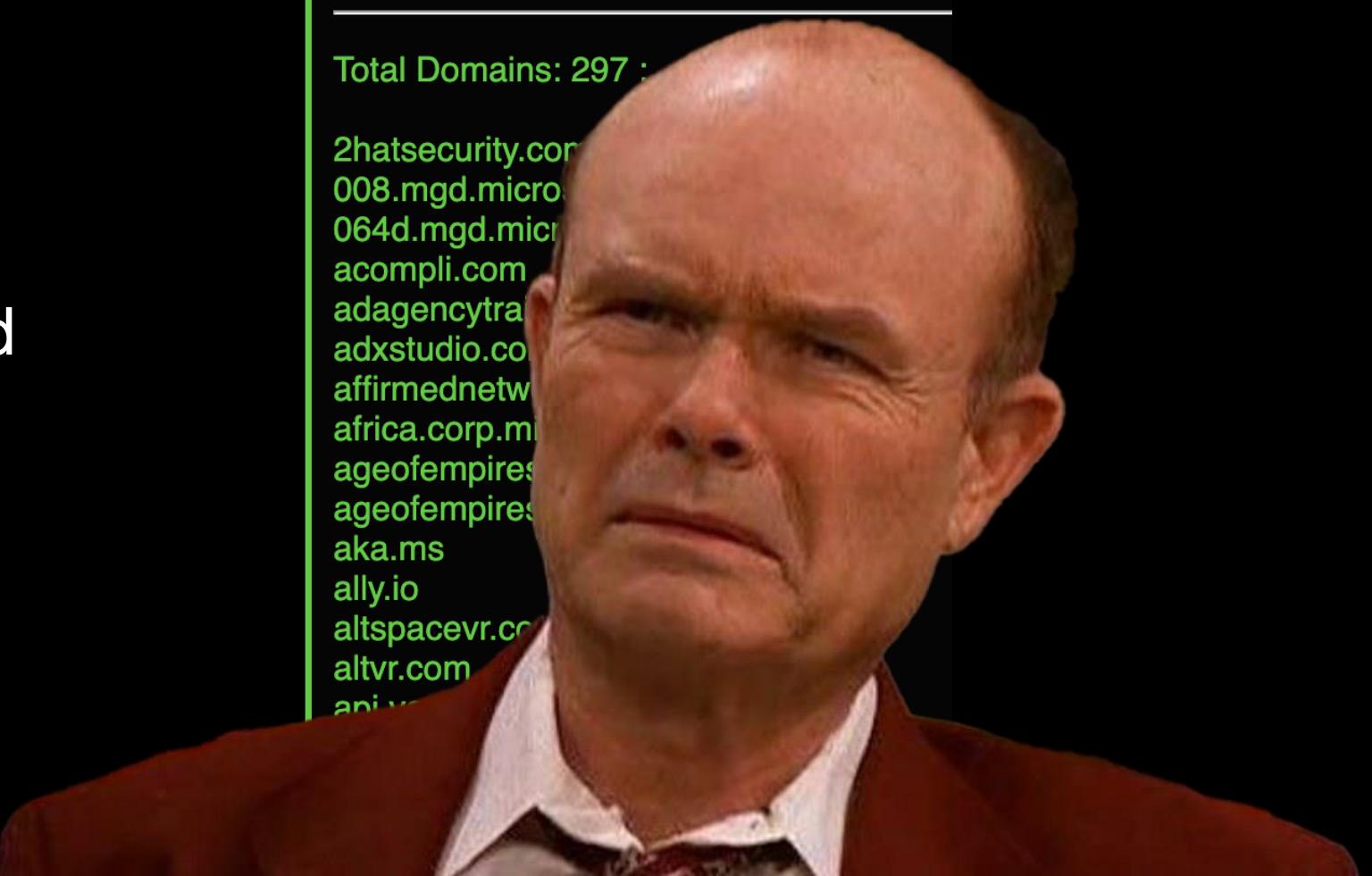
Microsoft APIs - AutoDiscover

<https://autodiscover-s.outlook.com/autodiscover/autodiscover.svc>

- Lookup a domain
- Returns all associated domains for tenant
- Thanks, Microsoft!

Total Domains: 297 :

2hatsecurity.com
008.mgd.microsoft.com
064d.mgd.microsoft.com
acompli.com
adagencytra...
adxstudio.com
affirmednetw...
africa.corp.microsoft.com
ageofempires.com
ageofempires.com
aka.ms
ally.io
altspacevr.com
altvr.com
api.vr



cloud kicker

<https://github.com/nyxgeek/cloudkicker>

- internal lookup tool for Azure
- similar in functionality to DrAzureAD's OSINT tool
- self-hosted, queries Microsoft servers directly
- PHP

Tenant Lookup
microsoft.com

Chuck Norris
**CHUCK 'CLOUDKICKER'
NORRIS**

ACTION HACKS

The domain is **microsoft.com**

Here are your results:

ONEDRIVE FOUND	microsoft-my.sharepoint.com
ONEDRIVE FOUND	microsoftapc-my.sharepoint.com
ONEDRIVE FOUND	microsofteur-my.sharepoint.com
ONEDRIVE FOUND	microsoftprd-my.sharepoint.com
SHAREPOINT FOUND	microsoft.sharepoint.com
SHAREPOINT FOUND	microsoftapc.sharepoint.com
SHAREPOINT FOUND	microsoftcan.sharepoint.com
SHAREPOINT FOUND	microsofteur.sharepoint.com
SHAREPOINT FOUND	microsoftprd.sharepoint.com
MAIL RECORD FOUND (indicates AD Sync Enabled)	msfts2.mail.onmicrosoft.com
MAIL RECORD FOUND (indicates AD Sync Enabled)	microsoft.mail.onmicrosoft.com
OneDrive: Not Enforced	(microsoft-my.sharepoint.com)
SharePoint: Not Enforced	(microsoft.sharepoint.com)
OneDrive: Not Enforced	(microsoftapc-my.sharepoint.com)
SharePoint: Not Enforced	(microsoftapc.sharepoint.com)
SharePoint: Not Enforced	(microsoftcan.sharepoint.com)
OneDrive: Not Enforced	(microsofteur-my.sharepoint.com)
SharePoint: Not Enforced	(microsofteur.sharepoint.com)
OneDrive: Not Enforced	(microsoftprd-my.sharepoint.com)
SharePoint: Not Enforced	(microsoftprd.sharepoint.com)
MODERN AUTH STATUS	

Total Tenants: 6 :

[microsoft](#)
[microsoftapc](#)
[microsoftcan](#)
[microsofteur](#)
[microsoftprd](#)
[msfts2](#)

Total Domains: 284 :

[2hatsecurity.com](#)
[008.mgd.microsoft.com](#)
[064d.mgd.microsoft.com](#)
[acomplii.com](#)
[advxstudio.com](#)



The Numbers

OneDrive User Enumeration

- 7,440,267 unique tenant/domain combos
- 35,435,056 wordlists completed
- 96,592,156,569+ requests made
- 1074 days from start
- 444,772.00 computer-hours of scraping
- 414 computer-hours / day on average

Teams Presence Monitoring

- 100,990 Microsoft employees
- 4.8~ million requests per day
- 1,148,805,858 total requests made
- 383 days of monitoring
- 52,348 Out of Office messages analyzed

State of the Azure

2022 - 2025

Live Tenants and Domains

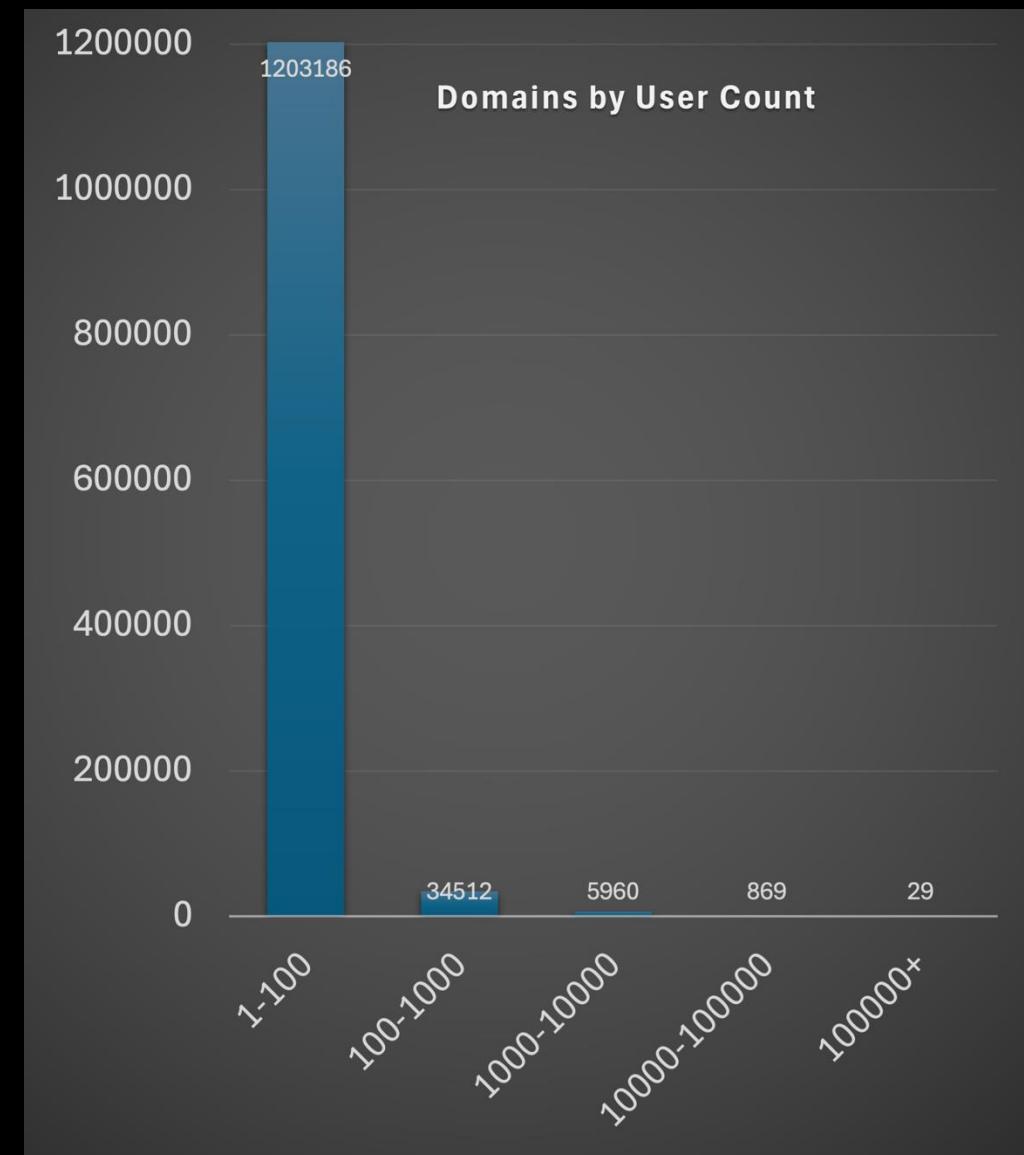
- **977,940 live tenants**
- **1,254,284 live domains**
- **1,257,742 live tenant/domain combinations**

- **50~ Users per Domain on Average**

Domains and Users

- 1,254,284 live domains

Population Range	Domain Count
1 - 100 users	1203186
101 - 1000 users	34512
1001 - 10000 users	5960
10001 - 100000 users	869
1000001+ users	29



Fortune 500 Azure Usage Over Time

2023 Survey

- 496 / 500 had Azure tenants (99.2%)
- 482 / 500 had SharePoint enabled (96.4%)
- 445 / 500 had usernames identified (89%)

2025 Survey

- 499 / 500 had Azure tenants (99.8%)
- 489 / 500 had SharePoint enabled (97.8%)
- 467 / 500 had OneDrive enabled (93.4%)
- 434 / 500 had usernames identified (86%)

Managed vs Federated (ADFS)

Fortune 500

- Total tenants: 499
 - ADFS: 211 (42.3%)
 - Managed: 288 (57.7%)
- Top External IdPs
 - 66 Okta (31.2%)
 - 4 OneLogin (1.8%)

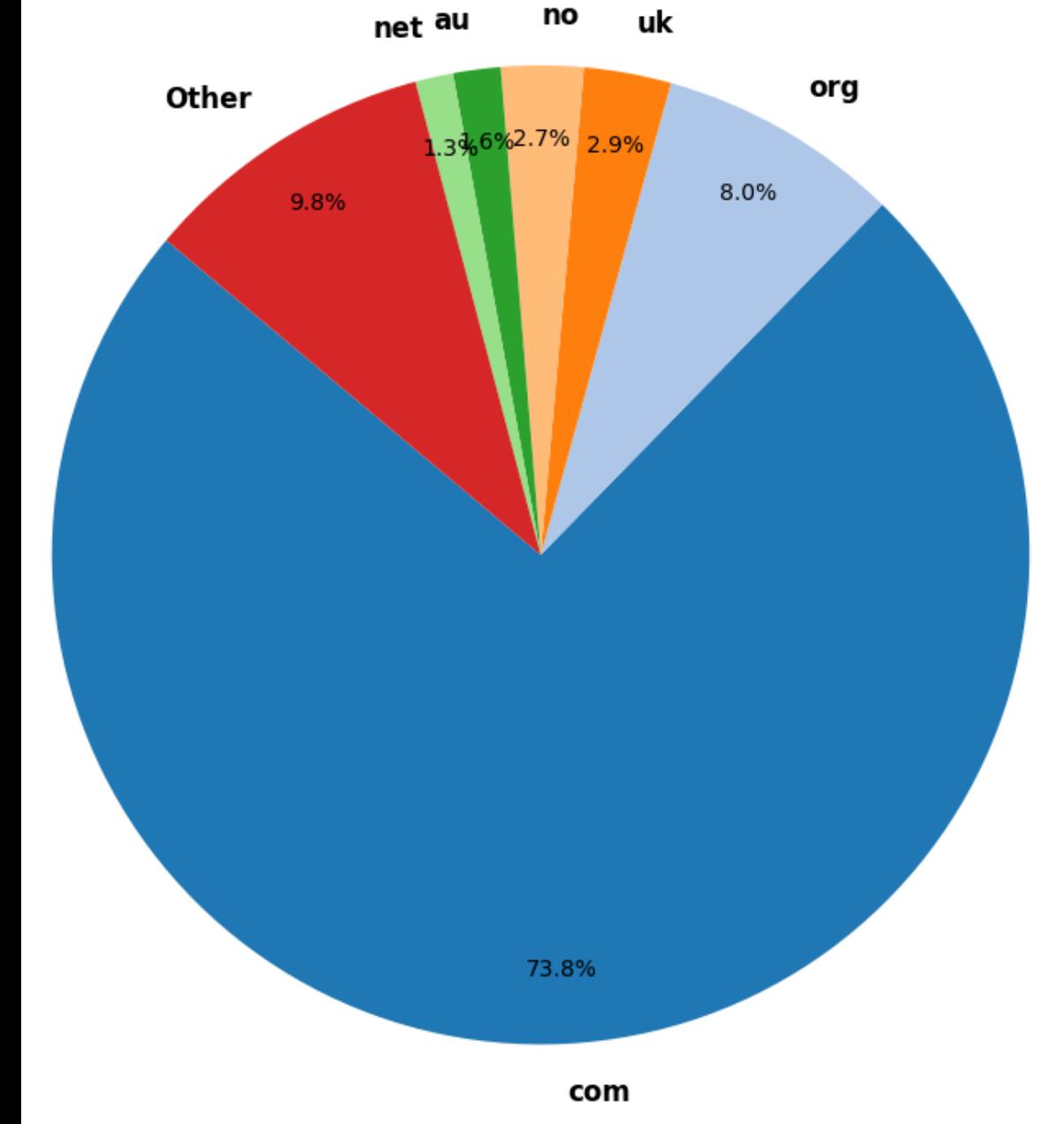
Overall

- Total tenants: 939706
 - ADFS: 98,344 (10.4%)
 - Managed: 841,362 (89.5%)
- Top External IdPs
 - 71961 godaddy.com
 - 5810 okta.com
 - 2551 sso.duosecurity.com
 - 1024 secureserver.net
 - 703 onelogin.com
 - 467 google.com
 - 203 okta-emea.com

