



# Chocolatey

The **package manager** for Windows

## Modern Software Management on Windows with Chocolatey

Rob Reynolds

@ferventcoder





# Rob Reynolds

- Creator and Founder of Chocolatey 
- Enjoys long walks on the beach and designing solutions that make hard things easy
- Co-wrote infrastructure framework known as the Chuck Norris Framework
- Over 10 years experience in infrastructure automation
- Obsesses over user experience
- Microsoft MVP for whatever they are calling .NET area now



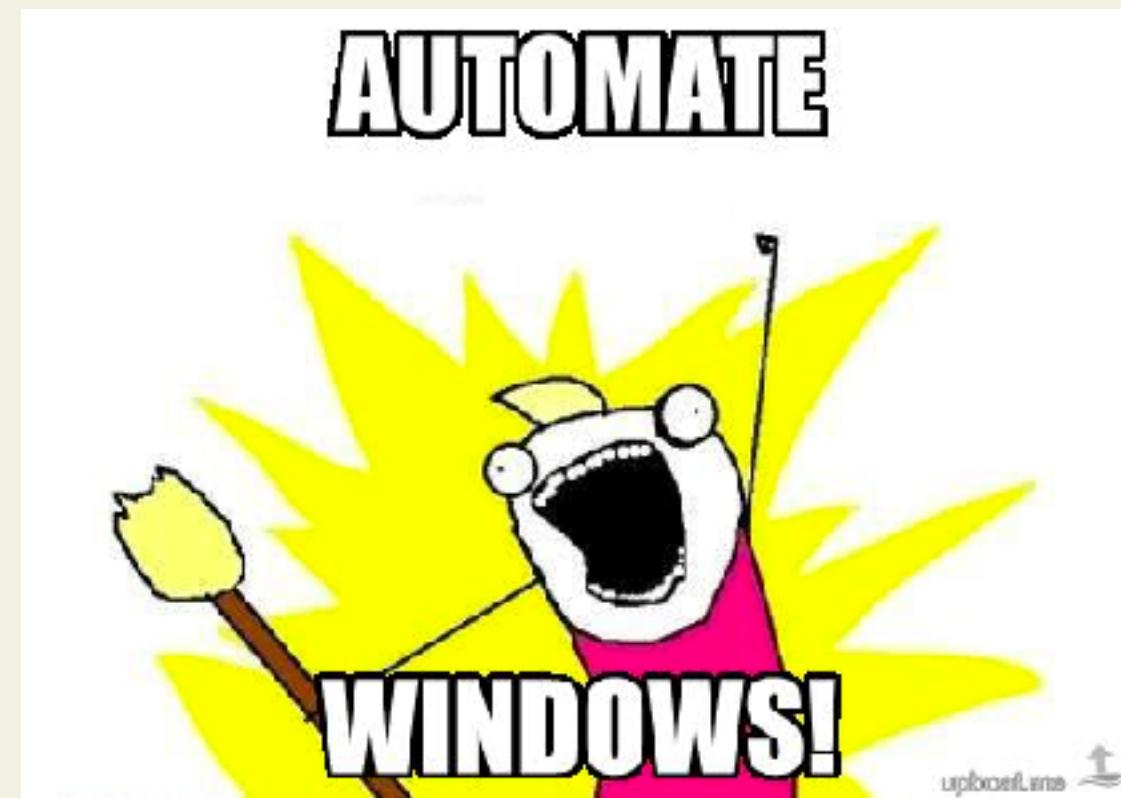


# Agenda

- What / Why
- Chocolatey
- How









# Why Chocolatey?



**Software management may  
account for 50-90% of your  
automation**



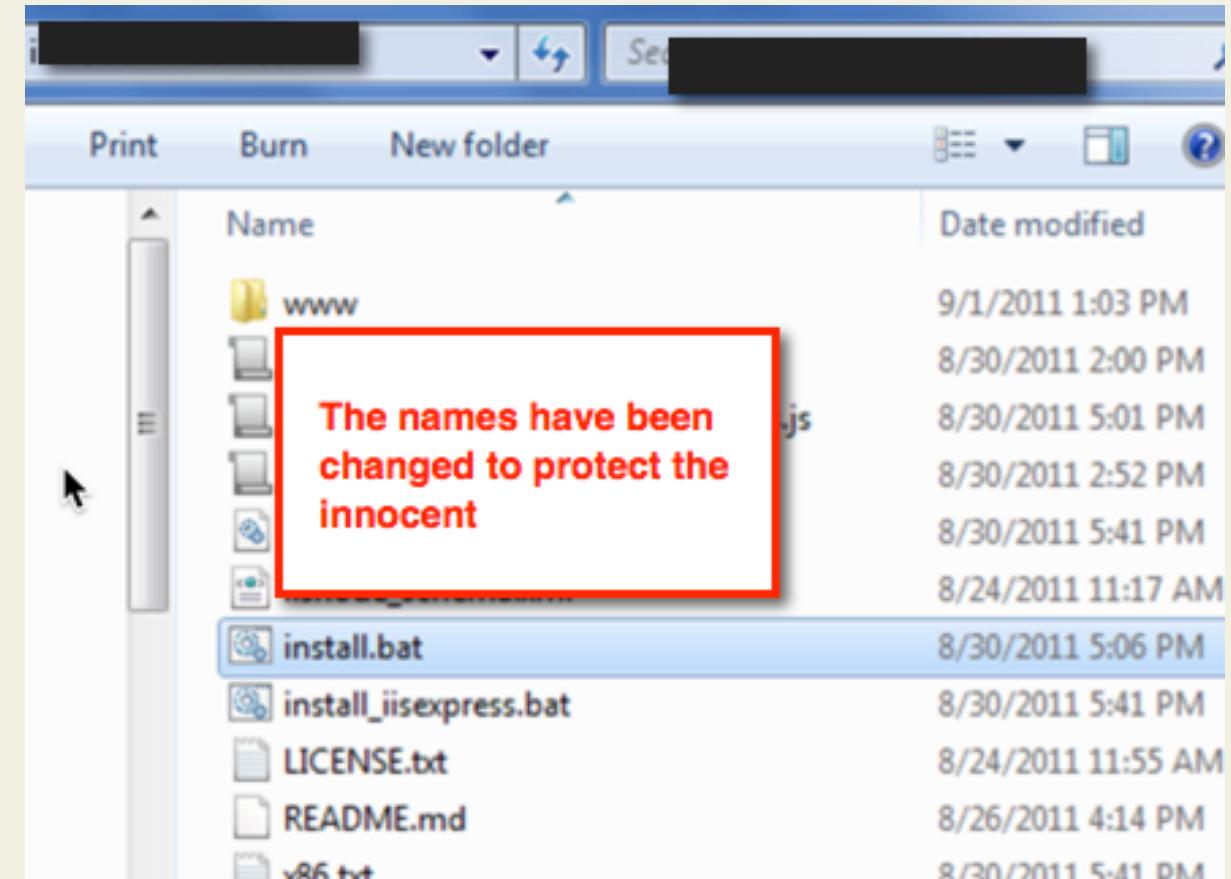
# Windows Software Ecosystem

- Over 20 installer formats and thousands of installers in the wild
- Zips and other archive formats
- Software installers are messy
- Deploy internal/3rd party software using same approach?
- It's like the Wild West

