JCSS Model Library

JCSS Standard Military Models

• **Data:** Workstation/Computer (SLIP/Ethernet), Cisco 2514, Cisco 4500, Cisco 7505, Cisco 7513, IP Cloud, ATM Cloud, FR Cloud, Accelerator 4000, IP Cisco switches. Hubs, Firewall, LAN, Foundry NetIron Switches, Multi-homed Server.

• **Tactical Voice, VTC and Circuit Switches:** AN/TTC-39A(V)3, AN/TTC-39A(V)4, AN/TTC-39D, AN/TTC-39E (CDS), AN/TTC-42, AN/TTC-46 (LEN), AN/TTC-47 (NCS), AN/TTC-48(SEN), SB-3865, SMU, DNVT, DSVT, STU-III, Redeem HDX, Redeem IGX, SB-3865, DSS, CDS, MCU, VTC Terminal.

• **Satellites & Earth Terminals:** AN/TSC-B5B, AN/TSC-85C, AN/TSC-93B, AN/TSC-93C, AN/TSC-94A, AN/TSC-100A, AN/TSC-152, AN/USC-59, AN/USC-60A, AN/WSC-6(V)*, DSCS, CSCI, UHF Dama*, STEP, GBS, Generic Terminal & Space Segment, TCP Protocol Enhancing Proxy, UHF DAMA: w/SRAP, FDMA Satellite, TSSP, ETSSP, ETSSP3G (TDMA+FDMA), TSR-4 GBS, JIPM (NCC, RM, and Satellite).

• **Transmission Devices:** AN/GRC-226, AN/GRC-239, AN/MRC-142, SRC-57, AN/TRC-170(V)2*, AN/TRC-170(V)3*, AN/TRC-173B, AN/TRC-175.

• **Encryption Devices:** KG-82, KG-84, KG-84A, KG-84C, KG-94, KG-94A, KG-194, KG-194A, KIV-7, KIV-7HS, KIV-7HSB, KIV-19, KIV-19A, KG-75, KG-95-2, KG-175 (TACLANE), KY-57, Motorola NES, KG-235, KG-250, Red Eagle-INE-100, KG-235 (Generic INE), KIV-19M, HAIPE, HPD.

• **Multiplexers:** AN/FCC-100(V)7, AN/FCC-100(V)9, IDNX-20, IDNX-90, Promina100, Promina 200, Promina 400, Promina 800, Timeplex Link/2+*, SHM-1337.

• **Tactical Radios:** SINCGARS, INC, EPLRS, HaveQuick, JTIDs*, AN/ARC-114*, AN/ARC-190*, AN/ARC-204*, AN/ARC-230*, Link 11, Generic UHF/VHF/HF Radios, Harris Megastar 155, Link 16* & JRE Gateway (SPAWAR), EPLRS Radio (HDR, CSMA, LDR needline support), JTRS (WNW, Radio Subnet, Gateway), Harris RF – 7800W, AN/PRC 152+, AN/VRC 110+, AN/PRC 117.

• **Gateways:** SCREAM, SHOUTip, Media Gateways, HAIPE Peer Discovery Model, PEP.

• **VoIP:** SIP, H.323, H.323 Border Element, H.323 Gatekeeper, VoIP Phone, SIP Proxy Server, AS-SIP.

• **ATM and Frame Relay:** Alcatel 7270, Alcatel 7470, Alcatel 7750, Cabletron SS2200, Cabletron SS6000, Cabletron SS9000, Marconi PH6000, Marconi PH7000, Marconi PH8000, Omni Switches, FoundryNetIron Routers.

• **Non Standard JCSS Models:** JTRS WNW, QED (QoS Edge Device) with MBAC (Measurement-Based Admission Control), DISN-IF (Intermediate Fidelity Model) (Note these models don't ship with JCSS and require JCSS PMO approval to gain access).

Additional JCSS Features **
These features may require additional licenses

• **Discrete Event Network Simulation**
Run discrete event simulations and employ comprehensive tools to display simulation. Analyze the results of a simulation session in graphs called Measures of Performance (MOPS).

• **NetMapper (license required)**
Export detailed network topology to Visio

• **VNE Server Import (VNESI)**
Collect network data from disparate sources, and merge this information to create a unified network representation that can be used for network planning and analysis, configuration auditing, and change management.

• **Ace Whiteboard**
Create multi-tier traffic applications and perform end-to-end application analysis.

