



# *Introducing iDirect Technologies*

## *Installation, Operations & Maintenance (IOM) - Level I*

*iDS v8.0*

*August 2007*

*Chapter 1*

## **iDirect Technologies Technical Training Manual**

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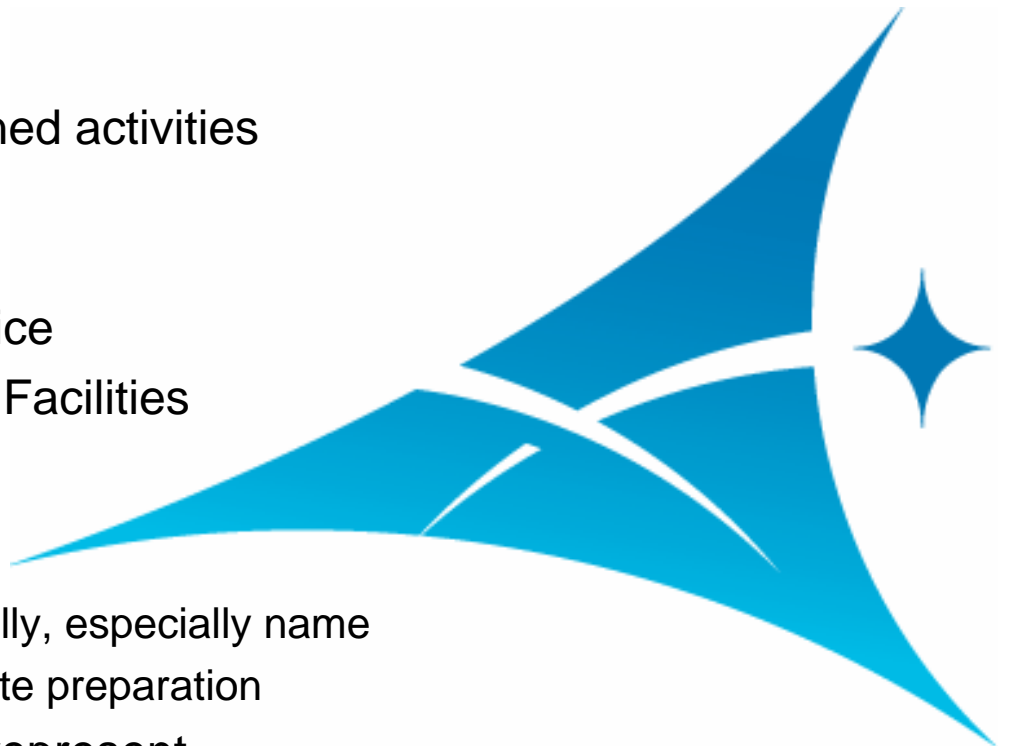
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## Administrative

- ✦ Schedule for the week, planned activities
  - Course Syllabus & Agenda
- ✦ Course materials list
- ✦ Refreshments and food service
- ✦ Creature Comforts and Rest Facilities

## Introductions:

- ✦ Name
  - Complete Class Log carefully, especially name
  - Log entry used for Certificate preparation
- ✦ Company/Organization you represent
- ✦ Background
  - Experience with Satellite Communication
  - Experience with Data/Voice Communication
- ✦ What you want to learn from this experience



