

Vue in Spartacus: "Vengeance" & "War of the Damned"



Production of Spartacus posed unprecedented challenges; indeed, the logistics of successfully tracking and producing thousands of shots in less than twelve months were quite an achievement. In this spotlight we will see how Vue was an essential component of the solution.

We had the privilege of discussing the production of Spartacus with the show's VFX Art Director Peter Baustaedter, and Jean-Baptiste Verdier, the team's VFX Matte Painter.

Production Background

Over the 39-episode, four-season series of Spartacus 13,255 VFX shots were created. In the final season there were 4,350 VFX shots, and the epic 53-minute series finale featured 935 VFX shots.

The TV series follows the story of Spartacus, a Thracian gladiator, who was one of the slave leaders in the Third Servile War, a major slave uprising against the Roman Republic.

While the visual effects shots were by far not as complex as in the average summer tent pole movie, their number was unprecedented. The logistics of tracking and producing thousands of shots in less than twelve months were quite a challenge.

Where, in a feature production there is ample time for R&D, the Spartacus VFX team was thrown into the project head first. Since time was so limited, picking the correct methodology was of the essence. Even a seemingly insignificant wrong choice had the potential to snowball into a major headache through the course of a season.

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Watch the full Vue in Spartacus making-of

Missions Given and Workflow

The main tasks of the VFX art department were the following: creating concepts for environments and effects, creating environment assets like matte paintings or 2.5D, 360 degree layered environments. Another important part was to come up with look development key art for all VFX sequences of an episode.

Additionally, the VFX art director was involved in color grading and look continuity of the VFX shots. Peter also accompanied the VFX supervisor to different vendors for shot reviews and was the artistic liaison to other departments of the production.

Next to shooting VFX reference photographs on set he was also responsible for gathering environment reference - one of the few cases where a camera actually ventured outside the studio.

During the entire production of Seasons 2 and 3, Vue was used in many capacities - from creating quick concepts and lighting studies to fully fledged 360 degree, multi-layered environments. Vue's great looking synthetic water was also used for one or the other shot.

Season 2 "Vengeance"

Peter Baustaedter: In pre-production, I used Vue to quickly design environment concepts to be presented to the production designer and executive producer.

For example, I imported geo from the art department so I had their set design as a base. I then quickly whipped up a landscape, vegetation and a nice atmosphere to give the concept an appropriate dimension. The render is refined and nudged into the final direction by a few Photoshop manipulations.

These two images are early concepts for a forest featured in episode 3 and 4.



This is one of the earliest concepts that were created in Vue to get a first impression of a proposed environment design.



Here we see a later concept of the forest, closer to what we see in episodes 3 and 4 of season 2.

For the forest, the production designer wanted a very stylized look. That's why you can't see any real branches in the second image - which was one of his requirements. Vue was a great tool for me to quickly realize different ideas for environments with realistic lighting. This quick turnaround allowed me to run through many iterations.

The other example is an early version of "The Road" environment from the beginning of episode 1. This was the first time that the show ventured "outside" and left the walled in sets of the Ludus and the city of Capua behind.

We quickly needed to come up with a design for a 360 environment that fit the set and worked in all directions. The background was to be mostly sky with some mountains in one direction, so the audience had an easier time knowing where they were looking. The production designer wanted to pursue a very stylized, simplified look.

I rendered out a spherical image, mapped it onto a sphere and created a quicktime with a 360 degree camera move. Very simple, but during the design meetings I could just point the animation in the right direction to illustrate our discussions.



Road spherical 21mm



Season 2 Episode 1 - Road Sequence

In general, Season 2 was a challenge for the newly assembled team, since there were several legacy issues that carried over from the previous seasons.

Because of the pace, there were no real opportunities to change a lot of approaches from scratch. 'Field modifications' during the production took care of the most pressing issues to satisfy the new demands of season 2.

For this reason "Vengeance" mostly employs matte paintings - but some of them are severely oversized, projected and extensively layered to accommodate multiple shots and views in a scene.

Jean-Baptiste Verdier: At the beginning, I was mainly doing look development, using assets and other approved elements in order to define the style of the shots. Pretty soon I was assigned my first matte painting which was an establishing shot of the Ludus at night, occupied by Roman soldiers.



Vue render / Matte painting.

The geometry of the Ludus and the terrain was provided by the art department, but there were no 3d tents available, so we decided to create them using simple geometry and cloth simulation.

The animation of the wind on the cloths allowed us to generate variations in the models.

The scene was set up externally and then imported to Vue for rendering. It was really easy to get the mood of the scene in Vue just by playing with light, atmosphere and materials from the collections.

Once the render was approved, I started the painting using the lighting established in Vue as a guide. The final matte painting is the result of the combination of many textures and photographs merged with the initial render.

During the painting work, it was important to keep the different elements layered, so that we had flexibility if the supervisor decided to create a post camera move or to insert any other elements.

In terms of productivity, it's really important to always think 3d when you create a matte painting, even if the final shot is supposed to be static because you never know if someone is going to change their mind. The different layers and passes were also necessary for the compositor to integrate live elements in the shot like torches, soldiers and horses.



Ludus - Final shot

The next shot I would like to talk about is part of the opening sequence of the last episode of the season 2. Spartacus and his friends have escaped from the temple to the top of Vesuvius and Roman troops have established their camp at the bottom of the volcano, blocking the only existing exit. Spartacus is trying to find a way to escape again and climbs halfway down the volcano to observe the Roman camp.