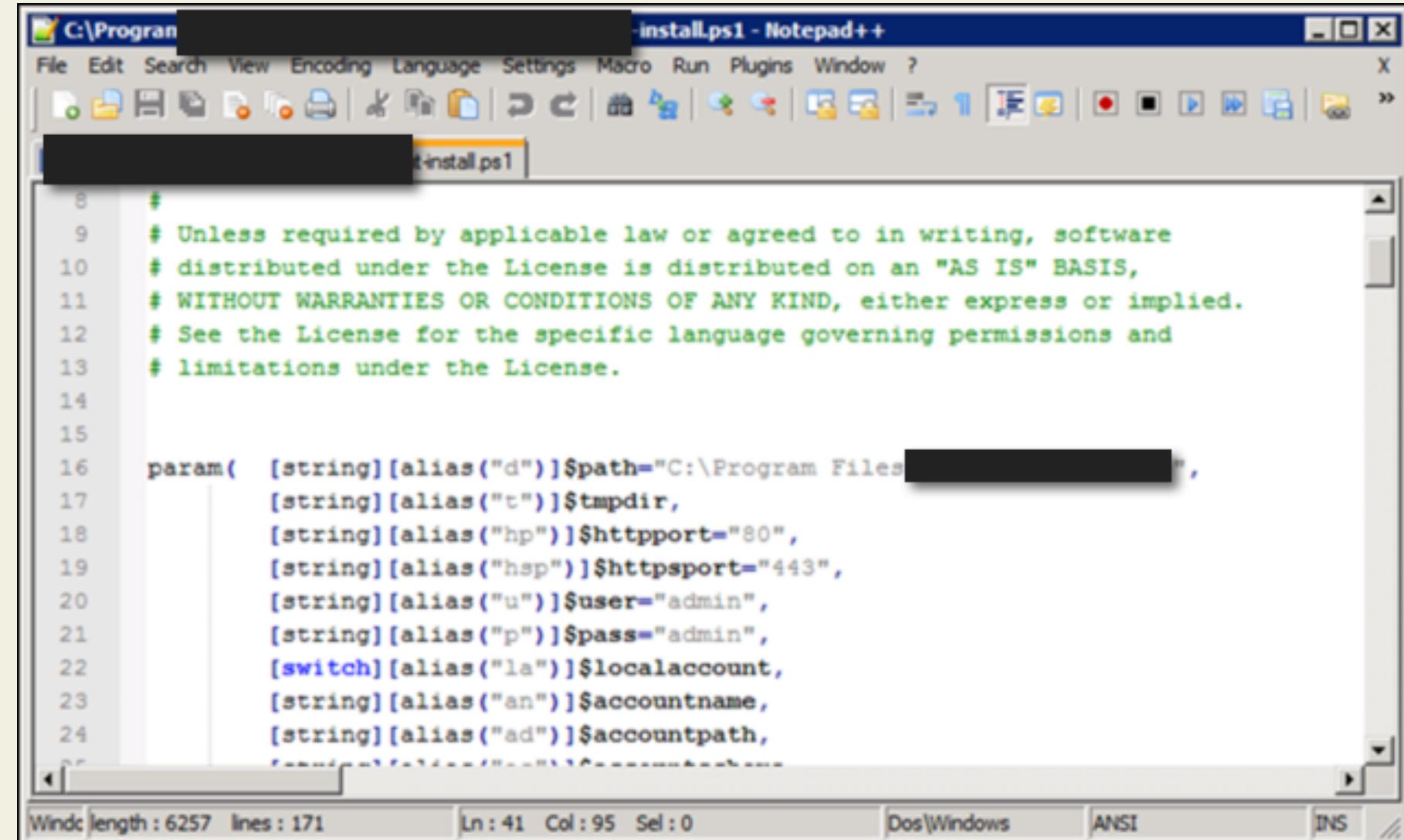


# Why?

- You already deploy software
- Likely already use deployment scripts
- Delivery mechanisms
- Internal Software



