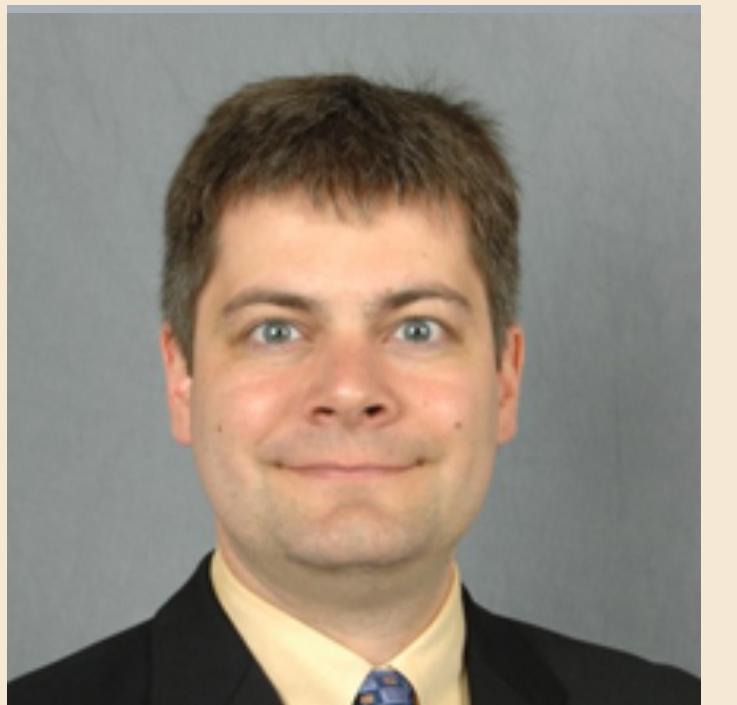




# Software and Configuration Deployment for Distributed IT Teams



# Chad Jacobsen

Iowa State University



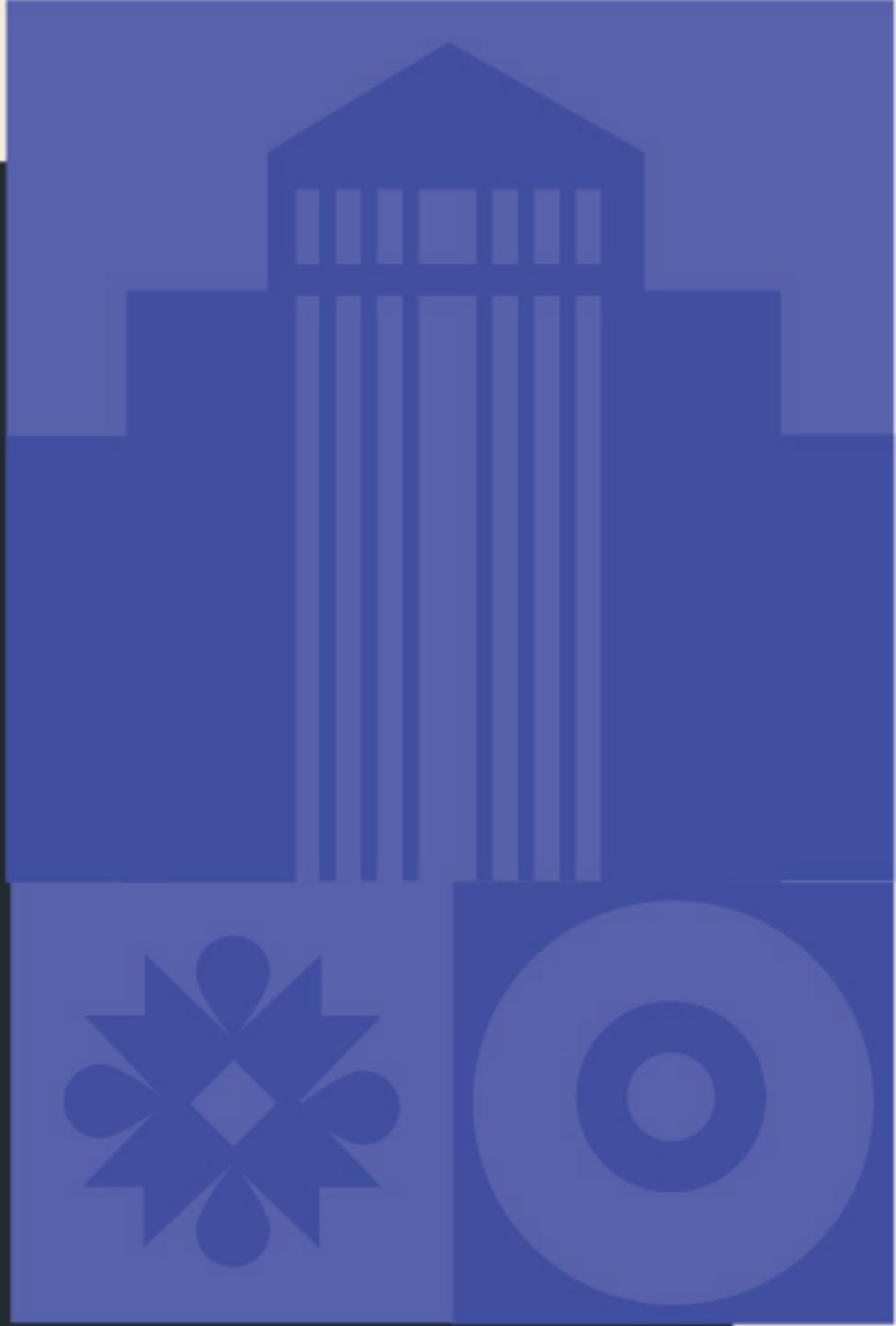
# Jennifer Johnson

Iowa State University



# Software and Configuration Deployment for Distributed IT Teams

- Apple @ ISU overview
- Challenges and lessons learned
- Global policies & config profiles
- Automation @ ISU
- Tips for distributed teams



# Iowa State University

- Ames, Iowa
- 7 colleges
- 30,000 undergrad, grad, professional students
- 15,000 faculty, staff, and part-time employees



# Apple @ ISU

- Central & distributed IT
  - Central IT (ITS)
  - College or unit IT areas
- 6,500 Macs & 3,200 Mobile
- 54 Jamf Sites\*
- FileVault required\*



# Why that many Jamf Sites??

- Individual college and unit IT areas
  - Ability to manage **their** devices
- Jamf Pro campus-wide server is valuable
  - Centralize the cost & staff maintaining Jamf Pro
  - Reduce duplicate work
  - 50+ separate Jamf servers is too intensive and costly
- Jamf Pro product design



# Apple @ ISU Roles

- Enterprise Admins
  - Maintain Jamf Pro and Apple services
- Unit Admins
  - Major users of Apple products
- Site Admins
  - Device enrollment and management



# Apple @ ISU Enterprise Admins

- Manage core Jamf and Apple services
- Package common good software
- Maintain set of global self service policies and global configuration profiles
- Handle institutional issues and reporting
- Site Admin training and support questions