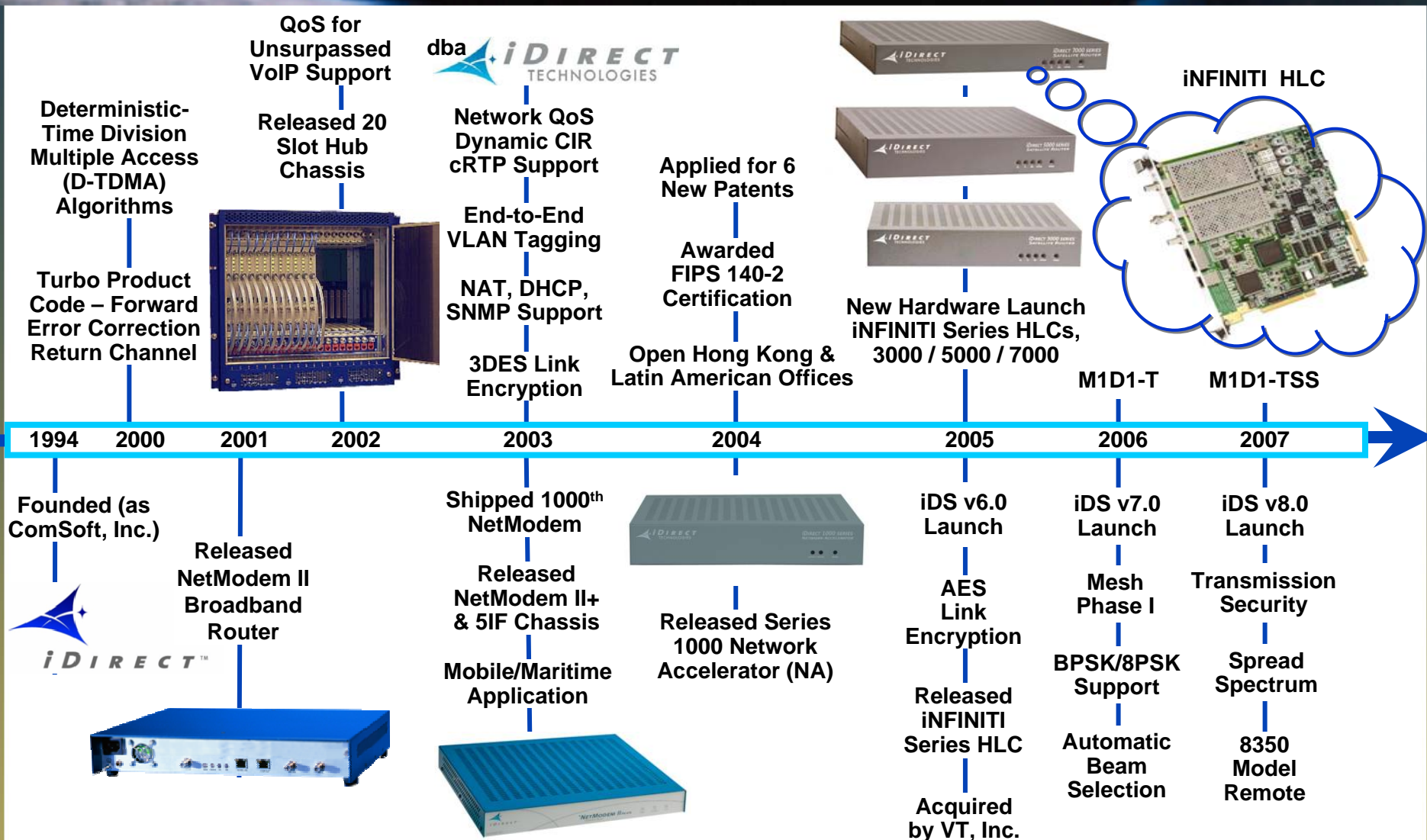


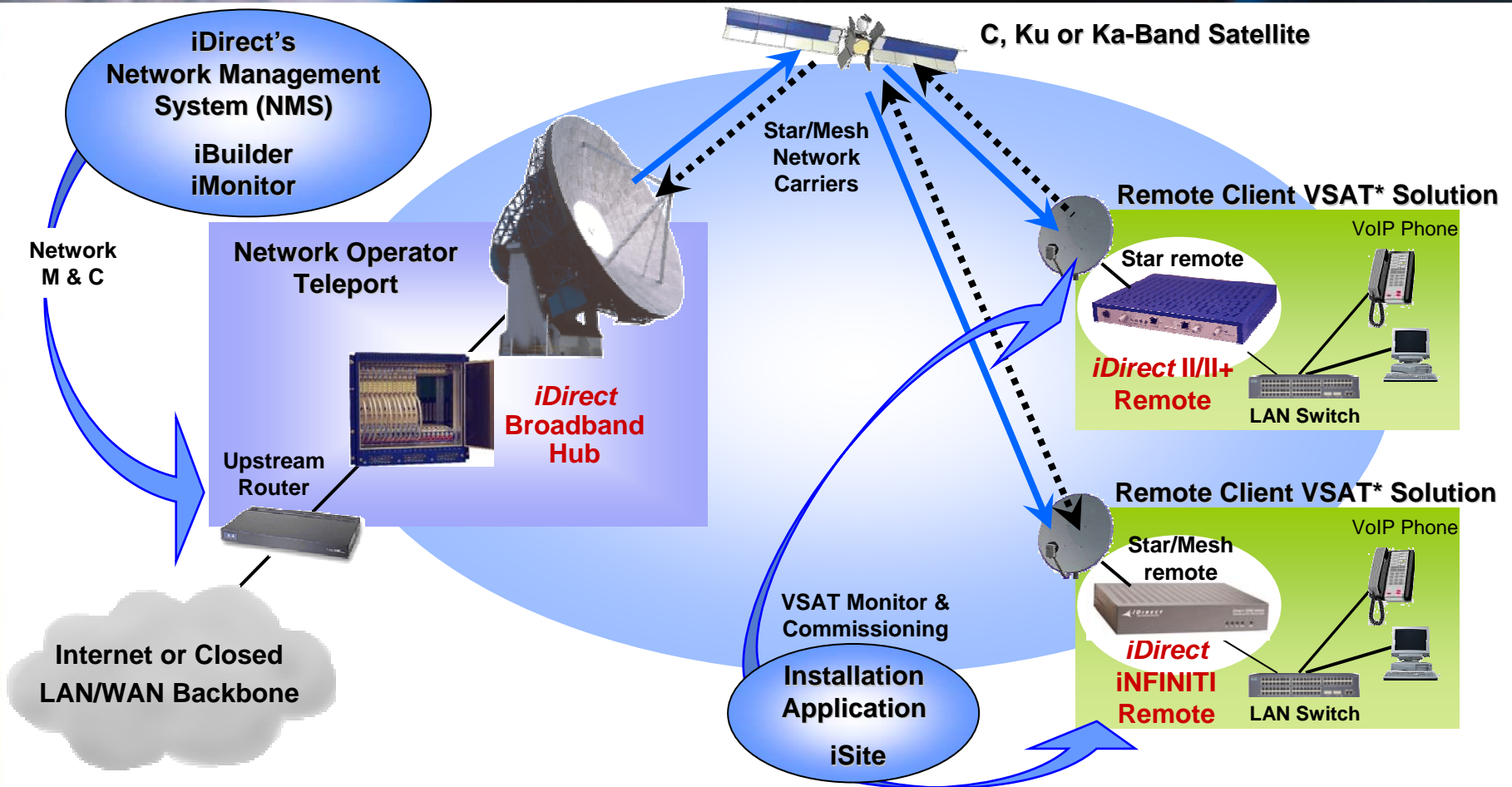
## ✦ iDirect Technologies is A Growing, High Technology Based Company That Produces Innovative IP Based Satellite Communication Products

