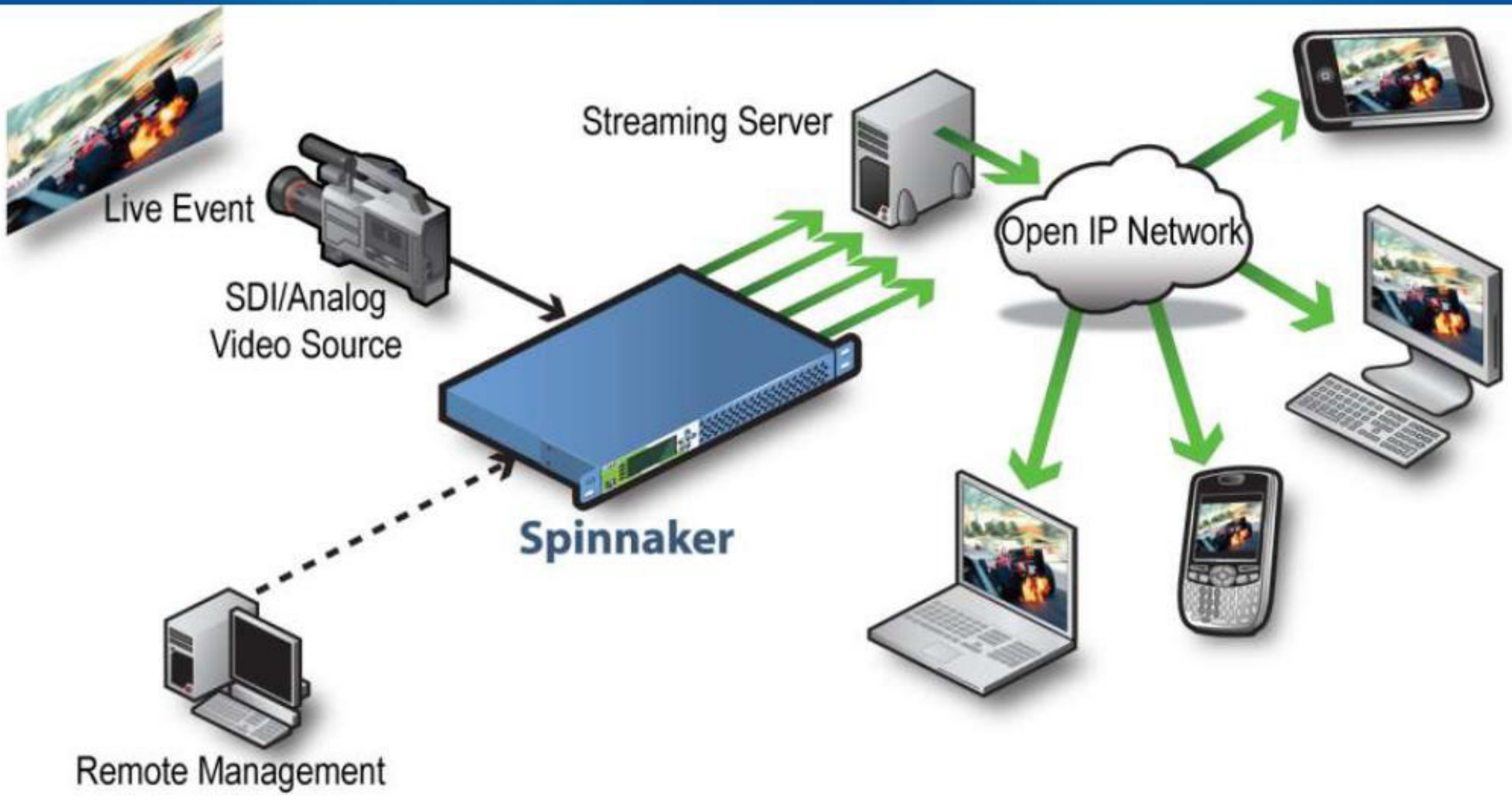
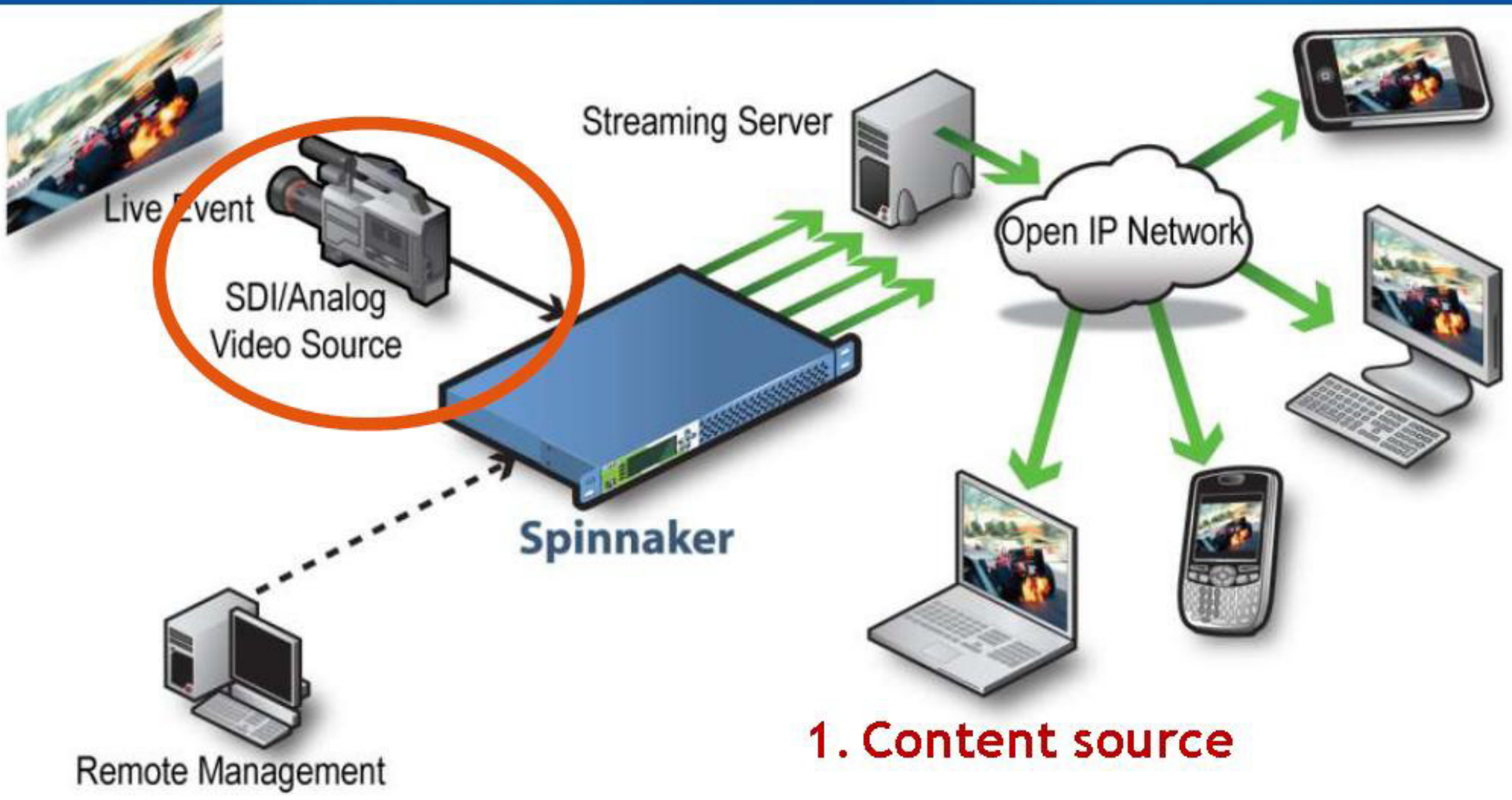