# Why?

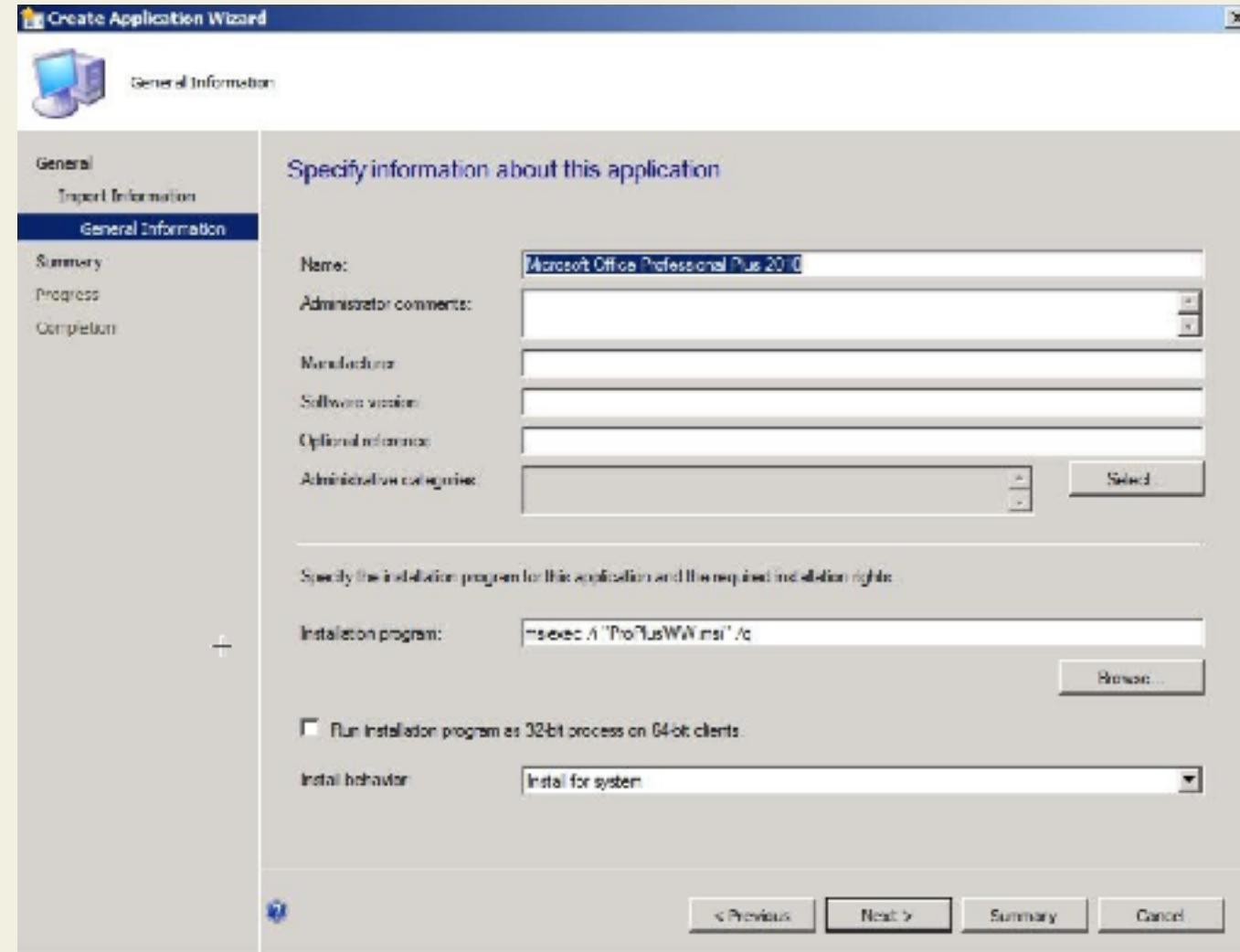


The screenshot shows a Notepad++ window with the file "install.ps1" open. The file contains a PowerShell script with several parameters defined. The code is color-coded, with comments in green and parameters in blue.

```
8  #
9  # Unless required by applicable law or agreed to in writing, software
10 # distributed under the License is distributed on an "AS IS" BASIS,
11 # WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
12 # See the License for the specific language governing permissions and
13 # limitations under the License.
14
15
16 param( [string][alias("d")]$path="C:\Program Files\Install\",
17       [string][alias("t")]$tmpdir,
18       [string][alias("hp")]$httpport="80",
19       [string][alias("hsp")]$httpsport="443",
20       [string][alias("u")]$user="admin",
21       [string][alias("p")]$pass="admin",
22       [switch][alias("la")]$localaccount,
23       [string][alias("an")]$accountname,
24       [string][alias("ad")]$accountpath,
```

Wind length : 6257 lines : 171 In : 41 Col : 95 Sel : 0 Dos\Windows ANSI INS

# Why?



**Jeffrey Snover**

@jsnover

Following



If you are skipping DevOps, you will become the next generation of "Cobol" programmers:  
Valuable but to an ever shirking group of employers

RETWEETS

80

LIKES

109



10:00 AM - 19 Apr 2017

15

80

109





# What is Chocolatey?



# What is Chocolatey?

- Software Management
- PowerShell
- Fancy zip files = “packages”
- Packages are independent software deployment artifacts
- Takes your deployment scripts to the next level





# Chocolatey - Sane Software Management

- Easily manage the software lifecycle
- Native installers, zips, binaries
- PowerShell module simplifies work
- Packages are independent building blocks
- Integrates with configuration management
- Business friendly features





# Chocolatey - The Approach

6+ years - proven technology

- Single, unifying interface - control the chaos
- Decentralized - multiple places to get packages, including internal
- PowerShell
- Flexible
- Secure
- Reliable



But does it work well in  
organizational sense?



**Community Package Repository**

- Public domain
- Distribution rights
- Has Internet dependencies - failure point
- Possible trust issues for organizations

## Understanding Chocolatey and Packaging

**Organizational Use**

- Internal / Offline
- Many thousands of packages larger
- Reliability

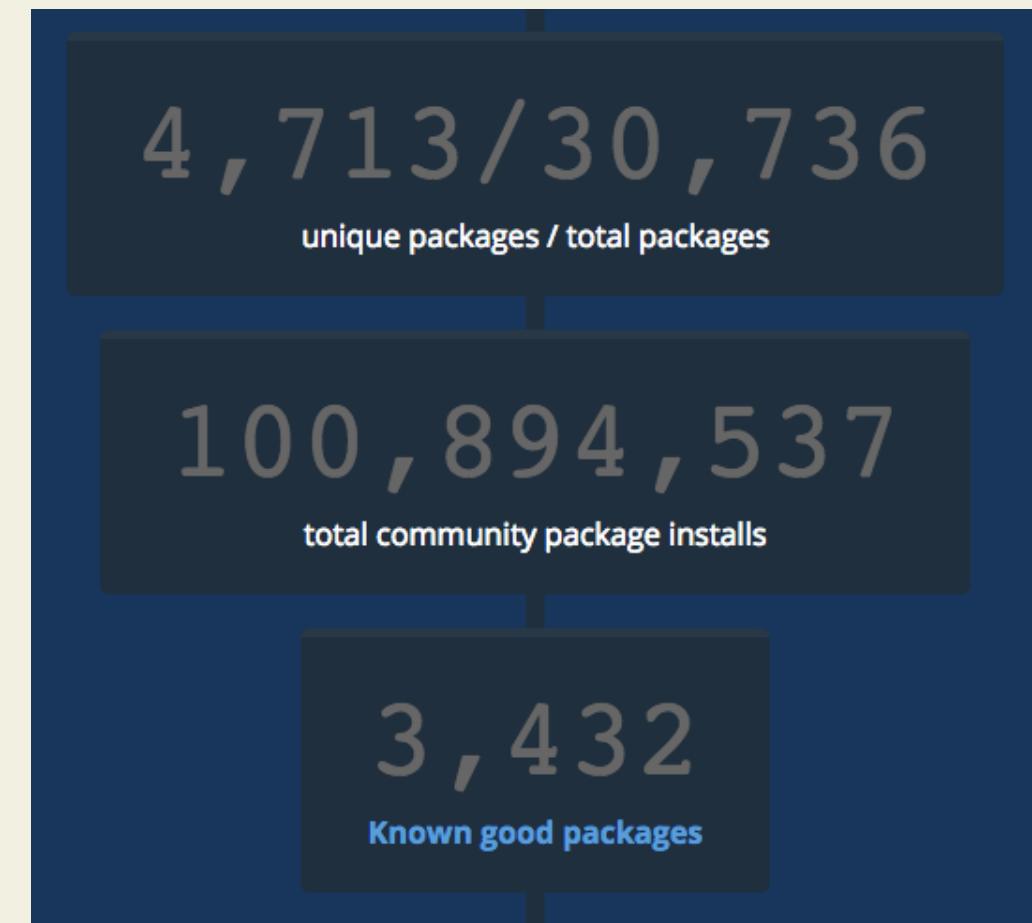
Do not cross this  
line to external /  
internet

WARNING: Objects in  
mirror may be larger  
than they appear



# Community Package Repository

- <https://chocolatey.org/packages>
- Community Feed / Community Maintained
- Moderated as of October 2014
- Everything goes through VirusTotal
- **Organizations Should Not Depend b/c Trust and Control**



**Manfred Wallner**

@schusterfredl

Following



when you replace a coworker's multi-100-line  
batch 'installer' with a single line of 'choco install'  
@chocolateynuget 😂 #greattool

RETWEETS

**5**

LIKES

**13**

4:04 AM - 16 Mar 2017



5

13





The Running Dev

@therunningdev

Follow



Choco everything! Just created a server configuration package with user creation, app deploy and config. Thanks [@ferventcoder](#) and team!

