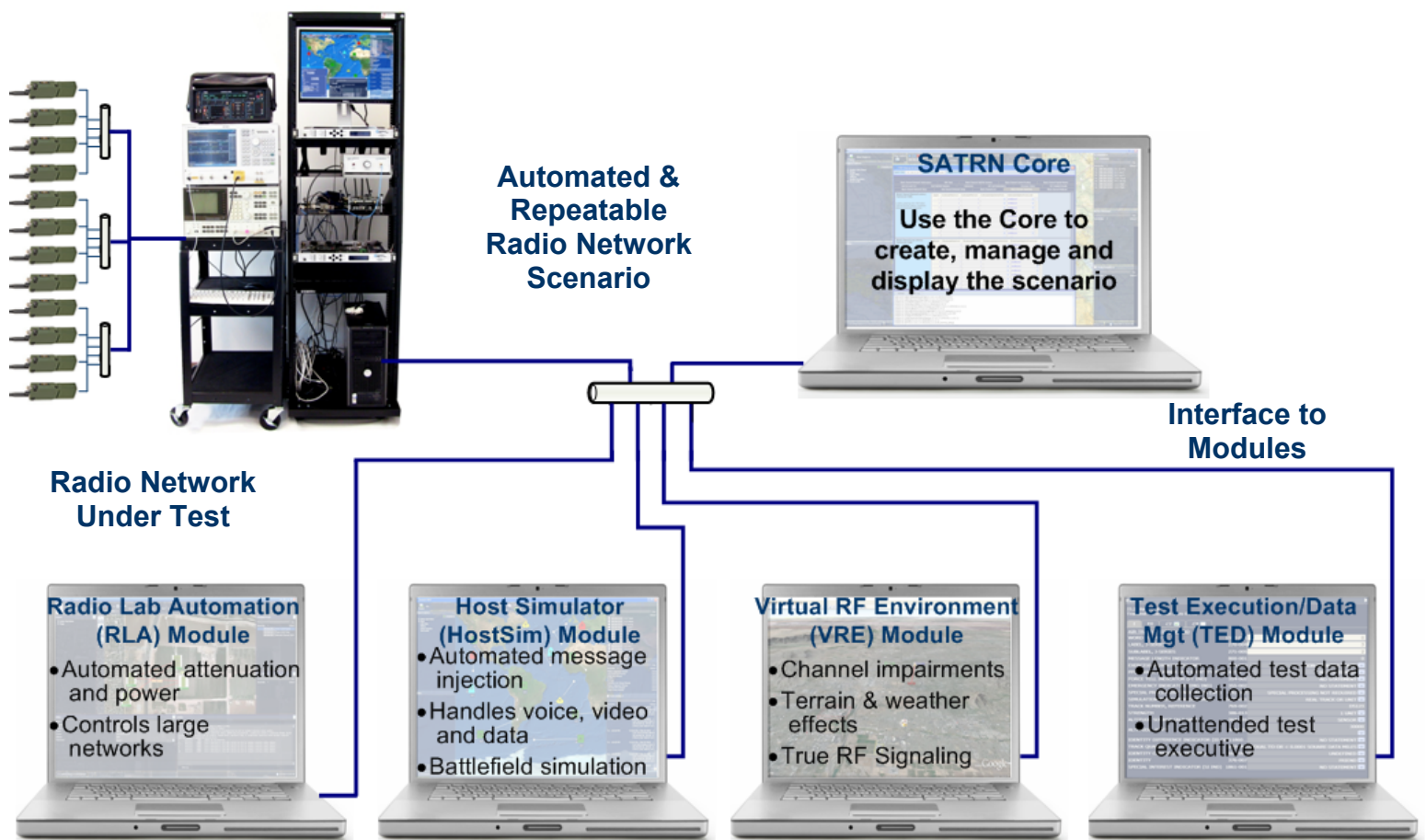## *A family of software modules for test & simulation of radio networks*

The SATRN family of test tools is used to test radio networks in a lab environment before they are deployed. The tools include a Host Simulator Module, a Radio Lab Automation Scenario Test Module, a Virtual RF Environment Test Module, and a Test Execution and Data Management Module.

SATRN provides automated capability for repeatable, scenario-based testing of radio networks, with user interfaces for scenario design and control of test execution. SATRN is a cost effective testing solution for large, complex, technically advanced programs.

Automated & Repeatable Radio Network Scenario

SATRN Core

Use the Core to create, manage and display the scenario

Interface to Modules

Radio Network Under Test

Radio Lab Automation (RLA) Module
- Automated attenuation and power
- Controls large networks

Host Simulator (HostSim) Module
- Automated message injection
- Handles voice, video and data
- Battlefield simulation

Virtual RF Environment (VRE) Module
- Channel impairments
- Terrain & weather effects
- True RF Signaling

Test Execution/Data Mgt (TED) Module
- Automated test data collection
- Unattended test executive

The SATRN family has distinct plug-in modules for creating and executing test scenarios

SATRN HostSim is a PC-based software product used to verify the interoperability of tactical SDR platforms in the emerging Network Centric Warfare (NCW) environment. HostSim simulates an airborne host platform by communicating with a test radio set exactly as an actual operational flight program would communicate to the same radio.

