

Piers Jackson is the Game Director at Frontier Developments. He's also a trained biochemist. Together with Principle Server Developer, Ian Pettitt, who has 15 years' experience as a full stack developer, Piers has helped to create a sim management game that allows users to fully immerse themselves in the world of zoo ownership.

Management sims form a big part of Frontier's DNA. Through the BAFTA-nominated *Elite Dangerous* and *Planet Coaster* games, Frontier has built a reputation for incredible attention to detail, ambitious gameplay, and immersive sandbox environments. Its newest title, *Planet Zoo*, is no exception.

With *Planet Zoo*, Frontier has taken its sim management expertise to the next level in a game that's highly technical and incredibly detailed. Its rich realism and technical capabilities provide online players with near real-time insights and a fully-developed online trading economy. Simply put, Frontier has created an authentic simulation world that leaves every other zoo sim coughing in its 3D dust.





Piers: “We needed to make this game”

We’ve always been involved in management sims, especially the scientific ones—these are part of our company’s DNA and we cherish them. We wanted to expand on the Planet franchise by building a world-class management sim that let us test our limits. When you combine this passion for sims and gaming, alongside the fact that it’s been a really long time since a good zoo sim game was released, you can see why we needed to make Planet Zoo.

Technology has come such a long way since we developed the Zoo Tycoon games, so we wanted to create something that would really push the boundaries—a game where people could build anything from a small zoo to something utterly amazing.

Piers: “The animals are the stars”

We created three core developmental pillars for the game. The first pillar is the animals. They are the stars, so everything has to revolve around them. Every aspect is detailed, realistic, and based on extensive research, from what each animal looks like, to exactly what they need in order to thrive. We wanted a big animal list, which was a challenge as it meant our team had to make an awful lot of characters. They couldn’t just make one elephant, they had to make male and female elephants, plus juveniles, and every age in between. I don’t think we’ve ever done anything as animation-heavy as Planet Zoo. It was a massive undertaking, and we had to develop tools throughout the course of the game’s development to give the animators the best possible environments in which to create what you see in the game today.

Piers: “The chimpanzee doesn’t want to get wet”

In the past, sims would have been 2D. With the technology that’s available today, we’ve been able to build a 3D, fully immersive experience where the animals exhibit plausible behaviors and do things that real animals would do. If that chimp doesn’t want to get wet, it’s going to go and find shelter. That behavior would have been difficult to create in the past.

Piers: “Our management pillar adds depth”

The second pillar is the zoo staff—this is our management pillar that adds depth and makes the game more than just a sim about animals. The zoo runs because of the staff, and players have to set them up, control them and keep them happy.

The third pillar is the guests. We needed advanced AI technology that would dictate how the guests respond to the habitats the players build.



PRO GAME TIP...

Beta reviewers lost some of their animals before they realized exactly how complex it is to raise animals in a zoo. Players are rewarded for researching the food, habitat, lifestyle, and foliage that will keep each animal happy and healthy.

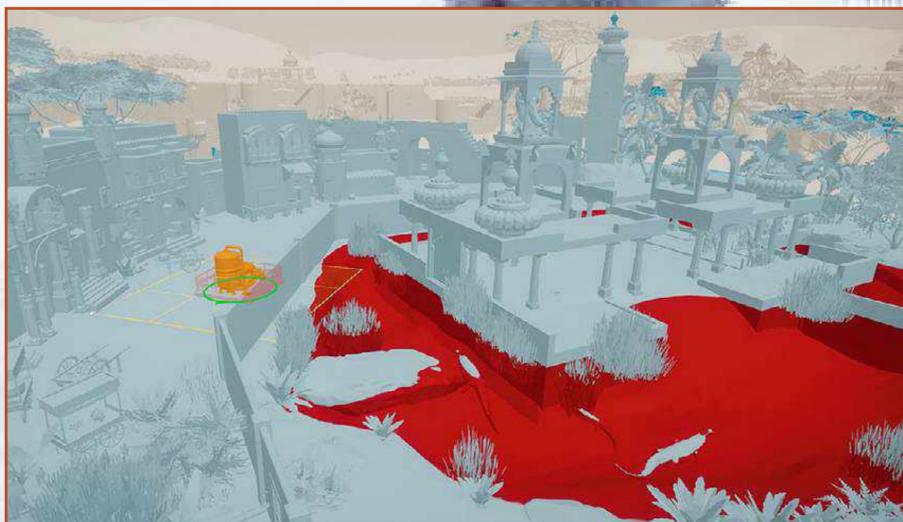
Piers: “We want players to care about the animals”

