

Introduction to Genesis Networks

You have only **one shot** to make history.
Put the right network behind you.




www.gen-networks.com

GENESIS
NETWORKS™
Transcending Transmission™ 

WBU-ISOG Atlanta

GENESIS

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Transcending Transmission™ 

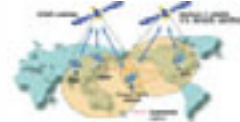
Global Transmission Network Services

- **Leading the Technology Evolution to Video over IP**
 - Flexible & Scalable
 - Supports all Broadcast Standards
- **Global Fiber-Based IP Backbone Network**
 - Sonet reliability; Ethernet Flexibility
 - Guaranteed Quality of Service



Key Attributes

- Global Reach
 - Allows customers to eliminate multiple satellite hops
- Technology: Video over IP
 - Unique Flexibility and Scalability, Supporting all Broadcast Standards and Bandwidth Transmission Rates
 - Uniquely Positioned to Support Global Industry Adoption of High Definition Video
- Reliability
 - Guaranteed QoS via Multi-Carrier Network Carrier Diversity for local and long haul routes
- Unique Customer Management Tools
 - IRIS Provisioning & Management System
 - Network Monitoring



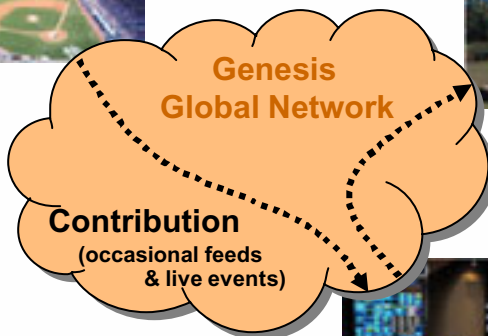
Video Transmission Services (example)



Event Location
(e.g. New York)
Live Program
Origination



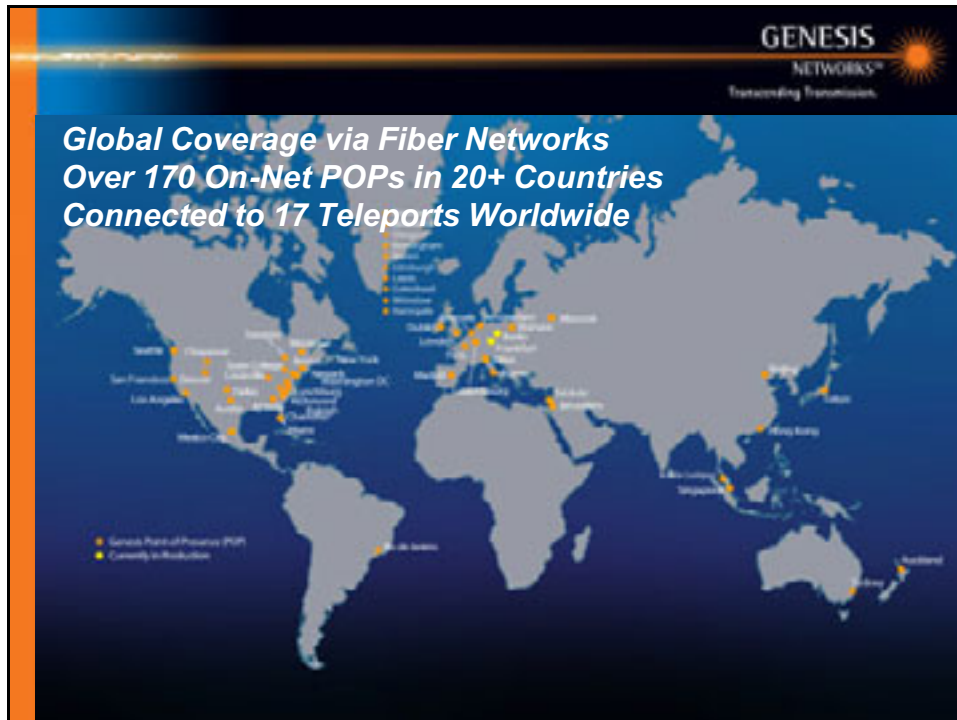
Uplink to Satellite for
Point to Multi-point
Distribution



Distribution
(full-time transmission
to affiliates)



