How your .NET software supply chain is open to attack

and how to fix it

Andrei EPURE

Engineering Manager at 

Software supply chain

Source code

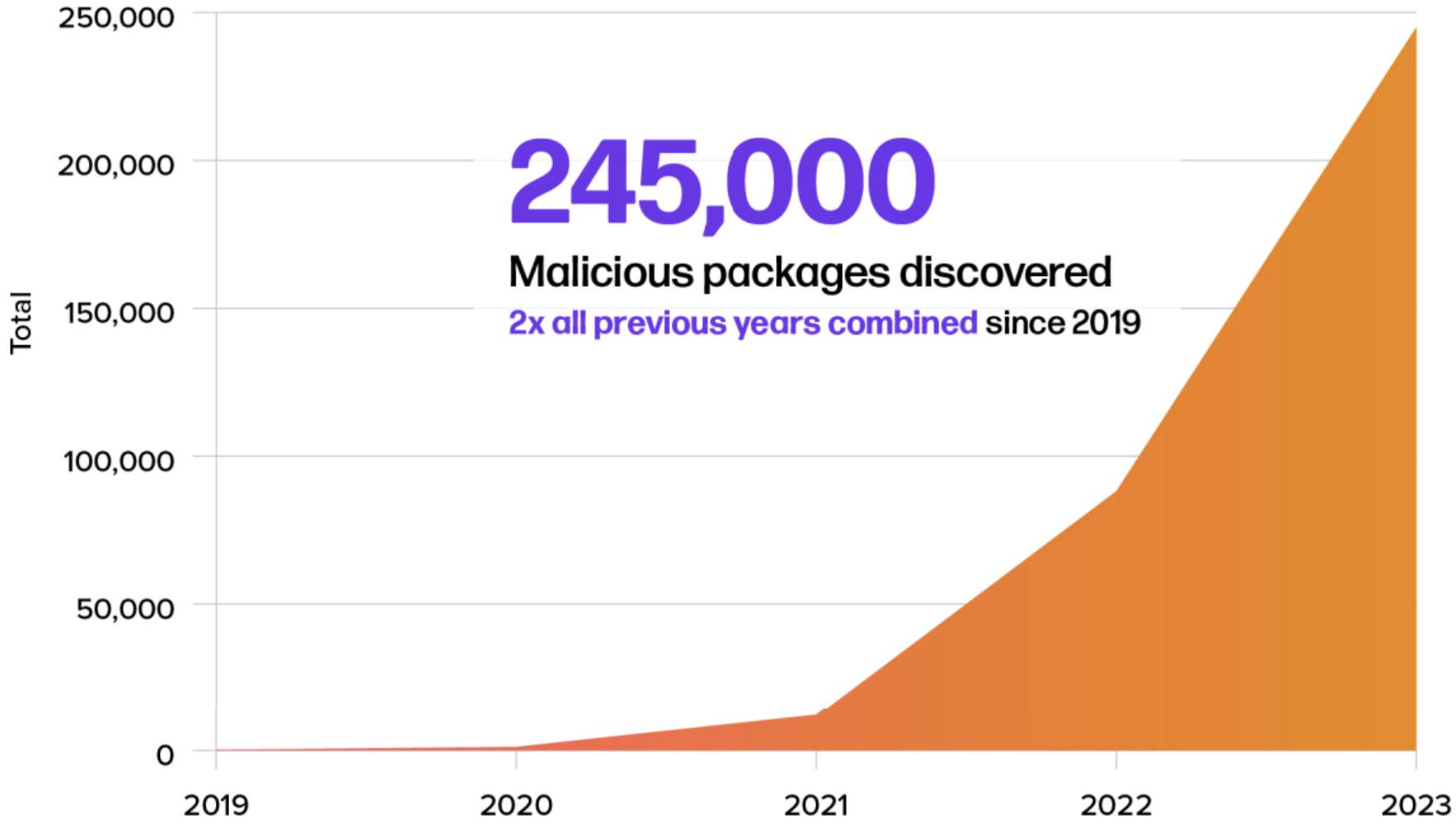
Libraries

Package managers (NuGet, NPM, PyPI)

Build tools, CI/CD, etc

FIGURE 1.7

NEXT GENERATION SOFTWARE SUPPLY CHAIN ATTACKS (2019-2023)



Source: Sonatype's "9th State of the Software Supply Chain report" (2023)

