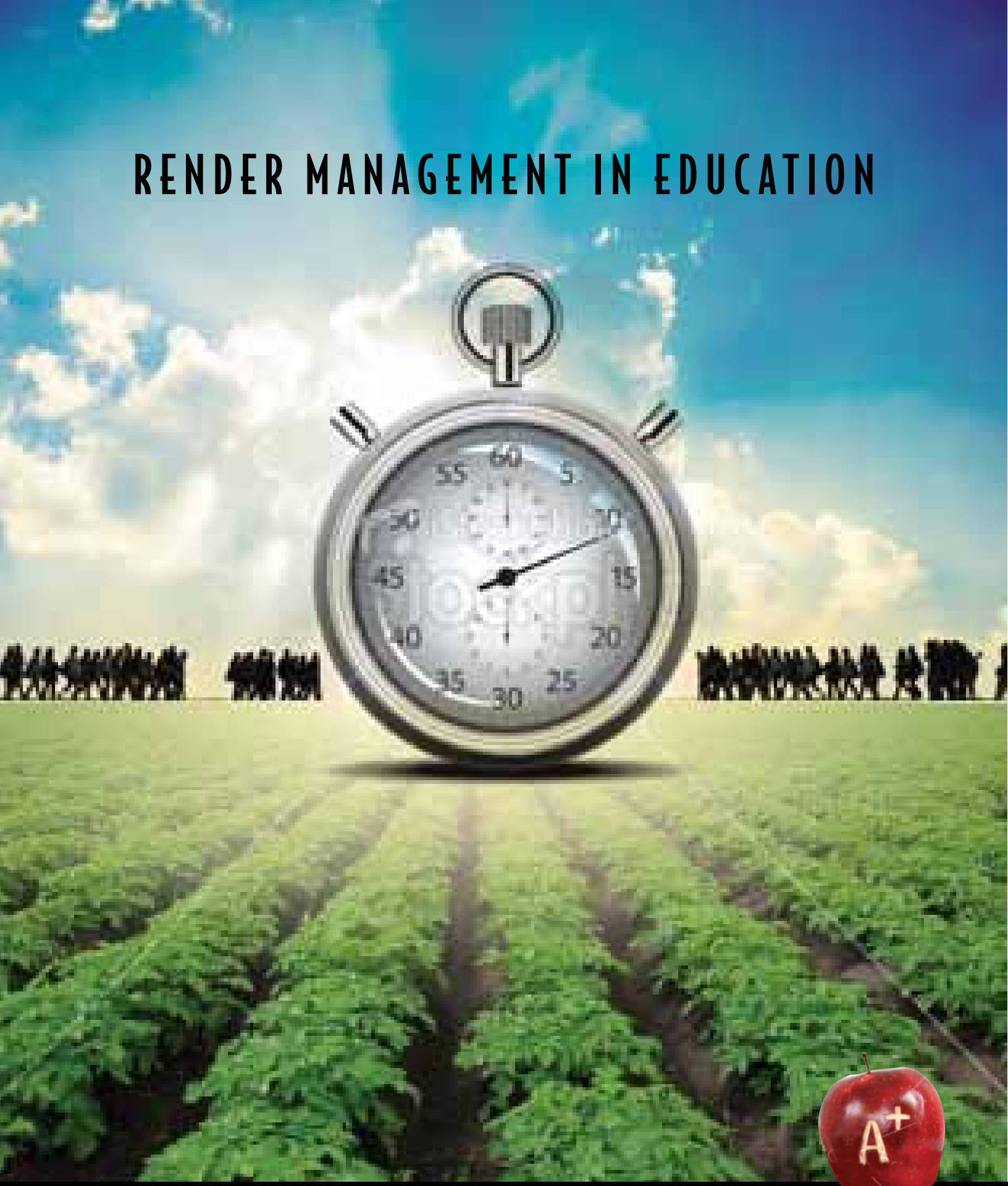
RENDER MANAGEMENT IN EDUCATION



Pipeline fx

SMART FARMING IS THE TIME SAVING WAY TO SUCCESS. JOIN THE REVOLUTION.