# Apple @ ISU Unit Admins

- Biweekly meetings with Enterprise Admins
  - Reps for their college or major unit
  - Report issues in their areas
  - Permissions to add/modify/delete printers, packages, scripts from Jamf
  - Resource for Jamf site admins



# Apple @ ISU Site Admins

- Day-to-day operations and end user support
- Deploy and maintain devices
  - Mac lab support and deployments
- Purchase and deploy unique software
- Inform enterprise admins on staff changes and when devices leave ISU



# Apple @ ISU Overview

- Every major unit or department has a site
  - Some IT staff manage multiple sites
- Enterprise admins maintain Jamf permissions
- Apple School Manager (ASM)
  - MDM server for each site
  - VPP account/location for each site



# Apple @ ISU Jamf Conventions

- Prefix all the things [SITENAME]
  - isu or [Full JSS] for enterprise things
- Packages
  - In notes/info include
    - Who, when, what
    - OS requirements and category
  - Don't replicate things others have done



# Apple @ ISU Lifecycle Management

- Procurement via on-campus bookstore
- Bookstore notifies enterprise admins for assignment to site
- Enterprise admins assign to site in ASM
- Site admin assigns to PreStage
- Turn on device and enroll



# Apple @ ISU Lifecycle Management

- Device enrolled with normal operations
  - Redeployed, moved, etc.
  - Enterprise admins assist if needed
- Jamf SCCM Plug-in to ingest Jamf data into SCCM then into ServiceNow
- PowerBI dashboards for reporting
  - <https://go.iastate.edu/RDJXSQ>