Top TLDs by "Live" Domain Count

- 905268 com
- 98394 org
- 35361 uk
- 33400 no
- 19197 au
- 15386 net
- 11730 ca
- 10718 nl
- 9337 de
- 7285 fr
- 4633 edu
- 4515 gov
- 4041 za
- 3916 it
- 3765 co
- 3743 us
- 3455 be
- 3358 es
- 3178 in
- 3052 se
- 2947 nz
- 2810 eu
- 2571 br
- 2481 ie
- 2446 dk
- 2277 ch

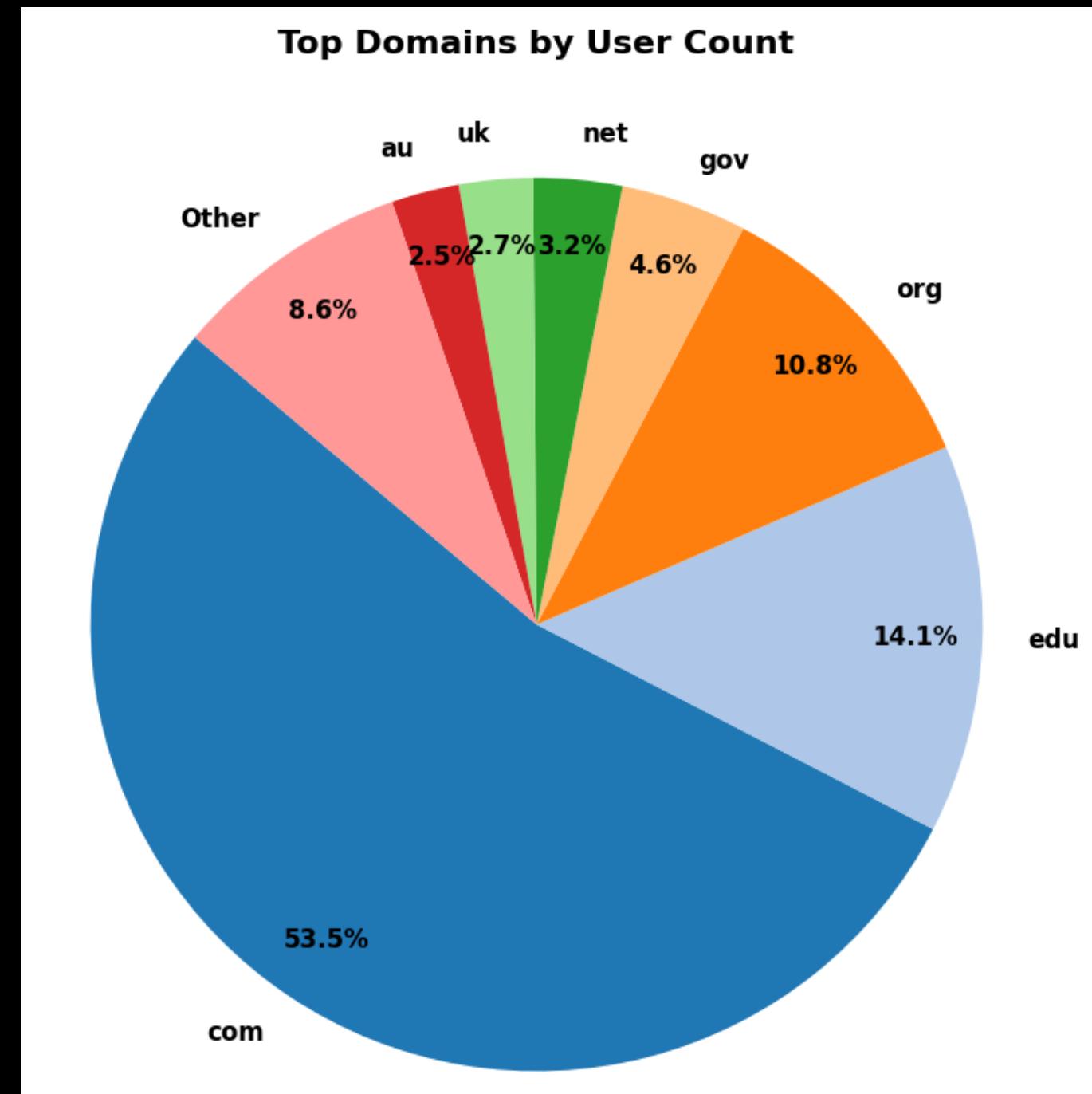
Top Domains by Domain Count



Top TLDs by Total Users

- 33550312 com
- 8817229 edu
- 6792403 org
- 2869125 gov
- 2010081 net
- 1679679 uk
- 1539061 au
- 937258 no
- 716234 us
- 620083 ca
- 412101 pe
- 301528 nl
- 219615 co
- 184511 br
- 177929 it
- 143766 es
- 142009 mx
- 132640 dk
- 113890 za
- 100897 nz
- 98483 de
- 91398 fr
- 86269 cz
- 79109 in
- 64606 ru
- 57175 pl

Top Domains by User Count



Az User Surveys 2022 - 2025

Username Statistics

Mapping M365

- **Survey Scripts**
 - meant to detect "live" tenants & domains
 - 20 popular formats
 - jsmith
 - j.smith
 - smith
 - john.smith
 - etc
 - high likelihood usernames based off census data
- **Service Account Lists**
 - also meant to detect "live" tenants & domains
 - common service accounts
 - admin
 - administrator
 - etc
 - Initially 47 accounts
 - Expanded to 686 accounts
 - Sourced from dumps and ChatGPT

Overall Username Stats

- Total usernames: 63.3 million
 - Numeric usernames: 7.76 million
 - Unique Numeric Usernames: 2,912,966
 - Non-numeric usernames: 55.5 million
 - Unique Non-Numeric Users (jsmith, jsmith2): 12,914,085
 - Unique Base Usernames (jsmith9 -> jsmith): 7,944,842
- Timeframe of Enumeration: 1074 days
- Average Rate of Enumeration: 59,000 new users / day

M365 Enumeration Score: 15.75%

- Estimated 400~ million M365 users

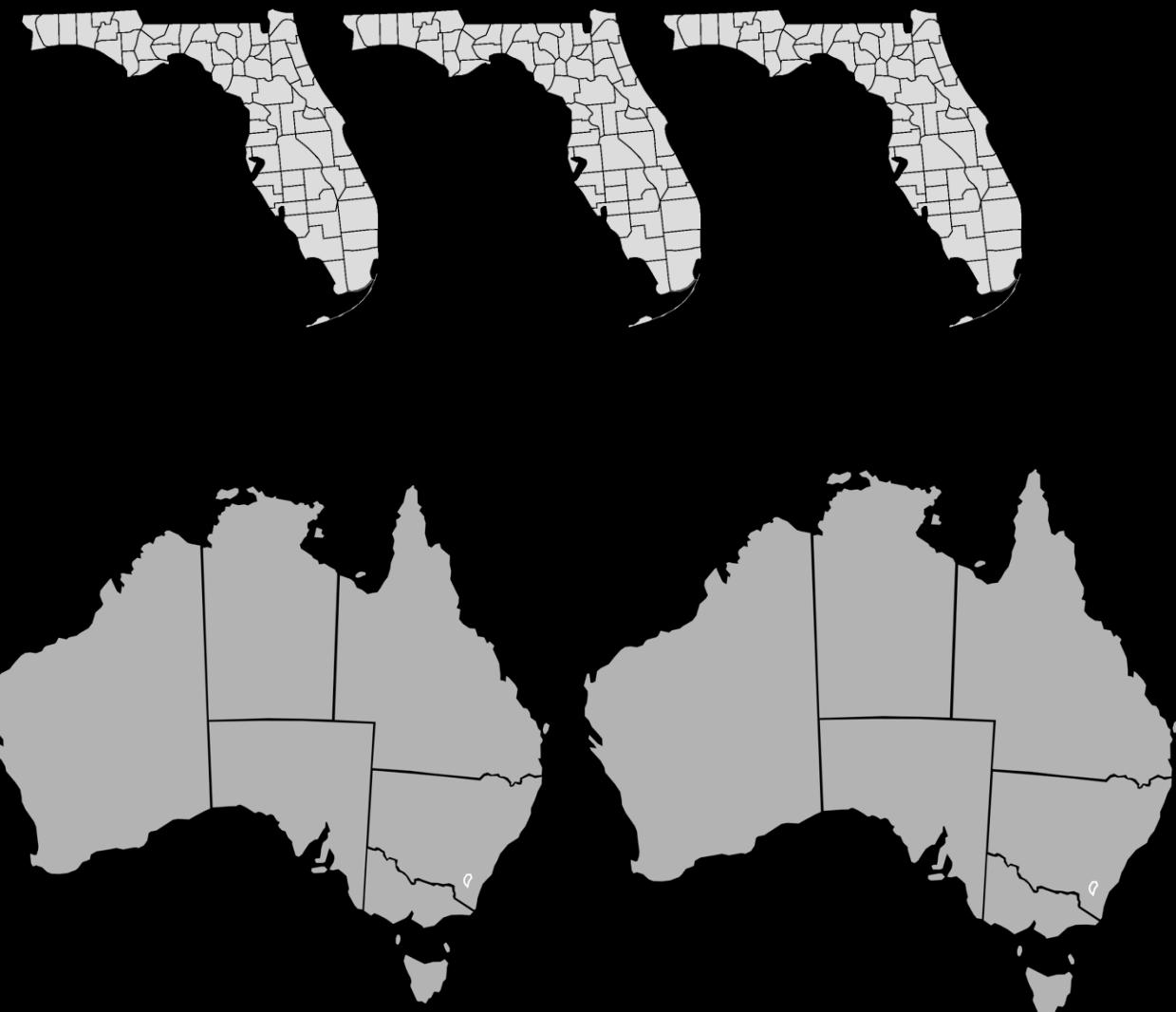
(Source: <https://office365itpros.com/2024/08/02/microsoft-fy24-q4-results/>)

- $63,300,000 / 400,000,000 = 15.75\%$

[#####.....] 63/400 (15.75%)

63 million – for comparison

- NYC – 9 million people
- New York State – 20 million people
- Florida – 21 million people
- Australia – 25 million people
- Fortune 500 – 32 million people
- California – 39 million people
- Spain – 47.5 million people



Top Usernames – All

332825 info	19952 chris	12518 asmith	10628 jbrown	9247 kim
329329 admin	19720 jsmith	12504 ssmith	10537 sam	9204 bsmith
72748 support	19061 office	12382 steve	10478 careers	9198 tim
68390 sales	18686 paul	12258 testuser	10461 no-reply	9182 adam
45196 hr	17175 james	12236 jjohnson	10240 laura	9118 rsmith
45166 administrator	16461 daniel	11996 conference	10150 service	9106 dan
43092 marketing	15935 mike	11931 robert	9977 mjohnson	9099 jgarcia
35943 contact	15818 msmith	11578 ap	9974 nick	9064 amanda
35338 accounts	15361 kevin	11578 andrew	9920 tsmith	9031 martin
33427 reception	15154 lisa	11576 richard	9893 jjones	9005 jrodriguez
28811 accounting	15040 jason	11553 ryan	9892 thomas	8965 kjohnson
27917 david	14607 alex	11378 training	9814 payroll	8887 amy
27431 it	14556 scanner	11346 jessica	9736 ajohnson	8776 eric
26449 finance	13751 jennifer	11317 maria	9688 cjohnson	8765 jmiller
25042 john	13633 sarah	11169 ksmith	9684 joe	8731 linda
23013 noreply	13613 brian	11081 michelle	9531 ben	8687 awilliams
23003 helpdesk	13419 scott	11072 dsmith	9521 peter	8631 mbrown
22198 test	13155 itsupport	10981 karen	9465 maintenance	8616 abrown
21894 michael	12755 csmith	10915 tom	9313 sjohnson	8563 djohnson
20857 mark	12521 matt	10789 jwilliams	9309 jeff	8546 swilliams

username format analysis – survey scripts

Username_Survey_Format	total_usernames	total_domains	avg_users_per_domain
john	366952	199317	1.8410
jsmith	518638	130706	3.9680
john.smith	261491	48872	5.3505
smith	64378	47580	1.3530
johns	52021	24335	2.1377
jjsmith	109955	22654	4.8537
sjohn	31967	19569	1.6336
jjs	13962	8425	1.6572
j.smith	20717	7381	2.8068
johnsmith	18546	6192	2.9952
smithj	26256	5138	5.1102
john.s	5959	3374	1.7662
smith.john	5557	2657	2.0915
john.j.smith	17395	1908	9.1169
s.john	2634	1828	1.4409
smithjj	12442	1599	7.7811
johnjs	2635	1460	1.8048
smith.j	1782	492	3.6220
smithjohn	1290	401	3.2170
john.james.smith	154	89	1.7303
smithjoh	320	27	11.8519

21 rows in set (44.75 sec)

Top Service Accounts

332825 info	9814 payroll	2297 sharepoint	1070 training1	403 foreman
329329 admin	8445 webmaster	2172 admin1	967 rt	394 localadmin
72748 support	8243 post	2083 jk	952 monitoring	370 sophos
68390 sales	8135 security	2045 cassandra	860 jira	349 desk
45196 hr	8011 boardroom	1994 supervisor	844 conference_room	326 tools
45166 administrator	7730 mail	1797 db	776 conf	325 recovery
43092 marketing	7452 invoices	1766 user	749 aws	316 serviceclient
35943 contact	5803 travis	1737 av	689 im	309 pbx
33427 reception	4863 servicedesk	1730 feedback	680 gl	307 kes
27431 it	4857 backup	1629 email	660 scm	303 log
26449 finance	4704 team	1627 administrador	642 dante	294 gitlab
23013 noreply	3890 voicemail	1585 information	596 hg	266 ci
23003 helpdesk	3872 guest	1570 spadmin	571 tempadmin	253 rcs
22198 test	3750 sysadmin	1481 globaladmin	554 its	253 glpi
13155 itsupport	3666 chef	1464 testaccount	552 buddy	247 stas
12258 testuser	3418 dev	1368 cloud	541 jenkins	244 build
11996 conference	3173 crm	1336 reservas	527 weddings	236 sip
11378 training	3097 accueil	1333 docs	524 root	230 zabbix
10478 careers	2928 ithelpdesk	1125 netadmin	489 hudson	226 vault
10461 no-reply	2599 audit	1089 webadmin	419 superadmin	224 gateway

```
mysql> select * from onedrive_enum WHERE email_address LIKE 'krbtgt%';
+-----+-----+
| email_address | domain_name |
+-----+-----+
| krbtgt@[REDACTED].onmicrosoft.com | [REDACTED].onmicrosoft.com |
| krbtgt@[REDACTED].nl |
| krbtgt@[REDACTED].de |
| krbtgt@[REDACTED].org |
+-----+
4 rows in set (0.00 sec)
```



I THINK WE GOT A
HACKER.

