

PRESS RELEASE

LEADING THINKERS CONVENE IN UK TO TACKLE SUPERCOMPUTER EFFICIENCY BARRIERS

- **Cray User Group and HPC in Meteorology conferences put ECMWF at the centre of global effort to tackle data processing challenge**

Global efforts to bring about crucial improvements in supercomputing efficiency and energy usage were placed centre stage this week as the European Centre for Medium-Range Weather Forecasts (ECMWF) welcomed users and vendors from around the world to London for the Cray User Group 2016 conference.

ECMWF, which runs one of the largest supercomputer facilities in Europe, is a leading proponent of ‘scalability’, a series of initiatives designed to improve supercomputer efficiency and energy usage. Innovative ways to allow high-performing computers to work more efficiently will enable greater amounts of data to be processed. This in turn will allow crucial weather forecast and Earth monitoring improvements to continue whilst sustainably managing the amount of energy needed. As a result, ECMWF’s numerical weather predictions will continue to support Europe’s meteorological services as they protect their citizens from the effects of severe weather.

Registration has also started for the 17th Workshop on High-Performance Computing in Meteorology, also being hosted by ECMWF in October, again emphasising the Centre’s role in driving progress on big data and forecasting.

Scalability draws on the knowledge of weather experts, computer scientists and hardware providers to understand coding challenges and test ideas in order to better

manage energy consumption and increase computational efficiency. This is aimed at providing more precise weather predictions.

Scalability was the key topic at this year's Cray User Group conference, hosted from 8 to 12 May by ECMWF, which brought together users of Cray supercomputers from all around the world. The event included tutorials and technical sessions on how best to use high-performance computing systems, and to discuss the importance of improving scalability in the area of numerical weather prediction.

ECMWF's first operational forecast in 1979, at 210 km global resolution, took 5 hours to run on a single-processor Cray-1A. Today, two Cray XC30 systems, each with more than 84,000 cores, provide more than 4 million times the sustained performance of that first Cray. This allows a much larger and more advanced forecasting system featuring a high-resolution global model resolution of 9 km and a 50-member ensemble with a model resolution of 18 km.

Further improvements in forecasting will require supercomputer energy consumption to increase in order to manage the more complex forecasting systems of the future. Current projections show that energy consumption at ECMWF would have to increase from around four megawatts today to around 50 megawatts within ten years. Scalability is intended to reduce this and keep supercomputers energy efficient as they contend with more data.

ECMWF Director-General Florence Rabier said: *"Improvements in predicting the weather from days to months and in understanding our climate call for ever more complex calculations. Supercomputer technology has played a key role in the great advances we've made over the past four decades.*

"But this same technology could ironically impair further advances unless we start tackling inefficiencies in data processing and energy use.

"The high interest in the presentations and discussions during the conference is encouraging and confirms the importance of the topic of scalability. The conference has been an excellent opportunity to raise the profile of ECMWF's Scalability Programme and has opened up the prospect of new collaborations in this area.

“If we can get this right, we won’t just be able to predict the weather more accurately further in advance and improve the resilience of our economies, we’ll also do it at a sustainable cost.”

The president and CEO of Cray, Peter Ungaro, said: *“The Cray User Group is a vibrant, user-managed community and its annual conference provides a unique forum for discussing and sharing solutions to some of the most challenging problems that are at the intersection of advanced technology, supercomputing and big data analytics.*

“We appreciate the support of ECMWF in hosting this year’s excellent conference, and we look forward to working closely with ECMWF and our customers around the globe to meet the scalability challenges of tomorrow.”

ECMWF is also putting scalability at the top of the agenda for the 17th Workshop on High-Performance Computing in Meteorology, which it is hosting from 24 to 28 October in Reading. It will bring together users from Member States and around the world to discuss achievements in high-performance computing over the past two years and requirements for computing power into the future.

Ends

Notes for editors

1. More details about the Cray User Group conference are available here: <https://cug.org/CUG2016>
2. More details and registration details for the 17th Workshop on High-Performance Computing in Meteorology are available at <http://www.ecmwf.int/en/learning/workshops-and-seminars/17th-workshop-high-performance-computing-meteorology>. The deadline to register is 26 August 2016.
3. The European Centre for Medium-Range Weather Forecasts (ECMWF) is an independent intergovernmental organisation supported by 34 states, established in 1975. ECMWF's core mission is to produce numerical weather forecasts, carry out scientific and technical research to improve forecast skill, and to maintain an archive of meteorological data.
4. ECMWF's Scalability Programme, launched in 2013, brings together meteorological modellers, computer scientists and hardware providers from around the world for a coordinated approach to hardware and software development.
5. For more information, please contact: pressoffice@ecmwf.int