![entuity logo - Taking the Work out of Network Management]

Entuity Network Management Technical Overview

Entuity is an all-in-one, enterprise-class network management solution that combines performance, fault, flow and inventory management into a single multi-function product. It provides service providers, systems integrators, and medium to large enterprises with the information they need to proactively manage complex and dynamic networks. Entuity is the solution of choice for medium to large multi-vendor networks (200+ devices) in need of deep, proactive network management and customizable, comprehensive reporting.

Highlights

- Automates discovery, topology, events, reports, root cause, etc

- Unifies network management in one product with one interface

- Ideal for medium to large multi-vendor networks (200+ devices)

- Scales easily—no limits. Servers automatically know how to communicate

- Supports hundreds of devices out of the box. Entuity adds new devices on demand

- Integrates with BMC, Oracle Enterprise Manager, HP, IBM

- Provides the industry's best reports. Elemental and flow side-by-side. Business reports

- Automated, standard, custom, ad hoc. Customizable dashboards. Drag and drop

- Simplifies license management through central license server

- Enables virtualized Entuity server

Entuity offers a rich web-based UI that makes navigation quick and easy. Drag and drop any UI component such as a chart, dashboard, event viewer, topology map or report into configurable custom dashboards.

All-in-One Network Management

Entuity is an all-in-one, enterprise-class network management solution for today's rapidly changing heterogenous networks.

Entuity includes all core network management functionality in a single solution, including and embedded database. There is no need to manually integrate the various functions. Each works with all of the others out of the box.

- Auto Discovery and Inventory
- Live Topology
- Events Management
- Root Cause Analysis

- Configuration Monitoring
- Seamless and Infinite Scalability
- Elemental Performance
- Integrated Application Flow
- Customizable Reporting/Dashboards
- Integrated Virtual/Physical Management
- Cloud Support

Entuity automatically discovers knowledge of network layers 2 and 3 and monitors layer 4 application services, thoroughly analyzes the data and delivers actionable information and extensive reporting capabilities. Customers rely on Entuity for its ease of installation, configuration and administration, minimal training, fast time to value and seamless scalability.

Simple, Comprehensive Data Management

Entuity's client-server architecture includes two primary server components: Data Management Kernel (DMK) and the Event Manager. The Data Management Kernel automatically controls data gathering, analysis and delivery of knowledge to the client. The Event Manager facilitates event monitoring and takes direction from the DMK.

Data Management Kernel

The Entuity intelligent discovery function knows in advance what data to seek. It includes out-of-the-box data models for a wide range of managed devices, including hundreds of Ethernet switches, routers and hubs, as well as non-traditional equipment such as blade servers, firewalls, and load balancers. These customizable data models define the attributes of each managed element, its possible dependencies in relation to other elements on the network, and the specific details to retrieve for each. The DMK manages these data models and automatically applies updates and changes to the Entuity database schema.

The Data Management Kernel controls:

1. Data gathering frequency, based on requirements for each type of data for each type of managed element

2. Data gathering methods that are device specific: SNMP polling, SYSLOG events, SNMP traps, TCP port probing

3. Entuity database schema, which is built and maintained automatically to align with, add or augment device specific data models

4. Data lifecycle management, which rolls up and ages data based on retention requirements for each type of statistic

5. Data delivery, which accommodates realtime requirements of the client user interfaces and aligns them with long-term data retention requirements

