

OPEN SOURCE OR NOT? IT DEPENDS

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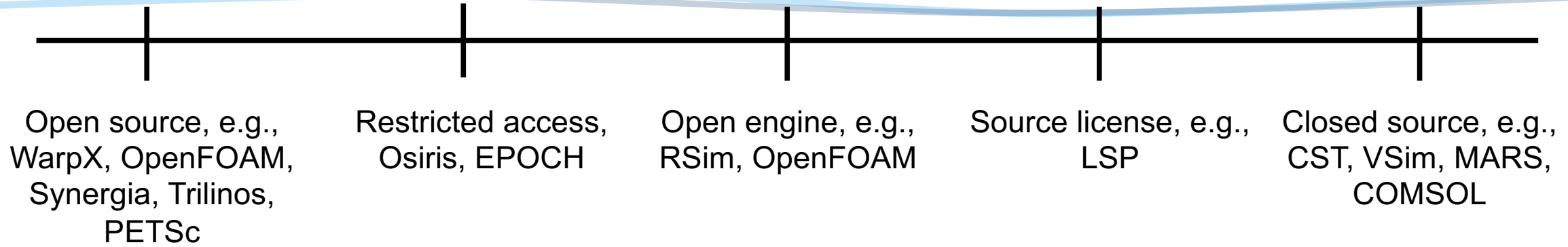
TECH-X CORP, U. COLORADO, BOULDER

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- Open versus closed source is a choice to be made on what one is providing and what one would like to have



Scientific software is a continuum of open source, access possibilities



FNAL Tech-X RadiaSoft

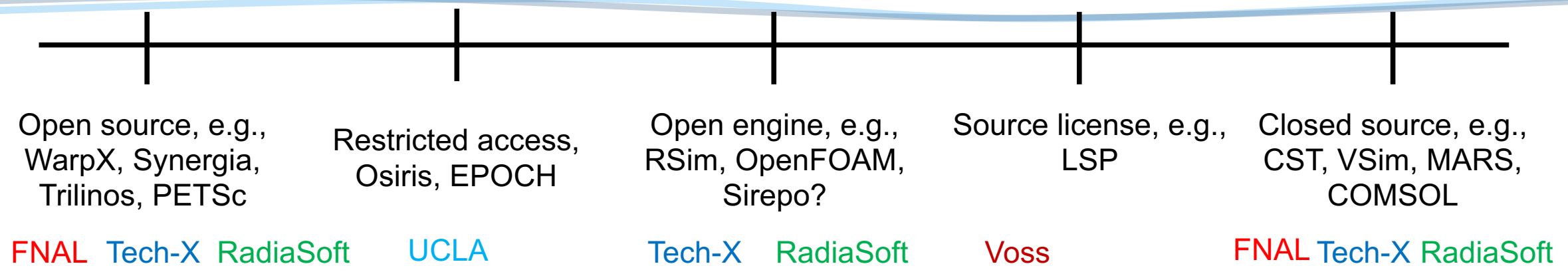
Tech-X RadiaSoft

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- Open source: one of the approved open source licenses applies to the entire code base
- Open access: downloadable with no registration
- Restricted access: downloadable upon satisfying some requirement (institution, MOU)
- Partially open source
 - Open engine: Interface is closed, engine is open source
 - Open core: Core features are open
- Source license: conditions (monetary, other) for access to code base, can modify
- Closed source: access as a binary

Institutions of all kinds provide under all kinds of licenses

When is open/closed source provided?



Institution type?

✓ Funding mechanism!

- Exascale and SciDAC require an open-source license
- Support of CAD geometry, ease of use, extensive documentation requires commercial revenue

Observed correlation

(FNAL, UCLA, RadiaSoft given opportunity to comment)



TECH-X Reasons for using open/closed source are

<u>License type</u>	<u>Comp. engine</u>	<u>Mod. engine</u>	<u>GUI</u>	<u>CAD (healing)</u>	<u>Physics features</u>	<u>Docs</u>	<u>Funding</u>	<u>Reqs</u>
Open source, e.g., WarpX, Synergia, Trilinos, PETSc	✓	✓	✗	✗	ask, do	lim	Fed	time
Open core, e.g., OpenFOAM	✓	NA	\$	\$	ask, do		Mix	time
Open engine, e.g., RSim,	✓	✓	✓	✓	eng do	✓	Mix	t/\$
Restricted access or Source license, e.g., LSP, Osiris, Chicago	✓	✓	LSP	✗	ask, do	?	Fed	t/\$
Closed source, e.g., MARS	✓	✓	✗	✗	ask	?	Fed	?
Closed source comm, CST, VSim, COMSOL, ...	✓	✓	✓	✓	Cust dmnd	✓	Mix	\$

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Notional: subject to correction

What does an open source requirement cost?

- Certain codes (MARS, VSim) not available
- Lose multiple approaches
- No longer have codes that can cross check in plasma acceleration, as one example
- No longer available: CAD, ..., delta-f, cut-cell dielectrics (DLA)
- Government pays for everything, no synergistic commercial revenue, which funds new algorithms, geometry, and ease of use

NOTE: only HEP has this open-source requirement. Not present in FES-SciDAC, e.g., which relies on closed-source software for meshing, simulations