

Overview: The System and Network Software for Telecommunication Engineering

RSoft Design Group produces design software for the telecommunication industry, specifically for optical system simulation and network planning. These advanced tools to enhance and accelerate user modeling capabilities and provide real field design scenarios using extensive industry specifications. Our users include optical component and equipment manufacturers, system integrators, service providers, as well as government labs and academic institutions.

Whether you are interested in maximizing performance, minimizing costs, reducing time-to-market, fast-prototyping, or analyzing multiple what-if scenarios for optical communication networks, these tools will become an inseparable partner and the secret of your success.

RSoft Design Group currently markets four software packages for the simulation, analysis, and planning of telecom systems and networks:

OptSim – Simulates a broad range of optical communication systems

ModeSYS – Simulates multimode optical communication systems

MetroWAND – Models network design, network engineering and network-planning

Artifex – Simulates discrete event networks through the Petri Nets formalism

Key Features of OptSim

OptSim provides the unique capability of simulating optical systems in both the time and frequency domains. Infinitely long bit sequences as well as Course WDM systems can be simulated with the highest efficiency. More than 600 models are readily available to setup a wide range of optical communication systems, including Nonlinear Fiber, VCSEL laser, SOA, EDFA and Raman amplifier models. New models can be created incorporating, among others, MATLAB, C/C++, Fortran and Java code, allowing legacy code to be reused with minimal effort. An impressive set of validations and an extensive customer base demonstrate the accuracy of OptSim results. OptSim can also be integrated with the RSoft Component Design Suites for a total application solution.

Key Features of ModeSYS

ModeSYS fully simulates multimode optical systems by taking into account the transverse mode profile propagating through the system. This unique capability ensures a correct signal shape and eye diagram and allows accurate performance estimates to be obtained. The inclusion of spatial effects into multimode models within a system-level simulation framework combines the accuracy of a device level simulation and the efficiency of a system-level simulation. ModeSYS provides, among others, the following key analyses: system bandwidth, launching condition, offset launch, arbitrary index profile, coupling, chromatic and modal dispersion, differential mode delay, and encircled flux.

Key Features of MetroWAND

MetroWAND uses high-level models to determine where ring and mesh topologies are most economic, given the network connectivity, traffic demands, and optical equipment constraints. MetroWAND's automated design approach is useful during both the planning and maintenance aspects of network design. Before a network is physically realized, an optical equipment manufacturer can use MetroWAND to reduce the time needed to create many 'what-if' scenarios as a part of a proposed network design solution for RFP and RFQ responses. Vendor's equipment libraries and design rules can be built into the tool so that the creation and demonstration of viable design scenarios is possible even by a non-specialist. Once a network is in place, MetroWAND can be used by service providers to accomplish their day-to-day network planning activities including network growth studies and network optimization.