6. Data retrieval, by pulling stored data, then processing and passing it to the reporting engine

7. Data export, which integrates network metrics into 3rd party vendor solutions for a unified management platform
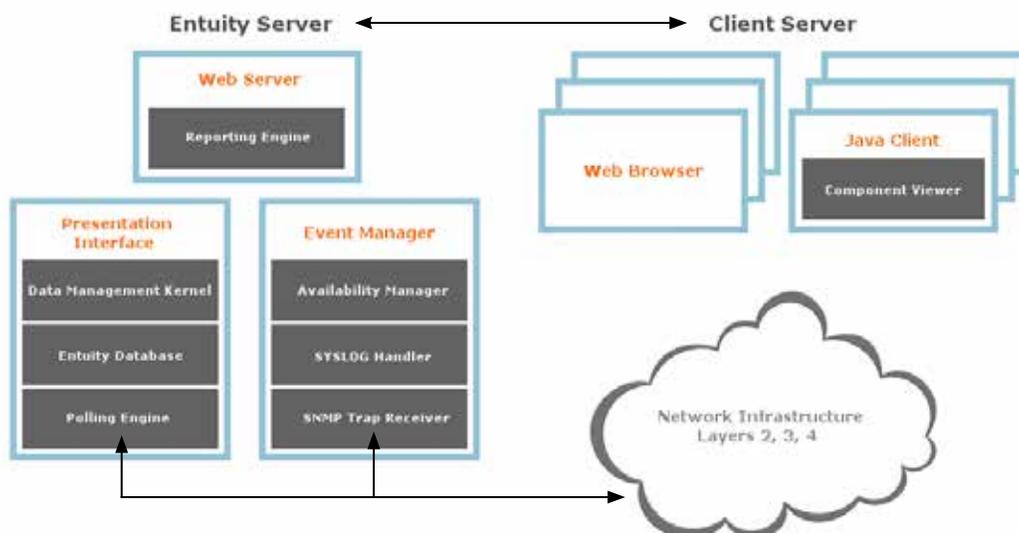
Event Management System

Traditionally, advanced event management systems have involved complex scripting and debugging. The Entuity embedded Event Management System (EMS), delivers the benefits of enterprise-class network event management with major differences from traditional event management systems.

The Entuity EMS allows users to choose between using a sophisticated set of out-of-the-box rules or customizing the system to handle events based on defined conditions and specific work-flows. All of this can be done through the Entuity web interface. All SNMP trap handling configuration also can be handled via the EMS web interface to streamline the entire trap handling process.

The EMS Summary screen provides an overview of how the system works, from incoming events (System, SNMP Traps, Syslog, etc.) through pre-storage processing (where rules are applied before reaching the database), post-storage processing (where rules are applied after an event has been stored to the database). Finally, multiple events are combined (correlated) into "Incidents," which are raised in response to one or more events to indicate that there is a situation that needs attention. In this way, they help to prevent event management overload.

Rules are the heart of the logic within the EMS. Every event that is generated by the system is processed by some or all of the rules. They can be configured to be processed either before or after events are stored in the database and forwarded to external or third-party event handling systems such as BMC TrueSight Operations Management or Oracle Enterprise Manager. In addition to the over 350 System Events that are shipped with the software, the EMS includes a dozen predefined rules, such as N of M/Holdoff, Flapping Detection, Pattern Detection, and Event Enrichment, as well as built-in automated escalation and notification.

Users can also create custom rules and events within the EMS can also be "enriched" with extra information (such as source device type and location).
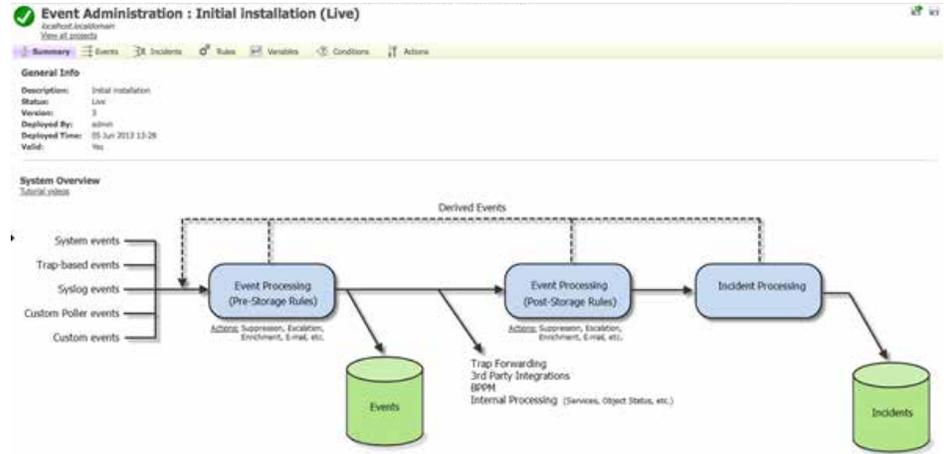
The Entuity EMS Summary Screen provides an overview of how the system works

