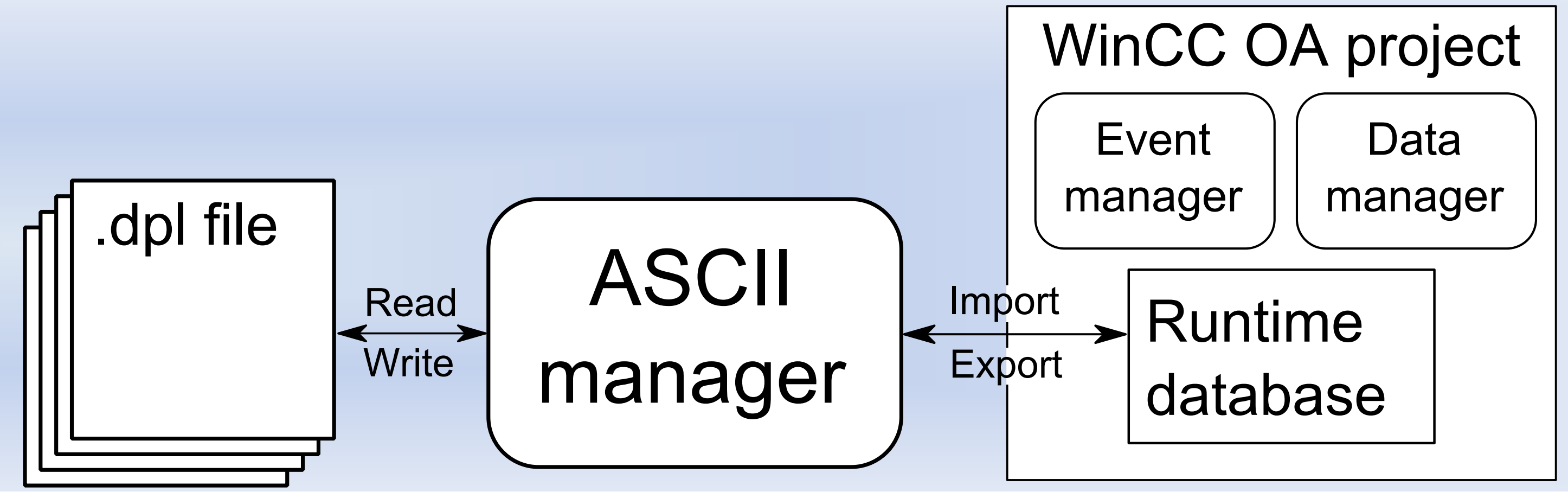


INTRODUCTION

Simatic WinCC Open Architecture (OA) [1] is a commercial SCADA package used for the controls systems of the LHC experiments and multiple accelerator services, such as: Cryogenics, Quench Protection System, Power Interlocks etc. All WinCC OA process variables (data-point types and data-points), as well as their parameterization (configs) are stored in a proprietary internal run-time database. The WinCC OA ASCII manager allows import/export of the contents of this database from/to plain text files. In the scope of CERN openlab, a flexible and fully automated test-suite was developed to benchmark the performance of the ASCII Manager and to identify possible bottlenecks, which may limit the scalability of the tool. The test-suite was used to compare the ASCII manager performance of two versions of the SCADA package under Windows and Linux.

