

# Using Open Source Software for Military M & S

MOVES Open House

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# Overview

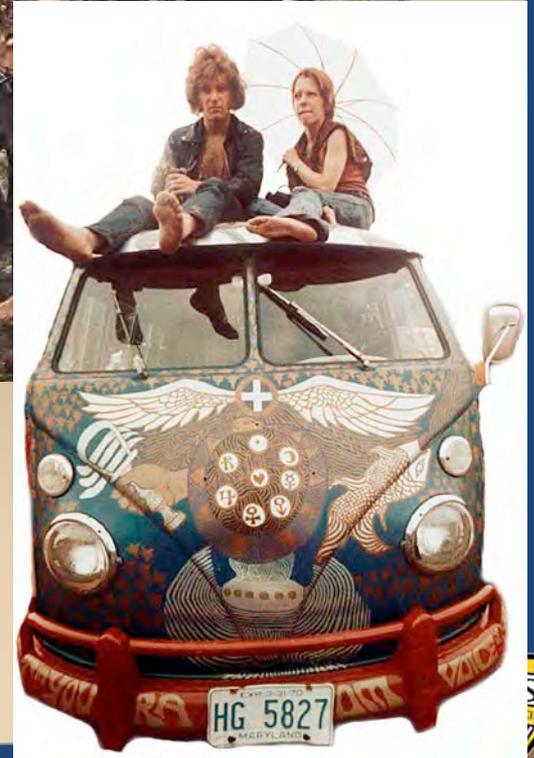
- Open Source 101
- Pros/Cons of Open Source
- Why Military Should Use Moore Open Source, especially for M&S
- How Contractors Can Make Money with Open Source
- What Needs to be Done to Expand OSS Use in the Military



# Open Source 101



# Who are the Open Source Advocates?



# Open Source

Come for the price

Stay for the value



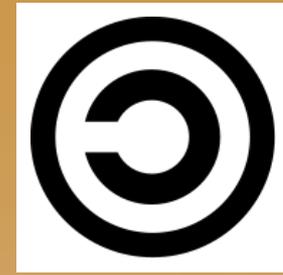
# History of Open Source

- Richard Stallman and Free Software Foundation
- Linux
- Other notable successes
- Licensing

# Open Source Licenses

- GPL
- LGPL
- Others
- Write your own
  - These might be especially interesting to the government
  - Too specific to government, however, might lose community

# Copyleft



“Copyleft may also be characterized as a copyright licensing scheme in which an author surrenders some but not all rights under copyright law... Under copyleft, copyright infringement may be avoided if the would-be infringer perpetuates the same copyleft scheme.”

- Wikipedia, May 4, 2007



# Pros/Cons of Open Source



# Pro: No Lock In

- Allows program managers to chose best company from many, rather than being limited to the previous builder because the project is based upon the builder's proprietary software



# Interesting Quote

Louis Gerstner, IBM's CEO in the 1990's, in a conversation with key IBM insiders soon after taking charge, noted:

"This is the only industry where competitors don't regularly agree on standards to enable greater value for the customers."

IBM executives response: "Let us explain about lock-in, network effects, de facto standards, and the five ways to play."

Gerstner's reaction was: "That's interesting ... let me get this straight ... you're telling me the strategy is to lock-in our customers and then gouge them on price?"



# Interesting Quote

“Since you own the IP, if the government wants to do a version two, they have to come back to you. So it guarantees you downstream revenue if they want to do a version two.”

Doug Whatley

CEO, Breakaway Games  
Game Developer Magazine

Feb. 2005



# Drug Procurement Metaphor

- Companies deserved to be paid for work in creating new drugs
  - Bad for society if it takes away incentive to make new drugs
- However, not forever
  - Design is that company makes enough money while patent is valid: but, after a certain amount of time, needs of society takes over



# Pro: More Flexibility

- Open source allows users to modify the software to meet their needs, which provides a better solution

*How do you value a solution that completely meets your needs compared to one that you must try to fit to your needs?*



# Example: How Open Source Works Better

- Delta3D can interact w/ SCORM conformant LMS
  - ECS built framework to start Delta3D apps from an OS LMS (Moodle) & report user performance to the same LMS
- A well respected academic group tried to do same thing & failed
  - This not to make point "ECS is better"
  - The group was trying to connect to an proprietary LMS - they couldn't get into source code



# Pro: Prevents Exorbitant Pricing

“What do you think MS Office would cost if there weren't a cheap alternative like OpenOffice?”