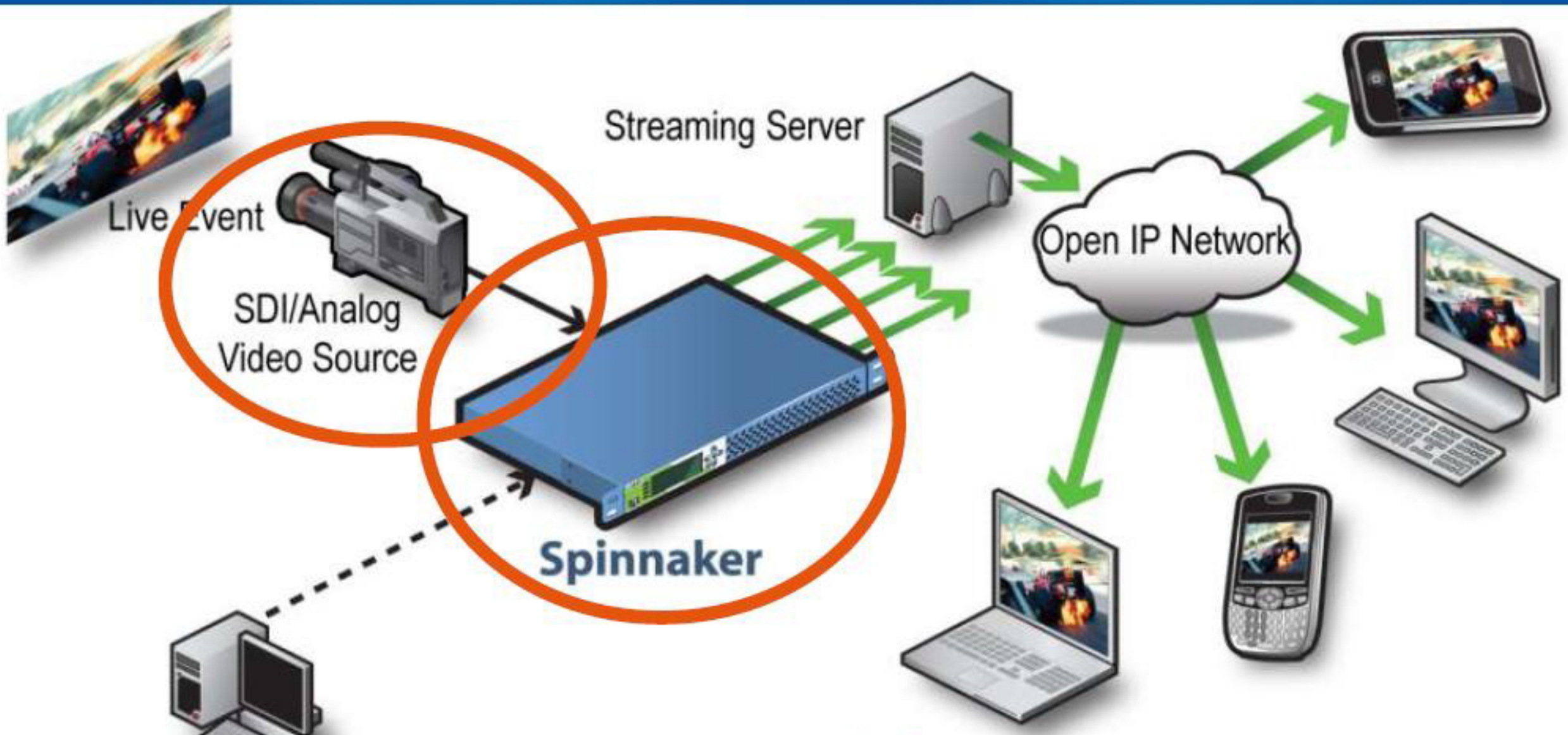
Traditional: Live streaming to Web