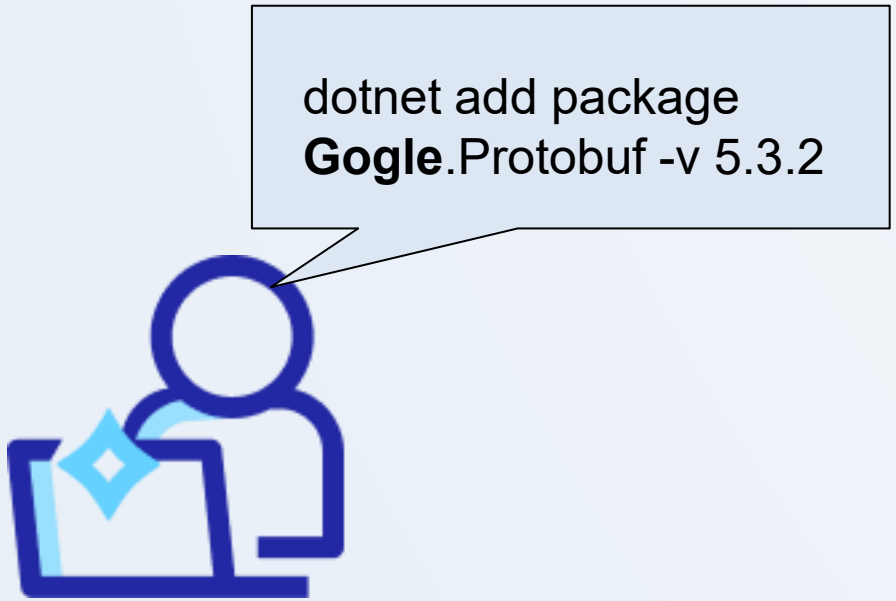
Agenda

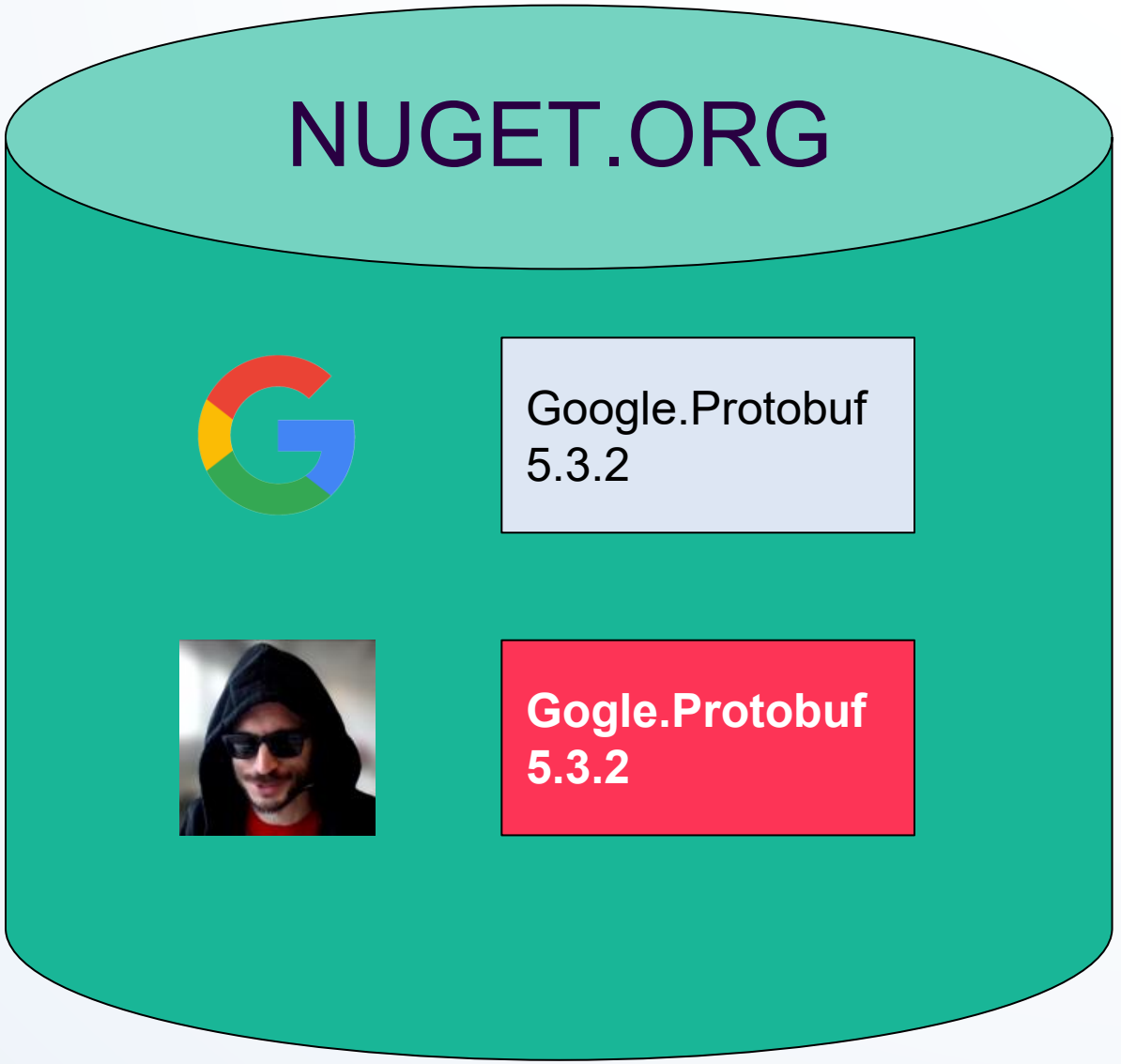
1. Typosquatting
2. Dependency confusion

