1.1.7 - Silicon software and simulation

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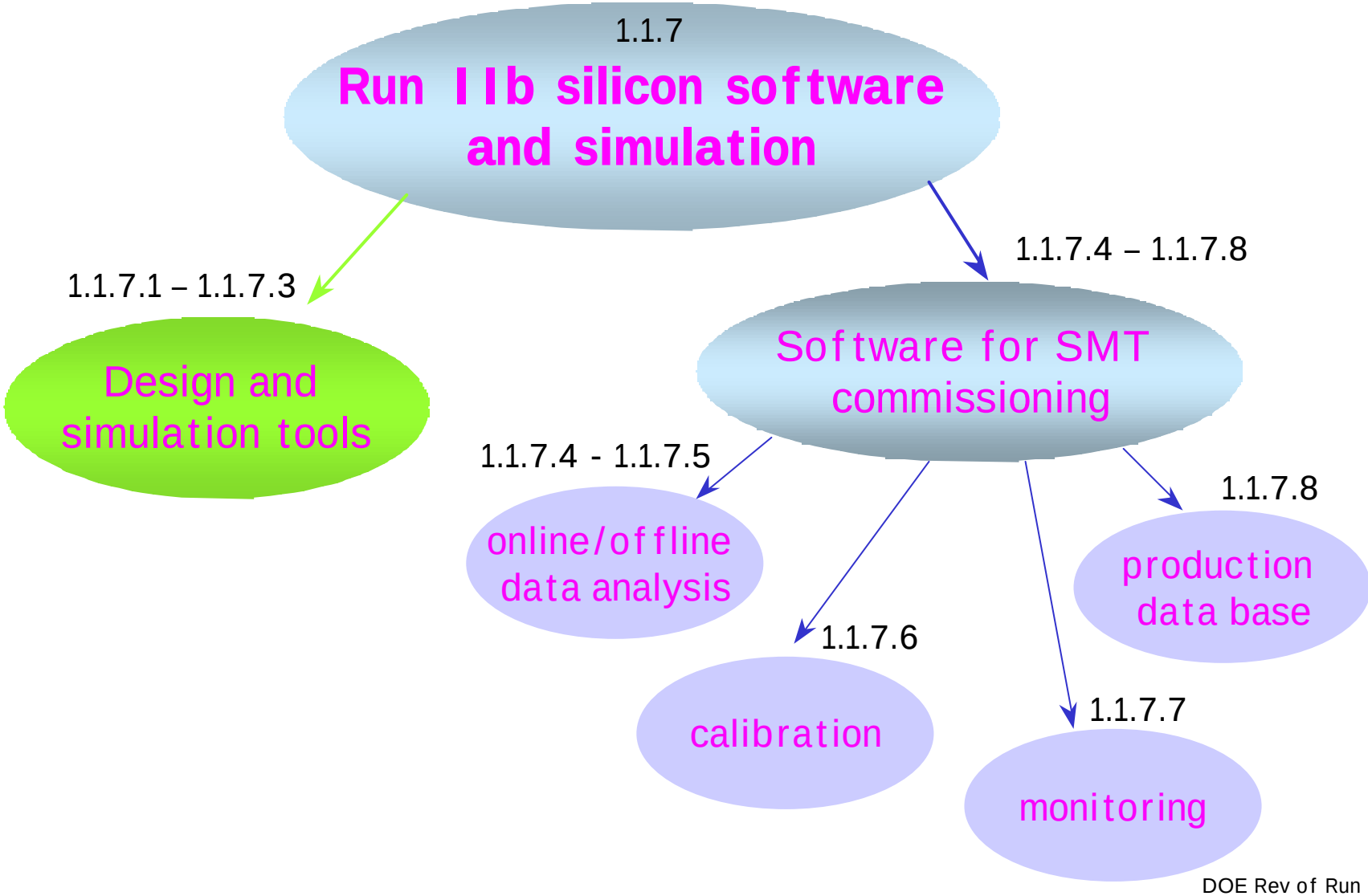
Scope:

- Design and/or modify software tools for Run IIb silicon tracker simulation and commissioning

Run IIb software tasks

- Develop and support software tools for design, optimization and performance evaluation of Run IIb silicon tracker
- Develop and support software packages for Run IIb SMT tracker system tests and commissioning