RETWEETS

4

LIKES

7



10:17 AM - 16 Mar 2017

1

4

7





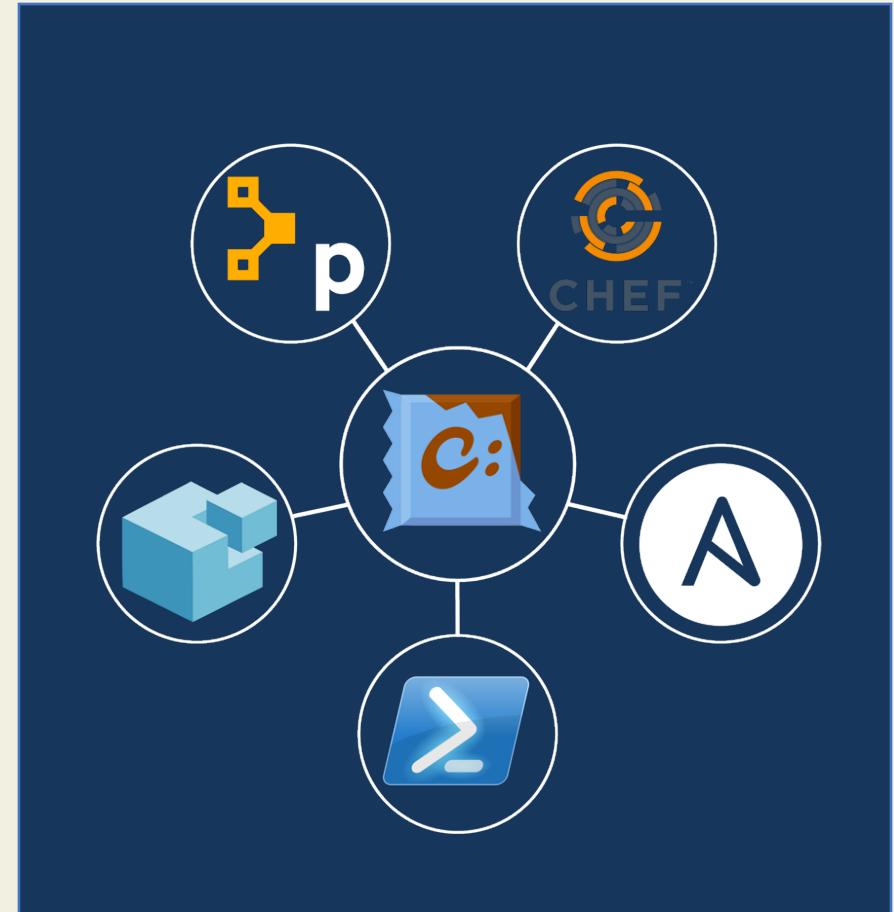
# What Does Chocolatey Integrate With?





# Integrations

- <https://chocolatey.org/docs/features-infrastructure-automation>
- Puppet
- Chef (built-in), cookbook
- PowerShell DSC
- Octopus Deploy
- Saltstack
- Ansible
- Boxstarter
- SCCM
- Anything that can run scripts





# Once you go Chocolatey...





# Would you go back to other methods?





# Automate Software Management Without Chocolatey?





# Automate Software Management Without Chocolatey?





# Automate Software Management Without Chocolatey?





# Internal / Organizational Use





# Reporting / Auditing





# Inventory - Comprehensive Software Audit

```
PS C:\> choco list -lo --include-programs
1password 4.6.0.603
chocolatey 0.9.10.3
chocolatey.extension 1.4.0
chocolatey.server 0.1.1
DotNet4.0 4.0.30319.20141222
git 2.7.0.0
GoogleChrome 51.0.2704.106
roundhouse 0.8.5.0
8 packages installed.

7-zip 9.22 (x64 edition)|9.22.00.0
Bitvise SSH Server 5.60 (remove only)|
ChocolateyGUI 0.13.2.0|0.13.2.0
Launchy 2.5|
Notepad++|6.4.2
Oracle VM VirtualBox Guest Additions 4.3.12|4.3.12.0
Puppet (64-bit)|3.8.3
7 applications not managed with Chocolatey.
```

- Exclusive to Chocolatey - Visibility beyond just the software 'installed' in Programs & Features
- Track versions of zip archives & own internal software that is not visible in system installation.
- Get a complete view of your systems. Chocolatey reports application in systems not directly under its management.





# Compliance – Audit Out of Date Software

- Call choco outdated
- Comprehensive reporting on available upgrades

```
PS C:\packages> choco outdated
Chocolatey v0.9.10-beta1-426-g3c8b16e Business
Outdated Packages
  Output is package name | current version | available version | last updated
nodejs|4.4.5|6.2.1|false
nodejs.install|4.4.5|6.2.1|false
notepadplusplus|6.8.1|6.9.2|false
notepadplusplus.install|6.8.1|6.9.2|false
roundhouse|0.8.5.0|0.8.6|false

Chocolatey has determined 5 package(s) are outdated.
PS C:\packages>
```





# Built-in Features



# Smart Installs / Smarter Upgrades

```
Administrator: Windows PowerShell
PS C:\packages> choco install git.install --source . -y
Chocolatey v0.9.10-beta1-426-g3c8b16e Business
Installing the following packages:
git.install
By installing you accept licenses for the packages.

git.install v2.8.4
Loading 'chocolatey.licensed' extension.
Copying git.install
  from 'C:\ProgramData\chocolatey\lib\git.install\tools\files\Git-2.8.4-64-bit.exe'
Virus checking skipped/turned off. Not verifying 'Git-2.8.4-64-bit.exe'
Installing Git-2.8.4-64-bit.exe...

Git-2.8.4-64-bit.exe has been installed.
WARNING: Git installed - You may need to close and reopen your shell for PATH changes to take effect.
Environment Vars (like PATH) have changed. Close/reopen your shell to see the changes (or in powershell/cmd.exe just type `refreshenv`).
The install of git.install was successful.
Software installed to 'C:\Program Files\Git\' ←

Chocolatey installed 1/1 package(s). 0 package(s) failed.
See the log for details (C:\ProgramData\chocolatey\logs\chocolatey.log).
PS C:\packages> git
git : The term 'git' is not recognized as the name of a cmdlet, function, script file, or operable program. Check the spelling of the name, or if a path was included, verify that the path is correct and try again.
At line:1 char:1
+ git
+ ~~~
  + CategoryInfo          : ObjectNotFound: (git:String) [], CommandNotFoundException
  + FullyQualifiedErrorId : CommandNotFoundException