} Attack & Defense

Typosquatting

To err is human





Typosquatting (2016) - Nikolai Tschacher

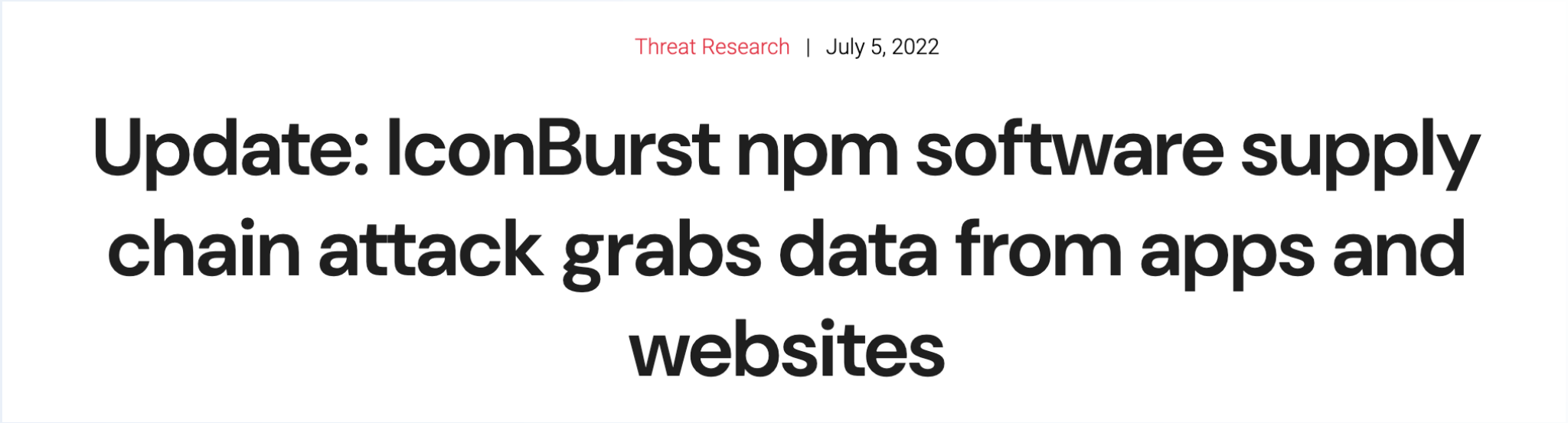
NPM and PyPi

17K infected PCs

50% admin privilege

Source: incolumitas.com

Typosquatting (2022)



27K downloads

Source: ReversingLabs

Typosquatting (2023)

BLOG HOME >

Attackers are starting to target .NET developers with malicious-code NuGet packages

By Natan Nehorai, Application Security Researcher | Brian Moussalli, JFrog Malware Research Team Leader | March 20, 2023

12 min read

SHARE:

