AMD

AMD RYZEN THREADRIPPER

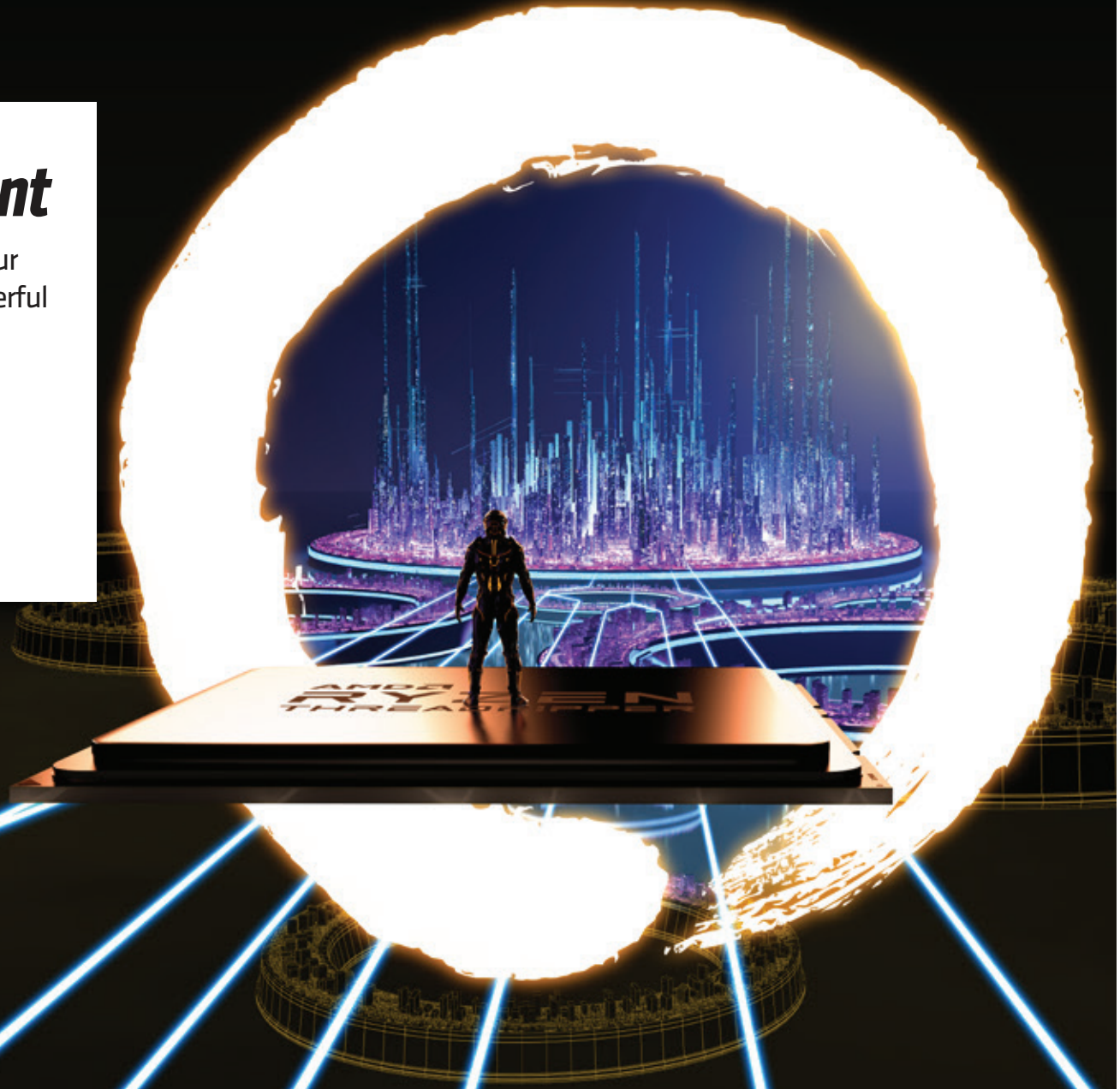
Render Time Irrelevant

Render time irrelevant

Break free from the render bar. Realize your creative vision with the world's most powerful desktop processor for workstation*.

AMD.com/Threadripper

AMD
RYZEN
THREADRIPPER



*Testing by AMD performance labs on 10/07/2019 comparing an AMD Ryzen™ Threadripper™ 3970X and AMD Ryzen™ Threadripper™ 3960X vs. Intel© Core™ i9-9980XE in the Cinebench R20 nT benchmark test. Results may vary. EPYC-02

FOREWORD

by team AnimationXpress.com

"Zip. Zap. Zoom." Blazing speeds. The need for super fast processors has never been felt more than today with the boom in content requirements from OTTs (Over-the-top), movie theatres, TV channels and game platforms. What's made content delivery deadlines more complex is the erosion of office and studio workplaces and the emergence of the work from home culture. This has happened at a time when directors are increasingly relying on VFX (Visual effects) heavy scenes to express their creative vision.

Yes, content makers have learned to create content virtually through innovative pipelines. But that has brought the importance of easy-to-use software and powerful beasts of machines to manage the complex tasks into the limelight.

Over the past 18 months, investments have been poured by studios into new gear boasting powerful chips which have had more and more silicon crunched into them, giving them the capability to easily lift the heavy tasks that are loaded onto them.

One of the global majors that has done well on the CPU side is AMD which has been rolling out newer generations of its muscular AMD Ryzen™ Threadripper™ desktop processor. Many Indian studios – gaming, post production, animation and VFX – have fallen for its gee-whiz processing power and today swear by the AMD Ryzen™ Threadripper™ CPU. From slow, dainty steps into using the AMD chips on a couple of machines, they are now opening their wallets willingly to convert their entire armoury of computers to the AMD star – the AMD Ryzen™ Threadripper™ CPU.

What benefits have accrued to them courtesy of this monstrously strong and robust CPU?

This coffee table book you are holding tells you the story from the studios themselves. AMD and India's leading AVGC (animation, visual effects, gaming and comics) online platform AnimationXpress.com reached out to the CXOs (Chief experience officer) of the Indian studios to get a first hand account. All we heard is the flood of praise from those who opted for the AMD CPU early. They swore by how much rendering time has been smashed, how parallel tasks are easily do-able on their machines which earlier used to crawl, and how creativity has been enhanced.

We hope this compendium of first-hand experiences from Indian and international studio leaders will help you make informed decisions as you go about planning your own in-house upgrade of hardware and software.

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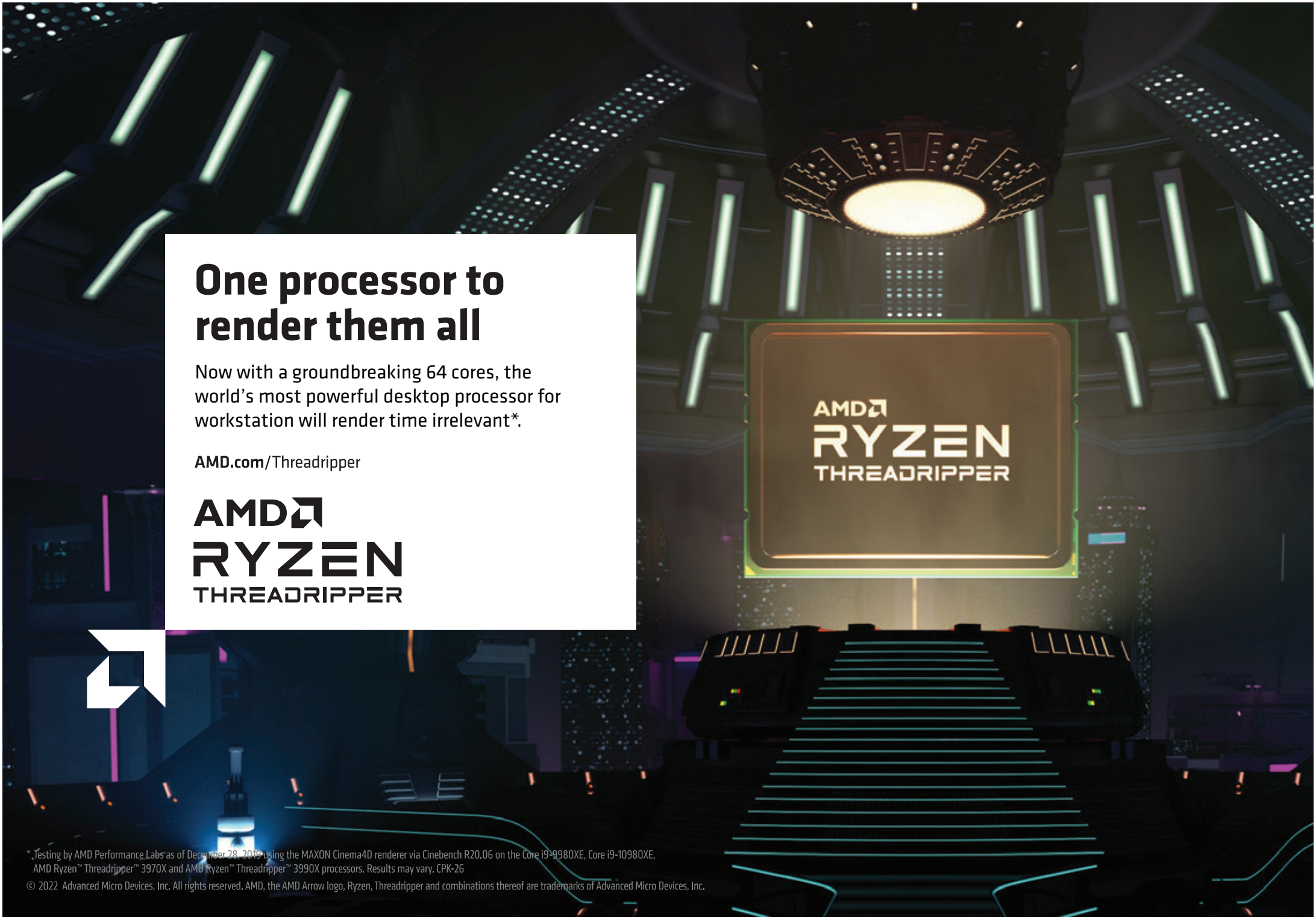
AMD



One processor to render them all

Now with a groundbreaking 64 cores, the world's most powerful desktop processor for workstation will render time irrelevant*.

AMD.com/Threadripper

AMD
RYZEN
THREADRIPPER

*Testing by AMD Performance Labs as of December 28, 2019 using the MAXON Cinema4D renderer via Cinebench R20.06 on the Core i9-9980XE, Core i9-10980XE, AMD Ryzen™ Threadripper™ 3970X and AMD Ryzen™ Threadripper™ 3990X processors. Results may vary. CPK-26

Nodding Heads and its performance advantage with AMD Ryzen™ Threadripper™ CPU

AMD RYZEN THREADRIPPER

CUSTOMER

NODDING HEADS GAMES

INDUSTRY
Game development

CHALLENGES
Light baking and rendering of 2D cinematics

SOLUTION
Deploy AMD Ryzen™ Threadripper™ CPU powered workstations and graphic cards

RESULTS
Created a seamless and successful light-bake along with faster rendering, thereby increasing productivity

AMD TECHNOLOGY AT A GLANCE
AMD Radeon™ R9 270X GPU
AMD Ryzen™ 2000, 3000 & 5000 series CPU, 1st Gen 16-core AMD Ryzen™ Threadripper™ CPU

Making breakthroughs in the gaming development space requires a blend of creativity, software expertise and strategic deployment of cutting-edge hardware that meets the need for speed. Nodding Heads Games is set to make an enhanced edition of the popular game using AMD Ryzen™ Threadripper™ CPU that promises to catalyze workflow performance, bringing the grand vision to life.

A CONSOLE AND PC GAME DEVELOPED IN INDIA?

Until recently, most would have dismissed this as a pipedream. But that did not deter Pune-based indie game studio Nodding Heads Games founding trio – Ian Maude, Avichal Singh and Shruti Ghosh. Five years ago, they took it upon themselves to develop *Raji: An Ancient Epic,* which was the first serious effort from an Indian indie gaming studio to develop a PC and console game. Despite several challenges, Nodding Heads Games and its young team persevered and released the game in 2020, in the thick of the pandemic and the lockdown.

Their gamble paid off when gamers worldwide downloaded the Indian origin game and made it one of the most popular titles that went on to bag top accolades.

And the studio is not stopping here. An enhanced edition of the popular game is in the works.

The Nodding Heads Games team says what is emboldening them to upgrade the game and seek new vistas is the increasing use of AMD's Ryzen™ Threadripper™ CPU products for their workflows.

POWERING INDIA'S BELOVED GAME 'RAJI: AN ANCIENT EPIC' WITH AMD

Nodding Heads Games started off the development of *Raji* using Unreal® Engine 4.0 as the game development engine and used AMD Radeon™ R9 270X graphics cards.

"We had procured three of these cards. This was way back in early 2017. At that time, a second-hand 270X was one of the only few cards out there that could fit our skimpy budget and was powerful enough to run UE4 at the same time," says the Nodding Heads Games team.

It was in 2018 when the need for upgradation started coming into sharper focus with the increasing size of the project and aging workstations.