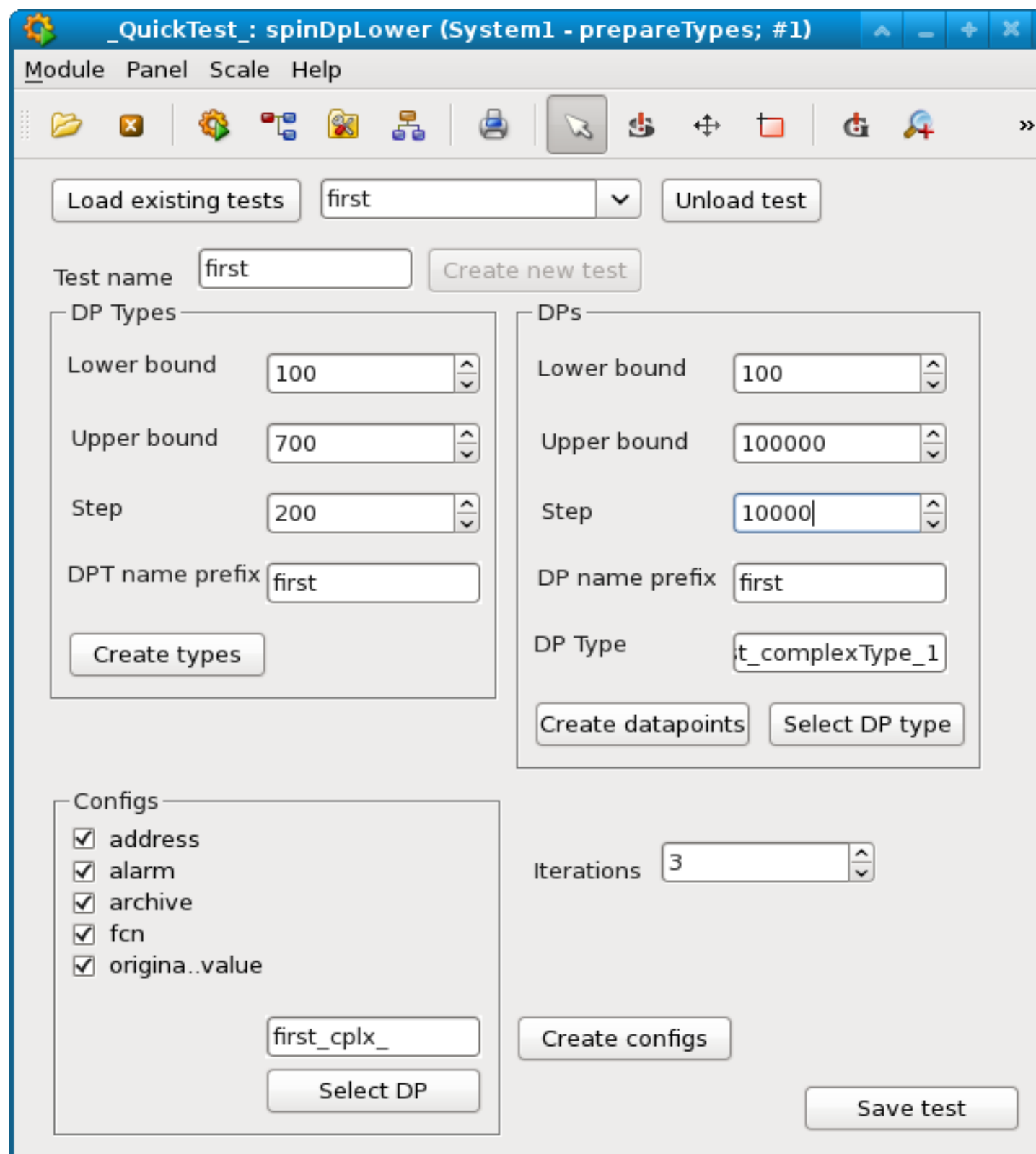
ASCII manager

- Large WinCC OA projects contain hundreds of thousands of variables
- The ASCII Manager allows to import and export project runtime database
- ASCII Manager is a vital component of WinCC OA that:
 - Enables an easy migration of applications between hosts
 - Eases the integration of multiple development
 - Facilitates maintenance of the applications



Benchmark suite

- Assesses the performance of the import/export of the WinCC OA runtime database
- Generic test-suite that supports multiple versions of WinCC OA
- Allows configuring the types (DPT), their instances (DP) as well as the parameterization to be imported/exported
- Fully automated execution of tests
- Each test is run a number of times. The suite ensures always the same initial conditions for each iteration
- Monitors system resources used during the test
- A wide variety of plots are generated