The point of view for this sequence is located quite high, looking down. It was important for this view that everything was very recognizable, the camp, the temple, the forest and the catapults since they are locations where action is going to happen later in the episode.



Opening sequence of the final episode of season 2

We did a basic track of the shot. Then we created a camera covering the visible area and we started to import the various basic elements of the environment provided by the art department. As most of those elements were low poly, we spent some time to improve the geometry of some of the objects.

Then, once the scene was correctly established, we exported everything to Vue, the geometry and the cameras.

I started working on the lighting and atmosphere first to match the lighting and mood of the plate. Our executive producer wanted to see the whole landscape up to the horizon, there was no way to hide things in the darkness or in haze. Even during a night shot, important elements must be visible and easy to spot for the audience to get story points across. What good is a nice matte painting if it doesn't serve the plot?



Vue render



Matte painting

The second task in this scene was to create the forest where the Romans had established their camp.

The camp had to keep this very strict shape and organisation but it also had to show some variations due to the topology of the natural environment. The ecosystem painter in Vue was a great help for that and the perfect tool for this task. It was easy to paint a lot of trees with variations and shape the camp grounds to exactly meet the requirements of this scene.

Once the forest was completed, I created all the lights in the camp, small camp fires and torches, using Vue point lights.

They worked great even if I would have loved more settings to tweak them individually.

The re-lighting feature in the version of Vue that we used was very helpful, I was able to export several versions of the render with various colors and intensities for the lights. Then it became very easy in Photoshop to superimpose the renders as layers and create diversity by hiding or revealing parts of each render.



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Final matte painting

I applied simple procedural materials from the Vue library to the rest of the geo because I knew that I was going to be covering those areas with photographic material.

We know that Vue can do a great job using procedural materials, but in this case we didn't have the time to experiment and to render more detailed and time-intensive images. That's where matte painting comes in.



The matte painting in Photoshop was the last part of the process for this sequence. Vue provided us the base of the environment and then photographs were mainly used to cover the CG aspect of the render. The photos were taken by our VFX Art Director Peter Baustaedter who went on an helicopter trip in several locations in New Zealand so that we could build a complete photo library for the season.

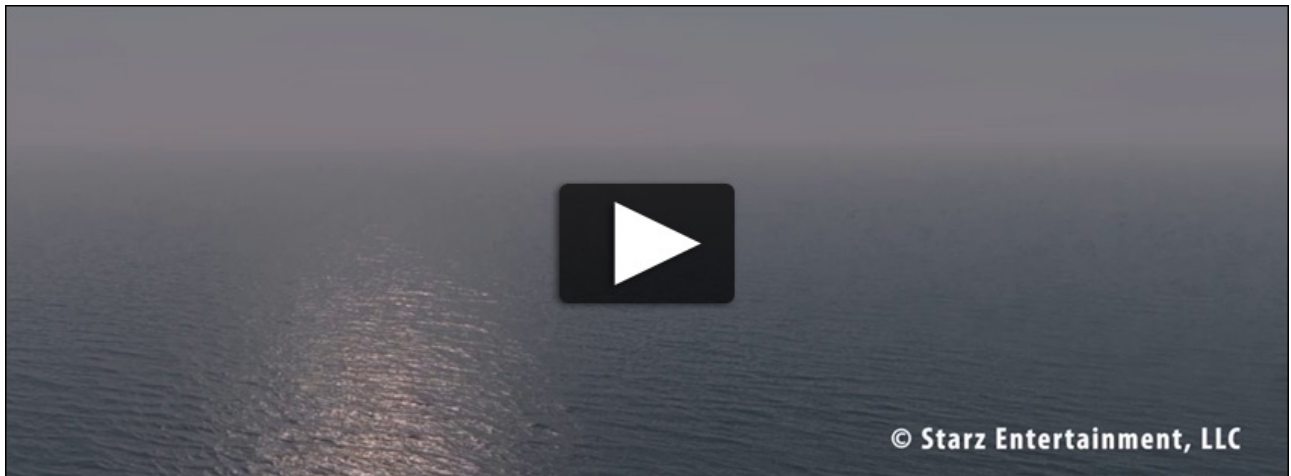
Season 3 "War of the Damned"

The VFX team started working on the final season of Spartacus: War of the Damned in February 2012 and the production allowed 5 weeks of pre-production to prepare the improved VFX workflow to create our now even more challenging environments.

Since we had to deliver our assets to different vendors, that had different internal pipelines, we also needed to come up with a standardized way of delivering our setups. The issue to be careful about was to keep our environments flexible enough, without overcomplicating things.



Pre-production research in Vue to get convincing rock shaders for the Sinuessa harbour and coastal environment



Pre-production research in Vue to get a convincing ocean/water shader and animation for the Sinuessa harbour and coastal environment



Water shader rendered in Vue

Pre-production time was also used to start working on key environments from the early episodes of the season. This was important not only to get an early start, but also to troubleshoot our proposed technical solutions.

Vue was used a lot during this period to find the appropriate look for rocks, cliffs, trees, terrains, light and atmosphere. We created a lot of scenes and presets to use during the VFX production later in the season. This also helped getting a unified look.



