

# EXata™ Product Family

Brought to you by the makers of QualNet, EXata is a wireless emulator that lets you evaluate on-the-move communication networks faster and with more realism than any other emulator. EXata creates a digital network replica that interfaces with real networks in real time, using real applications. Software, hardware, human, and Internet-in-the-loop connections enable ultra-realistic communication over all layers of the network. No more assuming “perfect communications” in your net-centric operations planning — get the real picture with EXata first.

In both military and commercial networks, next-generation communication systems are moving us closer together and empowering the individual. In the military context, net-centric systems are moving communications beyond link-based and stovepipe architectures and endeavoring to connect all war fighters, improve situational awareness, and provide a common operational picture.

All networks face common challenges like bandwidth limitations, bottlenecks, security attacks, session management, scalability, traffic congestion, and quality of service trade-offs. Mobile networks face even more challenging issues including terrain, weather, and environmental conditions, spectrum management, mobility effects and limited battery power. EXata is here to address these challenges.

## What Sets EXata Apart?

**EXata is new evaluation technology for new wireless technologies.** EXata is a digital representation of networks ... a representation so accurate that a user or component connected to the virtual network can not discern whether it's connected to the digital representation or the real thing. EXata emulation is not a substitute for existing modeling and simulation; it is a whole new category of evaluation/development tool that does what the other products were not designed to do.

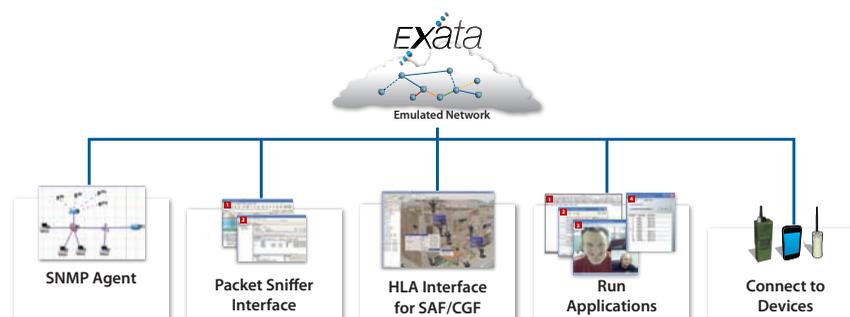
## Key Differences between EXata and QualNet (see reverse for more details)

- QualNet is a simulator; EXata is an emulator.
- QualNet is designed for a closed environment; EXata connects to live networks.
- QualNet runs in as fast-as possible mode; EXata runs in real time to interoperate with real networks
- All QualNet users with the IPNE add-on can upgrade to EXata. IPNE will no longer be available for QualNet. Instead, EXata 2.0 includes all QualNet and IPNE features plus many more.

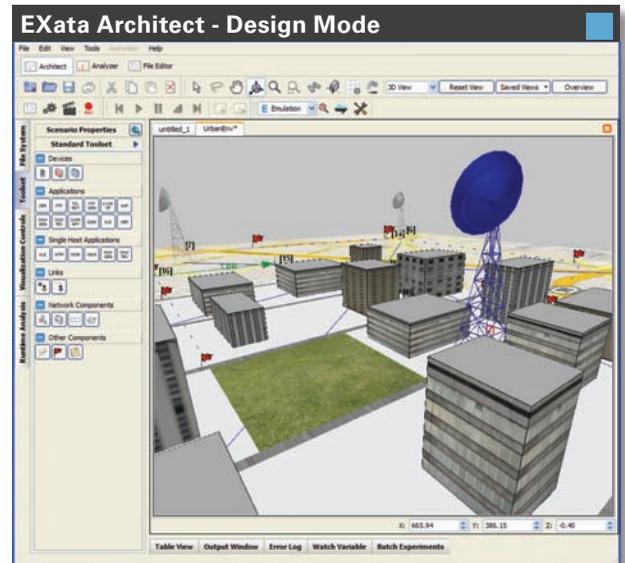
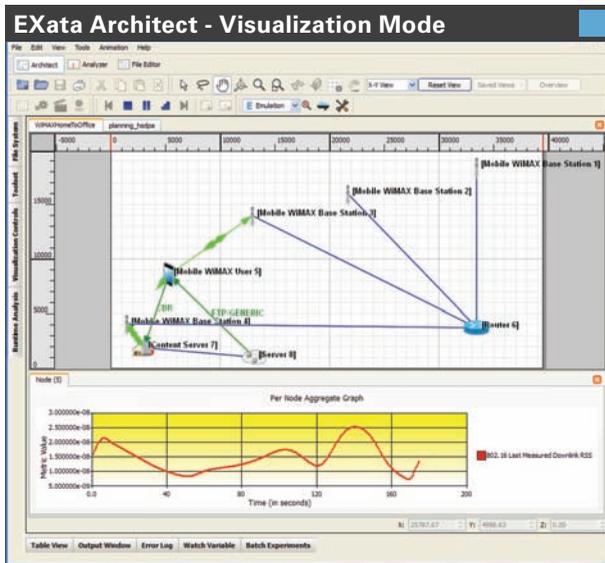
**EXata is a realistic software virtual network.** EXata enables you to digitally represent your entire network - devices, software, transmitters, antennas, terrain effects, atmospheric effects, and human interaction effects. You can now represent every variable that will affect the performance of your real network in an EXata Software Virtual Network.