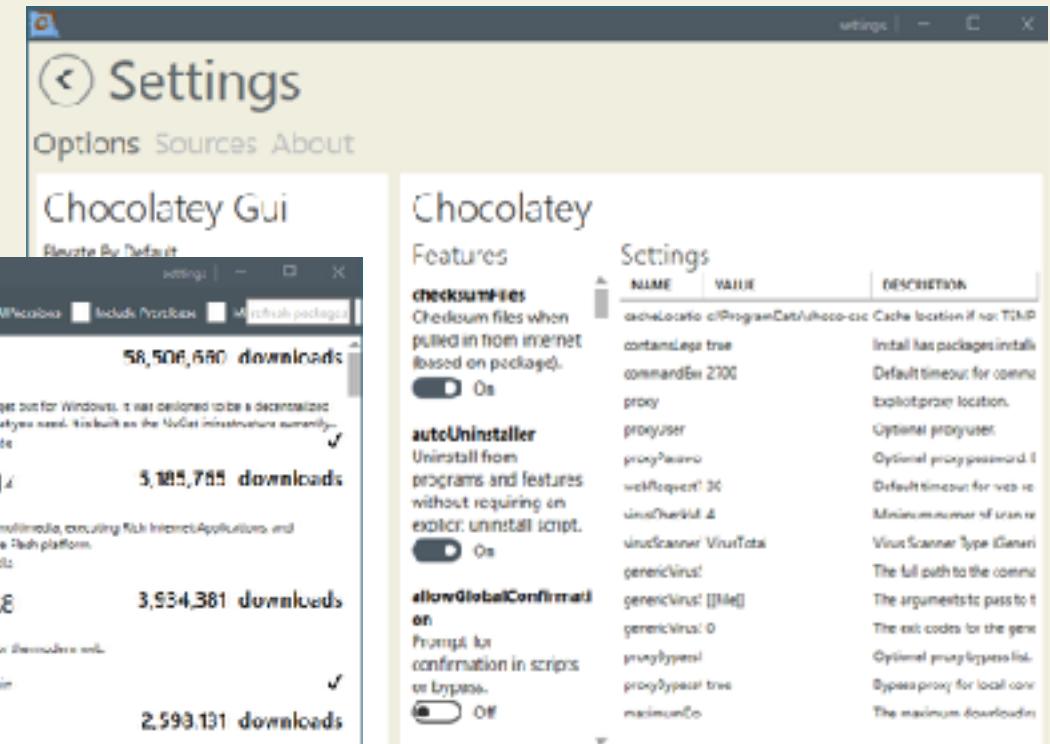
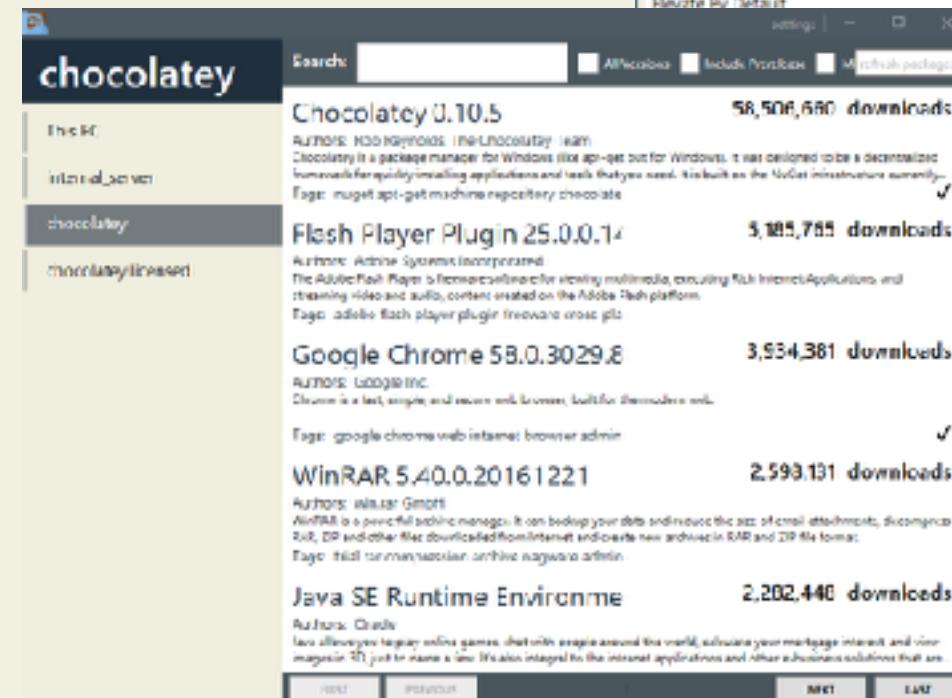
PS C:\packages> refreshenv ←
Refreshing environment variables from the registry...
Finished
PS C:\packages> git
usage: git [--version] [--help] [-c <path>] [-c name=value]
  [--exec-path=<path>] [--html-path] [--man-path] [--info-path]
```

- Track software installation in Programs & Features to map packages to system installs
- Track environment variable changes
- Leave out guesswork by reporting on software installation location
- Upgrades - Use XML Document Transform (XDT) for .NET configuration file changes
- Exclusive to Chocolatey - Use new tools / commands without closing / re-opening your shell for environment changes to take effect



# Graphical Interface - ChocolateyGUI

- Configure Chocolatey
- Manage software installations



# Automatic Uninstallation

```
PS C:\packages> choco uninstall 1password -y
Chocolatey v0.9.10-beta1-422-g335bc01 Business
Uninstalling the following packages:
1password

1password v4.6.0.598
Running auto uninstaller...
Auto uninstaller has successfully uninstalled 1password.
1password has been successfully uninstalled.

Chocolatey uninstalled 1/1 packages. 0 packages failed.
See the log for details (C:\ProgramData\chocolatey\logs\choco.log)
```

- Exclusive to Chocolatey - Automatically uninstall over 90% of installations without uninstall script
- AutoUninstaller reduces time by not developing and managing uninstall scripts

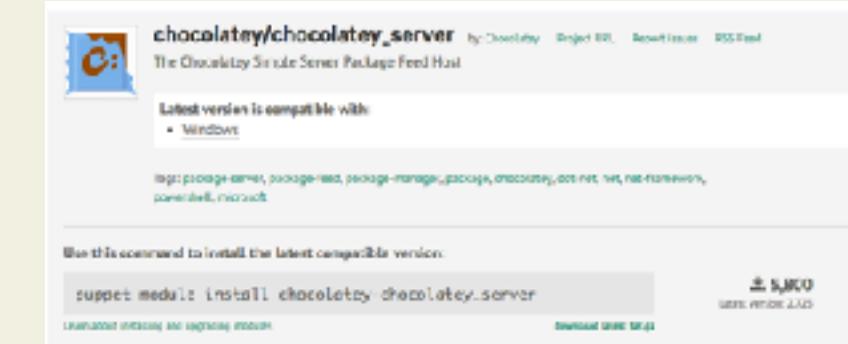


# Package Repository



# Hosting Your Own Package Server

- <https://chocolatey.org/docs/how-to-host-feed>
- Non-Windows Hosting
  - Artifactory 
  - Sonatype Nexus 
- NuGet Gallery proper 
- ProGet / MyGet 
- NuGet.Server / Chocolatey.Server
- Puppet - chocolatey/chocolatey\_server module
- Visual Studio Team Services



# Creating Software Deployment “Packages”





# Chocolatey Packages

- Zip files + Versioning, Dependencies & PowerShell
- Metadata - Software Information / Package Information
- PowerShell - <https://chocolatey.org/docs/helpers-reference>
  - 30+ Built-in functions - turn hard tasks into 1 liners
  - Handle additional missing installer logic (like add to PATH)
  - Add options missing from installer arguments
- Files - drop in binaries, native installers

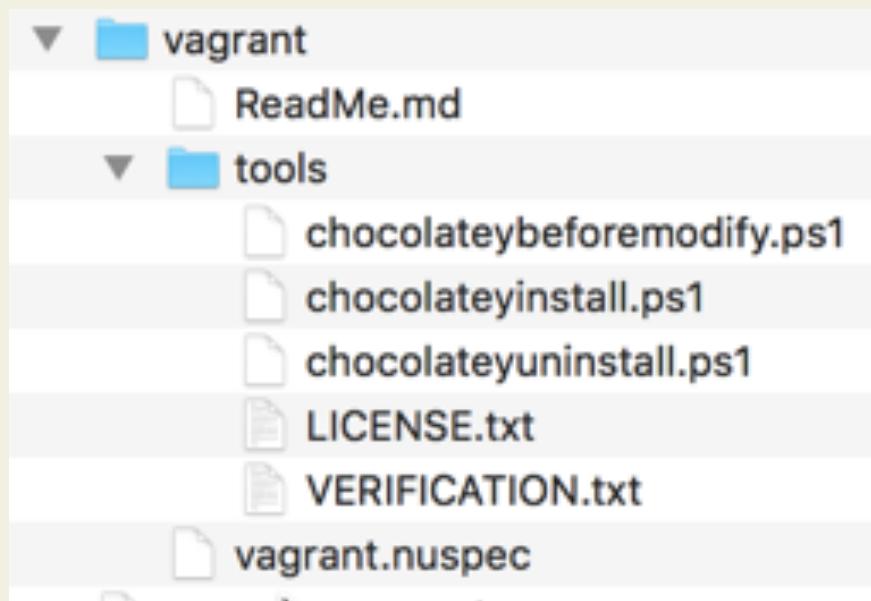




# Creating Packages

- <https://chocolatey.org/docs/create-packages>
- choco new
  - Generates package files with most of the work done
  - Create your own packaging templates!