Pre-production research in Vue to get the 'Spartacus' pine tree that we would use in our environments for the season

Peter Baustaedter: Being essentially the same crew as season 2, we could build on all of our experiences of the previous season and learn from our mistakes. We also had time to integrate some new solutions in order to tackle the new challenges posed to us.

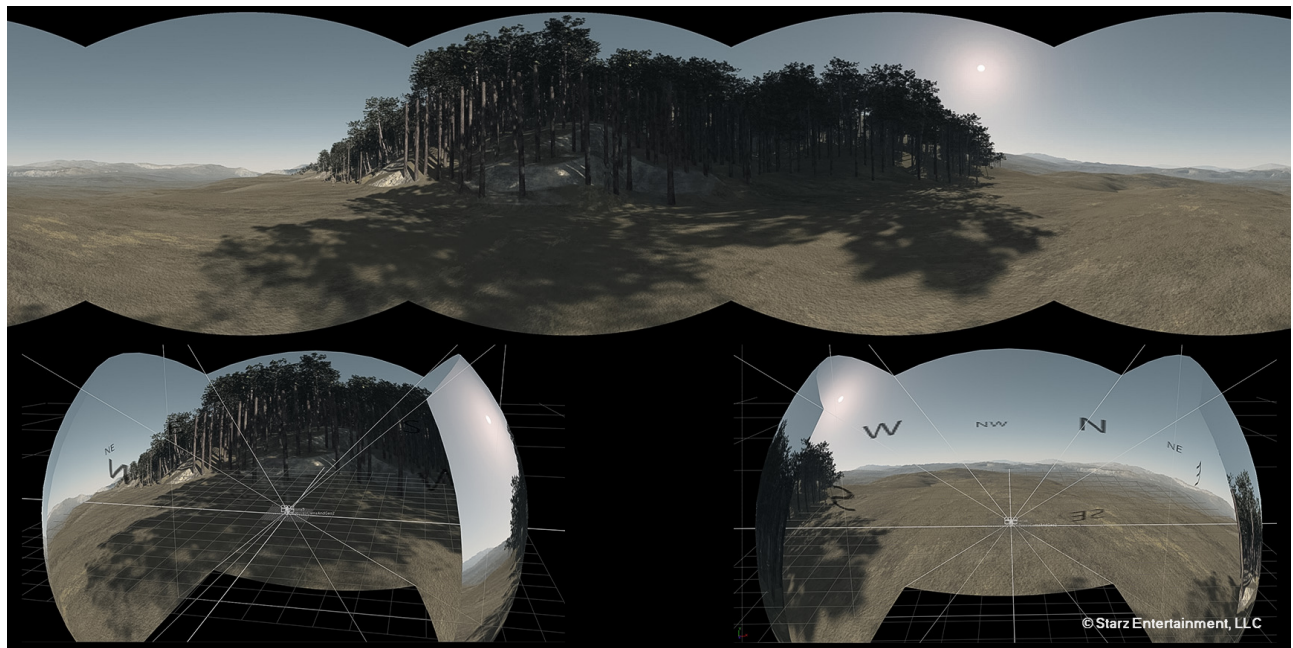
Season 3 had many more locations and much more demanding setups than season 2. We had to create the city of Sinuessa, its harbour, villages, camps, amphitheatres, snowed in mountain passes and a giant battlefield amongst many other environments.

We created a simple but effective pipeline that would help us tackle all of these tasks. It allowed us a standardized environment delivery to all the different vendors and to distribute a change in assets quickly and without too many headaches.

We would model our environment geometry around the converted CAD files we got from the set designers. This geo would go into Vue and the artist created the lighting, the atmosphere and additional details like vegetation.

We then rendered this through a cubic camera setup and passed the geo, render and cameras on to Nuke. There we would render out a layered, spherical image. Onto Photoshop afterwards to do our painting.

Once the painting was done, the image would go back to Nuke, be converted back into our cubic maps and being projected onto either layered spheres, or if necessary, onto simplified geometry.



This image shows a 4 pack cameras render from Vue, converted into a latlong and projected onto a sphere in Nuke

After the environment asset was created, the setup was cleaned up and packaged for delivery to our vendors who created the final VFX shots with our assets.

By sticking with this method for our 180, 270 and 360 environments and never abandoning this approach mid stream, we could always go back into our setups and quickly react to changes. One time it was necessary to lower our environment origin by a 150 meters - we could easily re-project the existing painting onto the geometry. After a bit of touch-up the new environment with a changed POV was ready to go.

Jean-Baptiste Verdier: The first example is the establishing shot of Sinuessa. Sinuessa is a fortified city that Spartacus will take to protect and rest his people.

We have created several variations of the same environment, night, dawn, including extension for some other sequences to serve.



