

David and Goliath: Rescale, ANSYS, and AWS Enable RF Antenna Design Startup Optisys to Disrupt Market



About Optisys

Optisys is a small, radiofrequency (RF) antenna design company based in Utah. Using revolutionary 3D metal printing technology and 50+ years of experience in RF engineering, Optisys specializes in 3D printing custom RF antenna solutions for military and commercial applications.

The Challenge

Like many RF design firms, Optisys employs ANSYS HFSS, a leading industry software, to perform electromagnetic (EM) simulations. Optisys uses the application to conduct RF simulations on 3D-printed antenna designs and predict their integrated performance. However, the company wanted to reduce the costs associated with running large, concurrent simulations. Before adopting Rescale, Optisys had their ANSYS HFSS and Mechanical licenses installed on local workstations, so that only one person was able to use them at a time at a given computer. "We have a core competency of designing and fabricating 3D-printed antennas, and we don't want to set up an IT department, an intranet, and local systems that are outside of our core competency," says Mike Hollenbeck, CTO and Lead Designer at Optisys. "Another pain point is that we didn't want to buy new high-performance computers for our simulation every two to three years. It's costly to purchase and maintain hardware—and then the hardware becomes antiquated and doesn't scale well with problem size."

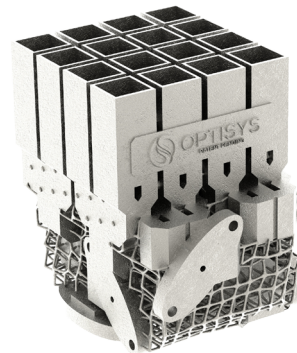
Optisys runs a variety of model sizes, from small to large, causing another technical challenge for scaling efficiently. Because they wanted to reduce costs and gain scalability, Optisys decided to search for a cloud provider.

The Rescale, ANSYS, and AWS Solution

Optisys ultimately decided to use the Rescale ScaleX® platform, running Amazon Web Services (AWS) hardware to run its ANSYS EM simulations. "We did a brief search, and Rescale with AWS was the best out there for running ANSYS on the cloud — absolutely the best," says Hollenbeck.

Rescale's seamless deployment of its ScaleX platform allows Optisys to efficiently and securely connect to instant and scalable AWS resources via an easy-to-use, web-based workflow specifically tailored to solve engineering simulation problems.

"I predominantly run optimizations on AWS with ScaleX," says Hollenbeck. "My optimizations require dozens or hundreds of simulations to run over a set of parameters to find an optimal solution. With Rescale I can automate concurrent job submission and scale up the AWS resources to complete those simulations on time."



This 16-element monopulse tracking array reduces a complex 100-part design into a single, highly-integrated part.

Optisys is able to access a suite of ANSYS software products in current and legacy versions and take advantage of numerous AWS services without having to configure or maintain software or hardware onsite. By running their analysis on-demand with Rescale, Optisys takes advantage of Amazon EC2 Spot instances, a way to use spare Amazon Elastic Compute Cloud (Amazon EC2) computing capacity at a discounted price through a bidding process. Rescale manages the bidding process entirely for their users, ensuring the lowest cost while maintaining guarantees that their job will run through completion.

When submitting a job using ScaleX, Optisys simulation data input and output are automatically uploaded securely using Amazon encryption services and stored into Amazon Simple Storage Service (Amazon S3) buckets.

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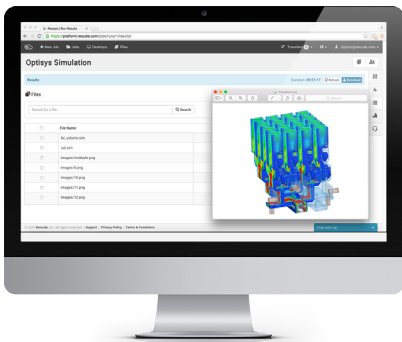
Mike Hollenbeck, CTO & co-founder at Optisys

With ScaleX, Optisys engineers can then search simulation data efficiently and share them with coworkers as needed, avoiding data duplication and large file downloads.

The Benefits

By using ANSYS software on AWS hardware via the Rescale platform, Optisys significantly increases its simulation capability and technical agility, allowing them to compete with much larger organizations. “With Rescale, we can scale our capabilities to the problems that we have that day,” says Hollenbeck. “Rescale makes us significantly more competitive than big companies because it gives us capabilities in excess of what they have, combined with the agility of a small company, so we can make decisions a lot faster.”

Optisys not only is able to scale their simulation to the problem type, but also their cash flow. “Hardware is expensive, and simulation tools are also expensive,” says Hollenbeck. “For a fast-growing company it’s really hard to juggle your finances if you have to pay for full licenses, the hardware, and put an IT program in place. Rescale has allowed us to bypass all of that headache and cost.”



ANSYS HFSS simulations on the Rescale ScaleX cloud simulation platform show electric fields on an antenna design.

Optisys doesn’t have to amortize any upfront expenses, nor do they have to purchase hardware and software for their highest workloads and hardest problems.

The company is also now able to scale ANSYS to multiple cores on AWS, providing the opportunity to target both small and large RF projects. For larger simulation projects, the organization runs ANSYS on AWS using up to 128 cores per run and leverages AWS hardware with 8 GB memory per core.

Optisys operates with additional geographic freedom by monitoring simulation residuals on the Rescale platform. “Rescale has allowed me to travel frequently and work from New York, Salt Lake, and visit conferences or customer sites,” says Hollenbeck. “It enables me to keep a continuous stream of simulation going so that we can meet our contractual obligations for our designs, and to innovate without any slowdown due to a hardware bottleneck.” In addition to managing simulation workflows from anywhere, Rescale alleviates headaches from licensing. According to Hollenbeck, “We are very excited to host our ANSYS licenses on the cloud. Companies spend a lot of time, effort, and money on license management systems to track license usage, but Rescale’s license hosting saved us a lot of pain and suffering and makes us a lot more efficient.”

With the ability to scale, Optisys expects to take on larger projects and continue to use ANSYS on Rescale and AWS. “Rescale is and will remain the hardware platform for Optisys as we grow. It makes total sense. There’s no reason why we would develop an IT team, a full suite of hardware, and our own license management software internally,” says Hollenbeck. “Why would we spend all that money when the Rescale platform running ANSYS on AWS allows us to be very agile, gives us all of this functionality, and provides amazing customer service?”

Learn More

To learn more about how Rescale, ANSYS, and AWS can help you manage your high performance computing solution, visit www.rescale.com.

About Rescale

Rescale™ is the global leader for enterprise big compute. Trusted by the Global Fortune 500, Rescale empowers the world’s top executives, IT leaders, engineers and scientists to securely manage product innovation and perform groundbreaking research and development faster at a lower cost. Rescale’s ScaleX platform solutions transform traditional fixed IT resources into flexible hybrid, private, and public cloud resources—built on the largest and most powerful high-performance computing infrastructure network in the world. Rescale offers hundreds of turnkey software applications on the platform which are instantly cloud-enabled for the enterprise. For more information on Rescale, visit www.rescale.com.

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