Kratos Networks: Company and Product Overview
• Network & IT management software products unit of Kratos Defense & Security Solutions
  o Leading IT and security solutions provider
  o 4,000 employees
  o 54 offices in 27 states, headquarters in San Diego, CA
  o Approx. $1 billion in revenue forecasted
  o Publicly traded on NASDAQ (KTOS)

• Powerful and flexible IT & RF network management products

• Assuring reliability, availability and security of mission critical organizations

• Proven in organizations as diverse as Intelsat, Singtel, Measat, Telefonica, DISA, MDA, and Microsoft
Service Manager – manages groupings of devices and components comprising a service. Requires NeuralStar and acts as a MoM for individual Compass nodes. Examples:

- **Teleport Management** - comprised of antennas, modems, ACUs, satellites, etc. that enable RF and IP traffic with satellites and across the business’ enterprise network.

- **Active Directory Management** - comprised of DNS, active directory, global catalog, forest, etc. that enable end user access to IT applications.
Kratos Solutions for Satellite Operators

- 360° consolidated view – From terrestrial to satellite networks
- Manager of Managers – Complete situational awareness
- Single platform – Manages all ground and network assets
- Dashboards – From the NOC to the network edge
- Integrated monitoring - Remote site, carrier, teleport systems and IP networks
- Reporting - Complete performance monitoring with reports
- Integration – With 3rd party EMS, legacy equipment, security systems and much more

EPOCH IPS
Satellite Telemetry & Command, Orbital Services

Monics and Sigmon
RF Signal Monitoring
Quality of Service Monitoring, Interference Detection, GEO Location

Compass M&C
Remote Site Management, Equipment Monitor and Control

RT Logic, Lumistar and Satcom Solutions (formerly CVG/Avtex)
Satcom and TT&C RF, signal processing, network, and archive products and integrated systems

Mission Data and Telemetry

www.KratosNetworks.com
Frustrations with Current Operations

- Operations are disjointed and involve many heads across disciplines to resolve issues.
- Tracing the path of a service/mission is difficult.
- Finding out what services go through a device or what devices supporting a service or mission is painful.
- Records of device details, configurations, locations etc. are spread across many applications on spreadsheets or on paper somewhere.
- System management requires a lot of highly qualified people.
- Operations go into Chaos when something breaks due to lack of E2E mission oriented visibility.
Challenge: Effective End-to-End Network Management with Many Disparate Tools

Inconsistent:
- Architectures
- GUI Layouts
- Naming Conventions

Non-Integrated tools and data

Manual loading and maintenance of data

No integration with corporate tools

No centralized view & control across all operations

Don’t have overall E2E networks awareness
Manage all the missions, quality of service and availability from single pane of glass

View services graphically, and truly End-to-End, at the TOC/NOC

Access any service from a common view

Correlate services & assets in inventory to the Customers

Measure Key Performance Indicators on end-to-end services
The first true End-to-End Service Management solution in the satellite and communications industry.

NeuralStar SQM manages services across the entire network to help service providers improve Service Quality Assurance and deliver visibility into customer impacting conditions to maximize revenue and reduce costs.
NeuralStar SQM:

Delivering a central view of all teleports

- Drill downs into specific teleport operations, associated equipment and facilities

Providing service level views mapped to equipment and carriers

- Real-time performance metrics

Displaying event and alarm details

- Filtered to specific service levels

Showing trends and analytics across teleports

- Predictive analytics

Offering service level and availability reports
Increase operator efficiency and cost savings

Combine satellite and terrestrial monitoring across RF and IP for End-to-End view of network health and status

Discover degradation or latency on the network before it becomes service affecting

View service performance from origination destination on your network

Identify, prioritize and recover services by equipment failures

Detect root cause of system failures and suppress sympathetic alarms

Scale to large enterprise levels
Service Status ListVUE displays all End-to-End services/ Missions sorted by alarm severity

This is the primary view for monitoring the availability and reliability of end-to-end services

Double-clicking a service opens its summary view, which provides the additional information needed to evaluate or troubleshoot the service/ mission
The Services ListVUE shows all uplink and downlink services that belong to an End-to-End (or Enterprise) service. Double-clicking a service opens its summary view.
Calculated availability based on status of underlying service components.

Calculated states based on underlying service components.

Service map representing uplink/downlink components from Compass or 3rd party EMS with related Antenna, Satellite, Microwave, Carrier information and IP Network.
Customer, Mission, Category, and Location information entered in NeuralStar SQM.

Alarm indicators display the number and severity of alarms related to this service.

Live metric charts display KPIs for each underlying service component.