Top Assorted Formats

john.smith	john.j.smith	john.james.smith	Top Middle Initials	Top Middle Names
3321 david.smith	78 david.a.smith	18 amit.kumar.singh	25799 a	313 van
3289 michael.smith	76 michael.j.smith	14 ashish.kumar.singh	18746 m	191 kumar
2910 jose.garcia	74 jose.a.rodriguez	13 juan.carlos.lopez	16501 l	155 erik
2630 james.smith	74 jose.a.hernandez	13 juan.carlos.garcia	14471 j	66 arne
2601 amit.kumar	73 michael.a.smith	13 jose.luis.rodriguez	11506 d	65 marie
2284 jose.rodriguez	69 jose.a.martinez	12 abhishek.kumar.singh	11492 r	58 petter
2050 michael.johnson	69 jose.a.garcia	11 ravi.kumar.singh	10007 e	47 martin
2031 david.jones	67 michael.a.johnson	11 miguel.angel.garcia	8983 c	44 maria
2025 andrew.smith	67 mark.a.smith	11 jan.erik.hansen	7691 s	43 dela
1995 david.brown	66 luis.a.rodriguez	11 arun.kumar.singh	5172 k	42 carlos
1977 david.williams	62 jose.l.rodriguez	10 vinay.kumar.singh	5111 x	42 ann
1971 jose.gonzalez	60 david.j.smith	10 juan.carlos.martinez	5103 b	41 kristian
1969 john.smith	59 david.a.jones	9 vivek.kumar.singh	4953 t	40 kristin
1963 michael.brown	58 david.m.smith	9 sanjay.kumar.singh	4895 p	38 ove
1963 jose.martinez	57 jose.a.gonzalez	9 rakesh.kumar.singh	4884 w	38 olav
1962 matthew.smith	52 paul.a.smith	9 raj.kumar.singh	4685 g	37 luis
1961 robert.smith	51 christopher.j.smith	9 praveen.kumar.singh	4351 n	36 john
1960 mark.smith	51 andrew.j.smith	9 miguel.angel.martinez	3227 h	36 christian
1936 michael.williams	50 michael.d.smith	9 miguel.angel.hernandez	3089 f	34 morten
1912 david.johnson	49 mark.a.johnson	9 manish.kumar.singh	1623 v	33 lise
1879 michael.jones	49 jose.a.lopez	9 juan.carlos.rodriguez	1472 i	33 ivar
1873 jose.hernandez	48 michael.a.jones	9 jose.luis.hernandez	1226 o	30 james
1833 david.garcia	48 jose.m.rodriguez	9 jose.luis.garcia	1212 y	30 inge
1796 maria.rodriguez	47 michael.j.brown	9 jose.antonio.gonzalez	394 z	28 tote
1796 maria.garcia	46 matthew.j.smith	9 amit.kumar.gupta	317 q	27 andre
			147 u	

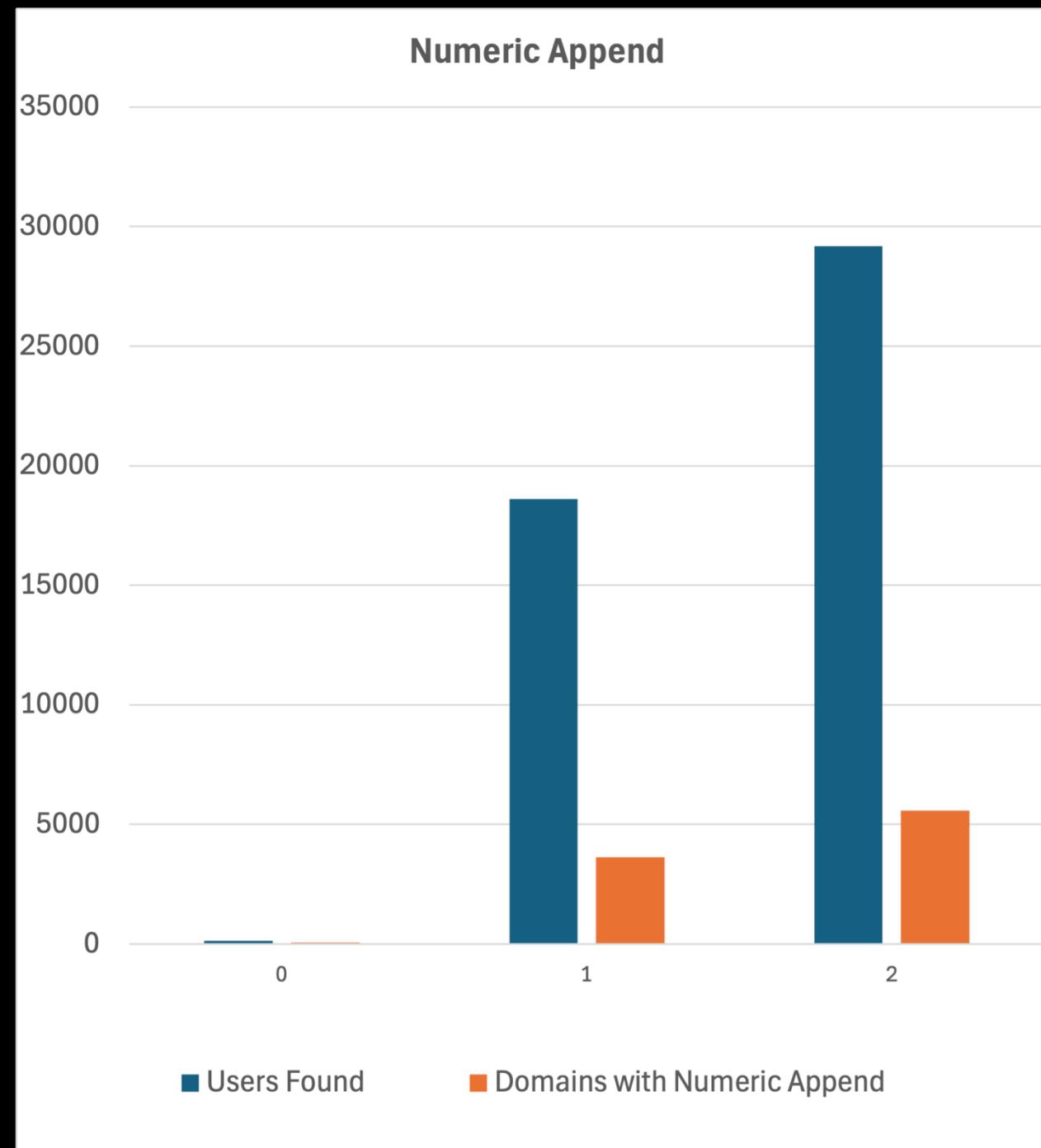
Top Usernames – Around the World

China	Russia	England	Germany	Norway
216 admin	609 info	6532 info	4039 info	7097 post
148 info	502 admin	4087 admin	1048 admin	1742 thomas
137 hr	126 support	2946 accounts	566 support	1610 morten
94 test	124 test	2330 sales	412 mail	1552 admin
73 it	116 it	1905 paul	350 administrator	1312 rune
65 sales	114 office	1817 james	346 marketing	1311 lars
63 support	84 sales	1749 mark	335 buchhaltung	1292 anders
57 marketing	76 buh	1699 david	305 it	1252 martin
55 liuyang	64 ivanova	1672 reception	242 noreply	1209 andreas
47 zhangwei	64 ivanov	1524 support	230 service	1191 espen
46 liwei	64 hr	1389 john	213 test	1174 stian
45 service	62 smirnova	1286 richard	205 sales	1114 bjorn
43 wangwei	56 sklad	1136 chris	163 thomas	1108 erik
42 jwang	56 elena	1122 finance	163 lager	1082 terje
41 lili	51 alex	996 sarah	162 mueller	1045 geir
38 zhangjing	44 service	944 marketing	159 helpdesk	1036 fredrik
36 liuwei	44 mail	943 michael	157 testuser	1030 ole
35 wangxin	43 noreply	864 sam	149 rechnung	1026 marius
35 liyan	43 anna	849 office	148 office	999 daniel
34 zhanglei	43 administrator	843 emma	137 team	966 trond
34 yangyang	42 olga	822 daniel	133 schmidt	946 kristian
34 wangjing	42 irina	814 lisa	125 daniel	941 christian
34 lijing	41 pr	813 administrator	124 martin	885 frode
33 zhangjian	41 manager	805 alex	122 michael	863 jan
33 liyang	40 reception	797 tom	119 frank	850 regnskap

Adding Numbers

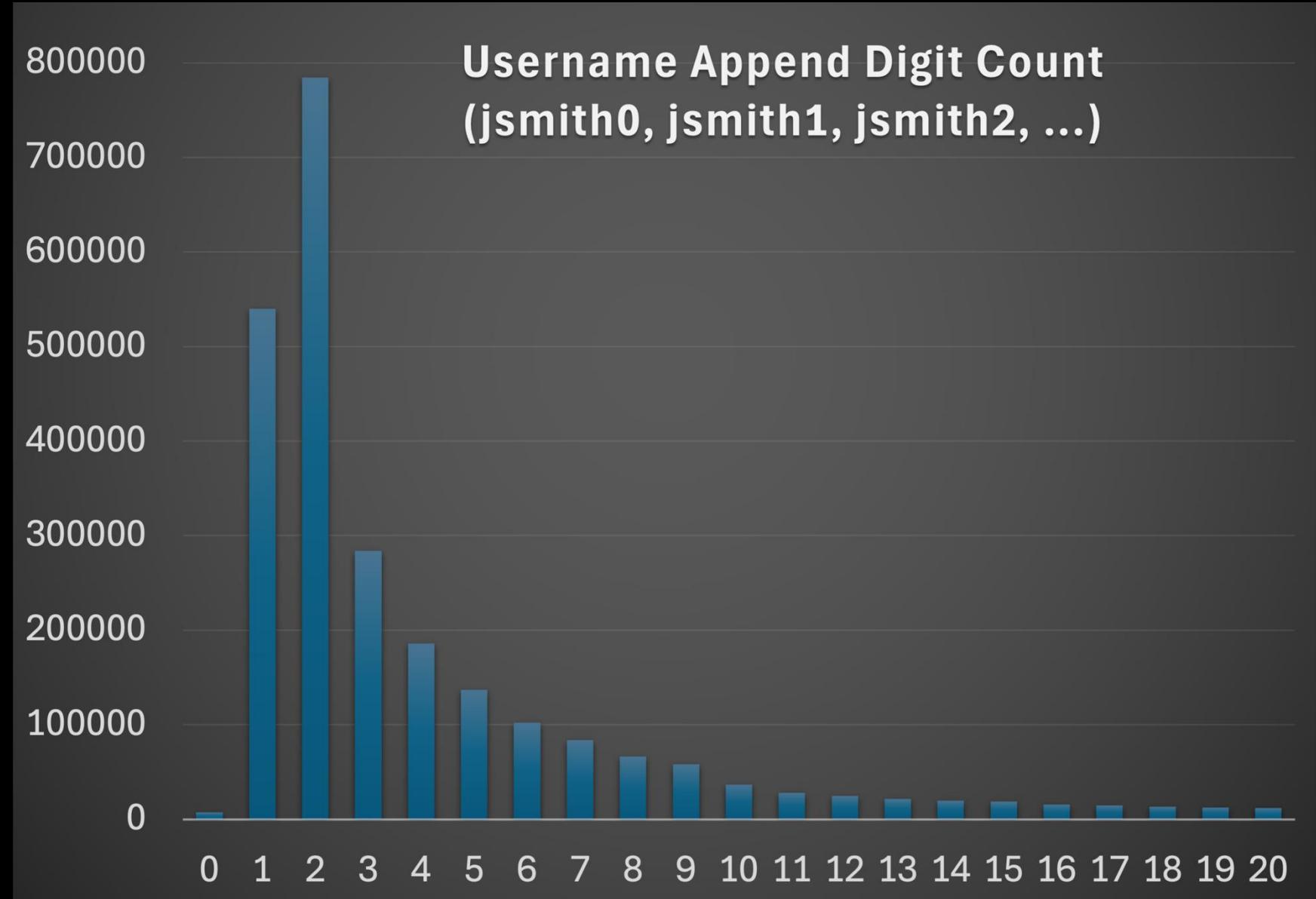
- jsmith0, jsmith1, jsmith2
- Used jsmith survey scripts
- Performed full scans appending 0, 1, and 2

	Users Found	Domains
0	141	54
1	18609	3616
2	29183	5566



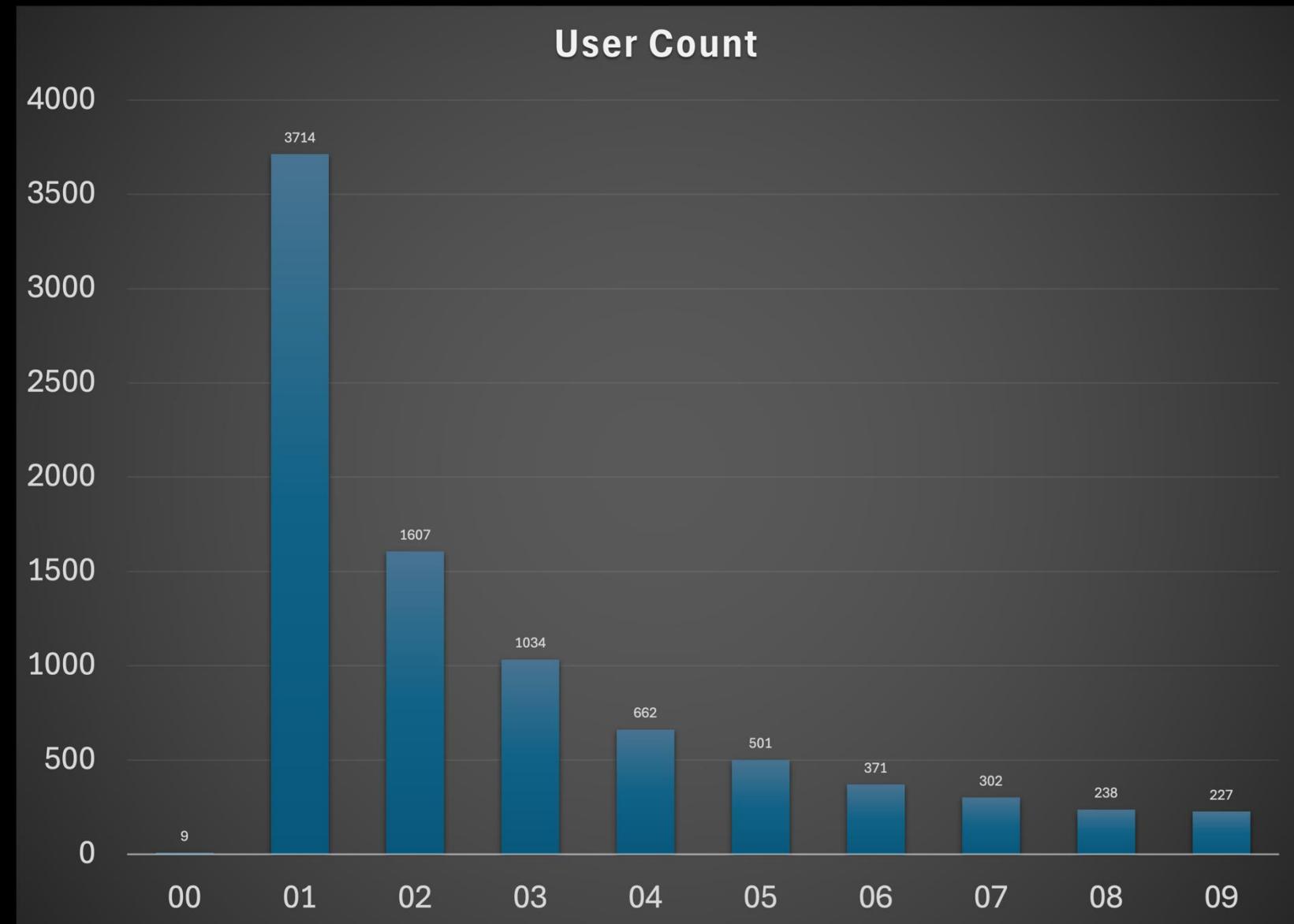
Adding Numbers – Total Usernames Found

jsmith0
jsmith1
jsmith2
jsmith3
...