# Apple @ ISU Lifecycle Management

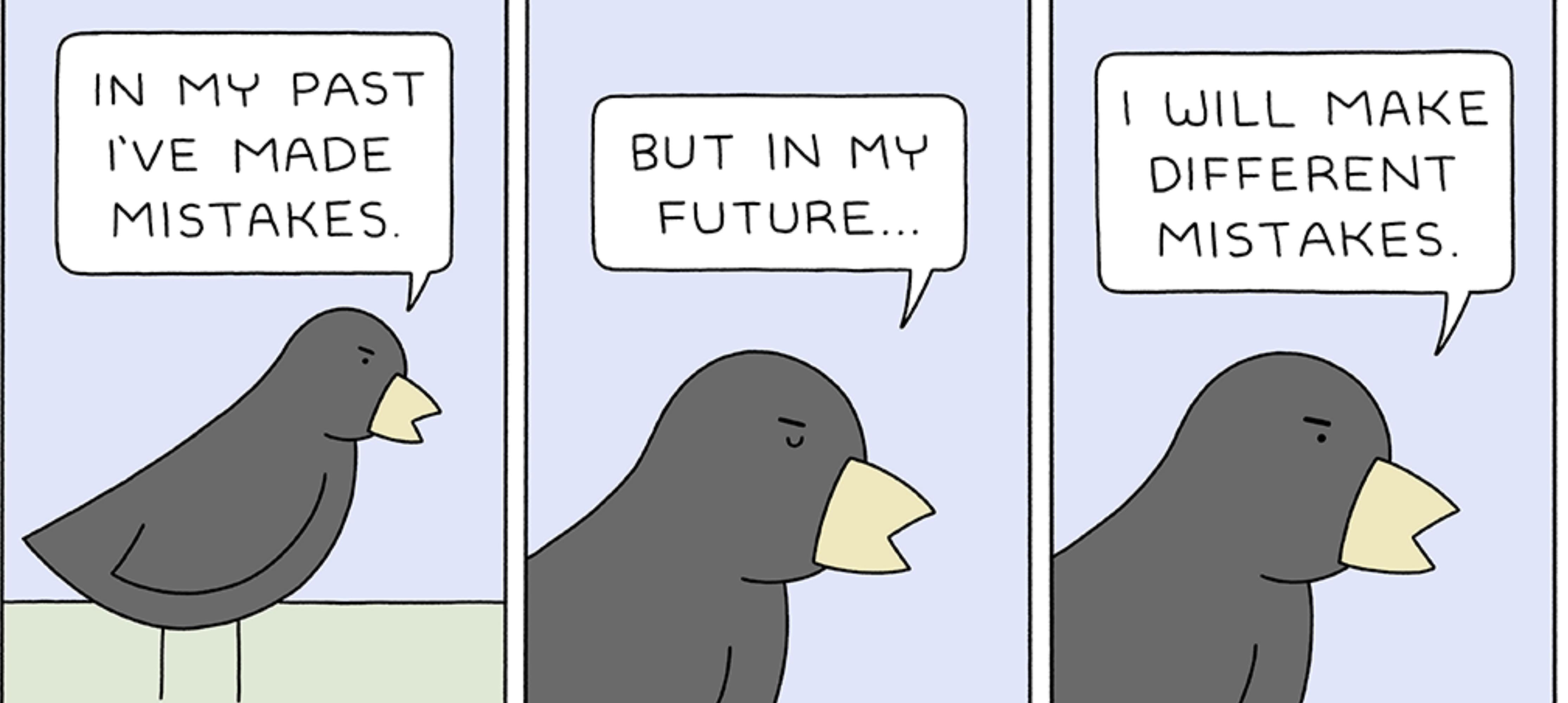
- End of life devices go to ISU Surplus for redistribution or sale to general public
- Site admins notify enterprise admins
  - Delete from Jamf and unassign from ASM
- Weekly reports of sold Apple devices
  - Release from ASM
- 2x yearly unmanage and remove from Jamf



# Apple @ ISU Training & Communications

- Bi-weekly meeting with unit admins
- Campus-wide meeting 2-3 times per year
- Periodic campus-wide workshops
- Documentation unique to ISU Apple setup
  - Jamf Training site
  - Welcome visits to new IT staff
  - Email list and Teams channels





IN MY PAST  
I'VE MADE  
MISTAKES.

BUT IN MY  
FUTURE...

I WILL MAKE  
DIFFERENT  
MISTAKES.

# Lessons Learned and Challenges

<https://poorlydrawnlines.com/comic/made-mistakes/>

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# Apple @ ISU Lessons Learned

- Too many sites
  - Compounds enterprise admin time
  - Duplicate effort and time for site admins
- Consolidating sites
  - Automated Device Enrollment (DEP/ADE) helps tremendously



# Apple @ ISU Lessons Learned

- IT Admins' Apple and Jamf knowledge
  - VPP token maintenance
  - Moving critical mass
  - Communicate with clarity and priority



# Apple @ ISU Challenges

- Jamf Pro product design
  - Flat structure
  - Reporting and scoping by Jamf site
  - Rare issues and bugs with sites
- Technical implementations
  - Reliance on enterprise admins to get it right



# Global Offerings @ ISU



# Apple @ ISU Global Offerings

- Packages and scripts
- Policies
  - Global Self Service
  - Custom Trigger
- Configuration Profiles
- Specialized installs and configurations
  - Microsoft Defender and TikTok Block



# Apple @ ISU Global Self Service Policies

- Provide consistent Mac environment for users
- All sites included by default
  - Opt-out only
- Consistent name, category, and descriptions
- 40 software titles and tools
- Reduce duplicate effort by IT staff



# Apple @ ISU Global Self Service Policies

The screenshot shows the Jamf Pro Self Service interface. On the left is a sidebar with categories like Business, Communication, Design, etc., and a 'ISU-Global' section which is currently selected. The main area displays a grid of software packages:

- Adobe Acrobat Reader 23.003.20244 (Install button)
- Adobe Creative Cloud Desktop Application (Install button)
- Audacity 3.3.3.0 (Install button)
- Box Drive (CyBox) 2.33.130 (Install button)
- Cisco Secure Client (VPN) (Reinstall button)
- Fetch (Install button)
- Firefox 115.0.2 (Install button)
- Google Chrome (Install button)
- Opera (Install button)
- Pinapple (Install button)

At the bottom left is a 'Log In' button.