- Software Developer, as quoted in Thomas L. Friedman's *The World is Flat*, 2005



# Pro: Open Source is Better than Open Standards

- Open Standards is merely half way there
- Here's the problems:
  - Flexibility
  - Lock in
    - Build an proprietary application which communicates via open standards
    - Now, it needs modification
    - What are your options?



# Pro: Open Source Improves with Little/No Effort

- In Summer 2005, OpenSceneGraph upgraded to OpenGL 2.0
  - It incorporated several upgrades, most importantly support for shader languages
- This work took THOUSANDS of manhours of development/testing
- It took a Delta3D engineer to days to incorporate change
- In effect, we got thousands of manhours of work for the price of too days pay



# Pro: Importance of Community

- Additionally, as more applications are built using the engine, additional functionality is added, e.g.:
  - LMS Integration
  - AAR Additions
- User pays ONCE for these improvements, and all future users benefit from them



# Con: “Open Source is not as good”

- Sometimes true
  - Although, not always
- Does the extra cost justify the extra performance?
  - If so:
    - Can an open source solution be modified to give same performance for the acquisition cost?
    - If not, go proprietary



# Con: “Government Shouldn’t Be Competing With Industry”

- Clinger-Cohen Act of 1996:
  - “Clinger-Cohen Act (CCA) of 1996 provides that the government information technology shop be operated exactly as an efficient and profitable business would be operated. Acquisition, planning and management of technology must be treated as a “capital investment.”<sup>1</sup>



# Con: Open Source Violates ITARS

- Every project is different
- However, there are very few reasons why an open source project would violate export regulations
- Unlikely an open source project would be created to do that



# Pro/Con: Total Cost of Ownership (TCO)

- Open source has lower TCO than proprietary
- Does not
- Does too
- Oh yeah, well my operating system can beat up your operating system
- Uhn, uhn, and your operating system is fat



# Con: Seeing the Software Makes Open Source Less Secure

- By not letting anyone outside the development team see the code, it is more secure
- Because in open source everyone can see the code, those projects are inherently more vulnerable to attacks from our enemies and other hackers



# Did You Notice Any Miss Steaks in my Slides?

- I choose not, two have any bode proof red them: because I was afraid they wood sea my err ors
- I hop eye didn't have to many faux pas is their a sign of a pour presentation
- Cane you sea; the intelligence in may approach?



**MORAL????**



# Moral

- If hiding writing from proof-readers doesn't improve it and doesn't prevent people from seeing the errors, will hiding code from other programmers improve it and prevent the errors from being discovered?

# Moral

- The history of software doesn't agree with the concept that hiding code is better
  - Which operating system has more viri, worms, etc., Windows or Linux?
  - Which browser has more vulnerabilities, Firefox or IE?
  - Which word processor is has more holes, Office or OpenOffice?



# Why Military Should Use More Open Source, especially for M&S



# OTD Roadmap

- Produced in 2006 for DUSD/AS&C
- Describes why open development is key for US military



## Roadmap Plan

April 2006

Prepared for:

Ms. Sue Payton  
Deputy Under Secretary of Defense  
Advanced Systems & Concepts  
[www.acq.osd.mil/asc/](http://www.acq.osd.mil/asc/)

Prepared by:

J.C. Herz  
Mark Lucas  
John Scott

Version 3.1 (Final)

Cleared for Open Publication, June 7, 2006  
Office of Security Review, Department of Defense

# OTD Roadmap

To summarize: OSS and open source development methodologies are important to the National Security and National Interest of the U.S. for the following reasons:

- Enhances agility of IT industries to more rapidly adapt and change to user needed capabilities.
- Strengthens the industrial base by not protecting industry from competition. Makes industry more likely to compete on ideas and execution versus product lock-in.



Roadmap Plan

April 2006

Prepared for:

Mr. Sus Peyton  
Deputy Under Secretary of Defense  
Advanced Systems & Concepts  
[www.acs.oid.mil/acsc/](http://www.acs.oid.mil/acsc/)

Prepared by:

J.C. Herz  
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John Scott

Version 3.1 (Final)

Issued for Open Publications January 2006  
is an Security Review, Governmental Document



# OTD Roadmap (cont)

- Adoption recognizes a change in our position with regard to balance of trade of IT.
- Enables DoD to secure the infrastructure and increase security by understanding what is actually in the source code of software installed in DoD networks.
- Rapidly respond to adversary actions as well as rapid changes in the technology industrial base.