I pressed "enter" on the Cadmus Motorola mini-computer and for the thousandth time, watched the screen slowly render a 24-bit image of downtown Raleigh, N.C. For the next 17 minutes I could only stare at the screen, waiting to photograph the final image and repeat the process, again and again. At the time, I was visualizing the results of a potential zoning law change, while studying architecture at the North Carolina State School of Design. But soon I would be forced to stop working on it outright. No reviewing my work with professor or peers; no more thoughts or new approaches; only a hard stop brought on by the time cost of slow rendering.

This was 1986, but I believe students utilizing computer animation and visualization systems still suffer the same roadblock today. Rendering is an ally, but it's also the primary barrier students face when working through the creative and iterative loop of computer graphics. To be successful, students need to think about their work, make something, render it out, and then review it with their teachers and peers.
Then re-think, re-do, re-render and review.

This loop happens over and over, and every time a scene or characters become more detailed, the time it takes to render your project grows. The sacrifice of having longer render times is that you won't get as many chances to iterate and critically assess your work. There's also no way around this; the process of thinking, working and reviewing simply takes as long as it takes.

But there is also some hope. Rendering, the creative loop's final element, can be improved with budget. We've seen it time and time again, schools that invest in render capacity and intelligent render management see immediate benefits in the computer graphics educational process; and the reason for this simple... when your rendering is more efficient you can get more creative iterations in, and as that number goes up, so does the quality of work.

STUDENTS UTILIZING COMPUTER ANIMATION AND VISUALIZATION SYSTEMS STILL SUFFER THE SAME ROADBLOCK TODAY. RENDERING IS AN ALLY, BUT IT'S ALSO THE PRIMARY BARRIER STUDENTS FACE WHEN WORKING THROUGH THE CREATIVE AND ITERATIVE LOOP OF COMPUTER GRAPHICS.

As CEO of PipelineFX, the leading render farm management software company for feature film, visual effects, post-production, broadcast and design graphics, I am so proud to have hundreds of private animation schools, universities, community colleges, trade schools and even high schools as customers. And this year we plan to make them feel even more welcome with our Education Burst License Program, which lets them double their render capacity twice a year for free. Now their students won't have to face the same crippling problem I faced over 25 years ago when finals roll around.

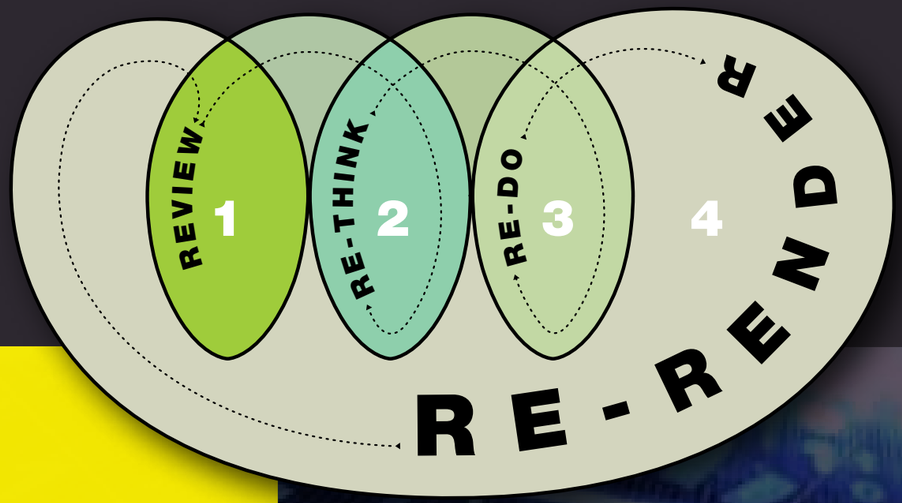
WHEN YOUR RENDERING IS MORE EFFICIENT YOU CAN GET MORE CREATIVE ITERATIONS IN, AND AS THAT NUMBER GOES UP, SO DOES THE QUALITY OF WORK.

I am also excited about the future of our industry. Computer graphics and simulation are becoming more and more mainstream, and as that develops you can expect that PipelineFX will be there providing intelligent software, render pipeline consulting services, software training and world class technical support to the next generation of CG artists and designers.