Source: JFrog

Oct 12, 2023 / 6 min read / Research

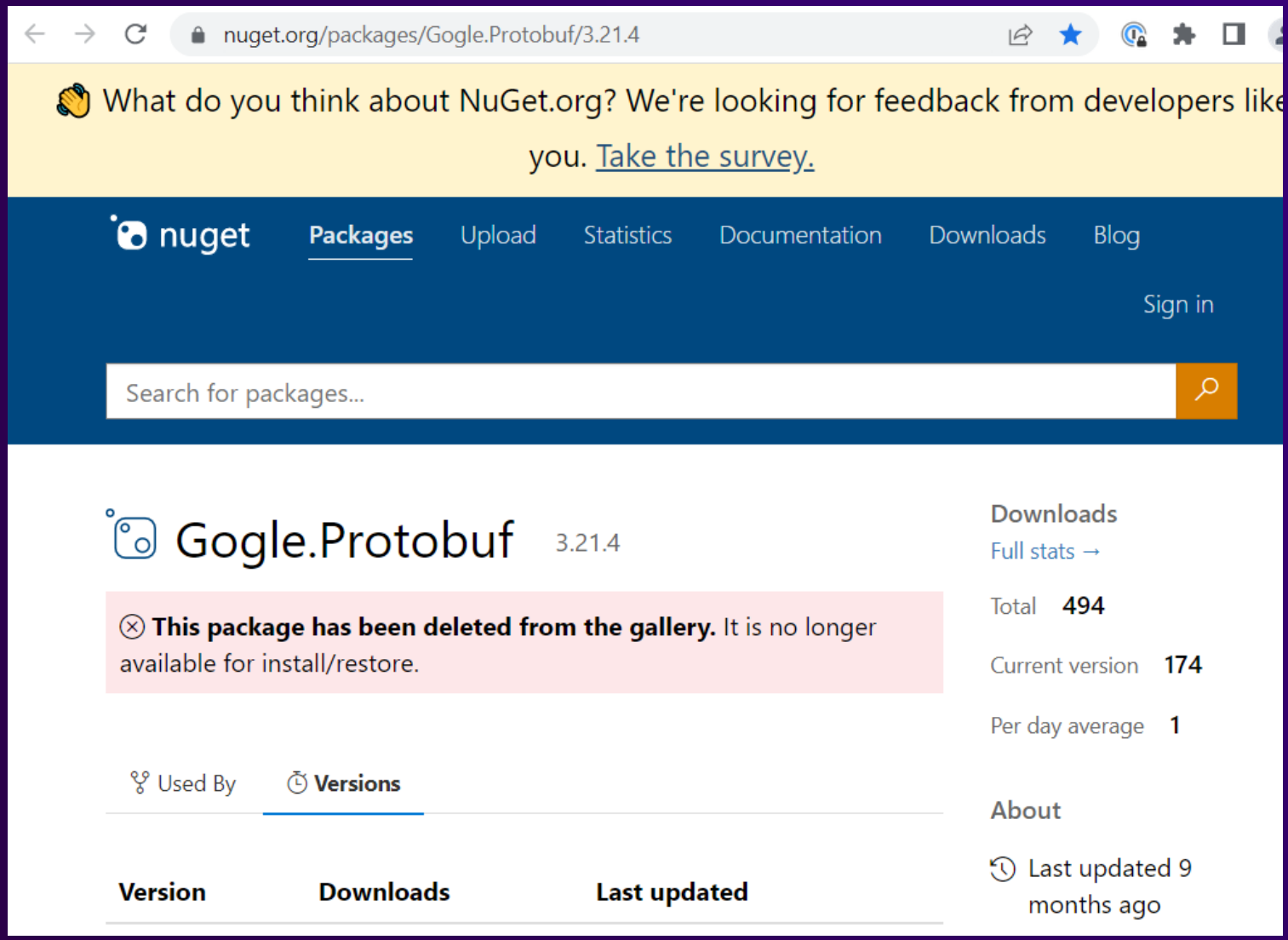
Phylum Discovers SeroXen RAT in Typosquatted NuGet Package