Roadmap Plan

April 2006

Prepared for:  
U.S. Dept. of Defense  
www.dau.mil/otd  
www.acq.odm.mil/otd

Prepared by:  
Horz,  
W. Lucas,  
and Scott.

Version 3.1 (Final)

Office of Naval Research, January 2006  
Office of Security Research, Government of Defense



# How Contractors Can Make Money with Open Source



# Interesting Quote

"Companies can no longer expect to lock in customers with proprietary standards. They must now compete on the value of their business execution. They monetize that value a little bit, spread over the entire community... So while it may seem counterintuitive for a company to share, it's the key to larger economic growth – not only for Sun, but also for everyone in the world."<sup>1</sup>

-Scott McNealy

Founder/CEO Sun Microsystems



# How Do Contractors Make Money Using Open Source?

- End users should pay for items which are not commodities
  - Some companies have outstanding systems which they have developed at great cost AND which is not readily available as a commodity in the open source world – deserve to be paid for it

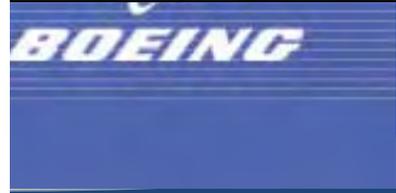


# How Do Contractors Make Money Using Open Source?

- Build software which is then released into open source
  - A current OS solution doesn't meet the government's need, so it hires a company to write code so it does
- Create Content
  - Users should pay for content
  - But only pay once, not repeatedly



# Delta3D Industry Users



# Interesting Quote

“Most companies exist in the gap between two changes in the market, the one that allowed them to enter the market in the first place and then the one they couldn't adapt to, because it was a stretch too far, and killed them off.”

- Adam Singer

2005 Edinburgh Interactive  
Entertainment Festival, August 2005



# What Needs to be Done to Expand Open Source Software



# Need Infrastructure

- This is not just for open source
- Need some sort of infrastructure so it is easy for anyone to find/get/use code/ applications/ models/etc. that is currently freely available to the government

# Need to Incentivize

- Come up with new payment scheme
  - Possible royalty scheme if company's code is used by another project
  - Possible royalty scheme if code for a PM is used for another project
- Possible increase in project funding by reusing open source/ existing code



