Sustainable Automated Software Deployment Practices

Or, How I Learned to Stop Worrying and Love the Script

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Vision

Automating software installation using silent and unattended methods, with various levels of administrative intervention, from help desk to administrator.
Why?
- Efficiency
- Consistency
- Speed
- Control
- Service

Where?
- Computer labs
- Multi-user servers
- Virtual systems
- Faculty/staff desktops
John @ The Pennsylvania State University

Penn State > Information Technology Services > University Services
32,000 computers : 8,500 lab computers
Indirect/cooperative administration
Centralized IT services

Dan @ Colorado State University

Colorado State > College of Engineering > Engineering Network Services
1,650 computers : 350 lab computers
Direct administration
Decentralized IT services
High-level process overview

1. Software Packaging
2. Software Distribution & Integration
3. Systems Management
High-level process overview

Software Packaging

Software Distribution & Integration

Systems Management
Software Packaging

7. Make sure Workbench Associate Interface is selected.
8. Enter the path to the Pro/E installation (For Creo 2.0, this is C:\Program Files\PTC\Creo 2.0\Parametric; for Pro-E, this is C:\Program Files\PTC\ProWildfire) can be left blank. Next.
9. On the SolidWorks screen that Workbench Associate Interface is selected, Next.
10. Make sure on the SolidWorks screen that Workbench Associate Interface is selected, Next.
11. On the Verifying License Manager File Dates screen, click Next, then Next to install. This will take some time.
   1. If you get a pop up asking for the 2nd directory...it's looking for the folder labeled "Disk 2." Just change the number at the end of the folder path given from a 1 to a 2.
12. After products are installed, click Next and let it configure the products.
13. Click Exit and Next.
14. Exit the web browser to skip the survey. Finish.
15. From the original install manager now select "Install ANSYS, Inc. License Manager" and click the 'Specify the License Server/Machine' tab (Click OK on the warning.
16. Choose 'I AGREE' and hit 'Next'>
17. Leave the default directory and hit "Next" until it starts the install.
18. After installation is complete, a window will pop up that asks you to specify the type of license server, choose "Cancel". Exit Exit Exit.
19. From the Start Menu, open ANSYS 14.5 > ANSYS Client Licensing > Client ANSPLIC_ADMIN Utility. Click the 'Specify the License Server/Machine' tab. Click OK on the warning.
20. When a license server is present, edit it, otherwise add one of the following defaults and change 'Hostnames' depending on where the computer is:
   - Lab PCs, Thin servers: anya-classroom-license-server
   - Virtual Lab, MERC lab, ALL OTHERS: anya-researcher-license-server
21. If any other servers are showing, delete them.
22. Highlight your server choice and click Close.
23. Click on Tools (top of the window), "Complete License Installation Configuration". Now wait till it's done and then hit Exit Exit.
24. From the Start Menu, open ANSYS 14.5 > Utilities > CAD Configuration Manager.
25. ANSYS Products: Check "Workbench and ANSYS Geometry Interface" and the top type C:\Program Files\PTC\Creo 1.0\Parametric as the param Files\PTC\Creo 1.0\Parametric\bin\parametric.bat as the b, click "Configure Selected CAD Interface" and workbench plugin configure successfully, click exit.
27. ANSYS 14.0 > Fluid Dynamics > CFX 14.5. Click on the following to any Windows Firewall messages that appear: CFX-Pre 14.5, -Post 14.5. Close CFX launcher.
28. ANSYS 14.5 > Fluid Dynamics > Fluent 14.5. Click the "Show More" folder to C:\temp, Change Fluent Root Path to C:\Program Files\Fluent 14.5 and add the path for path.
29. ANSYS 14.5 > Fluid Dynamics > Fluent 14.5. Click the "Show More" folder to C:\temp, Change Fluent Root Path to C:\Program Files\Fluent 14.5 and add the path for path.
30. Processing Options: Choose "Parallel" (unless running on single core CPU), the number of processors matching the computer (Check task manager, the number of windows for the CPU).
Silent
Doesn’t display anything.

vs.