Source: Phylum

Typosquatting DEMO

Mr. Evil Hacker

In production



Dependency confusion

In 2020, security researcher Alex Bîrsan 🇷🇴 used

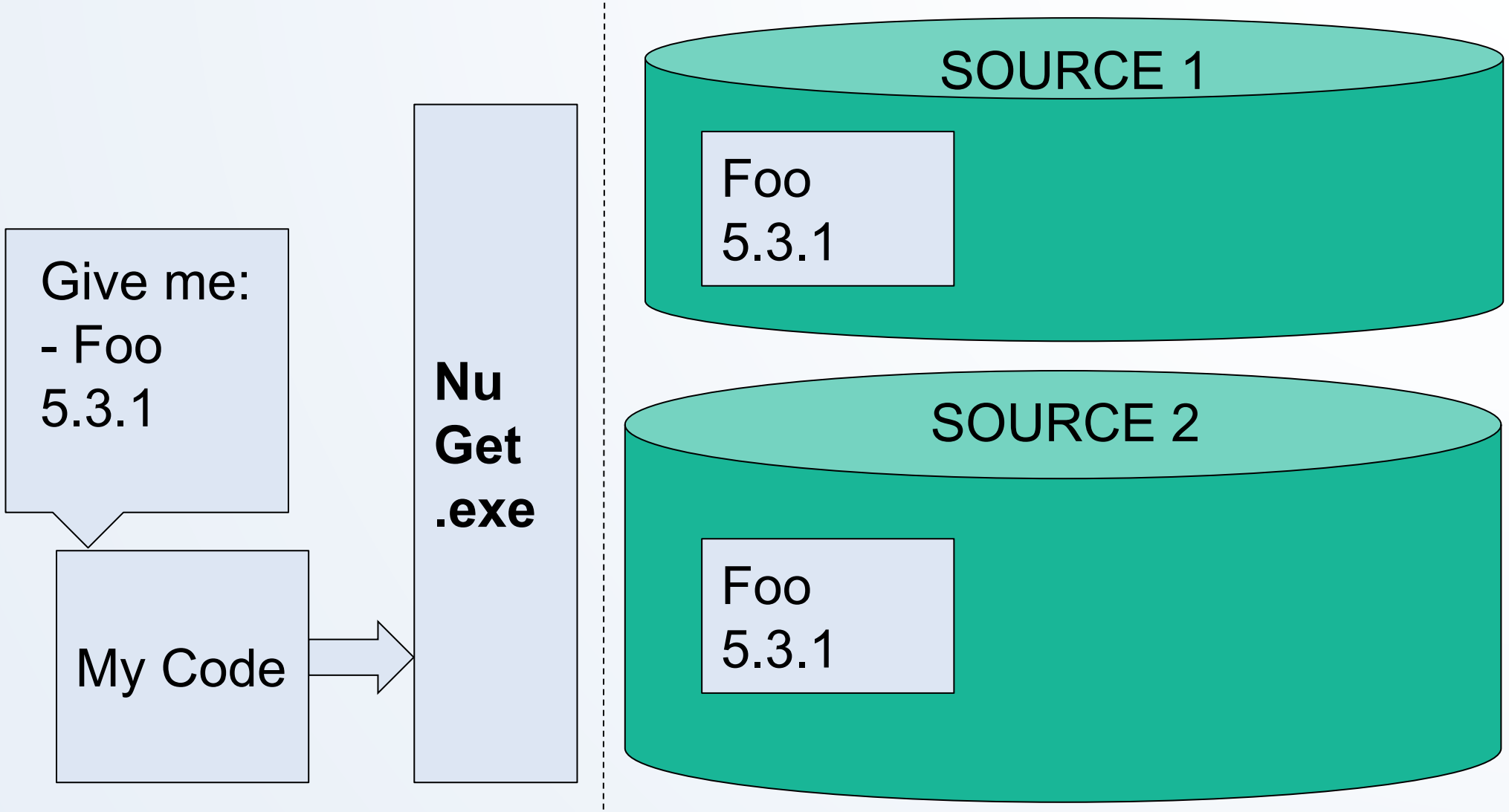
dependency confusion to hack into:

- Microsoft — $ 40K
- Apple — $ 30K
- Shopify — $ 30K
- Paypal — $ 30K
- … and another 31 big companies