Traditional: Live streaming to Web

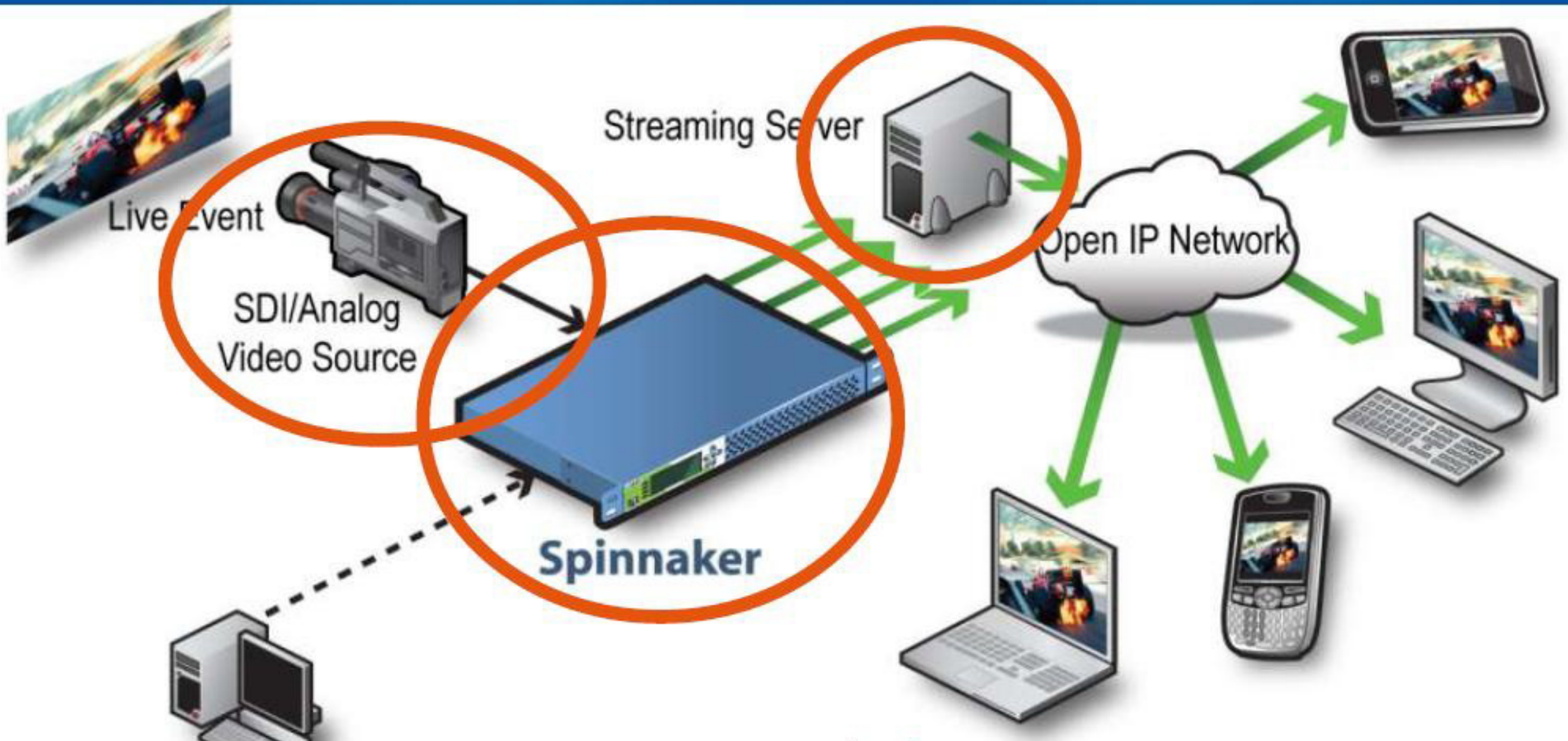


Traditional: Live streaming to Web



1. Content source
2. Spinnaker encoder

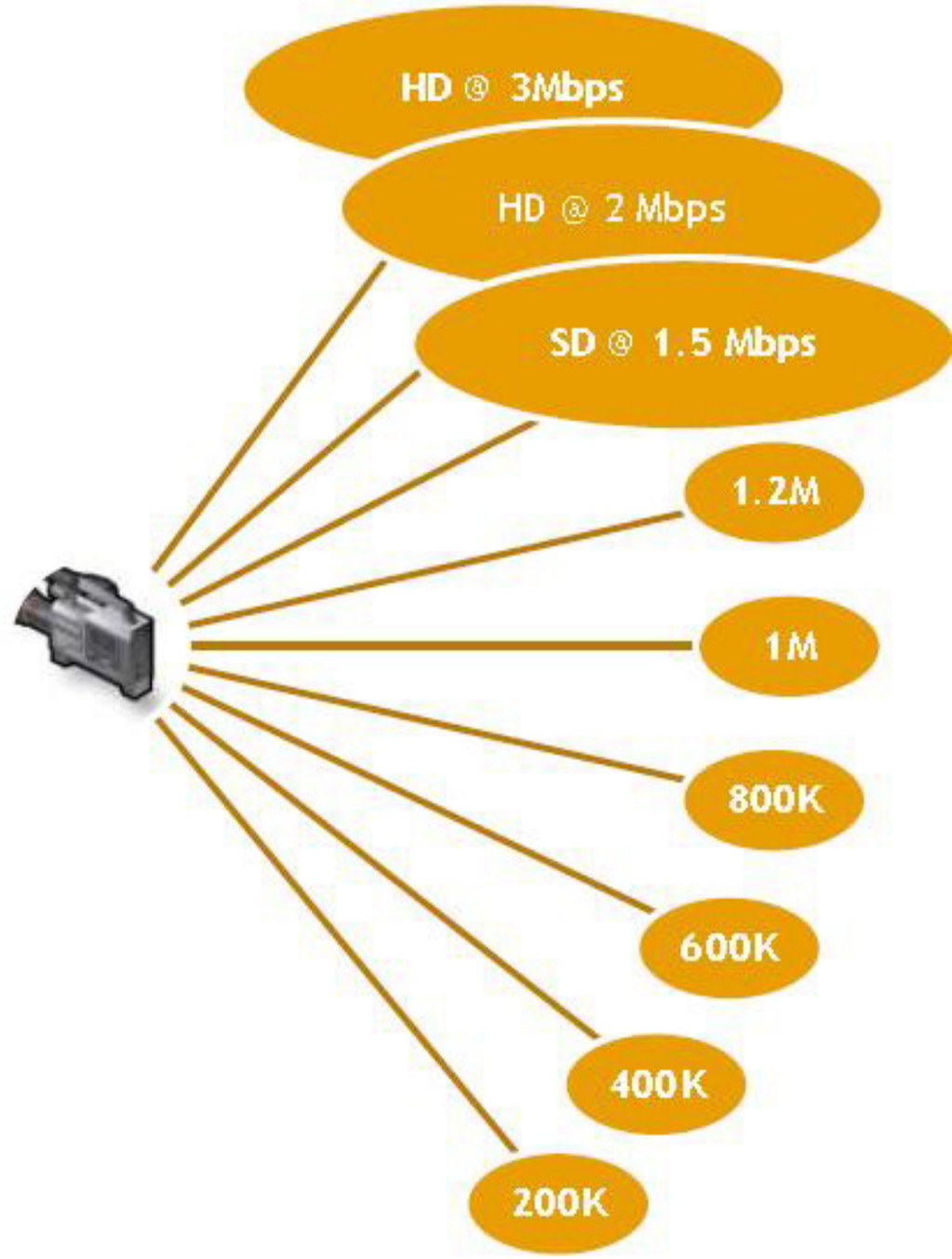
Traditional: Live streaming to Web



1. Content source
2. Spinnaker encoder
3. Streaming Server

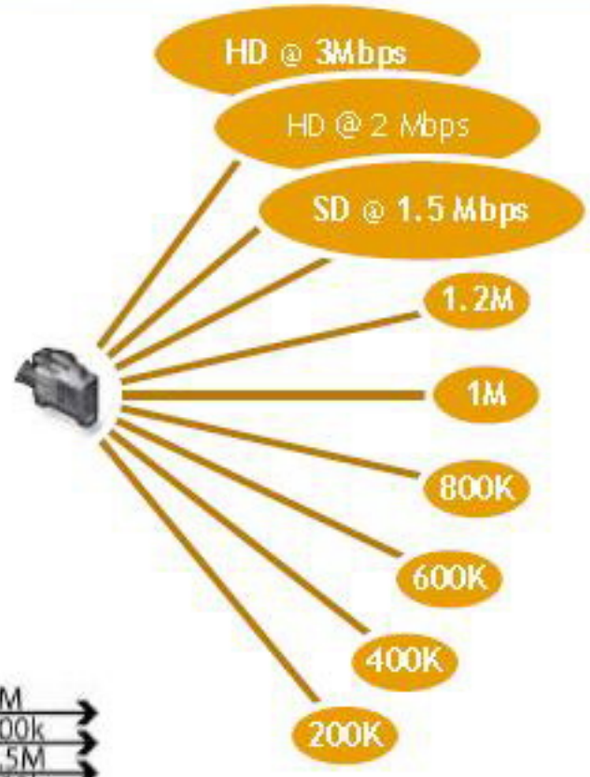
Live Challenges

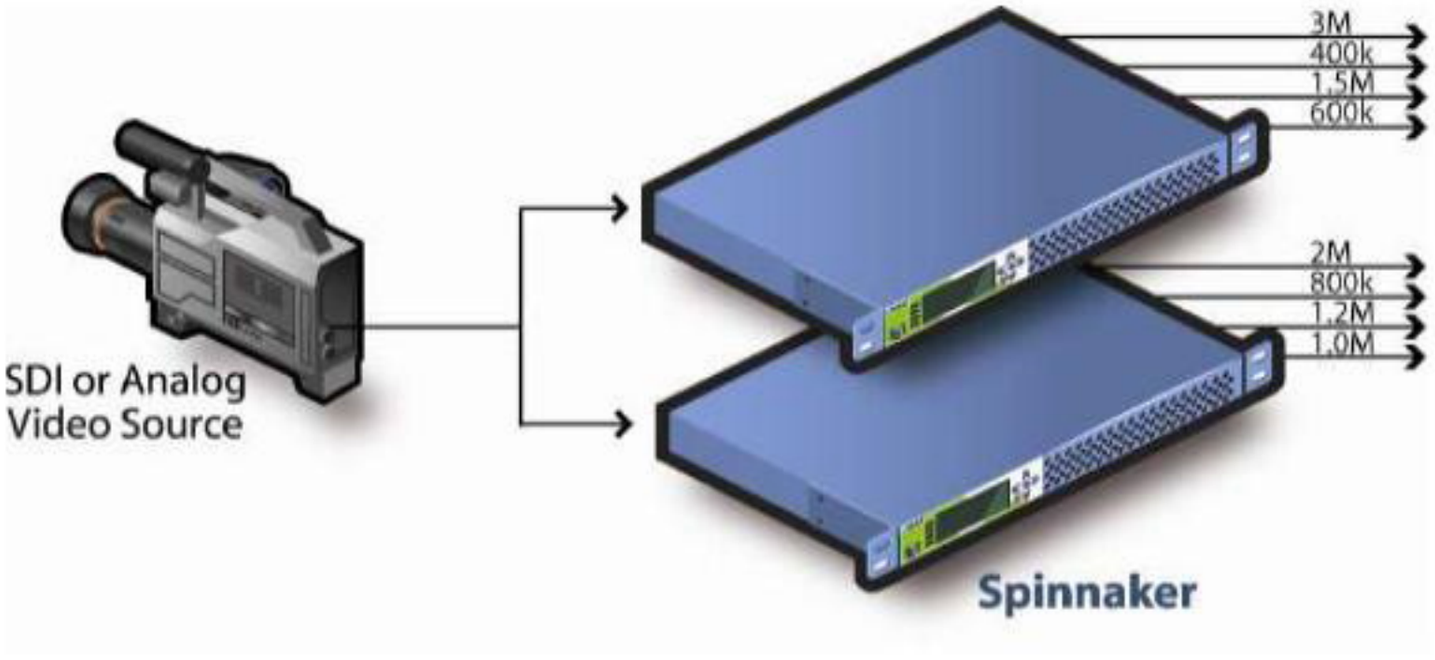
- It happens ONCE!
- One source → many outputs
  - Not all outputs from single encoder



Live Challenges

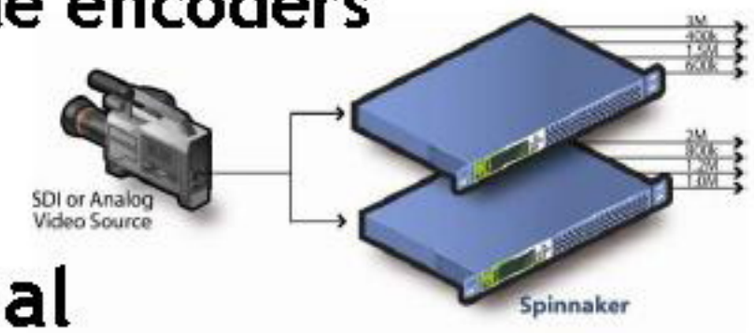