- ✦ Enabler of *Fast, Easy and Efficient Broadband Access Anywhere!*
- ✦ Products Designed to *Support Enterprise IT Communications Strategy* Leveraging Performance, Bandwidth Efficiency While *Providing Cost Improvements*
- ✦ *Global Partners Provide Rapid Deployment of Consistent, Secure, Business Class IP Access to All Your Business Locations*
- ✦ We Have *Overcome Many Technical Hurdles That Have Plagued Previous Satellite Technologies Such as The Effects of Latency and Satellite Bandwidth Inefficiencies*



iDirect Technologies' Corp. HQ, Herndon, Virginia, USA



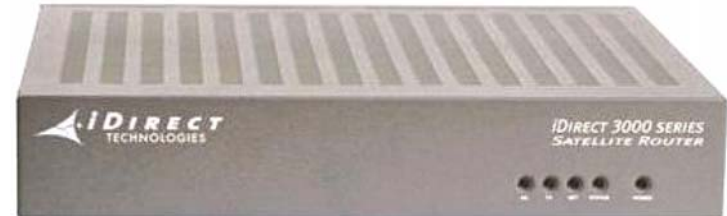


***iDirect's Broadband VSAT Network System Provides Highly Reliable, Secure, Two-way TCP/IP Transmission for High Speed, Multi-media Service Applications.***

\* VSAT = Very Small Aperture Terminal

## Hardware/Software

- ◆ Full Featured Router; Not only a Modem
  - Supports RIPv2 and Static Routes
  - Dynamic Routing Over-the-Air
  - Supports IP Multicast
- ◆ Automatic Network Adjustments (Uplink Control Process – UCP)
  - Remote Site Transmit Power, Frequency & Timing
- ◆ Remote Site Antenna Pointing Support using DC voltage detection
- ◆ Remote Software/Firmware Upgrade (from NMS)
- ◆ ‘Point-to-Point’ iSCPC (requires proper hardware & software package)
- ◆ Console/Telnet Interface Commands w/Secure Logins
- ◆ Automatic Redundancy (since iDS v6.0↑)
  - Hub Line Card supported, (enhanced beginning iDS v7.0.5)
  - Protocol Processor supported
  - NMS Server – manual switchover with automatic database backup capability
- ◆ Configurable ‘Mobile’ Remote Support
  - Configurable on a Site By Site Basis
  - Use Either GPS Direct Connection or Console Command Entry





## RF Spectrum

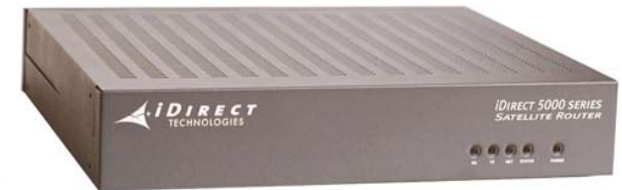
- ◆ Configurable Bandwidth
  - Dynamically Configurable Upstream/Downstream Bandwidth
  - Rate Limiting, Configurable on a Per-Site Basis
- ◆ Support for Multiple Transmission frequency Bands (C/Ku/Ka Band)
- ◆ Dynamic Upstream Time Slot Allocation (via synchronized burst timeplan)
- ◆ Support for Committed Information Rates (CIR)
  - Statically Committed, or Minimum Information Rate (Upstream only)
  - CIR also selectable/configurable per Group QoS Application Profile
  - Sticky, or persistent CIR; custom key feature available
- ◆ Single or Shared Multiple Upstream Channel Support
- ◆ Multiple Forward Error Correction (FEC) rates available
- ◆ Full Frequency Hopping Supported (Multiple Frequency Deterministic – Time Division Multiple Access, MFD-TDMA)
- ◆ 18.2 Mbps Max Downstream Data (Info) Rate for iNFINITI HLC





## Data Transport

- ◆ Configurable Traffic Service Levels
  - Quality of Service (QoS) & Prioritization
  - Configure Upstream & Downstream Separately
- ◆ Dynamic Host Control Protocol (DHCP) Support
- ◆ Network Address Translation (NAT)
- ◆ TCP/Web Acceleration
- ◆ Support for IEEE 802.1p (VLAN Traffic Management Standard)
  - Uses Precedence Bits from IP Headers
  - No Special Configuration Required
  - NAT/Port Forwarding/DHCP per VLAN
  - VLAN Tagging
- ◆ Embedded Link Encryption (3DES or AES)
- ◆ Local, on board DNS Cache Capability
- ◆ FIPS 140-2 Support
- ◆ GRE Tunnel & Data Compression



iDS v7.0.x contains the following features and options:

## **Hardware-related support:**

- ◆ Star and/or Mesh (peer-to-peer) network topologies, (Mesh Phase 1)
- ◆ Global NMS Architecture & Distributed NMS capabilities
- ◆ Enhanced NMS GUI support for
  - Private/Mini-Hubs, iConnex variations
  - iNFINITI Hub Line Card Variations (M0D1-NB, M1D1-SCPC, M1D1-T)\*
  - iSCPC point-to-point product support
  - Narrow Band product support capabilities
    - Rx Only HLC, MaxIR of 256 kbps, or up to 200 kbps IP Rate
    - 3100-NB Remote, Max Upstream IP Rate *Limit* of 200 kbps
  - Integrated 8-port managed switch on iNFINITI 5000 & 7000 Series

## **Reliability and Scalability Features:**

- ◆ Receive Cyclic Redundancy Check (CRC) Error Correlation
- ◆ NMS Archive Database restructuring reducing archive access time
- ◆ System Upgrade & Configuration Assistant (Revision, or RevServer)

\* M = modulator, 1=yes, 0=no  
D = demodulator, 1=yes, 0=no

## iDS v7.0.x contains additional features and options:

### **Performance-related support:**

- ✦ Bi-Phase Shift Keyed (BPSK) Modulation, Downstream & Upstream
- ✦ TCP Payload Compression capability
- ✦ UDP Header or Payload Compression, or both (includes cRTP header)
- ✦ NMS performance improvements
- ✦ QoS Priority & Best Effort Queuing options (CBWFQ remains as before)
- ✦ Improved iNFINITI restart time (reset board OS/application only options)
- ✦ GSM/Cellular Backhaul support
  - 8PSK Modulation (Downstream & Upstream supported)
- ✦ Remotely controllable Continuous Wave (CW) Carrier Generator

### **Mobility-related support:**

- ✦ Global NMS architecture w/network roaming remotes (Licensed feature)
- ✦ Supported only on iNFINITI platform; II/II+ are not capable
- ✦ Automatic Beam Selection, or ABS for true 'mobility' (available only with optionally licensed, Global NMS feature)

## **iDS v7.0.x miscellaneous features and options:**

### **Miscellaneous Features:**

- ◆ NMS Geographic Redundancy (redundant teleport/network recognition in time of catastrophic failure)
- ◆ NMS Geographic Mapping (Licensed feature)
- ◆ Remote-to-Network Locking capability
- ◆ NMS VNO User Groups (Licensed feature)
- ◆ Customer Network Observer (CNO) product (Licensed feature)
- ◆ Warning limit configuration capability via iBuilder GUI
- ◆ Extensions to iDirect NMS SNMP Proxy Agent MIB
- ◆ Line Card Failover enhancements
- ◆ Miscellaneous GUI enhancements



## iDS v7.1.x New Features:

### **Transmission Security (TRANSEC)**

- ◆ Prevents Basic Network Analysis by an Adversary
- ◆ Remote and Hub Authentication using Component Certificates
- ◆ Prevents All Unauthorized Access to TRANSEC Secure Network

### **Faster Acquisition Times**

- ◆ Same Fundamental Acquisition Process Still Used, However Better Use of the Acquisition Data by the Protocol Processor Occurs Now
- ◆ A Common Hub Receive Offset Allows for Reduced Acquisition Sweep Frequency Range, Reducing Time Required to Acquire

### **Remote Sleep Mode**

- ◆ Conserves Power During Periods of Network Inactivity

### **Soekris 1401 Support**

- ◆ Latest Hardware Release required for AES Link Encryption
- ◆ Required (in Protocol Processor) for AES or TRANSEC Enabled Networks