```

<xml version="1.0" encoding="UTF-8">
<!-- Do not remove this test for UTF-8: if "Ω" doesn't appear as greek uppercase omega letter enclosed in quotation
not this one. -->
<package xmlns="http://schemas.microsoft.com/packaging/2015/06/nuspec.xsd">
  <metadata>
    <!-- == PACKAGE SPECIFIC SECTION == -->
    <id>vagrant</id>
    <version>1.9.2</version>
    <packageSourceUrl>https://github.com/chocolatey/chocolatey-coreteampackages/tree/master/automation/vagrant</packageSourceUrl>
    <owners>Chocolatey Core Community Team</owners>
    <!-- ----- -->
    <!-- == SOFTWARE SPECIFIC SECTION == -->
    <title>Vagrant (Install)</title>
    <authors>Mitchell Hashimoto, John Bender, HashiCorp</authors>
    <projectUrl>https://www.vagrantup.com</projectUrl>
    <iconUrl>https://cdn.rawgit.com/chocolatey/chocolatey-coreteampackages/62469751380dc5a9f2620f4b34c08fd7c741e5a5/icon.png</iconUrl>
    <copyright>2015 - 2017 HashiCorp</copyright>
    <licenseUrl>https://github.com/mitchellh/vagrant/blob/master/LICENSE</licenseUrl>
    <requireLicenseAcceptance>true</requireLicenseAcceptance>
    <projectSourceUrl>https://github.com/mitchellh/vagrant</projectSourceUrl>
    <docsUrl>https://docs.vagrantup.com/docs/intro</docsUrl>
    <mailingListUrl>https://groups.google.com/forum/#!forum/vagrant-up</mailingListUrl>
    <bugTrackerUrl>https://github.com/mitchellh/vagrant/issues</bugTrackerUrl>
    <tags>vagrant admin sandbox virtual machine testing VM VirtualBox VMware cross-platform cross-click</tags>
    <summary>Vagrant - Development environments made easy.</summary>
  </metadata>
  <description>
    Vagrant provides easy to configure, reproducible, and portable work environments built on top of industry-standard
    workflow to help maximize the productivity and flexibility of you and your team.
  </description>
  <releaseNotes><CHANGELOG>https://github.com/mitchellh/vagrant/blob/master/CHANGELOG.md</CHANGELOG></releaseNotes>
  <!-- ----- -->
  </metadata>
  <files>
    <file src="tools\**" target="tools" />
  </files>
</package>

```





**Will Button**  
@wfbutton

Follow



Created my first @chocolatelynuget package. It was a pretty #awesome experience.

RETWEETS

3

LIKES

4



11:26 PM - 31 May 2016



3

4

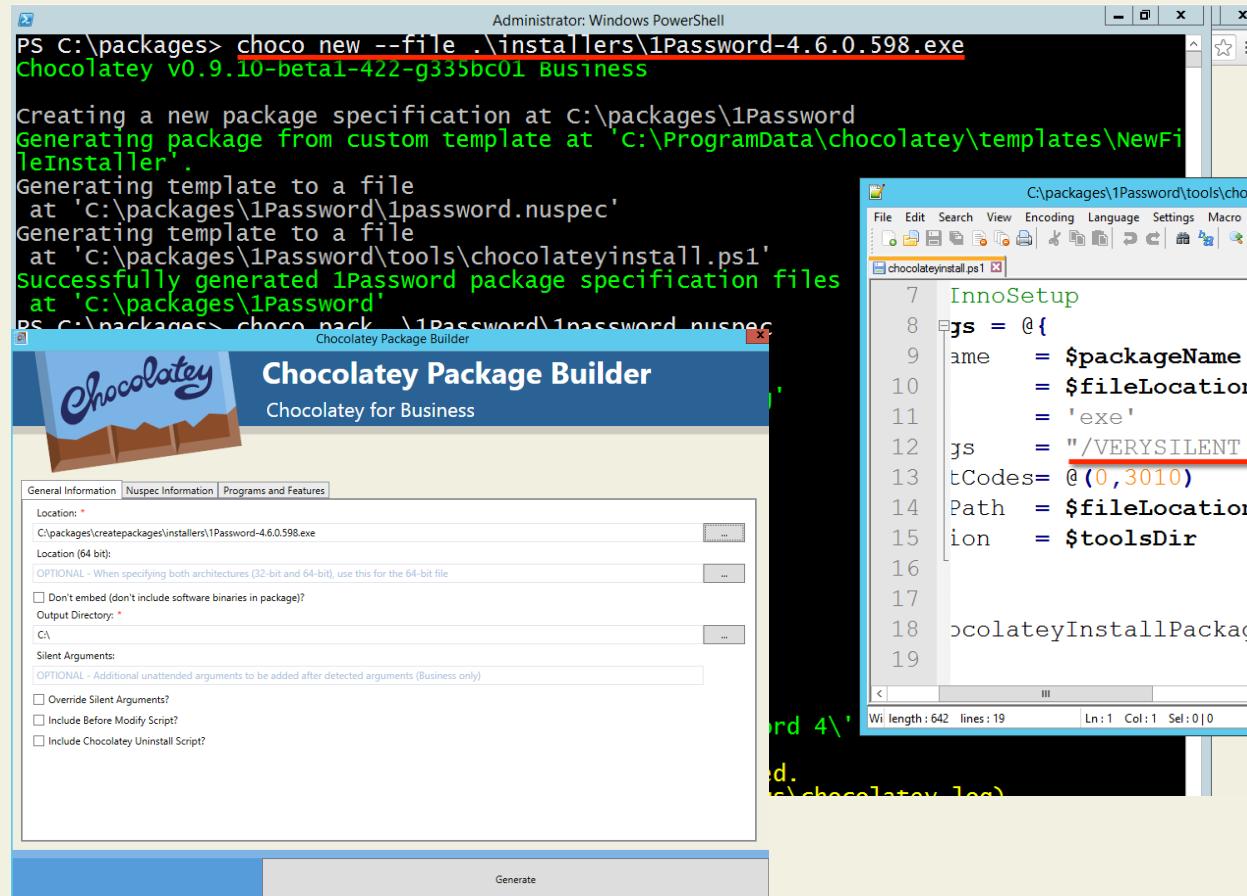


# Package Builder

**“Generates software deployment packages”**



# Package Builder



- Package Builder automatically creates high quality packaging from an installer/zip in 5-10 seconds
- Determines everything necessary for silently installing software
- Supports passing urls (and checksums) - downloads files first
- Allows customization
- Supports exe, msi, 7z, zip, msu, and msp files



# How does it work?







# Package Internalizer

**“Convert existing packages  
to offline”**





# Package Internalizer

- Take advantage of existing packages without dependency on the internet
- Downloads existing package and all remote resources
- Recompiles package to use those internal resources
- Option to download and point to other locations
- Ability to host packages on private internal repositories
- Visual Interface coming