- It happens ONCE!
- One source → many outputs
  - Not all outputs from single encoder
- One source → multiple encoders



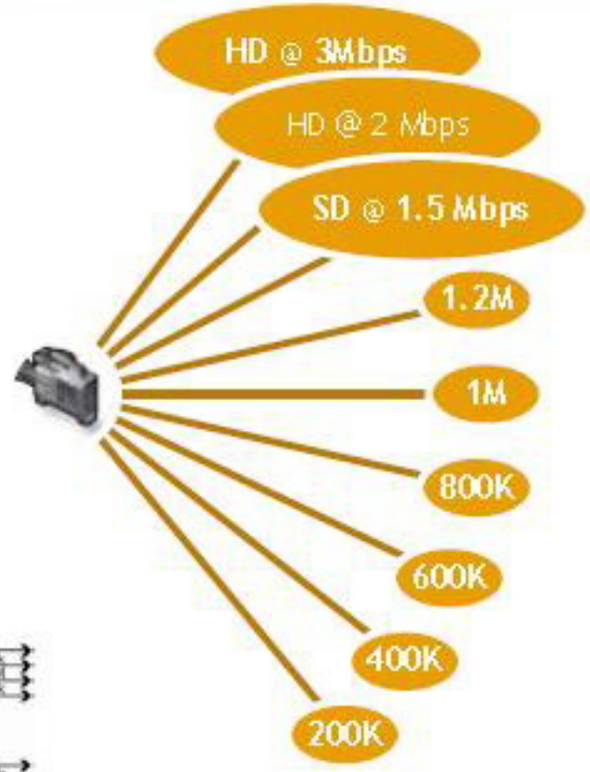


Live Challenges

- **It happens ONCE!**
- **One source → many outputs**
  - Not all outputs from single encoder
- **One source → multiple encoders**



- **Time sync is critical**
  - Frame accurate GOP alignment
  - Frame accurate Time alignment
- **Redundancy must be considered**
  - Failover encoders must adhere to established timing
  - Multi-publish points from encoders

