LEADING RENEWABLE ENERGY OPERATOR USES RED HAT STORAGE TO MANAGE BUSINESS-CRITICAL WEATHER PREDICTION DATA

FAST FACTS	
Customer	Pattern Energy
Industry	Energy
Geography	North America
Business challenge	To create a high-performance computing system that could help facilitate the development of energy-producing projects
Solution	Red Hat® Storage Software Appliance
Hardware	Three Intel McKay Creek storage servers connected via 4X DDR InfiniBand to two HP C7000 BladeSystem chassis with 32 total compute nodes
Benefits	High reliability and availability; Easy to deploy and manage; Cost savings; Ability to survive hardware failures

Pattern

BACKGROUND

As one of North America's leading renewable energy operators of wind, solar, and transmission assets, Pattern Energy is focused on developing, constructing, owning, and operating energy-producing projects that provide customers with clean, renewable electrical power. Pattern Energy identifies opportunities in the renewable energy sector, creating and implementing plans to convert opportunities into operating assets in the United States, Canada, and parts of Latin America.

BUSINESS CHALLENGE

Pattern Energy runs an atmospheric model that can analyze wind history at locations around the globe and forecasts weather patterns three to five days in advance. This helps gauge power output in specific areas as well as large regions. Wind history information allows Pattern to identify and pursue new business opportunities. The weather forecast data can optimize operations by better understanding the availability of natural resources needed to harvest and generate solar and wind power. The information technology team was tasked with the challenge of creating a high-performance computing system that could be used to help facilitate the development of energy-producing projects by finding new business opportunities and evaluating existing ones, as well as helping the company manage day-to-day wind assets.

"Our business is based on a technology that produces a large amount of data, requiring constant uptime in order to monitor and produce energy estimates," said Chad Ringley, manager of atmospheric modeling at Pattern Energy. "The implementation of an HPC platform was the only way we could support our business and operational needs. To go with this new platform, we needed a reliable storage solution that would provide the best uptime and the fastest speed and reliability, while delivering the comprehensiveness we needed to not have to deploy other storage systems."

"The cost savings we are experiencing with our HPC system are huge, and have more than paid for the investment we made in the infrastructure and our ongoing investment with Red Hat Storage."

– Chad Ringley,
manager of atmospheric modeling, Pattern Energy

SOLUTION

Without an HPC infrastructure in place, Pattern Energy (formerly Babcock and Brown) reached out to its HP channel partner in 2007 for guidance. Based on Pattern Energy's needs for high performance and reliability, the HP channel partner recommended Red Hat Storage Software Appliance, formerly Gluster, as the solution that would best meet Pattern Energy's needs.

"Red Hat Storage Software Appliance provides high throughput, which is important to our high number of I/O operations, supports a small InfiniBand network, and is able to read and write very quickly in an HPC environment. Our HP partner believed that, given the system we were designing from scratch, Red Hat Storage Software Appliance could meet our requirements best," stated Ringley.

Pattern Energy deployed storage technology, now known as Red Hat Storage, in November of 2007 and had its HPC environment up and running in production in less than six weeks. Pattern Energy was extremely pleased with the technical support it received during the implementation process.

The company currently deploys Red Hat Storage Software Appliance on over 20 terabytes of storage across three Intel McKay Creek storage servers connected via 4X DDR InfiniBand to two HP C7000 BladeSystem chassis with 32 total compute nodes.

BENEFITS

Red Hat Storage is enabling Pattern Energy to achieve its business goals by delivering high-performance, highly reliable and scalable storage that enables the company to save money, more precisely predict the presence of natural resources, and better manage its energy-producing assets. This has allowed development teams to more effectively plan the location of new wind projects around the world. The HPC platform has produced multiple lucrative business opportunities and continues to support day-to-day operations of existing assets.

Pattern is using Red Hat Storage in its atmospheric modeling operations to precisely forecast weather three to five days in advance. This type of heads-up knowledge enables Pattern to more effectively manage their energy producing assets. Wind history at different locations on the globe is analyzed to get a sense of regional power output capabilities and to determine where optimal locations exist for the development of wind farms. As part of more efficiently managing its operational assets, Pattern Energy uses Red Hat Storage Software Appliance to provide their maintenance crews with deeper insight into the weather forecast so that they can better plan required preventative and repair maintenance–ultimately avoiding times when wind speed is high and energy production is paramount.

"Overall Red Hat Storage is providing us with an extremely stable system with outstanding uptime. It really is amazing how simple it is. With the way we're using the system now, it's supporting our day-to-day operations, meeting time constraints, and allowing forecasts to run automated on the system. If the filesystem fails we cannot do that," said Ringley. "Red Hat Storage is crucial to the success of our HPC systems, so having this reliability and uptime has been the greatest benefit."

Cost savings is another clear benefit Pattern Energy is experiencing with Red Hat Storage Software Appliance. The studies it now conducts in-house on wind pattern predictions and other solar research using Red Hat Storage would typically need to be purchased from a third-party research firm. Studies by these firms cost anywhere between $15,000-$25,000. Since deploying Red Hat Storage Software Appliance, Pattern Energy has conducted hundreds of these studies on its own, allowing the company to dramatically reduce costs and save money.

"The cost savings we are experiencing with our HPC system are huge, and have more than paid for the investment we made in the infrastructure and our on-going investment with Red Hat Storage," said Ringley. "If we are able to generate one business opportunity that we otherwise wouldn't have had without the system, it pays for that initial upfront cost and our ongoing costs tenfold."

Additionally, the steadfast reliability and scale-out architecture of Red Hat Storage has given Pattern Energy the confidence to permit the system work on its own, utilizing the automation capabilities of their system. Employees are able to write automation code to enable the system to perform tasks on its own without human interaction, allowing the staff to focus on analyzing the data rather than maintaining it.

"Red Hat Storage provides us with a solution that allows us to run our business more efficiently," said Ringley. "We've had an extremely successful four years using Red Hat Storage Software Appliance, and look forward to the continued reliability and cost savings it will provide us."

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