LHC GridFest Speech

Where I come from, there is a great tradition of speech making, particularly every four years in a presidential election cycle, such as we are in now. Of course, most of those speeches are not very memorable, and my few words today will uphold that tradition.

Even though (in the words of a great speechmaker) “the world will little note nor long remember” the words said here today, the world will remember, I think, the LHC. The world will remember the LHC for the great discoveries it will make, and the new window it will open on the secrets of the universe. For high-energy physicists, this is a once-in-a-lifetime event, the chance to be there when a new vista is crossed and to discover something completely new about the universe we live in, to observe something that no human eye has ever seen.

And that is why the United States, and hundreds of scientists from the U.S., are here: because we want to be on the forefront of research, because this will be among the most exciting scientific adventures of the coming decades. The DOE, the NSF and its predecessors have supported research into fundamental scientific questions for more than five decades, and the LHC program is the natural extension of these investigations. The U.S. program in high-energy physics will continue to support LHC research as a high priority. This means not only supporting the scientists who make the discoveries, but also supporting the infrastructure that makes the research possible.

The scientific revolution will begin at the LHC. But this revolution, unlike those of the past, will be televised. And web-cast. And broadcast to smart-phones and other technologies yet to be invented. High-energy physics, because it tries to do experiments that have never been done before, relies on inventing or adopting new technologies to constantly advance. High-energy physics, because it is truly an international scientific endeavor, relies on the cooperation and teamwork of a diverse cadre of scientists, technicians, engineers, computer professionals to succeed. Because we understand the ubiquitous reach of new technologies, and the challenges of serving a diverse, international community of researchers, we have adopted the computing grid as a long-term investment that will enable discoveries both at the LHC and for whatever comes after.

This was not always the case. When I first came to the DOE several years ago, many people still advocated the idea that LHC data could be distributed by loading jet planes with digital tapes and flying them around the world (the “FedEx model”) to meet the global demand for data. Computer codes for physics experiments were still largely written, maintained and updated by physicists. The requirements and cost for computing were largely an afterthought to getting the experiments built. There was widespread discussion of distributed models in the computing community, but no one had yet adopted it for a large-scale scientific implementation. I remember going to several workshops and meetings when LHC Computing was still in the early phases of development, and the clear message to the HEP community was: “get professional help.” Meaning: get computing professionals involved early to develop a robust, maintainable system that can cope with your huge data requirements and widely distributed systems.

We listened. And today we have large-scale, international computing infrastructure that is already working for today's experiments at Fermilab, at the Laser Interferometer Gravitational Observatory, and is ready to take on the firehose of data from the LHC. Other scientific fields from molecular modeling to climate change are starting to explore what they might be able to achieve by adopting this computing model. Because we made the investments in distributed computing over the last several years, today we are ready to exploit the scientific opportunity of the LHC.

So maybe this idea that the world will remember the LHC for the great discoveries it will make about the secrets of the universe is a somewhat parochial view. Let's face it, the world at large doesn't care much if we live in a supersymmetric universe or one with 11 dimensions of space-time instead of 4. Other than Stephen Hawking, few people are wagering on the mass of the Higgs boson. Instead, maybe they will remember the LHC for the grand intellectual and scientific enterprise that it is. Maybe they will remember it for its sheer audacity, for the prospect of bringing together thousands of people from all over the world, over the course of twenty years just to imagine, design and build it. Maybe they will remember it for ushering in new technologies, like the Grid. But we do not have to debate the issue. Lets do the experiment and find out.