Original Sinuessa establishing shot

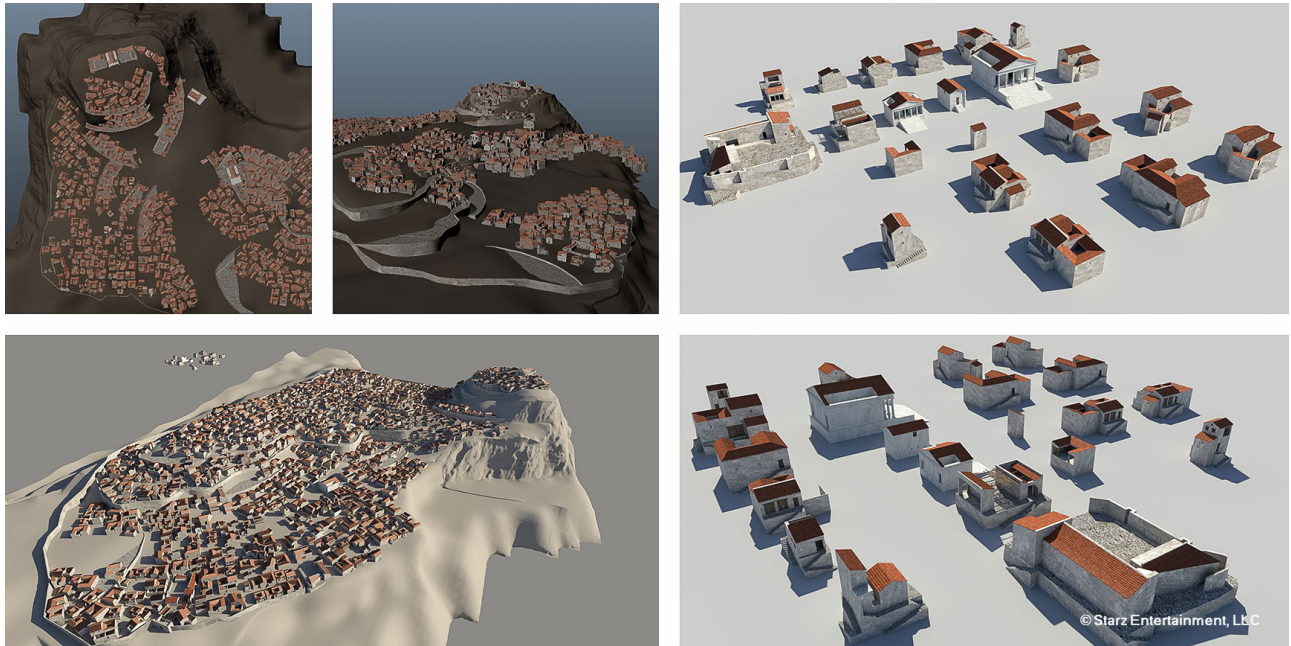
For this environment, we received concepts and low poly geometry from the art department. It included rough topography for the surroundings of Sinuessa and buildings from the city.

Those models were initially created in Sketchup as plans for building the set and were much too detailed for us.

My first assignment was to increase the level of detail of the terrain itself, to create clean, low poly versions of the buildings and to create the UVs and apply textures. Simple building models were really important, since they would be duplicated hundreds of times to create the city.

To populate the entire city and to follow the terrain, I created a library of blocks containing buildings with different positions and orientation. Then I dropped all the blocks on the terrain and I fixed the holes manually by adding terraces, walls and other accessories.

Here you can see how I built the city of Sinuessa and the library of buildings that I have prepared for it:



Sinuessa terrain and Sinuessa city in construction

We quickly needed a first version of the shot for the Comic-Con trailer of the final season:

Spartacus | War of the Damned Trailer | STARZ



Spartacus: War of the Damned Trailer

This shot would eventually be improved for the integration in the final episode.

For the Comic-Con version, the production allowed me a very short time of painting once the base render was finished. The idea was to get a good render to start with.

The scene was also built with sculpted elements from Sculptris. Once the camera position was established by the director of the episode, it was then synchronised in Vue thanks to the Vue Synchro plugin. The light, the atmosphere, the vegetation were added in Vue which is a great tool when you have to create the right atmosphere and the right mood requested by the art director.

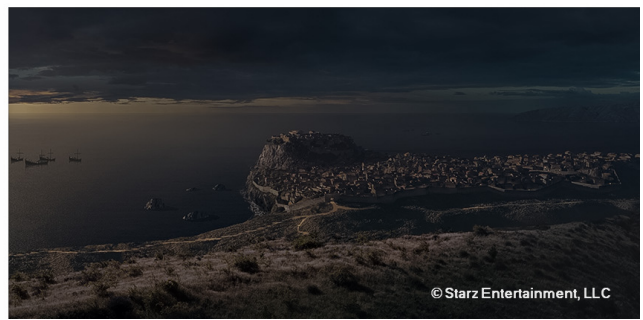
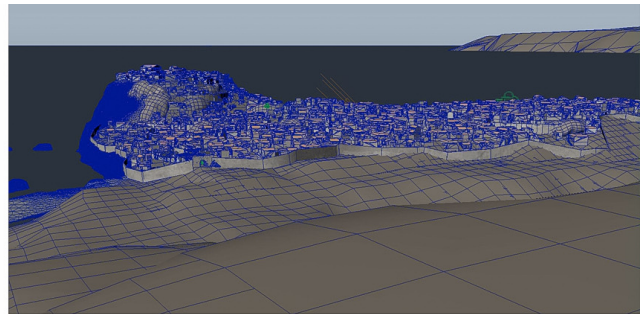
The rest of the work is completed in Photoshop, removing the CG aspect and then adding some natural details like irregularities, paths, light breaks and highlights.

Eventually, the matte painting is separated in several layers and passed to the compositor so that he can re-project it onto the geometry to add a camera move and to animate the sky and add some additional sweeteners like ocean waves, foreground vegetation plate elements and birds.

