



Use Case

Wildlife conservation

Challenge

To measure wildlife populations and diversity in remote areas of the planet, and make gathered data actionable

Solution

- HPE ProLiant Servers
- HPE Vertica Analytics Platform

Conservation International

How Big Data is helping improve global biodiversity

Conservation International, based in Arlington, Virginia, is non-profit organization using new technology to learn about the changing environment of tropical forests and other ecosystems around the world through the Tropical Ecology Assessment and Monitoring (TEAM) Network—originally created by Conservation International (CI) and now a partnership among CI, the Smithsonian Institution, and the Wildlife Conservation Society. A goal of the TEAM Network is to understand and protect dwindling animal species (whether they're on an official "endangered" list or not). They are now in the process of sharing that data in order to promote change and improvement on a local, national, and continental scale.

Earth Insights is a partnership between Conservation International and Hewlett Packard Enterprise. The mission is to generate real-time data for monitoring long-term trends in tropical biodiversity through a global network of field stations, providing an early warning system on the status of biodiversity to effectively guide conservation action. CI's Director of Technology, Eric Fegraus, says "What we have been able to do is bring analytics and a data-driven approach to building indices of wildlife communities in tropical forests, and be able to monitor them in near-real-time."

Challenges: Measuring what was once unmeasurable

"We know some general things; we know from satellite imagery that forests are increasing or decreasing from year to year," says Fegraus. But:

- CI could not derive finer scale measurements—e.g., what's happening within the forest, what animal species are increasing or are decreasing.
- Use of camera traps in the field to take images of animals as they pass by, and record ambient temperature, has helped CI evaluate those species over time. But this has led to very large datasets. "Over 12 TBs, representing millions of images and data records from many scientific domains with continual data curation," says Fegraus.

Top benefits

The analytics system Conservation International has built with HPE enables them to do the following:

- Have deeper, data-driven conversations with key stakeholders in the places CI works
- HPE Earth Insights' analytics enable scientists to identify and proactively respond to threats as they emerge—a huge step forward in the effort to protect nature

Customer at a glance

Industry

- Conservation

Company overview

- www.conservation.org
- Headquarters: Arlington, VA
- Founded: 1987
- Employees: 900

- Develop a Software as a Service (SaaS) solution enabling the TEAM Network to scale its footprint across government and private sector entities
- Allow findings to be shared with managers of protected areas and other public officials so that they can intervene with policies to address causes of endangerment in these ecosystems

“But we also take a modeling approach to that data, using some of the best statistics, to transform it into meaningful products; we also have the IT infrastructure to handle that data, along with the data visualization tools to really have those insights pop out at you.”

CI is not only involved with HPE in the Earth Insights project; they are also a consumer of HPE technology, “All of our servers are HPE ProLiant servers, which is the backbone of our analytical environment. We are also using (the analytical software package) Distributed R.”

Putting Big Data to work

CI’s agenda requires fundamental change, and convincing governments across the globe to adopt new policies and strategies. And they’re putting Big Data to work: “Our partnership with HPE is enabling us to have deeper insights into our data. It is really enabling us to execute our mission by shining a light on the trends of tropical forest wildlife that we can share with protected area managers. Vertica is the cornerstone of the analytics system we have developed together. We expect to continue to refine the system and engage with more and more organizations involved in managing protected areas and making protected area management more effective,” says Fegraus.

For this project, HPE addressed the specific need to collect, manage, and analyze millions of inputs from climate sensors and camera traps related to species, vegetation, precipitation,

temperature, carbon stocks, humidity, solar radiation, and more. As of September 2016, the project currently manages large and growing amounts and varieties of data, including:

- 12 TB of critical biodiversity information, representing more than 3.1 million photos and more than 8.6 million climate measurements
- HPE’s solutions can analyze the data nine times faster than before, generating species trends and reports on the related impacts of climate, people, and land use in 15 countries and more than 261 species within 30 hours

The right scale for understanding sustainability

As CI showed in recent presentations about 22% of 511 species populations TEAM monitors are declining in the tropical forests, and there are many cases where species are not yet perceived as being endangered. “It’s misleading, because species are ranked according to whether or not they are considered endangered. They’re either on, or off, the endangered list. So people assume that some species are doing okay, even when their numbers are declining steadily. There are some unexpected things happening here. Some animals we thought were safe are not that safe.”

Another problem is that some species are doing fine in one part of the world, but not in others. Which means that on an aggregate basis, things appear to be fine for a given species, but when you localize your inquiry, a different story can emerge. “As we aggregate data for a species up through sub-national to national, and even continental levels, that’s where we need the data to flow up and down those special scales.”

Focusing on the results, not the technology

One of CI's key goals is to get their information into the hands of decision-makers. "For visualization, we're using custom tools that were put together through our work with HPE Services. We are exploring different dashboard technologies as well."

"Traditionally, IT has been all about keeping the lights on, making sure everyone has a laptop. But when it comes to driving the 'business,' whether that's for-profit or not-for-profit, it's the business-driven initiatives within IT that are really doing the work. When we push that technology to our TEAM (Tropical Ecology Assessment and Monitoring) Network, we are providing them cutting-edge technology that has really changed the dynamic. No matter who we're supporting, we're making sure this technology meets their requirements from a scientific and program perspective."



"Our goal is to get the best science and technology, and get data at the right temporal scales, then package all this together as unbiased information to decision makers... HPE's solutions can analyze the data nine times faster than before, generating species trends and reports on the related impacts of climate, people, and land use in 16 countries and more than 261 species within 30 hours..." – Eric Fegraus, Director of Technology, CI

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