Powerful Analytics

Entuity has powerful analytics that process events and network topology data, including:

Spatial Correlation. Spatial correlation for event management uses Entuity's knowledge of the logical relationships and interconnectivity between managed elements to determine root cause events. Root Cause Analysis exposes what problems need to be prioritized so that service outages and Mean Time to Repair (MTTR) are kept to a minimum. Knowing what to work on first in a complex environment requires knowledge of the inter-dependencies between networking equipment, servers and applications. Entuity has this knowledge, maintained automatically in realtime, and uses it to provide meaningful information for decision making.

Sequential Correlation. Sequential correlation to analyze the sequence of events enables Entuity to determine persistent and severe

events presented in the web UI for tracking. These are the events that are most likely to cause service interruption.

Impact Analysis. Impact analysis correlates network events with application services to prioritize event management.

Actionable Information Delivery and Reporting

The Entuity web-based report builder creates actionable and graphically descriptive reports to keep both business and IT organizations aware of network performance results. There are over 100 out of the box reports that can be generated and the reporting engine delivers results in a variety of formats to meet most business needs, including PDF, HTML, XLS, CSV, RTF, DOCX, XLSX, ODF, ODS and XML. Entuity reports can be scheduled for automatic creation and email distribution, streamlining and minimizing the administrative overhead of report generation activities. There are reports specifically created for executives/CIOs/CEOs, business managers and IT personnel with summary and details that leverage the data maintained in the Entuity database in a format that these varied audiences can easily understand.

Entuity reports have hyperlinks that can be used to drill down for additional detail. Reports are categorized by functionalities that include: Activity, Administrative, Availability, Connectivity & Routing, Green IT, Inventory, Services and Virtualization Reports.

The extensive network data captured by Entuity and visualized through its rich catalog of reports equips IT organizations with accurate data for better network analysis. Customers can also create custom reports for their particular use using a drag-and-drop web based facility. All these reports provide the quantitative results that permit efficient, precise network management.

The Entuity Architecture

Entuity is built on an extensible, peer-to-peer federated architecture. All of Entuity's core functions have identical demands of and connections to the underlying architecture. This allows scaling to be done simply by adding instances of the all-in-one server.

Each server is responsible for all of the monitoring for a portion of the network, and interfacing of the servers is transparent to administrators and users. Servers communicate with each other to coordinate division of labor for service delivery.

An embedded database at each server means that data is collected and stored locally instead of having data storage and processing concentrated at a centralized database, which would introduce a bottleneck and a single point of failure, as with some other solutions.
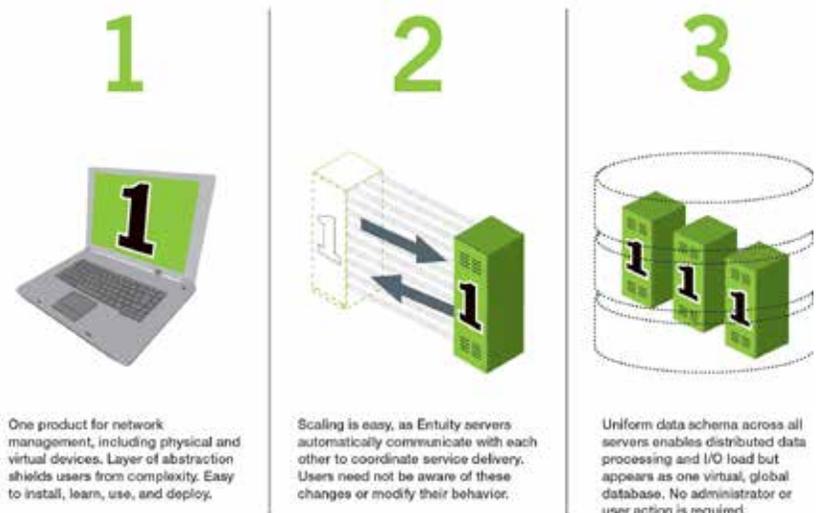
Entuity Device Modeling Framework

