

Tutorial S3 Outline

- 9:00 Introduction and overview of application performance modeling
- 9:15 What is Performance? An examination of performance metrics, and factors that influence and contribute to the performance of an application
- 10:00 Single processor Performance – measurement of CPU performance along with an overview some commonly used code optimization methods.
- 10:30 Break
- 10:45 Parallel Performance – factors that contribute as application and system use scale. This includes an examination of both application factors and system factors.
- 11:00 Analysis of application factors including: data decomposition, surface to volume, structured / un-structured grids, strong vs. weak scaling, resource requirements and frequency of use.
- 11:45 Analysis of system factors including: communication Performance – measurement and modeling of communication network, point-to-point, global communications, communication contention, memory characteristics.
- 12:30 Lunch
- 13:30 Identification of performance factors and model formation for an application.
- 14:00 Case studies: 1) Performance Model construction and use. Code: SWEEP3D, POP, TYCHO, MCNP
- 15:00 2) Predicting performance on existing and future architectures – using an example structured grid application.
- 15:30 Break
- 15:45 3) Verification of achieved performance on ASCI Q. Code: SAGE.
- 16:15 4) Comparison of the Earth Simulator and ASCI machines. Code: SAGE and SWEEP3D
- 16:45 Conclusions, lessons learned
- 17:00 End

Total duration: 8 hours with breaks.

It is envisaged that there will be time available for adequate discussion and interaction especially in the afternoon sessions.