DEPARTMENT OF THE NAVY
SBIR/STTR TRANSITION PROGRAM

SUCCESS STORY

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SCALABLE REAL-TIME ANALYSIS ENVIRONMENT FOR WIRELESS NETWORKS

Scalable Network Technologies is maintaining and enhancing its Joint Network Emulator (JNE) to continue to make Navy network testing faster, cheaper, and more reliable.

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THE CHALLENGE

Strong, consistent communications networks are vital to Naval mission success. However, testing of these networks traditionally requires multiple radios to be physically present in a large testbed. This approach is slow, expensive, and often fails to recreate the conditions in which the network will operate. To ensure smooth and efficient missions, the Navy needed a testing system that was cost-effective, repeatable, and easily scalable.

THE TECHNOLOGY

The Joint Network Emulator (JNE) allows the Navy to simulate tactical networks in a virtual environment, eliminating the need for physical testbeds. It uses the EXata Network Modeling software to allow users to display relevant radios, waveforms, satellite links, routers, and cyber threats concurrently within a simulation. Previously, similar testing required large numbers of radios to be physically present and tested at the same time. These earlier methods struggled to reliably account for environmental effects and cyber-attack scenarios. JNE enables accurate reproduction of both without the risks or cumbersome time burdens of traditional testing approaches.

THE TRANSITION

Scalable Network technologies received a phase III Indefinite Delivery/Indefinite Quantity contract from the Joint Program Executive Office for the Joint Tactical Radio System for JNE acquisition and enhancement in May 2011. At that time, multiple branches of the military recognized the potential value of JNE. The system continued to mature through SBIR lines, receiving multiple upgrades, including support for major tactical waveforms, joint interoperability features, improved cyber-attack modeling, and increased scalability.

On November 4, 2016, Scalable Network Technologies received a phase III contract from NAVWAR for technical support, maintenance, and Navy-specific enhancements of JNE. Under this contract, JNE was integrated into Naval networks, updated to support new waveforms and environmental scenarios, validated for the Navy's specific operational needs, and fully transitioned from a research product into an operational evaluation tool. Keysight Technologies, Inc. acquired Scalable Network Technologies in 2021 and has continued their work on JNE.

THE NAVAL BENEFIT

JNE enables the Navy to conduct critical network evaluations without assembling physical radio networks, saving significant time and money. It allows Sailors and engineers to accurately simulate conditions that live testing cannot reproduce and diagnose potential issues before fleet deployment, ensuring more consistent communication and mission success. JNE also provides realistic live virtual constructive mission simulations, helping users prepare for the full range of conditions they may encounter.

THE FUTURE

As communication technology evolves, JNE will continue to evolve alongside it. Ongoing enhancements to JNE will ensure the systems keep up to date with the latest waveforms, cyber-attack capabilities, the Navy's digital engineering ecosystem, and tactical networking models. In addition to military uses, JNE has commercial appeal to any company that needs to test resilient networks operating worldwide.

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