To facilitate fast integration and management of new device types, Entuity is designed with a robust modeling framework. This framework can quickly map the characteristics of any device type or previously unknown network object that has the characteristics of one or more of the traditional types of devices, such as a router with switching capabilities or even load balancers. This ensures that new device types can be put under management quickly for maximum coverage.

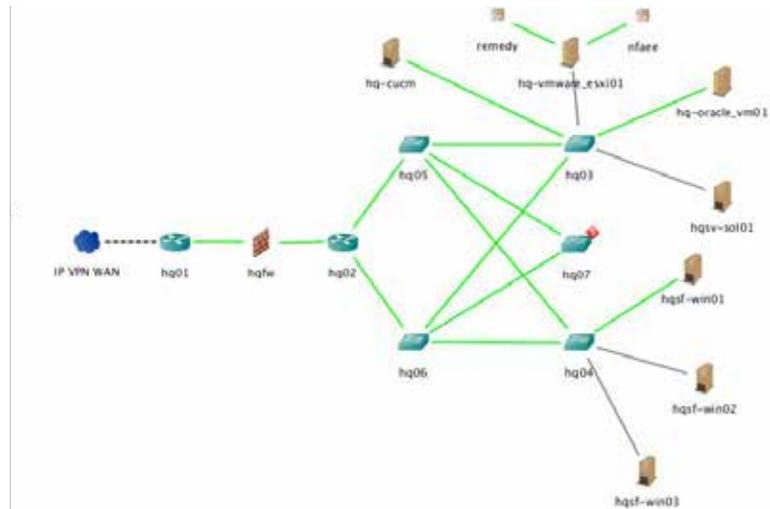## Integration with Industry Leaders Adds More Value

Entuity seamlessly integrates with leading third-party frameworks such as BMC, Oracle, HP, and IBM. This creates a uniform way to share network infrastructure data with application monitoring for a far-reaching management platform.

In addition to SNMP trap forwarding, the event export API exports realtime Incidents in a highly configurable manner (see "Event Management System" section above). IT teams can effortlessly drill down on Incidents sent to third-party applications via Entuity and its context-sensitive cross-launching capability.

Entuity topology maps illustrate both physical and virtual devices and are continually updated

Dynamic Thresholds to Baseline "Normal" for More Thorough Alert Management

Dynamic thresholding functionality to baseline network operational characteristics provides another level of visibility to normal operations. It allows IT managers to effectively prioritize and manage performance anomalies, alerting only when in violation of the baseline. This reduces the operational expense of unwarranted troubleshooting and unnecessary incident follow up.

Entuity's dynamic thresholds are calculated based on a running four-week sample for each relevant monitored attribute. The associated event/Incident generation can be enabled or disabled on a per-device basis, and overridden at a port level in a similar manner to Entuity static thresholds. An absolute tolerance can be specified for each dynamic threshold, generating alerts when polled attributes are compared against the baseline values and are seen to be too far above normal for that hour of the week.

Services Model to Represent Dependencies

Entuity services modeling provides a facility to create collections of components along with a range of logical operators to accurately portray complex dependencies. Defining representative services, IT can monitor and manage how the network infrastructure is serving business needs rather than just the status of individual devices. Service statuses are directly mapped to their effect on business. Operational anomalies, alerts or outages of any underlying components are visualized against the services, for insight into business impact.

Also, an "Applications View" allows users to view, add, edit and delete applications against a device while the "Applications Summary" dashboard shows details and history for individual application instances. Network outage events are shown against the device that indicates any impacted downstream network devices, servers or applications.