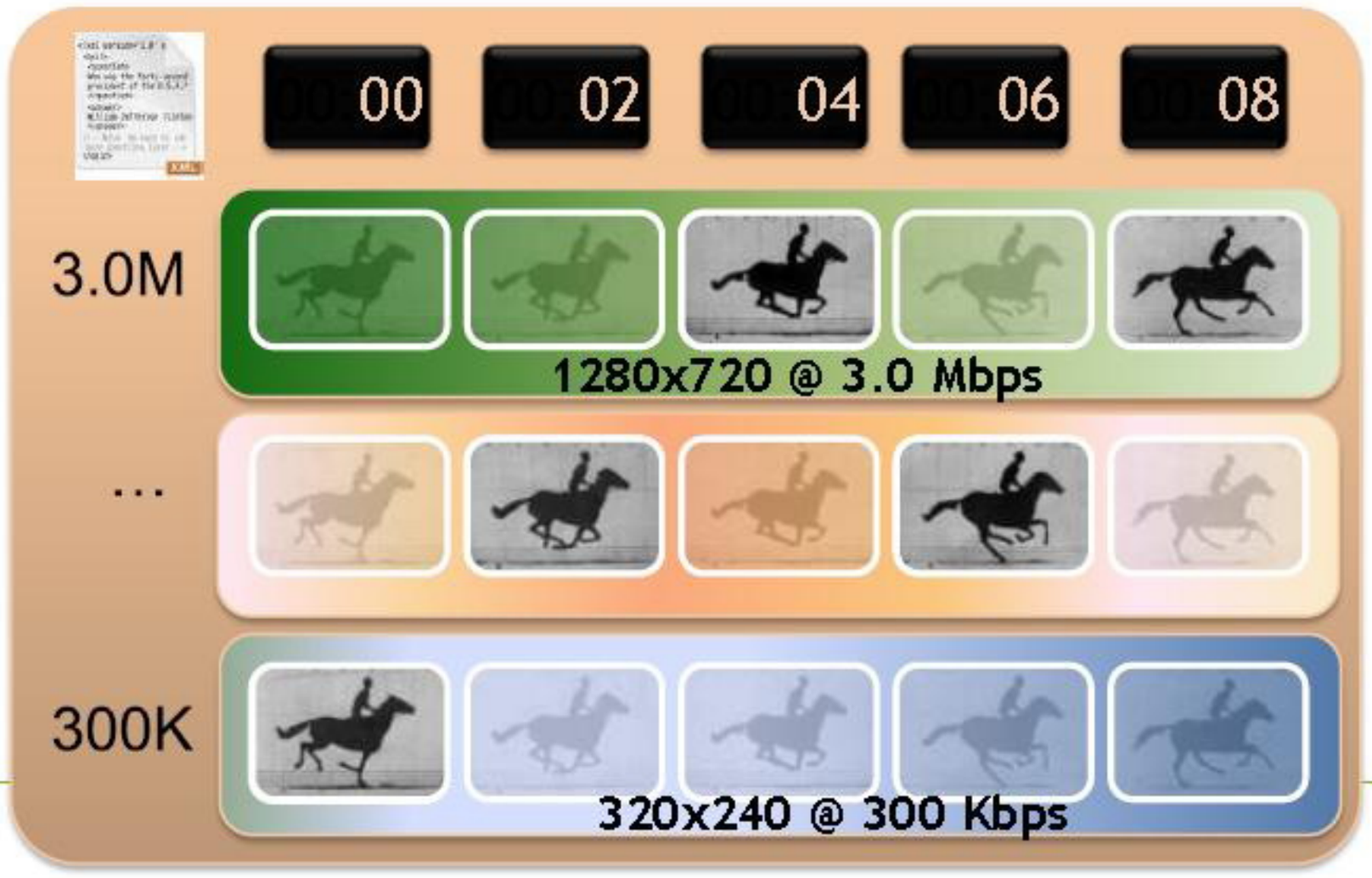


Adapting Bit Rate in Real-Time

Adapting Bit Rate in Real-Time

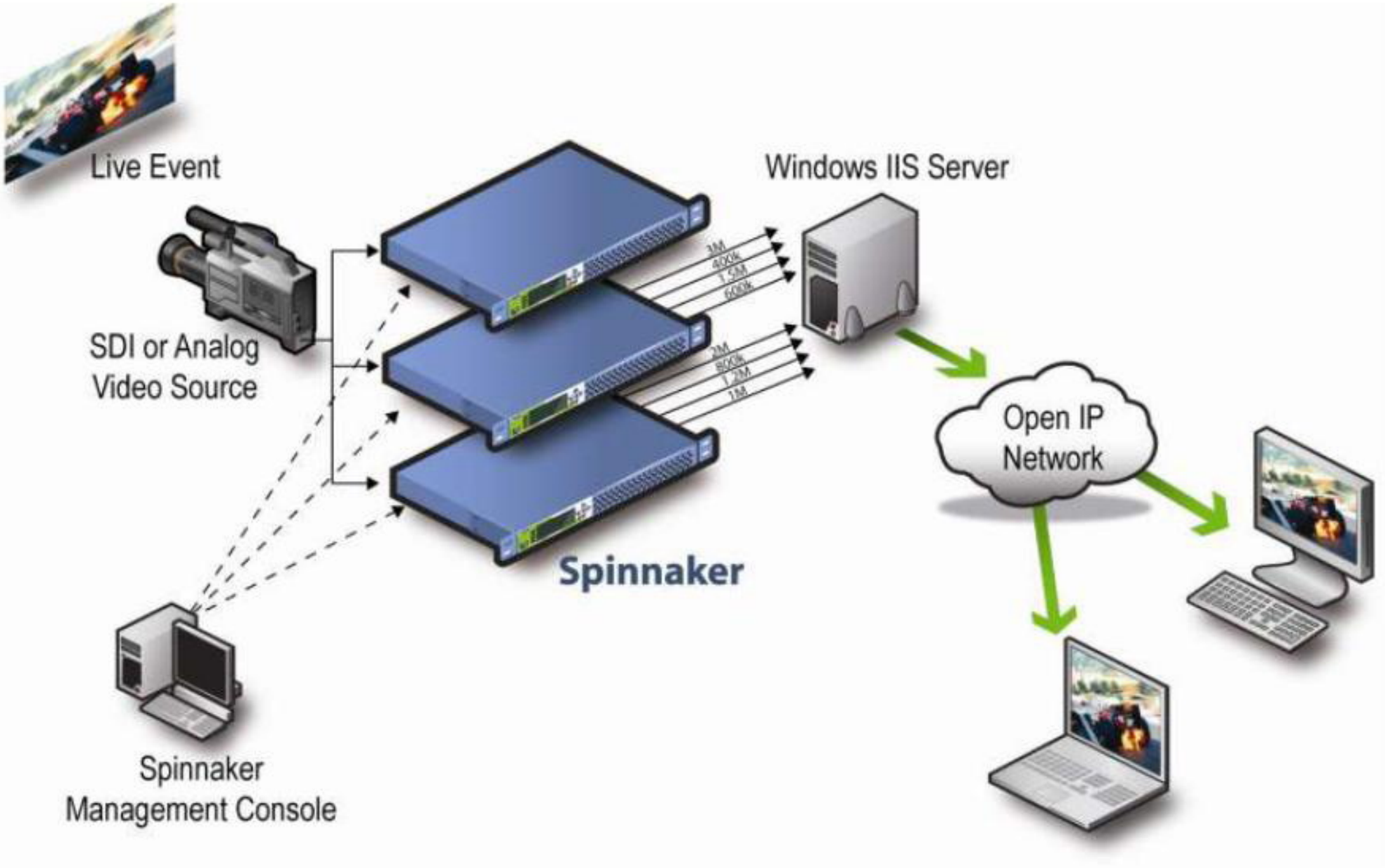
300K @ 00:00?
700K @ 00:02?
3.0M @ 00:04?
1.5M @ 00:06?
3.0M @ 00:08?

300K (start quickly)
700K (good network)
2.4M (great network)
1.5M (glitch)
3.0M (play on...)