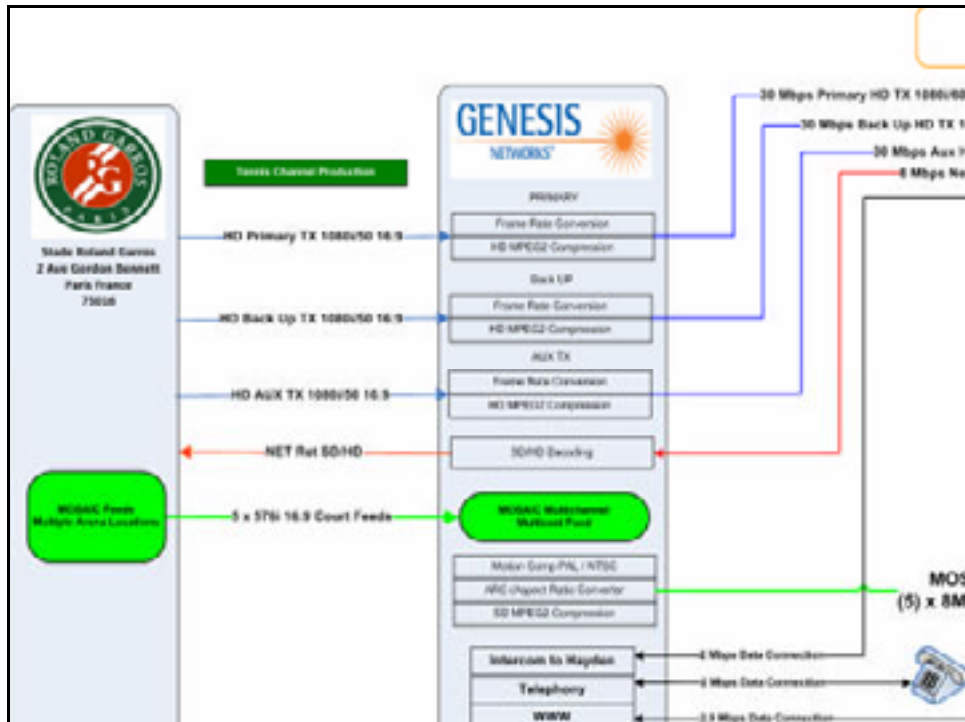
Customer Site
(e.g. Los Angeles)
for Editing &
Production



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Network Architecture / Services

- Next Generation Ethernet Infrastructure
 - Network built on multiple carriers networks added resiliency
 - Highly Reliable Layer 2 Ethernet Infrastructure overlaid onto underlying capacity
 - Multiple Layers of service protection including route & nodal diversity using MPLS
 - Large Multi-Gigabit network support from the edges of the network.
 - Multiple Points of Presence in many markets
- Supports wide range of Video Standards
 - Standard Definition
 - MPEG-2 from 1.5Mbps to 50Mbps – 4:2:0, 4:2:2
 - MPEG-4 / H.264 from 256Kbps up to 20Mbps
 - High Definition
 - MPEG-2 from 10Mbps to 80Mbps
 - MPEG-4 / H.264 from 6Mbps to 20Mbps
 - JPEG 2000 for loss-less compression at very high bitrates 100Mbps+
 - All Standards PAL, NTSC, Analog, Digital, DVB-ASI
- Provide Layer 2 Ethernet circuits for FTP, Comms, Voice applications



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IRIS Software Provisioning System – Network Control

- System provisioning, network bandwidth and resource management.
- Web based customer portal.
- Customers configure their own specific user profiles and security abilities.
- Customer defined “Type Of Service” designed by the customer to meet their specific needs.
- Real time provisioning, control and management system
- Provides the user with real time monitoring, alarming and fault reporting.

- 5 Common Misconceptions

1. IP = The Internet
2. Connectionless – Unpredictable Routing
3. Difficult to Manage
4. IP Networks Cannot Scale Well
5. Unreliable – It just doesn't work
6. High % of Overhead