Once we’d agreed this was the game we were going to make, we tested our ideas, ran the sims and the numbers, and developed some of the technology. The fur technology has allowed our artists to put realistic fur on the animals—fur that responds to rain and movement. The eyes are incredibly realistic and the attention to detail still blows me away. We spent a lot of time working on the eyes, the feathers, the fur, and the skin.

When people look at the animals, we want them to say: “That is a living, breathing animal that I care about.”

Piers: “The animals can cope with whatever players throw at them”

The navigation system is perhaps our most impressive technology feature. We’ve built this 3D terrain players can manipulate into any shape or form, but the animals still have to be able to navigate it. And they can! This is cutting-edge. Animals can swim, get out of the water onto land, climb trees, and navigate all the other things players have put in play. Our navigation system can update dynamically, so the animals can cope with whatever players throw at them. It took a lot of prototyping, blood, sweat, and tears. But it’s there.





Piers: “There’s a lot of foliage on Earth”

We invested a lot of time into our foliage to ensure players could build the right biomes for their animals. There’s a lot of foliage on our planet, so it was a huge undertaking. We created viable weather systems that send down snow, and rain and wind, and sunshine—all these engage with the environments incredibly realistically. Snow settles; pools of water appear in the rain; and as the animals get wet their fur flattens and gets darker. The animals get up and move if they don’t feel like being cold or wet or hot. There are a lot of reactive graphics involved in selling the realism. We want players to believe they’re there, making a difference, living in this world.

Piers: “We engaged with people who work in zoos”

Our goal was to ensure the game emulated a real zoo in every possible way. Even though the game includes certain mechanics, such as advanced time speeds, we’ve upheld the rules of a living zoo. These rules are very specific. You need to get a zoo license, educate people about biodiversity, create habitats that are suitable for animals, ensure high animal care, avoid escapes, and manage captive animal breeding to release animals into the wild, among many other factors.

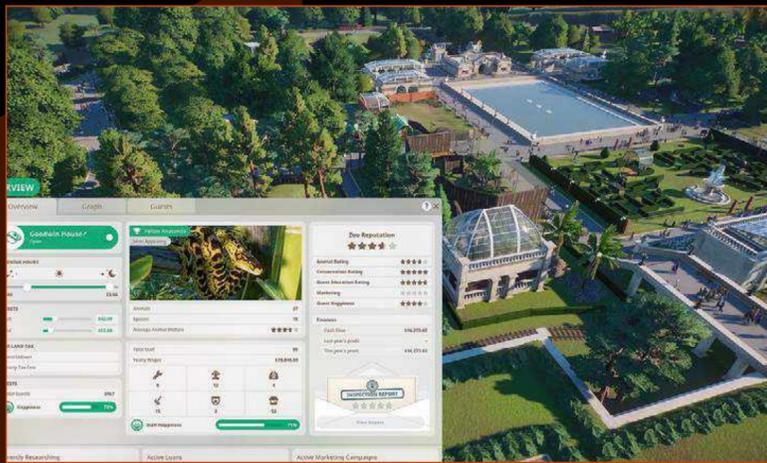
Authenticity has been key for us throughout the development of Planet Zoo. We’ve done all the research, engaged with the people who work in zoos, and tried to take onboard all the elements

that make up the running of a zoo. We’ve even built a Zoopedia that lists every animal and its husbandry—the depth is staggering, and it varies from animal to animal. So a lot of the management of the game is based on actual requirements for these animals in captivity.

Piers: “Thanks to our community, we added in a fourth game mode”

We learned so much from our Beta. We had a lot of positive, constructive feedback that led to us adding in a fourth game mode—an offline Challenge Mode.

Now we have Career Mode—a narrative campaign that runs across multiple zoos and challenges; Classic Sandbox Mode—where creative people build whatever they want and share their ideas with the online community; Franchise Mode—online gameplay that allows players to build multiple zoos and trade with other players online; and the new Classic Sandbox Mode—where players can participate in challenges, but where everything is purely offline within a fuller economy.