For some later episodes, improvements and variations of this painting have been done by John Walters. He did an amazing job with the buildings of Sinuessa. They are shown below.



a. Vue render - b. Matte painting Day version



c. Matte painting Night version - d. 3D geometry, ready to export into Vue - e. Matte painting Dawn version with extension on the left side



Compilation of the variations of the Sinuessa establishing shot

The next shot introduces the harbor of Sinuessa in episode 4. Sinuessa city and its harbor were two critical environments for the story. It required a lot of time in preproduction and in production to create all the 3D assets and to create the different setups, required by the different sequences that happen in the harbor.

Episode 4 didn't need a complete 360 yet so we focused on the visible area of the harbor. This allowed us to test our setup, before we went into a full 360 degree environment in episode 5.

The shot shows the camera tracking by the boat and ending up on the quay, finding two main characters.



This shot shows the integration of a specific matte-painting of the Sinuessa Harbor cliff face. The initial render was done in Vue and then painted to match the set.

Berrin Moody, our Nuke compositing artist did a great job tracking the camera, which was a bit tricky. The resulting 3D track gave us the initial position of the camera. From there, we synchronized the camera in Vue. The projection camera had a wide field of view in order to cover the whole shot during the camera move.

We rendered this first frame in Vue as a base for the matte painting. A lot of time was saved thanks to the initial work done in pre-production, sculpted details on the rock cliff and most of the Vue materials were already created. Some tweaks were needed to match the lighting of the shot.

We then painted textures and integrated photographs from set in the Vue render.

The matte painting was finally projected in Nuke onto a simplified geometry of the scene. You can see the result below.

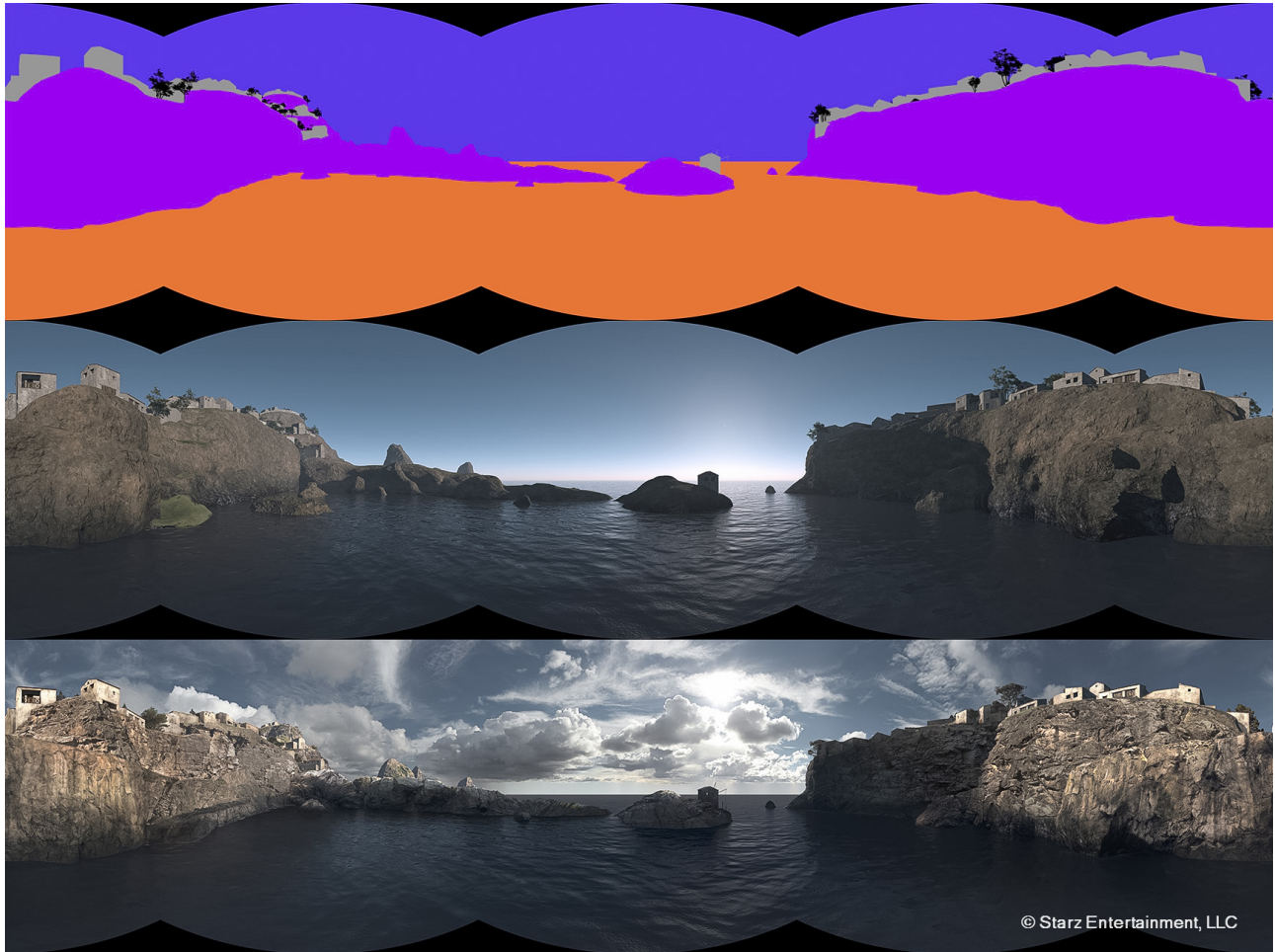


The original plate was tracked and then composited with the matte painting in the background by Berrin Moody

Episode 5 revealed the complete harbor at different time of the day and needed to have 360 degrees of coverage. We again used the cubic "sixpack" method described above by Peter.