This screenshot shows a detailed view of a software policy for Cisco Webex 43.7.0.26612. It includes:

- Download Size: 508 MB
- Version: 43.7.0.26612
- A note stating: "This Self Service policy is provided by Iowa State University."
- A note about updates: "The latest version of Webex will be installed. An icon will be placed in your Dock. Webex will automatically update itself using the vendor's built-in mechanism."
- A note for existing users: "If you have an older version already installed, please completely quit Webex by using Webex>Quit or (⌘+Q) before proceeding."
- A final note: "Please contact your local IT group with any questions."

# Apple @ ISU Global Configuration Policies

- Common, often replicated config profiles
- Focus on easing user access rather than restrictive payloads
- Not all-things-to-all-people
- 8 Global config profiles for macOS 11+ & iOS



# Apple @ ISU Global Configuration Policies

- Opt-In only
  - Site admins create a smart group
  - Send request to be added
  - Exclude DeepFreeze Macs
- Configuration Profile schemas and plists kept in GitHub



# Automation @ ISU



# Apple @ ISU Software Packaging

- Enterprise admins overwrite existing packages
- Naming and packaging schema
  - Loosely followed
- Manual work by enterprise admins
- Duplicate and out of date packages
- Confusion about software availability, maintainers, and version or update status



# Automate Software Packaging

- Started Fall 2022
- Automate packaging
  - AutoPkg
- Automate package upload to Jamf
  - Jamf Upload
- Automate package notifications
  - Microsoft Teams



# AutoPkg and Jamf Upload

- Standardize on YAML recipes
- Packages isu-%NAME%-%version%.pkg
- <https://maclabs.jazzace.ca/2022/07/14/jamfuploader.html>
- <https://github.com/grahampugh/jamf-upload/>
- #jamf-upload on MacAdmins Slack



# Jamf Upload

- Can't overwrite existing packages
- Updates up to 3 policies
  - Custom Trigger
  - Preview Self Service or Global Self Service
- Warned site admins to not use these packages directly in their policies
- Sends Teams notifications



# Jamf Upload

- Examples in GitHub
  - .jamf recipe templates
  - Using jcds\_mode
  - Only upload a package if different version

```
Description: |
Downloads the latest version of Google Chrome and creates a package
Then uploads the package to Jamf Pro server
Creates or updates a Global Self Service policy
Creates or updates a policy using a custom trigger
Both policies are scoped to all computers
Identifier: com.github.isuits.jamf.Chrome
ParentRecipe: com.github.isuits.pkg.Chrome
MinimumVersion: "2.3"
```

```
Input:
NAME: "Google Chrome"
SHORT_NAME: "GoogleChrome"
CATEGORY: "Internet"
PACKAGE_NOTES: "Generated and added via AutoPkg Jamf Uploader process"
PACKAGE_OS_REQUIREMENTS: "13.x,12.x,11.x,10.15.x"
PACKAGE_REPLACE: "False"
# Set stop criteria
UPDATE_PREDICATE: "pkg_uploaded != True"
```

```
Process:
- Processor: com.github.grahampugh.jamf-upload.processors/JamfCategoryUpload
  Arguments:
    category_name: "%CATEGORY%"

- Processor: com.github.grahampugh.jamf-upload.processors/JamfPackageUpload
  Arguments:
    pkg_category: "%CATEGORY%"
    os_requirements: "%PACKAGE_OS_REQUIREMENTS%"
    pkg_info: "%NAME% %version%"
    pkg_notes: "%PACKAGE_NOTES%"
    replace_pkg: "%PACKAGE_REPLACE%"

- Processor: StopProcessingIf
  Arguments:
    predicate: "%UPDATE_PREDICATE%"
```