Software project overview



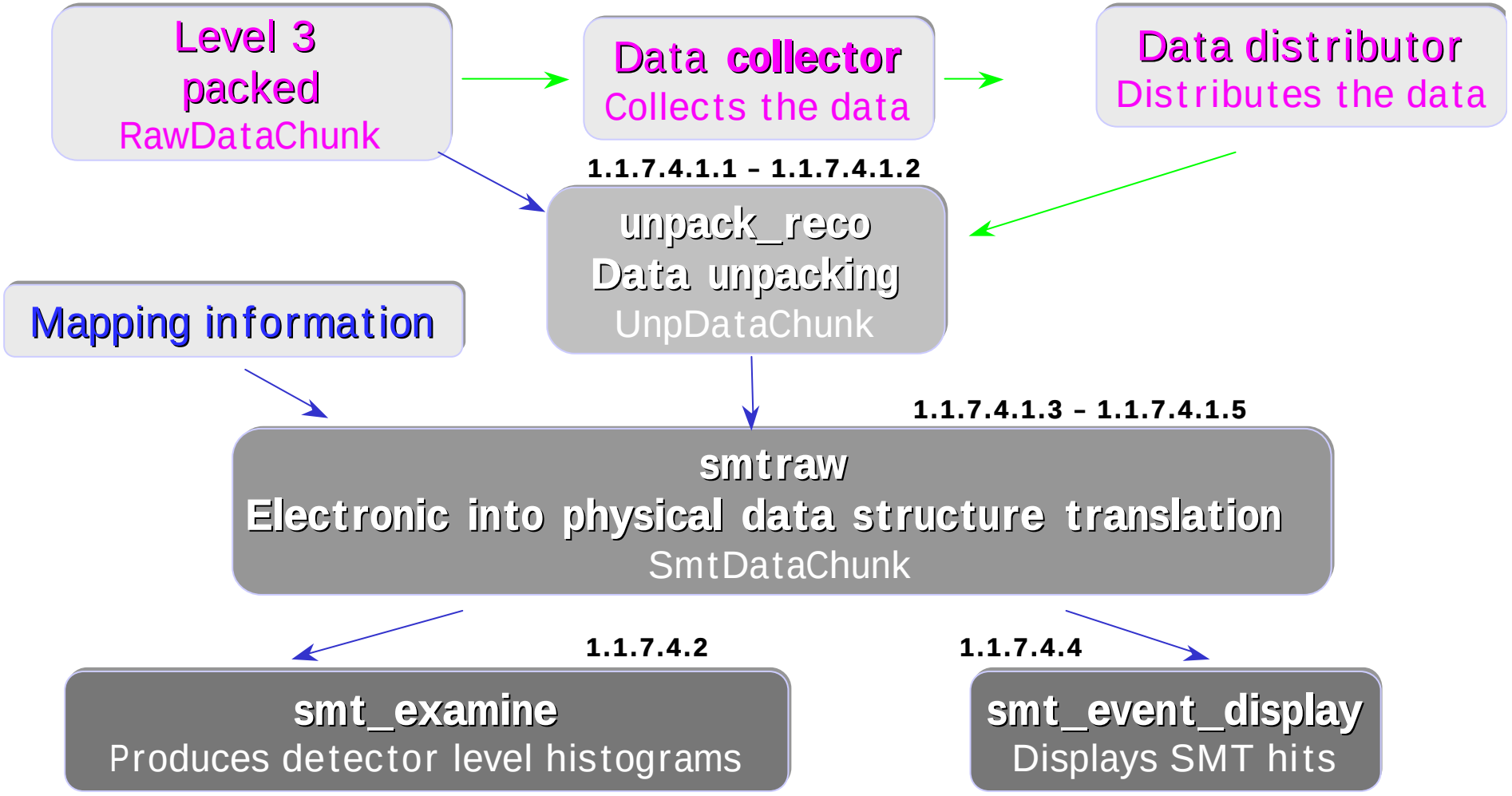
Design and simulation tools

- Implement new SMT geometry in D0gstar (D0 Geant)
- Modify SMT hit storage interface
- Modify SMT hit digitization package
- Modify SMT cluster reconstruction package
- Create standalone package for track reconstruction