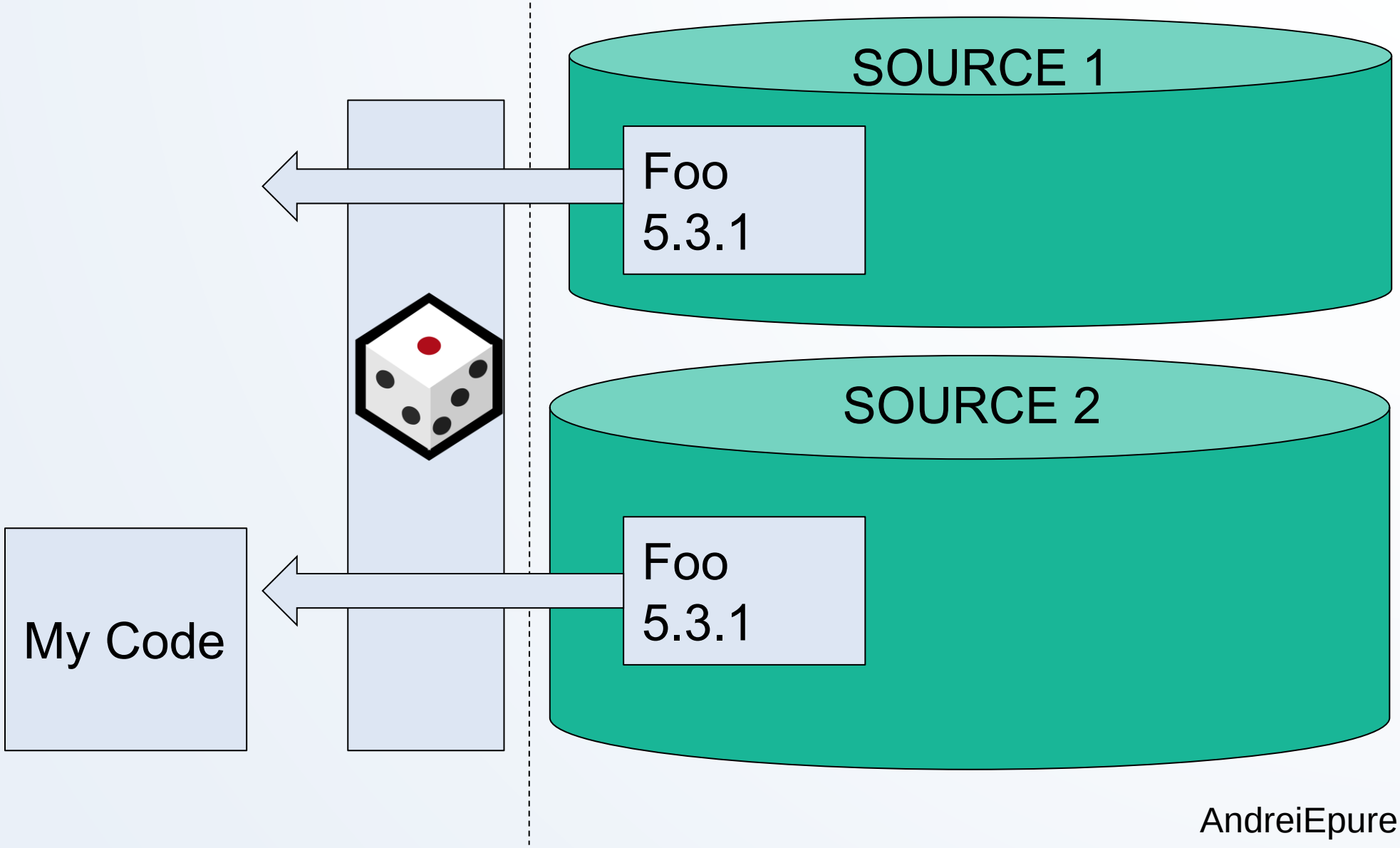
Bug bounties

Source: medium.com/@alex.birsan

NuGet Package Resolution



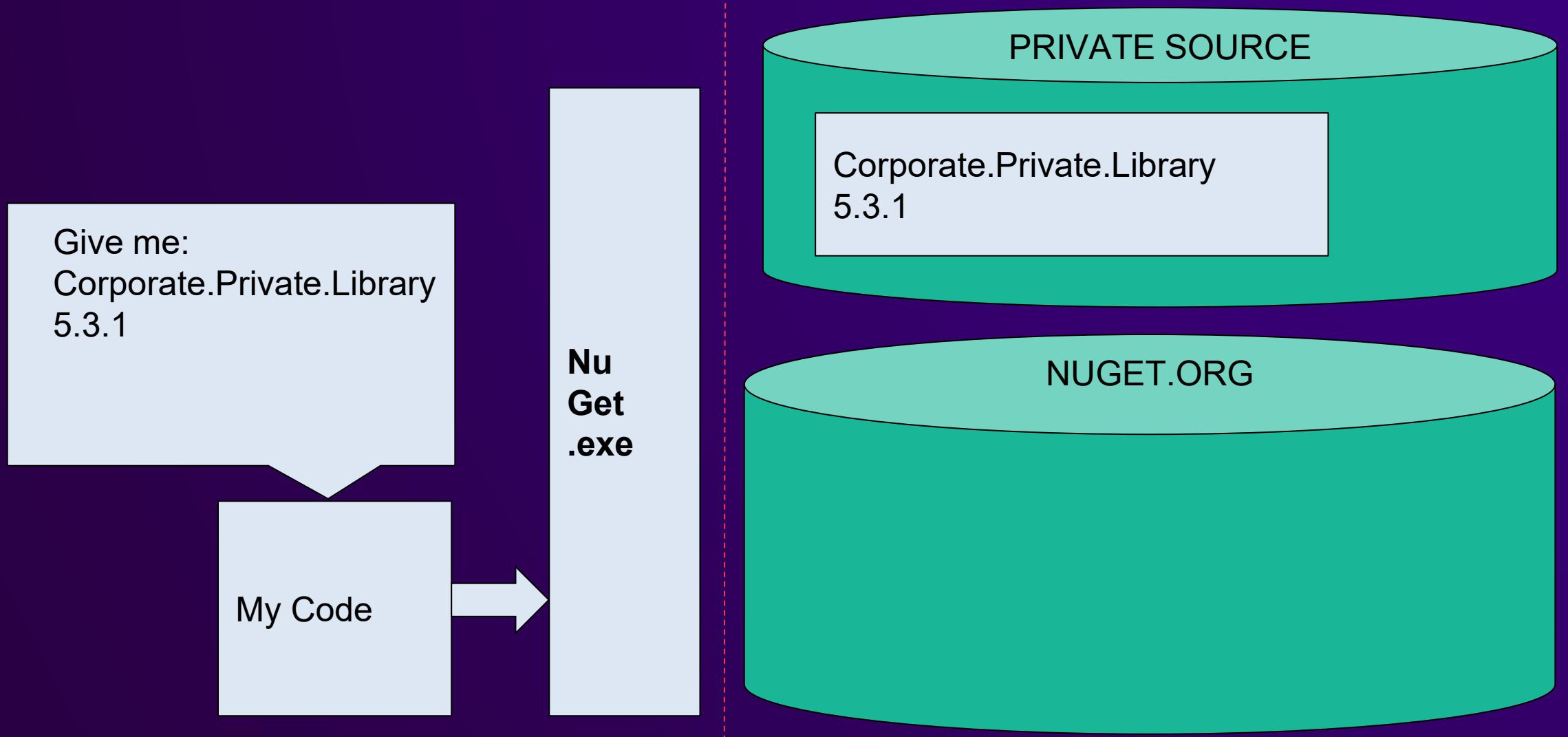
NuGet Package Resolution



Dependency Confusion

Mr. Evil Hacker

Dependency confusion



Dependency confusion

Give me:
Corporate.Private.Library
5.3.1

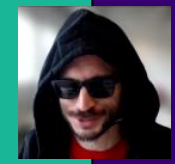
My Code

Nu Get .exe

PRIVATE SOURCE

Corporate.Private.Library
5.3.1

NUGET.ORG



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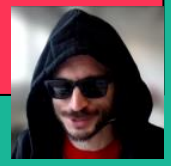
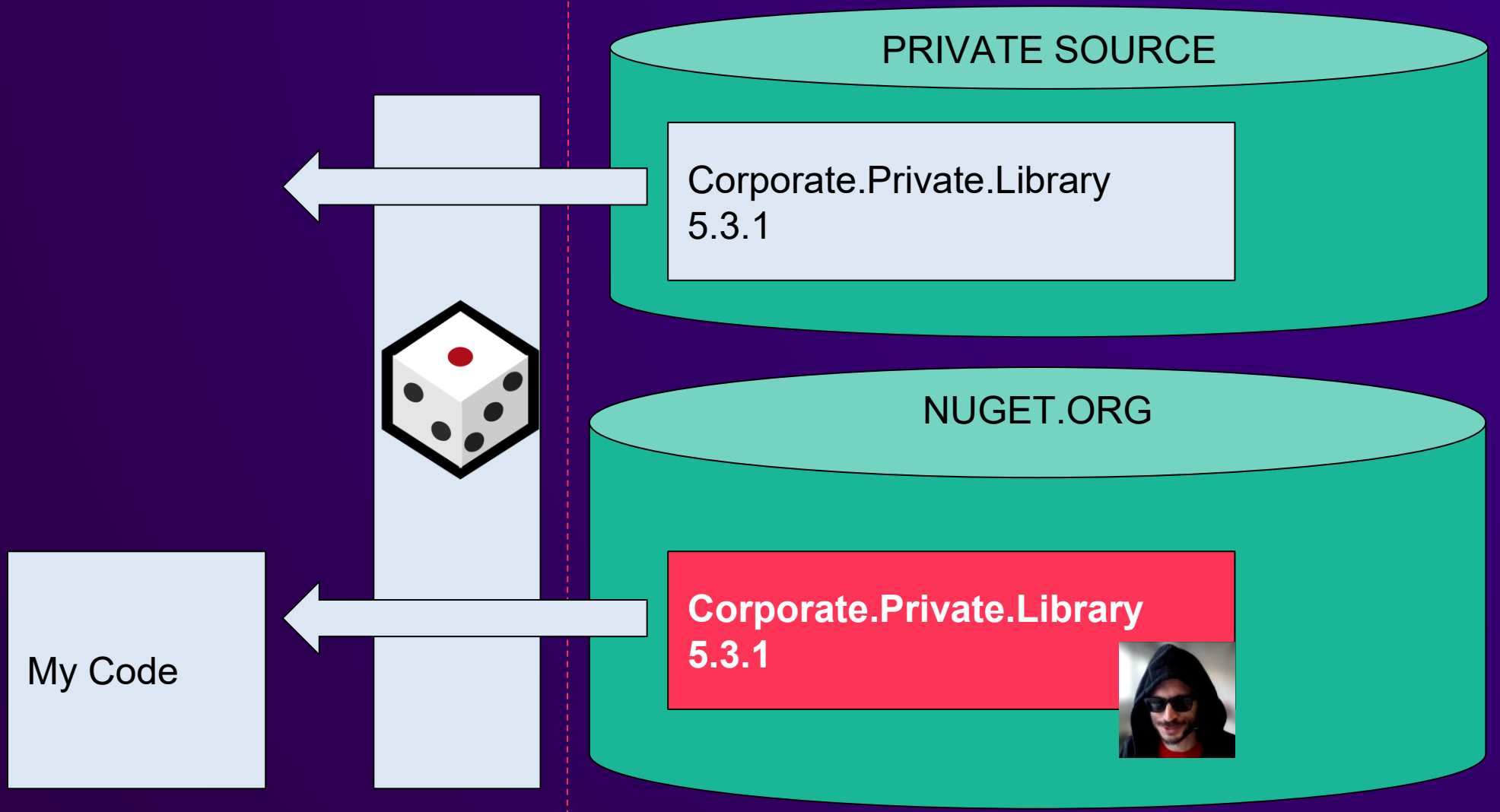