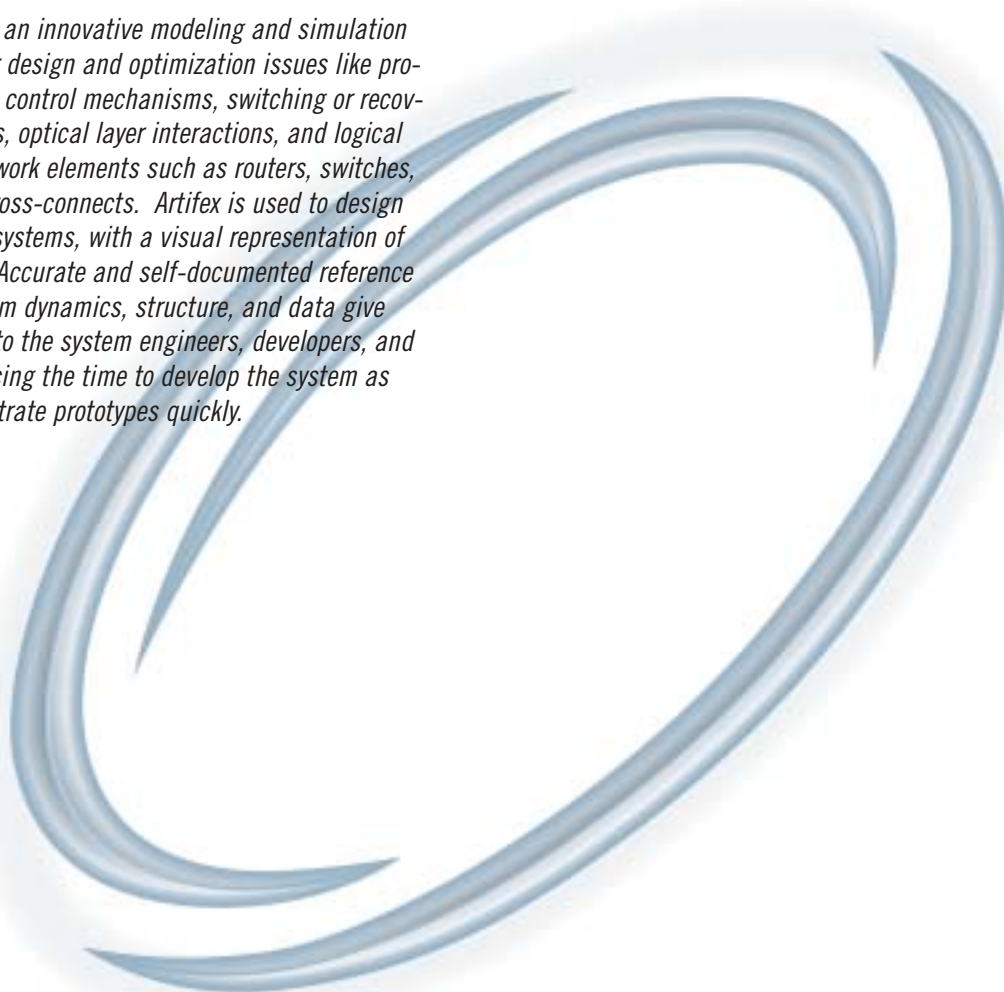
Computer Platforms and System Requirements

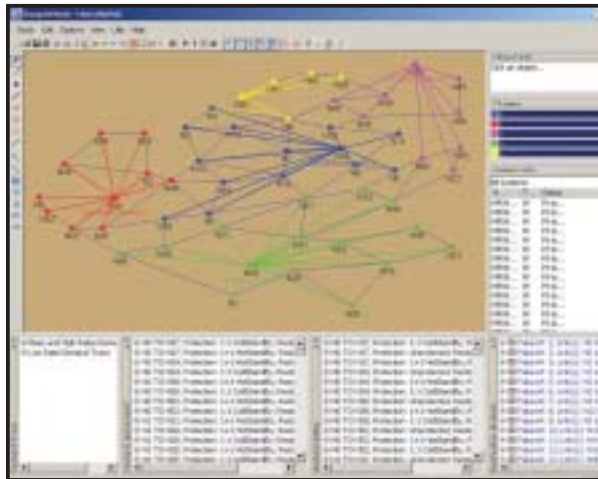
Currently the above System and Network tools are available on a variety of platforms including Windows, Linux and Unix (Sun Solaris) systems. Minimum system requirements for running the software vary depending on the application, but simple, low memory applications can run on a typical desktop computer. For further information on both software and hardware requirements, please contact RSoft Design Group.

For more information beyond this overview, please refer to the individual product sections. Please note that all products are licensed and sold as separate packages.

Key Features of Artifex

Artifex provides an innovative modeling and simulation environment for design and optimization issues like protocol dynamics, control mechanisms, switching or recovery mechanisms, optical layer interactions, and logical behavior of network elements such as routers, switches, WDM, optical cross-connects. Artifex is used to design discrete-event systems, with a visual representation of the dynamics. Accurate and self-documented reference models of system dynamics, structure, and data give early feedback to the system engineers, developers, and end users reducing the time to develop the system as well as demonstrate prototypes quickly.