Richard C. Lewis
CEO and co-founder, PipelineFX

THE ITERATIVE LOOP IN COMPUTER GRAPHICS

Every project has an iterative process and there's no way of getting around it. Rendering is THE bottleneck in the creative, iterative process of visual effects and 2D / 3D design work. it's the one process that grows over time and can be reduced with budget. With PipelineFX's render farm management software you can minimize this process – giving you more time to create quality work.



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Pratt

WHY PRATT PICKED PIPELINE FX

As one of the United States' top art schools, Pratt Institute is responsible for ushering the next generation of creative thinkers into the real world. To aid their 3D animation program, the school provides students with a computer lab/render farm that handles the output their students create with 3ds Max, Maya, Rhino, After Effects and Maxwell Render.

Today, the student lab runs like a dream, but for awhile it got so bad that the school threw out its render farm management software altogether.

CHALLENGE

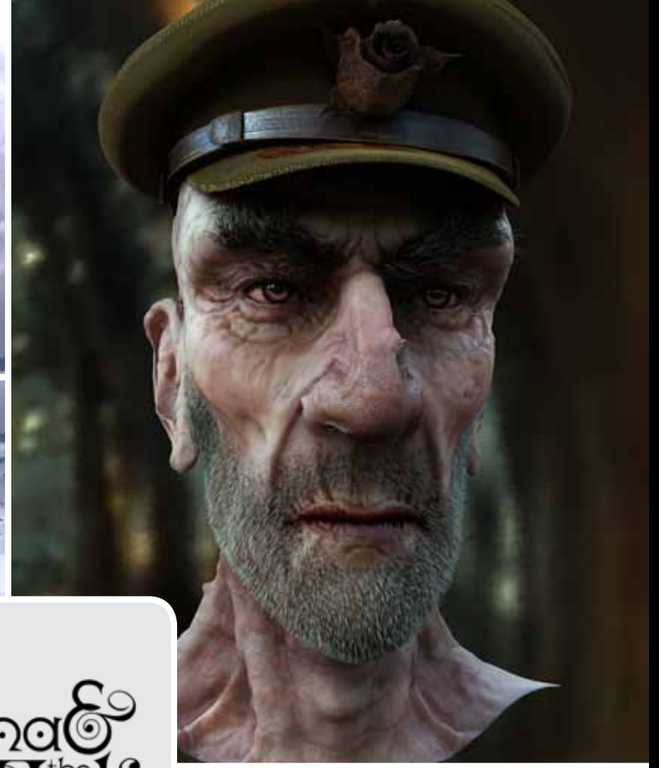
Limited Productivity: Before Qube!, the school's software package could only render two apps concurrently. Pratt uses five professional packages. Students paid the price and render times skyrocketed.
Zero Support: Is having a representative you can't get a hold of "support?" Pratt didn't think so either.
No Automation: Managing the workflow of a student lab requires special configurations and permissions that do the heavy lifting for the render wrangler; Pratt's tech had to manually oversee everything.

SOLUTION

Install Qube!: PipelineFX technicians assessed Pratt's problem and gave them a free trial version of their render farm management software, Qube!.
Introduce Support Team: Pratt's contract with PipelineFX gave them access to an expert support team that would be there to work through any problem or question they had.
Custom Configuration: PipelineFX engineers customized the GUI, the license use policies, the prioritization system, and set rules in the configuration files so specific programs – like Rhino – would only work on certain workers.
Maximize Resources: Public use computers can't be running for one student 24 hours a day. Work distribution over different hour ranges ensures renders can always be running with as much available power as possible.

RESULT

Top Issues Fixed Right Away: Prioritization tools, the ability to customize and easy access to world-class support came automatically.
Student Projects Finishing Faster: Quicker renders give students more time for iterations on their work. More iterations leads to more refinement and higher quality pieces for their portfolios.
A Flexible System: As applications change, Pratt can shift their system with the help of support. When finals hit, and student submissions soar, Pratt can get the extra licenses they need. If a student needs to use a worker computer for animation, Pratt can take comfort in the fact that Qube! will automatically reassign that job to another machine. No crashes and no slowdowns on a system rendering 24/7.



