

# Cray XE6 Optimization Workshop at HLRS, 2011, Feb. 2-4

## Day 1 : Basic Understanding of the Cray XE6

<b>9:00 – 9:30</b>	<b>Registration</b>
<b>9:30 – 9:40</b>	<b>Welcome (Stefan Wesner, HLRS)</b>
<b>9:40 – 10:30</b>	<b>Cray XE6 Architecture (Stefan Andersson, Cray)</b> Architecture of Cray XE6 Socket 34 architecture Gemini Interconnect
<b>10:30 – 10:45</b>	<b>Break</b>
<b>10:45 - 11:30</b>	<b>The CRAY Programming Environment – Part I (Charles Henriet, Cray)</b> Modules Compiler options and flags
<b>11:30 – 11:45</b>	<b>Break</b>
<b>11:45 – 13:00</b>	<b>The CRAY Programming Environment – Part II (Charles Henriet, Cray)</b> Programming considerations Running an application Cray Scientific Libraries
<b>13:00 – 14:00</b>	<b>Lunch</b>
<b>14:00 – 15:15</b>	<b>Optimization I</b> Optimization methodology ( <b>Jason J. Beech-Brandt, Cray</b> ) Using Craypat to profile applications ( <b>Stefan Andersson, Cray</b> )
<b>15:15 – 15:30</b>	<b>Break</b>
<b>15:30 – 17:30</b>	<b>Hands-on workshop to profile applications</b> Compilation, Execution and profiling of applications on the CRAY XE6. Attendees are encouraged having an application to work with

## Day 2: Optimization and usage of the Cray XE6

- 9:00 – 10:30**      **Optimization II (Stefan Andersson, Cray)**  
Memory understanding and optimization  
Vectorization  
Cache blocking examples
- 10:30 – 10:45**      **Break**
- 10:45 – 12:00**      **Optimization III (Stefan Andersson, Cray)**  
Shared Memory Optimization, Using OpenMP efficiently  
Using Craypat for examining OpenMP performance
- 12:00 – 12:45**      **Hands-on with Craypat**
- 12:45 – 13:45**      **Lunch**
- 13:45 – 15:15**      **Optimization IV (Stefan Andersson, Cray)**  
Optimization of I/O
- 15:15 – 15:30**      **Break**
- 15:30 – 17:30**      **Hands-on workshop to optimize applications**

## Day 3: Even more optimizations

- 9:00 – 10:30**      **Optimization V (Jason J. Beech-Brandt, Cray)**  
Scaling applications to thousands of processors  
MPI optimization  
Task placement
- 10:30 – 10:45**      **Break**
- 10:45 – 12:45**      **Co-array FORTRAN and UPC on Cray XE6 (Jason J. Beech-Brandt, Cray)**  
Advantages and Disadvantages of MPI and PGAS
- 12:45 – 13:45**      **Lunch**
- 13:45 – 15:15**      **Open Session for questions/review**
- 15:15 – 15:30**      **Break**
- 15:30 – 16:30**      **Hands on Workshop to optimize applications**