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# Consolidating HFC Device and Network Management and Monitoring under SCTE HMS SNMP

## NuDesign OEM Product Family

The SCTE HMS subcommittee has devised an extensive set of standards for outside and inside HFC plant management. These standards are based on SNMP management protocol and contain sets of SNMP MIBs for different classes of HFC devices.

NuDesign's embedded and PC based SNMP products provide for integration of customer systems with innovative SNMP technologies to proactively manage and monitor existing headend devices, HFC access infrastructure and advanced digital IP packet services using standardized HMS and IETF MIBs.

All products are available in a rack-mounted or standalone, embedded card versions. Custom form factors, and product's port into specific embedded environment inquiries are welcome.

## NuDesign OEM Product Family – Why?

Deploying HMS SNMP management and monitoring products improves your ability to detect, filter and consolidate critical alarm information from your HFC devices and network. These alarms can be viewed from SNMP based NOC Stations or Web Browsers. NuDesign's HMS SNMP products will quickly add these capabilities to your own devices.

## NuDesign OEM Product Family – How?

**Call us now!** We will adapt our software to your unique requirements; whether it is a legacy protocol accommodation or integration with your specific product. You will be shipping soon, with NuDesign standing by to help you support and evolve the product.

**Next step** – let us understand your needs and requirements. We can tailor our product to your environment and let customers enjoy the benefits of integration, increased visibility and remote, web based accessibility.



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## **SCTE HMS SNMP Proxy Agent for Headend Devices**

### **General Description**

The SCTE HMS SNMP compatible NuDesign Proxy Agent equips any headend device with SNMP capability. The Proxy embedded board connects to the network via the Ethernet port and to the headend device via system specific serial connect, optionally daisy chaining a number of option cards in a multi-card environment. Such serial access interface (such as a RS485 port) is also used to instrument pre-coded HMS MIBs subagent.

The Proxy contains NuDesign's extensible SNMP v1/v2c or v1/v2c/v3 Agent with MIB II and a set of HMS MIBs, selected for inclusion based on customer's product functionality. In addition, the specific custom MIB is added to accommodate device's unique features that are not covered by the HMS MIBs.

NuDesign's automated SNMP Agent Visual Code Generator facilitates very rapid development of custom MIB subagents. The typical MIB software project is completed in a fraction of time it takes in a traditional environment.

### **Benefits to the Customer**

The SNMP Proxy Agent for headend devices enables consolidation of device management and monitoring functions under a standard SCTE HMS SNMP protocol domain. It paves the way toward unified management applications that lower the operational cost, since MSO staff will not have to get familiar with many different proprietary management applications and interfaces but focus on SCTE HMS SNMP management framework.

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## **Headend Alarm & Event Monitor**

### **General Description**

The Headend Alarm & Event Monitor consolidates SNMP Traps from any headend or cable plant device supporting SNMP with the alarm information from legacy systems. Additionally, it can produce long term trend information and monitor alarm conditions, for any selected SNMP equipped devices, logging or generating SNMP Traps on their behalf.

The Monitor, being a focal point for all SNMP Traps (either received or locally generated as a result of monitoring configured alarms) and legacy Alarm notifications has a number of mechanisms to organize and convey this information to the NOC. It can be configured to build a local Alarm Log MIB, accessible via SNMP query. It can also be configured to preprocess the information and send or simply relay an SNMP Trap, e-mail, or pager notification.

Optionally, an ODBC compliant database update component, allows key network alarm log information to be stored to and maintained, in a relational database.

All configurations are controlled via an SNMP MIB that enables specification to be created for the update process. The system is dynamic in that specifications can be added or deleted on the fly by creating and deleting entries to a table.

The Headend Alarm and Event Monitor connects to the network via the Ethernet port.

### **Benefits to the Customer**

The Monitor integrates SNMP Traps and legacy system's alarms 'under one roof' exposing the alarm logs as an SNMP Alarm Log MIB along with a consolidated and configurable notification facility. The centralized alarm log information can be viewed via a Web Browser based application or a NOC application.

The Monitor will notify the NOC center of all important events, while localizing most of the management traffic to the local domain network only. This approach greatly enhances the scalability of a network management system.

## **Headend based HFC Infrastructure Monitor**

### **General Description**

The HFC Infrastructure Monitor is a product that, via SNMP, monitors and queries selected cable modems (CM's) and cable modem termination systems (CMTS's). It then builds, an SNMP MIB with instrumentation that keeps track of network RF and selected data layer information to provide current status, performance, configuration and error information, localized to a specific region of RF plant. From this MIB, trends and alarm detection and notifications can be configured, aiding in the monitoring of state and behavior of individual RF segments across the HFC RF infrastructure.

From the alarm conditions configured for this module, notifications alert the NOC or signal other network monitoring processes to automatically deploy diagnostic network resources such as spectrum analyzers.

Optionally, this product can be coupled with data available from your RF monitoring equipment, like spectrum analyzers or NuDesign's IP Packet Services product for cross correlation of status information.

The Monitor supports organization of the cable plant with presentation into regions or segments, utilizing selected devices to characterize each region or segment.

The HFC Infrastructure Monitor connects to the network via the Ethernet port.

### **Benefits to the Customer**

It is crucial that new services, delivered via Cable Modem connectivity, like Web browsing or email, be proactively monitored, detecting problems before they visibly affect the quality of service.

This product monitors quality of delivery via the HFC infrastructure by focusing on configured trends and alarms, RF segment by segment. It is not enough to simply read selected Cable Modem MIBs, only long term trending and cross correlation with CMTS information can reduce the volume of data to meaningful status information.

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## **Headend based IP Packet Services Monitor**

### **General Description**

This component enables automatic baselining of network behavior on IP packet layers. It monitors performance, utilization, errors, protocols statistics, conversations, provides Top N evaluations and long term trending, aiding in a network's fine tuning, proactive problem prevention, troubleshooting and evolution.

The Monitor supports plug-in applets architecture. Applets are added to the Monitor module, to extend it's monitoring capabilities. Applets also provide additional MIBs to the management domain. Applets for monitoring CM provisioning, duplicate IP addresses, URL usage and other aspects of advanced network monitoring are available.

The IP Packet Services Monitor connects to the network via the Ethernet port.

### **Benefits to the Customer**

The IP Packet Services Monitor provides the user with increased level of visibility in quality of IP packet services delivery. It focuses on networking layers, once configured will continually monitor and baseline the network generating meaning alarms in a form of SNMP Traps.