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*Free and Open Source Software
Overview and Preliminary Guidelines
for the Canadian Forces*

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List of Contents

- **Administrative summary** (5min)
 - Objectives
 - Study strategy and review process

- **Report overview** (10 min)
 - Executive introduction to FOSS
 - Proposed way-ahead for GoC
 - Guidelines to assess FOSS

- **Summary and perspectives for the CF** (5 min)



Study Context

- Challenging Context
 - *A very complex reality... with many biased perspectives*
 - *Changing very rapidly*
 - *Huge diversity in the target audience*



Summary Report on FOSS

- Synthesis – *High-level vision*
 - *Systematically referring to credible, up-to-date, rigorous reports*
- 3-Cycle validation process
 - *Cycle 1 – DRDC Valcartier*
 - *Cycle 2 – DRDC Corporate HQ*
 - *Cycle 3 – DND/CF and OGD*

DRDC: Defence R&D Canada

DND/CF: Department of National Defence / Canadian Forces
Defence R&D Canada – Valcartier # 4

OGD: Other Government Departments



DRDC- Advisory Team on FOSS

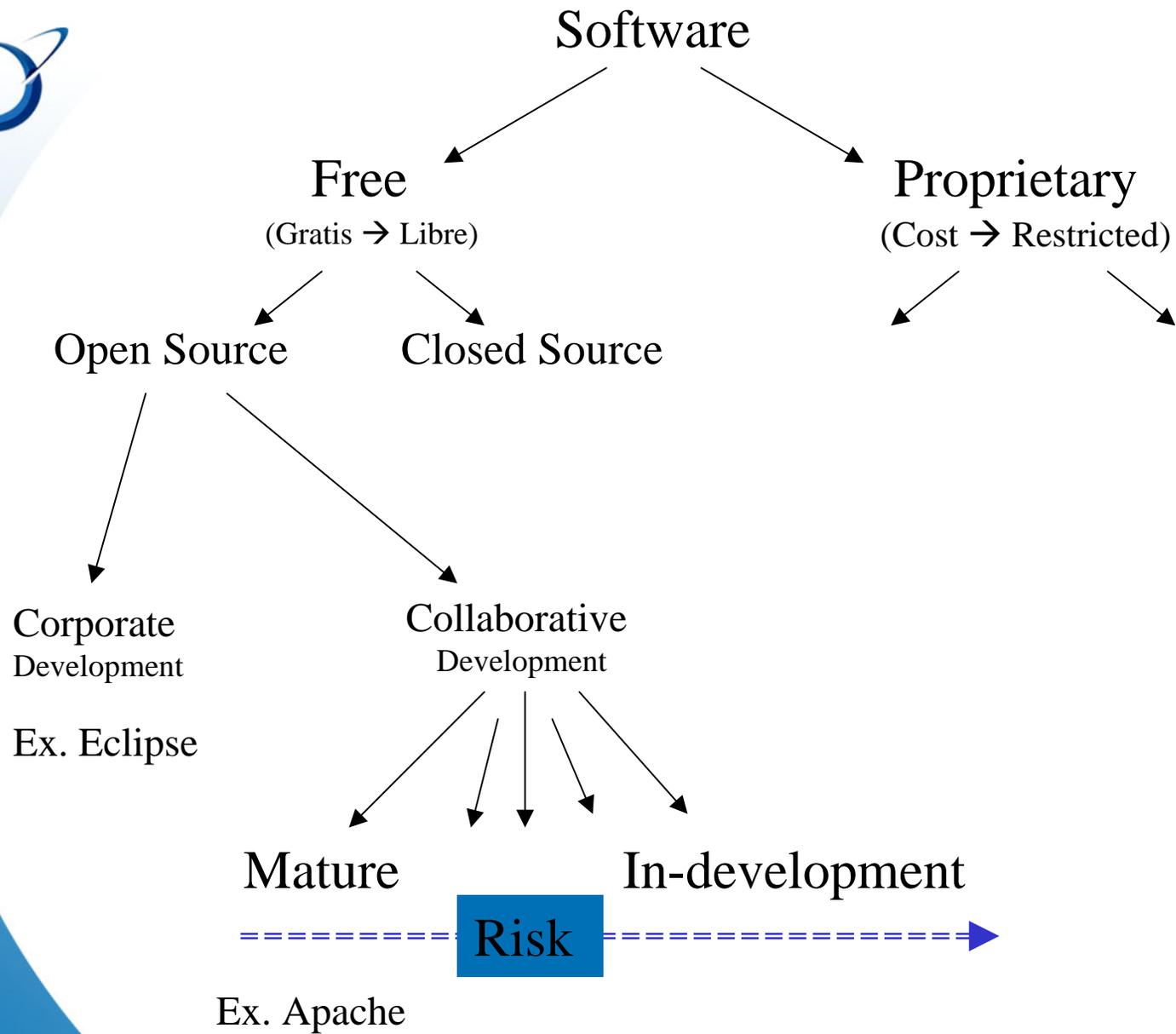


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Archive & Report Status

- Archive :
 - ~ 287 technical reports evaluated
- Reports :
 - ~ 124 references used in the report
 - ~ 17 topics discussed (~ 59 main statements)
 - ~ 394 selected FOSS introduced



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Report Overview

Part #1 – Executive Introduction to FOSS



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FOSS Evolution

- Approximately 115,000 projects registered
 - more than half of them are inactive (or duplicates)
 - 115-150 software applications on the secure/mature lists
- Collaborative development evolved in a very efficient process
 - Well-structured
 - Systematic code review and testing
 - Very fast bug fixing



FOSS Benefits

- Mature FOSS repeatedly suggested many benefits
 - Huge diversity of software
 - High flexibility and scalability through code editing
 - High reliability and security through code review