Shares the team, "Thankfully, at around the same time the Ryzen 2000 series was launched, which saw some of the team members making the move to the AMD Ryzen™ processor. Presently, about 90 percent of our workstations are running on the AMD Ryzen™ processors spread across the 2000, 3000 and 5000 series."

"Unreal Engine 4 is the primary middleware used in our studio. Having it run on a processor with superior multi-threaded performance is a big plus. It greatly reduces the pain of waiting for over 10K shaders to compile since a lot more instances of the "ShaderCompileWorker" can run in parallel," they add.

Details and intricacies like those in *Raji* require the tightest possible code. They share that their visual studio leverages the higher thread count of the Ryzen™ processors really well, resulting in shorter code compilation times.

RACING AGAINST TIME WITH AMD RYZEN™ THREADRIPPER™ CPU

One of the biggest challenges that the studio faced was light baking and rendering of 2D cinematics. That was until they discovered the AMD Ryzen™ Threarripper™ CPU. The team asserts, "AMD Ryzen™ Threadripper™ CPU is one of the best hardwares we've received."

AMD Ryzen™ Threadripper™ CPU promised a single, desktop solution that solved the need for a distributed build mechanism and enabled the rapid code iteration that they needed.

Explaining how it solved their problem, Nodding Heads Games shares, "The CPU works like a charm for light baking. Previously it used to take anything between 12 to 72 hours to light bake one level. And imagine having to do corrections! Hours rolled into days, days into weeks... and did we mention that all our studio PCs had to be connected. During work hours, these PC's could not be used, but during the unsociable hours, this is when light baking would take place. However, this was not foolproof by any stretch because with the best of intentions there were numerous technical failures. Be it power cuts, PC's disconnecting from the seed network, you get the picture. Needless to say, a successful lightbake [whatever the outcome] was met with optimism and celebration."

AMD Ryzen™ Threadripper™ CPU led them to create a seamless and successful light bake along with faster rendering. "Threadripper™ is so powerful, it's effortless. It is able to handle any light baking and rendering we throw at it, causing one of our artists to grin from ear to ear like the Cheshire cat. Having an opportunity to test this hardware in the studio has been such a delightful and moral boosting experience," they add.

Describing what AMD Ryzen™ Threadripper™ CPU means to Nodding Heads Games, they mention, "Threadripper™ has not only been a joy, but a lifeline and this is by no means an exaggeration. It has reduced render times, light baking of levels from what would normally take days or weeks to hours."

A MULTITHREADED SOLUTION

When they started out as an Indie studio, the studio shares that despite budgetary constraints they knew about the effectiveness of having a AMD Ryzen™ Threadripper™ CPU, and what it could do in terms of sheer computation.

Nodding Heads Games used a unit equipped with a 1st Gen 16-core AMD Ryzen™ Threadripper™ CPU. To the team's delight, on software utilised the advantage of multithreading, it performed up way faster than the competitive processors.

Nodding Heads Games is so pleased with the performance that the team wishes they were in a fortuitous position to have had a Threadripper™ at the start of *Raji's* production.

They feel that AMD has always had an edge over its peers in multi-threaded performance. This has only been bettered with the release of each AMD Ryzen™ series over the years.

"Threadripper has reduced render times, light baking of levels from what would normally take days/weeks to hours."

Nodding Heads Games Team

**All performance and cost savings claims are provided by Nodding Heads and have not been independently verified by AMD. Performance and cost benefits are impacted by a variety of variables. Results herein are specific to Nodding Heads and may not be typical. GD-181*

ABOUT NODDING HEADS GAMES

Nodding Heads Games are a team of passionate developers and are currently based out of Pune, India. Their goal is to deliver quality games which reflect stories, myths and lore from the Indian subcontinent. They are creators of the award winning title Raji: An Ancient Epic, with over 30 accolades and coverage from both international and national media. Their mandate to put India on the gamedev map was achieved with Raji's success. For more information visit: noddingheadsgames.com

NODDING HEADS GAMES FOUNDERS
AVICHAL SINGH, SHRUTI GHOSH, IAN MAUDE


RAJI™
AN
ANCIENT EPIC


NODDING HEADS
GAMES


Raj Vfx Pvt. Ltd.

Raj VFX catalyses workflows with AMD Ryzen™ Threadripper™ CPUs

AMD RYZEN THREADRIPPER

CUSTOMER

Raj Vfx Pvt. Ltd.

INDUSTRY
Visual Effects

CHALLENGES
Rendering complex imagery and work seamlessly on remote pipelines

SOLUTION
Second Generation AMD Ryzen™ Threadripper™ 2990WX 32core

RESULTS
Achieved productivity, speed and optimisation in projects. Fast rendering.

SOFTWARE USED
Photoshop | Adobe
After Effects | Adobe
Maya | Autodesk

AMD TECHNOLOGY AT A GLANCE
2nd Gen AMD Ryzen™ Threadripper™ 2990WX 32core

Mumbai-based post production house Raj VFX has aimed to fundamentally redefine the way VFX and CGI is crafted over the years with the extraordinary breadth of projects its team has been delivering.

Packing a staff of over 120 artists, the studio has turned out more than 300,000 minutes of high-quality VFX ever since it was set up in 2009.

“We’ve been trying new technologies and software to make work more efficient,” says CG supervisor and animator at Raj VFX, Sunny Bhajbhuje. “The pandemic and lockdowns made us believe in something which always seemed impossible - working from home. We have completed our work in the given timeline. There were challenges of course but we have managed to sort it out and ride through a smooth way.”

AN ALL-ENCOMPASSING SOLUTION

What has allowed Raj VFX to ensure high productivity in the time of a remote working setup is its move to updrage the studio's hardware to AMD Ryzen™ Threadripper™ CPU. “It is our research and IT teams who are always searching for new solutions about how our hardware can be upgraded to keep our pipeline working flawlessly. This is how we were introduced to Threadripper.” discloses Sunny.

Switching to new hardware is never easy; the first steps to invest in new tech were small at the Mumbai based office. “We continued with the former brand for many years, and we had good experiences,” confesses Sunny. “However, we are getting so much more power out of our AMD machines for the same money. Right now, our future is with AMD; there's no reason to move back,” he shares.

The benefits have been immense: higher productivity, improved speed and optimisation. Adds Sunny: “It understands the requirements of the software and gives it the power to deliver with performance.”

RAJ VFX’S TIME SAVING DEVICE

According to him, AMD CPUs - especially the second generation AMD Ryzen™ Threadripper™ 2990wx 32 core chip - have proved to be a “time-saving device, with workflow accelerating three times faster than the previous processors. You cannot beat that price to its performance ratio,” he asserts.

Praising the technology, he highlights that the processors have increased power efficiency which delivers high performance. “And this efficiency is perfect for smaller form factory systems as it has the efficiency of giving higher computing performance as compared to others.”

Having all those cores helps to get the images processed faster. The multi-threaded capabilities of Threadripper have empowered the team with lightning-fast render speeds whilst being able to perform other tasks without interruption.

“Threadripper is so powerful that it could keep working simultaneously working with multiple renders. This allows artists to work on more samplings much more quickly,” he expounds.

RENDERING IN A FLASH WITH THREADRIPPER

For studios, rendering times can majorly slow down project turnaround times, something which Raj VFX also faces. VFX artists would do touch ups and major changes on shots on local machines, push the work onto another unit which served as a rendering machine; see how it has turned out. They would then again engage in rework on their local machines and send it back to the rendering unit. "This meant that they could not use their local machines for additional work until the render was completed," says Sunny.

AMD Ryzen™ Threadripper™ has been instrumental in providing artists the ease of navigating multiple tasks at once whilst making sure the renders are taken care of too.

"AMD gives us the ability to perform multiple tasks at the same instance, that is, work on the shot as well as render it to see the results on the same artist workstation, and so resulting in more creative output and better results," he elaborates. "We can get that extra bump in quality or get that last-minute request fulfilled. That can make a big difference on the creative end," he adds.

With the AMD Ryzen™ Threadripper™ CPU solving complex problems, Raj VFX has decided to upgrade to the latest third generation Threadripper for all workstations. "We are upgrading to achieve better performance at a economic price compared to other processors as it is the fastest processor ever created to date," he notes.

"We are upgrading to achieve better performance at an economic price compared to other processors as Threadripper is the fastest processor ever created to date."

Sunny Bhajbhuje, CG supervisor and animator, Raj VFX

Acknowledging the unprecedented capabilities of AMD Ryzen™ Threadripper™ CPU, he shares, "We would like to appreciate the kind of work AMD has done for making things possible and push our limits for giving better performance at high speed." "We can now move on to other projects ahead of schedule with AMD Ryzen™ Threadripper™ CPU," says a smiling and happy Sunny.

It has been two years since Raj VFX made the shift to AMD Ryzen™ Threadripper™ CPU. The projects that it powered include: *Sunflower* (a digital original series for Zee5) and *Special Ops 1* and *Special Ops 1.5* (a digital series for Hotstar), and feature film like *Sangeen.*

ABOUT RAJ VFX

Formed in 2009, RAJ VFX PVT LTD is a Mumbai based VFX studio. VFX is our delight; we bring pioneering technology and top-notch creativity into play creating visuals that exceed your expectations. With great attention to detail, we make every effort to bring your fruits to fruition. You just have to say your dream and we'll be competently working on it and helping you enjoy the distinct VFX effect.
Commitment is the key to our excellence and with high-end technological infrastructure available; we always have the drive to reach international standards. Quality is our drive to perform, with a keen eye on the project throughout its span; commitment, excellence, communication and outstanding delivery are etched into our DNA. For more information visit: rajstudios.in

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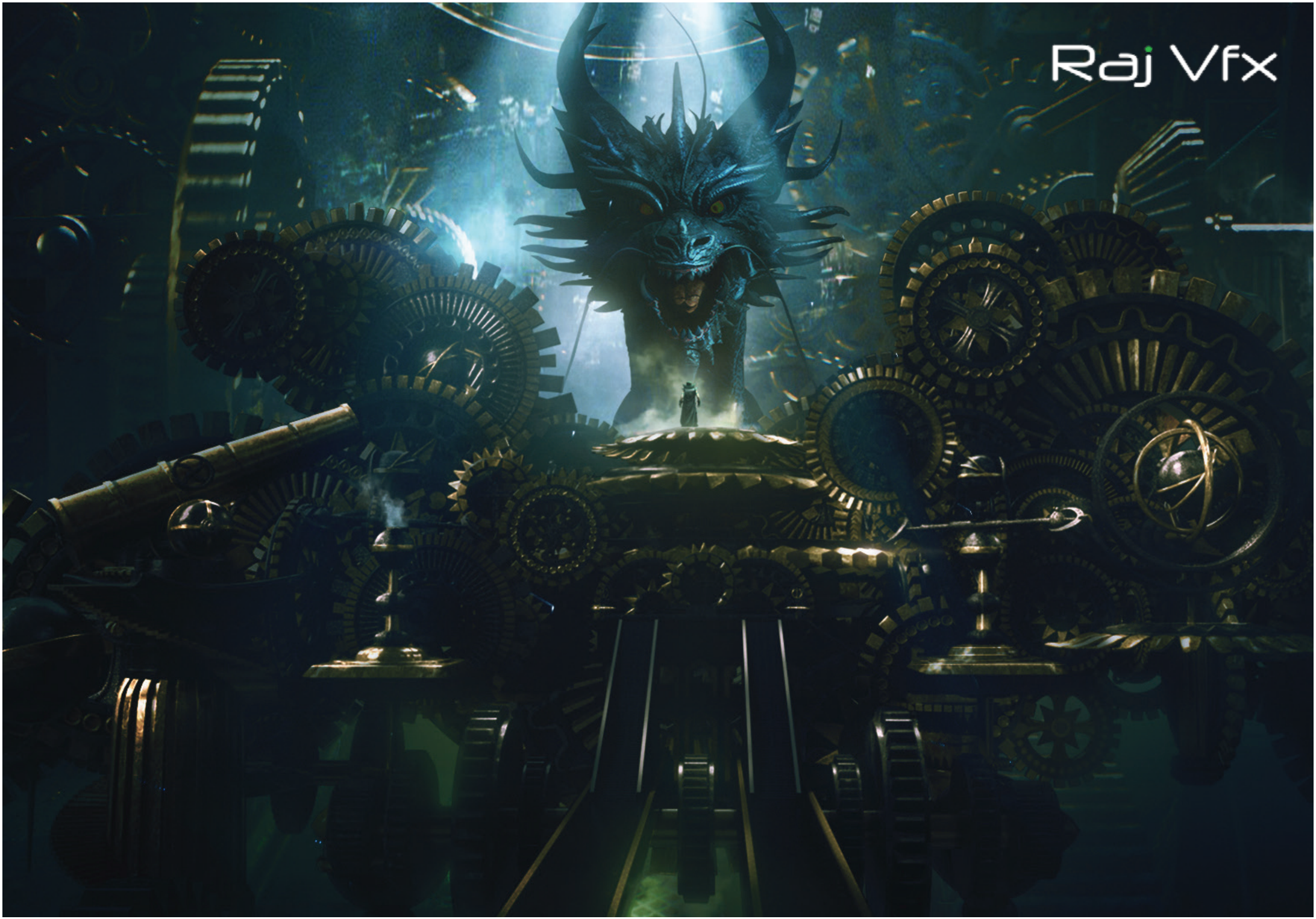
Raj Vfx

AMD Ryzen™ Threadripper™ CPU adds a silver lining to the SilverCloud Studios

AMD RYZEN THREADRIPPER

CUSTOMER

SilverCloud Studios Pvt Ltd

INDUSTRY

Visual Effects

CHALLENGES

Rendering and multitasking

SOLUTION

Deploy AMD Ryzen™ Threadripper™ PRO 3975WX 32 core with 128GB RAM

RESULTS

The studio is now able to deliver complex projects and attain speed like never before

SOFTWARE USED

Maya | Autodesk
Nuke | Foundry

AMD TECHNOLOGY AT A GLANCE

AMD Ryzen™ Threadripper™ PRO 3975WX 32 core with 128GB RAM

As a creative company, SilverCloud Studios has been invested in creating extraordinary images and effects for a variety of clients across the entertainment ecosystem; right from Viacom18, Sony, TAG, Glitch Media, HUL, Fox, Applause Entertainment, Netflix, Amazon and more! From a modest beginning it has become a leading VFX services provider which also creates digital intermediates, mastering services, title design, creative editing and high and digital finishing of film and video based projects.

