An Interview with Dr Putchong Uthayopas
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In September 2003, SVU had the privilege of hosting one of the region’s foremost experts in HPC and Linux clusters, Dr Putchong Uthayopas from Kasetsart University (KU), Thailand, when we invited him to give a seminar on Parallel Programming on Linux Cluster. Needless to say, we had a full house in our Auditorium. Participants also learned much about the tips and tricks in parallel programming especially in optimising and tuning their parallel programs. Dr Putchong also showed us first hand the speed up obtained from using Myrinet as opposed to ordinary Ethernet interconnects.

To get a glimpse of the man and his philosophy on his work, we asked for a short interview with him. The following is what transpired.

SVU: Dr Putchong, thank you for kindly agreeing to this interview. Firstly, we are curious as to how the high performance computing efforts in your university got started. Could you tell us a brief history on this?

Dr Putchong: Well, high performance computing effort in KU started around 1997. Traditionally, KU has many researchers conducting their research in physics, chemistry, and engineering for a long time already.

For example, KU researchers are working on using quantum chemistry to study the property of zeolite compound, or working continuously on drug design. However, many started to turn to the use of advanced computational modeling to solve their problems. Anyway, most of the early explorations have been done on workstations such as SUN, DEC Alpha, and High-end PC servers. Although, the results obtained were quite satisfactory but the throughput was very low. At that time I happened to come back from my PhD study. As a newly, fresh PhD graduate, I was looking for a way to apply my knowledge. This seems to be a challenging problem at that time. How can you supply an immense computing power cheaply for the scientists? That is the main motivation for my work. I finally decided to work on PC clustering which seems to be the only solution to the problem that we face.

SVU: How did you get involved with the Beowulf project?

Dr Putchong: Everything started around 1996-97. At that time, I started working at my department after I got my PhD in parallel computing. My work is mostly on analyzing the performance of parallel algorithms on clusters of workstations. I used SUN machines for most of the work. At that time I was also keen on using Linux since I started using it to develop my work and ported to SUN. When I came back, there were no SUN to be seen since it is very expensive in Thailand. From my past experience with Linux, I found that it is powerful enough to replace SUN on some work. Moreover, the cost of PC, even a very high end one, is much cheaper than any commercial workstation. It seems to be a perfect match to build Linux supercomputer since most of the required software such as PVM, MPI are available in public domain.

Somehow, my paper was accepted in Cluster Computing Conference 1997 in Atlanta. There, I met the Beowulf team from NASA led by Thomas Sterling. I had a great opportunity to attend the first Beowulf workshop. It was worth flying over half of the globe since it opens up a limitless opportunity in my mind.

This workshop confirms my belief that clusters will dominate the scene of computing for another 10-15 years. Moreover, I also met many people who later had much influence on my life and my research. First, is Rusty Lusk from Argonne National Laboratory, US who is, with Bill Gropp, leading MPICH effort. Later, with Rusty’s help, I had many chances to work...
fruitfully in Argonne National Laboratory with his team.

Another person, Amnon Barak, who is the father of MOSIX technology, has also inspired me in many ways. He later came and visited me briefly and taught me many useful things about this research area.

I have continued with my research and built up the team. Starting from me alone, there are now about 20 people in our group with funding from international corporations like COMPAQ and AMD. We are already involved in building several of largest computing system in my country using cluster technology. I am grateful for the help and inspiration from many people. But we are still at the beginning and a lot can be done and need to be done.

**SVU:** What is your philosophy on the open source movement?

**Dr Putchong:** I think open source is going to be a great paradigm shift in computing world. It practically shows a few things.

First, it is possible to build high quality software by good people working together. Open source also creates choices for people who want to unleash computing power for their work without paying a premium price for the companies. I do not think making money is the bad thing, but you need choices for people who want freedom and independence. What is still needed is a killer business model that allows open source developers to make a good living. This will ensure that open source movement can maintain its continuity in the long term.

In terms of technology, open source helps drive the speed of technology development. When people invent new things, everybody can quickly use these good ideas. Hence, every company must be very innovative to stay ahead. In addition, we are almost reaching the point that open source software can fulfill our basic needs. For example, open office can do a lot already although it is not the best software suite in the market. Thus, open source movement will drive companies to work on niche market that is very innovative to survive. For example, they must work on advanced speech and text recognition instead of simple accounting software.

What I want to see more is outreach and education. I strongly think it is important for developing countries to adopt open source to lower the spending and maintain their technological independence. Open source allows you to be developer and contributor to mankind not the consumer of technology alone. Governments should get involve in defining a clear direction for the open source efforts in their countries.

**SVU:** Finally, what is your advice to those who are exploring open-source software and thinking of building their own supercomputing resources?

**Dr Putchong:** Ammm....

There are pros and cons. Pros is that you can really get a cost effective solution. Also, you will learn a lot. You will be able to master this technology and control your own destiny. But building your own Linux supercomputer is not a trivial task. Although many tools such as NPACI ROCKS help simplify the process tremendously, it is still rather difficult for new comers. The solution is to get help from people, mailing list, do the search for tricks and tips on the Internet. But you definitely need an in-house expertise in Linux to help maintain a stable system. One thing that might help is to start small, building expertise first, then scale up. The great thing about clusters is that you can build a 4-node system, then work and scale to 1000-node system later.

Finally, make sure you have things to run before building your own supercomputer. Application is the key to getting benefits from the cluster.

The Supercomputing & Visualisation Unit would like to record our thanks and gratitude to Dr Putchong for the 3-day seminar that he conducted for us, as well as for graciously agreeing to this interview.