

Crest On The Road To Fastest Supercomputing

By Amit Tripathi

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Although the adage 'failure is the stepping stone to success' is commonly heard but seldom manifested, recent efforts at Mumbai based, Crest Animation Studios, suggests that a failure can be the launch pad into the big league of high performance computing (HPC) or supercomputing and then to the highest.

Speaking to CXOtoday, Krishna Prasad, senior manager systems, Crest Animation Studios, described his march into the HPC league and beyond.

The challenge

Crest, which is into graphics and animation, has been catering to the domestic and international market since more than a decade. Over this period, its competency has made it the most sought after animation studio in Asia.

To facilitate this huge demand, a faster 'rendering' plays a crucial role. Rendering is a process to create a sequence of continuous frames for a shot in respective to lights, background, and animation. The delivery of a product in the animation industry rests very heavily on rendering. And the more quicker it is, faster becomes the trial and error process (re-rendering), and subsequently greater credibility and confidence from the client end.

Says Prasad, "Since we got multiple orders we needed to render more scenes a day to meet our deadlines. Although we had multiple high-end servers to render those scenes, still the rendering was very slow (at times a few complex scenes used to take hours and days). To make matters worse, if the scene needs to be corrected the whole process is re-rendered for correction and better quality."

Currently the company produces 80 minutes of animation per month, which is phenomenal by industry standards.

According to Prasad, "Initially, Virtual Vertex's muster software was used for network rendering. But the performance level was below the local rendering. Local rendering is a render fired on an individual system. Later we used 'Rush' network rendering software. With that the performance increased but not to the level to meet our project requirements."

The Solution: Grid Computing

Says Prasad, "The solution to the problem was not available. We had to do a lot of number crunching and peer evaluation. Although many studios use some or the other technology for high quality rendering, they are proprietary. Thus the only way out was to innovate and subsequently we came up with our approach of rendering based on HPC."

Grid Set up:

In phase A, 50 blades were configured and three HPC clusters were designed for redundancy purpose. Three clusters of 14 blades each were created. RenderMAX (692.50 Gflops) was the name given to this new HPC.

Added Prasad, "The system is broken into three clusters with 14 blades each. The first blade in each cluster is the controlling blade and is called master node. All other blades are called computing nodes. Configuration is done in such a way that the master node does not take part in actual computing. Hence, in reality only 13 blades perform actual rendering work."

To calculate total power of a HPC cluster, Linpack benchmarking has been done for 150 blades and 1U servers and has 692.5G flops, becoming India's second fastest grid computer.

With 250 high-end graphic workstations and around 150 HP and IBM servers (a combination of blade, 1U and 2U) and 10TB of central storage, the IT infrastructure at Crest remains unparalleled. It also uses 650 Giga Ports of Ethernet connecting the entire production. Most importantly, the studio has become the first in India to use 10Gig Ethernet between its premises.

At Crest, the HPC performs on a Red Hat Linux platform (RHEL 3). Prasad added, "We selected Red Hat since in addition to security and cost aspect, it also offers the freedom to customize it to our desired level of core performance. This itself provides an added level of security. Secondly, the input / output (I/O) operation reduces to as low as 20% as compared to that on Windows."

The studio uses a slew of operating systems namely Windows 2000/XP/Linux at the workstations, Linux in more than 150 IBM x-series blade servers, OSX for Apple Mac systems and IRIX for SGI high level computing servers.

Future plans:

If Prasad is to be believed for what lies ahead, it is definitely going to take them beyond the stage of unparalleled supercomputing. The future expansion includes frame slicing, dynamic render farm using high-end workstations in production for rendering during its idle times, and integration of all grids to form a single powerful grid as and when required.

To facilitate this, plans are afoot to install 150 more graphic workstations, 300 render servers, 950 Giga Ethernet ports on a chassis based switch with ten 10Gig uplink ports

With the HPC in place the company has increased its capability to handle multiple projects simultaneously. Says Prasad, "This decision was crucial since it involved very high budget (to the tune of Rs 15-20 crore as against the turnover of Rs 60 crore) but the benefit in terms of getting more business outweighed that aspect."

The business is booming as Prasad informed that these days apart from many other projects, a project by Disney is being carried out at Crest and soon they would be working on a full fledged movie as well.