The introduction of AMD Ryzen™ Threadripper™ CPU has added a silver lining to SilverCloud's workflow.

TRYST WITH AMD RYZEN™ THREADRIPPER™ CPU

In the field of visual effects, every project comes with new challenges and complexities. The newer projects undertaken by the studio, had highly complex shots which couldn't possibly be delivered with old rickety hardware and infrastructure.

"So we initiated testing multiple CPU options. We tried Maya rendering one of the complex shots from our previous project and calculated the machine configuration and render time," expresses SilverCloud Studios Head of Department - Technology, Navin Kumar Patro.

Majorly dominated by Maya and Nuke, the studio has experienced a huge performance benefit of these softwares on the AMD platform. "Threadripper packs a big WOW factor for every user that works on it," Patro reveals, describing its ability to handle multifold complexities of the effects business.

"Threadripper packs a big WOW factor for every user that works on it."

Navin Kumar Patro, HOD - Technology, SilverCloud Studios

SLAYING A MILLION TASKS WITH AMD PROCESSORS

Six months into using AMD products, Patro informs that half of SilverCloud's projects are already being deployed on the former's CPUs. According to him, the studio can now successfully accommodate 28000 crores (56000 threads) of processing power AMD EPYC™ processor in its small 6-racked datacenter; something which is not possible otherwise. "In a city like Mumbai where space is a big problem, what more would you expect?" he jokes.

With the need for speed emerging burningly in the wake of remote working and digital portals, studios across the world have been upgrading their infrastructures with technologies that can keep up with the latest standards.

On infrastructure recalibration with AMD, Patro discloses that SilverCloud has already initiated the migration process to AMD. "We are halfway through," says he. "All our new render nodes are AMD EPYC based servers. Even our storage servers are EPYC-based. By next year, we will be fully AMD powered if we receive good support from AMD," he shares.

He believes that AMD CPUs deliver 'excellent processing power'.

For those at AMD that's super good to hear.

ABOUT SILVERCLOUD STUDIOS

Located at Mumbai, After studio now extended and also known as Silvercloud studios was founded in 2011 by a team of specialist VFX artists, editors, technologists and producers. Silvercloud studios' creates digital intermediates, mastering services, title design and digital vfx, creative editing and high and digital finishing of film and video based projects. They consistently keep upgrading their technology to match the times. This advanced technology when coupled with the finest professionals, helps them deliver the best post production services at the most optimum speed.

They are honoured to have provided work for Viacom 18, Sony, Star India, Publicis, Schbang, HUL, T-series, Fox, RSVP, Balaji telefilms, Excel entertainment, Applause entertainment, Netflix, Amazon and more. For more information visit: silvercloudstudios.in

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PhantomFX betters speed and performance with AMD Ryzen™ Threadripper™ CPU

AMD RYZEN THREADRIPPER

CUSTOMER

Phantomfx

INDUSTRY
Visual Effects

CHALLENGES
Rendering and multitasking

SOLUTION
Deploy AMD Ryzen™ Threadripper™ 3970X

RESULTS
Rendering became super fast. The studio got the desired output with 6x to 10x improvement in most cases.

SOFTWARE USED
Maya | Autodesk
Blender

AMD TECHNOLOGY AT A GLANCE
AMD Ryzen™ Threadripper™ 3970X Processor

Tamil Nadu's premier VFX studio PhantomFX has been setting benchmarks regularly in the space it operates. Creating magic on screen requires creativity, talent depth and technical prowess – attributes that PhantomFX has come to be known for consistently over the numerous projects that have been assigned to it.

AMD: PHANTOMFX'S BEST CHOICE

Having serviced demanding domestic and international clients, PhantomFX is one of the very few studios that had no shortage of work even during the peak of the pandemic. "We were fortunate to have projects running at full steam and we did deliver on time," says the studio's technical head Vinay Gedan who feels that the dearth of chipsets across the world is impacting the industry and delaying access to affordable hardware.

PhantomFX has been using AMD since the introduction of multi-chip modules (MCMs). "We felt that the Threadripper would be the best choice for production and went ahead with it," reveals Vinay.

The recent past for PhantomFX has been hectic with the quantum of projects increasing across theatrical, VOD and OTT.

This is exactly what made the team opt for the AMD Ryzen™ Threadripper™ CPU. "Being a VFX studio with multiple projects on the floor, we've always been on a lookout for better performance from the CPU," he explains.

THREADRIPPER'S SEAMLESS COMPATIBILITY

Threadripper is compatible with almost all the software that dominate the VFX and animation industry including Maya and Blender which PhantomFX and its artists use a-plenty, explains Vinay.

The Chennai-based studio reports that AMD Ryzen™ Threadripper™ CPU 3970x CPU has allowed it to get the desired output with a whopping six to ten times improvement in most cases.

The studio has been using AMD Ryzen™ Threadripper™ since the beginning of 2020. *When calls the Heart:* Season 8, *Van Helsing:* Season 5, *Superman and Lois:* Season 1, *Project Blue Book:* Season 2, *Grey's Anatomy:* Season 17, *Cats & Dogs 3: Paws Unite, Christmas in Evergreen: Bells Are Ringing, Haathi Mere Saathi, and Anabelle Sethupathi* are some of the many projects that PhantomFX has delivered successfully using Threadripper.

Giving lightning-fast rendering capabilities along with seamless multitasking experience, AMD has simplified the workflow in an unprecedented way for PhantomFX.

"From faster processing to faster rendering, AMD has touched our entire pipeline," he asserts.

PUSHING THE BOUNDARIES WITH AMD

The studio is actively planning to push more boundaries with the help of the latest technologies. "Future upgrades would be more towards GPU but still we would need more better and efficient AMD processors down the line," he discloses, stating his eyes are on the potential processors that AMD can further unlock.

Vinay is hopeful that AMD will keep solving industry problems with ingeniously created processors and chipsets. "Keep up the pace in innovation, AMD," he says.

Vinay Gedan
Technical Head at PhantomFX

ABOUT PHANTOMFX

PhantomFX is a TPN Certified, full-fledged creative studio, based in India with offices operating in US and Canada. It provides high-end visual effects solutions for commercials, feature films, and television media globally.

Phantom offers all sorts of creative VFX services, ranging from final compositing and roto to creating 3D Elements, photo real creatures and environments, 3D matchmove, and animation. The team of talented and passionate creatives at Phantom are capable of handling projects of any scale and complexity. For more information, visit: phantom-fx.com

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GAMI
TRONICS
SPEEDY GUN SAVAGE
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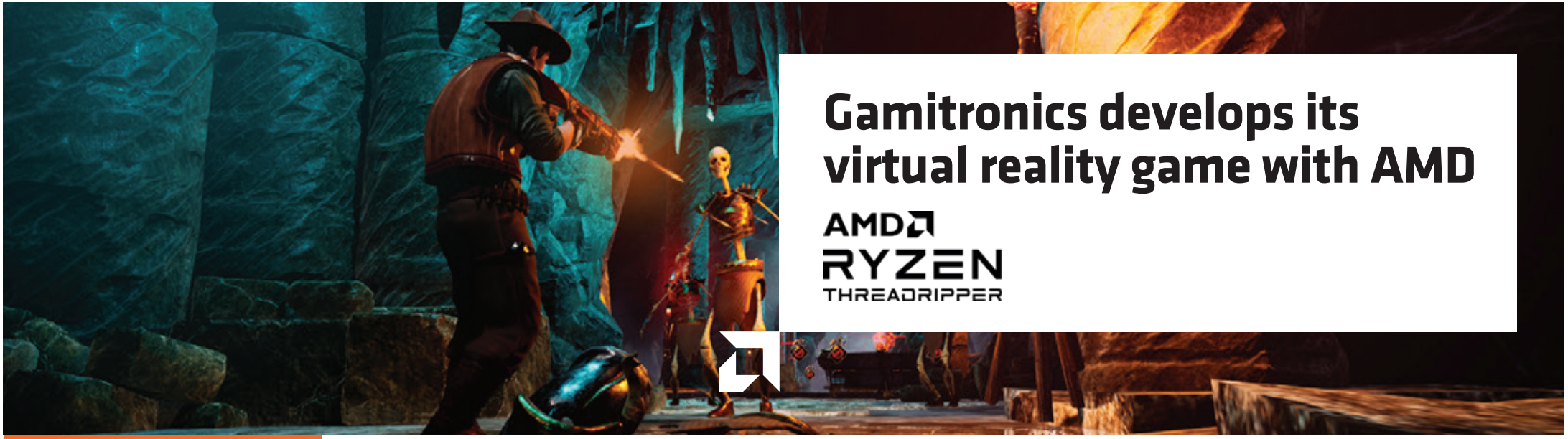

Gamitronics develops its virtual reality game with AMD

AMD RYZEN THREADRIPPER

CUSTOMER

INDUSTRY
Game Development, AR-VR, Animation and Theme Parks

CHALLENGES
Rendering complex imagery in one go and light baking

SOLUTION
Deploy AMD Ryzen™ Threadripper™ PRO 3955WX 16-core

RESULTS
Heating issues eliminated. Rendering became super fast. Light-baking was fluid, uninterrupted and smooth.

SOFTWARE USED
Unreal Engine | Epic Games
3ds Max | Autodesk
Maya | Autodesk
Blender

AMD TECHNOLOGY AT A GLANCE
AMD Ryzen™ Threadripper™ PRO 3955WX 16-core

Founded with an aim to advance the growth of VR/AR and use extensive knowledge of AI and robotics to build affordable smart toys, Hyderabad-based studio Gamitronics has set numerous benchmarks across game development, theme parks and virtual reality.

POWERING GAMITRONICS WITH AMD

Simulating spell-binding experiences in VR games is no mean feat. In order to capture imaginations, creativity has to be stretched and that requires enabling by cutting-edge technology. Developers are constantly scouting for ways to improve their iteration time, even as the games increase in size and quality and projects become more complex.

According to Gamitronics Studio Head Vishnu Murthy, the decision to opt for the AMD Ryzen™ Threadripper™ CPU was made during the early stages of the successful VR game *Speedy Gun Savage*. "We were checking all sorts of hardware options which could enable all the features that Unreal had to offer. Being an AMD fanboy for over a decade, I suggested trying an AMD PC for rendering the *Speedy Gun Savage* trailer," he recounts.

THREADRIPPER™; A RENDERFARM EQUIVALENT?

The decision proved fortuitous: it has led to 'faster and cost-effective' production. Advocating AMD's Ryzen™ Threadripper ™ CPU-based workstations that they used for real-time rendering using a game engine to a "render-farm in the traditional production pipeline," Vishnu shares that the chip has adequate configuration to handle art assets that the studio deploys. He adds that the 16 cores/32 threads that the AMD Ryzen™ Threadripper™ has in one CPU makes it twice as cheap as the competition and it performs gracefully, with no overheating issues.

"AMD helped our artist create bigger worlds and better VFX in a shorter time especially during the shader compilation and light baking."

Vishnu Murthy, Studio Head, Gamitronics

AMD is compatible with a host of industry-standard software and so far, no compatibility issues have come to light. He discloses that the studio mostly works with Unreal, while deploying Max, Maya and Blender for art assets.

World-building is an iterative process and oftentimes, complex elements are placed in one single project which increases the load. "AMD helped our artists create bigger worlds and better VFX in a shorter time especially during the shader compilation and light baking," he shares.

With the integration of AMD Ryzen™ Threadripper™, the studio has witnessed lightning-fast results and better quality, helping it come up with 'more iterations to get the desired output.'

AMD Ryzen™ Threadripper™, with its lightning fast speed and multi-threaded feature, has opened gateways of new possibilities that the founder had not fathomed before. "During the presentation in front of Rajat Ojha (Gamitronics Studios founder), the artist could quickly apply the feedback and check instantly. It saved a lot of time in the feedback process. AMD has made the real time rendering process much faster during *Taarak Mehta ka Chhota Chashmah*, an animated TV series from Sony YAY!. Rendering massive environments with lots of characters and VFX at one shot wouldn't have been possible without it," Vishnu higlights.

ELIMINATING HEATING WITH AMD

For Gamitronics, the biggest challenge was building massive environments in one go. In order to execute the vision, the development team had to build each by dividing them into smaller zones.