We had to position our camera sixpack in the 3D environment to match the location on set, where the photographic reference was shot from.

We synchronised everything in Vue and rendered the scene as a base for the environment. Below, you can see the Vue render and then the final matte painting.



This image shows the 360° Vue render converted as a latlong image and below is the final matte painting ready to be projected onto concentric spheres in Nuke

Those 360 environments were projected onto spheres in Nuke. This required good preparation during the creation of the matte paintings. Using Vue was also very helpful getting different render passes via the 'multi pass' option. Quite often we had to do a day and a night version of the same background. The schedule was so tight that we couldn't afford to re-render a night version, so all the different passes made a "day for night" post treatment much quicker and easier.

Many of Vue's other render features were helpful too, one for instance was the fact that you can turn off light, atmosphere, shadows, etc. on each material of each object of the scene. This allowed us to render flat shaded environments to make easy selections in the painting process and also helped us to accurately separate the elements which were going to be projected onto different geometry from the beginning.



Sequence showing the 360° Sinuessa harbour in the background

The Difference Between Feature Film and TV VFX

Peter Baustaedter: First of all I think one major distinction has to be made between Spartacus and other VFX heavy TV shows like "Game of Thrones". It is the enormous shot count! We did 10 episodes in a year and none of our episodes had a shot count under 350 shots. Episode 7 had over 700 shots and episode 10 over 900. It's my understanding that other shows have an average shot count of 150-300 shots per episode.

When looking at those numbers, at our not bottomless budget and the schedule, you realize that compromises had to be made every step of the way. I think our team did an excellent job of keeping the visual quality as high as possible given these circumstances.

We had to simplify everything. I kept reminding myself that the biggest trap to fall into was "wishful thinking" - meaning not to be realistic about our limitations and heading towards grand solutions that would get us into big trouble because they were either unreliable or took too much time to finish.

As general rule we would go for the most simple solution first, leaving a path open to 'escalate' to a more complex approach should circumstances require and the schedule allow it.

Certain shots, like establishing shots or key events would then be pushed even further to be "money shots".

We approached all of our challenges that way. I have to say we never really got into trouble. Of course there were a couple of ugly shots here and there, a couple of close calls, but we always delivered and kept to a minimum standard which we never really broke.



Vue render



Final matte-painting

VFX producer, Romola Lang and our VFX supervisor, Charlie McClellan, always understood investing in something that gave us great visual bang for the buck. Like buying a Vue license. Or shooting photographic reference. We did elaborate shoots for both seasons. Especially season 3 where we shot over ten thousand photos of environment reference.

Not only did the reference help us in creating all the landscape. Since it was all shot the same way, it gave us a visual continuity that would have been hard to achieve with 'borrowed' reference.

The last, most important factor is that we were blessed with a great team. At the peak of production our visual effects art department consisted of 8 talented artists, which had their head in the game and great enthusiasm. A great combination.

We had a few long nights here and there but nothing like your typical three month long crunch time on your average tent-pole feature movie. That was thanks to our VFX producer and VFX supervisor. Rom and Charlie always planned as far ahead as possible and had a lot of contingency plans at the ready.

At this point it's also necessary to mention our great production coordinators. With so many assets to keep track of, going to so many different vendors all under a fast forward schedule, they did an awesome job keeping everything on track. It would have been impossible without them.



This matte-painting was created to show the city of Rome viewed from the field of Mars where Crassus army is prepared to fight the rebellion of Roman slaves under the leadership of Spartacus. On the left, the Vue render and on the right, the final matte painting



Final shot of the field of Mars

General Successes, Personal Satisfaction

Peter Baustaedter: I joined Spartacus when it was already a well-established, successful series. The two previous seasons had each a different VFX art director. I inherited somewhat of a mix of visual styles, a jumble of assets and solutions their different approaches had left behind. In the VFX art department, no real 3D was used in design and asset creation.

I think I did pretty well in introducing Vue - version 9 by the way, Nuke and other software, to establish a pipeline that did not only yield good results, but was both flexible and efficient. Approved concepts could quickly be turned into final assets and a standardized workflow minimized mistakes.

I also introduced a color pipeline. Previously, the vendors themselves graded the raw plates, which, quite often, led to unpredictable results. At the end we shipped pre-graded plates to the vendors, which made life a lot easier for us and them.

Overall my personal satisfaction is to have gone through both seasons without any major hiccups and with my boss, VFX supervisor Charlie McClellan and the executive producer Rob Tapert being happy with the results my team delivered.

Speaking of team, I consider myself very lucky to have been able to work with such a professional and talented team. That is actually the real secret behind those two successful seasons.

Jean-Baptiste Verdier: I arrived in the middle of the production of Spartacus: Vengeance and I started working on episode 5 which was one of the tentpole episodes of that season because of the burning arena sequences.

At the end of season 2 I signed up again for another season because I thought that it was a very cool project and we had a great team of people.

I'm very pleased with the entire series of shots that we have provided for the 2 last seasons of Spartacus. The quality was always increasing as our processes and workflow were improved from episode to episode. We were a fairly small team but this allowed us to use all our skills to achieve the final result. There was a big part of the work time for discussion and creativity but we were also very flexible and on the ball when the production needed something very quickly.

