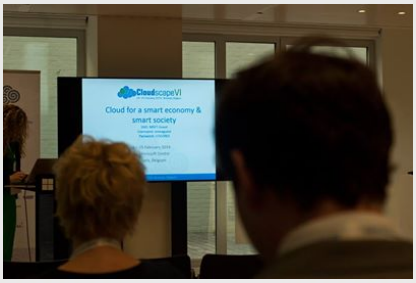

The sky's the limit for cloud computing

iSGTW reports from Cloudscape VI, where Helix Nebula gave attendees a first glimpse of its new production platform. Discussion at the event, held in Brussels, Belgium, also focused on sustainability and the legal aspects of cloud computing, as well as the barriers to greater adoption of this technology in both the public and private sectors.

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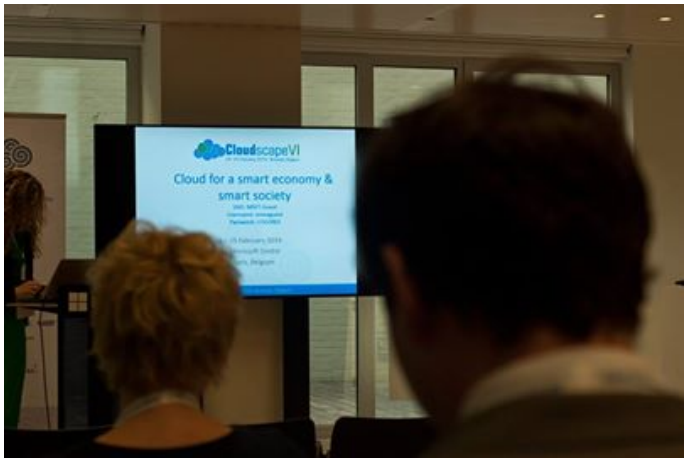

The event was held in the Microsoft Center, Brussels, Belgium. Image courtesy Neasan O'Neill.

week, *iSGTW* attended Cloudscape VI in Brussels,

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Andrew Purcell
European editor

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Belgium. The event, which had the tagline 'cloud for a smart economy and smart society', featured much discussion of the policy aspects of cloud computing, as well as the potential benefits of cloud computing for both business and scientific research. "Cloud is still very emergent," says Ken Ducatel, head of software and services, cloud computing at the European Commission. "There are a lot of business models and they're very complex: there's no one-size fits all solution."

The event also featured a panel discussion on the subject of cloud adoption and how to measure success. In this session, Ducatel cited trust as the greatest barrier to adoption, whereas Abdella Battou from the US National Institute of Standards and Technology highlighted standards, particularly in relation to security, as the greatest barrier. By contrast, Gabriella Cattaneo of the International Data Corporation (IDC) says: "There is no single barrier. Security and standards are very important, but the trust barrier may be more important for some, while interoperability can also be a major issue." Meanwhile, David Bernstein, a senior member of the Institute of Electrical and Electronics Engineers (IEEE), believes that the greatest barrier to successful cloud adoption is, simply, imagination: "the fathers of the telephone never imagined today's mobility," he says.

Brazilian connections

At Cloudscape VI, it was revealed that the popular conference series will also be heading to Brazil, with the launch of Cloudscape Brazil later this year.

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Cloudscape Brazil I and II will be led by the EU Brazil Cloud Connect project. "Through Cloudscape Brazil, we will emphasize the benefits that cloud computing approaches can bring to the e-science community in Brazil and attract government and industry players to share first-hand best practices in cloud computing developments worldwide," says Francisco Brasileiro from the Federal University of Campina Grande, who is the Brazilian coordinator of EU Brazil Cloud Connect. "Cloudscape Brazil will also encourage active contributions of Brazilian groups to the several on-going standardization initiatives across the globe."

EU Brazil Cloud Connect launched last month and is seeking to create a federated research e-infrastructure based on a user-centric approach. It will adapt existing applications to tackle new scenarios in areas of mutual interest to Brazil and Europe with high social impact and innovation: neglected diseases, climate change, and health. It will integrate frameworks and programming models for scientific gateways and complex workflows that meet not only the requirements of these three specific use cases, but potentially also a much larger user community.

"EU Brazil Cloud Connect will drive advances in several research areas," explains Ignacio Blanquer from Valencia University of Technology, who is the European coordinator of the project. He says that these areas will include virtualized resource federation using clouds that promote sustainability, programming frameworks in the cloud, and high-

performance computing and big data in the cloud. In addition, the project will also pursue interoperability and integration of existing systems, such as coordinating technical interoperability with Helix Nebula, incorporating relevant standards, and extending links with EGI.