## iDS v7.1.x New Features:

### **Improved Bandwidth Fairness Algorithm**

- ◆ New Algorithm Better Favors Remotes with CIR & Real-Time Demand

### **iWeb API**

- ◆ Option Allowing Development of Custom Applications Using gSOAP Message Protocol
- ◆ Offers Capability to Perform Standard NMS Operations using External Custom Application Interface

## iDS v8.0.x New Features:

### **Group QoS (Quality of Service)**

- ◆ Radically new and improved QoS feature for TDMA networks
- ◆ Allows advanced Network Operators a high degree of QoS flexibility
- ◆ Upgrading to iDS v8.0 involves several important considerations
  - Pre-Release 8.0 QoS configuration is *not* preserved after upgrade
  - New operational paradigm prevents complete preservation of old rule behavior
  - Upgrade allows database conversion of old, pre-iDS 8.0 QoS rules into new Group QoS rules, matching the old rules as close as is possible.

### **Spread Spectrum**

- ◆ Spread Spectrum supported for both Downstream & Upstream carriers
- ◆ Requires specific hardware for both remote and HLC
  - iNFINITI Remote 8350
  - M1D1-TSS HLC
    - Requires 2 dedicated/physical slots in chassis

## iDS v8.0.x New Features:

### **Support for Higher TDMA Data Rates**

- ✦ iDirect networks now support higher Upstream data rates
  - Up to 8.0 Mbps, or 5 Msps
- ✦ HLC must be an iNFINITI M1D1 or M0D1 configured as Rx Only
- ✦ Network must use QPSK modulation & be configured for Star Mode
  - Limited to .793 large block FEC
  - New operational paradigm prevents complete preservation of old rule behavior
  - Upgrade allows database conversion of old, pre-iDS 8.0 QoS rules into new Group QoS rules, matching the old rules as close as is possible.

### **VLAN DNS Enhancement**

- ✦ DNS service is now available per VLAN; no longer only VLAN1 (default)
- ✦ Each VLAN may now have a separate & uniquely configured external DNS server



## iDS v8.0.x New Features:

### **Activity Logger**

- ✦ Viewable via iBuilder account with 'Logger' permissions enabled
- ✦ Displays user activities by account such as logins, resets, downloads, etc.

### **External Device Monitoring**

- ✦ iBuilder now supports the monitoring of devices connected externally to the iDirect hardware platform
  - Addressable devices are monitored using IP & simple ICMP pings
  - Both remote side and/or hub side external devices (defined in iBuilder) can be monitored using the iDirect NMS

### **Fixed Upstream Carrier Assignment**

- ✦ Remotes can now be assigned to a fixed, or dedicated Upstream carrier
- ✦ Useful for isolation of remotes when troubleshooting or testing

## iDS v8.0.x New Features:

### **TRANSEC Hardware Updates**

- ◆ Capability now extends to 8350 remotes
- ◆ Hub supports M1D1-TSS (in addition to M1D1-T)

### **NMS Enhancements & Improvements**

- ◆ Geographic Mapping Enhancements
- ◆ Global NMS Enhancements
- ◆ iMonitor improvements
  - Remote Continuous Wave & Modulated (PN) carrier safety check
  - New Start of Frame (SOF) alarm included
  - Extended HLC failover time (12 sec. to 1 min.)







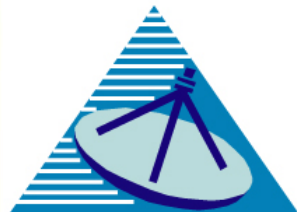
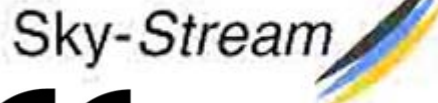
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***Installation,  
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***Introducing  
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***Thanks, . . .***

***Questions? . .***

***Chapter 1***