```
PS C:\packages> choco download --recompile git.install
Chocolatey v0.9.10-beta1-426-g3c8b16e Business
Downloading an existing package to C:\packages\download

git.install v2.8.4 [Approved]
Found Install-ChocolateyPackage. Inspecting values for remote resources.
Found 'https://github.com/git-for-windows/git/releases/download/v2.8.4.windows-2.8.4-32-bit.exe' for replacement.
Found 'https://github.com/git-for-windows/git/releases/download/v2.8.4.windows-2.8.4-64-bit.exe' for replacement.

Download of 'Git-2.8.4-32-bit.exe' completed.
Replacing 'https://github.com/git-for-windows/git/releases/download/v2.8.4.windows-2.8.4-32-bit.exe' with '$(Split-Path -parent $MyInvocation.MyCommand.Definition.Path)\Git-2.8.4-32-bit.exe'

Download of 'Git-2.8.4-64-bit.exe' completed.
Replacing 'https://github.com/git-for-windows/git/releases/download/v2.8.4.windows-2.8.4-64-bit.exe' with '$(Split-Path -parent $MyInvocation.MyCommand.Definition.Path)\Git-2.8.4-64-bit.exe'
Updating chocolateyInstall.ps1 with local resources.
Recompiling package.

Recompiled package files available at 'C:\packages\download\git.install'
Recompiled nupkg available in 'C:\packages'
```





# Package Synchronizer





# You detect a theme for feature names





# Package Synchronizer - Auto Sync

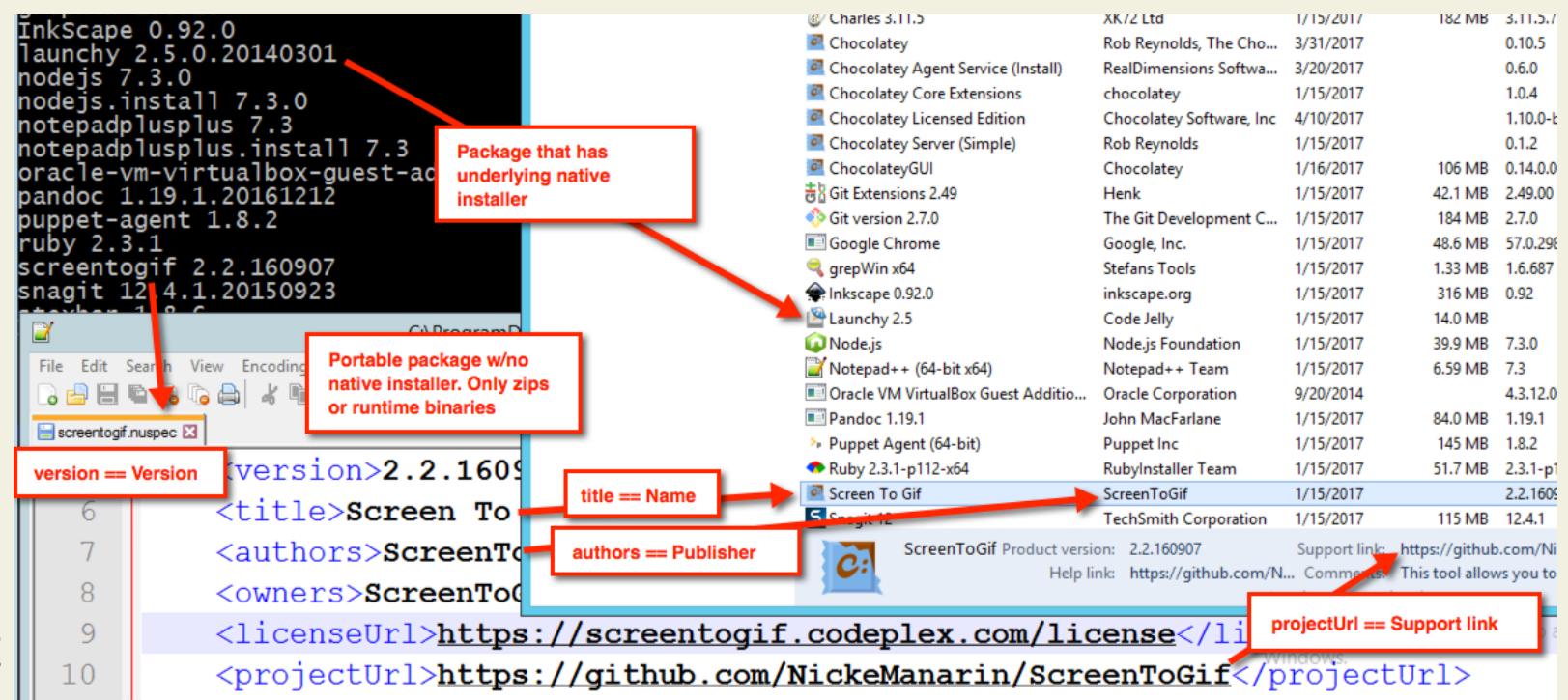
```
PS C:\> choco list -lo
Chocolatey v0.9.10-beta1-422-g335bc01 Bu
[Synchronize] Removing 1password package
tey.
chocolatey 0.9.10-beta-20160609
chocolatey.extension 1.4.0
chocolatey.server 0.1.1
DotNet4.0 4.0.30319.20141222
git 2.7.0.0
git.install 2.8.4
GoogleChrome 51.0.2704.84
Launchy 2.5.0.20140301
roundhouse 0.8.5.0
9 packages installed.
PS C:\>
```

- Chocolatey maintains state based on packages. System state can be manipulated outside of Chocolatey
- Any Chocolatey command will trigger synchronization in licensed editions of Chocolatey
- Package Synchronizer syncs with manual software removal
- Syncs w/software that automatically upgrades, such as Chrome



# Package Synchronizer - All Packages in Programs and Features

- Any Chocolatey package installed will result in an entry in Programs and Features, even if it doesn't have a native install
- Supporting legacy inventory reporting systems is now a snap
- Do not need to build MSIs / Installers for internal use just to support legacy reporting



# Package Synchronizer - Choco Sync Command