Adding Numbers – Total Usernames Found

Double digit
Leading zeroes

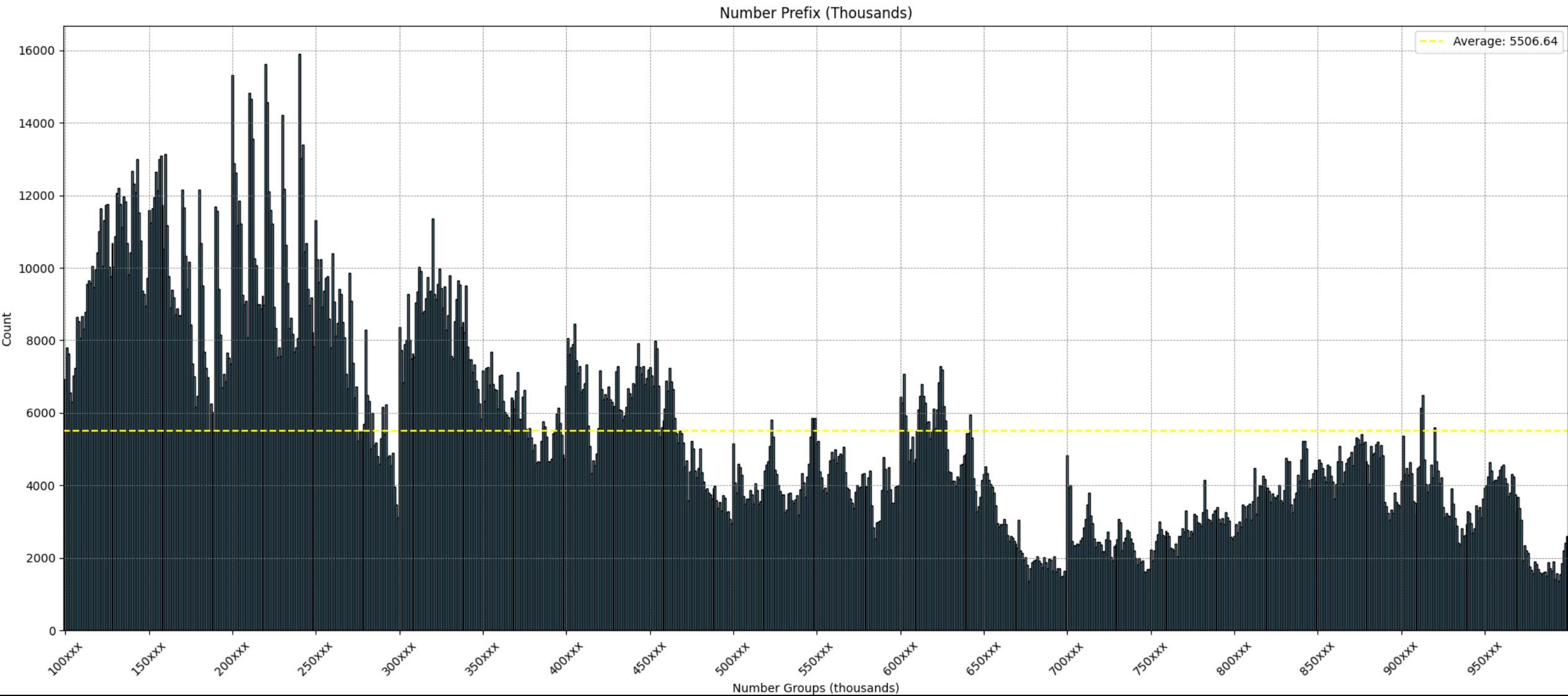


Purely Numeric Usernames

- 7.7m usernames found were numeric (12% of all usernames)
- Can be hard to identify but once you find one, you find them all
- All 6 digit numeric domains were scanned 100,000 -> 999,999

Numeric Username Length	Example	Total usernames	Distinct Domains
1 digit	1	120	82
2 digits	12	225	65
3 digits	123	366	33
4 digits	1234	5,670	26
5 digits	12345	70,459	39
6 digits	123456	4,964,119	594
7 digits	1234567	2,699,044	200
8 digits	12345678	15,663	6

Top Numeric Usernames



trontastic usernames

- https://github.com/nyxgeek/trontastic_usernames
- top format lists
- survey scripts
- service account lists

username format analysis - regex

- Working from found UPN (email address) list
- Identify formats of found usernames based on delimiter placement
 - j.smith
 - smith.j
 - name.name (smith.john or john.smith)
 - john.j.smith
 - john.james.smith
 - name (john, smith, jsmith, smithj, etc)



Statistics – socradar vs trontastic

	SOCRadar	trontastic
General Statistics		
Total Users	328,147,329	63,304,783
Unique Users	106,084,171	12,914,085
Unique Domains	5,770,202	1,254,284

Username Formats (unique name count)	SOCRadar	trontastic
j.smith / s.john	1,407,818	221,876
smith.j / john.s	479,065	69,078
name*	78,325,283	3,620,780
name.name	19,724,384	3,735,237
john.j.smith	573,864	218,350

* includes: john, smith, jsmith, smithj, johnjs, jjs, etc

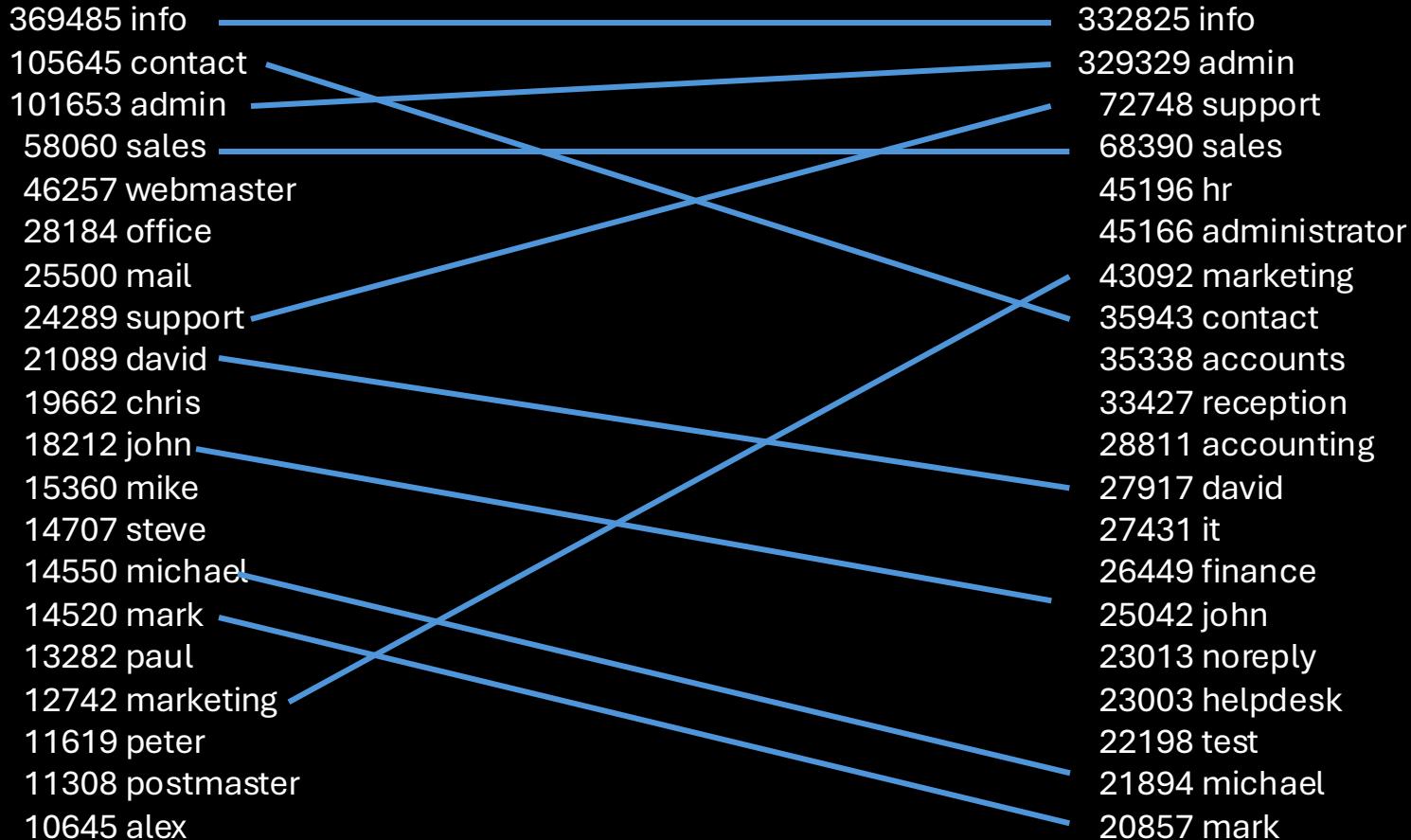
Top 20 Users – SOCRadar vs trontastic

socradar

369485 info
105645 contact
101653 admin
58060 sales
46257 webmaster
28184 office
25500 mail
24289 support
21089 david
19662 chris
18212 john
15360 mike
14707 steve
14550 michael
14520 mark
13282 paul
12742 marketing
11619 peter
11308 postmaster
10645 alex

trontastic

332825 info
329329 admin
72748 support
68390 sales
45196 hr
45166 administrator
43092 marketing
35943 contact
35338 accounts
33427 reception
28811 accounting
27917 david
27431 it
26449 finance
25042 john
23013 noreply
23003 helpdesk
22198 test
21894 michael
20857 mark



STAGE 2: PRESENCE ENUMERATION



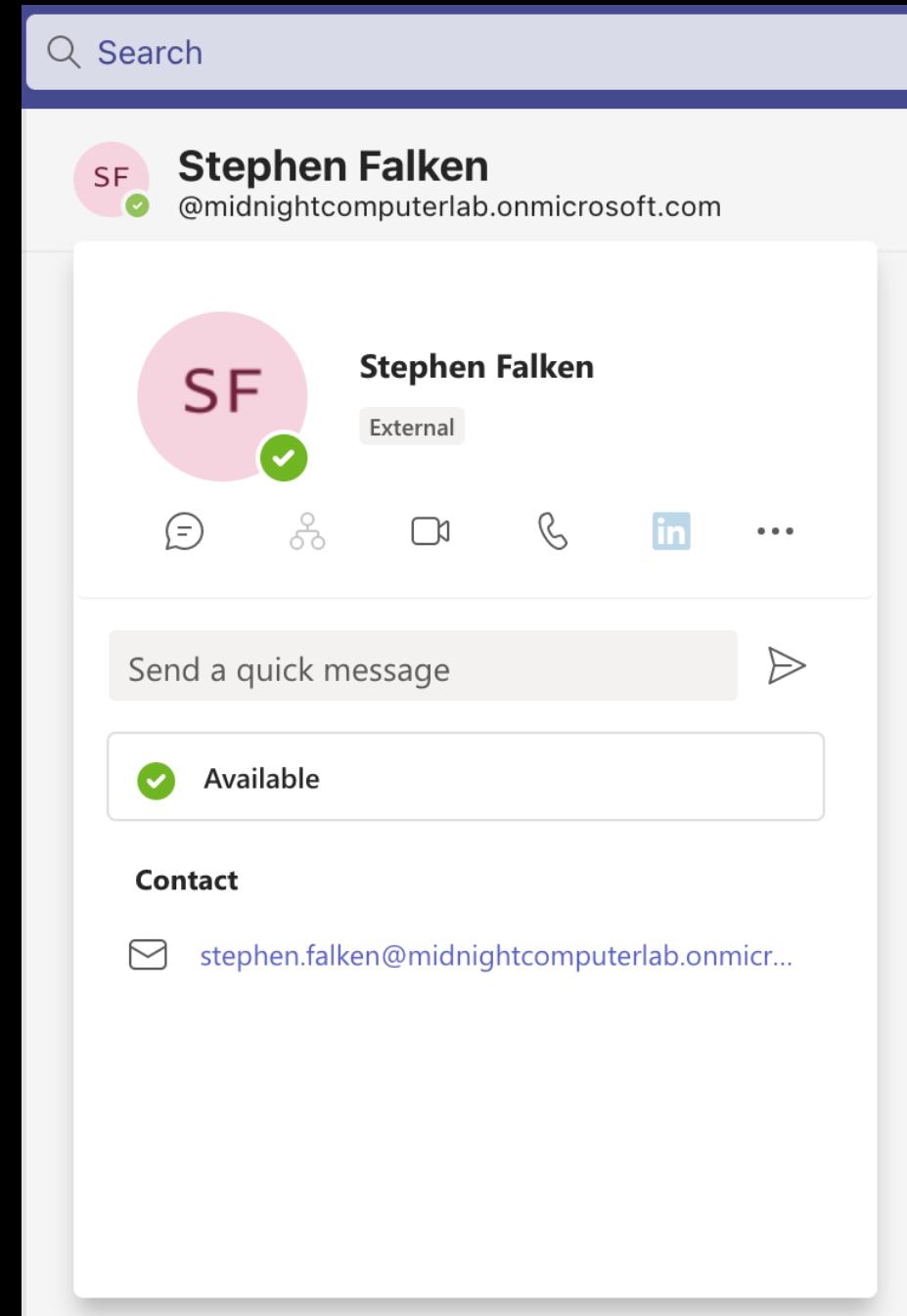
A vibrant, futuristic cityscape at night, featuring a dense grid of buildings with glowing blue and purple neon signs. One prominent sign reads "MONITORING TEAMS". The scene is filled with streaks of light from moving vehicles, creating a sense of motion and digital energy.

Monitoring Teams

Tracking Users Across an Enterprise

External Access in Teams

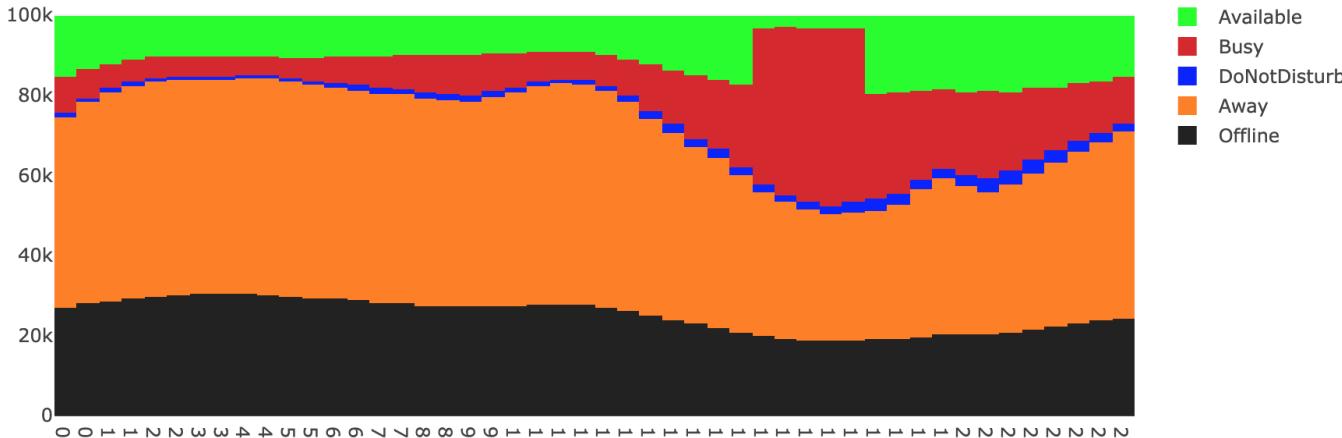
- Default setting for External Access allows any Teams user to communicate, see presence
- Previously known as Open Federation with Lync and Skype for Business
- Became enabled by default around 2014~
- Shoutout to Karl Fosaaen (@kfosaaen) for his Skype4B research



Microsoft Build Event - 2023

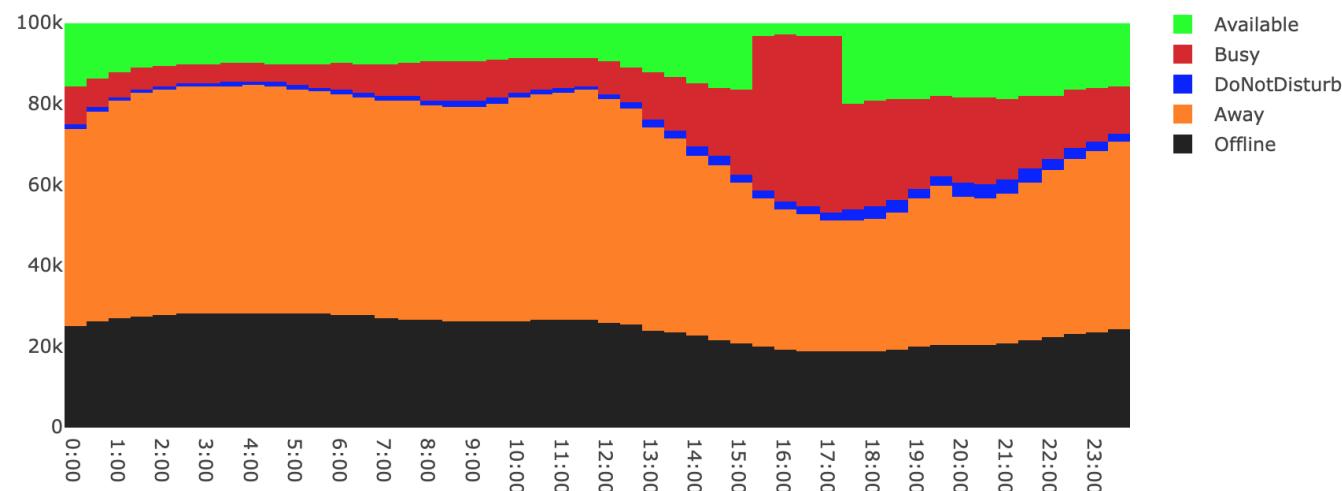
Tuesday, May 23, 2023

< 2023-05-23 >
Normalize



Wednesday, May 24, 2023

< 2023-05-24 >
Normalize



Microsoft Developer ⚡
@msdev

Calling all devs!