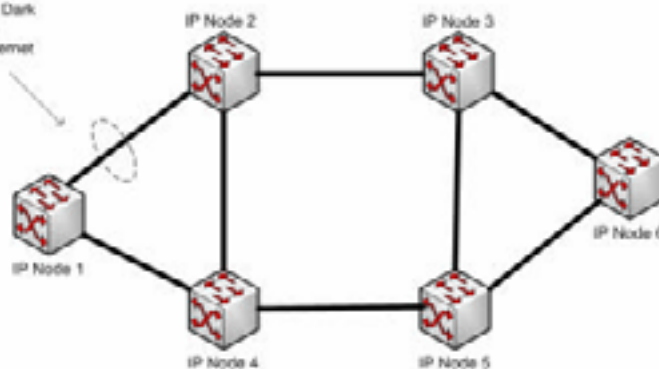
Myth 1 & 2

IP is synonymous with the Internet
IP is connectionless

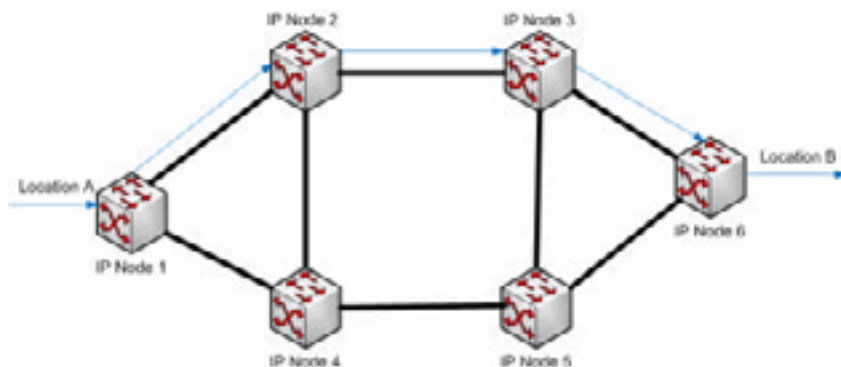
- IP = internet protocol, **not The Internet**
 - IP is a Packet Based protocol that can be used for the transmission of real time data including high bandwidth broadcast video for low latency applications
 - Connection Oriented - *IP Flow*
 - Series of packets based on source and destination addresses
 - After a router looks up the first packet, the route is pushed to the line cards, in the hardware tables **perfect for broadcast video**
 - This is be enhanced by using basic policy based routing and/or MPLS

Inside The Cloud

Dedicated Private Line
Circuits - SONET / Dark
Fiber / SDH /
Wavelengths / Ethernet



IP Flow



The Switch CPU looks up the first packet, then all subsequent packets matching the same criteria will be forwarded in hardware

Myth 3 – IP Networks are difficult to manage

- All networking technologies have a learning curve
- IP is everywhere – home, office, etc.
fundamentals remain the same
- IP is engaging all aspects of broadcasting and transmission
- Technical expertise is widely available

Myth 4 & 5 – IP Networks do not scale well and are unreliable

- Type Of Service Bits
 - TOS bits in IP Header allows Prioritization and Classification of traffic = full utilization while guaranteeing service to broadcasts
 - Most Codec Manufacturers support TOS bits in each IP flow

•MPLS – Multi Protocol Label Switching

- An MPLS enabled network allows the creation of Label Switch Path's (virtual circuit) that can tunnel traffic through the network
 - Traffic Engineering
 - Deterministic Routing
 - Enables proper Bandwidth Management
 - Reliability
 - Build Redundant LSP's
 - Fast Reroute (sub 50ms)
 - Simultaneous IP Services - Hardware
 - Manufacturers will support receiving multiple IP Flows and do protection in the end video devices such has Harris and Medialinks.

Bandwidth Management

- Network Manager needs to ensure no oversubscription of High Priority Flows
- External system required to properly manage broadcasts (i.e. Genesis Networks IRIS)
 - System must know and understand the network topology
 - System must accept and manage all high priority data on the network
 - System must understand all future bandwidth that will be placed on the network

This is true of any networking technology

Why use IP over other networking technologies?

- Multi Switch Vendor Support - Cisco, Juniper, Alcatel Lucent, Nortel, etc.
 - Competition forces rapid feature enhancement
 - Lower Cost of Ownership – 50% below competing technologies
- Widespread video hardware support from multiple vendors
 - Uncompressed SD, HD, MPEG-2, MPEG-4, JPEG-2000,
- Carrier Support / IP Over Everything
 - Telecommunications companies are migrating towards Ethernet based Infrastructures
 - Cost Can be a Fraction of a Typical TDM and SONET based circuits cost
 - Bandwidth Scalability
- Native Multicast Support – Variety of protocols to choose from
- Easy Integration with File based systems
- Single Converged Network – Same Switch Line cards support data / voice / video