# Jamf Upload

- Global Self Service
  - Use existing groups
  - Limit to supported OS's
- Preview Self Service
  - Limited group (AD)
- Custom trigger policies
  - Scoped to All Computers



```
# Self Service Policy Settings
SELF_SERVICE_POLICY_TEMPLATE: "Policy_SelfService_Global.xml"
SELF_SERVICE_POLICY_NAME: "[Full JSS] %NAME%"
SELF_SERVICE_POLICY_FREQUENCY: "Ongoing"
SELF_SERVICE_POLICY_REPLACE: "true"
SELF_SERVICE_POLICY_RECON: "false"
SELF_SERVICE_POLICY_SCRIPT_1: ""
SELF_SERVICE_POLICY_SCRIPT_PRIORITY_1: ""
SELF_SERVICE_POLICY_SCRIPT_2: ""
SELF_SERVICE_POLICY_SCRIPT_PRIORITY_2: ""

# Self Service Feature and Categories
SELF_SERVICE_POLICY_CATEGORY: "ISU-Global"
SELF_SERVICE_FEATURE_MAIN_PAGE: "false"
SELF_SERVICE_POLICY_CATEGORY_1: "%CATEGORY%"
SELF_SERVICE_POLICY_CATEGORY_FEATURE_1: "false"
SELF_SERVICE_POLICY_CATEGORY_2: "%CATEGORY%"
SELF_SERVICE_POLICY_CATEGORY_3: "%CATEGORY%"
SELF_SERVICE_POLICY_CATEGORY_4: "%CATEGORY%"

# Self Service Policy information
SELF_SERVICE_DISPLAY_NAME: "%NAME% %version%"
SELF_SERVICE_PACKAGE_SIZE: "172 MB" #In MB or GB, e.g. 42 MB
SELF_SERVICE_DESCRIPTION: |
    Download Size: %SELF_SERVICE_PACKAGE_SIZE%
    Version: %version%

This Self Service policy is provided by Institution.

The latest version of **%NAME*** will be installed. An icon will be placed in your Dock. %NAME% will automatically update itself using the vendor's built-in mechanism.

If you have an older version already installed, please completely quit %NAME% by using **%NAME%>Quit
(**%-Q**) before proceeding.

Please contact your **local IT group** with any questions.

SELF_SERVICE_ICON: "%NAME%.png"
SELF_SERVICE_BUTTON_UNINSTALL: "Install"
SELF_SERVICE_BUTTON_REINSTALL: "Reinstall"

# Self Service User Interaction
SELF_SERVICE_USER_INTERACTION_START: "Starting %NAME% installation policy."
SELF_SERVICE_USER_INTERACTION_FINISH: "%NAME% installation policy completed."

# Self Service Group Exclusion
SELF_SERVICE_GROUP_EXCLUSION_1: "[Full JSS] Global Self Service Exclusions - All"
# Example: [Full JSS] Macs with OS X 10.13.x or older
SELF_SERVICE_GROUP_EXCLUSION_2: "[Full JSS] Macs with OS X 10.12.x or older"
SELF_SERVICE_GROUP_EXCLUSION_3: "%SELF_SERVICE_GROUP_EXCLUSION_1%"
SELF_SERVICE_GROUP_EXCLUSION_4: "%SELF_SERVICE_GROUP_EXCLUSION_1%"
SELF_SERVICE_GROUP_EXCLUSION_5: "%SELF_SERVICE_GROUP_EXCLUSION_1%"
```

Computers : Policies

← [Full JSS] Google Chrome

Options Scope Self Service User Interaction

Make the policy available in Self Service

**Self Service Display Name** Display name for the policy in Self Service (Self Service 10.0.0 or later)  
Google Chrome 115.0.5790.114

**Button Name Before Initiation** Name for the button that users click to initiate the policy  
Install

**Button Name After Initiation** Name for the button that users click to reinitiate the policy  
Reinstall

**Description** Description to display for the policy in Self Service

Download Size: 172 MB  
Version: 115.0.5790.114

This Self Service policy is provided by Iowa State University.

The latest version of "Google Chrome" will be installed. An icon will be placed in your Dock. Google Chrome will automatically update itself using the vendor's built-in mechanism.

If you have an older version already installed, please completely quit Google Chrome by using "Google Chrome>Quit" or ("⌘-Q") before proceeding.

Please contact your "local IT group" with any questions.

Ensure that users view the description  
Force users to view the description before the policy runs

**Notification**

Display notifications for the policy

**Icon** Icon to display for the policy. It is recommended that you use a file with the GIF or PNG format. The recommended size is 512x512 pixels.  
 Google Chrome.png

[Full JSS] Adobe Connect Custom Trigger	Ongoing	ISUAdobeConnect
[Full JSS] Adobe Acrobat Reader Custom Trigger	Ongoing	ISUAdobeReader
[Full JSS] Audacity Custom Trigger	Ongoing	ISUAudacity
[Full JSS] Box Drive (CyBox) Custom Trigger	Ongoing	ISUBoxDrive
[Full JSS] Dropbox Custom Trigger	Ongoing	ISUDropbox
[Full JSS] EndNote 20 Custom Trigger	Ongoing	ISUEndNote20
[Full JSS] EndNote 21 Custom Trigger	Ongoing	ISUEndNote21
[Full JSS] Firefox Custom Trigger	Ongoing	ISUFirefox
[Full JSS] Firefox ESR Custom Trigger	Ongoing	ISUFirefoxESR
[Full JSS] GitHub Desktop Custom Trigger	Ongoing	ISUGitHubDesktop
[Full JSS] Google Chrome Custom Trigger	Ongoing	ISUGoogleChrome
[Full JSS] Grammarly Desktop Custom Trigger	Ongoing	ISUGrammarlyDesktop
[Full JSS] Handbrake Custom Trigger	Ongoing	ISUHandbrake

Files and Processes Configured >

Microsoft Device Compliance Not Configured

**Execute Command** Command to execute on computers. This command is executed as the "root" user  
jamf policy -event ISUGitHubDesktop

# GitHub Actions

- Low cost, low effort, low complexity, max gain
- No physical AutoPkg server
  - Avoid costs and access control, security, patching, & hardware failure
- GitHub Enterprise
  - GitHub Actions
  - GitHub Secrets



