

Information & Communication Technologies - Ireland

Summer/Autumn 2011

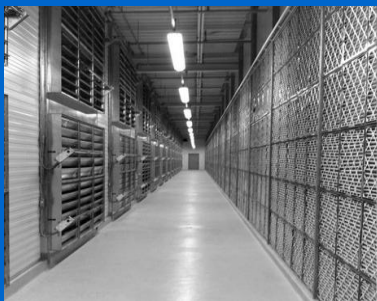
Dell's first Cloud Computing R&D Centre located in Ireland



Dell announcement June 2011: Jeff Clarke, Vice Chairman, Global Operations & End User Computing Solutions, Dell Inc., Irish Prime Minister Enda Kenny and Irish Finance Minister Michael Noonan.

"The investment in Ireland is central to our broader strategy of establishing leadership in cloud computing..... We see Ireland as an ideal home for our cloud-based activities", Jeff Clarke, Vice Chairman, Global Operations & End User Computing Solutions, Dell Inc.

"We performed a site assessment and chose Dublin....The [Dell] guys who came over from the US were blown away with the range of talent available in the market, so they decided to go and do the whole thing in Dublin", Steve McKenna, Executive Director, Services Solutions Group, Dell Inc.



Ireland is the Strategic European Data Centre location of choice for Microsoft, Google, Yahoo, Vodafone, IBM, Adobe, EMC and Amazon.com.

The selection by the above companies of Ireland for strategic hosting is testimony to their confidence in Ireland for hosting/data centre operations.

IRELAND LEADING THE WAY IN CLOUD COMPUTING

Cloud Computing - A Strategic Focus for Ireland

Cloud computing is a strategic focus for the Irish Government and IDA Ireland, and is a priority for development and support. Ireland is leading the way in global cloud computing investment as evident by recent investments by global leaders, who are making Ireland the centre for their cloud computing strategies. New investments include:

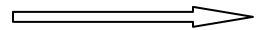
R&D:

Dell, in June 2011, announced that Ireland would be the company's first Cloud Research and Development Centre, whose engineers will have responsibility for developing the company's next generation of cloud computing architectures. 150 jobs (with other research) will be created.

HP, which employs 4,000+ in Ireland, announced in April 2011 an expansion of its Cloud Services Centre in Galway, with plans to create 50 new engineering positions. The centre was established in October 2009. The expansion follows the success of the new centre and the company's successful recruitment drive for new software engineers for a separate 105 person R&D project announced in December 2010.

EMC in April 2011 announced the expansion of its cloud computing, big data and data centre research programmes with the establishment of EMC Research Europe in Cork. The expansion follows the success of EMC's investment of €20 million in a new R&D centre in 2008. EMC, in Ireland since 1988, employs over 2,500 (including VMware) in manufacturing, shared services - finance, customer support and supply chain management, inside sales and software development.

IBM established its first European Cloud Computing Centre in Ireland in 2008. The centre is one of eight projects, primarily R&D, initiated by IBM in Ireland between 2008 and 2010.



Ireland - Europe's Number 1 Location for R&D

Ireland is one of the world's leading R&D locations and in 2010 was rated by Mazars¹ as Number 1 in Europe and Number 2 worldwide from an after-tax cost perspective. Ireland's 25% R&D tax credit and 12.5% corporate tax rate were key factors.

According to Mazars, Ireland also rates highly for R&D on a number of critical non tax factors, which include the availability of qualified research institutions, the education level of available workforce, the cost and availability of resources, facilities, equipment and materials, intellectual property (IP) laws on ownership and protection, and political stability.

Ireland's 25% R&D tax credit can be availed of through a reduction in a company's Irish corporate tax liability or, in certain circumstances, through a cash refund from the Revenue Commissioners. IDA Ireland provides generous grant support for corporate R&D, with enhanced support for collaborative research projects with research institutions.