Piers: “Meeting fans’ expectations has been the biggest challenge”

Players have expectations about what they’re going to see and do in Planet Zoo, and we’ve had to fulfill these as best we can. That’s been the biggest challenge. Our character artists and animal and render specialists have pulled together something remarkable. But the thing I love most about this game is seeing what people do with it. We can create the environment and the simulation, and we can have ideas about what a zoo should look like and how you should play the game, but the joy is in watching people do something completely different.

Ian: “Someone built a huge dragon skeleton”

We saw some incredible player builds in our Beta. Habitats inside glass buildings that have these complex internal terrains and hidden staff and management areas. Someone built a huge dragon skeleton and put it into a habitat for the animals to live in. There are already so many videos of people’s creations!

Ian: “We’ve developed a flexible system that can cope with different events”

In the online franchise mode, we track all the animals from birth, through all life events, and allow for players to trade these animals. It involves a lot of data

storage in [Amazon Aurora](#) to keep track of the animals, the users, the zoos, the franchises, and the state of trading.

We’ve also introduced community challenges consisting of different in-game events where we encourage all online players to participate in exchange for rewards. This means we have to provide near real-time statistics for players and the community as a whole. We use [AWS Lambda](#) and [Amazon Athena](#) to take on telemetry data from events in the game, and then we use [AWS Glue](#) to crunch the numbers for percentiles and stats that we then return, via API, to the players. [AWS Glue](#) also analyzes the performance of the community and the individual contributions and rewards of the players in the game. Because the challenges differ every week, we’ve developed a flexible system that can cope with different events and rewards. We use the technology stack to track and reward people, and [Amazon Simple Storage Service \(Amazon S3\)](#) for storage.

Ian: “We have enough capacity to cope with a sudden influx of players”

Using the AWS cloud, we can scale to ensure we have enough capacity within minutes of an influx of players; we increase capacity through [Amazon Aurora](#) and [AWS Elastic Beanstalk](#) to cope with variable player numbers. We use autoscaler in [Amazon Aurora](#) to reduce the number of instances, dependent on players and time of day, to make costs

more manageable. We’ve implemented [Amazon S3](#) and [Amazon Athena](#) to ensure we’re not overloading the system and, with [Amazon Relational Database Service \(Amazon RDS\)](#), make sure the game is responsive to players at any time of the night or day.

We picked [Amazon Aurora](#) because player numbers differ all over the world, and we have different demands at different times. We needed a system that could scale in and out so players are never disappointed. We’ve also found [Amazon Athena](#) is the right fit in terms of responsiveness and in handling the variety of different player statistics that need to be aggregated.



Piers: "It's important to make games for other people"

We all grow and learn in this industry and perhaps my biggest lesson has been to make games for other people and not for myself. The key is to look beyond your own requirements and to put the players who will engage with the games at the center of what you're doing. It may sound obvious, but when you're first starting out, this may not be your first thought.

Piers: "Make a game that's different"

The biggest challenge facing the sector right now is how to make something that stands apart from everyone else. There are a lot of 'me too' games out there, but the goal should always be to make a game that looks and feels different. That's a good way to look at any challenge in any business—how do you differentiate?

STUDIO
STATS & FACTS



	Founded: 1994
	Team Size: 500
	AWS Services include: Amazon Aurora , AWS Lambda , Amazon Athena and AWS Glue
	Biggest hit game: Jurassic World Evolution, 2m+
	Key awards: Named one of UK game industry's Best Places to Work in the Gameindustry.biz awards.
	Follow: @frontierdev

GAME
STATS & FACTS



	Genre: Simulation Management Game
	Platforms: PC
	Launch date: 5 November 2019
	Metacritic score: 81
	Fast fact: The Deluxe version of the game includes an extra three unique animals—the Pygmy Hippo, Thomson's Gazelle and Komodo Dragon.

TEAM
STATS & FACTS



	Director: Piers Jackson
	Producer: Steve Wilkins
	Principal server developer: Ian Pettitt
	Lead programmer: Andrew Chappell
	Lead designer: James Taylor
	Artist: Marc Cox
	Composer: J.J. Ipsen