

# VSC Training Course: Parallelization with MPI

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Vienna Scientific Cluster  
[vsc.ac.at](http://vsc.ac.at)

On clusters and distributed memory architectures, parallel programming with the Message Passing Interface (MPI) is the dominating programming model. In this 3 days course parallel programming with MPI is taught starting from a beginners level. Hands-on sessions (in C and Fortran) will allow users to immediately test and understand the basic constructs of the Message Passing Interface (MPI).

This course has been originally developed by Rolf Rabenseifner from the High-Performance Computing-Center Stuttgart (HLRS) and is organized in cooperation with HLRS. It is a retake of the MPI course in May 2016 in Vienna.  
(Content Level: 70% for beginners, 30% advanced)



Agenda

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[1] Slide 1 / 4

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## MPI course (3 days) — Vienna — 1st day

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- 8:45 **Registration**
- 9:00 **Welcome / Introduction** [2,7] (talk)
- 9:15 **MPI – Introduction to the Message Passing Interface** [3] (talk)
- 9:30 **Chapter 1: MPI Overview** (talk)
- 10:15 **Chapter 2: MPI Process Model** (talk+practical)
- 11:30 **Coffee**
- 11:45 **Chapter 3: Messages and Point-to-Point Communication** (talk+practical)
- 13:00 **Lunch**
- 14:00 **Chapter 4: Non-Blocking Communication** (talk+practical)
- 15:30 **Coffee**
- 15:45 **Chapter 6-(1): Collective Communication** (talk+practical)
- 16:45 **Chapter 5: Fortran and MPI** [4] (talk – only for Fortran participants)
- 17:30 **End**



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[1] Slide 2 / 4

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## MPI course (3 days) — Vienna — 2nd day

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- 9:00 **Chapter 8-(1): Groups & Communicators** [3 cont.] (talk+practical)
- 10:15 **Chapter 8-(2): Re-numbering on a cluster** (talk)
- 10:30 **Coffee**
- 10:45 **Chapter 9: Virtual Topologies** (talk+practical)
- 12:00 **Chapter 12-(1): Derived Datatypes** (talk)
- 12:30 **Lunch**
- 13:30 **HPC I/O** [6a] (talk)
- 14:00 **Chapter 13-(1): Parallel File I/O (basics)** [3 cont.] (talk+practical)
- 15:00 **Coffee**
- 15:30 **Chapter 13-(2+3): Parallel File I/O (fileviews)** (talk+practical)
- 17:30 **End**



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[1] Slide 3 / 4

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## MPI course (3 days) — Vienna — 3rd day

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- 9:00 **Chapter 10: One-sided Communication** [3 cont.] (talk+practical)
- 10:30 **Coffee**
- 10:45 **Chapter 11-(1): Shared Memory One-sided Communication** (talk+practical)
- 12:00 **Chap. 7, 14-17: Short Tour** (talk)
- 12:15 **The Vienna Scientific Cluster (VSC)** [5] (talk)
- 12:30 **Lunch**
- 13:30 **Best Practice for Code Parallelization** [7] (talk)
- 14:30 **Coffee**
- 15:00 **Parallel Programming Models** [6] (talk)
- 15:45 **Summary / Q&A** [8] (talk)
- 16:00 **End**



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[1] Slide 4 / 4

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