Find out more about EU Brazil Cloud Connect on the project website.

Discussion at the event also focused on the environmental impacts of cloud computing. "ICT is enabling energy reduction through optimization, but ICT also consumes a lot of energy," says Kyriakos Baxevanidis, deputy head of the European Commission's Smart Cities and Sustainability unit within DG CONNECT. "If the cloud were a country, it would rank fifth in the world in terms of energy consumption." Baxevanidis also stressed the importance of taking the environmental impact of the networking infrastructure into account, as well as that of the data centers, and he highlighted work done in Europe to establish standards across industry for measuring the environmental footprint of ICT.

Linda Strick, coordinator of the Cloud for Europe project, spoke in the same panel session, entitled 'how to deliver better citizen services and make cost and efficiency savings'. She explained how the different nation states that exist in Europe can make the provision of public services via the cloud particularly difficult. "The public sector doesn't really understand what cloud is," says Strick. "We need to initiate dialogues between public sector and

industry, and address concerns on data protection, security, legal, and contractual aspects." She adds: "We also need to support related research from industry and use of pre-commercial procurement as an instrument for innovation in public sector."

Kuan Hon, from Queen Mary University of London, UK, used her keynote address at Cloudscape VI to give a fascinating overview of the Cloud Legal Research Project, which aims to address the various aspects of the legal and regulatory status of cloud computing. She explained that doing so is essential to the successful development and widespread adoption of cloud computing. Research published by Hon and her project colleagues has played an important role in helping the public sector better understand the legal aspects of using commercial cloud services. And, at the event, Hon discussed at length her belief that when applying data protection rules in a cloud computing context, the current European focus on geographical location is inappropriate. Instead, she says: "regulation should be based on control of logical access to intelligible data."

Another subject focused upon at the event was data preservation, with Evangelos Floros, a project manager at the Greek Research and Technology Network, highlighting the importance of the work done by European projects such as EUDAT and OpenAIRE in this area. Delegates discussed the challenges surrounding targets to preserve data beyond the lifetimes of the research projects which have generated the data. Simon Woodman of the

University of Newcastle, UK, who presented e-Science Central at the event, argued that a large part of the challenge is related to traditional funding structures, which have evolved around a model based on capital expenditure. "Funders typically don't know how to fund cloud costs," he says. David Wallom, associate director for innovation of the Oxford e-Research Centre, agrees, noting: "it costs money to store data; open data is not free data."

Wallom also gave a brief update at the event on the European Grid Infrastructure (EGI) Federated Cloud. The EGI Federated Cloud is a seamless grid of academic private clouds and virtualized resources, built around open standards and focusing on the requirements of the scientific community. "We're pushing forward to create this federated, open marketplace for Europe," says Wallom. "I want it to be open to every type of resource provider and user community."

Finally, Bob Jones, head of CERN openlab, presented the Helix Nebula production platform for the first time at the event. The platform, which will be launched in the coming weeks, won the award for best position paper at Cloudscape VI. "It integrates with existing e-infrastructures to form a hybrid cloud marketplace and will reach out to Europe's research communities," says Jones. "It will take a hybrid approach to building on public and commercial assets to cover the entire scientific workflow, and will provide researchers with access to world class resources through a dynamic and

sustainable marketplace, offering a broad range of services that are free at the point of use."

The Helix Nebula Marketplace (HNX) - as the platform will be known - will deliver easy and large-scale access to a range of commercial cloud services through the innovative broker technology deployed within the Helix Nebula initiative over the last two years and tested with flagship applications from CERN, EMBL and ESA. Federation of public sector data center resources from within EGI with the Helix Nebula Marketplace will also enable EGI's research communities to use the Helix Nebula Marketplace services through a hybrid cloud model. "We aim to drive convergence between existing e-infrastructure providers and use market mechanisms to attract new service providers and consumers to the marketplace," explains Jones. "The Helix Nebula Marketplace is a step towards 'infrastructure as a service'," adds Steven James of CGI, one of several partner companies working in Helix Nebula. "We want to create an ecosystem where we bring science and industry together for the benefit of Europe."

The Cloudscape event series is the legacy of two previous European Commission coordination and support actions funded under the e-Infrastructures unit of the EU Seventh Framework Programme for Research (FP7).

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