**EXata empowers you to move from months to minutes.** With emulation, network and equipment tests that traditionally required months to perform all the calculations can now be performed in minutes, with real-network behavior.

**EXata brings ultra-fidelity at 50 or 5,000 nodes.** Competitors' simulation programs, written with legacy sequential processing code, can only simulate a maximum of about 200 devices, and fidelity drops as you approach that number. With EXata, you get the same accurate representation of your network whether you're testing 50 nodes or 5,000.



EXata's ability to interface seamlessly with a wide variety of applications and devices enables emulation.



## Components of EXata

The EXata Product Family consists of EXata and a number of add-on libraries that model a variety of communication protocols. You can also add the power of additional processors by simply upgrading the license.

Like QualNet, EXata allows users to design, develop, and run custom network models. A feature-rich visual development environment allows users to set up models quickly and then run models that present real-time statistics and helpful packet-level debugging insight.

EXata's main components include:

- GUI (Architect, Analyzer, File Editor),
- Emulation Kernel,
- UPA,
- Connection Manager, and
- Packet Sniffer and SNMP Agent

EXata provides out-of-the-box support for quad-core processor systems. This means you could achieve real-time emulation with the base EXata product. For additional speedup and scalability through parallel execution, upgrade EXata to run on multiples of four processors.

### Architect

EXata features an easy drag-and-drop GUI to build network topologies and advanced editors to allow fine-grained design of devices and networks. Use the Device Model Editor to build custom communication devices or use pre-built devices like routers, switches, hubs, ATM, wireless access points, base stations, and mobile users.

Run emulations and simulations with full control in 2D and 3D. Visualization Controls allow you to monitor

emulation progress and control per-layer & per-event animation.

### Analyzer

Both Architect and Analyzer have powerful analysis and debugging tools that allow you to get to the bottom of network problems. You can monitor the values of an important parameter, or view dynamic graphs of critical performance indicators like received signal strength or uplink/downlink bandwidth. EXata also provides the flexibility to build customized key performance indicators (KPIs).

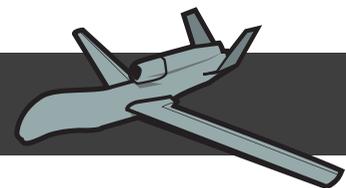
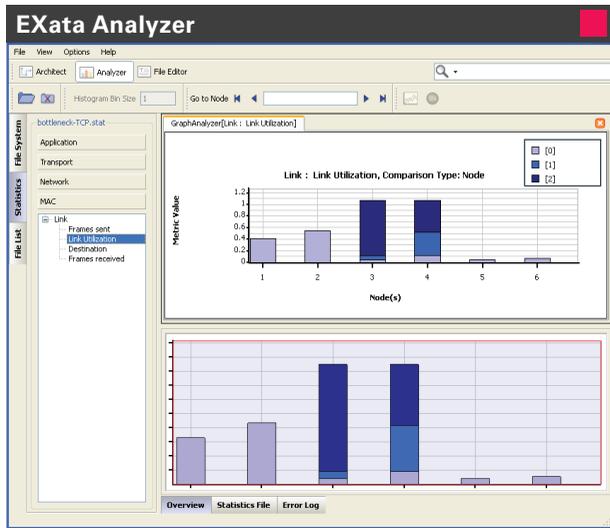
### File Editor

The File Editor is a simple text editor for modifying text-based scenario files and mobility trace files.

### Emulation Kernel

EXata is designed to take full advantage of all cores of processing power on multi-core, multi-processor or cluster systems. EXata allocates network devices across multiple cores, processors and cluster nodes. Its multithreaded kernel speeds up networking, requiring very little user intervention. EXata also makes it much easier for developers to create programs that squeeze every last drop of power from multi-core systems.

The emulation core of EXata ensures that your network's digital replica (the emulated or virtual network) runs in real-time and treats packets as real packets, not abstract ones. EXata has high-fidelity models that can interoperate with real networks. The emulation core powers the software- and hardware-in-the-loop capabilities of EXata.



Now you can easily design and customize virtual networks and then evaluate applications running on real systems using the emulated virtual network in EXata.

## Universal Protocol Adapter (UPA)

The EXata Universal Protocol Adapter (UPA) enables users to run multiple real applications on a single computer and assign each to run on a different emulated node in EXata. So instead of using tens of separate computers to test applications on networks, you can use one computer connected to EXata. UPA is an SNT technology that is accessible from an easy to use Connection Manager running on operational systems.

## Connection Manager

EXata comes in two parts: the main EXata emulation engine that creates a digital replica of your target network, and the Connection Manager that runs on your operational systems.