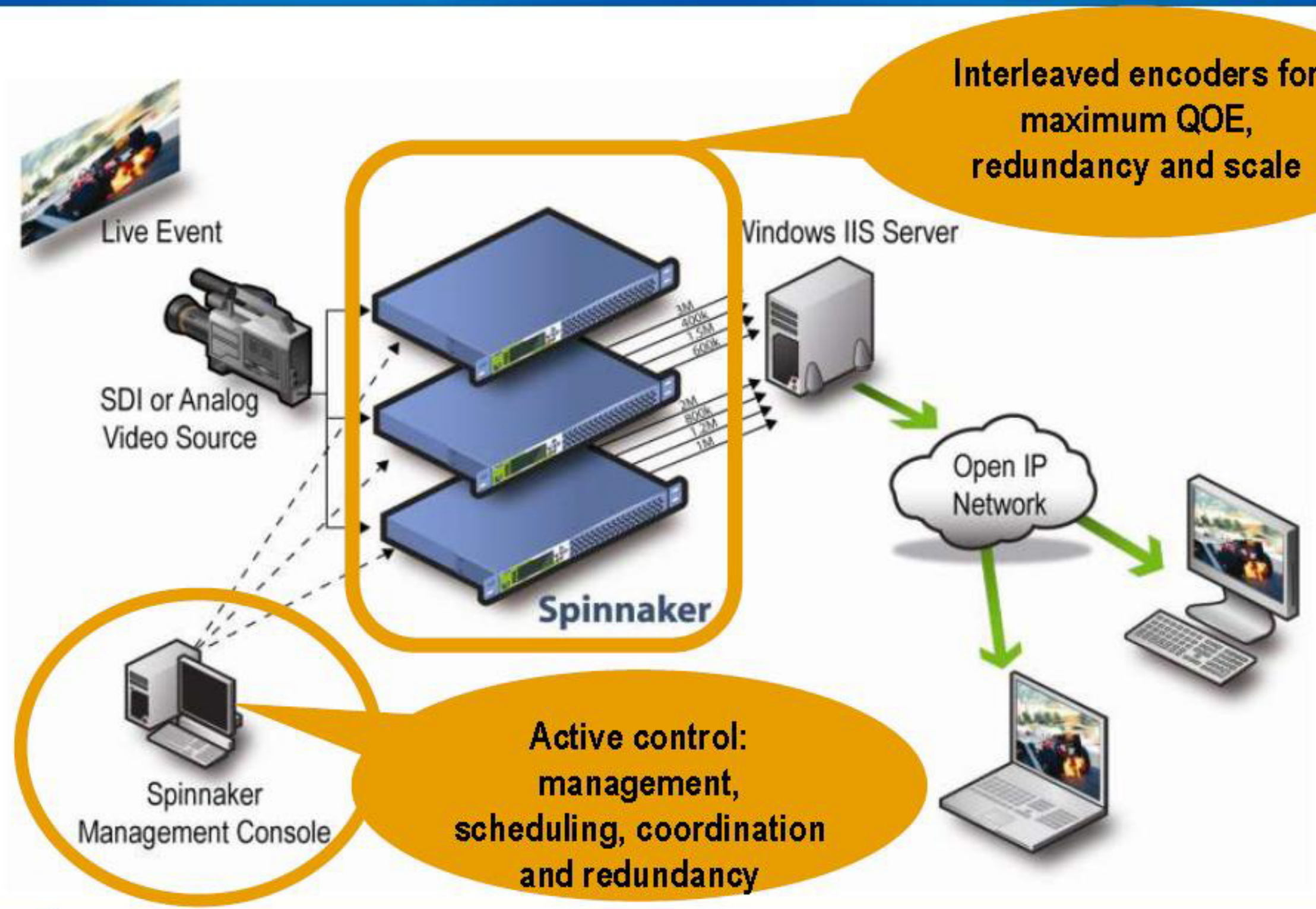


Bit rate & frame rate heuristics

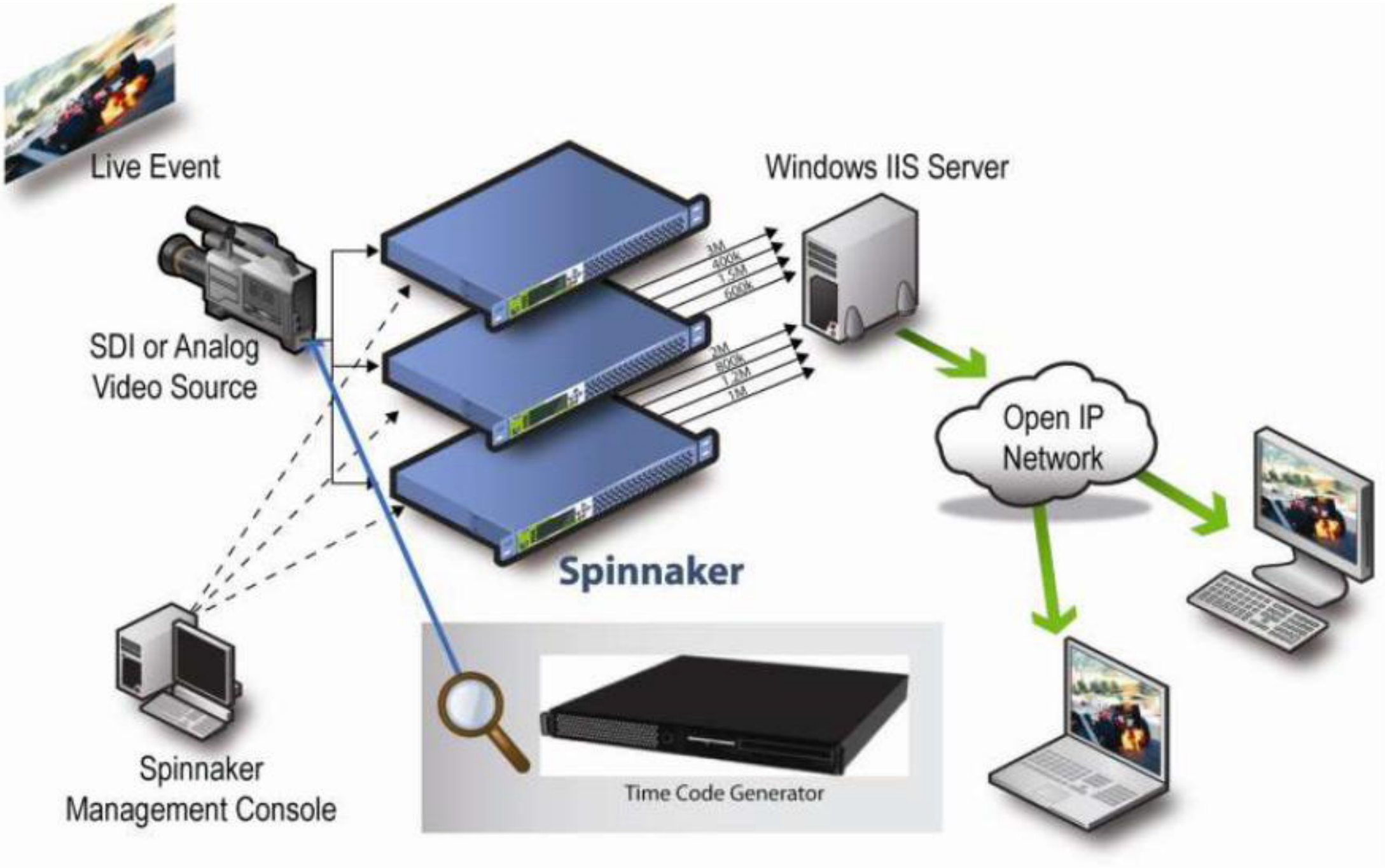
Live Smooth Stream overview