Flow Monitoring Adds Sophisticated Traffic Management

The ability to monitor traffic flows within a network management environment delivers a necessary piece of management capability for bandwidth-hungry applications. Entuity offers two built-in flow-based solutions that complement its element monitoring expertise. The first, Integrated Flow Analyzer (IFA), is included in the Entuity base product at no extra charge. Suitable for basic traffic troubleshooting over a small number of interfaces, IFA provides reatime reports with 5-minute aggregates for the prior two hours up to daily aggregates for up to 35 days.

The second, Integrated Flow Analyzer Premium (IFAP), is for those who want more detailed information about network traffic over a small to medium number of interfaces. IFAP's advanced analytical capabilities include real-time visibility into top conversations, extensive reports with 1-minute granularity, custom breakdowns, adjustable data retention settings, flexible grouping controls, and the ability to store years of rolled-up data. IFA Premium is available through a licensing fee that includes unlimited use per physical site.

Both IFA and IFAP support NetFlow versions 5, 7, and 9 (support for the most commonly used templates), IPFIX (support for the most commonly used templates), Netstream versions 5 and 9, JFlow (for Juniper) and sFlow versions 4 and 5. NetFlow and sFlow are supported in both sampled and non-sampled modes.

Entuity Network Management Flow Summary screen

Entuity Insight Center Shows How the Network is Supporting the Business

Measuring the business value of IT is critical to a company's success. The Entuity Insight Center is a set of dashboards called "Perspectives" and linked reports that showcase tangible network results in terms of business operations. Examples include Service Delivery, Network Delivery, Green IT, CIO, Virtualization and Branch Office Perspectives. These Perspectives can be customized to your needs and can aid in:

- ✓ Reducing capital equipment costs

- ✓ Improving capacity management

- ✓ Better resource utilization

- ✓ Reducing energy costs

- ✓ IT efficiency for both network infrastructure and services delivery

- ✓ Business-to-IT Alignment (e.g., how are my Services performing to particular groups and where are changes needed?)

- ✓ Generating reports for results and improving communications with non-IT audiences

Entuity Modules Supply Extra Functionality

Entuity Network Management also contains an integrated set of add-on modules that provide specific management capabilities such as, IBM BladeCenters, Cisco Unified Communications Manager, Firewalls, Cisco IP SLA, MPLS, Quality of Service, Wireless, High Availability, Routing Protocols, SSL Proxy Services, VPN Gateways and Power over Ethernet.

Integration with SurePath Application Path Monitoring

SurePath is a software solution from Entuity that provides near realtime application path monitoring and analysis. SurePath uses patent pending algorithms to automatically discover, typically in 30 seconds or less, the actual path(s) that interconnect clients and servers (or servers and servers) responsible for delivering an application service between two points anywhere on the network, with layer 2 and 3 visibility.

It can be used for troubleshooting application performance problems or for ongoing monitoring of paths as SurePath provides automatic alerts to changes in application paths.

Although SurePath can be used effectively as a standalone product by both network managers and business units, it also can be seamlessly integrated with Entuity version 15 to further automate path creation and integrate path details into services, dashboards, and reports in the Entuity system.

The Entuity CIO Perspective—one of several executive dashboards available from the Entuity Insight Center

Together, Entuity and SurePath deliver important benefits:

⊘ Application focused network management by enabling users to focus on the exact components underpinning a given application service.

⊘ Ease of use through increased automation, consolidation of Entuity and SurePath UIs, and automated service and path creation.

⊘ More proactive path monitoring due to deeper path insight and the ability to quickly view path status and details.

⊘ Increased Security through Entuity's advanced access control features.

Supported Platforms

Entuity is available on the Windows Server 2008 (R2 and SP2), 64-bit, Windows Server 2012, 64-bit, Red Hat Enterprise Linux and Oracle Linux, 64-bit, Microsoft Hyper-V Server and VMware ESX/ESXi Server.

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