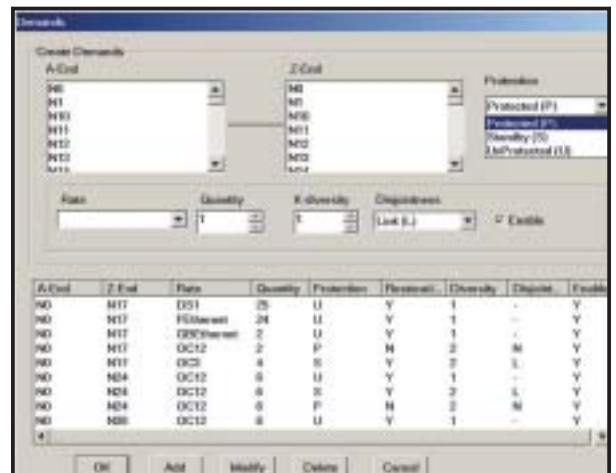
Partition the network into different clusters

The ability to evaluate and integrate new technologies into existing high capacity transport networks is a tremendously complex issue that the entire telecommunications industry faces today. The explosion of service complexity has caused vendors to produce transport equipment capable of handling many combinations of services. Due to the rapid expansion of services and new equipment, it is imperative that service providers time the implementation of new technology to receive the fastest return of-investment. Cost-effective implementation of any new technology is critical to provider success and depends greatly on the existing network. Modeling and analysis of existing networks, expansion of the existing network, or design of a new network is crucial and time consuming for service providers and their equipment vendors. MetroWAND is a network-modeling environment that helps service providers and equipment vendors to streamline their network modeling, network design and service planning functionalities.

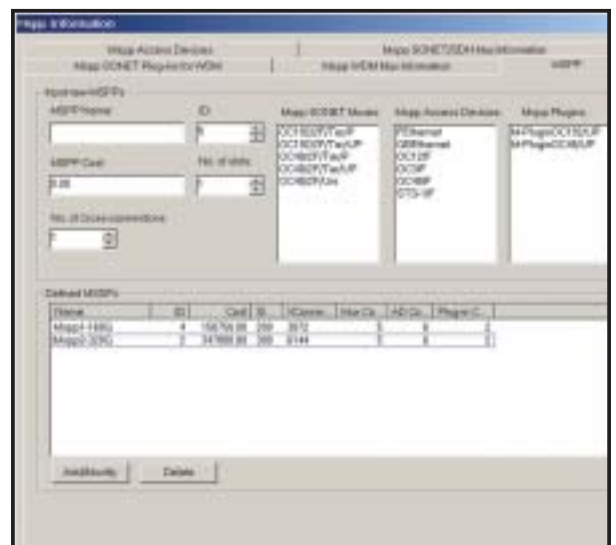
MetroWAND is ideal for transport networks using SONET, SDH and WDM technologies. As a network-modeling tool MetroWAND is used to simulate various network configuration scenarios, various routing methods, failure scenarios and traffic load analysis, and to obtain various statistics like system utilization, wavelength utilization, throughput rates and equipment capacity.

MetroWAND Ring:

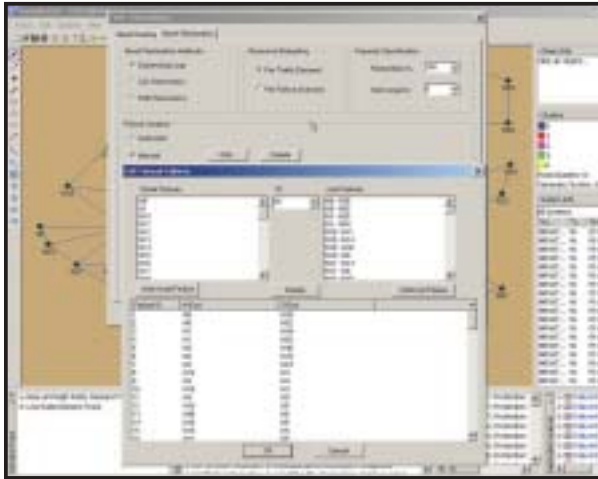
MetroWAND Ring is the modeling tool for SONET/SDH/WDM ring networks. The tool optimizes the placement of rings, number of rings, as well as routing of traffic in different ring technologies like UPSR, BLSR and WDM rings. The tool also considers single or dual ring inter-connection as well as hubs and grooming of traffic demands.



