

DEFENCE



DÉFENSE

The Poly-Arctic Project

Partnership with Red Hat - DRDC Perspective

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Defence Research and
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Recherche et développement
pour la défense Canada

Canada



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1- DRDC Context (At Valcartier)

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DRDC: an agency delivering R&D services to the Department of National Defence (DND) and Public Safety (PS)

- **Main mission:** support DND & PS in technology evolution
- Methodology:
 - Conduct preliminary studies:
 - Needs & requirements (**C2IS, protection from cyber attacks, ...**)
 - Vision definition & SOTA on solution options
 - Inform & train clients (workshops): help them choose best options
 - Conduct feasibility studies on selected solution options
 - Propose & drive major **S&T projects**; each involves:
 - Financial contributors: industry, GoC (NSERC, DRDC)
 - Academic organisations

C2IS: Command and Control Information Systems

SOTA: State Of The Art

GoC: Government of Canada

NSERC: Natural Sciences and Engineering Research Council of Canada

(www.nserc-crsng.gc.ca)



1- DRDC Context

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The complexity of C2IS will continue to grow in the future
C2IS are operated in hostile environments (Internet, ...)

- Debugging is much harder (multi-core, multi-level, ...)
- Protection against cyber attacks is mandatory

New complementary technological solutions are needed to improve:
trustworthiness, availability, performance & security of C2IS
during operations

→ One major S&T initiative: Poly-Tracing (started April '09)

Highly qualified participants

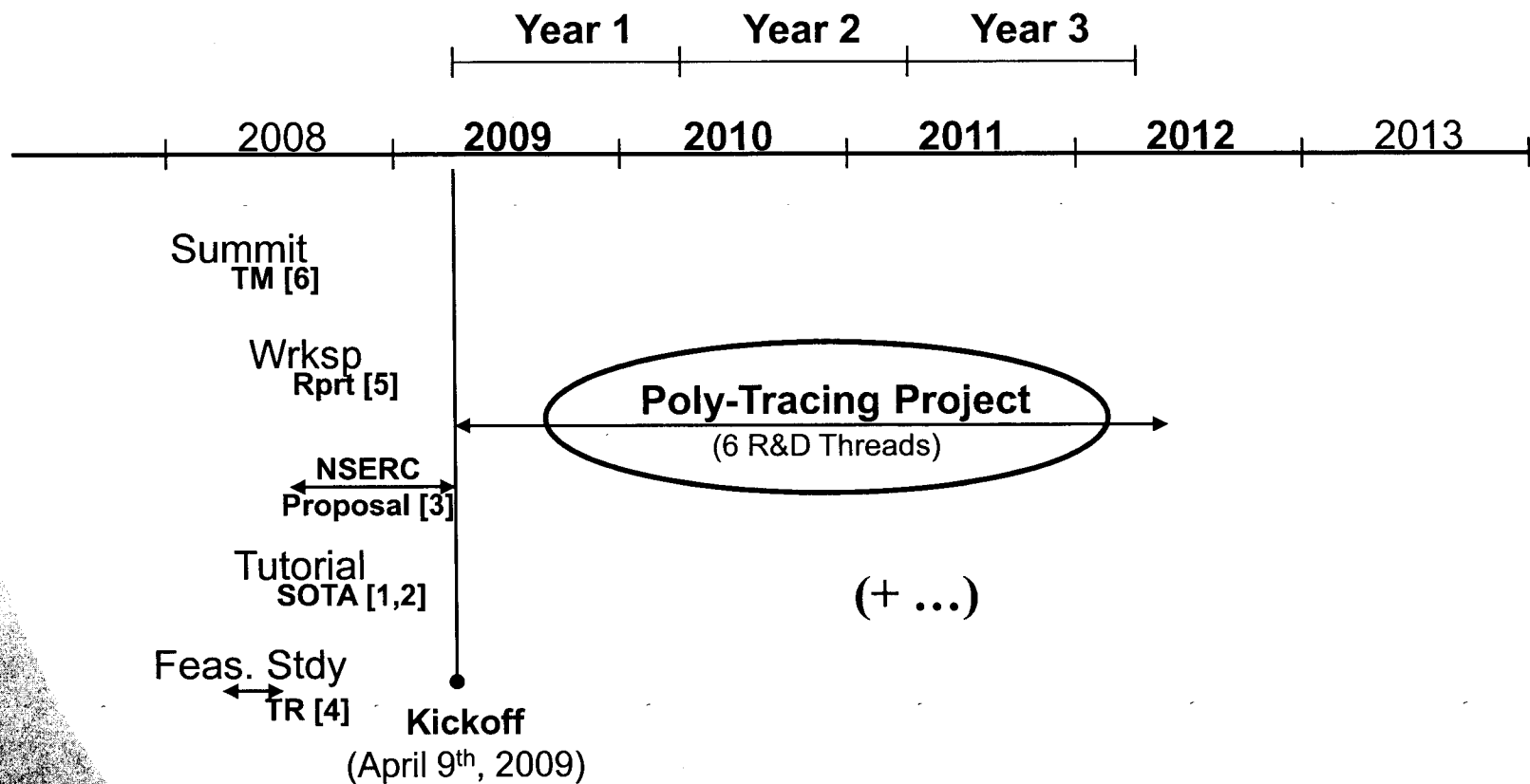
3-to-1 leverage: **NSERC + Ericsson + DRDC**