Failures, Regrets

Peter Baustaedter: Thinking about the technical challenges as it pertains to Vue, one thing to mention is the, naturally occurring, long render times. It is really important to choose the right quality levels, lighting model, filtering and resolution. Even more important is, to know how far to push Vue and when to move things over into photoshop. If not careful, one can get caught tweaking things for days while the deadlines just woosh by.

When kicking off multi pass renders, one should make sure, only to activate the channels one really needs. Being frugal is important - otherwise you end up with your render 23% done in the morning and finding that it hasn't even reached the "hard part" yet. Not everything needs to be in radiosity.

The other issue we had to tackle was the challenge of getting geo and cameras into and out of Vue. I wish we could have had Vue 2014 already back then, because with an FBX import and export capability, life all of a sudden becomes a lot easier.

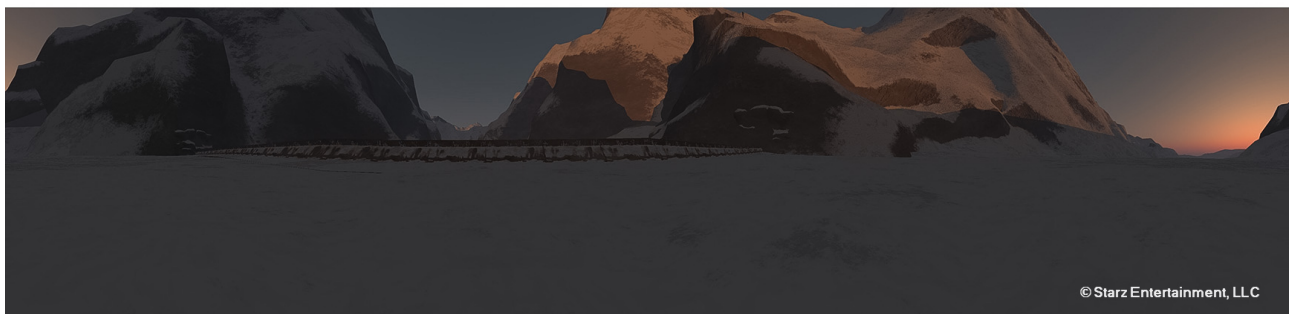
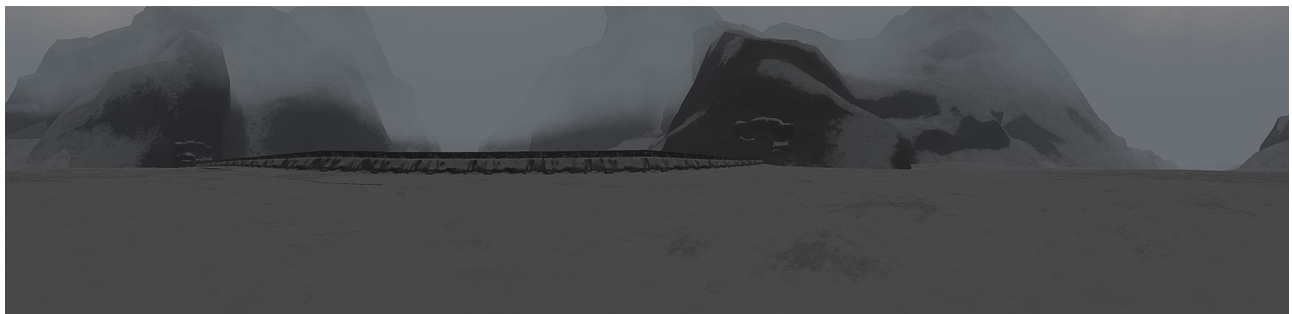
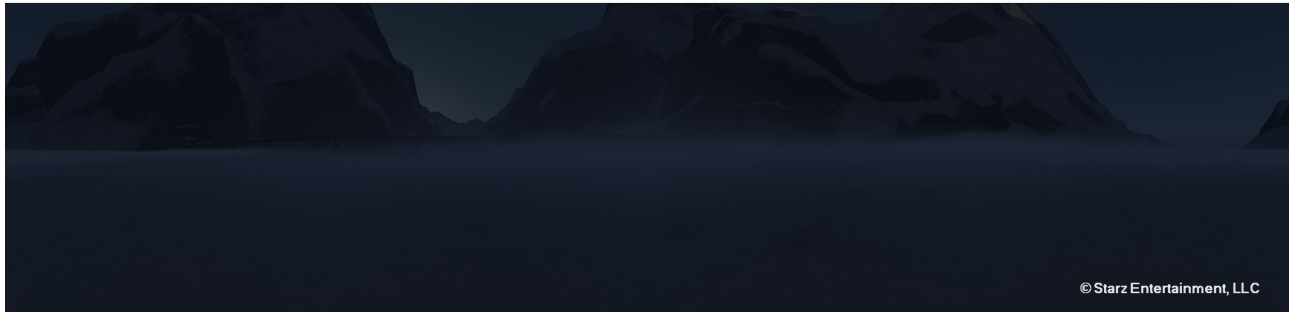
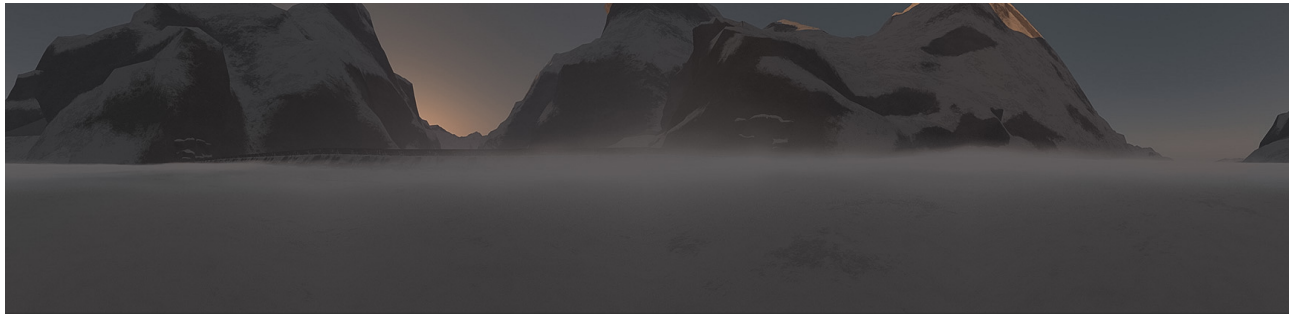
The reason for that is: For a lot of professional environment artists, whether they are freelance or work at big, renowned VFX facilities, Vue is a part of their pipeline. A very important part that enables them to create things that other packages can't, but it is never being used as a standalone 'do it all' package.

