Ansys

CASE STUDY /

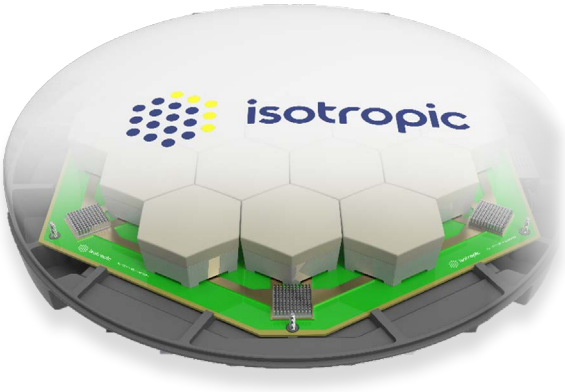
Ansys + Isotropic

"Our company uses Ansys HFSS extensively to make rapid design iterations and evaluations of novel structures to optimize the configuration of our antenna products. The accuracy and flexibility of the tool allows us to solve problems from small-scale PCB layouts to patch antennas to significant subsets of our electrically large terminals. Ansys Optimetrics software, HPC packs and distributed solvers have been particularly instrumental in helping us to meet our tight product development schedule."

Jeremy Turpin
CTO / Isotropic Systems Ltd.

CASE STUDY

Isotropic Systems Reduces Simulation Time by Using the High-Performance Computing Capabilities of Ansys HFSS

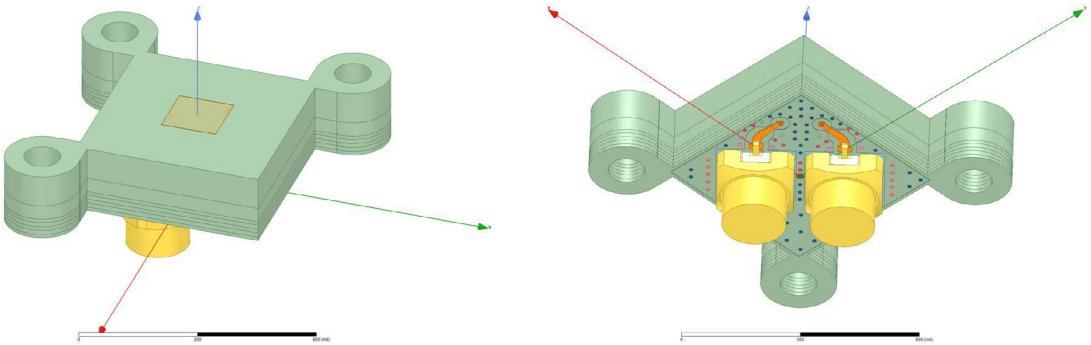


Challenge

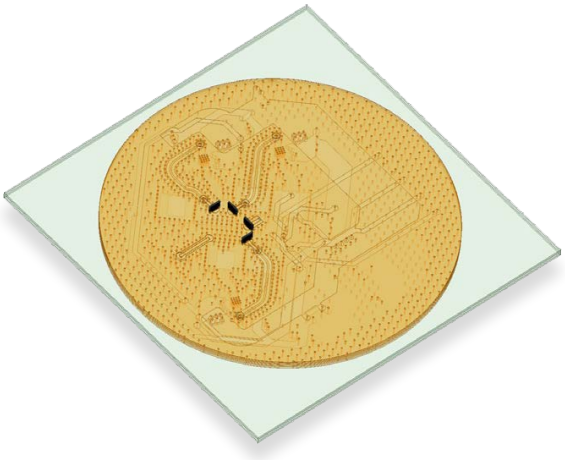
A typical Isotropic antenna uses an array of optical beamformer modules for beam scanning applications. Each beamformer module contains an array of antenna elements with related circuitry and an optical beamformer unit. These modules are computationally challenging, as they contain both large structures and fine features that are tightly coupled. Simulating one or several such modules is a very computationally intensive and time-consuming problem, even when applying symmetry conditions and hybrid solver methods. As the level of detail within the models increases, the simulation memory requirements can grow to the terabyte level. It, therefore, made sense to leverage the cloud to run simulations in parallel and to scale up compute resources, but we needed a simulation tool that natively supports such a move. Ansys HFSS was an obvious choice.

Solution

The first step in eliminating the cumbersome, single-node simulations was to move the simulations from in-house servers to the AWS cloud, thus shattering our limitations on physical compute resources. Following this, we used the Distributed Solve Option (DSO) tool, along with high-performance computing (HPC) packs, to enable the massive parallelization of design variation sweeps, and effectively reduce the individual node requirements and simulation time by more than two orders of magnitude.



Microwave patch antennas are a common design task for Isotropic Systems. HFSS allows us to run full-wave validation models of final printed circuit board (PCB) structures before they are fabricated.



Technology Used

Ansys Electronics Desktop

Ansys HFSS

Importing complex PCB structures enables modeling of the behavior of active linear MMIC and ASIC components into the simulation. Including structures with both fine detail and large dimensions is a challenge for most modeling tools.

/ Benefits

Using the DSO and HPC licenses on the AWS cloud, Isotropic Systems was able to achieve a level of force multiplication in simulation and analysis that greatly enhanced the pace of engineering and discovery. With these techniques, we can analyze larger and larger portions of our antenna system, enhance our understanding and drive out engineering execution risk as a result.

/ Company Description

Isotropic Systems is developing the world's most spectrally efficient, low-profile antennas that are conformal, multiband and electronically steerable. The company's team of industry experts and scientists has reached a major breakthrough in technology and innovative antenna design.

For more information visit www.isotropicsystems.com or follow us on social media: @isotropicsystems.

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