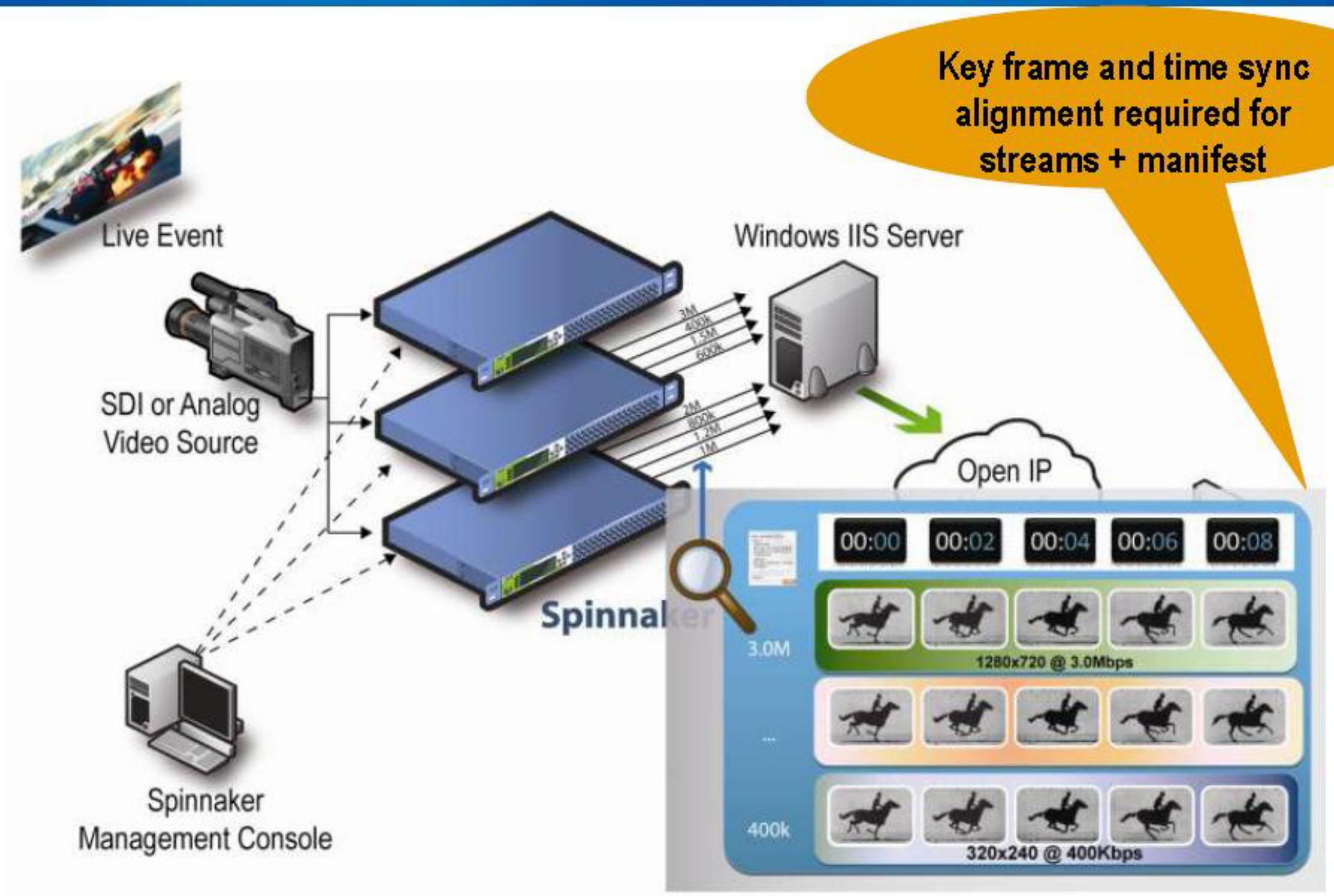
Live Smooth Stream overview



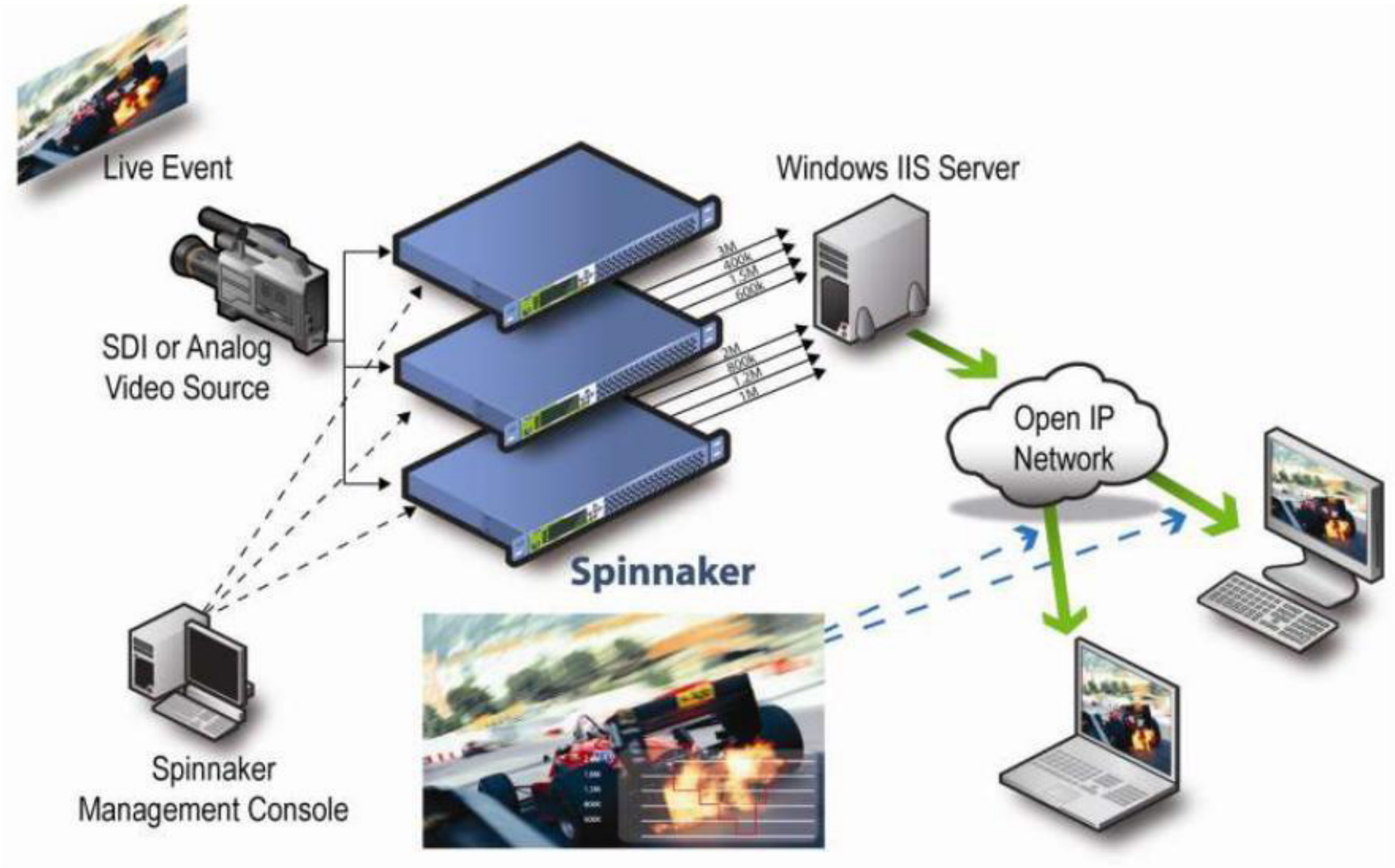
Live Smooth - source to encoder close-up