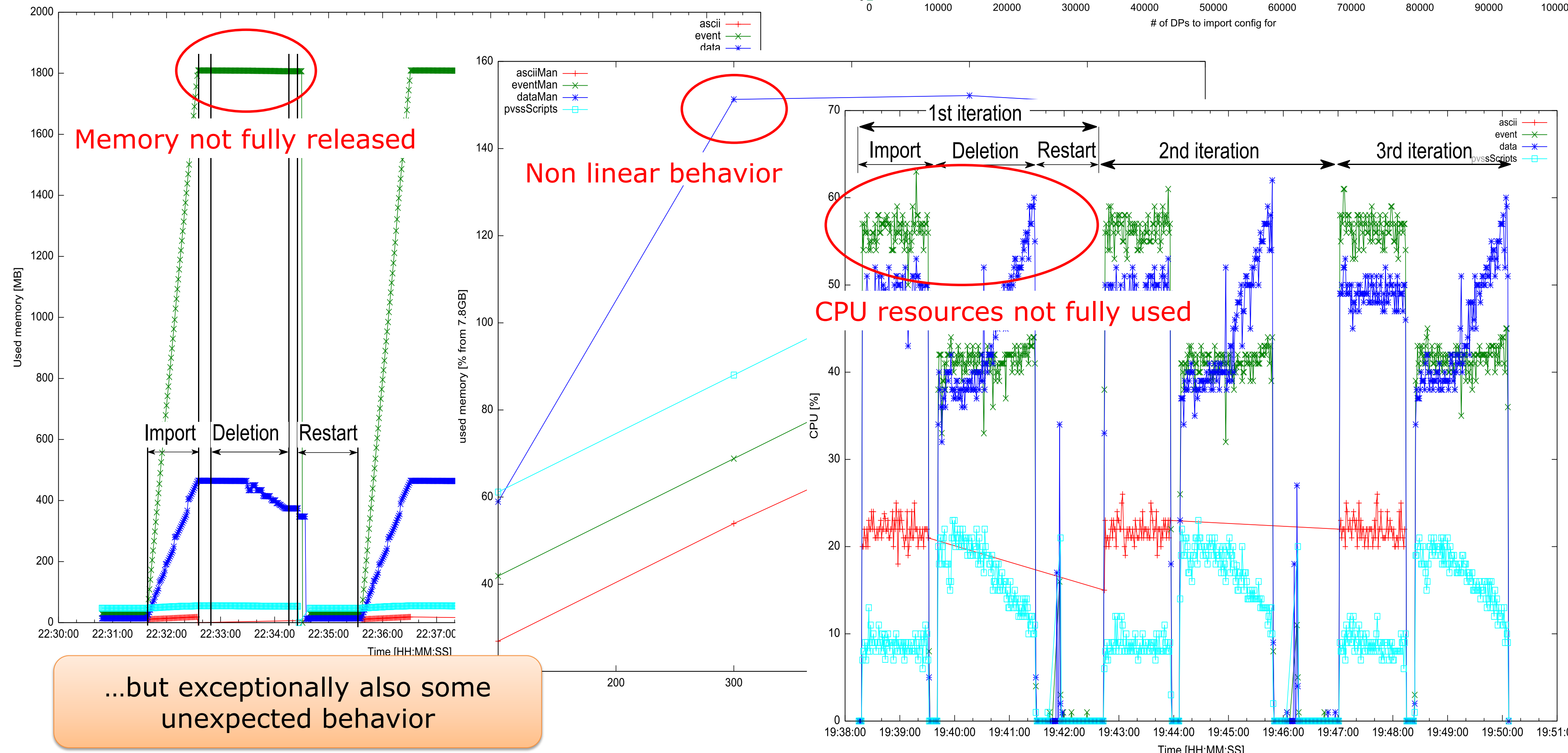
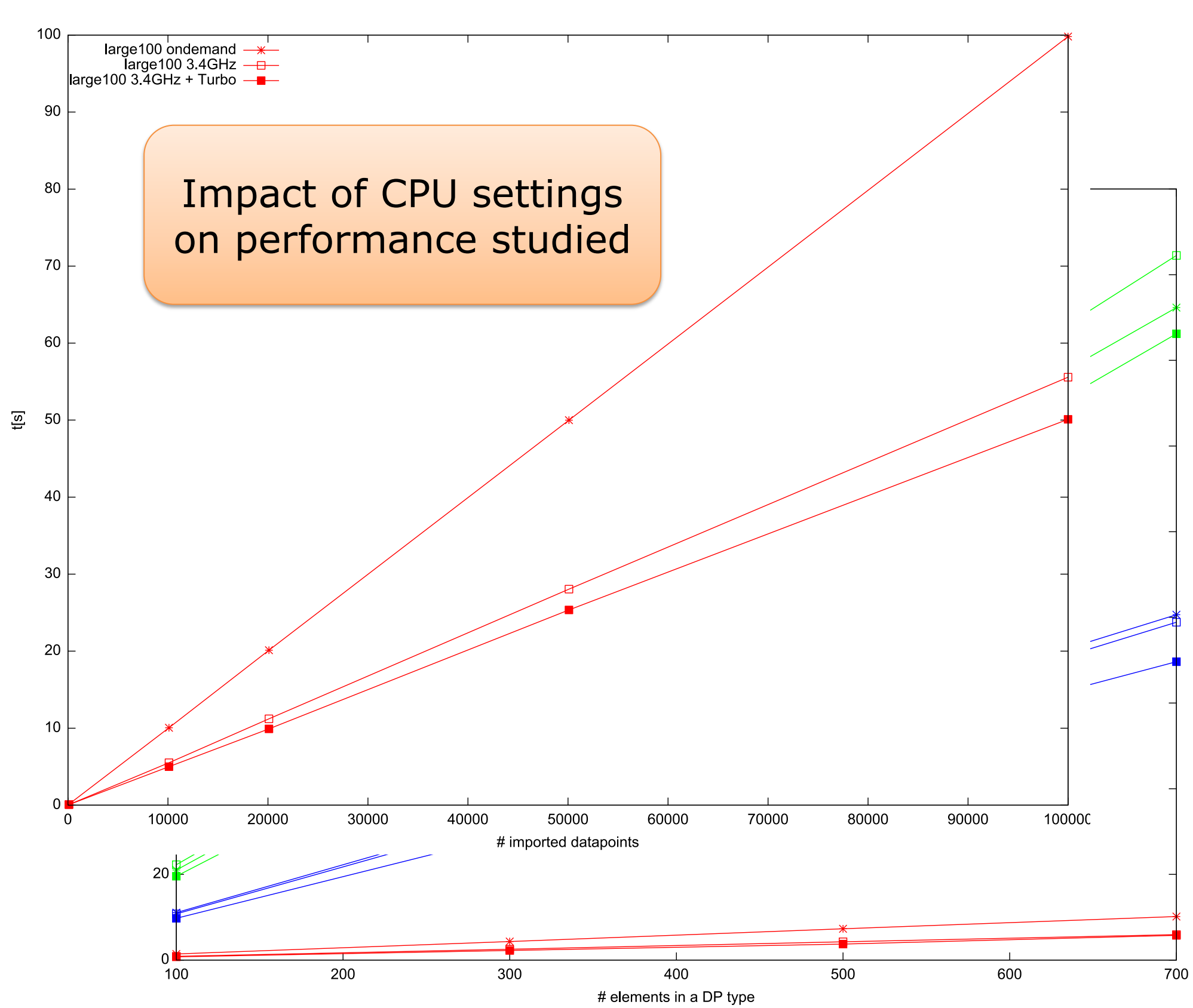
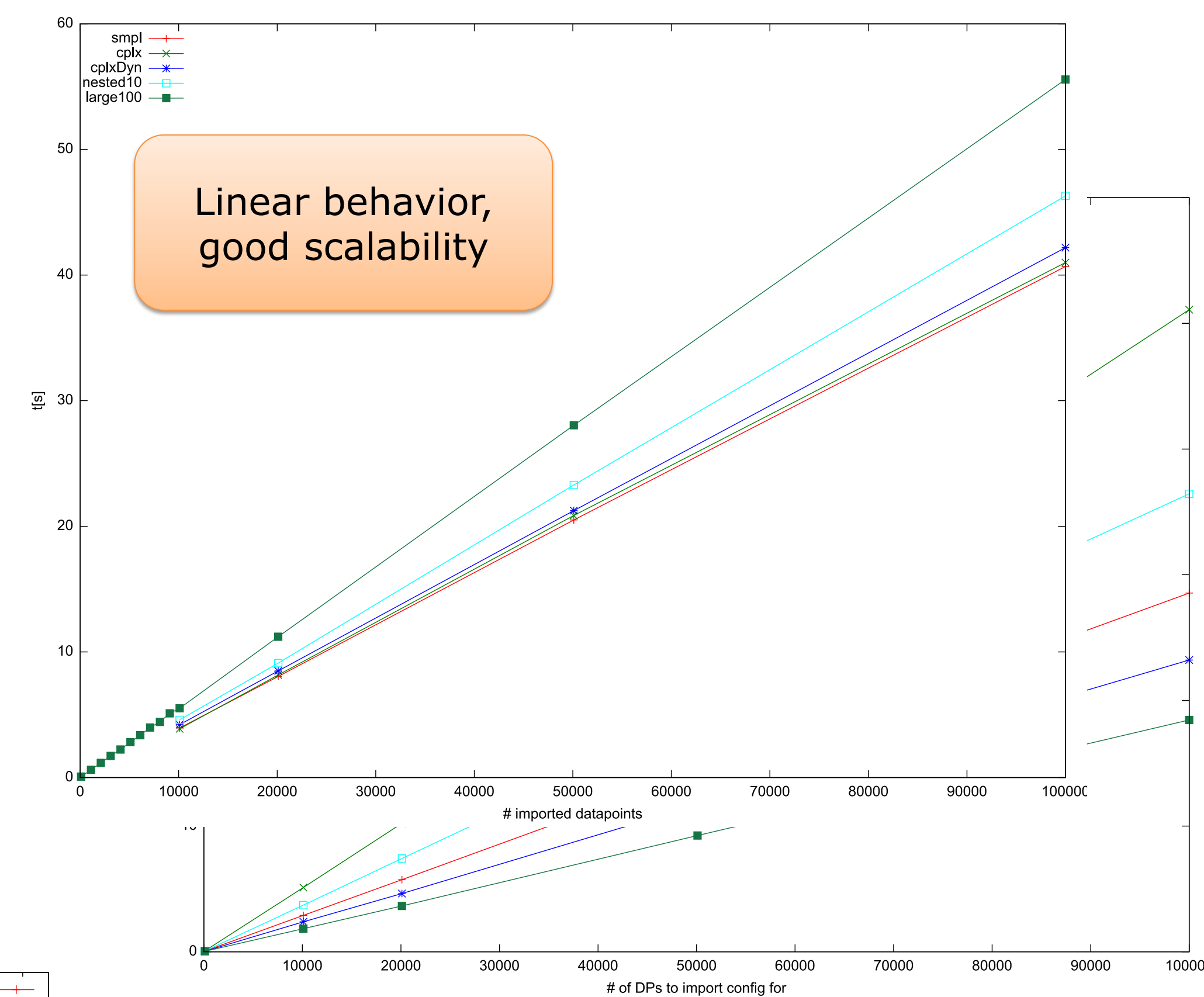
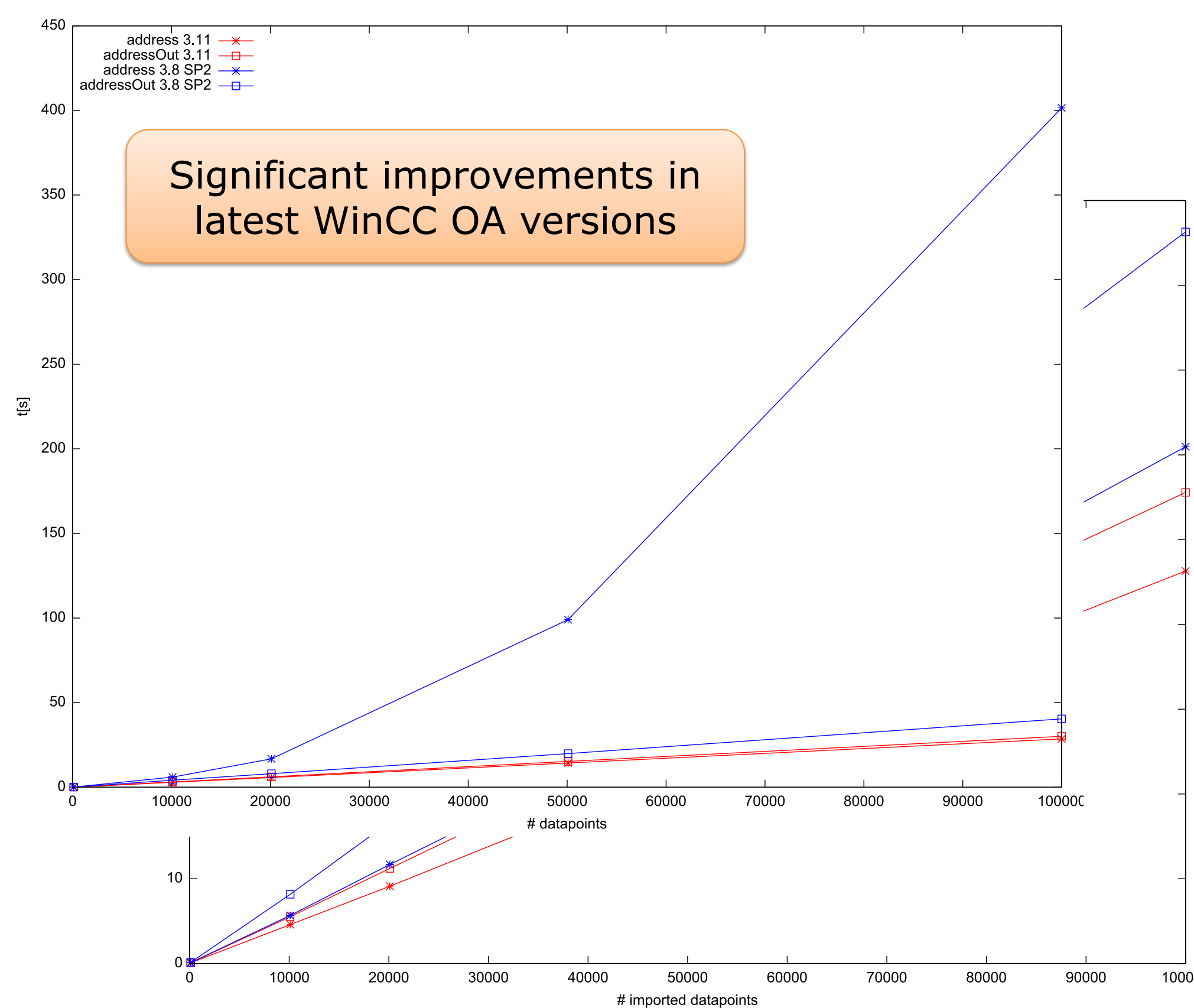
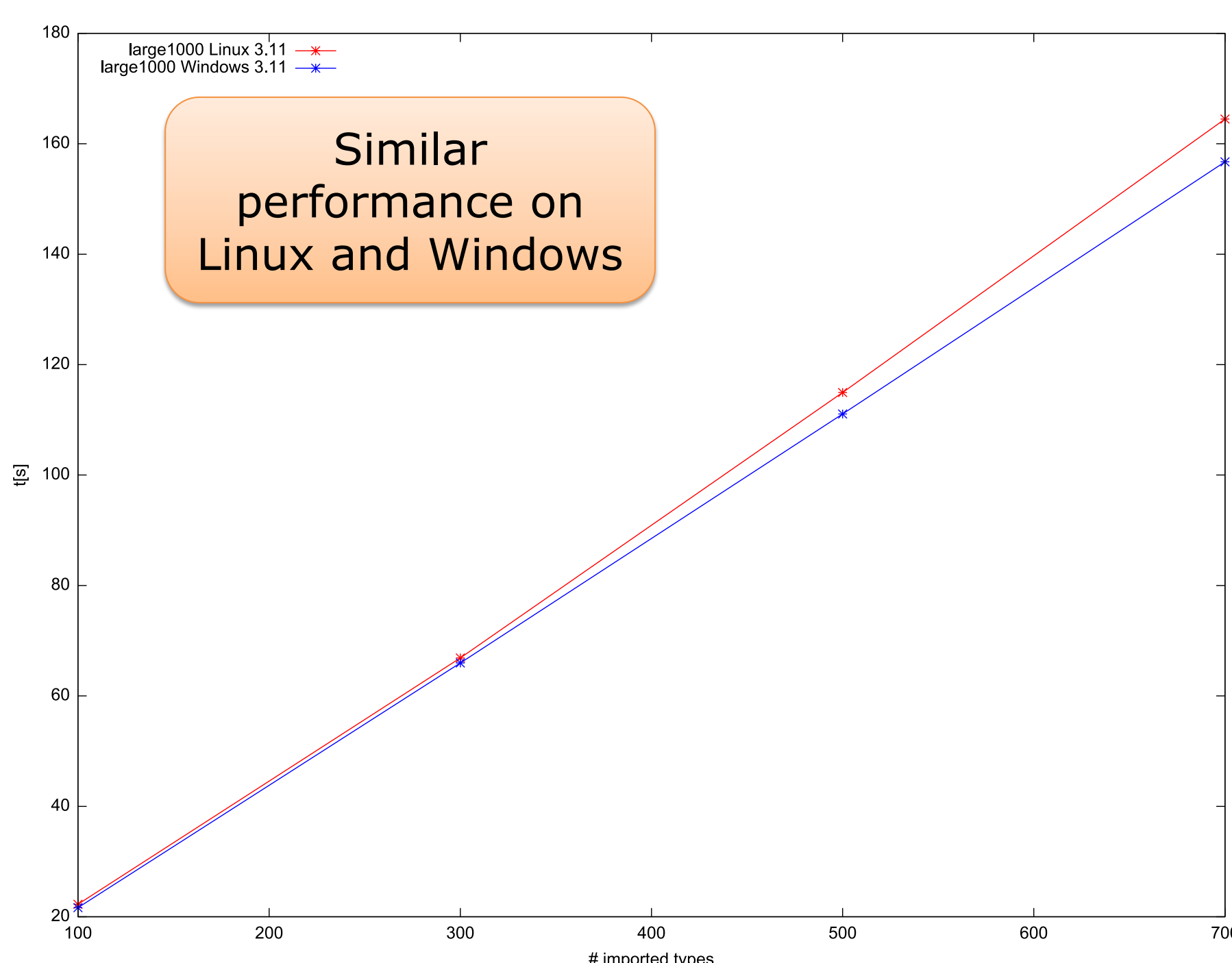
Screen for the definition of the test contents

Table 1: Tests statistics

What?	How many?	Remarks
Number of DPT templates	18	Different element types and number
Range of DPT*	100-700	For each type template
Range of DP*	10 ² -10 ⁵	For 5 DPTs
Range of DP elements*	10 ² -10 ⁷	bool, int, float, string elements
Max number of configs per DPE	5	Possible to export/import each of them in turn or combined
Number of plots	288	
Largest file size	~120 MB	

* Maximum values are a factor 10 larger than the largest applications at CERN

Results



CONCLUSIONS

A generic test-suite was developed to benchmark the performance of the ASCII manager of various versions of WinCC OA. Several tests were performed, which included the import of types (DPTs), instances (DPs) and attributes (configs) under SLC6 64bit and Windows 7 64bit systems for both WinCC OA 3.11 and 3.8-SP2 versions. The results that we obtained showed a linear behavior for time required by the ASCII manager to import items as a function of their number. Comparison of the data for both versions of WinCC OA showed an improvement of the performance of the ASCII manager in WinCC OA 3.11. All results have been summarized in a report sent to Siemens ETM [2]. These results will be a valuable input for the development of future WinCC OA versions.

References

- [1] <http://www.pvss.com>
 [2] <http://www.etm.at>