On top of that, the entire process was riddled with 'system crashes and glitches during the light bake process.' Adopting AMD solved these problems by facilitating faster, smoother and uninterrupted workflow. "By introducing AMD Threadripper now, we are delighted that all these difficulties are a thing of the past," he happily states.

"With the onset of future projects, we are planning to upgrade the rest of the machines also with AMD. We look forward to seeing how AMD pushes processor technology with their future products."

Vishnu Murthy, Studio Head, Gamitronics

Having already upgraded a string of workstations in the studio with AMD, Gamitronics is planning further to AMD-ify the entire facility. "With the onset of future projects, we are planning to upgrade the rest of the machines also with AMD. We look forward to seeing how AMD pushes processor technology with their future products," Vishnu emphasizes.

Game on, shall we say for Gamitronics?

ABOUT GAMITRONICS

Gamitronics is the pioneering theme park, VR/AR and robotics/AI company based in Hyderabad. Gamitronics has worked on multiple theme parks and is leading VR/AR from the forefront. Gamitronics is building electronic toys and enterprise robots using cutting edge computer vision, NLP and sensors. For more information visit: gamitronics.com

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Power of Trust
Power of Desire
AMD
INDIA'S MOST TRUSTED &
DESIRED BRAND
(IN THE SEMICONDUCTOR CATEGORY)
AMD
RYZEN
THREADRIPPER
AMD
THREADRIPPER
PRO
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The Coalition accelerates game development with AMD Ryzen™ Threadripper™ CPUs

Fast compile and build on one system using AMD Ryzen™ Threadripper™ processors

AMD RYZEN THREADRIPPER

CUSTOMER

The Coalition

INDUSTRY

Game Devlopment

CHALLENGES

Keep developers effective while working from home

SOLUTION

Deploy AMD Ryzen™ Threadripper™ 3970X CPU powered workstations

RESULTS

Developers can now compile and link code quickly with a single workstation

AMD TECHNOLOGY AT A GLANCE

AMD Ryzen™ Threadripper™ 3970X with 32 cores
AMD Ryzen™ Threadripper™ 3990X with 64 cores

Designing and coding graphically complex games requires powerful workstation hardware, constantly pushing the limits of what is available.

The Coalition is a Microsoft-owned studio that has been developing the hugely popular and graphically outstanding *Gears of War* series since the Ultimate Edition, released in 2015, which remastered the original game from the ground up. The studio has since then delivered *Gears of War 4* and *Gears 5*. Developers are constantly looking for ways to improve their iteration time, while the games grow in size and scope. This led the studio towards the AMD Ryzen™ Threadripper™CPUs, to help manage the increasing complexity of their projects.

"I was often not able to task switch on my other machine while utilizing the cores, and my Threadripper™ processor has allowed me to switch more easily."

Jaysen Huculak, Lead PC Engineer at The Coalition

CONFLICTING NEEDS OF COMPILE AND LINK

"Our development is split into two parts, compile and link," explains Mike Perzel, Rendering Lead at The Coalition. "Compile is building all of your compile objects and then linking is taking all of those compile objects and building them into one EXE. Compile wants a lot of cores, and it doesn't care too much about the speed of those cores. Linking is a traditionally single-threaded operation. It is bound by how fast your processor is going to be under your desk. There's no way to farm it out." "A high-end workstation used to be a dual Intel Xeon box," adds Joe Vogt, IT Manager at The Coalition. "You'd get 12 or 16 cores, but still those cores weren't going to be that quick. " This had other repercussions in the development process. "When we first started, a lot of us were doing PC development on low clock speed Intel Xeon CPUs, and testing our changes against these slower CPUs," says Perzel. "We were not getting an accurateview of what our CPU usage was going to look like for end users, because we were slower than the average end-user machine."

"We had Intel Xeon machines that were able to compile all of our files in 20 minutes, but our linking phase was still taking 20 minutes," says Perzel. This led The Coalition to turn to a network-distributed model for the compile phase, alongside the move away from traditional desktop workstation hardware. "We turned to a network distributed build environment to solve the multiple core problems, by using other idle cores on the network."

"We needed a lower number of very fast cores, so we started to get consumer CPUs, as consumer CPUs started to have six, eight, and even 10 fast cores," says Vogt. "This got our link times down a lot,

but it meant that we had fewer, faster cores under the desk, and more cores spread out throughout the network," adds Perzel.

"It created a split where the affordability of a single machine with a whole lot of fast cores was impractical," says Vogt. "The idea of putting 32 cores under a developer's desk, or even more, was ridiculous in the Intel Xeon world. We're not going to pay 15 or 20 thousand dollars for a pair of Intel Xeons." Then The Coalition came across AMD Ryzen™ Threadripper™ processors, but it wasn't initially in a workstation context.

AN INTRODUCTION TO AMD RYZEN ™ THREADRIPPER™ CPUS

"The first time we started talking about Threadripper™ was as a user," says Perzel. "How would it run *Gears 5*?" Jaysen Huculak, PC Development Lead at The Coalition, tried out a 16-core AMD Ryzen Threadripper 2950X processor at home. "We were able to get *Gears 5* to over 200 frames per second," continues Perzel. "As a gaming device, it was astounding."

However, the AMD Ryzen™ Threadripper™ CPU-based system had capabilities far beyond playing games. "It ended up quickly becoming my primary dev machine because of the combination of fast single-core performance and high thread count," says Huculak. "I previously had to run two machines, one to represent more of what the consumer experience was with a higher clock rate and single core, and my Intel Xeon machine with a much lower clock rate, which couldn't run our benchmarks at a speed that would push the GPU to max. My ability to go from two machines down to one was a game changer. When I switched to Threadripper I stopped using my secondary machine. I'm finding that I have less overhead in moving between machines and doing things in multiple places."

All of this changed very suddenly with the arrival of the pandemic, and all of the Developers at the Coalition moving to work from home. "Suddenly, that very fast network we had grown reliant on wasn't there," says Perzel. "Home Internet speeds and stability were a lot more variable, and it was a big problem for some of the Developers."

THREADRIPPERS TO THE RESCUE

Right around the same time as the switch to working from home, some new Threadripper workstations arrived at The Coalition. Perzel tested building on an Intel Core i9 with 10 cores against an AMD Ryzen™ Threadripper™ 3970X CPU with 32 cores, using the distributed build system. "The AMD processor was about 20 percent faster," says Perzel. "It wasn't getting massively faster, because a lot of our build was still being distributed across the network. When I did a build without the distributed build, however, that's where I noticed the big difference. Compared to my Intel Core i7 machine, it was 270 percent faster, and it was 205 percent faster than the Core i9. The final number that was the most interesting was that the Threadripper with no networked build was 70 percent of the speed of the Core i9 compiling in-office with the distributed build system. It was still in the 25-minute range, but now you have something that doesn't require an incredibly fast network. If those machines get moved back into the office, it will still be great, as those very fast cores will be available to the network."

"One of the things that I noticed when I was compiling locally," adds Huculak, "was that my Threadripper system was more usable than my other machine. Before, I was often not able to task switch on my Xeon while utilizing the cores, but my Threadripper™ processor has allowed me to switch more easily."

"A lot of our developers had additional PCs," adds Vogt. "They would start a build on one and then work on something else on the other computer, because it would still be usable. You gain a fair amount of savings by not having to have that second machine." This is allowing the developer team to tune their code more iteratively, too. "As a developer, it's all about the compile time," says Perzel. "The faster we get our compile time back, the more changes we can do."

"Before this, you always had to choose your processor based off what would be more important to you, number of cores or speed, and this processor doesn't make you have that choice."

Joe Vogt, IT Manager at The Coalition

The Coalition is also now trying the 64-core AMD Ryzen™ Threadripper™ 3990X. "One developer working from home has four machines networked together as a local build farm," says Perzel. "We are going to try and replace that with a single 64-core machine. Having one tower that does everything is a pretty big deal for quality of life when you're working from home. Not a lot of people have room for multiple machines in their homes. If you can get one of these CPUs, you should take it!"

"Threadripper is everything you want in a processor," concludes Vogt. "It has the speed and it has the number of cores. Before this, you always had to choose your processor based off what would be more important to you, number of cores or speed, and this processor doesn't make you have that choice."

ABOUT THE COALITION

About The Coalition Founded in 2010 under the name Zipline Studios, The Coalition is a Microsoft-owned game design studio based in Vancouver, Canada. It has been developing the Gears of War series since Gears of War Ultimate, when Microsoft acquired the franchise from Epic Games. It is part of Xbox Game Studios and has subsequently developed Gears of War 4 and Gears 5. The company's name, The Coalition, is derived from an entity within Gears of War called the Coalition of Ordered Governments. The studio now employs 200 designers and developers. For more information, visit thecoalitionstudio.com.

**All performance and cost savings claims are provided by The Coalition and have not been independently verified by AMD. Performance and cost benefits are impacted by a variety of variables. Results herein are specific to The Coalition and may not be typical. GD-181*

BLAZING NEW TRAILS IN POST PRODUCTION

AMD Ryzen™ Threadripper™ CPU boosts the performance of MTI Film's CORTEX, helping it lead the way in IMF packaging and post production

CUSTOMER

MTI FILM

INDUSTRY

Media and Entertainment

CHALLENGES

To achieve real-time playback capabilities when encoding and decoding JPEG 2000 format media for IMF packaging as well as to enable faster IMF packaging and accelerated up-resing capabilities.

SOLUTION

MTI Film replaced the dual-core Intel Xeon processors in its workstations with AMD's 16-core AMD Ryzen™ Threadripper™ CPUs.

RESULTS

Processing dailies, IMF packaging, and up-resing became between 15 and 40 percent faster, depending on the format and the application.

SOFTWARE USED

CORTEX Enterprise
DRS™ NOVA

AMD TECHNOLOGY AT A GLANCE

AMD Ryzen™ Threadripper™ CPU

When your company's name is synonymous with innovation and excellence in media and entertainment, you want nothing but the best CPU technology driving your software. That's why, for MTI Film, making the switch from dual-core Intel® Xeon® processors to AMD's 16-core Threadripper™ for Ryzen™ workstations was a logical step.

AMD Ryzen™ Threadripper™ boosted the performance of MTI Film's proprietary software CORTEX by between 15 and 40 percent, delivering real-time playback capabilities when encoding and decoding JPEG 2000 format media as well as faster IMF packaging and accelerated up-resing, which is the process of transcoding standard-definition footage to HD or higher quality.

ALWAYS ON THE CUTTING EDGE OF FILM TECHNOLOGY

Founded in 1999 and headed by CEO Larry Chernoff, recipient of the Hollywood Professional Association's 2017 Lifetime Achievement Award and member of the Academy's Scientific and Technical Achievement Committee, MTI Film has been a leader in post-production and restoration services and technology for 20 years.

The trailblazing company provides high-quality post-production and remastering services to studios and independent producers alike. As such, it has completed more than 50 episodic TV series since 2010. Moreover, its world-class restoration services are highly sought after. In the past eight years, it has completed more than 100 film restoration projects for a range of libraries and studios, including the Academy of Motion Picture Arts and Sciences, 20th Century Fox, Sony Pictures, The Museum of Modern Art (MoMA), Universal Pictures, and Warner Bros.

"When we added our first Ryzen Threadripper-powered workstation, we were astonished to achieve somewhere between 25 and 28 frames per second. That's approximately 38 percent faster—a huge step."

Randy Reck, Director of Product Development, MTI Film

In addition, MTI Film's CORTEX and DRS™ NOVA software is used by many of the media and entertainment industry's most respected players. CORTEX is a powerful set-to-screen workflow solution with a host of features that enable the management of media throughout the production cycle as well as the packaging of media to comply with complex delivery formats. DRS™ NOVA offers a full suite of manual and automated tools to clean and restore old or damaged media.

In 2016, MTI Film introduced CORTEX 3.0, which came with several new features, including interoperable master format (IMF) packaging. IMF is a file-based framework that enables the processing of various versions of a single high-quality digital content product for distribution around the world. The growing importance of IMF can be illustrated by the fact that Netflix, which commissions $8 billion worth of content on an annual basis, requests all of its deliveries in IMF.

For MTI Film, it's essential to keep pushing the performance boundaries of its software. When AMD approached the company with the 16-core Ryzen Threadripper for workstation use, it was excited to try it out.

MAKING REAL TIME A REALITY

Thanks to AMD's hardware, MTI Film was also able to speed up the time associated with IMF packaging in CORTEX. In the past, packaging a 60-minute TV episode—which is realistically approximately 50 minutes of content—would take between 60 and 75 minutes.

With AMD Ryzen™ Threadripper™, the process accelerated to a little faster than real time, depending on the format. As a result, the company now enjoys faster turnaround times and can handle higher volumes of content.

ACCELERATING MTI-SAMSUNG UPRES

Another area where MTI Film experienced significant improvements was up-resing. Equipped with the MTI-Samsung UpRes algorithm, CORTEX has the ability to perform a high-quality upres. However, with the dual-core Intel Xeon processors, the process was both GPU- and time-intensive. With AMD Ryzen™ Threadripper™ CPU, the company achieved a significant acceleration and throughput that even approached real time. And as Reck points out, "If you're up-resing a two-hour movie and you get a 20 percent boost in speed, it starts to become really significant."