1. Mazars 'Review of Global R&D Tax Incentives' study, involving 20 countries, including US, UK, Netherlands, France and Israel. The study determined the countries with the most effective tax rates, from an R&D investment perspective, using a given level of R&D expenditure.

Microsoft's EMEA Cloud Services Centre located in Ireland



Arne Josefsberg, General Manager, Internet Hosting, Microsoft Corp., Paul Rellis, Managing Director, Microsoft Ireland, Ireland's former Prime Minister, Brian Cowen, Jean-Philippe Courtois, President Microsoft International and Barry O'Leary, CEO, IDA Ireland at the official opening in Dublin of Microsoft's first EMEA Cloud Computing Services Centre (September 2009).

"The opening of the data centre is a milestone in our ongoing investment in Europe and provides the critical infrastructure to support the local delivery of our next generation of online services...The opening also celebrates Microsoft's long-term commitment to Ireland...", Jean-Philippe Courtois, President, Microsoft International.

Why Ireland for Salesforce.com

"Salesforce.com has been investing in Ireland since 2001..... Ireland has played a key role in the success of Salesforce.com. We have been delighted with the calibre, flexibility and commitment of our Irish employees and we believe that Ireland continues to be a highly attractive location for high tech industries", Dr Steve Garnett, Chairman EMEA Salesforce.com (October 2010).

VMware Expands

VMware in September 2011 announced that it is to expand its 550 person EMEA operation in Cork, by adding 250 new positions, mainly in customer support and sales.



Hosting:

Google announced in September 2011 a €75 million investment in a new highly energy efficient, air cooled datacentre in Dublin. This follows its recent purchase of three large office buildings, including a 210,000 sq ft office to support future growth and expansion.

Microsoft in 2009 officially opened in Dublin its first Cloud Services Centre for its EMEA customers. The 'mega data centre' of 303,000 sq ft, which involved an investment of \$500 million, supports Microsoft's EMEA online, live and cloud services. Ireland was chosen following a comprehensive global analysis.

Amazon.com has a large data centre footprint in Ireland, and offers its Amazon Web Services for utility and computing processing services via a cloud computing infrastructure. Amazon.com continues to expand in Ireland.

IBM in 2008 announced an investment of €30 million in a next generation data centre, which now serves as global hub for delivering IBM software to clients in 85 countries worldwide.

Ireland's data centre service providers such as Cable & Wireless, Digiweb and Data Electronics continue to expand their operations on an ongoing basis.

Software as a Service (SaaS):

Salesforce.com: In October 2010, Salesforce.com announced an expansion of its 300 person Dublin-based multilingual European Corporate Sales Headquarters. This involves the recruitment of 100 new employees in sales, marketing, technical IT and customer support.

Marketo, one of the fastest growing Silicon Valley cloud computing companies, announced in May 2011 the establishment of its European Headquarters in Dublin. 125 jobs are to be created in sales, marketing, customer support, consulting and software development.

Workday, a supplier of on-demand human resources and financial management software, acquired Irish company Cape Clear in 2008 and now employs 60 employees in software development, testing, QA, customer support and sales at its International HQ operation in Dublin. The company continues to expand.

Increasing Cloud Computing Talent

The ready availability of top quality talent has been an important contributor to the growth and success of the software/internet sector in Ireland. Going forward, there will be a greater supply of high quality technical talent, particularly cloud computing talent, for a number of reasons, which include:

- Numbers commencing undergraduate computer/software courses are up 40% since 2007. Most of these students on graduation will have received education/training in cloud computing and related technologies, as new courses/modules continue to be introduced (e.g. Cork Institute of Technology's masters and undergraduate cloud computing degrees).
- Cloud computing courses (certificate/diploma) are currently being introduced to upskill unemployed¹ IT professionals (e.g. Dublin Institute of Technology, Dublin Business School and National College of Ireland).
- As a member of the EU, Ireland is readily able to attract software² and multilingual talent, which provides valuable corporate diversity, knowledge and experience. The EU will be an important source of cloud computing talent.
- World class Irish research institutes (e.g. DERI, TSSG), with cloud computing and related technologies research programmes, will be a valuable source of post graduates/post doctorates.