# GitHub Actions

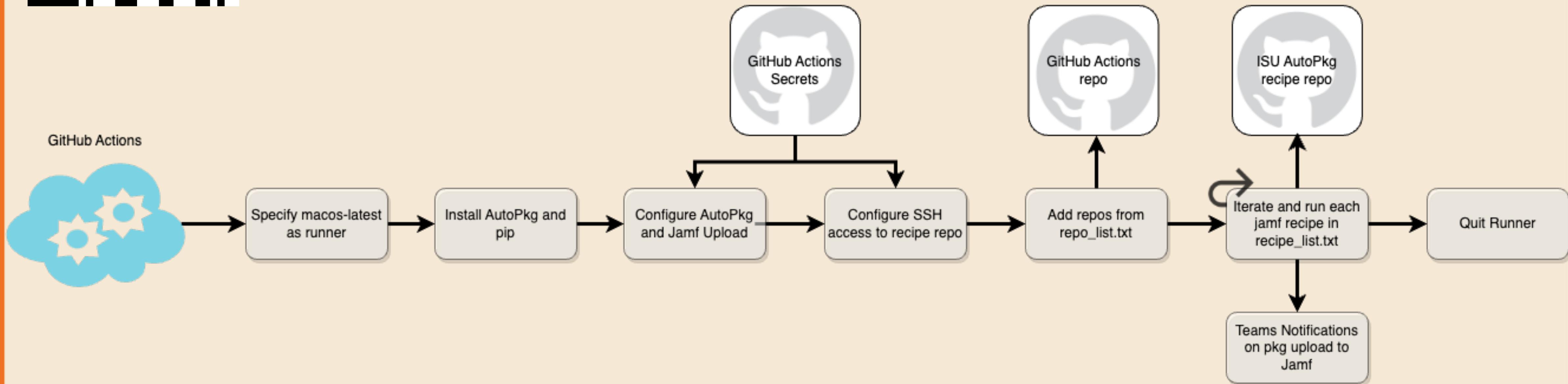
- Modified Gusto's workflow
  - <https://github.com/Gusto/it-cpe-opensource>
- Add ISU repo behind SSH and SSO
- Use GitHub Secrets

```
- name: Configure AutoPkg and Git
  run: |
    defaults write com.github.autopkg RECIPE_OVERRIDE_DIRS "$(pwd)"/overrides/
    defaults write com.github.autopkg RECIPE_REPO_DIR "$(pwd)"/repos/
    defaults write com.github.autopkg FAIL_RECIPES_WITHOUT_TRUST_INFO -bool YES
    defaults write com.github.autopkg GITHUB_TOKEN "${{ secrets.GITHUB_TOKEN }}"
    defaults write com.github.autopkg TEAMS_URL "${{ secrets.ITS_JAMF_JSS_PROD_TEAMS_URL }}"
    defaults write com.github.autopkg SLACK_URL "${{ secrets.ITS_JAMF_JSS_PROD_SLACK_URL }}"
    defaults write com.github.autopkg JSS_URL "${{ secrets.ITS_JAMF_JSS_PROD_URL }}"
    defaults write com.github.autopkg API_USERNAME "${{ secrets.ITS_JAMF_JSS_PROD_API_USERNAME }}"
    defaults write com.github.autopkg API_PASSWORD "${{ secrets.ITS_JAMF_JSS_PROD_API_PASS }}"
    defaults write com.github.autopkg jcds_mode "true"

    git config --global user.name "runner"
    git config --global user.email "runner@githubactions.local"

- name: Configure SSH for ITS Jamf recipe repo
  run: |
    mkdir -p ~/.ssh/
    echo "${{ secrets.ITS_JAMF_AUTOPKG_RECIPES_KEY }}" > ~/.ssh/id_ed25519
    sudo chmod 600 ~/.ssh/id_ed25519
```