Connect with product experts, industry disruptors, and cutting-edge partners to share ideas to build the future.

Digitally: May 23–24

In person in Seattle, WA: May 23–25

Register now for #MSBuild—made by and for developers:
msft.it/60105ljg6

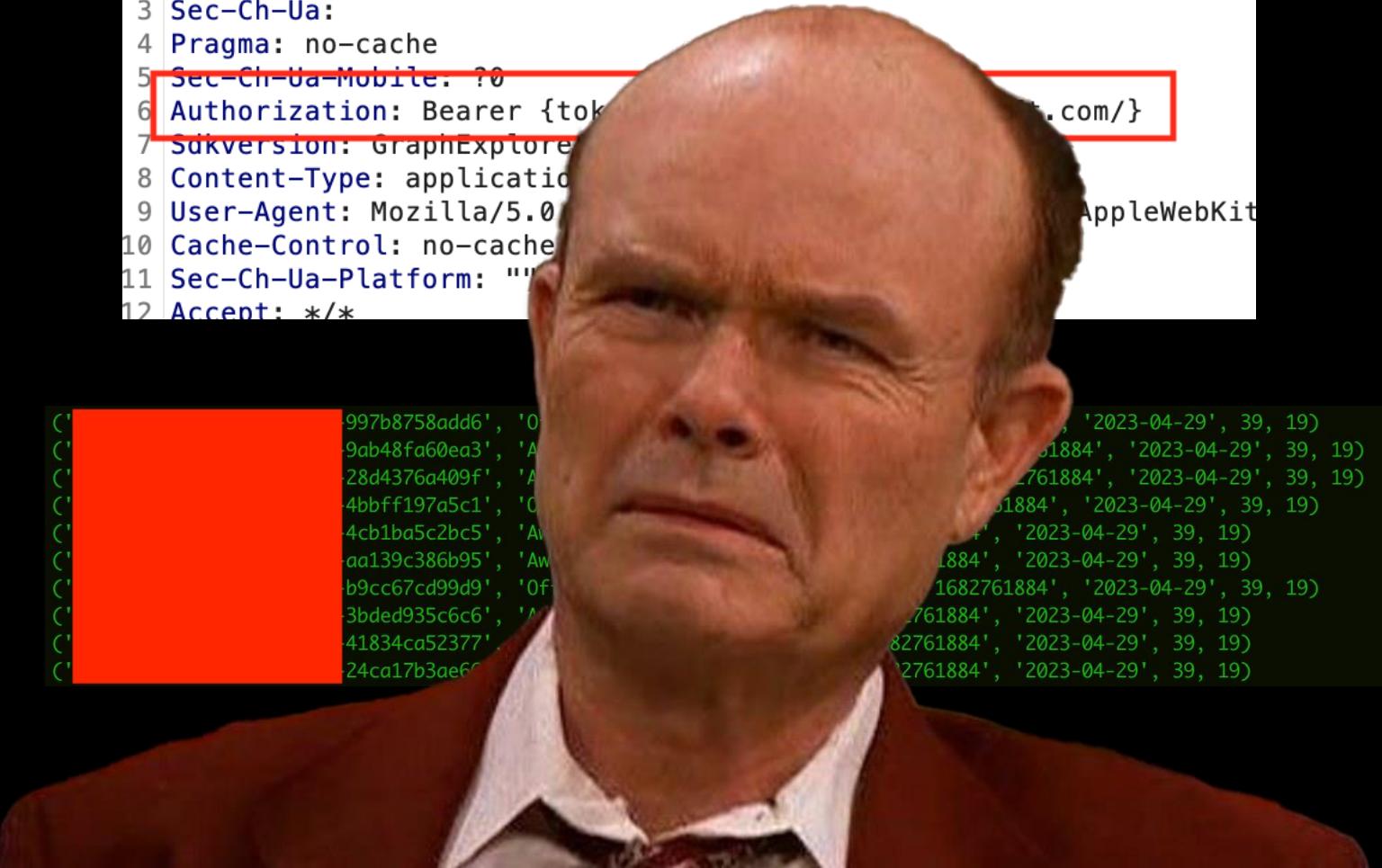
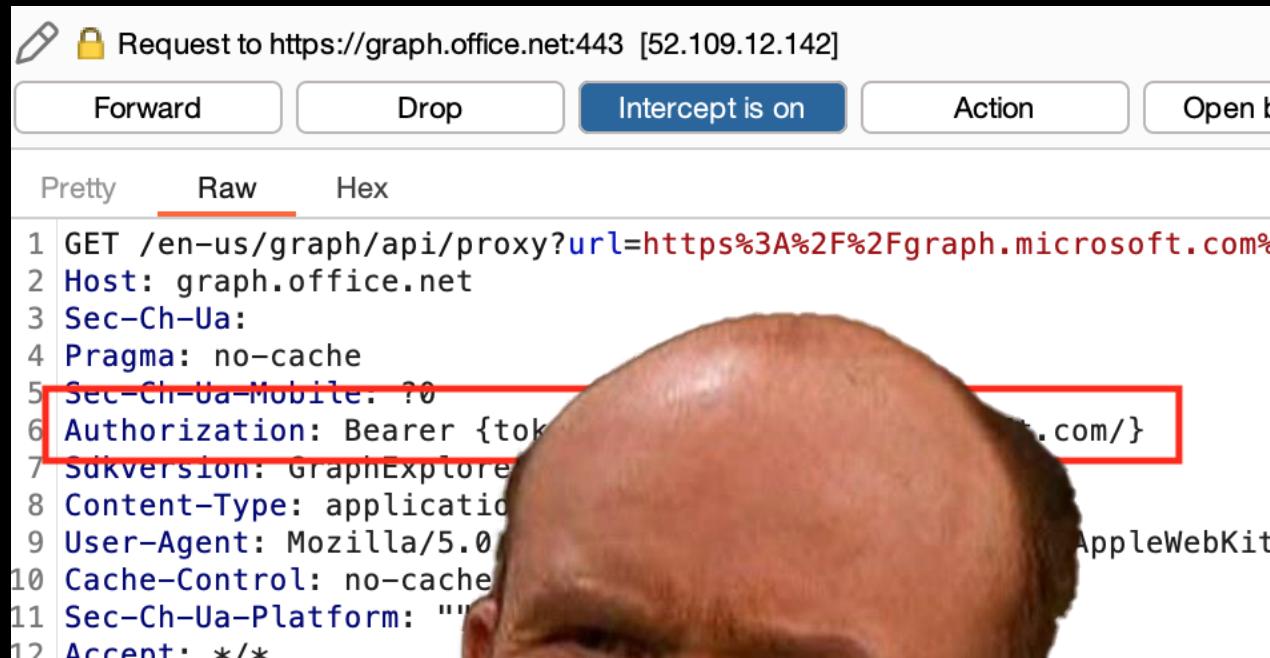


1:00 PM · Mar 14, 2023 · 211.2K Views

TeamsTracker

- Released after DC31
 - Used anonymous API in GraphExplorer app
 - Stupid MS decision that allowed GraphExplorer app to function without being signed in
 - DEFUNCT WITHIN 24 HOURS OF RELEASE

<https://github.com/nyxgeek/teamstracker>



The "Fix"

- Microsoft removed the ANONYMOUS access
- Can still perform Presence lookups via Graph API or Teams lookups
 - Update endpoint
 - Provide bearer token of account with Teams license
 - Good to go again
- This is a documented feature.



Example 2: Get the presence information of another user

The following example shows how to get the presence information for another user. This operation requires the Presence.Read.All permission.

Request

HTTP

C#

CLI

Go

Java

JavaScript

PHP

PowerShell

Python

msgraph

Copy

Try It

GET https://graph.microsoft.com/beta/users/66825e03-7ef5-42da-9069-724602c31f6b/presence

TeamsTracker 2.0



icu for Teams

- "i-see-you"
- Self-hosted Dashboard
 - Online Users
 - Hourly Graphs of Availability
 - Monthly Heatmaps
 - Out of Office Message Analysis
- To be released in February



Employee Availability Monitoring



iCU

Microsoft Teams Viewer

Keeping an Eye Toward Productivity

Over 100,000 Microsoft employees monitored!

ICU Friends - Online Now - Daily Graphs - Monthly Heatmap - Out of Office - FAQ - About

Wednesday, September 4, 2024

< 2024-09-04 >
Normalize

Microsoft Employees Online Status

Wednesday, September 4, 2024

Percent

0 20 40 60 80 100

0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 23:30

Available
Busy
DoNotDisturb
Away
Offline

Tracking the Teams Presence of approximately 90,000 Microsoft Employees Every 30 minutes

Daily Statistics	
Date	2024-09-04
Total Users:	100853
Total Active:	92260
Daily 'Available' Users:	79357 (78.7%)
Daily OOO Users:	7521 (7.5%)

Logging Periods	Microsoft Build Events	Other Meetings (2023)	Other Meetings (2024)
2023-04-28 through 2023-05-19	2023-05-23 through 2024-05-21	2023-05-11 through 2023-06-21	2024-06-20 through 2024-07-09
2024-05-14 through Today	2024-05-22	2023-07-06 through 2023-07-19	2024-07-10 through 2023-07-26

Monthly Heatmaps



icu

Microsoft Teams Viewer

Keeping an Eye Toward Productivity

Over 100,000 Microsoft employees monitored!

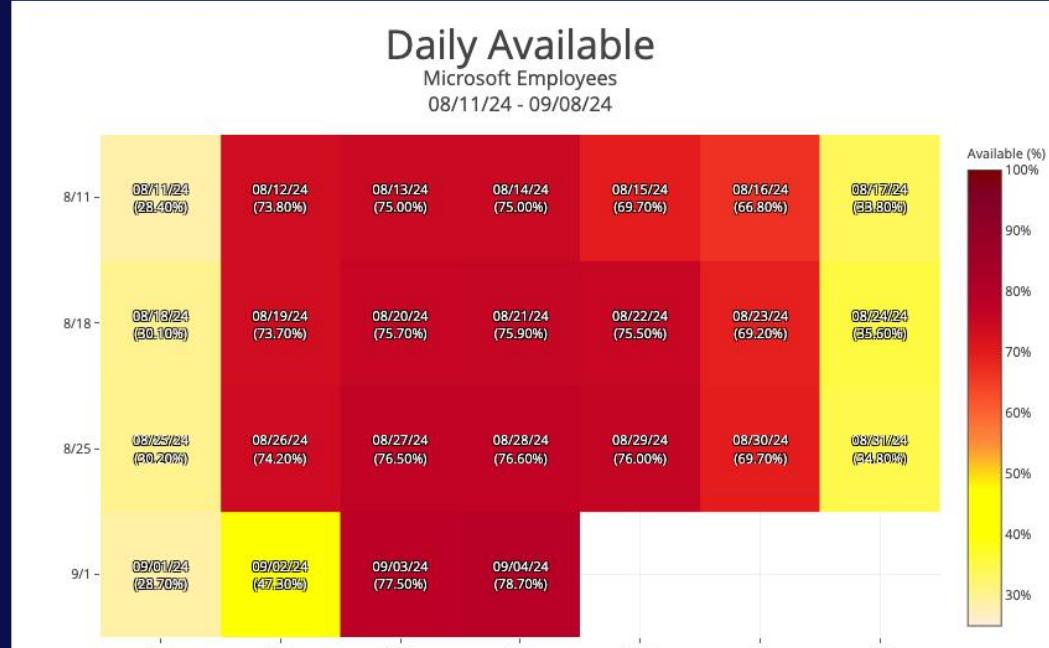
ICU Friends - Online Now - Daily Graphs - Monthly Heatmap - Out of Office - FAQ - About

< 2024-08-15 >

Available Available 2hrs+ Available 4hrs+ Active Users Always Offline Out of Office

Daily Available

Microsoft Employees
08/11/24 - 09/08/24



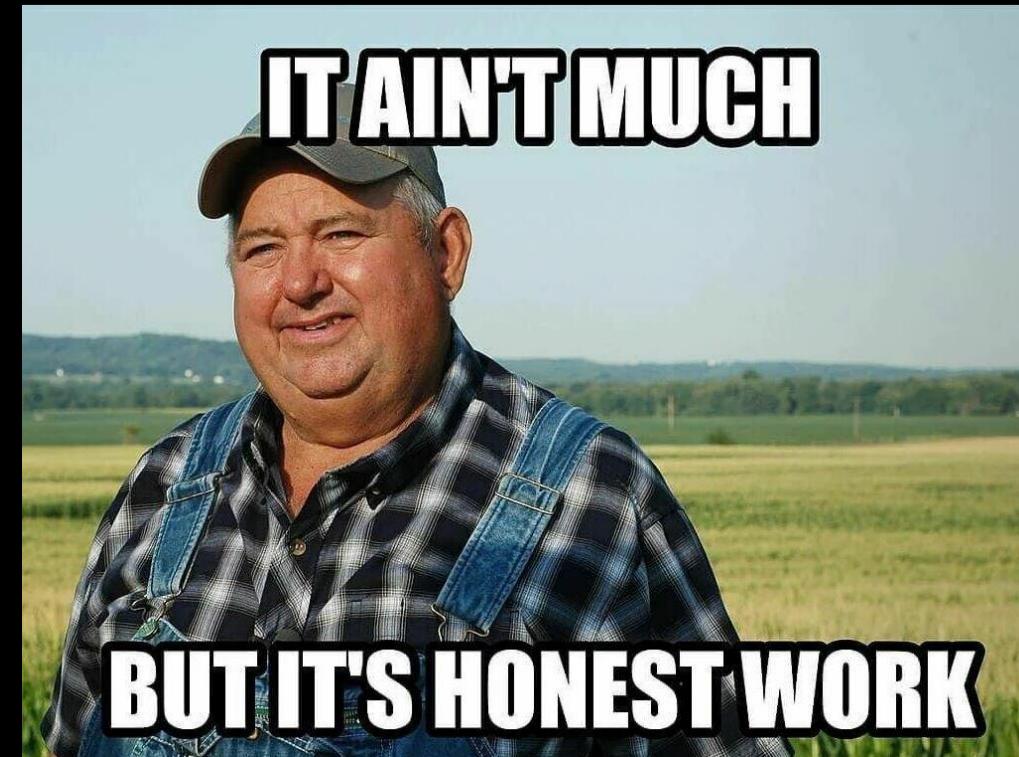
Date	Availability (%)
08/11/24	(28.40%)
08/12/24	(73.80%)
08/13/24	(75.00%)
08/14/24	(75.00%)
08/15/24	(69.70%)
08/16/24	(66.80%)
08/17/24	(53.80%)
08/18/24	(50.10%)
08/19/24	(73.70%)
08/20/24	(75.70%)
08/21/24	(75.90%)
08/22/24	(75.50%)
08/23/24	(69.20%)
08/24/24	(55.50%)
08/25/24	(50.20%)
08/26/24	(74.20%)
08/27/24	(76.50%)
08/28/24	(76.60%)
08/29/24	(76.00%)
08/30/24	(69.70%)
08/31/24	(54.80%)
09/01/24	(28.70%)
09/02/24	(49.30%)
09/03/24	(77.50%)
09/04/24	(78.70%)