OPNET COTS Model Library
• **Data Link Layer Technologies**: ATM, Ethernet, FDDI, Frame Relay, TokenRing, X.25
• **Network Protocols:** IPv4, IPv6, RSVP
• **Routing Protocols:** BGP, EIGRP, IGRP, ISIS, OSPF, OSPFV3, PNNI, RIP, RIPng
• **Physical Layer Technologies:** SONET, xDSL, ISDN, PPP, SLIP
• **Wireless:** 8.02.11(a, b, e, g), WiMAX, Zigbee, AODV, DSR, OLSR
• **Vendor Devices:** 3Com, ADC, Alcatel-Lucent, Alteon, Avici, Bay Networks (Nortel), Brocade, Cabletron, Cisco, Foundry, HP, Juniper, Lucent, Mo¬torola, NEC, NET, Nortel

*** Model Developed by Service Organization (SPAWAR, AFCA)**
**** Requires OPNET license**

Mission Statement

JCSS is the Joint Communications Modelling & Simulation tool developed to enable C4 planners and analysts to:

- **Conduct high-level planning**
- **Conduct end-to-end performance assessments**

Focus Areas:

- **Address Network Traffic Analysis**
- **Evaluation of emerging technologies**
- **Support to rapid contingency planning**
- **Support to wargaming (force-on-force)***

Usability Objectives:

- **Support reuse of service and jointly developed models**
- **Provide common modeling environment**
- **Model military and commercial communications systems**
- **Be readily accessible to C4 community**
- **Reduce time to conduct analysis**
- **Use COTS**

*Support to wargaming (force-on-force is through HLA Federation, a supplemental component of JCSS'

Configuration Requirements

- **Windows 2000/XP operating System/Vista**
- **2 GHz Pentium CPU**
- **512 MB of RAM (recommended 2 GB)**
- **2 GB of hard disk space**
- **JCSS software and license (provided by JCSS PMO**

DISA JCSS PMO

JCSS@disa.mil

Joint Communication Simulation System

www.disa.mil/jcss

JCSS

The Joint Communication Simulation System (JCSS), formerly known as NETWARS, is the Joint Chiefs of Staff standard for modeling military communication systems. It is a desktop software application that provides modeling and simulation capabilities for measuring and assessing the information flow through strategic, operational, and tactical military communications networks.

During the 1997 Quadrennial Defense Review (QDR), the Joint Staff discovered that the effects of improved communications on battle outcome could not be adequately represented by any of the current models. The Director for Command, Control, Communications and Computer (C4) Systems (DJ6) initiated NETWARS, to address this shorfall.

JCSS Capabilities

- Realistically simulates battlefield communications
- Allows for rapid construction, "what-if" drills, and modifications to warfighter communication architectures and operations plans (OPLAN)
- Users can configure organizational structure, scenarios, architectures, communication device models, and information exchange requirements (IER)
- Promotes interoperability of communication device models and traffic models built by individual Services and Agencies
- Provides guidelines for model development
- Advances the ability to validate current and future acquisitions
- Has the flexibility to assess communications at all levels of conflict and organizational constructs

Warfighters and Operational Planners

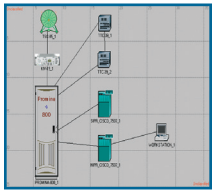
- High-level planning and performance assessments of military networks
- Rapidly construct, update and visualize network plans
- Collaboratively plan network topologies
- Develop reuseable device and traffic models
- Share network plans and information (e.g., HTML and PowerPoint)
- Develop network plans based on equipment inventories

Analysts and Acquisition Specialists

- Assess the impact and performance of applications, network layer technology, and deployment strategies
- Advance common network modeling and simulation framework and standards
- Develop and promote interoperability of device models and traffic models
- Support wargaming and the evaluation of emerging technologies
- Validate current and future acquisitions

Modeling Methodology

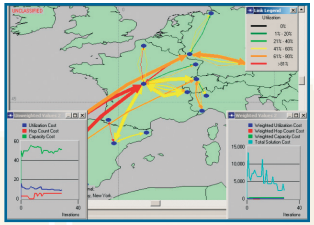
Scenario Builder



Provides capabilities to help users develop network topologies that include detailed communication system representation. point-to-point, wireless, broadcast and/ or SATCOM connections, and traffic information

