

# SmartStream

INTERACTIVE DIGITAL CABLE SYSTEM



## SDM HIGHLIGHTS:

- Provides cable operators with the ability to monitor and manage all ARRIS digital video network elements (ARPD/RPD, APEX 1000/1500/3000, CS 1000, DAC 6000, IRT, MPS, NC 1500/2000, NE 1000/2000/2500, OM 1000/2000, RADD 6000, SEM).
- Provides a single dashboard view of the status of all ARRIS digital headend devices, consolidating front panel and Java™ Console controls.
- Communicates with devices supporting the BOOTP, TFTP and SNMP protocols for parameter entry, firmware download and alarm forwarding.
- Provides information about network loading and allows performance management of the interactive network, including notification and proactive elimination of network outages.

### Configuration Management

- Java Console Integration
- Centralized Information Management

### Fault Management

- Trap/Event Processing
- Alarm Forwarding
- Interconnect to NMS
- NBI Filtering

### Backup/Restore

- Schedule backup daily or on-demand
- Specify location based on file path (local or network drive)
- Centralized storage of configuration data across all devices

### Tracking of Device Statistics

- OM packet statistics
- DAC program queue

## SOLUTION OVERVIEW:

The SmartStream Device Manager (SDM) interfaces ARRIS headend products with network management systems to relay the health, status and configurations of headend operating elements. The SDM provides an easier and more efficient way to control, manage, and monitor your ARRIS digital headend systems.

### HARDWARE SPECS

The SDM software shipped on an HP DL360 G8 server with the following installed components:

- Intel Xeon E5-2620 Processor (2.0Ghz/6-core/15MB/95W)
  - 8GB DDR3-1600 memory
  - 300GB HDD
  - DVD RW
  - HP 460W Common Slot Platinum Plus Power Supply – for more information please refer to the HP datasheet online at <http://www8.hp.com/h20195/v2/getpdf.aspx/c04111541.pdf?ver=2>
- For more detailed information regarding the HP DL360 G8 platform please refer to the HP datasheet online found at <http://www8.hp.com/h20195/v2/GetDocument.aspx?docname=c04123167>

## CONFIGURATION MANAGEMENT

The Configuration Management component supports the configuration and management of ARRIS headend devices. Configuration information is transmitted to devices on the network and between other SDM components such as the fault management component. The Configuration Management component also receives messages from the network elements that contain parameter information and stores that information for user reference. There are four major functional tasks contained within the configuration management component of the SDM.

These are:

- Parameter Maintenance/Application
- Parameter Validation/Discrepancy Identification
- Device Relationship Management
- Firmware Management

### Parameter Maintenance/Application

The SDM, as the centralized parameter entry device for the ARRIS headend, maintains all configuration parameters for devices. This includes the task of communicating any device parameters that are changed at the SDM level, as well as retrieving and storing any changes made to the device from an interface other than the SDM, such as local element manager changes. The communication of parameters from the SDM to the Network devices will use a combination of BOOTP and SNMP protocols.

### Parameter Validation/Discrepancy Identification

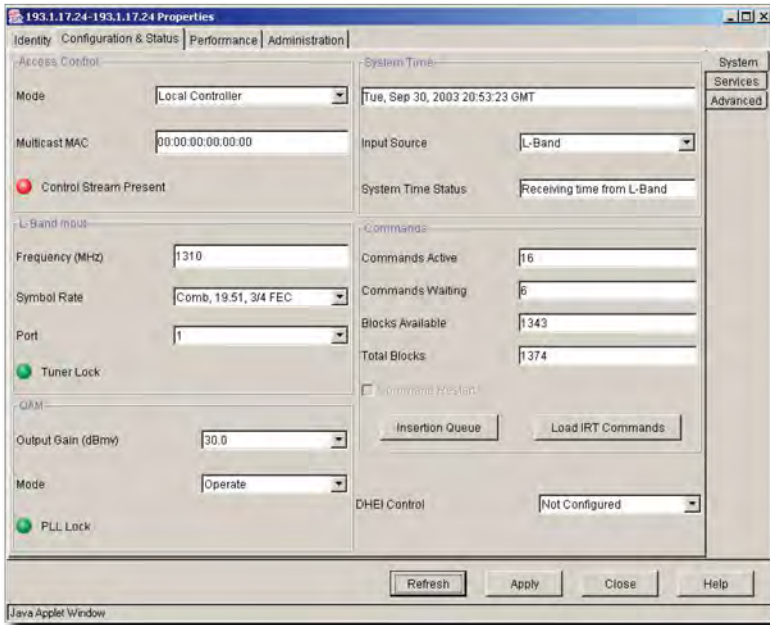
The SDM verifies that individual device parameters are valid for the specific application and do not conflict with parameters entered for other devices. Additionally, if there is a discrepancy between the SDM entered value and a value retrieved from the device during a device poll or in response to a configuration change trap, the SDM will present this discrepancy to the user and allow the user to apply the correct value to the device. As an example, the upstream frequency entered into a advanced return path demodulator must be consistent across the demodulator (ARPD), the interactive network controller (NC-1500) and the addressable controller (DAC-6000). The SDM will ensure this consistency across devices.