SATRN HostSim can plan simulated mission scenarios over geographic regions and inject tactical data onto a network to be received by other systems under test on the network. HostSim will construct and transmit both valid and invalid messages for the purpose of evaluating the responses of other receiving platforms under test.

HostSim test scenarios are stored so they may be repeated, and logs of message traffic at the host-to-terminal control and tactical data levels are created so they may be referenced in the event that a system under test fails to respond as required.

Features

- Scenario based TADIL-J message injection
- Automated J-series message generation
- Open architecture can be configured with new wireless protocols
- Integrates with other M&S tools via DIS/HLA/TENA interfaces

Users

- Development Test and Evaluation during platform integration as well as for Operational Test and Evaluation during pre-flight certification and mission testing
- Troubleshooting fielded radios, platforms and waveforms using playback and debug data recorded on the test radio
- During waveform development, test WF sent vs. WF received, analyze stress conditions, and perform timing analysis
- SATRN used in conjunction with the DataSoft Advanced Network Analyzer (DANA) tool can monitor the network under test to study the effects of valid and invalid messages injected into the network
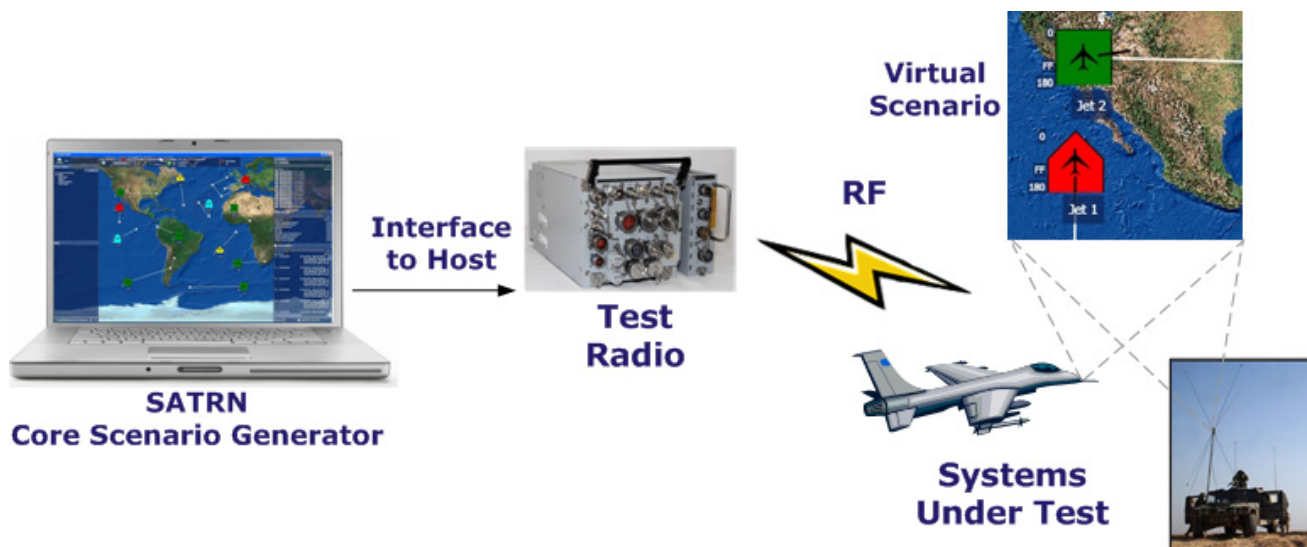
SATRN HostSim: Create Virtual Message Traffic with Easy Graphic Interface

SATRN RLA is a PC-based software product used to support the evaluation, characterization, and validation of radio network performance.

SATRN RLA provides a test automation capability for simulation of realistic scenarios in a lab environment. The tool will dynamically control programmable attenuators to simulate the path-loss effects that may be encountered between radio nodes in a given scenario.

RLA stimulates the radio network with unicast and multicast data traffic to simulate the host applications that would load the network. RLA controls radio power to simulate node loss and arrival and to support test procedure automation.

Features

- Designed for tactical SDR radio networks
- Scenario-based network data traffic loading
- Scenario-based attenuation and power control
- Data traffic injection at any point in the network
- Centralized user interface for control of the entire radio network environment
- Highly customizable data traffic controls
- Repeatable, automated radio network testing based on user-defined scenarios
- Configurable path-loss model parameters

Users

- Development Test and Evaluation during platform integration as well as for Operational Test and Evaluation during pre-flight certification and mission testing
- Troubleshooting fielded radios, platforms and waveforms using playback and debug data recorded on SATRN Core Scenario Generator

SATRN RLA: Create & Execute Repeatable Radio Network Test Scenarios

SATRN
Virtual RF Environment (VRE)

DataSoft

SATRN VRE is a PC-based software product for testing Command, Control & Communications (C3) systems.