Dependency confusion



Dependency confusion

Give me:
Corporate.Private.Library

5.3.*

My Code

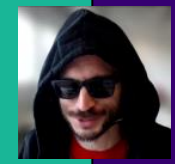
Nu Get .exe

PRIVATE SOURCE

Corpo
5.3.1

Corporate.Private.Library
5.3.2

NUGET.ORG



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My Code

Nu Get .exe

PRIVATE SOURCE

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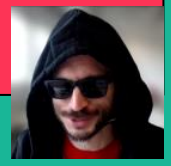
5.3.1

Corporate.Private.Library
5.3.2

NUGET.ORG

Corporate.Private.Library
5.3.999



Dependency confusion

Here you are:

Corporate.Private.Library
5.3.999

Nu Get .exe

My Code

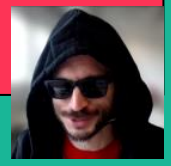
PRIVATE SOURCE

Corpo
5.3.1

Corporate.Private.Library
5.3.2

NUGET.ORG

Corporate.Private.Library
5.3.999



Dependency confusion DEMO

Do not let  win!

1. <clear>
2. Package Source Mapping or single source
3. <trustedSigners>

More details in: How to secure your NuGet supply chain

Do not let  win!

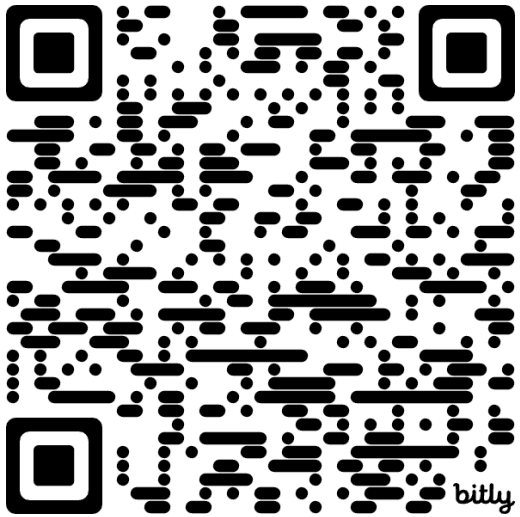
5. Fixed versions

6. Sign your packages

7. Reserve prefixes on nuget.org

More details in: How to secure your NuGet supply chain

Q & A



feedback form & slides on

AndreiEpure.ro