To integrate Vue in a full workflow, or collaborate with other companies or artists, Vue needs to be as open and as scalable as it can be. So, looking at it from the point of view of an environment artist working in a large production, FBX import / export is a huge step and gets me as excited as the latest additions to it's creative functionality.

Generating EXR files is a great step forward too, a feature which would have been invaluable to have had on Spartacus.

Looking back, I have to say that in general I do not have any real regrets. We tried to tackle things as well as we could. There might be some moments where I wish we I could have gone back and decided differently. But, I think we always tried to make the best decisions by looking at everything we knew at that time.

I'm still surprised how well things went, not only visually, but how we worked together, how good the communication was, the cohesivity of the team and how much everyone learned and grew during that time. I consider myself lucky I got to be a part of a project like this and to have the opportunity to learn so much and hopefully grow myself.



This series of 360° renders show how it was easy and quick to setup several ambiances of the same environment in Vue. This was very useful to get the approval of the art director and the VFX supervisor during our daily meetings

Conclusion - What's Coming Next

Those two seasons on the production Spartacus were a crazy, challenging satisfying ride. We all took a bit of a break to recover, only to find when returning that film production in New Zealand, outside of Peter Jackson's productions, had pretty much seized. A combination of a high NZ dollar and a lack of attractive rebates and incentives, have left us in the dust of the international productions moving to other places.

As alarming as this sounds, this is the nature of contemporary VFX business. Some members of the VFX art team have moved abroad to follow big productions, some have left the business, and some successfully freelance from home for domestic and international clients.

Hopefully circumstances will change, so Spartacus veterans can come together once more, to tackle the next insane visual effects challenge posed to them.



Studio and Team Background

Pacific Renaissance Spartacus Ltd and Starz Entertainment LLC crew had built an impressively successful series of "Spartacus: Blood and Sand" and "Spartacus: Gods of the Arena", but wanted to raise the bar of the VFX for the next series "Spartacus: Vengeance" and "Spartacus: War of the Damned".



Executive produced by industry veteran Rob Tapert (Hercules, Xena, Evil Dead, 30 Days of Night) and produced by Chloe Smith, Spartacus was shot entirely on green screen stages in Auckland, New Zealand.

Rick Jacobson was the producing director on the final season. He also directed several episodes in the series, including the final one.

Charlie McClellan led the the visual effects effort as supervisor on all seasons. Charlie is an experienced VFX supervisor and has worked on projects including The Frighteners, Lord of the Rings, 30 Days of Night and Under the Mountain.

The VFX Art Director, Peter Baustaedter, came on board at the beginning of season 2 - "Vengeance".

Peter started his career in visual effects in 1995 at Digital Domain in Venice, California, working on the movie Apollo 13.

Ever since then Peter has been involved in high end projects like Titanic, Final Fantasy – The Spirits Within, LOTR – The Two Towers, Kong, Avatar and many more.

Before he joined Spartacus as a VFX Art director, Peter spent several years at Weta Digital as a senior matte painter. Peter received a VES award in 2009 for his work on James Cameron's Avatar.

Vue has been part of Peters tool set as far back as 2006 and has, over the years, become an integral part of his workflow.

The VFX Matte Painter, Jean-Baptiste Verdier, graduated in computer science, started his career as a multimedia engineer at e-on software, working on various projects related to software and websites.

His passion for visual effects growing and especially environments, he became a matte painter and worked on the movie Upside Down at La Maison VFX in Paris before joining the VFX team in the middle of season 2 - "Vengeance".

His technical background helps him to solve production problems and gives him a pragmatic approach to create 3D matte paintings / environments. Vue has always been one of his key software since he started in the VFX industry.

Nevertheless, all his technical prowess is equally matched by his artistic sensibilities and instinct for natural lighting.

Links

Bowshot studios: www.bowshotstudio.com

Peter Baustaedter's personal website: www.baustaedter.com

Jean- Baptiste Verdier's personal website: www.lejbs.com

Spartacus official page: www.starz.com/originals/spartacus

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