CREATING MORE VALUE FOR LESS

MTI Film was so pleased with the performance of AMD's hardware that AMD Ryzen™ Threadripper™ 2, AMD's recently revealed CPU, was the obvious choice when it came to building a customized workstation to showcase CORTEX Enterprise and DRS™ NOVA at IBC 2018. "We wanted to create a custom workstation that hit the sweet spot of two GPUs and offered the best possible performance—not a huge, expensive machine with eight GPUs and powerful fans," says Reck.

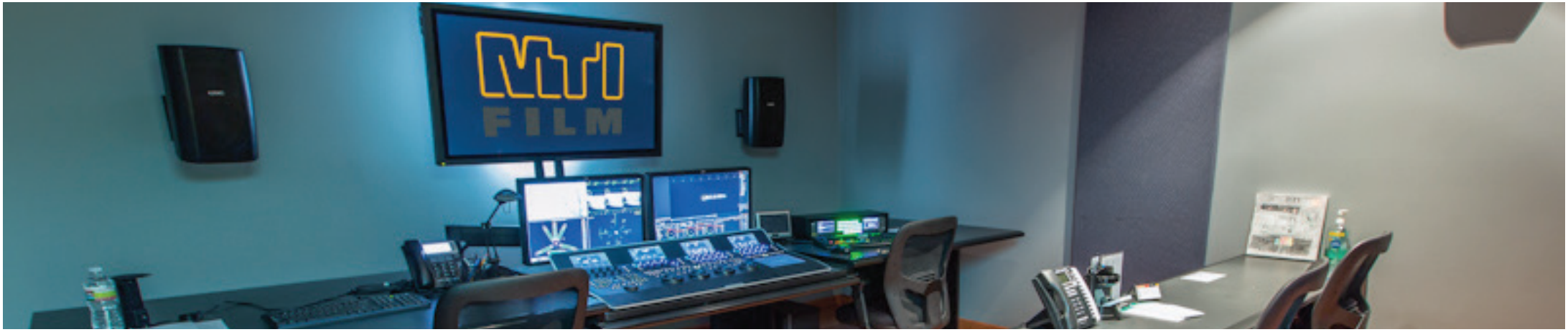
"And we were able to show some pretty incredible performance numbers. Some of the HD renders approached 300 frames per second, which were speeds we'd never seen before on CORTEX."

A HAPPY SURPRISE

Currently, MTI Film has four AMD Ryzen™ Threadripper™-powered workstations. And since AMD's CPU provides the optimum configuration for the company's proprietary applications, the company is in the process of replacing all of its existing dual-core Intel Xeon processors with AMD Ryzen™ Threadripper™ 2. Moreover, it recommends AMD's product to customers purchasing its software.

For MTI Film, one of the most important outcomes of using AMD Ryzen™ Threadripper™ is that the faster CPU enables the company to add more features to its software. Ultimately, this will provide an enhanced creative experience for every artist or operator who uses it.

All things considered, MTI Film couldn't be more pleased with AMD Ryzen™ Threadripper™—nor with the collaboration with AMD. "In all my decades of being an engineer in this industry, I had yet to run into a chip manufacturer that has as much understanding of the media and entertainment industry as AMD," says Reck. "It was a bit of a surprise—but a happy one."



ABOUT MTI FILM LAB

As a leading full-service post production facility, MTI Film provides high-quality post-finishing services for features, television, and commercial projects, including Syfy's "The Magicians." Its critically acclaimed digital film-restoration services have helped restore works such as "The Bridge on the River Kwai" and "Taxi Driver."In addition, MTI Film's proprietary software CORTEX and DRS™ NOVA are used by top-tier studios, production houses, post-production houses, and film archives around the world. For more information about MTI Film's products and services, visit mtifilm.com.

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Lemon Sky Studios pushes boundaries for CGI art with AMD Thre

for animation and video game titles

AMD RYZEN THREADRIPPER

PARTNER

lemon sky STUDIOS

INDUSTRY

CG art for animation and video game titles.

CHALLENGES

To find the best rendering solution for intensive tasks while considering office and remote workspaces.

SOLUTION

Lemon Sky transitioned from using cloud rendering solutions to building an in-house render farm with AMD Ryzen™ Threadripper™ CPUs.

RESULTS

Using their in-house render farm powered by AMD Ryzen™ Threadripper™, Lemon Sky was able to render their frames 3 times faster without any security risks.

AMD TECHNOLOGY AT A GLANCE

AMD Ryzen™ Threadripper™ 2990WX CPU

Founded in 2006, Lemon Sky Studios is Malaysia's leading CGI studio and one of the region's best art outsourcing companies in the video game and animation industry with an inhouse render farm that is powered by AMD Ryzen™ Threadripper™ CPUs.

Lemon Sky's company motto is to "Make Good Art". They strive to be one of the best studios in the region that is involved in high quality gaming content as well as providing a healthy work environment for their artists. To date, they have a 350-strong workforce across different principles, ranging from animators, concept artists and modelers.

With an aim to create positive changes in the industry, Lemon Sky is constantly involved in the local community by organizing talks and workshops to improve the future generation of artists in terms of skill development outside of the education system. Additionally, they also provide specialized training for their artists to teach them new skills to give them a more competitive edge in the industry.

With over a decade of experience in the animation industry, Lemon Sky has a stellar reputation producing top notch 3D animation that meets the standards of the world's biggest animation studios. The company has a proud history of creating worlds, characters, and creatures for countless video game projects for some of the most iconic AAA game titles .

CPU RENDERING IS STILL THE INDUSTRY STANDARD

As a CGI company, rendering remains one of the most resource intensive computing tasks.

Cloud render farms were part of the initial consideration but they were not a viable option for Lemon Sky due to the nature of the work that they do. As a service provider for industry leading content publishers, Lemon Sky would have to render and rerender repeatedly for hundreds of times daily. For instance, a major project, Lemon Sky artists rendered long sequences at 24 frames per second that quickly piled up. With the implementation of AMD Ryzen™ Threadripper™ 2990WX processors, the faster render speed has significantly ramped up their project timeline by up to 3 times.

"We use the 2nd Gen Threadripper™ 2990WX for render farms as it is 3 times faster than our previous solutions and of course, you can't beat the price to performance ratio."

Hon Gene Loo,
Head of Production at Lemon

With a robust team of animators whose tasks include a constant need for rendering, the expenses from using a cloud rendering solution were not a feasible option for the company in the long run. Plus, not many cloud render facilities are updated with the newest hardware, especially when it comes to CPU rendering.

Of course, there are also security concerns for sending confidential data out of the studio. In their search for the most efficient and cost effective method, Lemon Sky decided to build an in-house render

farm that uses plugins such as V-RAY and MENTAL RAY, and softwares like KEYSHOT, DEADLINE and NUKE. Initially, they started using a non-AMD hardware, and while they were decently performing, much was left to be desired. Lemon Sky needed something that not only excels in multi-threaded workloads but also has good single core performance.

AMD RYZEN™ THREADRIPPER™ IS THE PERFECT RENDERING SOLUTION

Since December 2018, Lemon Sky has implemented AMD hardware into their workflow. Afterward, the company is able to complete tasks at a faster rate, which enables them to move on to other projects ahead of schedule.

With the 2nd Gen AMD Ryzen™ Threadripper™, AMD has managed to fit in 32 cores and 64 threads into a single processor with a max boost clock of 4.2GHz1. This unprecedented hybrid between core counts that was only seen in server CPUs and the clockspeeds of gaming chips has led to a huge surge in rendering performance.

In fact, the company was so pleased with the results that they decided to incorporate more Threadripper™ systems into their pipeline. Their render farm has since expanded into a 30- machine-strong workhorse and continues to grow alongside the company's business.

COVID-19 CHALLENGES

In 2020, as the pandemic swept across the world, Lemon Sky had to adapt to the new normal by making arrangements for their artists to work from home. This meant the company had to loan out the workstations for employees to work in the safety of their homes.

Having relied mostly on competitive technology for this part of their work, Lemon Sky is keen to explore workstation options from AMD, such as the brand new AMD Ryzen™ Threadripper™ PRO, to help prevent any bottlenecks within their creative processes. The requirement for increasingly powerful computers is necessary to keep the company competitive in a world where visual fidelity is getting higher and higher. They are now testing out new systems from AMD and hope to implement them in the near future.

"We believe in creating a healthy work environment in our studio. Not only do we meticulously plan for the production of every project, we're constantly striving to provide our artists with the best tools for the job to boost their productivity and work/life balance," says Loo.

ABOUT LEMON SKY

Lemon Sky Studio was officially founded by malaysian artist cjengfei wong and ken foong armed with a well-rounded understanding of the video game and animation industry's the company's specialized skill makes them the leading CGI studio in malasia as well as one of the region's best art companies. Their ability to tailor solutions to the client's creative vision propelled the company to collaborate with some of the biggest names in the business. To learn more about Lemon Sky visit www.lemonskystudio.com

**All performance and cost savings claims are provided by Lemon Sky Studios and have not been independently verified by AMD. Performance and cost benefits are impacted by a variety of variables. Results herein are specific to Lemon Sky Studios and may not be typical. GD-181*

AMD accelerates Unreal Engine development workflows with AMD Ryzen™ Threadripper™ CPUs

Epic Games sees dramatic performance increase and enhanced productivity

AMD RYZEN THREADRIPPER

CUSTOMER

EPIC GAMES

INDUSTRY

Media & Entertainment; Games and Software Development; AEC

CHALLENGES

To streamline the code compiling process and achieve faster iteration and shading times. In addition, to enable the engineers to work quickly and effectively from home during the pandemic.

SOLUTION

Epic Games replaced its previous workstation CPUs with AMD Ryzen™ Threadripper™ 3970X/3990X and Lenovo P620 with AMD Ryzen™ Threadripper™ PRO 3995WX.

RESULTS

Using Threadripper in their workstations, Epic was able to compile the engine much faster than before without having to rely on additional cores in the cloud. In addition, the iteration time and the time for compiling shaders was drastically reduced.

TECHNOLOGY AT A GLANCE

AMD Ryzen™ Threadripper™ CPU and AMD Ryzen™ Threadripper™ PRO CPU

TECHNOLOGY PARTNER

Lenovo

For nearly 30 years, Epic Games has had a proven track record of success in the game development industry. The company's latest platform, Unreal Engine 4, is the world's leading game engine across PC, console, and mobile devices. Epic Games also developed *Fortnite*, the number one game in the world, which generated $2.4 billion in revenue in 2018 and more than $1.8 billion in 2019.

Staying at the top of the game design industry in this way takes a combination of creative flair and strategic implementation of the latest technology. Epic Games has maintained its lead by giving its development team the very best hardware to work with, allowing the developers to achieve their goals in the fastest time possible. This constant need for speed led the company to AMD Ryzen™ Threadripper™ processors, which promised to take workflow performance to the next level.

POWERING REAL-TIME 3D BEYOND GAMES

Unreal Engine has more than 11 million licensees and is seeing a rapid adoption into industries beyond gaming, including media and entertainment, live events, automotive, architecture, healthcare, and simulation. Since 2016, Unreal Engine 4 has been used in more than 120 film and television productions such as *The Mandalorian; Star Wars: Rise of Skywalker;* HBO's *Game of Thrones;* and *Westworld.*

In the automotive industry, manufacturers use Unreal Engine for everything from design and engineering to final sales and marketing renders. Surveys by industry-leading publication CG Architect show that in architecture, Unreal Engine has been the premier real-time rendering solution since 2016, with world-class firms such as HKS, Foster + Partners, ZAHA Hadid, and Zoan all leveraging it. But creating an engine flexible enough for all these diverse usage scenarios requires the tightest possible code. Epic Games has historically struggled against a significant challenge during development. "One of the most common workflows is compiling code – a process that can be massively parallelized," explains Nick Penwarden, VP of Engineering at Epic Games. "For us, the ability to quickly compile and iterate code is critical to quality."

"There's nothing else that can compare to what the Threadripper 3990X CPU does in any price range."

Pat Swanson, IT Engineer

The team couldn't find a solution that offered both high clock speed and high parallelism simultaneously. "It's a big challenge when you can save five or 10 minutes on your compiling but then lose five minutes on your linking," says Pat Swanson, an IT Engineer with the End User Team. That was, until they came across the AMD Ryzen™ Threadripper™, which promised a single, desktop solution that solved the need for a distributed build mechanism and enabled the rapid code iteration they longed for.

CHANGING THE GAME WITH AMD RYZEN™ THREADRIPPER™ CPUS

Epic Games tried AMD Ryzen™ Threadripper™ CPUs with a range of its workloads and were absolutely blown away by the performance the processors could deliver. "3rd Gen AMD Ryzen™ Threadripper™ CPUs with 32 and 64 cores were a gamechanger," says Andrew Grant, Technical Technical Director in Epic Games' Special Products Group. "They offered significantly more processing power than anything we could build ourselves with the hardware we'd previously used. It was nothing short of a watershed moment."

"The numbers we were gettingwere just jawdropping. I could show them to any engineer, and their response was, 'Can I have one of those? Please?"