Data tabs show related alarms, inventory and attributes associated with this service.
Customizable Service View

- Allow map as standalone widget. Operations typically prefer service logical view.
- Group Alarms and Alarm Duration adjusted for scope of current service view.
- Adjust for grid layout so wide views don’t waste real estate. Option to order by alarm priority with highest/newest alarm on top.

Performance Indicators (Points)
- ONLINE EQUIPMENT
  - OCONVERTER.FREQUENCY
  - OCONVERTER.ATTENUATION
  - OMODEM_N.RX_LEVEL
  - OMODEM_N.EBNO
  - OMODEM_N.BER
Right-click a device icon to open the device in the Compass Client or 3rd Party EMS
**Our Unique Capabilities for E2E Management**

Only provider to offer these unique capabilities in combination to manage E2E environments:

- **Seamless scalability** – managing some of the largest enterprise environments
  - Full scale multi-tiered enterprise solution – managing almost 1 million devices generating over 10 million events per hour with 12 thousand clients for an organization.

- **Centralized and local management** – managing remote sites and the NOC with an integrated solution
  - Managing enterprise NOCs and remote sites with over 3,000 global installations.

- **Complete visibility** – delivering a single view into service and performance management
  - Delivering visibility and service transparency from source to destination across circuit (satellite/microwave) and packet (IP) networks.

- **Tool consolidation** – integrate existing tools into a MoM platform with analytic capabilities
  - API for integration with other products
  - Complex Event Processing Engine for correlation, analysis and filtering for improved decision making.

- **Integrated monitoring** – monitoring IP and non-IP networks
  - Standards based (SNMP, ICMP, Syslog, WMI, etc) for routers, servers and other IP equipment
  - Proprietary protocol support (1,100 drivers) for modems, converters, transmitters and other non-IP equipment.

- **Enhanced collaboration** – providing user-definable and targeted views for each operator level
  - Tailored and user-definable dashboards through a single system to improve collaboration and productivity for each team member.

Dramatically reduce costs by double digit percentages on:

- Software
- Hardware
- Services
- Operations
Compass NMS / Monitor and Control System
Compass Product Suite

Compass Server and GUI – Element and Network Management

- Provides full monitor and control of ground infrastructure
  - Manage equipment directly (Antennas/RF, computer network, to facility infrastructure)
  - Manage other management systems to provide single interface to your entire system
- Advanced features in a low cost, product solution
  - Configurable web-based client
  - Auto generated screens
  - Auto detect new equipment and auto update displays
  - Rapid anomaly resolution using advanced automated notification technology

Compass Appliance & nControl – Remote Site Management

- Provides centralized intelligence for distributed applications
- Full remote management of large and small unmanned sites
  - Monitor and control of all network, communications, and facilities systems
  - Optimized data compression: Works over links as low as 9.6K
Compass – Integrated Add-on Modules

- Compass Redundancy
- Compass Switching Client
- Automated Service Manager
  - Management by service, not equipment, improving response time and saving money
- Compass SNMP Agent & Server
What Equipment Can Compass Manage?

Serial Equipment
- RS232/422/485
- Ethernet Equipment
- GPIB/IEEE488
- SNMP Equipment
- Other standards based interfaces: Corba, TL-1, TBOS/TABS, Modbus etc.

Currently have 1,500+ drivers in our library ....and growing....
- Interfaces to Satellite Earth station equipment
- TV/AM/FM Transmitters
- Microwave Radios
- UPS and Power systems
- Security Systems
- Facility Alarms (Door Open, fire, temperature etc.)
- Satellite (LMI)
- Network Infrastructure (Routers, Servers, Firewalls etc.)
- Fiber Optic Tx/Rx
- Broadcast Equipment (Video Servers, Commercial Insertion, video routers etc.)
- Baseband Equipment

Additional **Standard Equipment Drivers developed at NO COST** with License Purchase
- HPAs, LNAs, Converters, Receivers, ACUs, Most Modems, Encoders, Decoders, GPS, UPS etc.
- Excluded Test Equipment, Govt. Equipment, etc.
- APIs Provided so you can build any interfaces internally
- Visual Driver Studio for non programmers
Web based

No local software need be installed

Diagrams can be updated by operators

Rapid navigation

SSL encryption

Explorer like tree for system status

Full path color Alarm Propagation

Auto generated screens with style sheet (detail and hierarchical)

Proprietary or Single Secure Sign On (LDAP)

Extensive user authorization and partitioning
A simple way to organize and show operational details by:

- Equipment Type
- Antenna
- Service / Circuit
- Geographical Area
- Customer, etc.