 - One-order of magnitude faster release rate than COTS products
 - Rapid “customizing” through code reuse
 - High degree of compliance with open standards
 - Lifetime extension of FOSS-based systems without lock-in



Current Concerns

- Version control may be more complex (*evolving*)
- System maintainability requires more local resources
- Higher technical skill needed from system administrators
- May offer less integration between applications and less user-friendliness (*evolving*)



FOSS around the World

- European Union is actively adopting FOSS
 - *United Kingdom – policy and partial migration plan*
 - *Germany, France & Sweden – policy and migration up to desktop*
 - *24 countries reviewing policies (as of June 2003)*
- Latin American, African, Oceanian and Asian countries are also moving toward FOSS in varying degrees
- Main motivations:
 - *Direct cost savings*
 - *Less economic losses at the national level compared with COTS imports*
 - *Improve national IT expertise in software*



FOSS in the USA

- FOSS originated largely in the USA and is still strong
- Many large American corporations contribute to FOSS
 - *IBM, Hewlett-Packard, Sun Microsystems, Silicon Graphics etc*
- Some US government initiatives contribute to FOSS
 - *NSA offered SE Linux (Security Enhanced Linux)*
 - *NTA sponsored an impressive Geomatics project (OSPR)*
 - *NASA used collaborative FOSS development for Mars exploration*
 -
- Adopting a strong FOSS policy could be problematic for the US Government since the software industry strongly supports the US economy

NSA = National Security Agency

NTA = National Technology Alliance

OSPR = Open Source Prototype Research = Geomatics



FOSS in Canada

- Canada appeared to be behind the curve in FOSS adoption
- Some comprehensive initiatives can be found in the education and health sectors
- GoC position on FOSS adopted on 17th May 2004
 - No barriers to procurement
 - Ensuring that GoC staff are aware of the options available
 - Collaboration between departments is encouraged