Applications use the Connection Manager to run their network traffic over the EXata network. Most importantly, Connection Manager makes EXata's advanced emulation technology easy and simple to use. Applications need no modification or customization to use the realistic emulated network in EXata.

Connection Manager supports a large variety of applications such as:

- Internet browsers,
- Tactical communications,
- Situational awareness information,
- Sensor data,
- Instant messengers,
- VoIP,

- Streaming video, and
- Multi player games.

EXata can also interface with Semi-Automated Forces (SAF) or Computer Generated Forces (CGF) via HLA or DIS. SAFs provide a rich environment to represent a full range of operations, systems, and control processes from entity up to brigade level. Using a standard interface like HLA/DIS, EXata can serve as the communications effects server for a SAF, providing realistic communications. The Standard Interfaces Library for EXata is sold separately.

## Packet Sniffer and SNMP Agent

EXata supports a packet sniffer interface to enable capture and analysis of network traffic using standard packet sniffer/analysis tools like Wireshark or Microsoft Network Monitor\*\*. Additionally, EXata can be managed using standard SNMP network managers like HP OpenView, IBM Tivoli or SolarWinds Orion\*\*.

\*\* The third party applications are listed as examples and do not imply explicit support of all their features. Microsoft Network Monitor is a trademark of Microsoft. HP OpenView is a trademark of HP. IBM Tivoli is a trademark of IBM. SolarWinds and Orion are registered trademarks of SolarWinds Inc.

## EXata vs. QualNet

### EXata 2.0 vs. QualNet 4.5

EXata is built on the same ultra efficient parallel kernel as QualNet. EXata and QualNet have similar GUI capabilities.

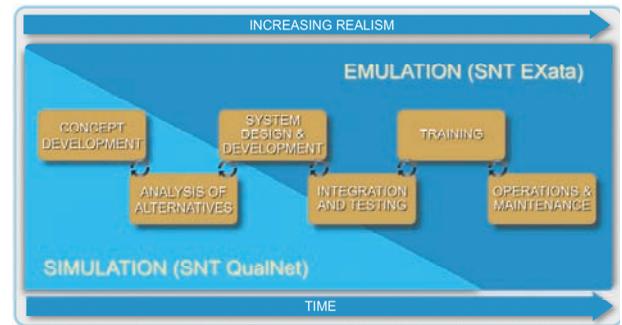
With respect to QualNet 4.5, EXata 2.0 offers the following new capabilities:

- Connect multiple real applications and devices with a large, realistic virtual network in EXata,
- Conduct training and operations with next-generation tactical networks and devices that are being designed,
- Evaluate the impact of terrain, mobility, channel and network protocols on real applications, and
- Analyze and manage EXata virtual networks with popular packet sniffers and SNMP managers.

### EXata Model Libraries

All of QualNet's Model Libraries are available for EXata\*. Model Libraries in C/C++ greatly extend the base capabilities of EXata and are customizable. From supporting specialized networks, such as WiFi, sensor networks, cellular, MANET, WiMAX, and satellite, to enabling powerful 3-D visualization, Model Libraries add significant capabilities to EXata and consist of the following:

- Developer Library †,
- Wireless Library †,
- Multimedia and Enterprise Library †,



QualNet and EXata are complimentary tools. QualNet, a simulation engine, is used earlier in the product lifecycle for analysis of alternatives, design and development. EXata, an emulation engine, is used later in the product lifecycle in testing, training and operations.

- Advanced Wireless Library,
- Cellular Library,
- Military Radios Library †,
- Network Security Library,
- Propagation Library: ALE/ASAPS †,
- Propagation Library: TIREM Interface \*\* †,
- Propagation Library: Urban
- Satellite Library,
- Sensor Networks Library,
- Standard Interfaces Library, and
- UMTS Library.

\* Network Emulation Library is no longer sold as an add-on to any product, as this functionality is a core feature of EXata only.

† Developer, Wireless and Multimedia and Enterprise Libraries are included with EXata.

‡ These libraries are subject to export restriction under the International Traffic in Arms Regulations (ITAR) 22 CFR 120-130. International sales of these modules require authorization from the US Department of State.

\*\* These libraries require code from a third party.

## Minimum System Requirements for EXata 2.0

### Hardware

- X86 compatible processor (Intel & AMD Dual-core, Quad-core and multi-processors, clusters)
- 500 MB disk space
- 64 MB free for LAN-size simulations without GUI
- 2 GB free for LAN-size simulations with GUI
- 4 GB free for a large network (1000+ nodes)

### GUI

- 1024 x 768 Screen resolution
- 1 GB RAM
- A graphics card with 64 MB RAM minimum, 128 MB or higher recommended

### Compiler (Microsoft Windows XP and Linux)

Compilers listed below are required if you modify source code to add customized models or include add-on libraries:

- Visual Studio 2005 (VC8)
- Visual Studio 2005 Express

### Linux (32-bit)

- Supported Linux OS's
  - Fedora Core 4
  - Red Hat Enterprise Linux 4
  - SUSE Linux 9.3, 10.1
  - Ubuntu 6.06
- gcc 4.0
- glibc 2.3