Andrew Grant, Technical Director

The tests Grant performed with Unreal Engine workloads were a revelation. In an internal engine build test of software executables, an Intel® Core™ i9-9900X with 10 cores (used for event demos) took 46 mins and 43 sec, whereas a AMD Ryzen™ Threadripper™ 3970X with 32 cores took a mere 15 mins

and 12 sec less than a third of the time. In the same test, an Intel® Core™ I9-10900X with 10 cores (again, used for event demos) took 40 minutes and 34 seconds, whereas a AMD Ryzen™ Threadripper™ 3990X with 64 cores took only 12 minutes. In a cook test, where content is integrated into the engine, the Intel® Core™ i9-9900X and 10900X took around 60 percent longer than the AMD Ryzen™ Threadripper™ 3970X and 3990X. And with other scenarios such as tasks with fewer cores or backed by the IncrediBuild distributed compute platform, the team still saw notable increases almost across the board.

"Using Threadripper, we're able to compile the engine much more quickly than we could previously. That's a huge efficiency boost for all the engineers on the team."

Nick Penwarden, VP of Engineering at Epic Games

Overall, the 3rd Gen AMD Ryzen™ Threadripper™ CPUs achieved a 60 to 100 percent increase in performance on tasks that could utilize all cores versus the dual 12-core Xeon systems the team was using, for a fraction of the price. Threadripper was so fast, Swanson had to run the benchmarks several times before he realized the results weren't incorrect. "The numbers we were getting were just jaw-dropping," enthuses Grant. "Every engineer I showed them to asked, 'Can I have one of those? Please?'"

ENHANCED PERFORMANCE FOR DEVELOPERS WORKING AT HOME

Putting a single AMD Ryzen™ Threadripper™ on an engineer's desk provided such enhanced performance over using IncrediBuild that Epic Games decided to equip its key engineering team members with Threadripper CPU based workstations.

"The dream would be for every one of our engineers to have a Threadripper under their desk and maybe a second one to access as a building system," says Grant.

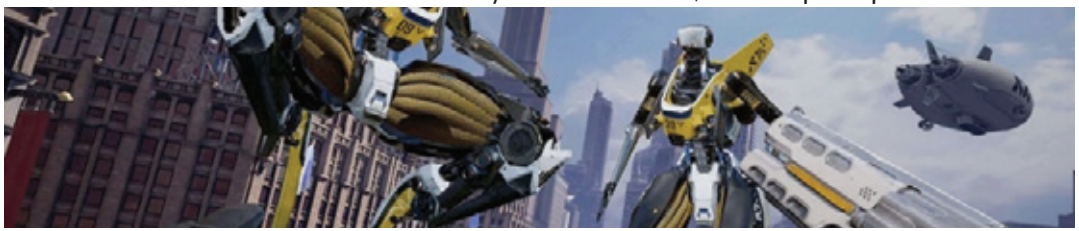
The new AMD Ryzen™ Threadripper™ CPUs have so many cores and offer so much speed, the team's engineers and developers have been able to work on multiple projects at once – unlike before.

"Using Threadripper, we're able to compile the engine much more quickly than we could previously," says Penwarden. "That's a huge efficiency boost for all the engineers on the team. The less time they're spending compiling code, the more time they can spend actually developing features, testing the functionality, and working on improving Unreal Engine. "Thanks to Threadripper, iterations now take a fraction of the time they used to. Compiling and rebuilding shaders have also become much faster. The team's engineers and developers can now touch anything and rebuild the entire engine in less than 10 minutes versus the 30-40 minutes it used to take.

INCREASED PRODUCTIVITY

As Epic started to deploy AMD Ryzen™ Threadripper™ workstations to key engineers working from home it proved to be a huge win. "While users at the office were saving 10 to 15 minutes," Swanson said. "Users at home were saving hours. After that, many users were so excited about the numbers their peers were getting, they went out and bought their own Threadripper CPUs for their setups at home.

"The Epic team reports that switching to Threadripper CPUs has generated a lot of excitement within the organization. "There's nothing else that can compare to what the AMD Ryzen™ Threadripper™ 3990X CPU does in any price range," says Swanson. "I could ask another manufacturer to send me a $20,000 chip, and the Threadripper is still going to match it or beat it. It's not that money is a barrier here, but the price-performance



ABOUT EPIC GAMES

Founded in 1991, Epic Games is an American company founded by CEO Tim Sweeney. The company is headquartered in Cary, North Carolina and has more than 40 offices worldwide. Today Epic is a leading interactive entertainment company and provider of 3D engine technology. Epic operates Fortnite, one of the world's largest games with over 350 million accounts and 2.5 billion friend connections. Epic also develops Unreal Engine, which powers the world's leading games and is also adopted across industries such as film and television, architecture, automotive, manufacturing, and simulation. Through Unreal Engine, Epic Games Store, and Epic Online Services, Epic provides an end-to-end digital ecosystem for developers and creators to build, distribute, and operate games and other content. For more information, visit epicgames.com.

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'MANOU THE SWIFT' ISN'T THE ONLY HERO FOR LUXX

Switching to AMD Ryzen™ and AMD Ryzen™ Threadripper™ CPUs, as well as AMD Radeon™ PRO WX 7100 GPUs is helping Germany's LUXX Studios to complete its first animated feature faster than it ever thought possible.

CUSTOMER

LUXXSTUDIOS

INDUSTRY

Media and Entertainment

CHALLENGES

To enable small independent effects visual facility LUXX Studios to complete its first animated feature to the same visual standards as a Hollywood movie, but on a much lower budget.

SOLUTION

LUXX switched to AMD Radeon™ Pro WX 7100 professional graphics cards in its artists' workstations and from Intel® Xeon E5-2620 processors to AMD Ryzen™ 7 1800X and AMD Ryzen™ Threadripper™ 1950X CPUs in workstations and render nodes.

RESULTS

Improved viewport performance enabled LUXX's artists to complete more iterations of a shot in the time available, while completed shots rendered "50-60% faster on the AMD hardware.

SOFTWARE USED

3ds Max® | Autodesk®
Forest Pack | iToo Software
Nuke® | Foundry
Ornatrix | Ephere
Phoenix FD | Chaos Group
V-Ray | Chaos Group

AMD TECHNOLOGY AT A GLANCE

AMD Ryzen™ 1800X CPU
AMD Radeon™ PRO WX 7100 GPU
AMD Ryzen™ Threadripper™ 1950X CPU

When you're an independent studio trying to complete an animated feature with the charm of a Pixar movie but the resources of a typical European film, every second counts. Which is why LUXX Studios switched to AMD.

For *Manou the Swift,* its Ugly-Duckling-meets-Romeo-and-Juliet tale of an orphaned swift raised by seagulls, the Stuttgart-based firm switched to AMD's Radeon™ PRO WX 7100 graphics cards and AMD Ryzen™ Threadripper™ 1950X processors in its artists' workstations, and from Intel® Xeon to AMD Ryzen™ 7 1800X processors in its render farm.

"For output in the viewport, AMD's Radeon Pro WX 7100 graphics cards are unbeatable most of the time. They make artists more creative as work is more fun for them."

Christian Haas, CEO and VFX supervisor, LUXX Studios

The AMD Radeon™ PRO cards made Manou's feather and flocking simulations quicker to manipulate on screen, cutting shot iteration times. And the AMD CPUs slashed render times in half, according to LUXX, even enabling it to run more iterations until final.

FROM VFX HOUSE TO ANIMATION STUDIO

Founded in 2006 by Christian Haas and Andrea Block, LUXX Studios specialized in visual effects for German TV before Hollywood called on them to provide visual effects for Roland Emmerich's *White House Down* and his most recent blockbuster, *Independence Day: Resurgence.* And although they were rapidly making a name for themselves on the international visual effects scene, LUXX's founders harbored a secret desire: to create their own intellectual property. The idea for *Manou the Swift* originated while Haas and Block were on a sailing trip and observed young seagulls learning to fly.

Block wrote the script together with screenwriter – and Filmakademie colleague–Axel Melzener to help turn the concept into a screenplay, eventually winning an award at the 2012 Cinekid international film festival.

Buoyed up by the success of the script, LUXX began to develop assets for Manou in parallel to the studio's commercial jobs, completing its first trailer in 2014. The movie–now a full-length animated feature with an English voice cast that includes Kate Winslet and Willem Dafoe–would move into full production in 2017 as LUXX's biggest project to date. "Before we had only 80 to 400 shots to work on, even for big movie projects," says Haas. "On Manou, we have to deal with 1,600."

AMD RADEON™ PRO GPUS SPEED UP SHOTS

In production, LUXX uses a pipeline based around 3ds Max, V-Ray and Nuke, mixing its own custom scripts for flocking and crowd simulations with off-the-shelf plugins including scattering tool Forest Pack, fluid simulation software Phoenix FD, and hair, fur and feathers system Ornatrix.

Such complex simulations–crowd shots feature around 20 different types of bird models, while each hero character sports millions of individual feathers–place a heavy load on an artist's GPU. To speed up workflow, LUXX turned to AMD's Radeon™ PRO WX 7100 professional graphics cards. With their 5.73 TFLOPS of peak single-precision floating-point performance and 8GB of GDDR5 memory, the AMD Radeon™ PRO WX

7100 cards make it possible to navigate even the largest of scenes inside 3ds Max without the display freezing or stuttering.

"For output in the viewport, they're unbeatable most of the time," says Haas. "As Show Supervisor and director, I can see how our shot count has increased."

Not only do artists complete shots faster: they complete them better. "With faster GPUs, artists try more different versions of a shot," says Haas. "They're more creative as it's more fun for them."

AMD RYZEN™ AND AMD RYZEN™ THREADRIPPER™ CPUS CUT RENDER TIMES

Another key problem solved by AMD hardware was render time. On LUXX's old render nodes, which had dual Intel Xeon E5-2620 CPUs, close-ups of Manou could take five hours to render. When the studio switched to single AMD Ryzen™ 7 1800Xs, times fell to under two hours per frame."AMD's Ryzen™ 7 1800X processors, with their 16 threads, are around 50-60% faster than our old [dual] Intel CPUs, with their 24 threads," says Haas. "That's quite impressive."

CUTTING COSTS WITHOUT CUTTING PERFORMANCE

Switching from Intel to AMD also reduced the cost of new render machines, both because the chips themselves cost less, and because there was no need for expensive dual-socket motherboards. "We were very impressed by the [Ryzen/Threadripper machines'] price-to-performance ratio," says Haas. "They're far beyond our expectations."

Haas admits that he was initially skeptical whether AMD CPUs could really perform as well in production as the old Intel chips previously used by LUXX, but that after seeing how stable the new AMD Ryzen™ 7 1800X processors were, he became a convert.

"AMD's Ryzen 7 1800X processors, with their 16 threads, are around 50-60% faster than our old dual Intel Xeon E5-2620s, with their 24 threads. That's quite impressive."

Christian Haas, CEO and VFX supervisor, LUXX Studios

"They run at 100% power usage for weeks and weeks with no issues," he says. "For people out there, who have tried AMD hardware before, I'd say: try it again – it has changed a lot recently."

AN ANIMATED FEATURE POWERED BY AMD CHIPS

Thanks to AMD hardware, LUXX Studios is completing its first animated feature faster and to a higher standard of quality than it thought possible. AMD Radeon Pro WX 7100 graphics cards enable its artists to try more variations of a shot before handing it over to be rendered, while AMD Ryzen™ and AMD Ryzen™ Threadripper CPUs are chewing through the frames in record time for *Manou the Swift's* autumn release.

LUXX is now rolling out the CPUs to its workstations as well as its render nodes. "The artists love it," laughs Haas. "If they see a new batch of Ryzens coming, they ask to switch."

"For us, as a small company, it's an easy calculation," he concludes. "If we get so much more power out of our AMD machines for the money, there's no reason to move back. We stuck with Intel for many years, and we had good experiences. But right now, we will plan with AMD in the future."

ABOUT LUXX

LUXX Studios produces stunning, tailor-made visual effects and appealing animation for international movies, TV series and commercials. Using state-of-the-art technologhy they create convincingly real futuristic cities, historic sites, overwhelming lanscapes, fantastic scenarios enhanced with fire, wind or water effects, bustling with digital crowds and animated creatures.

LUXX Studios' sister company, LUXX Film, specializes in content creation, development and production of VFX features and animated media. For more information, visit www.LUXX-studios.com and www.LUXX-film.com.

**All performance and cost savings claims are provided by LUXX Studios and have not been independently verified by AMD. Performance and cost benefits are impacted by a variety of variables. Results herein are specific to LUXX Studios and may not be typical. GD-181*

Blur Studio empowers greater creativity with AMD Ryzen™ Threadripper™ CPUs

Faster rendering means more time for improving creative results with AMD Ryzen™ Threadripper™ processors

CUSTOMER

BLUR

INDUSTRY

Animation and VFX for media and entertainment

CHALLENGES

Reduce time for test renders during the creative animation process

SOLUTION

Deploy AMD Ryzen™ Threadripper™ CPU-based workstations

RESULTS

Artists able to complete test renders on local machines while still working, improving the quality of their output

SOFTWARE USED

Maya
Blender | Autodesk

AMD TECHNOLOGY AT A GLANCE

AMD Ryzen™ Threadripper™ 3970X CPU with 32 cores

Producing the all-action visual effects that give modern movies their exhilaration is a partnership between creativity and brute computing power. An artist may be able to imagine an amazing sequence, but if rendering it out takes too long, that idea may never be realized in time For the filmmaking deadline. When Blur Studio took on a key action scene for Terminator: Dark Fate, it realized that a New workstation platform could radically improve the production pipeline and make unprecedented levels of creative work possible.