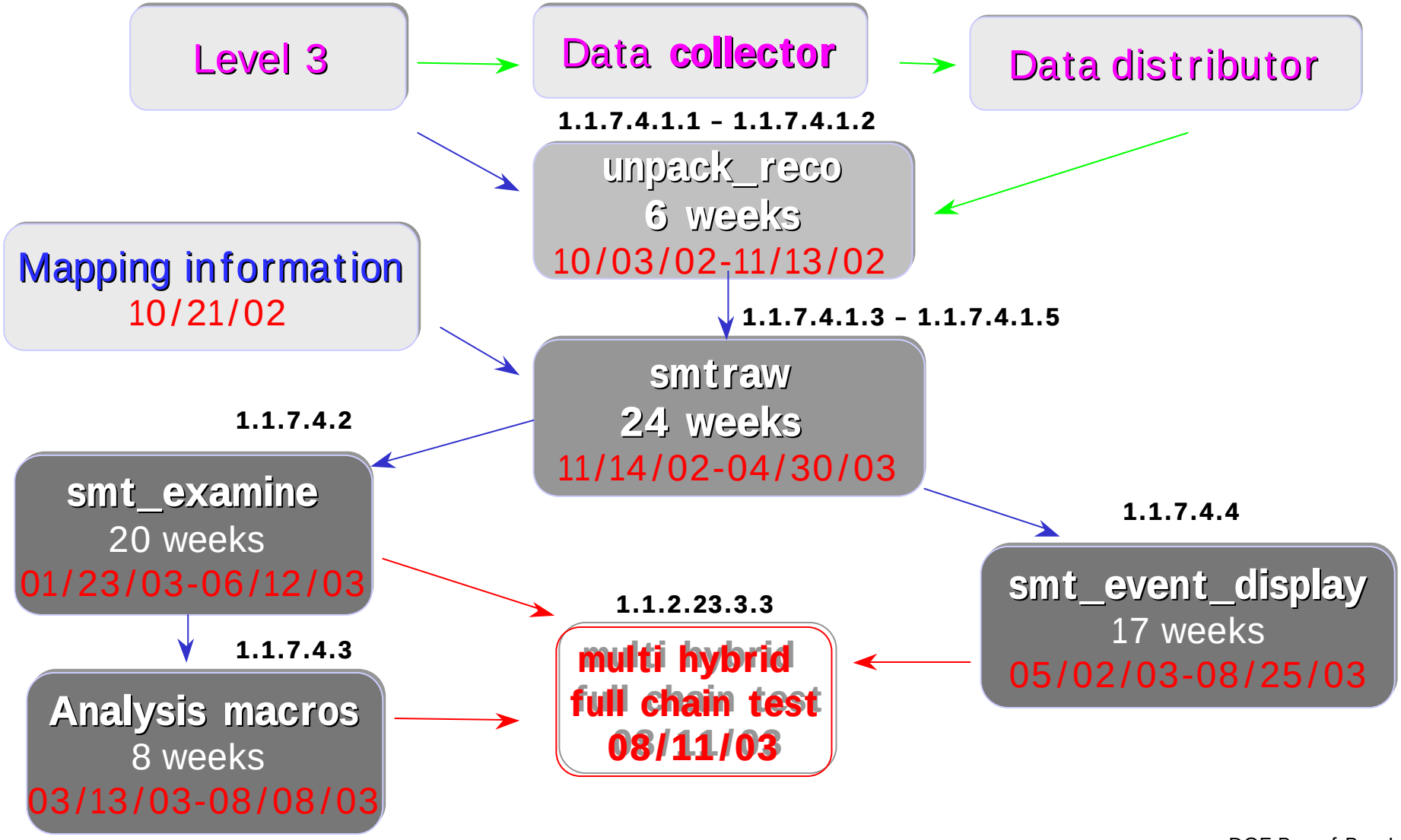
« DONE »

Results of the simulation of SMT performance are presented in TDR

Data flow and associated packages



Schedule for data analysis packages



Basis of estimate

	Run IIa		Run IIb		
packages	*duration*	*manpower*	*duration*	*manpower*	*Changes required*
1.1.7.4.1 unpack_reco	26 w	1@100%	6 w	1@50%	small
1.1.7.4.1 smtraw	52 w	1@50%	24 w	1@50% 1@50%	significant
1.1.7.4.2 smt_examine	52 w	1@50%	20 w	1@100% 1@50%	Very significant
1.1.7.4.3 analysis macros	8 w	1@50%	8 w	1@50%	Very significant
1.1.7.4.4 smt_event display	18 w	1@50%	17 w	1@50%	Very significant

Manpower

- Consists of 4 persons right now
- Universities involved : KSU, UIC, Northwestern University
- Develop and support existing Run IIb simulation software: F.Rizatdinova, A.Khanov (KSU) and E.Chabalina (UIC)
- Software development and support for the Run IIb commissioning: 2 postdocs + student (12 months)
- Calibration and monitoring: 2 postdocs and student from Northwestern University

Conclusions

- Simulation tools have been developed and extensively used for both SMT design and performance evaluation
- Standalone reconstruction code has been developed and used for the physics performance evaluation
- All Run IIb simulation packages are in the standard D0 code repository – available for everyone
- Tasks 1.1.7.1 – 1.1.7.3 have been successfully completed in time
- The scope of the silicon Run IIb software project is well understood and the estimates for both time scale and manpower based on the Run IIa experience are proved to be realistic.