Sun Mon Tue Wed Thu Fri Sat

Brought to you by the Midnight Computer Lab

Farming Out of Office Replies

- Harvested OOO messages while monitoring Presence data
- Rolling db
 - one OOO message per user
 - Updates overwrite last saved OOO
- 100,990 Microsoft users
- 52,348 have enabled OOO before
- Logging date ranges:
 - 2023-04-28 through 2023-09-19
 - 2024-05-14 through 2024-10-02



Out of Office Analysis:

Top Words - All

45403	please	7381	limited
40692	will	7252	until
38781	your	7237	response
32447	office	7176	best
29898	email	6949	expect
26650	thank	6873	monday
17710	contact	6705	case
16897	urgent	6637	september
14748	thanks	6430	from
13757	support	6416	during
13524	currently	6223	delayed
13244	return	6110	time
13216	with	6021	returning
12891	reach	5861	hours
12593	regards	5238	team
11800	access	5174	immediate
11584	hello	5074	soon
10798	have	5021	leave
10593	back	4974	august
10589	microsoft	4815	dear
10047	this	4796	may
10022	manager	4713	delay
9236	message	4528	responses
9007	respond	4460	emails
8650	assistance	4419	when
8222	need		

Out of Office Analysis:

Top Words - Themed

47312	microsoft	25	cellular
20624	day	24	covid
5746	azure	22	wild
4073	today	22	wedding
3638	vacation	15	gcp
2535	week	11	oracle
1902	holiday	10	died
1100	traveling	10	death
1090	sick	10	apple
635	travelling	5	married
539	trip	5	covid-19
474	tomorrow	5	cancer
394	camp	4	yolo
368	holidays	4	hunting
341	enjoying	3	yesterday
281	country	3	creek
269	tour	2	wilderness
184	illness	2	rafting
111	visiting	2	google
82	sickness	1	touring
79	party	1	swimming
75	lake	1	swim
68	month	1	kayaking
67	river	1	kayak
56	aws	1	canoe
49	fish	1	cabin
39	beach		

Out of Office Analysis:

Hello & Goodbye

2297	Hello,	136	Hi
1433	Thanks,	129	Cheers,
1243	Hi,	124	Hello
1167	Regards,	117	Kind regards
1039	Thank you,	116	OOF
895	Best regards,	116	Best regards
659	Dear Sender,	112	Sincerely,
590	Thank you for your email.	99	Greetings,
491	Thanks	86	Bonjour,
490	Best Regards,	82	Best Regards
475	Best,	79	Thanks.
444	Dear sender,	74	Kind Regards
384	Kind regards,	73	Thank you for your email!
355	Thank you!	71	Many thanks,
304	Thanks!	67	Warm regards,
287	Thank you for your understanding.	65	Support Engineer
280	Regards	64	Hi!
228	Thank you	63	Have a great day!
218	Hello!	60	Thank You,
215	Thank you.	60	Datenschutzerklärung
184	Kind Regards,	59	All the best,
184	Hi there,	57	Thank
172	Microsoft	57	Home
158	Thanks for your email.	55	Customer Success Account Manager
157	Thank you for your message.		

Out of Office Analysis: Please & Thank you

- 7162 Thank you for your email.
- 2445 Thank you for your message.
- 1532 Thanks for your email.
- 1487 Thank you!
- 1386 Thanks,
- 1236 Thank you.
 - 816 Thank you for your understanding.
 - 693 Thank you for reaching out.
 - 640 Thank you,
 - 627 Thank you for your email!
 - 523 Thanks for your message.
 - 508 Please expect a delay in my response.
 - 437 Thank you for your e-mail.
 - 393 Thank you for your mail.
 - 304 Thank you for your message!
 - 303 Thank you for your patience.
 - 265 Please expect a delayed response.
 - 264 Thanks for your mail.
 - 249 Please expect a delay in response.
 - 227 Thanks for reaching out.
 - 217 Thanks for your email!
 - 143 Thank you for contacting me.
 - 136 Please expect delayed responses.
 - 135 Please expect delay in response.
 - 132 Thank you for your
 - 122 Thanks for your patience.
- 116 Thank you for contacting Microsoft.
- 115 Please expect delay in my response.
- 112 Thanks for your understanding.
- 111 Thanks for your e-mail.
- 110 Thanks for your message!
- 109 Thank you for the email.
- 107 Thank you for reaching out!
- 107 Please note this service is only provided in English.
- 98 Thanks for reaching out!
- 95 Thank you for your note.
- 94 Please expect a delay in my response time.
- 88 Thanks, .
- 87 Please expect delays in my response.
- 83 Thank you and have a great day!
- 81 Please note this escalation help is only provided in English.
- 79 Thank you for your patience!
- 74 Thank you for reaching out to me.
- 71 Please expect delayed response.
- 70 Please expect a delay in my responses.
- 68 Thank you for your understanding!
- 65 Thank you for your understanding and patience.
- 64 Please expect a delay in responses.

Out of Office Analysis:

Days & Months

6612	Monday	6474	September
2963	Friday	4826	August
2416	Tuesday	3631	July
1347	Thursday	1760	Sept
1324	Wednesday	1678	October
522	Mon	1671	June
394	Fri	1445	Aug
210	Sunday	1102	Sep
177	Wed	1089	May
105	Tues	927	Oct
100	Saturday	326	Jul
60	Sun	265	April
58	Thu	254	Jun
29	Sat	138	March
		106	January
		85	Jan
		83	November
		59	December
		58	Feb
		53	February
		47	Apr
		41	Dec
		35	Mar
		27	Nov

Out of Office Analysis:

"| ..."

- 878 I am currently out of the office
- 731 I will respond to your message when I return
- 565 I am currently out of office
- 550 I am out of the office
- 512 I am out of office
- 233 I will respond to your email as soon as possible upon my return
- 215 I am OOF
- 197 I will get back to you as soon as possible
- 195 I am out of the office today
- 187 I will have limited access to my email
- 187 I will have limited access to email
- 184 I will be out of the office
- 173 I will address them upon my return
- 162 I'm out of office
- 153 I'm currently out of office
- 147 I am out of office today
- 136 I will get back to you as soon as I can
- 134 I'm currently out of the office
- 132 I will be out of the office from
- 127 I'm out of the office
- 119 I am out of the office until
- 119 I am out of office until
- 115 I am currently OOF
- 114 I will respond to your email upon my return
- 110 I will respond upon my return
- 109 I am out
- 101 I am OOF today
- 96 I am OOO

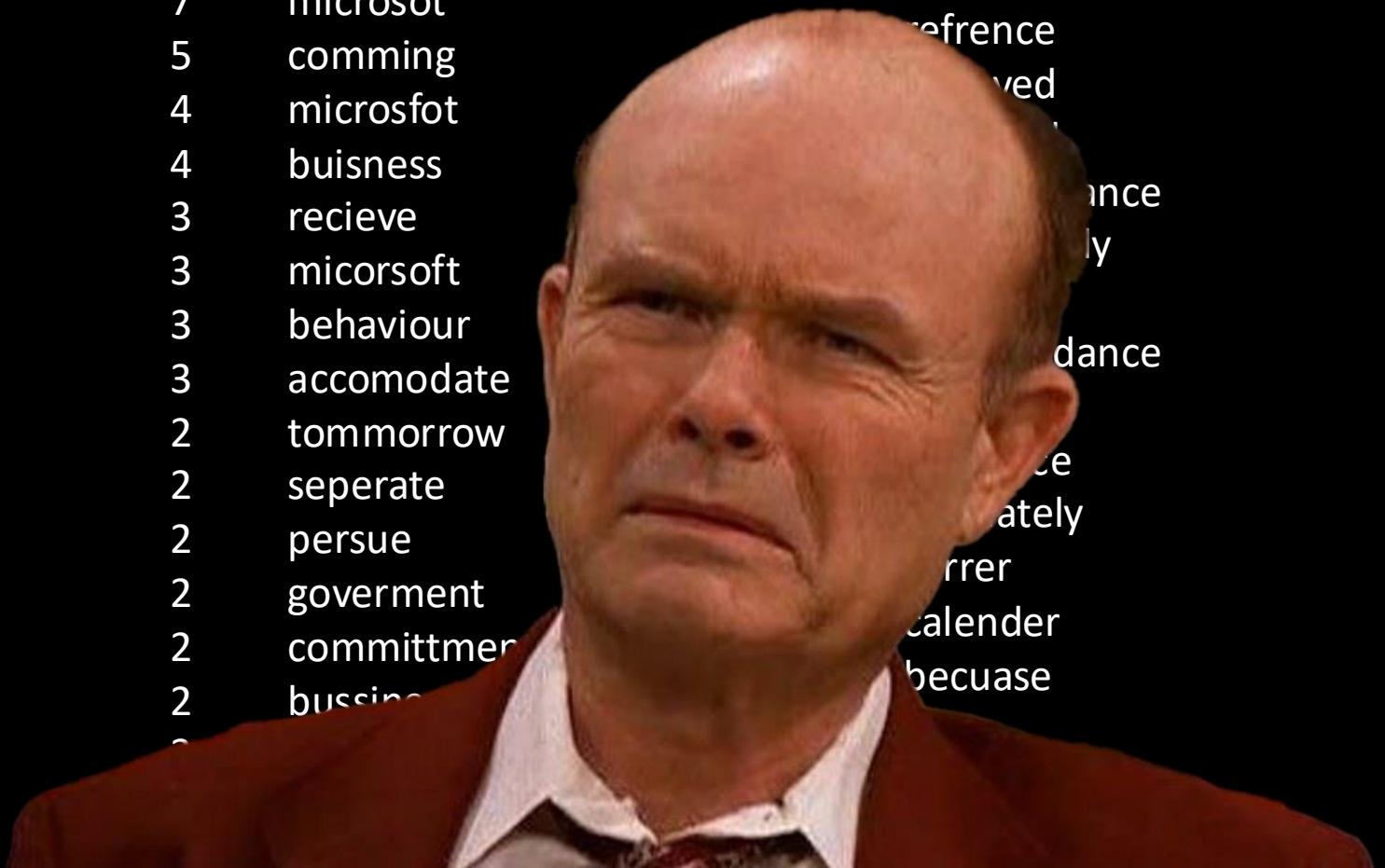
Out of Office Analysis:

"If you ..."

- 159 If you need help escalating a case outside my business hours you can email
- 84 If you need immediate assistance, please contact
- 56 If you are not the intended recipient, take no action and contact the sender immediately
- 42 If you need assistance outside of my working hours, please use the following options
- 40 If you need to work with another Support Engineer outside of my working hours, please send email to azurek
- 38 If you have a Critical, business-impacting problem
- 33 If you need immediate assistance please contact
- 31 If you need urgent assistance outside of my working hour, please send an email to my backup mentioned bel
- 29 If you need to raise the case severity or contact our Customer Service Representative for urgent assistance, p
- 29 If you need assistance outside my normal working hours, please reach out to azurebu
- 26 If you are receiving this email, I am currently outside of my working hours and out of office
- 20 If you require urgent case escalation, then please engage with your Incident Manager as your primary point c
- 19 If you need assistance for this service request, please send an email to
- 19 If you are receiving this response, I am currently outside of my working hours
- 18 If you need immediate attention for any of the ongoing case while I am out of shift, please send a separate e
- 18 If you need additional escalation support, please contact CritSit Management at crit
- 16 If you need immediate assistance, please reach out to azurebu
- 14 If you need to request urgent assistance, please contact our Customer Service Representative through your lo
- 14 If you need to raise the case severity or contact our Customer Service Representative for urgent assistance, p
- 14 If you need help escalating a case outside my business hours you can email AfterHourCaseHelp
- 14 If you need assistance, please contact my manager
- 14 If you are not the intended recipient, please contact the sender by reply email and destroy all copies of the o
- 13 If you require urgent case escalation, then please engage with your Incident Manager as your primary point c
- 13 If you need to re-engage with support for your incident, please visit the Service Hub Or alternatively call your
- 12 If you need urgent assistance outside of my working hour, please send an email Azure backup
- 11 If you require urgent support, please see contact options below
- 11 If you have any feedback about my work, please let either me or my manager know
- 11 If you are receiving this email, that mean's I am currently outside of my working hours and out of office
- 11 If you are in need of an escalation that warrants a Severity A- Critical Situation, please feel free to call the Pre

Out of Office Analysis: Misspelled Words

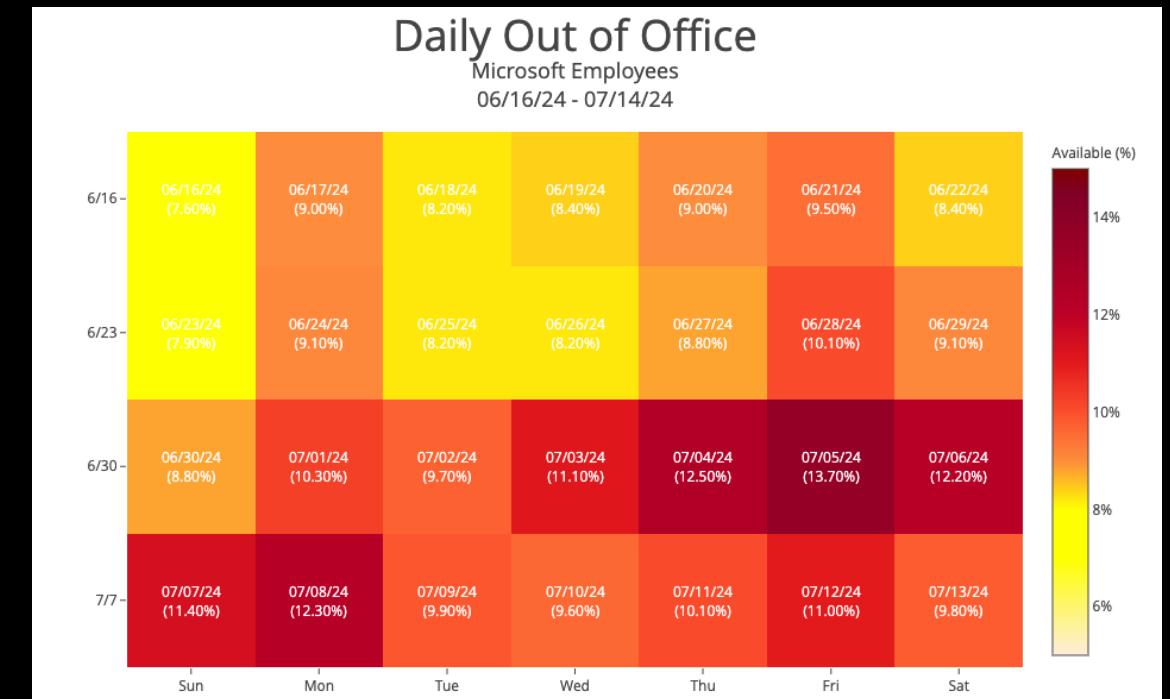
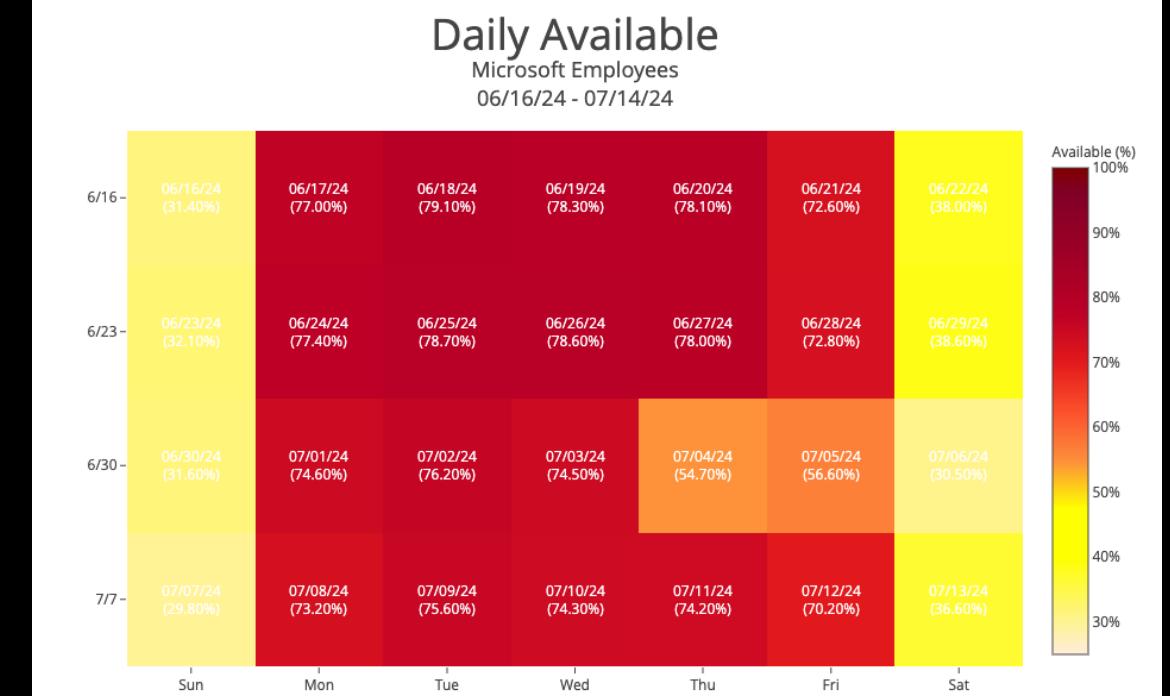
67	absense	1	writting
53	untill	1	wich
37	adress	1	wether
30	thier	1	truely
18	collegue	1	sincerly
11	occassionally	1	relevent
7	microsot	1	refrence
5	comming	1	oved
4	microsfot	1	rance
4	buisness	1	ly
3	recieve	1	dance
3	micorsoft	1	ce
3	behaviour	1	ately
3	accomodate	1	rrier
2	tommorrow	1	calender
2	seperate	1	becuase
2	persue		
2	goverment		
2	committmen		
2	bussine		
2			