C2IS: Command and Control Information Systems



2- Poly-Tracing Project

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2- Poly-Tracing Project

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The Six main R&D threads:

- 1- Adaptive fault probing (LTTng, LTTV in Eclipse)
- 2- Multi-level, multi-core distributed traces synchronisation
- 3- Trace abstraction, analysis and correlation
- 4- Automated fault identification
- 5- System health monitoring and corrective measure activation
- 6- Trace directed modelling

LTTng: Linux Trace Toolkit Next Generation
(ltt.polymtl.ca; elinux.org/LTTng)
LTTV: Linux Trace Toolkit Viewer



3- Invitation to Follow our Progress

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Invitation

- The core (LTTng) will soon be part of the mainline of the Linux kernel
 - Additional advanced technologies will be developed, tested and validated
 - This technology will continue to be improved after the project
 - *Linux is increasingly accepted and utilized in military spheres (DND, DoD) and the Poly-Tracing technology already has interest in this community*
- The Red Hat participation in this project is an asset to DRDC and other participants

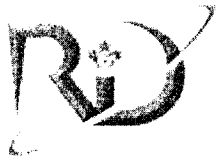
Strong reputation of good partnership with Open source software

Highly qualified personnel, high-quality products

Adapted support for enterprises

(...)

DoD: (U.S.) Department of Defense



4- Concluding Remarks

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Tracing is important for DRDC and Ericsson

LTTng/trace and Eclipse are important tools

→ This meeting to invite Red Hat to participate in the project

Many types of contribution (other than financial) could be of great help

The project is already funded

For example (DRDC): the possibility of using Red Hat products in the two end-project technical demonstrations (for the development, preparation, and the demo itself)



References

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- [3] Dagenais *et al.*, 2008c. *Tracing and Monitoring Tools for Distributed Multi-Core Systems*, NSERC 90429374, July 2008.
- [4] Couture *et al.*, 2008b. *Tracing, Monitoring and Analysis of distributed Multi-core Information Systems - Selected Feasibility Studies*, DRDC Valcartier TR 2008-300, November 2008.
- [5] Charpentier and Dagenais, 2008. *Rapport d'atelier stratégique CRSNG*, STPWS 364780-08, July 2008.
- [6] Couture *et al.*, 2008a. *Monitoring and Tracing of Critical Software Systems - SOTA*, DRDC Valcartier TM 2008-144, June 2008.