1. According to the CSO, there were 2,500 software engineers/programmers/analysts not working in Q4, 2010, and available for immediate employment and training.
2. c.22% of software developers are non Irish (13% in 2000).

Irish Data Centres - Big Cost Advantage



Data centres in Ireland operate at a distinct competitive and cost advantage, due to the country's cool climate, which eliminates/reduces the need for mechanical or refrigerated cooling; the net result is lower costs for operators, which can then be passed on to customers through lower charges.

The use of 'free air' cooling was an important consideration in Microsoft's selection of Ireland for its 303,000 sq ft EMEA Cloud Services Centre.

Ireland was chosen by Microsoft for its Cloud Centre following a comprehensive global analysis.

Cloud Computing Skills



Numbers commencing undergraduate computer/software courses are up 40% since 2007, which is positive for cloud computing skills availability.

Government Commitment to 12.5% Corporate Tax Rate

"[Ireland's] 12.5% rate of corporation tax is here to stay. It is central to our industrial policy and is an integral part of our international brand", Michael Noonan, Minister for Finance, May 2011.

Ireland – A
winning proposition
for Cloud Computing

Ireland - Excellence in Cloud Computing

Ireland is well placed and poised to be a Global Centre of Excellence in Cloud Computing for a number of reasons, which include:

- 1. Ireland's substantive base** of global software, telecommunications, internet and games companies provides a solid foundation for expansion into cloud computing activities. Ireland:
 - Hosts 9 of the top 10 global software companies, including Microsoft, IBM, Oracle, SAP, HP, Adobe and Siemens, and is one of the largest global exporters of software.
 - Is the '*Internet Capital of Europe*' with Google, Facebook, LinkedIn, Yahoo, AOL, eBay and Amazon.com all having substantial operations.
 - Has 3 of the top 5 games companies, including Electronic Arts, Activision Blizzard and Microsoft, and recently became the location of choice for online companies Zynga and Zenimax.
 - Hosts the world's leading security software companies, including Symantec, McAfee and Trend Micro.
- 2. Track Record of Strategic Hosting:** Microsoft, Vodafone, Google, Yahoo, EMC, IBM, Adobe and Amazon.com are examples of companies that have chosen Ireland for strategic EMEA hosting operations.
- 3. Supportive Infrastructure:**
 - Data Centre Choice: There is a good supply of commercial operators offering co-location and managed services. These include BT, Cable & Wireless, Verizon, HP (Citadel 100), Eircom, Servecentric, Data Electronics, Interxion, Digiweb and CIX (Cork Internet Exchange).
 - Tier 1 Carriers: There is a range of Tier 1 carriers to choose from, which include Verizon, Cable & Wireless, BT and AT&T.
 - Redundancy/Security of Service: Ample diversity and capacity of international connectivity routes ensures adequate redundancy and security of service.
 - Competitiveness: Ireland's cool climate means that data centres have much lower operational and cooling costs than most other global locations, resulting in lower costs/charges to customers. The cost of international leased lines in Ireland is also one of the lowest in the OECD.
- 4. Favourable Tax Environment:** Ireland's 12.5% corporate tax rate, extensive tax treaty network (with 55+ countries) and 25% R&D tax credit is a valuable component of the country's cloud computing hosting and R&D value propositions.
- 5. Increasing Cloud Computing Talent Base:** Ireland's growing software/computing student population, most of which will have education/training in cloud computing and related technologies, will drive Ireland's cloud computing industry going forward.
- 6. Research Support:** Attractive IDA Ireland grant support packages, 25% tax credit and university cloud computing research expertise are available to support corporate research programmes.
- 7. Data/IP Protection:** Ireland's modern legislative framework is regarded as one of the most advanced in Europe and highly protective of company data/IP, and has been a contributing factor to company decisions to host from Ireland.