Holiday: July 4th

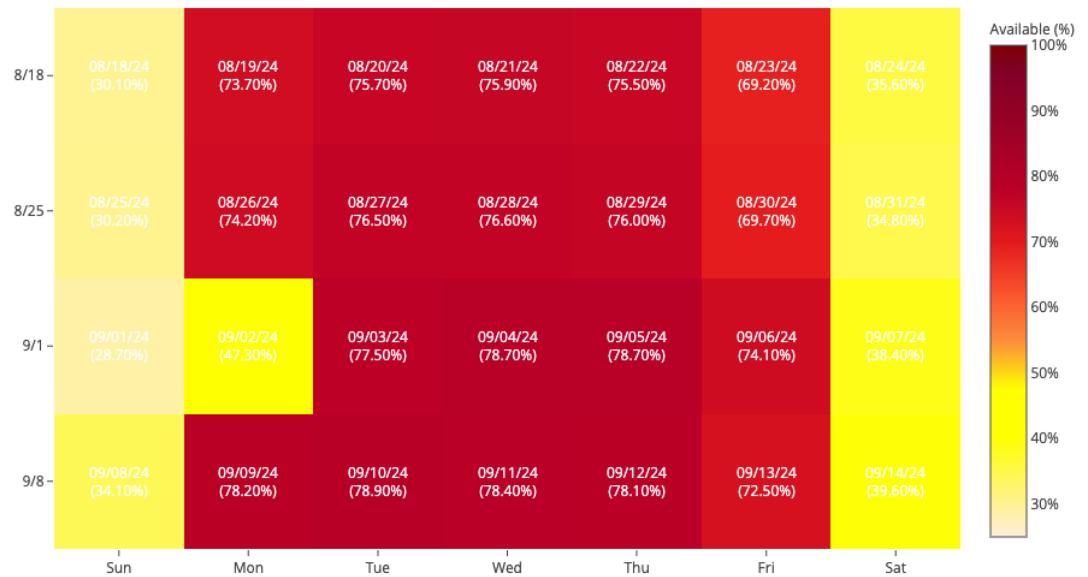
Top OOO Holiday Keywords

- 522 July 4th
- 301 4th of July
- 170 Independence Day
- 31 Fourth of July
- 11 Independence day
- 3 independence day
- 1 JULY 4th
- 1 fourth of July



Daily Available

Microsoft Employees
08/18/24 - 09/15/24

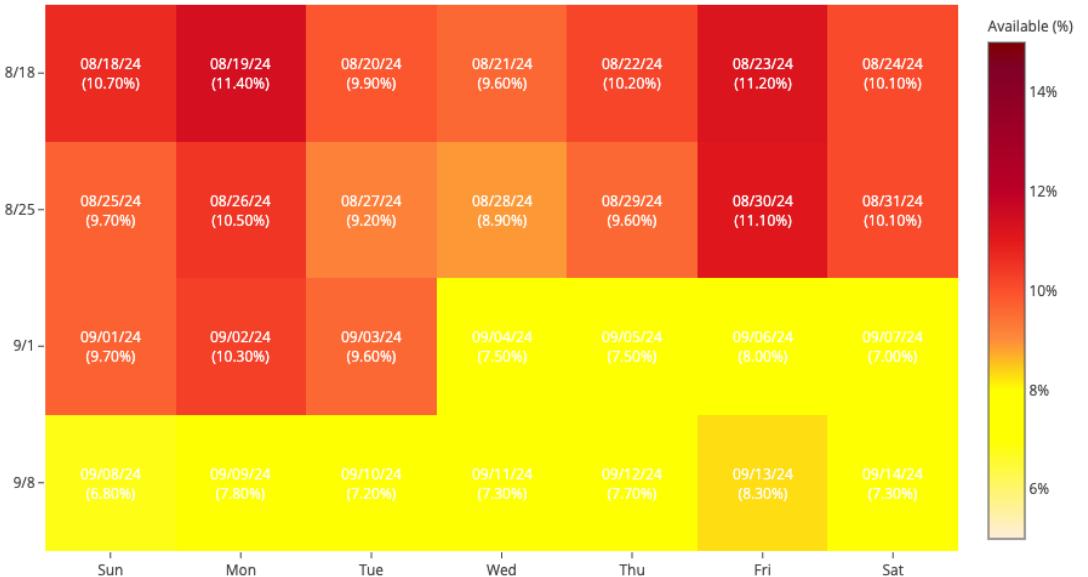


Top OOO Holiday Keywords

407 Labor Day
23 labor day
17 Labor day
1 labor Day

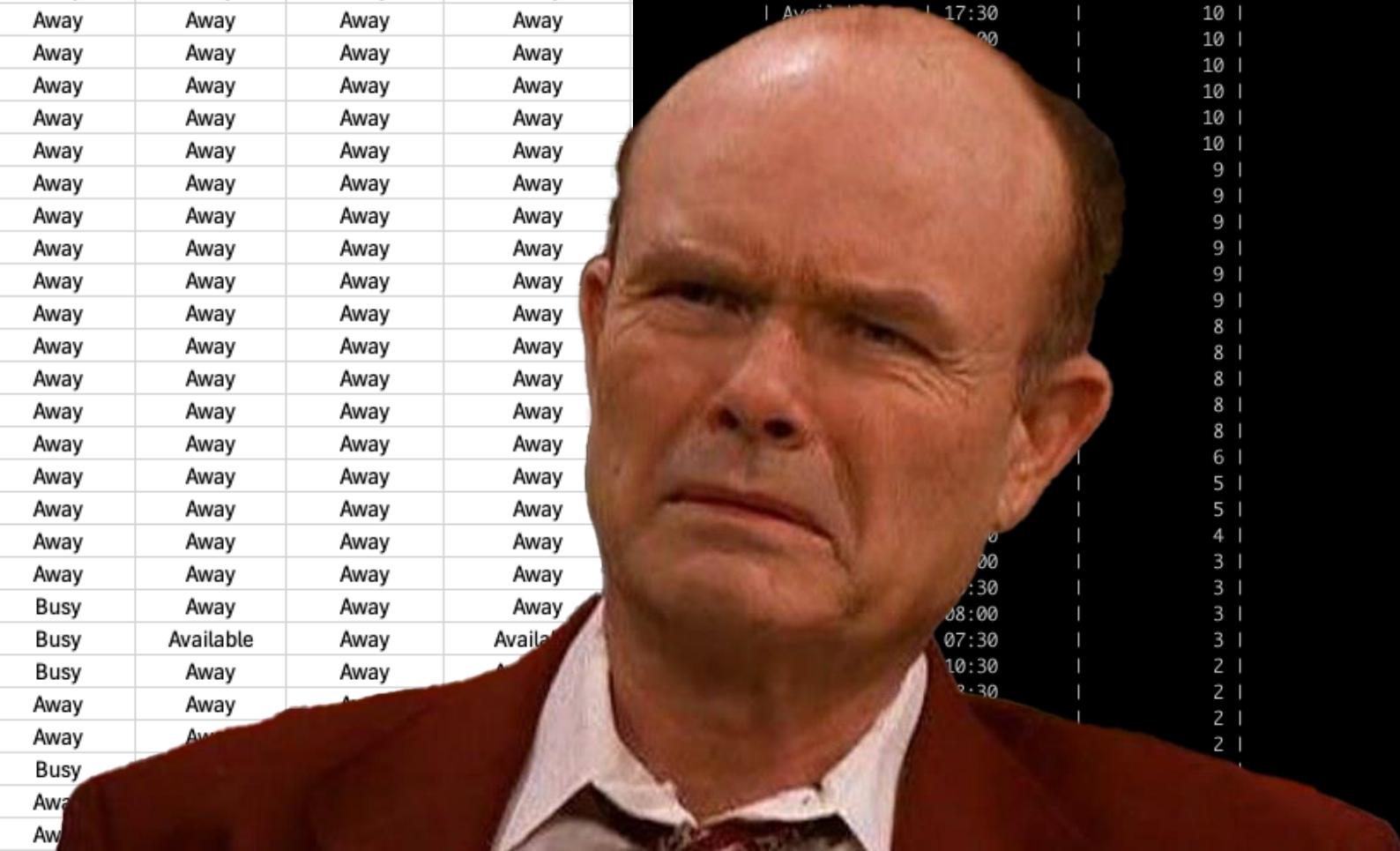
Daily Out of Office

Microsoft Employees
08/18/24 - 09/15/24



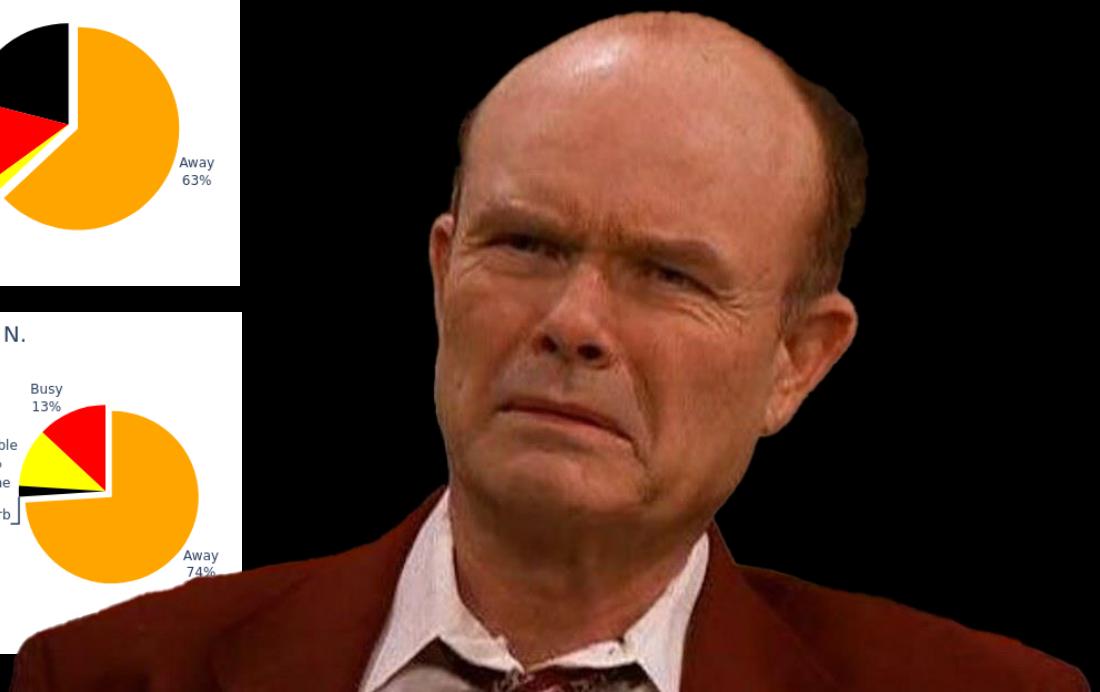
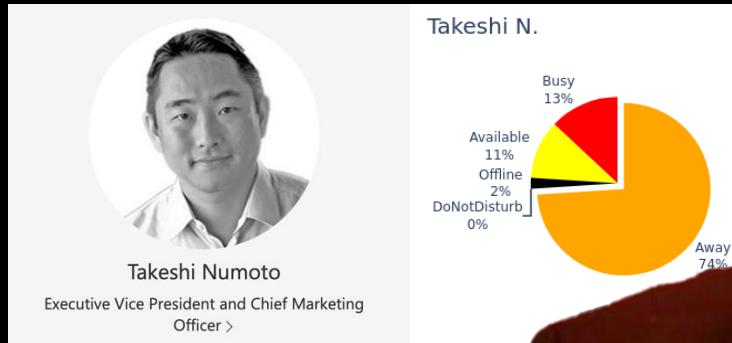
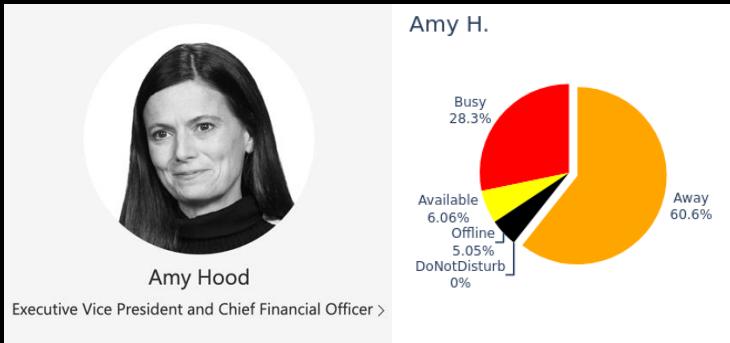
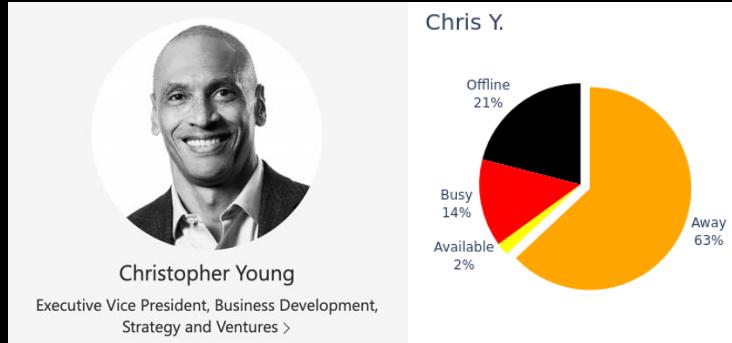
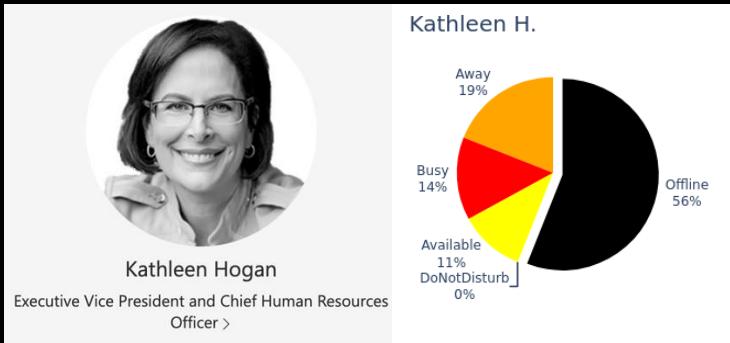
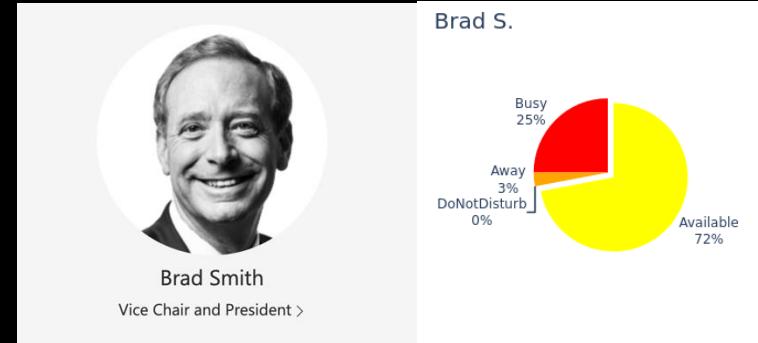
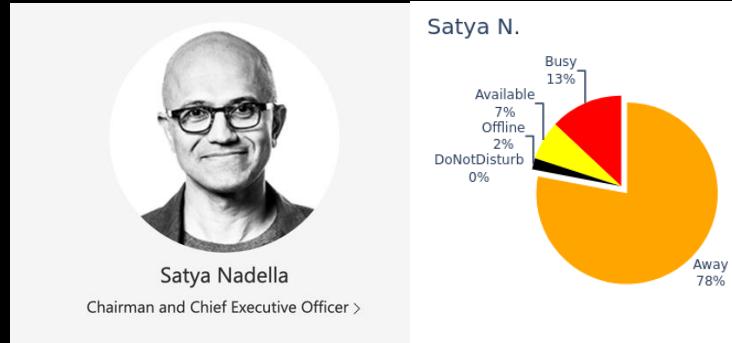
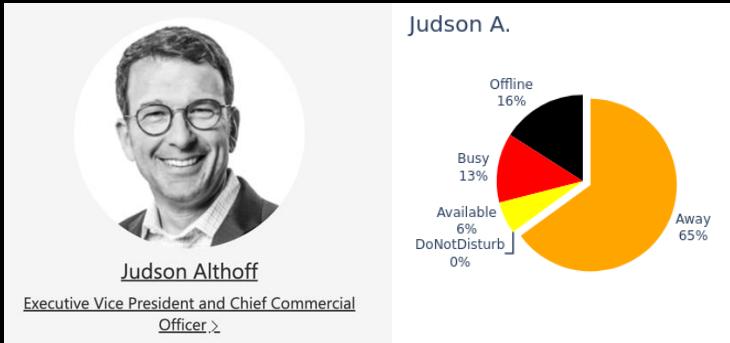
Where's Satya?