University of Portsmouth

10 CONSIDERATIONS FOR RENDER FARM MANAGEMENT – A SCHOOL'S PERSPECTIVE

When University of Portsmouth was looking into options for jump starting our render farm setup, we had two main areas to consider: the day-to-day rendering of student work, and the production needs of our animated feature film, "Stina & the Wolf" (which we built around a complex pipeline of Softimage and Arnold). We chose Qube! from PipelineFX.

After your main requirements, here's our list of the top ten things any University or school should consider when looking for the right render farm management software:

1. **Flexibility** – In our case, we had to cover all of our packages (Softimage, Maya, and Nuke) and all of our renderers (Autodesk: Scanline, Mental Ray and Arnold). Your render farm management software also needs to work with any specialized pipelines that may be in place.
2. **Ease of use** – Simplicity is essential to reduce staff management overhead and allow students to manage and submit jobs themselves.
3. **Scheduling** – Our farm uses teacher machines, instead of a dedicated series of slaves, so we had to organize our workers efficiently to allow for off-hour rendering.
4. **Security and multi-user environments** – Consider any policies that may be in effect on the network, be they Active Directory or similar, and how this will affect the permissions of your render manager while running and during installation.
5. **Network resources** – Make sure that you have centralised storage that can store jobs and rendered frames. Also give students access.
6. **Good working practice** – Naming conventions (e.g. textures), ensure that project structures are adhered to. This will avoid missing map file errors and reduce re-sends.
7. **Installation and support** – Setting up a farm is a big task, so on-site installation assistance is a great help. As is easy access to after-sales support as Universities do not usually have dedicated render wranglers.
8. **Remote job submission** – Students tend to like working from home, so we are looking into the possibility of them submitting jobs from wherever they want.
9. **Rendering standards** – Resolution, frame rates and file formats. Presets in the render software can remove lots of headaches down the line, and giving students a limited set of presets within the job submission can alleviate mistakes.
10. **Deadlines for submission to farm** – Know your hand-in dates, and talk to the students to make sure they understand the importance of planning their render times in advance.

INVESTING IN A STORAGE SYSTEM WITH THE RIGHT SIZE AND SPEED IS ESSENTIAL TO A SMOOTH PIPELINE.