```
PS C:\> choco sync -r
Package Id|Display Name|Version|New Package
7zip|7-Zip 16.02 (x64)|16.2|False
oracle-vm-virtualbox-guest-additions|Oracle V
12.0|True
bitvise-ssh-server|Bitvise SSH Server 5.60 (r
PS C:\>
```

- Brings all software in Programs and Features under Chocolatey management
- Generates packaging and baselines to Chocolatey install
- Provides packaging code to take back to source control



# How does it work?







# Self-Service Packages



# Self-Service Installer / Background Mode

The screenshot displays a Windows PowerShell window titled "Windows PowerShell" running under "nonadmin" user. The command entered is "choco install adobereader". The output shows "Chocolatey v0.10.3-28-gb738646 Business" and "Running in background mode". A red arrow points from the "Running in background mode" text to a red box containing the text "Running from background service". The process continues with "Installing the following packages: adobereader" and "By installing you accept licenses for the packages.". It then shows the download of "adobereader v2015.007.20033.01" from "http://ardownload.adobe.com/pub/adobe/reader/DC1500720033\_MUI.exe". The download completes successfully, and the package is installed to "C:\Program Files (x86)\Adobe\Acrobat Reader DC\". The entire process is completed without a UI, demonstrating "Background mode only for install / upgrade (configuring commands allowed on roadmap)".

Windows PowerShell

```
PS C:\Users\nonadmin> choco install adobereader
Chocolatey v0.10.3-28-gb738646 Business
Running in background mode
Running from background service
Installing the following packages:
adobereader
By installing you accept licenses for the packages.

adobereader v2015.007.20033.01
adobereader package files install completed. Performing other installation steps...
Downloading adobereader
    from 'http://ardownload.adobe.com/pub/adobe/reader/DC1500720033_MUI.exe'

Completed download of 'AcroRdrDC1500720033_MUI.exe' (146.89 MB)
can engines flagged this assembly as a possible threat. If any of these
false positives we fail at 4 minutes. This file has been flagged by multiple
indicate this file is probably malicious. You can learn more about this file at
total.com/file/dfc4b3c70b7ecaeb/
asis/
C1500720033_MUI.exe...

_MUI.exe has been installed.
adobereader was successful.
d to 'C:\Program Files (x86)\Adobe\Acrobat Reader DC\'.

1/1 packages. 0 packages failed.
tails (C:\ProgramData\chocolatey\logs\chocolatey.log).

Adobe Acrobat Reader DC
```

Google Chrome 56.0.2924.87

Authors: Google Inc. | Maintainers:

Downloads 346,220

Total Downloads 3,168,471

Last update 2/2/2017 12:10 AM

Package Size 4.65 KB

Project Site License Report Abuse

Pin Reinstall Uninstall

## Background Mode / Self-Service Installer

- Non-admin can install only from approved, configured sources
- Chocolatey Agent Service validates commands prior to running
- Output streams as it happens
- Attempted abuses are logged for further review
- Background mode only for install / upgrade (configuring commands allowed on roadmap)
- GUI on roadmap



# Roadmap



# Roadmap

- Upcoming Central Management UI
- WSA / Windows Nano Support
- PowerShell PackageManagement Official Provider
- Package Grid
- Package Enhancements
- More Security / UX improvements
- Package Throttle
- Choco Deploy
- Possible support on other platforms



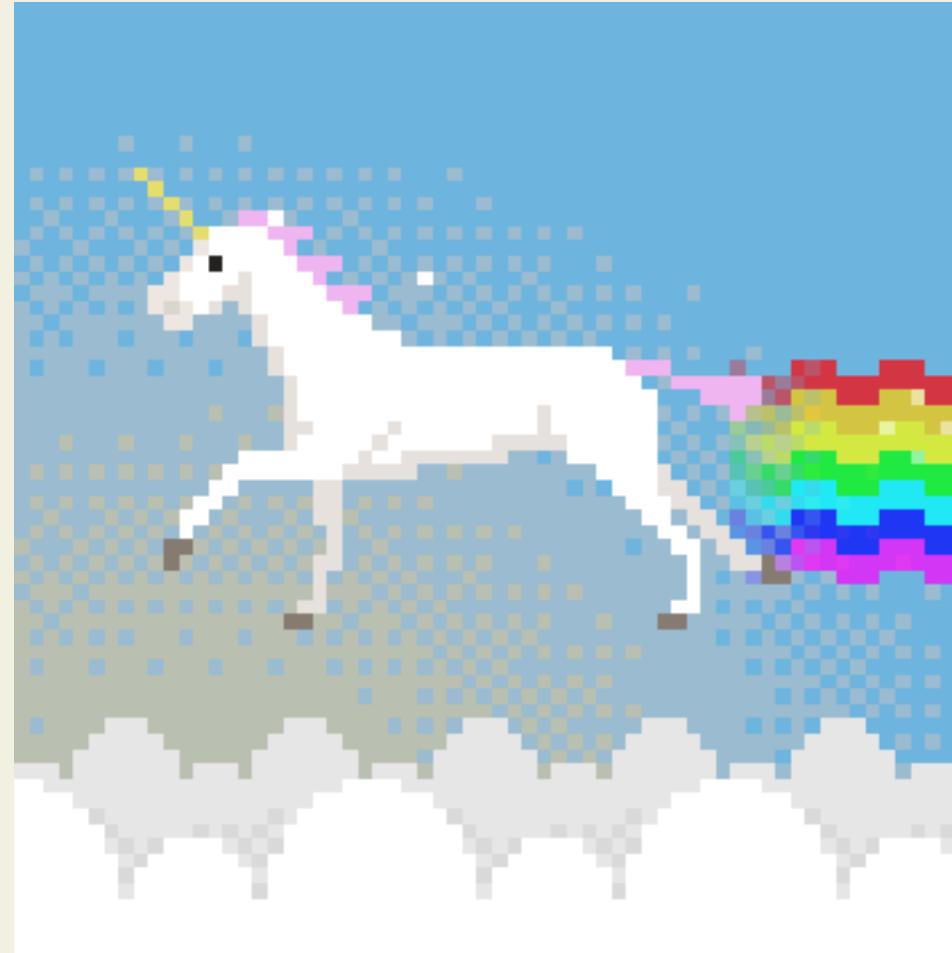
# Demo





# This is you







# This is you on Chocolatey







# Any Questions?





- Rob
- @ferventcoder
- ferventcoder at gmail



Evaluate Chocolatey for Business in your environment - special discounts available conference attendees - reach out at <https://chocolatey.org/contact> for details