	Monday	Tuesday	Wednesday	Thursday	Friday	
	2024-09-05	2024-09-06	2024-09-07	2024-09-08	2024-09-09	+-----+-----+-----+-----+
0:00	Away	Away	Away	Away	Available	availability time_period period_count
0:30	Away	Away	Away	Away	Away	+-----+-----+-----+-----+
1:00	Away	Away	Away	Away	Away	Available 03:30 26
1:30	Away	Away	Away	Away	Away	Available 04:00 25
2:00	Away	Away	Away	Away	Away	Available 03:00 16
2:30	Away	Away	Away	Away	Away	Available 04:30 15
3:00	Away	Away	Away	Away	Available	Available 01:00 15
3:30	Away	Away	Away	Away	Away	Available 00:30 15
4:00	Away	Away	Away	Away	Away	Available 00:00 14
4:30	Away	Away	Available	Away	Away	Available 14:30 14
5:00	Away	Away	Away	Away	Away	Available 02:00 14
5:30	Away	Away	Away	Away	Away	Available 01:30 12
6:00	Away	Away	Away	Away	Away	Available 14:00 12
6:30	Away	Away	Away	Away	Away	Available 05:00 12
7:00	Away	Away	Away	Away	Away	Available 21:30 10
7:30	Away	Away	Away	Away	Away	Available 17:30 10
8:00	Away	Away	Away	Away	Away	Available 00:00 10
8:30	Away	Away	Away	Away	Away	Available 10:00 10
9:00	Away	Away	Away	Away	Away	Available 09:00 9
9:30	Away	Away	Away	Away	Away	Available 08:00 9
10:00	Away	Away	Away	Away	Away	Available 07:00 9
10:30	Away	Away	Away	Away	Away	Available 06:00 9
11:00	Away	Away	Away	Away	Away	Available 05:00 8
11:30	Away	Away	Away	Away	Away	Available 04:00 8
12:00	Away	Away	Away	Away	Away	Available 03:00 8
12:30	Away	Away	Away	Away	Away	Available 02:00 6
13:00	Away	Away	Away	Away	Away	Available 01:00 5
13:30	Away	Away	Away	Away	Away	Available 00:00 5
14:00	Away	Away	Away	Away	Away	Available 00:00 4
14:30	Away	Busy	Away	Away	Away	Available 00:00 3
15:00	Busy	Busy	Available	Away	Available	Available 00:00 3
15:30	Busy	Busy	Away	Away	Away	Available 00:00 3
16:00	Away	Away	Away	Away	Away	Available 00:00 2
16:30	Away	Away	Away	Away	Away	Available 00:00 2
17:00	Away	Busy	Away	Away	Away	Available 00:00 2
17:30	Busy	Away	Away	Away	Away	Available 00:00 2
18:00	Busy	Away	Away	Away	Away	Available 00:00 2

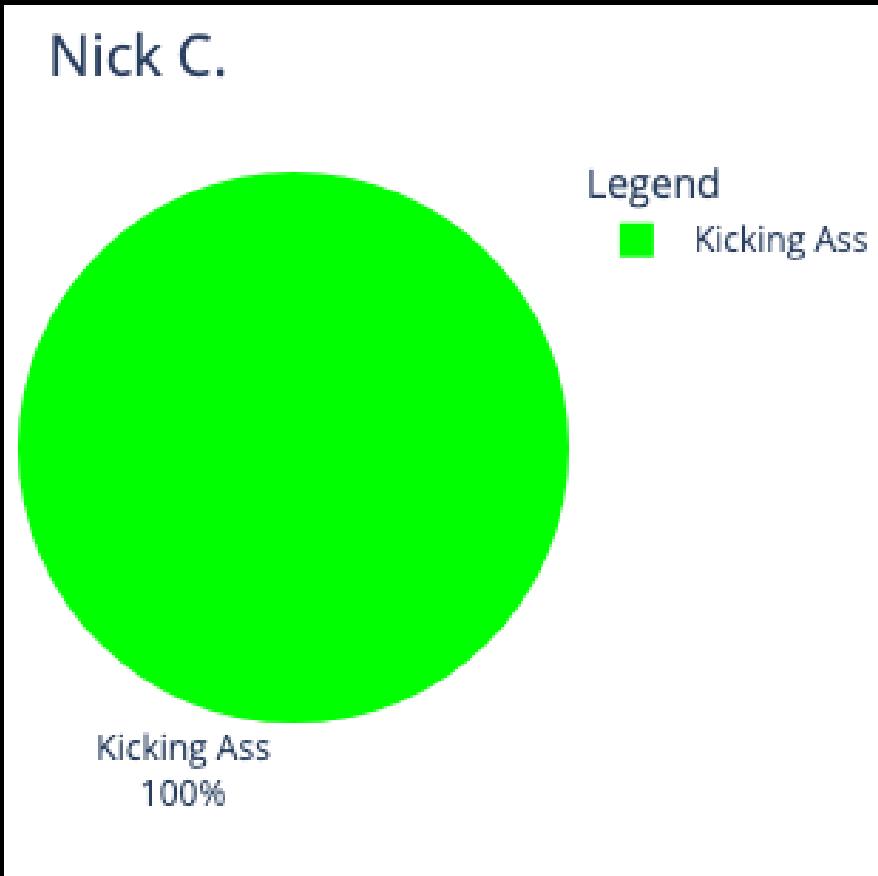


Who's Online Most – C Level Edition

<https://news.microsoft.com/leadership/>



Where's Nick Carr?

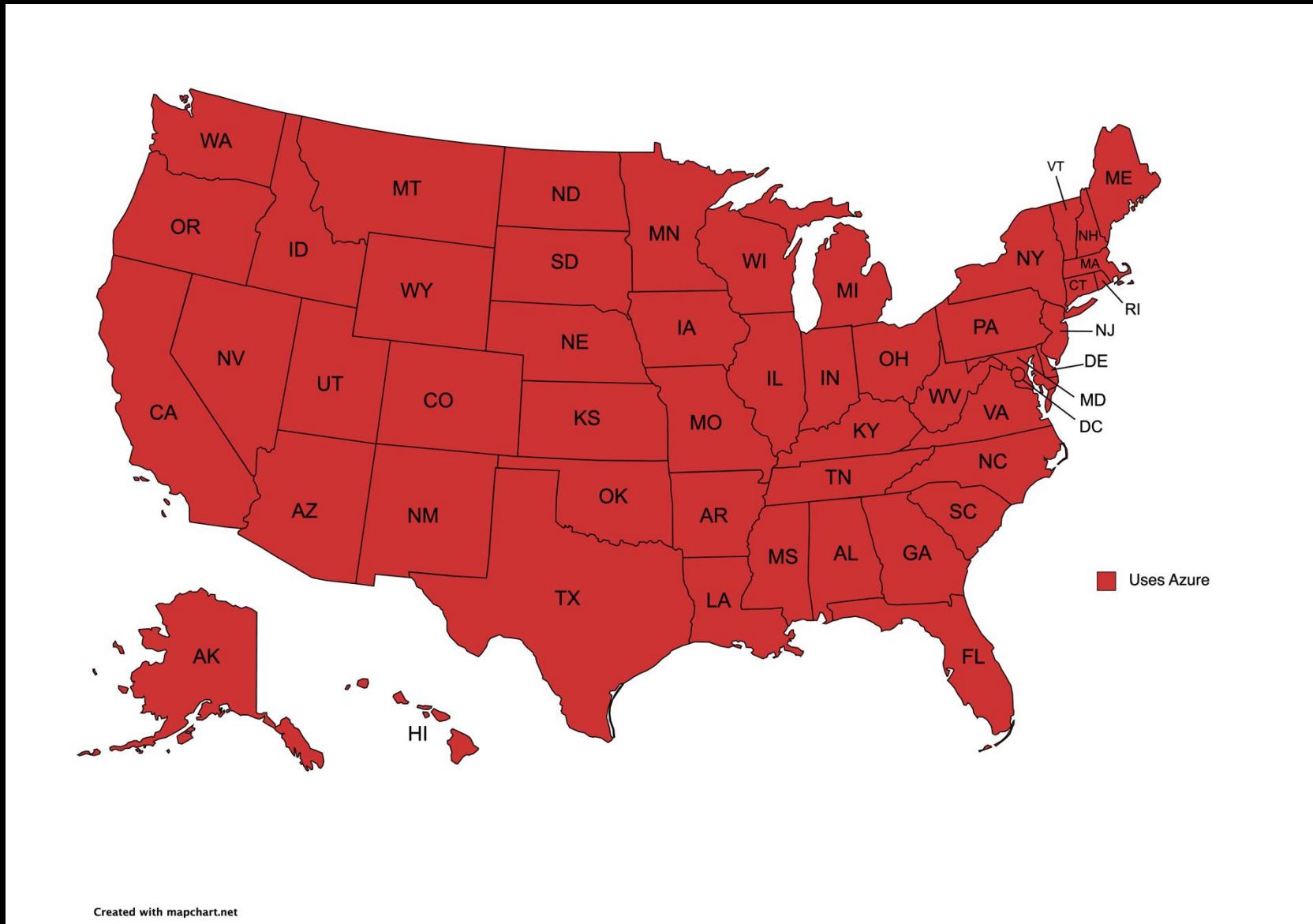


availability	time_period	display_name
Kicking Ass	23:30	Nick Carr
Kicking Ass	23:00	Nick Carr
Kicking Ass	22:30	Nick Carr
Kicking Ass	22:00	Nick Carr
Kicking Ass	21:30	Nick Carr
Kicking Ass	21:00	Nick Carr
Kicking Ass	20:30	Nick Carr
Kicking Ass	20:00	Nick Carr
Kicking Ass	19:30	Nick Carr
Kicking Ass	19:00	Nick Carr
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Kicking Ass	04:30	Nick Carr
Kicking Ass	04:00	Nick Carr
Kicking Ass	03:30	Nick Carr
Kicking Ass	03:00	Nick Carr
Kicking Ass	02:30	Nick Carr
Kicking Ass	02:00	Nick Carr
Kicking Ass	01:30	Nick Carr

Microsoft and America

A Potentially Dangerous Partnership

Azure adoption in State Government



Azure and OneDrive adoption in FedGov



who uses azure

USES AZURE

- United States
- Great Britain
- Australia
- Western Europe
- Japan
- Korea

DOESN'T USE AZURE*

- Russia
- China
- North Korea

* Use in meaningful numbers

Estimating Azure Usage – US/CN/NO/RU

The screenshot shows a web browser window with the URL <https://trends.builtwith.com/hosting/Microsoft-Azure/United-States>. The page title is "Websites using Microsoft Azure in the United States". It displays a download link for a list of 572,310 Microsoft Azure Customers in the United States.

The screenshot shows a web browser window with the URL <https://trends.builtwith.com/hosting/Microsoft-Azure/China>. The page title is "Websites using Microsoft Azure in China". It displays a download link for a list of 11,686 Microsoft Azure Customers in China.

The screenshot shows a web browser window with the URL <https://trends.builtwith.com/hosting/Microsoft-Azure/Norway>. The page title is "Websites using Microsoft Azure in Norway". It displays a download link for a list of 8,108 Microsoft Azure Customers in Norway.

The screenshot shows a web browser window with the URL <https://trends.builtwith.com/hosting/Microsoft-Azure/Russia>. The page title is "Websites using Microsoft Azure in Russia". It displays a download link for a list of 2,091 Microsoft Azure Customers in Russia.

Country	Population	Sites per Capita
United States	332m	$572k/332m = 0.001673421053 = \mathbf{0.17\%}$ (1:580)
China	1.412b	$11.7k/1.4b = 0.000008276203966 = \mathbf{0.0008\%}$ (1:120,828)
Norway	5.4m	$8k/5.4m = 0.001501481481 = \mathbf{0.15\%}$ (1:666)
Russia	143m	$2k/143m = 0.00001462237762 = \mathbf{0.0015\%}$ (1:68,388)

azure in china

Homogenous Attack Surface

- Attacks work across all tenants equally
- Attacks often work across Azure Environments
 - OneDrive works for Azure Commercial, Azure Gov, Azure DoD
 - Teams is not compatible between Azure Commercial and others
- Ability to focus on ONE provider
- High rate of new services in Azure

Bug Bounties Are Insufficient

- Gamble for Researchers
 - Bounties are not guaranteed
 - Public recognition is not guaranteed
- An adversary will not disclose a critical bug for any amount of money
- Even researchers are likely to hang onto vulnerabilities
 - Never want to reveal all of your tricks
 - IRL benefit to possessing zero days

User Enumeration and US

- US Adversary's dream
 - A list of target companies in
 - US Federal Gov
 - State Gov
 - Corporate America
 - All suffer from various user enumeration flaws in Azure
- Do we want people to be able to create lists of users in:
 - critical infrastructure companies
 - supply chain companies
 - federal agencies
 - federal government
- People don't change their names often – long term investment

Microsoft should ...

- Easy Wins:
 - Treat user enumeration as a vulnerability
 - Set secure defaults in Azure
 - Stop charging extra for security features in Azure
- Invest more in security. They rely on the goodwill of kind nerds to secure them.
 - **\$245 billion in revenue, \$109 billion in operating income.**
 - <https://www.microsoft.com/investor/reports/ar24/>
- Find more vulnerabilities on their own. The sheer number of new exploits identified by external researchers shows MS is not performing adequate testing.
- Disclose all vulnerabilities they remediate
- Pay off their ~~technical~~ security debt. They have years of sloppy security to make up for. Put the brakes on new dev and fix your shit.

shoutoutz and greetz

- @DrAzureAD
- @techr0mancer
- @karlfosaaen
- @Flangvik
- @rootsecdev
- @Oddvarmoe
- @HackingDave
- @HackingLZ
- The entire crew at TrustedSec
- My gang of bots working around the clock
- Special thanks to the EFF!