Traffic-demands modeling captures protected, unprotected and pre-emptible traffic



The SONET/SDH/WDM equipment library in MetroWAND



Failure Analysis in MetroWAND

Applications:

- ▼ Design and optimization of UPSR, 2-fiber BLSR, 4-fiber BLSR, SNCP and MSSP rings.
- ▼ Obtain the minimum network cost by optimizing fiber, structure, cable, amplifier, and regenerator usage along with ring ADMs.
- ▼ Model and analyze the existing rings together with planned rings as well as with new rings for the expansion of the network.
- ▼ Model multiple equipment types (ADMs, Cross-connects and MSPPS) and design the network.
- ▼ Design and optimize SONET/SDH and DWDM rings together.
- ▼ Design and optimize the network when the network is portioned into multiple small networks.

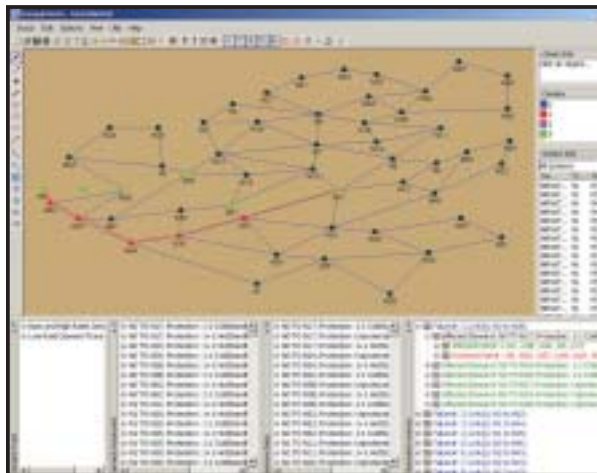
MetroWAND Mesh:

MetroWAND Mesh is the modeling tool for SONET/SDH and WDM mesh networks.

MetroWAND can help in investigating whether a mesh network is cost effective by simulating a cost-optimized network design considering protected, unprotected, and pre-emptible traffic demands and protected and unprotected equipment types, as well as various restoration schemes. MetroWAND can even design a mesh network on top of your existing ring network. Using MetroWAND, users can quickly run through failure scenarios for each node or link in the network. MetroWAND also determines how restoration percentages and demand protection types affect network cost.

Applications:

- ▼ Considers ANY transport rate – SONET, SDH, or data – including uncommon rates. This is ideal for equipment vendors offering a multi-service provisioning platform (MSPP) in which network systems route SONET over DWDM, data over SONET over DWDM, or data over DWDM.
- ▼ Design and optimize SONET/SDH and WDM networks with different routing matrices.
- ▼ Design and optimize SONET/SDH and WDM networks for different mesh network architectures like path protected mesh network, shared path protected mesh network, link restored mesh network and path restored mesh network.
- ▼ Perform joint cost optimization for working and protection capacities.
- ▼ Perform joint optimization factoring the equipment protection capabilities as well as the traffic demand type such as protected, unprotected and pre-emptible.
- ▼ The failure and Restoration Analysis module in MetroWAND gives a detailed analysis on how 1+1, 1:1 and Mesh Restoration traffic are rerouted and restored in a network when multi-event failures occur. A failure event can be a) Link failures b) Node failures OR c) a combination of both link and node failures. A failure can be manually specified by the user or automatically created by the tool. The manual specification allows user to study different failure scenarios, logical isolation of nodes and different attacks that can happen to the network. The results of these analyses can be further extended to computation of "level of Risks" and "availability of traffic".



View working and restoration paths in MetroWAND