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Interview with Shajy Thomas, Head of Technology, Crest Animation Studios

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BY ANIMATIONXPRESS.COM TEAM

While planning a project, how is the technical requirement forecasted and implemented at Crest?

Before the start of the project the Process, production and IT team analyzes the project requirements. The STG (systems technical group) on the basis of project type, format and length does the calculation for Storage (capacity and throughput), Backup, Disaster recovery, Renderfarm power, network, post requirements, review systems ,security etc. Based on this we decide which all of these can be used or shared with the available resources and what has to be additionally procured. We then evaluate on the load on the network and storage and accordingly plan and distribute it.



There is always a continuous interaction between the creative and the technical team. Wherein the knowledge sharing and inputs are shared visa versa, the creative team comes up with their requirements or problem and then we analyze and provide the necessary solutions. This could be choosing the workstation configs, software, pluggins , storage, backup etc.

Importance of R & D dept in a studio and how does it work at Crest?

Crest has a full fledge dedicated R&D team who are involved in lot of research. Before the project starts they study the requirements and find out the critical, complex elements involved in it, then accordingly try to tweak it by finding an effective way. Some of the major R&D done are for Fur, crowd, shaders, looks etc. Few of the examples are "tree generation animation", wherein tools are created for custom animation matching the project specifications. Other works did include crowd generation and management tools. As such no budgets are dedicated specifically for the R&D as the same team is involved in other development activities.

Can you name some of the best technology practices adopted at Crest?

We have always made sure that what ever technology is implemented in Crest is aligned with the business need. Continuous efforts are made towards research, design,

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implementation and optimization. Creating a quality CGI product requires complex IT resources like high throughput storage, high performing renderfarms and a strong network backplane to support the high data transfers. We have designed a consolidated central storage which serves data to the windows CG workstation, Linux render farms, mac compositing machine, and all getting authenticated through a single ldap server. The advantage is single path access, no data duplication, high availability, better analysis and reporting. This solution is designed with HP EVA8000 and polyserve filesystem cluster gateway. Some of the key features are Clustered file Service with Dynamic Load Balancing and parallel data path, Single Virtual Name Space [Global Name Space] and Performance Scalability Linearly.

To serve the huge rendering requirements we had setup an HPC based renderfarm. The network design of crest enables the clients (workstations, render nodes etc) to reach the storage or the ldap server or any of the database application in a single path. It is a complete non-blocking architecture, capable of handling the network traffic on the full operation load. Based on the load the interconnects are 10G/1G.

All the CG workstations are Hi-end dual cpu workstations with Nvidia graphic adapters, these workstations are of different configuration based on the department/project requirement. This is to perform smooth operations with lower investments. To monitor all the servers, render node we had implemented a opensource tool which reports about the availability, utilization, over utilization of the resource, and also alerts about the failures for further action to be taken.

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How much of open source resources are used at your studio?

All the 450 render servers are on open source Linux. This enables us to save on lot of license cost and invest it for other needs. Apart from these the Asset Management System, Web serve and most of the inhouse developed applications are on opensource platform. This allows us to have more control on the applications and enable and compile it based on business requirements.

Crest has a huge manpower set up, so how do you handle Digital Asset Management (DAM) in a seamless manner?

Crest with its years of experience in this field has utilized the knowledge and developed an Asset Management System(AMS) to streamline its CGI creation process. DAM is one of its modules which maintain the complete asset library with its history, description and specifications. Some of the other key features of AMS are file management, workflow management, productivity check, library systems, referencing, file generation and creation; System based naming convention, same across all the project. File versioning, application versioning, file checks, playback versions, project tracking and monitoring

With so much of quality CGI production being done at Crest, how is the rendering infrastructure at Crest like?

Crest has configured an HPC render farm comprised of 450 servers (2000 cores). The configuration includes dual CPUs dual- and quad-core computers with 4 to 8 GB of Ram;

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high-throughput storage and a nonblocking, high-bandwidth network, opensource linux is the operating system.

These servers on the backend are clubbed together to form clusters based on the project requirement. The master node controls these clusters and a front end scheduler is used to fire, manage, prioritize, and render jobs with various parameters. Moreover we also utilize the workstation compute resource during their idle time. Housing this big IT infrastructure also calls for a proper Data Centre design with high power efficiency. For our focus towards Green IT we had designed the data centre with an adaptive Infrastructure design, Power and Cooling Resource Management, Eco friendly hardware's, Proper cabling, Automated Tools, Management Software's, Virtualization, Future planning and scalability. The rendering application also enables the Power on Demand features which make sure that only the active nodes are consuming power.

Some of the key features of the rendering solutions are

- Consolidated design: All the compute nodes accessing the same central storage and authentication from single LDAP, This prevents multiple data duplication, and single point authentication and reporting.
- Smart scheduler: the Scheduling engine takes control of the job submission, prioritization, and management etc
- Server Pooling: All the compute nodes are in a single cluster. The nodes are allocated project wise. Based on the availability the idle nodes can be dynamically assigned to the active pool if required.
- Self healing: Some of the common errors like memory segmentation, NFS errors and IO errors are solved automatically by the scripts
- Detailed Reporting: Project / Department wise reporting, this helps for better analysis and planning.

Any kind of technology practices that you have observed internationally, which according to you needs to be adapted in India?

Each company based on their requirements plans and implements technology practices. Capex plays a major role in selecting the solutions. All the solution options available internationally are also available here. Infact we do lot of activities to optimize and utilize the available resource before planning for a new purchase or upgrades.

What are the day to day challenges and bottlenecks faced by the IT dept at Crest?

Apart for the normal day to day maintenance activity below listed are some of the activities we have to carry

- Understanding data and applicable applications interoperability and performance transparency issues.
- Facing bottlenecks due to seasonal workload surges and addressing it.
- Since our pipeline demands for huge resource requirement, need to continuously identify the usage and accordingly allocate.
- Software License utilization
- Apart from these all the engineers at any point of time are being assigned with some special task individually.

With your experience could you share a few insights on-

o Storage

Data is one of the most important and critical asset. For us it is one of the most expensive parts. It needs to be used and maintained well. Some of the Dos and Donts for the storage are ...

- Designed well for the capacity and throughput requirement
- Data availability has to be planned, keeping in mind all the failure factors
- Optimized utilization. Creating policies for moving less accessed files to less expensive disk.
- Data duplexing and unwanted data to be controlled
- Frequent analysis of the data storage.

o Networking

Network is one of the simplest thing to be controlled if designed and maintained effectively, otherwise it can be real pain. Some of the Dos and Don'ts for the networking are

- Network design to be made based on the workflow requirement, also make it flexible for the future scalability.
- To avoid any performance bottlenecks it should be non-blocking and HA
- Proper documentation should be maintained for the design, topology, integration, cable management
- Planning to be done and documented for any possible failures
- All the unwanted protocols and vulnerability to be blocked.
- Switch OS and config backups to be regularly taken.

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