### Device Relationship Management

Managing device relationships consists of maintaining ARRIS system topology and identifying devices that work together to support a function, especially when they share parameter values. For example, an ARPD and an NC work in tandem to receive and process PPV purchase data and interactive requests. In the case of the ARPD-NC relationship, the NC must be configured with parameters that pertain to the ARPD, e.g., demod settings. When defining the NC, the user can identify the related ARPD(s) for the NC and avoid entering ARPD parameters that have already been entered directly for ARPD devices. The system uses the related ARPD parameters from the source when configuring the NC. This will be enabled in a future firmware release.

### Firmware Management

The SDM manages firmware downloads to ARRIS digital devices. The firmware management function allows you to view device firmware information, add new firmware, or upgrade existing firmware versions. The mechanism to provide the downloads utilizes BOOTP and TFTP protocols.



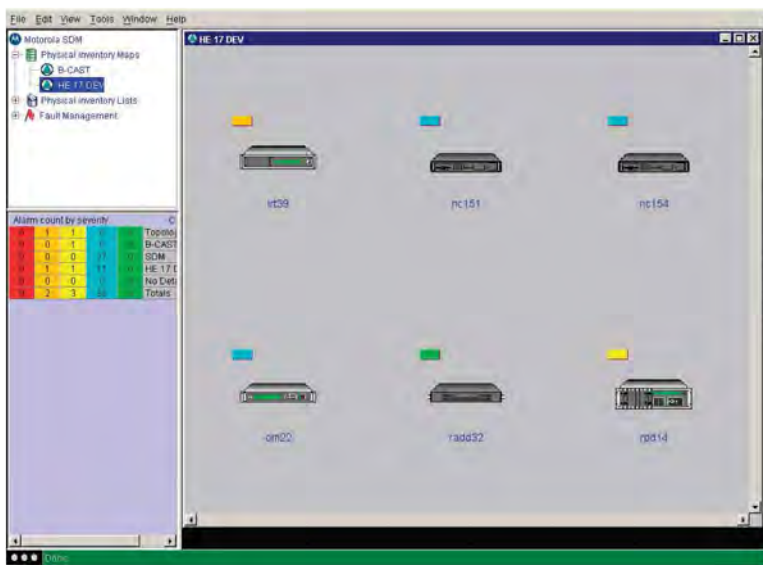
Configuration management allows you to view headend device information and configure headend devices, including setting IP addresses and maintaining configuration information for devices. The device properties window allows you to view or configure device-specific information, including:

- Identity
- Performance
- Administration
- Configuration and Status

The Configuration and Status page enables configuration management and status monitoring for analog and digital device settings as well as information specific to the device you are viewing.

## FAULT MANAGEMENT

The fault manager receives and routes device alarms sent by headend devices. Most often these messages are in the form of traps sent by a device's SNMP agent. For some alarms, the appropriate data may not be contained in the trap. In these cases, the fault manager retrieves the data from the device and either displays it for the viewer to review or passes it to a higher-level Network Management System (NMS). The fault management contained within the SDM is intended to be part of a larger NMS operated by the MSO which will contain additional element managers for other sections of the network, such as transmission equipment or cable modem equipment. The SDM provides an "upstream" or "northbound" interface between itself and the NMS to provide data relating to the ARRIS digital devices. This interface can pass SNMP traps based on criteria such as severity level (i.e. only traps of critical severity), or SDM generated traps which provide for the digital system fault correlation. The SDM currently supports SNMP on this northbound interface and has the flexibility to support additional protocols as required.



In the Physical Inventory Maps view, the colored bar over each device group indicates the aggregate status of all the alarms for the device group.

## Feature to Entitlement Mapping

Feature	SDM Configuration and Enhanced	SDM Configuration only	SDM Enhanced Capabilities only	SDM Performance Statistics	SDM Northbound Interface Filtering	CAST
BOOTP/TFTP Server	X	X				
View/Edit/Report Device Configurations	X	X				
View/Report Device Status	X	X				
View/Report Device Statistics	X	X				
Device Discovery	X	X				
Device Add/Copy	X	X				
Device Configuration Utilities	X	X				
Mass Configuration	X	X				
Manual Configuration Sync	X	X				
Periodic Configuration Sync	X		X			
Group Management	X	X				
User Security and Auditing	X	X				
Entitlements	X	X				
Trap Forwarding	X		X			
Rcv and process traps/notifications from external devices	X		X			
Event Processing	X	X				
Event Filtering	X	X				
Event Viewing and Reporting	X	X				
Alarm Processing	X	X				
Alarm Filtering	X	X				
Alarm Viewing and Reporting	X	X				
Modify Alarms	X	X				
Northbound Trap Processing	X		X			
Northbound Trap Configuration	X		X			
Northbound Trap Filtering					X <sup>1</sup>	
Periodic Status Polling	X	X				
Communication and Interface Alarm Processing	X		X			
Manual Status Polling	X		X			
Periodic Alarm Sync	X		X			
Manual Alarm Sync	X		X			
SDM Health Reporting	X		X			
SDM Statistics	X		X			
SDM Statistics Alarm Thresholds	X		X			
Device Performance Poll				X <sup>1</sup>		
CAST Support						X <sup>1</sup>

<sup>1</sup> Note: Requires Enhanced Capabilities

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