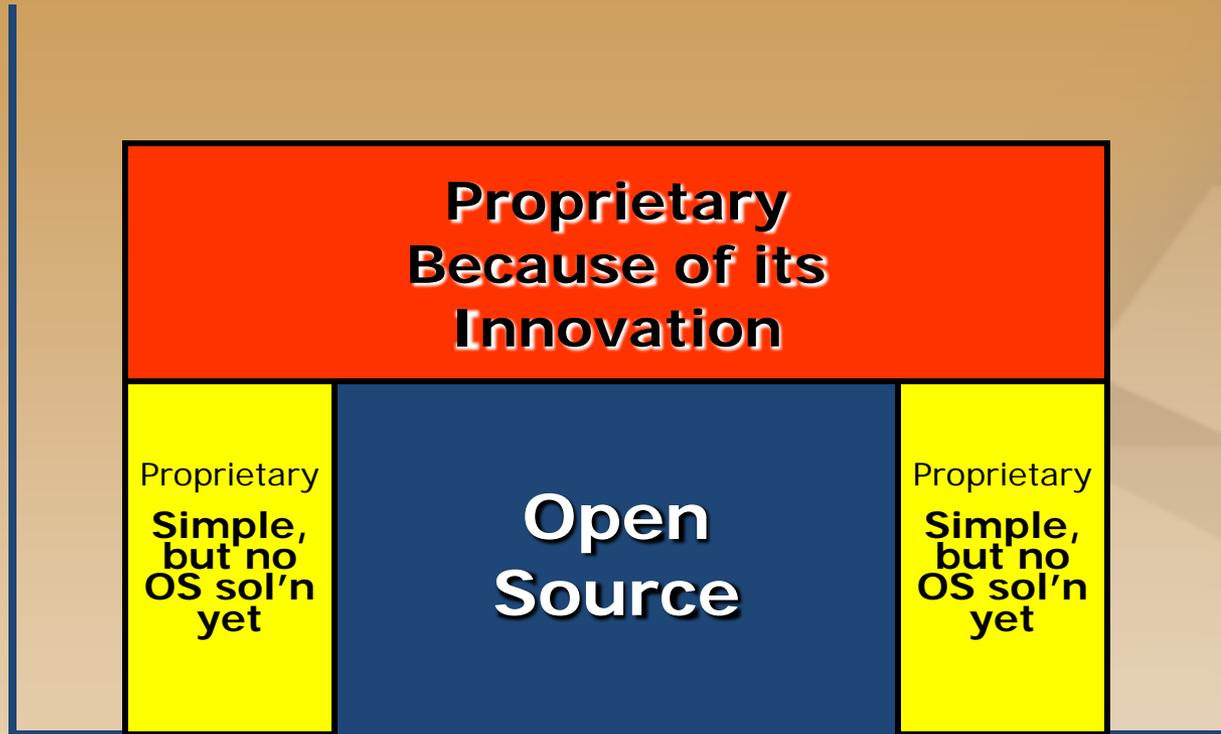
# Need to Incentivize

- Contracts need to be written to ensure ability to reuse is considered as delivery criteria



# Fitting it Together

Technical  
Level

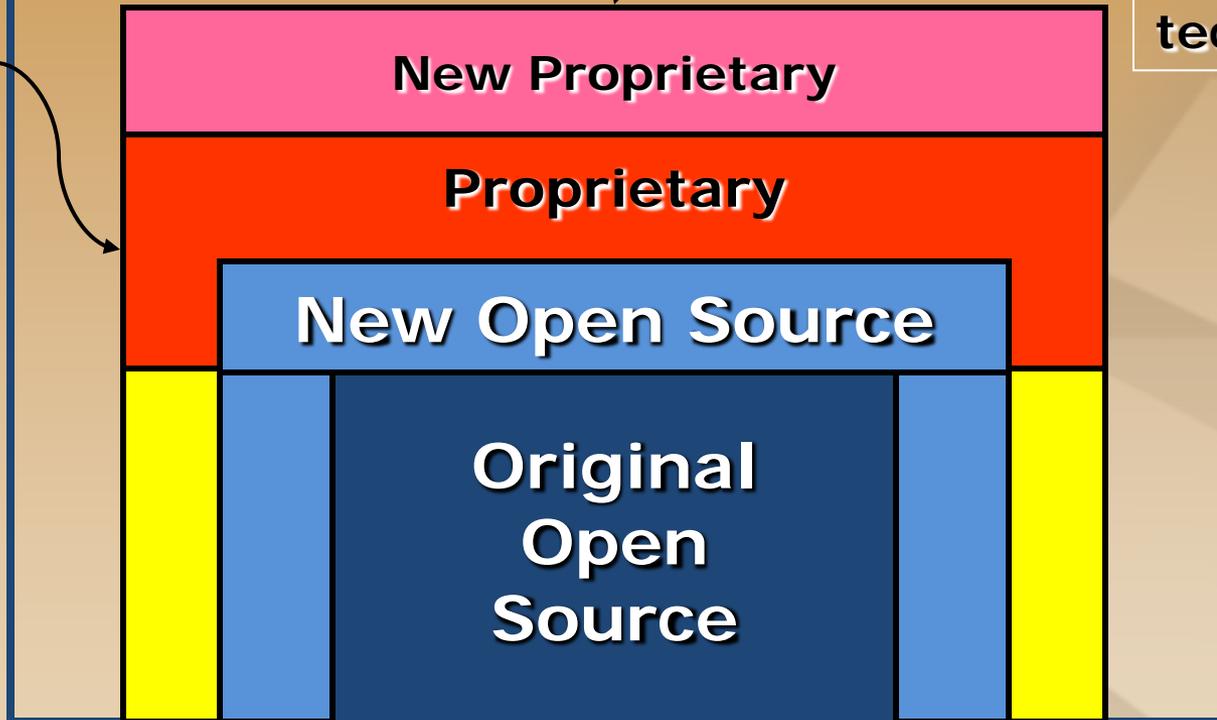


Differing Technologies

# As Technologies Mature...

Companies make money by providing improved technology

Reduced areas for companies to provide proprietary technology



Differing Technologies

# Come to the Delta3D Consortium Meeting

- July 16-17 in Monterey, CA
- In conjunction with the MOVES Open House (July 17-19)
- Bringing together the community to:
  - Determine the direction of Delta3D
  - Bring together customers and providers



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