- Organization and Operational Facility (OPFAC) Libraries
- Communication Device Model Libraries
- Semi-Collaborative Planning Features
- XML-based Importation of Scenarios and OPFACs
- Importation of network topology, traffic, and router configuration from Network Management Systems (i.e., Cisco Works, Concord eHealth)
- Customized exportaton of Visio and PowerPoint presentations, web report, screen captures and text-based formats
- Customized Network Visualization Methods (i.e., Logical Views, System Views, Operational Views)
- Terrain Modeling Module
- Joint standard and commercial symbology

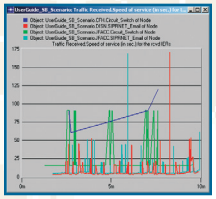
Capacity Planner



Provides features and capabilities to assess networks or scenarios developed in the Scenario Builder in terms of network loading through analytical calculated link and/or broadcast network utilizations based on associated traffic exchange requirements. Additionally, the Capacity Planner provides optimization functions that suggest new links and alternate link capacities and/or traffic loads based on a set of user-defined network performance targets such as desired average link utilization.

- Visualization of Network Performance
- Capacity optimization functions
- Link and Broadcast Network Utilization Reports
- Traffic Routing Reports
- Failure Analysis

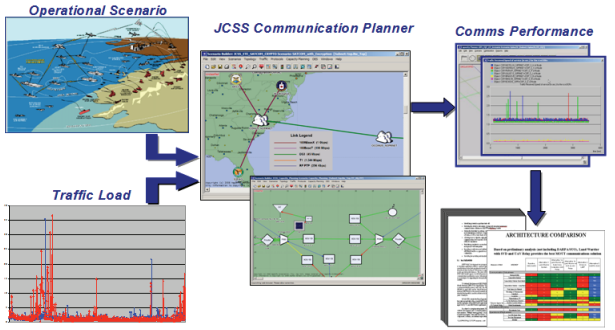
Simulation Domain and Results Analyzer



Provides capabilities to execute discrete event simulation (DES) of networks or scenarios developed in the Scenario Builder. DES is based on the OPNET Modeler® product and provides detailed packet level representation of network behavior. Simulation output such as latency, completion percentage, and link utilization can be examined and compared via the results analysis interface.

- Detailed Network Representation
- Transport, Network, Link and Physical Layer Overheads (e.g., TCP/ IP, BGP, EIGRP)
- Performance Metrics (e.g., latency, jitter, completion percentage)
- System Performance Metrics (e.g., buffer usage, interface overflows, TCP retransmissions)
- Quality of Service (QoS) and IPv6 analysis
- Exportation of Scenario and Simulation Data to PowerPoint Presetations, Visio, XML and Text-Based Formats

Architecture



Key JCSS Features

Comprehensive Device Model Library
Includes hundreds of military and commercial communication device models, including transmission systems, multiplexers, circuit switches, routers, switches, and workstations.

Template Organizations and OPFACS
Choose pre-built organizations, OPFACs, and utility nodes from a vast library of templates.

Device Configuration
Configure device attributes that control model functionality, behavior, and physical characteristics.

Device Configuration Information (DCI) Importation
Import router configuration information collected by network management tools to replicate network topologies in JCSS.

Scenario Development
Add organization and OPFACs to develop topologies that accurately represent communication plans and architectures.

Capacity Planning
Evaluate and optimize network performance given a network and traffic, JCSS optimizes the network and provides suggestions for optimal link and network bandwidth capacities.

64 Bit Support
JCSS support both a 32 and 64 bit platform.

High Level Architecture
Support to wargaming (force-on-force) via HLA Federation.

Link Deployment Wizard
Deploy different links types quickly and efficiently using the built LDW wizard.

IER Deployment Wizard
Allow for rapid deployment of IER traffic and Threads.

Circuit Deployment Wizard (Import/Export)
Allow users to create and export custom circuit devices (Promina, Mux circuits, CTP, Scream ATM, Scream IP, TSSP, SHOUT IP). Circuit import/export capability.

Custom Wireless Pipelines
Utilize custom wireless configurations, including custom Bit Error Rates, custom Antenna Patterns, and custom ECC Thresholds.

Collaborative Planning
Allow lead planners to designate portions of the planning process, and topology building to subordinate planners.

DoDAF Support
Import and Export OV-3 and SV-6 DoDAF traffic into JCSS. Export OV-6c/SV-10c, OV-2, and SV-2.