STORAGE IN THE SCHOOL HOUSE

Disrupting bottlenecks

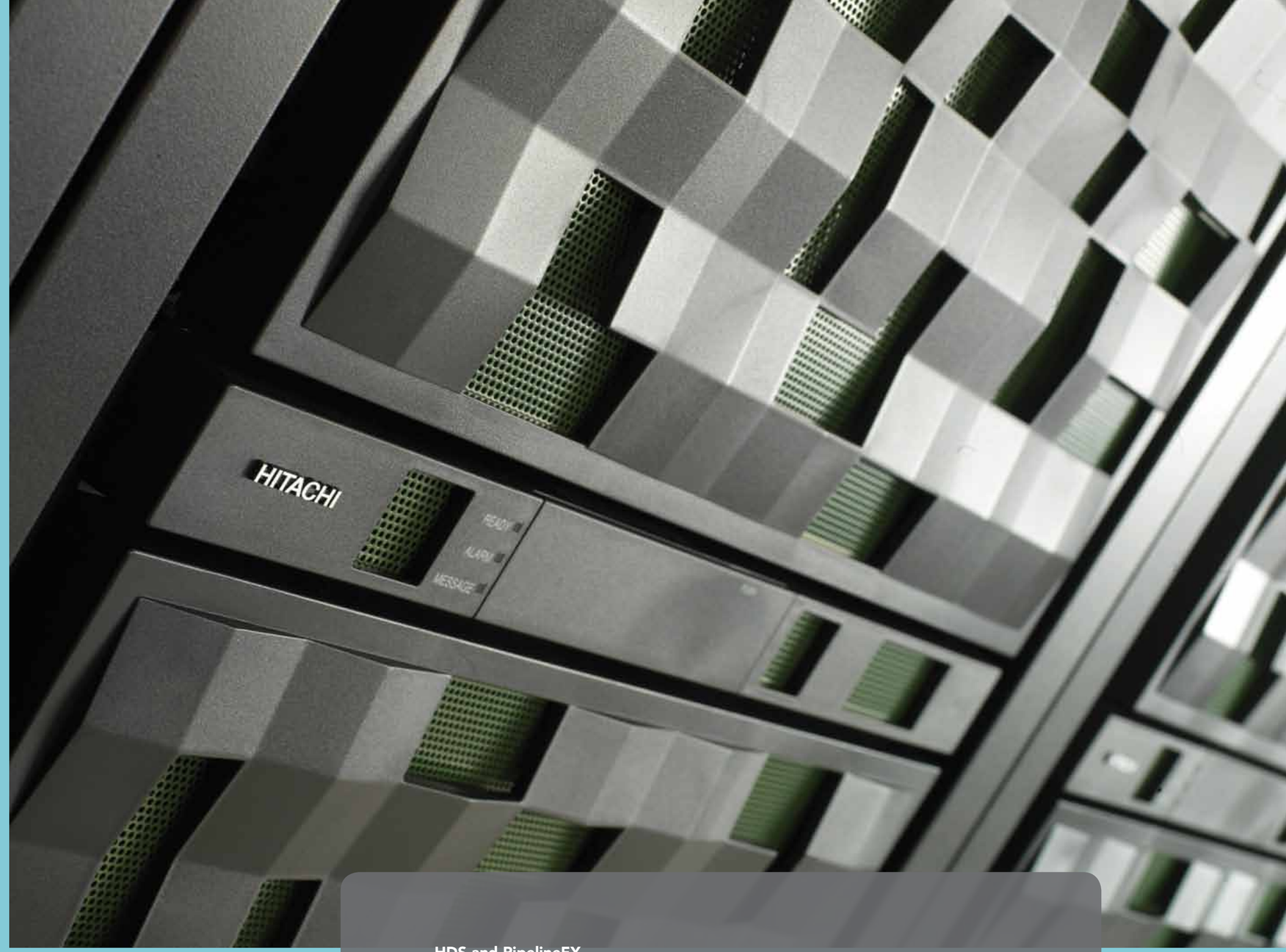
A powerful render pipeline will be an efficient mix of four essential elements: software, network, render nodes and storage. One weak link in the chain and you open yourself up to efficiency-killing bottlenecks. In a school setting, this leads to less iterations for students, more headaches for systems administrators, and more turmoil during high-traffic rendering periods.

Storage and render farm management products work together to combat this by removing the factors that lead to bottlenecks through a process of automation and prioritization. With both you get efficiency, and with efficiency you improve throughput.

When storage meets render farm

3D renders can be data intensive, especially as they become more complex. Add in a bunch of students all working on projects at once, and the need for a high performance system becomes glaring. Mixing a great storage system with a prioritized render farm is the secret to a strong render pipeline.

The correct mix is going to deliver better I/O, throughput and render times for students and faculty. A great storage system provides enough disk space to handle all the requests coming in from the render farm and enough speed to manage the back and forth. A great render farm manager, on the other hand, can actually break insufficient storage systems due to the load required to truly maximize existing CPU resources. When your render queue is firing on all cylinders, your storage system had better keep up. A smart render farm will likely be I/O bound before any other bottleneck, so investing in a storage system with the right size and speed is essential to a smooth pipeline.



HDS and PipelineFX

Like the products we make, PipelineFX and Hitachi Data Systems work together to tackle the efficiency issues many schools still face on a daily basis. For a long time, universities used to think of their IT departments as cost centers, but today, thanks to high-performance storage and intelligent render farm management systems, those departments are becoming strategic investments that give students more opportunities to create stunning work.

Hitachi Data Systems

In education, render farm spikes are synonymous with finals. Huge surges in rendering can be expected in those last few weeks as students rush to get their animated shorts and 3D stills ready for final assessment. However, even with this information, most schools aren't able to capitalize on it. Education budgets generally aren't big enough to handle the overflow, leaving administrators with two options: accept the traffic jam and reduce the length/size/quality of student work or find money to rent more render farm management licenses.

This year though, PipelineFX will render this entire situation null and void with the introduction of their Education Burst License program. This program – exclusive to PipelineFX – allows all PipelineFX education customers on subscription to periodically double their current license capacity at no additional charge. They can access this program twice a year by choosing either a one month burst that starts at the beginning of a selected month or a 30 day burst that begins on a date they specify.