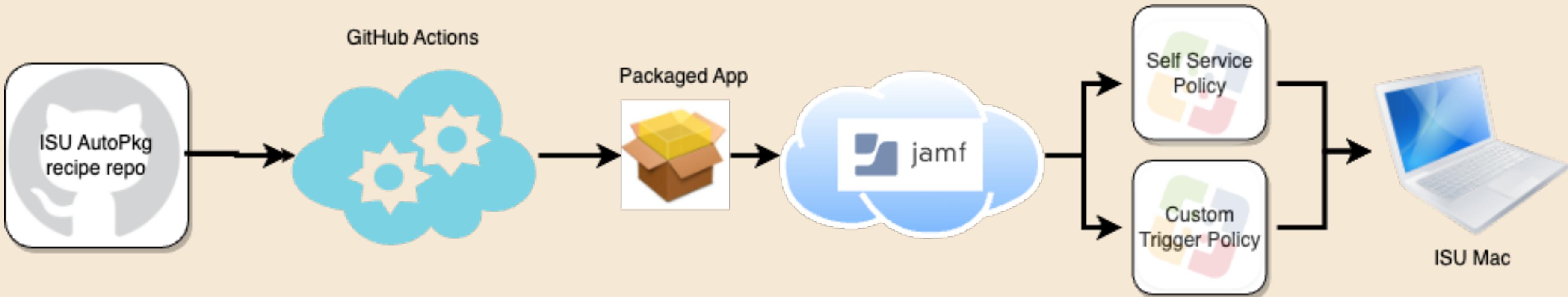


<https://go.iastate.edu/ZAZQU4>

# GitHub Actions Processes

- 2 runners, Dev and Prod
  - Test new recipes in Dev for awhile
  - Update overrides as recipes change
- Utilize change management (ServiceNow)
- Admin guide for setting up developer environment and add/update runners





```

The following new items were downloaded:
Download Path
-----
/Users/runner/Library/AutoPkg/Cache/local.jamf.Chrome/downloads/Google Chrome.pkg

The following packages were copied:
Pkg Path
-----
/Users/runner/Library/AutoPkg/Cache/local.jamf.Chrome/isu-Google Chrome-115.0.5790.114.pkg

The following packages were uploaded to or updated in Jamf Pro:
Category Name Pkg Name Pkg Path Version
----- -----
Internet Google Chrome isu-Google Chrome-115.0.5790.114.pkg /Users/runner/Library/AutoPkg/Cache/local.jamf.Chrome/isu-Google Chrome-115.0.5790.114.pkg 115.0.5790.114

The following dock items were created or updated in Jamf Pro:
Dock Item Id Dock Item Name Dock Item Type Dock Item Path
----- -----
244 Google Chrome App file:///Applications/Google%20Chrome.app/

The following policies were created or updated in Jamf Pro:
Policy Template Icon
----- -----
[Full JSS] Google Chrome /Users/runner/work/Jamf-Actions/Jamf-Actions/repos/com.github.iastate-its.Jamf-autopkg/Jamf Templates/Policy_SelfService_Global.xml Google Chrome.png
[Full JSS] Google Chrome Custom Trigger /Users/runner/work/Jamf-Actions/Jamf-Actions/repos/com.github.iastate-its.Jamf-autopkg/Jamf Templates/Policy_CustomTrigger_Global_NoDock.xml Google Chrome.png

The following items were queried from the VirusTotal database:
Name Ratio Permalink
----- -----
Google Chrome.pkg 0/54 https://www.virustotal.com/gui/file/0b89640d3abac416d723d7d3acd76648cba3b65b16fd341780d761794d02508c/detection/f-
0b89640d3abac416d723d7d3acd76648cba3b65b16fd341780d761794d02508c-1690332214
  
```



Settings : Computer management > Packages

← isu-Google Chrome-115.0.5790.114.pkg

**General**   **Options**   **Limitations**

**Display Name** Display name for the package  
isu-Google Chrome-115.0.5790.114.pkg

**Category** Category to add the package to  
Internet

**Filename** Filename of the package on the distribution point (e.g. "MyPackage.pkg")  
Choose File

**Manifest File**

Upload Manifest File

**Info** Information to display to the administrator when the package is deployed or uninstalled  
Google Chrome 115.0.5790.114

**Notes** Notes to display about the package (e.g. who built it and when it was built)  
Generated and added via AutoPkg Jamf Uploader process

NAME	FREQUENCY	TRIGGER	SCOPE	SITE
ISU-Global				
1 [Full JSS] Google Chrome	Ongoing	Self Service	All computers, 2 computer groups excluded	None
1 Start Message: Starting Google Chrome installation policy.				
2 Install isu-Google Chrome-115.0.5790.114.pkg				
3 Dock Item Google Chrome (Add To End)				
4 Complete Message: Google Chrome installation policy completed.				
ISUGoogleChrome				
1 Install isu-Google Chrome-115.0.5790.114.pkg				

Search > Google Chrome 115.0.5790.114

## Google Chrome 115.0.5790.114



Download Size: 172 MB  
Version: 115.0.5790.114

This Self Service policy is provided by Iowa State University.

The latest version of **Google Chrome** will be installed. An icon will be placed in your Dock. Google Chrome will automatically update itself using the vendor's built-in mechanism.

If you have an older version already installed, please completely quit Google Chrome by using **Google Chrome>Quit** or **(⌘-Q)** before proceeding.

Please contact your local IT group with any questions.

AutoPkg Yesterday 11:12 PM

New item uploaded to Jamf Pro

 AutoPkg  
<https://jss.its.iastate.edu:8443>

Title	Google Chrome
Version	115.0.5790.114
Category	Internet
Policy Name	[Full JSS] Google Chrome Custom Trigger
Package	isu-Google Chrome-115.0.5790.114.pkg

# AutoPkg Service Summary

- Rolled out April 2023
  - Started with 16 software titles
  - 34 software titles currently in production
- > 200 packages added to Jamf
- Documentation and cleanup
  - Purged > 600 old packages from Jamf
  - <https://github.com/BIG-RAT/Prune>



# Apple @ ISU What's Next

- AutoPkg GitHub Actions
  - Save compute time
  - Add JamfPackageCleaner processor
  - More cleanup of Jamf Pro server
  - GitHub Actions all the things!
  - Get Jamf site data



# Tips for Distributed Teams



# Distributed Environment Tips

- Identify your organization structure
- Determine what serves common good
- Lifecycle management
  - Enrolling new devices
  - Decide who's managing and doing what
  - Removing devices from environment