FOSS and Software Security

- Access to source code greatly eases security enforcement
- Other key advantages include:
 - « Leaner and meaner » software systems
 - Possible source code enrichment
 - Increased code diversity in software ecosystem
- Increased risks to manage:
 - Internal expertise to develop and maintain
 - Lack of imputability when software is developed via internet collaboration



Authors' Synthesis

- FOSS should not be considered as a panacea --
but appears to be a credible and productive approach
 - *Cost-effective in many instances*
 - *Offering a good maturity, flexibility, high productivity*

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Part # 2 – Proposed Way-Ahead for GoC



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Guiding Principles for a Way-Ahead

- FOSS represents a real and credible opportunity for GoC
- Diversity in supplies is preferable
(Custom Software, COTS and FOSS)
- Open Standards and specifications lead to system interoperability
- Evaluation of FOSS must be done on a case-by-case basis

COTS: Commercial-Off-The-Shelf
FOSS: Free and Open Source Software



Proposed Way-Ahead for GoC

- *Promote progressive FOSS adoption in GoC*
 - *Inform project leaders of potential FOSS benefits*
 - *Provide navigation aids to help identify suitable FOSS*
 - *Provide guidelines to assess FOSS in context*
 - *Train personnel to interpret licenses and estimate cost*
- *Consider FOSS-based solutions in some RFP and*
Choose « best value on the market » with technology neutrality

http://publiservice.cio-dpi.gc.ca/fap-paf/oss-ll/foss-llo/foss-llo00_e.asp

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Part # 3– GoC Guidelines to Assess FOSS



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Recommended Evaluation Steps

- Define the application context
- Identify candidates (FOSS and COTS)
- Compare side-by-side the 3-4 best options
- Perform an in-depth code analysis if needed
- Seek approval from local management and client
- Document the lessons learned
 - *An evaluation spreadsheet is proposed*
 - *A simple cost model is offered*
 - http://publiservice.cio-dpi.gc.ca/fap-paf/oss-ll/foss-llo/foss-llo00_e.asp



Ingredients for Success

- A good working product
- Led by committed leaders
- Providing a general community service
- Supported by developers who are also its users

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Part #4 – Catalogue of Selected FOSS



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High-Quality FOSS Lists

- GRAS: Generally Recognized As Secure (*115 FOSS – MITRE / DoD*)
- GRAM: Generally Recognized As Mature (*39 FOSS - Wheeler*)
- IDA: Interchange Data Administrations (*multiple FOSS - EU*)
- DRDC: Includes scientific FOSS (*± 394 FOSS – DRDC*)

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Summary and Perspectives for the Canadian Forces



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Summary

- Importance of FOSS will be increasing
for most Government departments including DND/CF
- Practical guidelines proposed
for comparing FOSS and COTS software in project context
- Numerous navigation aids included in the report
- French version available



Next Steps

- **Quality and Security assessment of FOSS**
 - *Tools and methodologies to verify & validate C and C++ software*
 - Report for GoC project leaders and security architects
 - *Tools and methodologies to verify & validate Java software*
 - Report for GoC project leaders and security architects
- **FOSS licenses and other legal issues**
 - Practical information needed to support FOSS adoption in GoC
- **Cost estimation**
 - Practical information needed to support FOSS adoption in GoC



Issues Requiring Some Attention by the GoC

- Expertise for system development and maintenance
i.e. more reliance on internal resources – often scarce
- Lack of imputability
when software is developed via internet collaboration
- Fragmentation of our computer base
compatibility with existing systems and databases to maintain
- Duplication of certification efforts
centralized software certification and GoC pre-qualified list of FOSS



Issues Requiring Some Attention by the CF

- Good technology in some cases; criteria to clarify
- Maintain interoperability with our allies moving to FOSS
 - List of trusted sources in preparation
- Assess threat of FOSS having offensive capabilities
 - List of offensive FOSS being built

For comments :

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http://www.cio-dpi.gc.ca/fap-paf/oss-11/oss-11_e.asp