Unattended
Doesn’t require interaction
Silent
Doesn’t display anything.

Unattended
Doesn’t require interaction
Managing Software Installation Packages

- File organization
- Version control
- Inter-departmental sharing
EASI Make

Template creation utility

Helps with management

(Alternative: Copy & Paste)
Bundling Software Packages

Images source: Ninite.com
The EASI Utility
Software Distribution

Managed vs Unmanaged...

... Computer Type

... Deployment Methods
Unmanaged Deployment

- Modularity
- Typical use: Tech in the field
- Use with any level of computer
- Typical automated installer:
  - Windows PowerShell or batch script
  - Set environment variables
  - Perform error checks & pre-installation checklist
  - Triggers silent unattended installer
Managed Deployment

- Goal: Install software without human intervention.
- Typical use: Centralized management
- Typically scheduled or triggered by event (such as system start)
- Can run without interrupting sessions
- Invisible to user; pervasive to user environments
Systems Management Utilities

• Commercial systems
  o IBM Endpoint Manager/BigFix
  o KACE, SCCM, Altiris

• Built-in systems
  o Group Policy software installations
  o Group Policy startup scripts
IBM Endpoint Manager

• Execute any command-line/terminal command
  o *Real time*
  o *On- or off-network*

• Determine which software updates are relevant to computers

• If the installation fails, automatically attempt to retry
Group Policy Software Installations

- Only works with .msi files
  - “Gold Standard” installer
  - Difficult to make changes
  - Very difficult to make your own
- Installation happens at system start
Group Policy Startup Scripts

- Execute batch files at system start
- Use traditional command-line instructions
- Sometimes not as flexible
Triggers & Scheduling

Common triggers:
• Scheduled Task
  o Day of week or month
  o Time of day (e.g., the 3 a.m. maintenance window, or 15 minutes before the next class)
• Startup
• User login
• Manual initiation
Client-Driven Updates

**Key:** Computer always installs software at trigger time.

Nothing to do? No problem!

Administrator or technician can fine-tune by group, or case-by-case basis
Control Files

Use to:
• Manage and guide installations
• Manage exclusions
• Determine flow

Typically includes:
• Build version & date
• List of software exclusions
• Environment variables
Master Script

Alternative to control file

• Redirect clients to master script appropriate for its group or type
• Resides on server, so changes are global
UPDATER

Unified Process for Distributing Automated Tasks and Executables Remotely

• Optimized series of modular steps (scripts)
• Error-checking & logging
• Detects installation failures
• Prevents infinite installation loops
• Integrates with other timed events
• Differentiates between build versions
Visible Status to the User

- Yes, we *said*: silent & unattended
  - At the software installer level

- In certain cases you might want to display status
  - At the system level
Press CTRL + ALT + DELETE to log on

THIS COMPUTER IS UNAVAILABLE
A system build is currently in progress.
Please use another computer.
Press CTRL + ALT + DELETE to log on

INSTALLING SOFTWARE...
This system is downloading and installing software in the background. System performance may be impacted, and not all software may be available at this time.
Software Integration

• Post-installation scripting
  o One-touch imaging
• Synchronization and error-checking
• Coexistence with other automated processes
Administrators’ Needs

• Automate procedures that are repetitive
  • Gain efficiency, increase productivity
• Consider indirect IT effects
  • Bandwidth
  • Storage
  • Licensing (if sharing packages)
Users’ Needs

• Organize computers into groups... carefully
  o Not every computer may need every update
• Stagger automated installations
  o Systems management utilities
  o Windows task scheduler random delay
Example Workflows

- Computer Labs
- Computer Classrooms
- Multi-user Servers
- Faculty & Staff computers
- Laptops
- Others?
You’ve got questions.