# Distributed Environment Tips

- What can Jamf do?
- Keep the platform safe and usable
  - Determine degree of autonomy for IT teams
  - What is handled centrally
  - Avoid chaos and tragedies
- The best technical option may not be the best

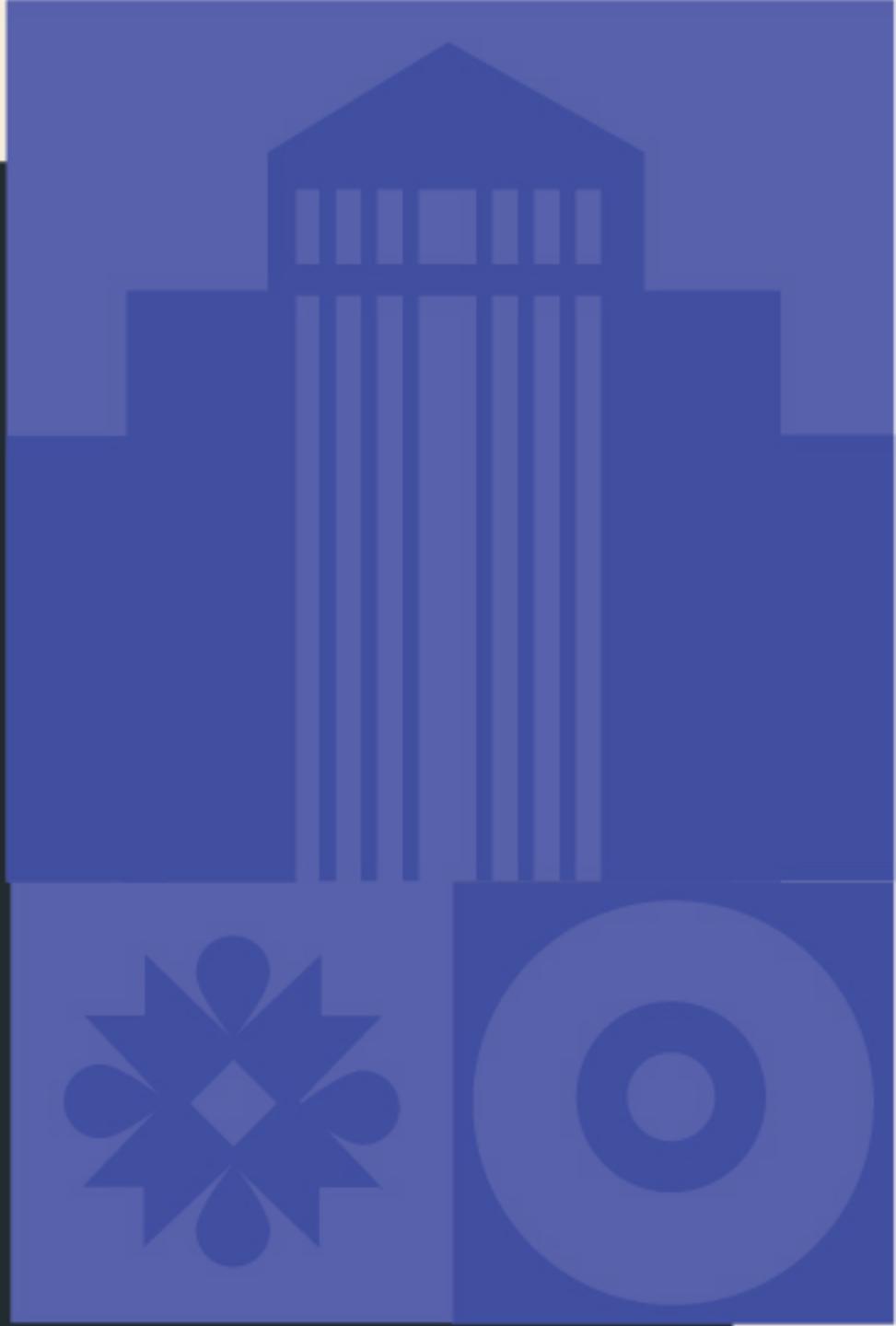


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- Shane Palmer
- Iowa State IT staff and Apple admins
- Matthew Nelson
- AutoPkg maintainers and #autopkg members
- Graham Pugh
- Folks at Meta and Gusto Engineering
- Others that have presented, written, contributed over the years



Thank you for  
listening!





**[https://go.iastate.edu/  
ZAZQU4](https://go.iastate.edu/ZAZQU4)**

# Additional Resources

- AutoPkg
  - <https://github.com/autopkg/autopkg>
- Gusto Engineering Blog Post
  - <https://engineering.gusto.com/running-autopkg-in-github-actions/>
- Facebook/Meta GitHub AutoPkg Runner
  - [https://github.com/facebook/IT-CPE/tree/main/legacy/autopkg\\_tools](https://github.com/facebook/IT-CPE/tree/main/legacy/autopkg_tools)
- Demystifying JamfUploader
  - <https://www.youtube.com/watch?v=3DcoVdVyXtU>