Blur Studio did much of the visual effects work for *Terminator: Dark Fate*, and a key sequence was where a watershed moment in the Backstory of one of the maincharacters of the film is revealed. Known as the "Dragonfly" sequence, it's a showcase of fast-paced action and incredible animation that took many hours of work to complete. But it would not have been so full of impact without the enhanced workflow made possible by AMD Ryzen™ Threadripper™ processors.

"To build a workstation with dual Xeons, You're looking at $20,000 in processors, And now the Threadripper 3990WX is $4,000. It's faster, so Intel Xeon really just doesn't make any sense at this point."

Shawn Wallbridge, Head of IT at Blur Studio

DISCOVERING THE POWER OF AMD THREADRIPPER CPUS

"We were looking at our options, and I tried an AMD machine we had," says Shawn Wallbridge, Head of IT at Blur Studio. "I started to play around with it and was blown away at just how fast it was. That was the 1st Gen EPYC™ 7351." Wallbridge's admiration for the EPYC processor led him to build a workstation for his own use based on the 2nd Gen AMD Ryzen™ Threadripper™ 2990WX processor. "I was even more impressed; it was just incredibly fast."

This all happened around the time work was picking up on *Terminator: Dark Fate.* "We needed to get some more machines and I said, 'my Threadripper is pretty awesome,'" continues Wallbridge. "So I priced out what we would typically buy, which would be a dual-Xeon machine, usually from Supermicro, and realized that we could get so much more performance and at a lower cost by going with AMD. I pitched that to accounting, and they were on board with it."

Traditionally, a VFX studio will perform creative work on local workstations, then render this to see how it will look, before making adjustments and rendering again. The artists can do these test renders on their local machines, but this usually means they can't use them for more animation work until the render is complete. Alternatively, they can wait in Line for a slot on the server render farm to be available. A sequence of just a few seconds typically requires 20-30 revisions before completion, so waiting for numerous test renders can mean a major interruption to workflow. The Dragonfly sequence contains a huge explosion with 1.4 billion voxels. But for a sequence like this, there is a tradeoff between the level of detail that can be accomplished and the time it takes to test-render and revise each Design version.

MANY CORES MAKE LIGHT WORK

This was where the workstations powered by the 32-core AMD Ryzen™ Threadripper™ 3970X processor proved revolutionary. They were both great at design work and superb for test rendering.

"The Threadripper was scoring about 45,000 in the V-Ray benchmark," explains Wallbridge. "Our Xeon workstations based on

dual E5-2630 V4 CPUs were around the 25,000 range, so that was just insane." This meant that the artists could use their workstations for test renders, rather than push them out and wait in line for the render farm. "We had three big projects delivering right around the same time. One of the comp renders had been on the farm for 15hours. The artist launched it on his machine and that finished in five minutes while he was still working."

This had a huge secondary effect for the creative process. "They could iterate quicker, get it in front of the client, in this case Tim Miller, Blur Studio's founder, and get his comments and feedback and make the shot that much better," says Wallbridge. "The Threadripper workstations were so powerful that compatibility with production software is always a concern for hardware used in M&E, but the AMD Ryzen™ Threadripper™ CPU-based workstations behaved seamlessly.

"One of the things that we did early on was we rendered an image on an Intel machine and on an AMD machine and then took that image into Nuke and did a difference. We had zero issues, which meant that we were able to mix those two platforms in our environment without worrying about variations between frames."

"The Threadripper workstations were so powerful that they could keep working and then launch multiple background renders at the same time."

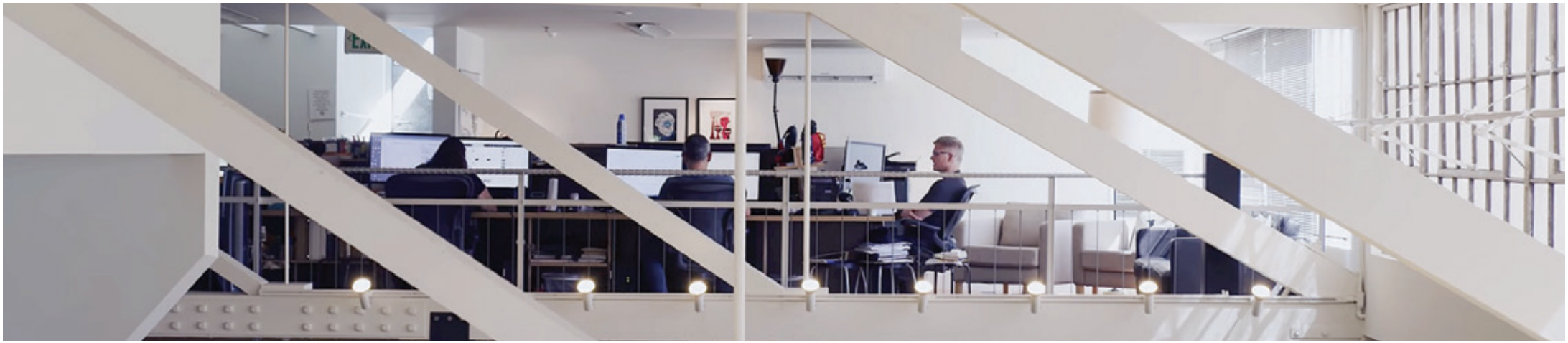
Shawn Wallbridge, Head of IT at Blur Studio

Blur also predominately uses NVIDIA graphics hardware, which worked without issue with every generation of AMD Ryzen™ Threadripper™ CPU-based workstation in the studio.

FASTER RESULTS MEAN BETTER QUALITY

The AMD Ryzen™ Threadripper™ processor enabled Blur to hit deadlines that would not have been possible otherwise. "We were coming up to a trailer for Terminator, and Tim decided he wanted to put one of the shots that we were working on in the trailer," says Wallbridge. "At first it was very hit or miss whether we could do it, but having those machines actually allowed us to meet the deadline. With the existing workstations we had before that, none of us think it would have been possible. For that sequence, our work was actually given to other vendors as a reference for what to strive for quality wise."

Wallbridge remains committed to the platform going forward. "I have zero intent on buying any more Xeons," he says. "To build a workstation with dual Xeons, you're looking at $20,000 in processors and now the AMD Ryzen™ Threadripper™ CPU 3990WX is $4,000. It's faster, so Intel Xeon really just doesn't make any sense at this point."



ABOUT BLUR STUDIOS

In 1995, Tim Miller founded Blur as a studio for animators and artists to collaborate and be in control of their creative destinies. Since then, Blur has evolved into an award-winning production company with work spanning the realms of game cinematics, commercials, feature films, and more. Committed to its clients, its people, and the telling of great stories, Blur Studio continues to grow not only as a high-end animation studio but also as original content creators, having recently helmed Netflix's first animated anthology, Love, Death + Robots. To learn more about Blur Studio, visit blur.com.

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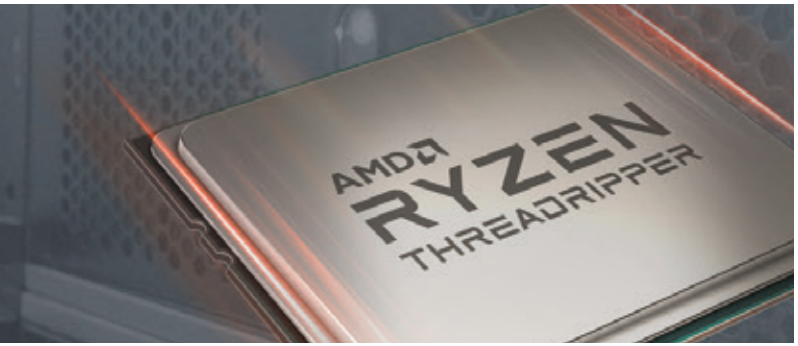
FROM THE STUDIO TO THE SCREEN FASTER THAN EVER BEFORE WITH AMD

Thanks to AMD partnership and technology, Fox VFX Lab achieves real-time virtual production capabilities—fundamentally changing the way movies are made



CUSTOMER

FoxVFXLab

INDUSTRY

Media and Entertainment

CHALLENGES

Streamline the on-set creative process by providing storytellers with rapid visual feedback and real-time insight into virtual environments while reducing final frame render times.

SOLUTION

Fox VFX Lab used customized BOXX APEXX T4 workstations equipped with AMD Ryzen™ Threadripper™ processors for facial animation. After initially using the EPYC™ processor-based servers for light baking, it started employing the servers for extensive light art, photogrammetry and construction setup.

RESULTS

With AMD Ryzen™ Threadripper™ processors, Fox VFX Lab achieved significantly faster times than with dual-socket Intel® Xeon® processors. The EPYC processor-powered servers eliminated the need for render farms for complex calculations.

AMD TECHNOLOGY AT A GLANCE

AMD Ryzen™ Threadripper™ 1950X CPU
AMD Ryzen™ Threadripper™ 2950X CPU
Dual AMD EPYC™ 7601 processors

Through its use of groundbreaking, high-quality real-time visualization, Fox VFX Lab has shattered the barriers to the creative process—making it virtually limitless. To accomplish this, Fox VFX Lab needed the best in high-performance hardware for its artists. AMD suggested using BOXX APEXX T4 workstations equipped with AMD Ryzen™ Threadripper™ processors, as well as servers powered by AMD EPYC™, for virtual production, which combines live action with virtual elements while shooting scenes.

The BOXX workstations with AMD Ryzen™ Threadripper™ processors delivered significantly faster performance—ultimately closing the gap to real-time creativity. In addition, the AMD EPYC™ processor-powered servers proved advantageous for reducing final frame rendering.

CREATING THE 20TH CENTURY STORY BOARD

When 20th Century Fox Film needed its own in-house virtual production team, acquiring Glenn Derry's company Technoprops to create Fox VFX Lab was the best course of action. Technoprops was responsible for the virtual production work on blockbuster movies such as James Cameron's "Avatar" and games like "Call of Duty: WWII."

Today, with Derry as vice president of visual effects for 20th Century Fox, Fox VFX Lab continues Technoprop's legacy, creating and executing creative content for film, TV, games, and VR productions. Currently, the team is working on "The Call of the Wild," directed by Chris Sanders and starring Harrison Ford.

Using advanced virtual production techniques, Fox VFX Lab is fundamentally changing the way movies are being made. The Fox VFX Lab team calls the process "pre-viz on steroids."

To combine previsualization with motion capture, it introduces virtual elements in the camera frame when shooting live action. This has artistic benefits, as it allows the director to interact with the environment and actors in real time. It also has functional benefits, because every detail—from cameras to lighting—can be worked out ahead of time. In effect, it produces the storyboard of the twenty-first century.

THE NEED FOR PROCESSING SPEED

In order to achieve virtual production effectively and economically, Fox VFX Lab needed workstations and servers that could drive faster render times. "It's important to get as close as possible to real time in order to leverage your creative instinct and feedback so you can make the right decisions," said Derry. One of the biggest challenges to this process was light baking. Due to the complex calculations involved, agreat deal of the work had to be performed during setup.

ACCELERATING THE CREATIVE PROCESS

"Derry wanted his artists to have hardware that didn't limit their creativity and enabled the team to work extremely quickly. "We have a very tactile, very fast flow of creative ideas, so you don't have time to wait for renders. We're essentially doing a live show every day," he explains. "We were looking for the best machine we could get so the artists would never say, 'If only my workstation were a little more this or a little more that."

"We were pretty stunned to see the workstations perform so amazingly fast."

**Glenn Derry,
VP of Visual Effects,
20th Century Fox**

As Derry's team began testing processors, James Knight, virtual production director at AMD, who worked as the performance capture project manager with Derry on "Avatar", was there to help. With a deep understanding of what Fox VFX Lab needed and a sincere desire to enable the next generation of filmmaking, Knight and his AMD team suggested using AMD Ryzen™ Threadripper™ CPUs in customized BOXX APEXX T4 workstations, along with two EPYC processor-based servers.

Thanks to the 16 core AMD Ryzen™ Threadripper™ CPU, the new workstations delivered lightning-fast performance when rendering. That meant that every machine was capable of working at the speed needed for real-time visualization. "We were pretty stunned to see the workstations perform so amazingly fast," said Derry. "It was a notable performance advantage in base workloads. And that's only gotten better over time with the next-gen Ryzen Threadripper with 32 cores, which allow us to shine in occasional workloads that depend on a high core count."

After initially employing the AMD EPYC™ processor-powered servers for light baking, the team started to use them for extensive light art, photogrammetry, and construction setup. In the future, Derry is even planning to use them for neural network training.

As a result of all these improvements, the creative process became much faster. "The AMD EPYC™ processor-based servers took performance to another level of amazing," said Ron Fischer, senior software engineer at Fox VFX Lab. Instead of waiting on rendering, the team gained more time and could focus entirely on creating. Everyone was delighted with the new hardware. "As an artist, it's top-down, wind-in-your-face, artistic computing," said Derry. "It's exhilarating, being able to turn out high-quality work very, very quickly."