The Compass User interface adapts to your operational practices not you adapting your operational practices to our user interface.
Alarm and Event Viewing

Alarm Viewing
Centralized alarm viewing for all managed assets from one location
Alarm viewer allows you view and filter alarms based on many variables
Pop up window with audible alert for unacknowledged alarms

Events and Historical Logs
Built from the RTDB, stored in a Relational DB
Provides “beginning” to “end” record of all actions within Compass and systems it monitors and controls
Provides historical records for post mortem event analysis
**Device Detail Information**

Presentation Is

- Consistent
- Intuitive
- Tabulated

Device detail screens include:

- Device Status and equipment info
- Control
- Configuration
- Alarms
- Driver Communication Status

Driver screens are user modifiable

All device points are presented
Interface directly to facilities monitoring equipment

Manager of Manager (MoM) functionality to Interface with existing facilities management systems

Monitor

- Temperatures
- HVAC Systems
- Generators
- UPS Systems
- Fire alarms
- Building door alarms
Incorporate Web-based cameras directly within Compass GUI.
Compass Process Monitor

Manages Critical Compass Software Processes
- Compass Server
- Compass Drivers
- SNMP Manager and Agent
- Compass GUI
- Compass Database
- Compass Clients
- Inventory Manager
- Topology Manager
- Service Manager
- Trouble Ticketing System

Will sense if any process fails, and will restart the process

If it fails to restart the process, it will alarm the operator

Ensures no critical software component failure will go un-noticed

Allows System Administrators to respond to issue before it becomes service affecting
Displays Overview of the service
  • See all equipment associated with service transmission
  • See detailed data for each service
  • Instantly determine service status

Provides operators the ability to see Services affected by an equipment failure
  • Proactively respond to service failures
  • Prioritize the recovery of services
  • Track and report on service reliability

Build profiles based upon the service
  • Apply profile upon service initiation to an equipment chain
  • Provide default configurations for each service
  • Apply profile to new equipment chain to recover service when equipment failures occur

Interface with Scheduling Systems to automate initiation and termination of services
Add-on module for Service Manager and Compass

Save off and restore settings for devices managed by Compass

Transfer settings from one device or service to another
- Template system allows users to map settings from one manufacturer device to another manufactures similar device

Lock critical settings and expose typical settings
Compass Reporting Tool

Interactive Web Based Reporting Tool

Graphical iReporting Tool with Jasper Reporting Engine

User can easily create custom reports

Export reports to PDF, Excel, HTML or Word

Standard Reports Provided

Service Manager
- Service Utilization
- Service Status
- Equipment allocated

Inventory Manager
- Equipment Utilization
- MTBF
- Spares by Location
- Maintenance Schedule
- Warranty Expirations
- Maintenance Expirations

Trouble Ticketing
- MTTR
- Open Tickets by Site
- Tickets by Technician
- Tickets by Device
- Tickets by Service
Automate processes such as redundancy switching, power control etc.

Suppress or correlate alarms

Execute multiple commands with a single click of a button

Tasks can be executed on schedule, operator initiated, or based upon system events

Graphical Automation routines may be built within the TrueNorth environment without the need to understand programming syntax

• Routines are edited in TrueNorth but execute on the server

LUA Scripting Language used for more complex tasks

Troubleshoot scripts by executing “step by step”
Bi-Directional Interface

- Compass alarms sent to Monics/DSA
- Equipment Status sent to Monics/DSA
- Carrier Alarms sent to Compass
- Carrier Status sent to Compass
- Commands sent to Compass for execution

Enables:

- Correlation of alarms based upon Equipment and Carrier Status
- Suppression of equipment alarms caused by carrier problems
- Suppression of carrier alarms caused by equipment problems
- Automating control of equipment based upon carrier information, for example UPC
- Automate moving services to another satellite when there are carrier problems
Intel Atom 1.6GHz Dual Core Processor
Single configuration full 2U with more interior options
  • 4 Expansion bays
Front LCD Display for basic configuration and status
Fans are the only onboard moving parts
  • 2 Front Fans and 1 Rear Fan
Extremely low power consumptions for all circuit boards and peripherals
Extremely low heat buildup in the interior
Front Ethernet port for technicians to hook up a laptop to perform local management
Compass Appliance

- Runs on common Linux OS and uses same Compass builds and standard product
- Software selectable serial ports configured at front panel LCD or from Compass GUI
- 32GB Solid State SATA drives with over 100 years MTBF
- Up-to 64 serial ports (RJ45) of any combination of RJ45 and DB9 in units of 8 ports
- Has 2 GB Ethernet (Auto switching 10/100/1000) ports (Can have 2 IP addresses)
- Has 2 SATA ports internally
- Basic AC surge suppression is now included inside chassis
- Operating temp (0° - 60°)
- Optional: RAID Technology configuration from Compass GUI
- Optional: Internal UPS battery backup with configurable auto shutdown to protect against critical data loss in the event of loss or bad power
- Optional: Redundant Power supplies (AC (110V – 220V) or DC ~(18V – 60V))