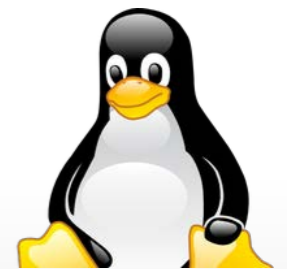# A Multi OS Hub Approach:
Integrating the Windows Operating System Into the Hub

By Christopher J. Nuland

Windows

Linux

About Me

Chris and Melissa Nuland

- Graduated from Purdue University with a BS in Computer Science, 2012
- Focused in information systems and virtualization
- Development Manager of cdmHub (IN3) since 2013
- Live in West Lafayette, IN, with my wife, Melissa

cdmHub.org

Challenges for cdmHub

- Drop Java integration for running tools

- Integrate HTML5 for running tools

- Implement a backend system that is scalable

- Address industry related security concerns

- Implement a system that can run both Linux and **Windows** tools
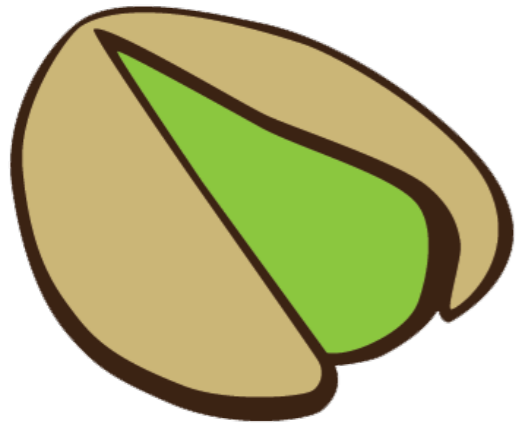
Technology

Guacamole (HTML5)   VMWare (Windows Support)

Pistachio Library

Pistachio Alpha
Version 0.5

Release Date
Late November
2014

- Backend tool system built around VMWare
- Uses Guacamole code for displaying tools (HTML5)
- Removes the need for separate graphics server
- Allows for future scaleability
- Addresses some security concerns

Tool Upload Process

For the average user the upload process remains mostly the same

Pros

- Allows cdmHub to run both Windows and Linux based tools

- Can move tools between servers more easily (scalability)

- Can more easily secure a single session

- Faster graphic card response time

- More easily guarantee resources for a session

Cons

- More expensive compared to the open source HubZero system

HubZero running Pistachio	Open Source HubZero
20 Linux Sessions	100+ Linux Sessions
3 Linux Windows Sessions	
Windows and VMware License Fees	No Licence Fees
1 Server	4 Servers
$1,000 per/month (SingleHop)	$1,000 per/month (SingleHop)

Future

- Implement more cloud based technology into Pistachio

- Allow for local servers to create "MicroHubs"

- Add virtual desktop features for more work collaboration

- Release open source version of software

Conclusion
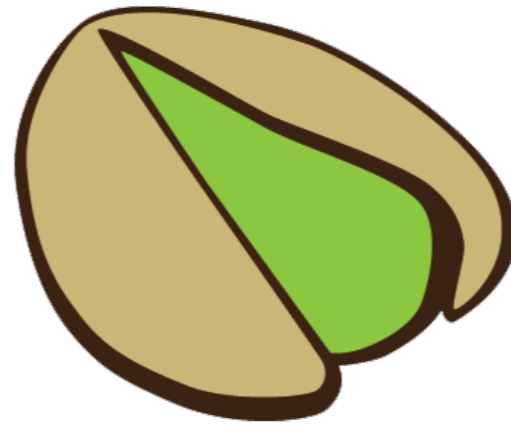
Christopher J Nuland

cnuland@in3applications.com

in3applications.com