WORKING ON "THE CALL OF THE WILD"

Fox VFX Lab's work on "The Call of the Wild" has been greatly facilitated thanks to the new workstations and servers. Interestingly, the movie was greenlit with the help of a previsualization created by the team. Currently, Fox VFX Lab is working closely with director Chris Sanders, employing a simul-cam technique that superimposes some of the dog characters live into the camera's view finder during live-action filming. The team's ability to quickly take Sanders' directions and relay them to on-screen visuals offers Sanders a high degree of agility in the storytelling process—something that's needed when translating Jack London's classic into a family-friendly movie.

PUSHING THE ENVELOPE WITH AMD AND BOXX

Initially, Derry planned to add a significant number of servers. However, because AMD Ryzen™ Threadripper™ gave the artists the ability to render at their workstations, it was no longer necessary. Moreover, the workstations had a small footprint, which was beneficial on set.

Fox VFX Lab purchased more than 80 AMD Ryzen™ Threadripper™ processor based workstations, a move that also caught the eye of several other industry leaders who subsequently copied the Lab's workstation strategy.

"The EPYC processor-based servers took performance to another level of amazing,"

Ron Fischer, Senior software engineer, Fox VFX Lab

In addition, the team's feedback has prompted AMD and BOXX to create even more powerful and innovative solutions. As a result, BOXX is implementing an overclocked version of AMD Ryzen™ Threadripper™ CPU to increase speed and performance. And whereas APEXX T4 was a tall workstation solution, BOXX has developed a multiple rack-mounted configuration with many of the same sturdy, practical design features but equipped with a newly-developed AMD Ryzen™ Threadripper™ processor designed specifically for this kind of configuration.

Derry and Fischer emphasize how pleased they are with both AMD and BOXX's partnership, service, and technical support. "It's so important to have a partner that can look you in the eye and offer you the support you need," said Fischer. Derry agreed. "AMD really give us the white-glove treatment," he said. "Whenever we have any tech questions or ask for something, they respond immediately. It's those little things that make all the difference."

ABOUT FOX VFX LAB

Fox VFX Lab, the in-house virtual production team for 20th Century Fox Film, was founded in April 2017 when Fox acquired Technoprops, an industry leader in virtual production and real-time visualization that contributed to blockbusters such as "Avatar," "Zero Dark Thirty," and "The Jungle Book." Under the guidance of Glenn Derry, founder of Technoprops and currently vice president of visual effects at Fox VFX Lab, the team's capabilities span from creative content development and execution to cutting-edge previsualizations for film, TV, game, and VR productions. For more information visit foxvfxlab.com.

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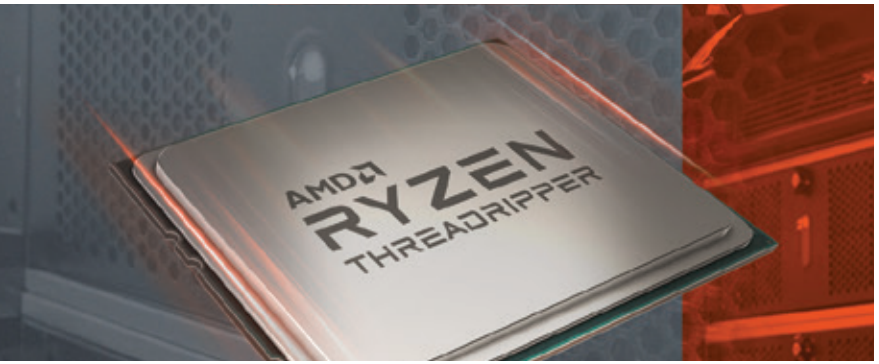
ROOSTER TEETH PUSHES CREATIVE BOUNDARIES WITH AMD RYZEN™ THREADRIPPER™ CPU

Using Ryzen™ Threadripper™ CPUs, Rooster Teeth was able to significantly accelerate its rendering and compositing processes, giving its team more artistic freedom



CUSTOMER

ROOSTER TEETH

INDUSTRY

Media and Entertainment

CHALLENGES

To find a CPU that could shorten the time for rendering multiple shots and heavier composites while maximizing server room space.

SOLUTION

Rooster Teeth used AMD Ryzen™ Threadripper™ CPUs to render toon shading with Pencil +4 in 3D Studio Max and to perform heavier compositing tasks.

RESULTS

The AMD Ryzen™ Threadripper™ performed up to four times faster on software that could handle multiple threads, enabling the artists to get feedback much faster and allowing Rooster Teeth to meet its production targets.

SOFTWARE USED

PSOFT Pencil +4
3D Studio Max
Adobe After Effects

AMD TECHNOLOGY AT A GLANCE

CPU: AMD Ryzen™ Threadripper™ 2990WX
Motherboard: Gigabyte X399
RAM: 128GB

As the producer of a host of weekly and biweekly animation series for an audience of more than 45 million subscribers, Rooster Teeth can't afford to miss a deadline. Using processors from one of AMD's biggest competitors, the company's animation was experiencing slow render times, so it decided to try out a 1st Gen 16-core AMD Ryzen™ Threadripper™ CPU.

The AMD Ryzen™ Threadripper™ CPU proved to be significantly faster than its competitive counterparts, enabling Rooster Teeth to complete its rendering processes in a matter of hours instead of overnight. This reduced the pressure surrounding the production process and allowed the company's artists to make more iterations and be more creative, achieve their goals in the fastest time possible. This constant need for speed led the company to AMD Ryzen™ Threadripper™ processors, which promised to take workflow performance to the next level.

BUILDING A MASSIVE ONLINE FAN BASE

Founded in 2003, Rooster Teeth is a groundbreaking media and entertainment company that has produced several acclaimed online series and podcasts, including "Red vs. Blue," "RWBY," the "Rooster Teeth Podcast," "Immersion," and "gen:LOCK." The company, which enjoys approximately five million visitors to its website each month, has a dedicated fan base that includes three million registered community members and more than 9.6 million subscribers to its YouTube channel. In total, all of its channels together have over 45 million subscribers.

THE NEED FOR MORE POWERFUL PROCESSORS

One of the most important aspects of Rooster Teeth's creative process is toon shading, which gives its productions their anime-style signature look. Rooster Teeth's animation team uses PSOFT Pencil +4, a CPU-based solution that can be used within 3ds Max.

Previously, the team used competitive CPUs for its rendering processes. Due to the time involved, it had to perform the rendering overnight, which could be stressful if it wasn't sure the processes would be completed by the next morning. Since Pencil +4 can handle more threads than Pencil +3, the team realized it could gain a significant amount of rendering power if it could leverage more threads than what was offered by its four machines with competitive CPUs. However, in order to maximize server room space, it was looking for CPUs with a high core count that could meet its rendering needs.

ACHIEVING FASTER RENDER TIMES WITH AMD RYZEN™ THREADRIPPER™

Supervising Technical Director for Rooster Teeth Animation Eric J. Turman first learned about AMD Ryzen™ Threadripper™ processors on tech forums and tech websites. The high core count immediately grabbed his attention. "I felt compelled to take a closer look," he said.

AMD provided Turman's team with a test unit equipped with a 1st Gen 16-core AMD Ryzen™ Threadripper™ CPU. To the team's surprise, on software that took advantage of multithreading, it performed up to four times faster than the competitive processors. "It was just tearing through those renders," said Turman.

> ***"It was a night-and-day change for the artists. It's just all positives when you're using AMD technology."***
>
> ***Shane Davis, VXF/Post Producer, Rooster Teeth***

"Initially, the artists couldn't believe the renders were good because they were so fast. But when they checked the frames and saw they were all there, they were simply stunned."

Rooster Teeth was so pleased with the test unit, it purchased eight AMD Ryzen™ Threadripper™ processors for its dedicated units and one for pipeline processing in the render farm.

In addition to rendering four or five shots on a single unit, the team was also able to multitask, running multiple applications at the same time. On top of rendering and compositing, the team also started to use the Ryzen Threadripper CPUs to rapidly package projects and transmit them across the network with Rooster Teeth's proprietary multithreaded transfer software.

With the AMD Ryzen™ Threadripper™ processors, overnight rendering became a thing of the past. Turnaround times improved dramatically. Additional performance boosts were realized when Rooster Teeth upgraded to 2nd Gen 32- core AMD Ryzen™ Threadripper™ processors and doubled the number of cores per node, which proved to reduce their render

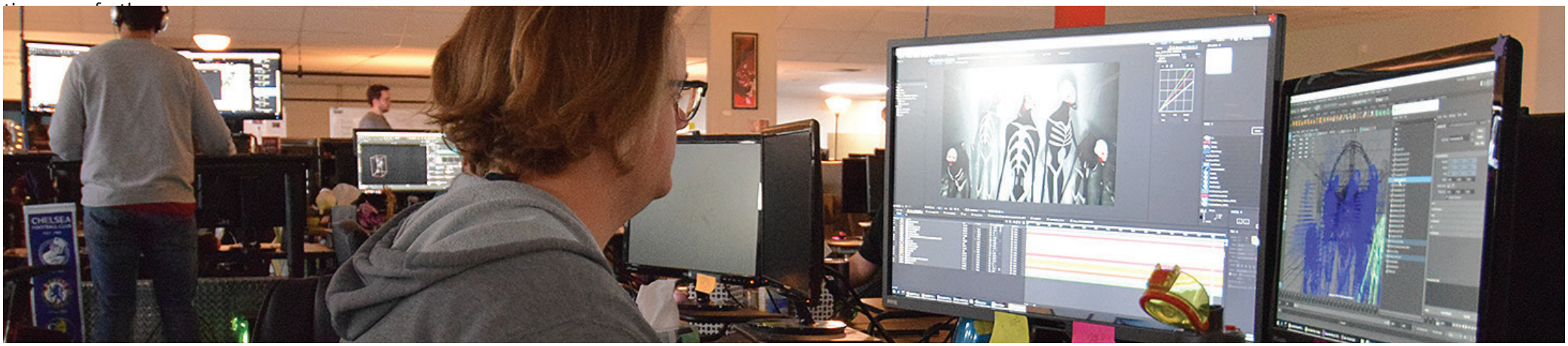
"The fact that the next-gen CPU is twice as dense while still using the same socket meant that we could immediately take advantage of the performance improvements after dropping it into our current hardware," said Turman.

"It [Ryzen Threadripper] was just tearing through those renders. Initially, the artists couldn't believe the renders were good because they were so fast. But when they checked the frames and saw they were all there, they were simply stunned"

Eric J. Turman, Supervising Technical Director, Rooster Teeth

He gave an example of how the AMD Ryzen™ Threadripper™ CPUs have improved Rooster Teeth's rendering and pipeline processing times: The team recently rendered out a 2,400-frame shot using one AMD Ryzen™ Threadripper™ CPU—within less than an hour. With game-changing performance gains, he's extremely happy with the new processors. "It puts the magic back in the computing," he explained. "And that allows our artists to be more creative.

"It was a night-and-day change for the artists," said Shane Davis, VFX/Post Producer for Rooster Teeth Animation. "Before, the time it took to render caused a lot of frustration. Once we were able to push that process to the AMD Ryzen™ Threadrippers™ CPU, it increased throughput and greatly improved morale. Now artists can iterate more, experiment further and quickly get feedback on their work. It's just all positives when you're using AMD technology."



ABOUT ROOSTER TEETH

Rooster Teeth is a pioneering media and entertainment company responsible for some of the biggest online series in history, such as the award-winning and longest-running web series, Red vs. Blue. They also produce the globally acclaimed animated series RWBY, the first western anime series to be distributed in Japan; the award-winning Rooster Teeth Podcast; and Immersion, a reality format that brings video game theory to the real world. Rooster Teeth has a massive global footprint of more than 45 million subscribers to its YouTube Network, 5 million unique monthly visitors to its RoosterTeeth.com hub and 3 million registered community members. The company was founded in 2003, and is a subsidiary of Otter Media, a WarnerMedia company. Discover more at RoosterTeeth.com.

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AMD RYZEN™ THREADRIPPER™ DESKTOP PROCESSORS

MODEL	GRAPHICS MODEL	# OF CPU CORES	# OF THREADS	MAX. BOOST CLOCK	BASE CLOCK	THERMAL SOLUTION (PIB)	DEFAULT TDP
AMD Ryzen™ Threadripper™ 3990X	Discrete Graphics Card Required	64	64	Up to 4.3GHz	2.9GHz	Cooler Not Included, Liquid Cooling Recommended	280W
AMD Ryzen™ Threadripper™ 3970X	Discrete Graphics Card Required	32	32	Up to 4.5GHz	3.7GHz	Not included	280W
AMD Ryzen™ Threadripper™ 3960X	Discrete Graphics Card Required	24	24	Up to 4.5GHz	3.8GHz	Not included	280W

AMD RYZEN™ THREADRIPPER™ PRO DESKTOP PROCESSORS

AMD Ryzen™ Threadripper™ PRO 3995WX	Discrete Graphics Card Required	64	128	Up to 4.2GHz	2.7GHz	Not included	280W
AMD Ryzen™ Threadripper™ PRO 3975WX	Discrete Graphics Card Required	32	64	Up to 4.2GHz	3.5GHz	Not included	280W
AMD Ryzen™ Threadripper™ PRO 3955WX	Discrete Graphics Card Required	16	32	Up to 4.3GHz	3.9GHz	Not included	280W
AMD Ryzen™ Threadripper™ PRO 3945WX	Discrete Graphics Card Required	12	24	Up to 4.3GHz	4.0GHz	Not included	280W

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