SATRN VRE will stress real tactical C3 systems in the same manner they would face in fielded operations and will support characterization and verification of these systems.

VRE allows a few representative C3 systems under test to be exercised through various scenarios of operation in a simulated environment emulating channel effects and hundreds of virtual emitters. The systems under test are presented with RF signals containing the information they may see in a field application.

Features

- True RF signaling between systems under test to emulate the effects of the environment
- RF signals driven by link–, network–, and application– layer emulation, allows the same layers in the Systems Under Test (SUT) radios to be exercised
- Processes RF signals originated by the SUT radios and the associated link–, network–, and application– layer messages and responds to theses messages in a realistic way
- Includes distinct, but related elements: Channel Emulation and "Virtual" Radio Emulation

Users

- Flight Test: This tool is specifically developed for Operational Test and Evaluation during pre-flight certification and mission testing

Availability

- Q2 2013
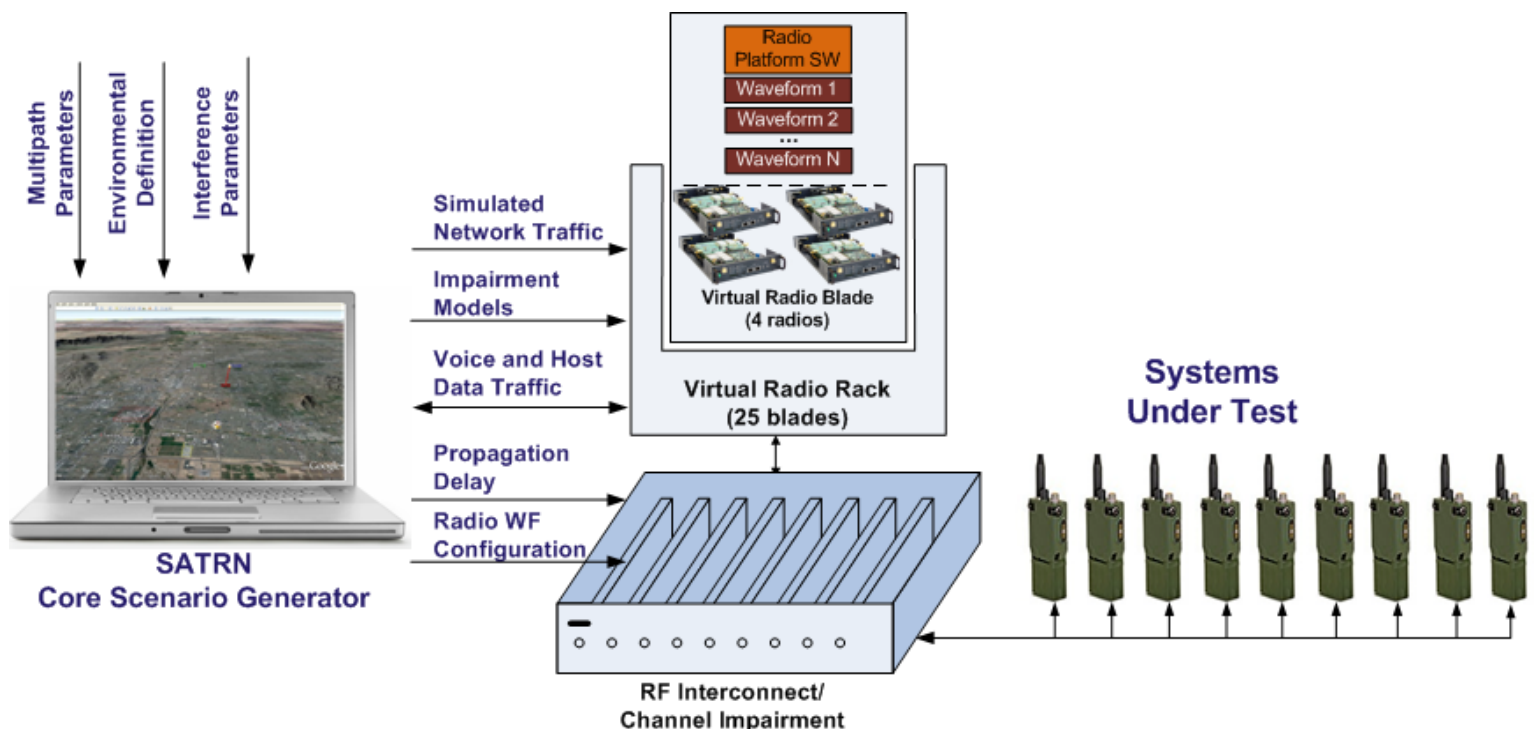
SATRN VRE: Create a Virtual RF Environment for realistic testing of large networks