Ireland - Some Key Facts:

- Number of first time investors in Ireland in 2011 up 40% on 2010 (first 6 months)
 - Ireland: 1st for real corporate taxes¹
 - 1st for availability of skilled labour¹
 - 1st for investment incentives¹
 - 1st for business legislation for foreign investors¹
 - 1st in Eurozone countries for doing business (Forbes 2010)
 - 2nd most globalised economy²
 - World's number 1 provider of employable graduates (EU Commission study Nov 2009)
 - Ireland: 1st for FDI and Corporate Tax regime (2009 Global Innovation Survey)
1. *IMD World Competitiveness Yearbook 2011.*
 2. *EIU/Ernst & Young 2011. Measure reflects openness to trade, capital movements, exchange of technology and ideas, labour movement and cultural integration.*



HOW IDA IRELAND CAN HELP

- Start up assistance and advice for foreign investors
- Provision of grant aid (Employment and R&D) for investments
- Provision of information on tax, skills, education and research programmes, data centres, labour law, investment opportunities, operating costs, infrastructure, support services, etc
- Introductions to peer companies, industry groups and educational / research institutions
- Itinerary planning and execution
- Single point of contact for foreign investors

For further information on investing in Ireland, please contact:

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World Class Research to Support Cloud Computing

Key to the development of new cloud computing technologies is the presence of a supportive R&D collaborative environment. Ireland has a number of world class research institutions to support companies in their cloud computing and related technologies research programmes. These include:

- **DERI (Digital Enterprise Research Institute):** DERI is the world's largest applied research centre in next generation web technologies (semantic web). Cloud research programmes include research on developing efficient storage infrastructures, new security protocols and lifecycle models for cloud based IT projects. Partners include Cisco, Ericsson, Avaya and Alcatel-Lucent. www.deri.ie
- **TSSG (Telecommunications Software and Systems Group):** Research at TSSG focuses on telecommunication networks, including next generation internet networks, converged services, security and mobile services. One cloud computing project is on security/data protection in e-Government. TSSG partners include Nokia, Ericsson, Alcatel-lucent, T-Mobile and Vodafone. www.tssg.ie
- **LERO (Irish Software Engineering Research Centre):** Cloud computing is part of LERO's research remit, with research initiatives in service-oriented computing, security, privacy, trust, self managing software and reliable software systems. IBM, HP, Microsoft, Fidelity Investments and Siemens are partners. www.lero.ie
- **CLARITY (Centre for Sensor Web Technologies):** CLARITY's research includes research on sensor web platforms and software infrastructures, web-scale sensing and real time web, and content analysis. Partners include Intel, Microsoft and BT. www.clarity.ie
- **FAME (Federated, Autonomic Management of End-To-End Communications Services):** FAME, based at TSSG, is focused on developing solutions, involving semantic techniques, for managing federated networks. Partners include Alcatel-Lucent, Cisco, Ericsson, HP, IBM and Telefonica. www.fame.ie

Other research institutes with cloud computing and related expertise include CNGL (Next Generation Localization) (www.cngl.ie), the Heterogeneous Computing Laboratory (<http://hcl.ucd.ie>) at University College Dublin and the Irish Centre for High-End Computing (www.ichec.ie).

New Cloud Computing Applied Research Centre



In May 2011, Minister for Jobs, Enterprise and Innovation Richard Bruton announced that the Government intended establishing a €5 million dedicated Cloud Computing Applied Research Centre. This centre, which is expected to be established within the next year, will connect companies with leading cloud computing researchers and resources, for the purpose of developing commercially focused and market led cloud computing products.

Data Centre Property

Ireland has a variety of data centre property solutions, which have been developed with stakeholders such as utility companies and local authorities. The solutions include large scale utility intensive sites and privately owned technology buildings, which can be retrofitted to facilitate a data centre.

Ireland is now a more competitive location for data centre investment. Land values and prime rents have fallen since 2007 by up to 70% and 40%, respectively, with construction tendering prices down to 1998 price levels.