Cloud technology to combat cancer

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(PhysOrg.com) -- Cloud services provided over grid technology are helping to treat cancer patients, thanks to an enormous effort by European researchers working closely with industry.

Cancer is Europe's second largest killer and one of the most difficult diseases to treat. There are dozens of therapeutic protocols designed to respond to the vast diversity of cases that confront doctors.

Radiotherapy has proven a particularly effective treatment. Here a linear accelerator, or Linacs in the jargon, attacks the cancer directly by delivering radiation from several directions. But treatment is complex. The direction, size and duration of dosages are all tailored to each case, and must be recalculated every time via simulation.

It is a phenomenally complicated computation, requiring lengthy processing time, so much so that it can mean delays and this has the knock-on impact of lowering the number of patients who can be treated by each Linacs machine.

Faster diagnoses would help, but the required computing power is expensive, dramatically increasing the Linacs installation and operation costs. It is a critical bottleneck.

Cloudy strategy clears bottleneck

But not for long. A cloud computing solution for radiotherapy developed by the BEinGRID project uses a computer grid. This type of

infrastructure can share out resources like processors, storage, networking and software, wherever they are and on whatever platform.

Grids can deliver on-demand hardware and software, and because they are combined into a super system, they offer much more power at lower cost.

The individual elements of the system are hidden in the cloud, invisible to the user. The new RadiotherapyGrid delivers two services: treatment plan verification and search. The search function is optimised to provide alternative treatment plans based on the patient scan, treatment prescriptions and other constraints.

Both services can run in the background. The doctor simply enters the details in a browser window, and is alerted by email when the results are ready. Security and Service Level Agreements (SSLAs) are a particular focus of the RadiotherapyGrid.

Grids excel at delivering these kinds of benefits, because they ensure that resources are used to the maximum of their capacity. Security can be guaranteed because the computers on the grid behave like a single supercomputer.

Better and cheaper

The upshot is that doctors can call on enormous computing resources without paying the full costs. It offers better performance, delivering faster results, and only when the service is required. Hospitals do not have to pay when the machines are idle.

"The system can also be extended and adapted, to use new algorithms when new techniques and protocols are developed," reveals Andrés Gómez Tato, a BEinGRID Business Experiment manager from CESGA,

one of BEinGRID's partner.

The BEinGRID partners in the radiotherapy application are now looking to exploit the service commercially, and they believe the market is very promising. Initially, the RadiotherapyGrid will be primarily marketed as a 'software-as-a-service' platform at these institutions, but ultimately it may also come with hardware.

Moreover, the RadiotherapyGrid could be applied to other treatment modalities, like the Image Guided Radiotherapy (IGRT), hadrontherapy or brachiatherapy.

Not just power, intelligence too

Cloud services, however, are not just for healthcare. The power, security, reliability and collaborative advantages of grids could offer cloud services to any industry sector. In fact, BEinGrid developed 25 Business Experiments in various industrial sectors to demonstrate to SMEs the power of cloud computing.

The RadiotherapyGrid has demonstrated the power, security and reliability of the cloud for the health sector, while another demonstration, the TravelCRMGrid service, demonstrates the power of the cloud's collaboration and information sharing potential in tourism.

The Independent Travel Agencies (ITA) lining high streets across the continent are under threat from new market forces like the internet. Typically, these ITAs are very small and consist of a few branches. Usually, they band with other ITAs to form a confederate Travel Agency Group (TAG).

TAGging more business

These TAGs could compete better if they could capture more qualitative data about their customers and share that data between them. It would enable them to provide a better, more tailored service, and market to a larger number of customers.

This describes the sort of benefits expected from advanced content resource management (CRM) and business intelligence (BI) services. They are usually pricey, and deploying them on a motley collection of diverse platforms would raise the cost further. BEinGRID's TravelCRMGrid Business Experiment sought to push the issues of cost and complexity into the cloud.

TravelCRMGrid is an e-commerce travel solution that will offer these tools, capable of generating valuable data within the travel sector, based on the real day-to-day transactions of TAGs.

It means more intelligent business decisions about what to buy from wholesalers or how to create effective and focused marketing campaigns. By focusing on more profitable strategies, ITAs will be able to offer high-value personalised travel services to their customers at reasonable prices and effectively compete in an arena currently the preserve of large companies that can afford CRM and BI in-house solutions and have enough data to make their use worthwhile.

SMEs enter the cloud

These are just two compelling examples developed by BEinGRID to show how cloud computing services can help SMEs.

The intention is to provide best practices, case studies and tools, and to develop cloud implementation expertise in Europe.

SMEs are the lifeblood of European competitiveness but so far they have

been slow to benefit from the power of cloud computing. The BEinGRID project, however, proves that clouds are more than a just a cancer killer, they are a killer app.

More information: BEinGRID project - www.beingrid.eu/

Provided by ICT Results

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