"WHERE RENDER ANARCHY ONCE WAS THREATENED; THERE WILL NOW BE PEACE. WHERE THE VERY SURVIVAL OF OUR RENDER WRANGLERS WAS IN QUESTION; THERE WILL NOW BE HARMONY. AND WHERE LOOMING DEADLINES ONCE LEFT US GASPING; THERE WILL BE (MORE) ROOM TO BREATHE!" –

John McIntosh, Chairman of the School of Visual Arts

"THERE IS A LOT TO BE SAID FOR A POLICY THAT PROVIDES EXTRA RENDER NODES DURING A CRUCIAL CRUNCH PERIOD. EVEN THOUGH STUDENTS WORK HARD ON THEIR PROJECTS ALL TERM, THEY STILL USUALLY HONE THEM UNTIL THE LAST MINUTE, LEAVING LITTLE TIME TO RENDER. THE ADDITIONAL LICENSES WILL GIVE THOSE STUDENTS THE EXTRA TIME THEY NEED TO MEET THE COURSE DEADLINE." –

Pete Bandstra, Program Director of Full Sail University

SCHOOLS THAT USE QUBE!. DON'T MISS OUT. GET ON THE LIST.

Aberdeen College of FE
• AAU
Algonquin College
Anglia Ruskin University
Ball State University
Beijing Information Technology College
Beijing Jinsong Vocational School
Beijing University of Technology
Bournemouth University
Bradley University
California Academy of Sciences
• Cal Arts
Capilano University
Carleton University School of Architechture
Central Gippsland Institute for TAFE
Central Piedmont Community College
Centre NAD
Changchun Vocational Institute of Technology (CVIT)
Chapman University
City University of Hong Kong
Cogswell Polytechnical College
Collin County Community College District
Dalian Vocational and Technical College
DeMontfort University
DongShin University
Drexel University
East Tennessee State University
East Valley Institute of Technology
Emily Carr Institute
Expression College
• FIT
Florida Atlantic University
• Full Sail
FUNDACION PARQUE DE LA LIBERTAD
Gobelins School - l'ecole de l'Image
Great Northern Way
Guangxi Overseas Chinese School
Harrington College of Art & Design
Harvard University
Hong Kong Polytechnic University
Hubei Institute of Fine Arts
I.V.E. Hong Kong Institute of Vocational Education
• IADT
Induk Institute of Technology
JiLin College Of The Arts
Kansas City Art Insititute
Kapiolani Community College
Kogakuin University
Korea National University of the Arts KNUA
Kwangwoon University
Laguna College of Arts & Design
Leeds Metropolitan University
Leeward Community College
Los Angeles Film School
• LMU
Madison Media Institute
McGill University
Mercy College
Minneapolis Media Institute
NAFA Nanyang Academy of Fine Arts
Nanjing Finance and Economics University
Nanjing Normal University
National Center for High Performance Computing (NCHC)
National Institute of Information & Communications Technology (NICT)
National University of Singapore
The National Academy of Chinese Theatre Arts
New Trier High School
NYIT
Ngee Ann Polytechnic
North Carolina State University
Northeast Normal University
• NYU
Oxford Brookes University
Pratt
Ravensbourne College of Design & Communication
Rutgers University
• SVA
Shanghai Universal Software Park
Shanghai Yuhang Engineering Institute
Southeastern Community College
Southern Adventist University
Staffordshire University
Taipei National University of the Arts - TNUA
Texas A&M at Qatar
The New School
The University of the Arts
Tianjin University of Technology and Education
University for the Creative Arts
University of Adelaide
University Of Advancing Technology
University of Birmingham
University of Central Florida
University of Colorado
University of Glamorgan
University of Hawaii
University of Malaysia Sabah
University of Nebraska-Lincoln
• University of New Mexico
University of North Carolina
University of Rhode Island
University of Salford
University of South Australia
University of Sunderland
University of Sydney
University of Teesside
University of Texas Arlington
University of Waterloo
University of Western Australia
University of Wisconsin
University of York
• Vancouver Film School
Washington University St. Louis
Woodbury University
Wuxi GuangXin Film and Animation Technology Company
Xi An Aviation Information Academy
Xinyang Vocational And Technical College
Yavapai College

INTELLIGENT RENDER MANAGEMENT FOR DIGITAL MEDIA CREATION

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