Live Smooth - Encoder output



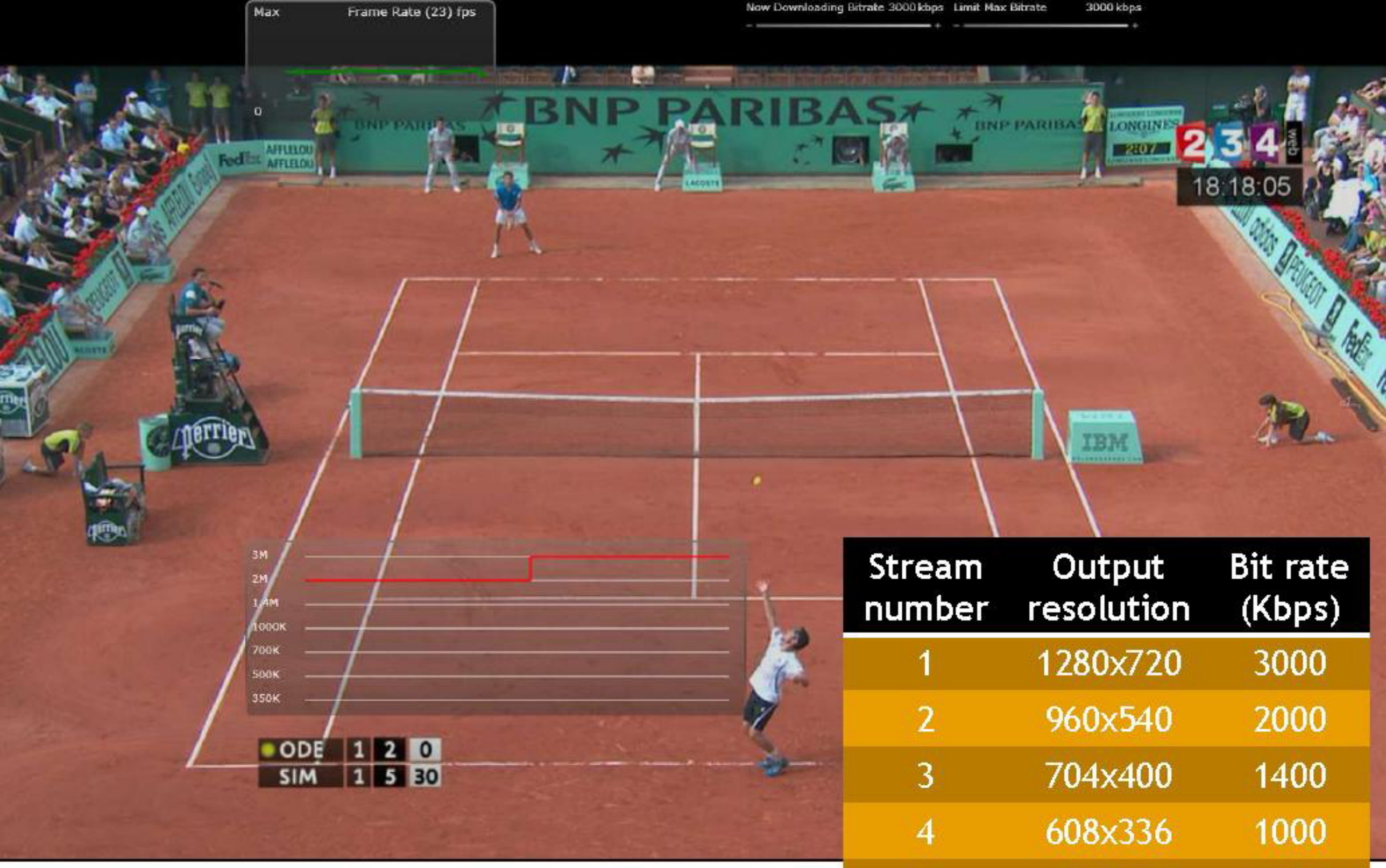
Live Smooth - Player close-up



Live Smooth Streaming benefits

- User experience
  - Dramatic increase in Quality Of Experience (QOE)
    - Eliminates the “re-buffering” experience
      - Increases content stickiness
      - Enhances time spent watching (TSW)
    - One click & watch
      - No more high, med, low
      - Instant on
    - Transparent user experience

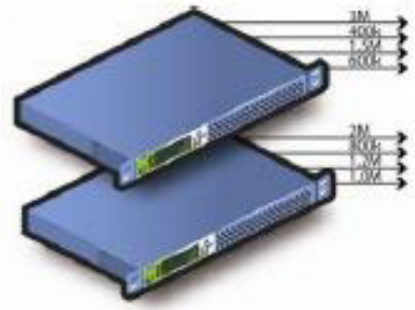
- Infrastructure
  - Non-disruptive encoding changes
  - Faster time to VOD
  - Increased redundancy options
    - Encoder redundancy
    - Server redundancy
  - Lower TCO
    - Leverages existing HTTP infrastructure



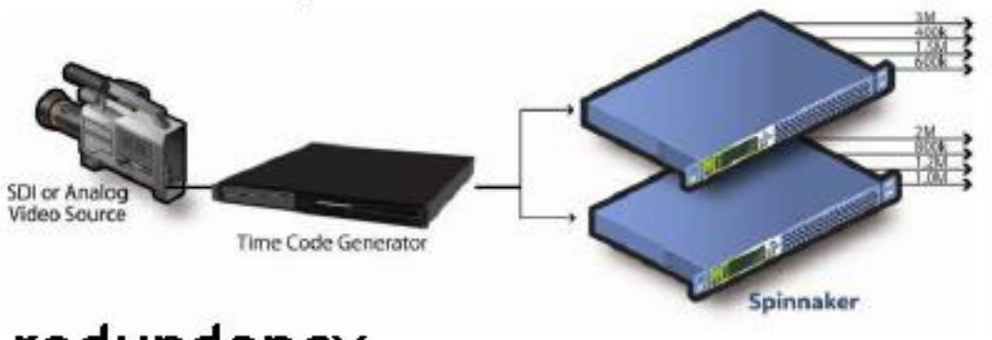
Stream number	Output resolution	Bit rate (Kbps)
1	1280x720	3000
2	960x540	2000
3	704x400	1400
4	608x336	1000
5	448x256	700
6	336x192	500
7	288x160	350

Architecture considerations

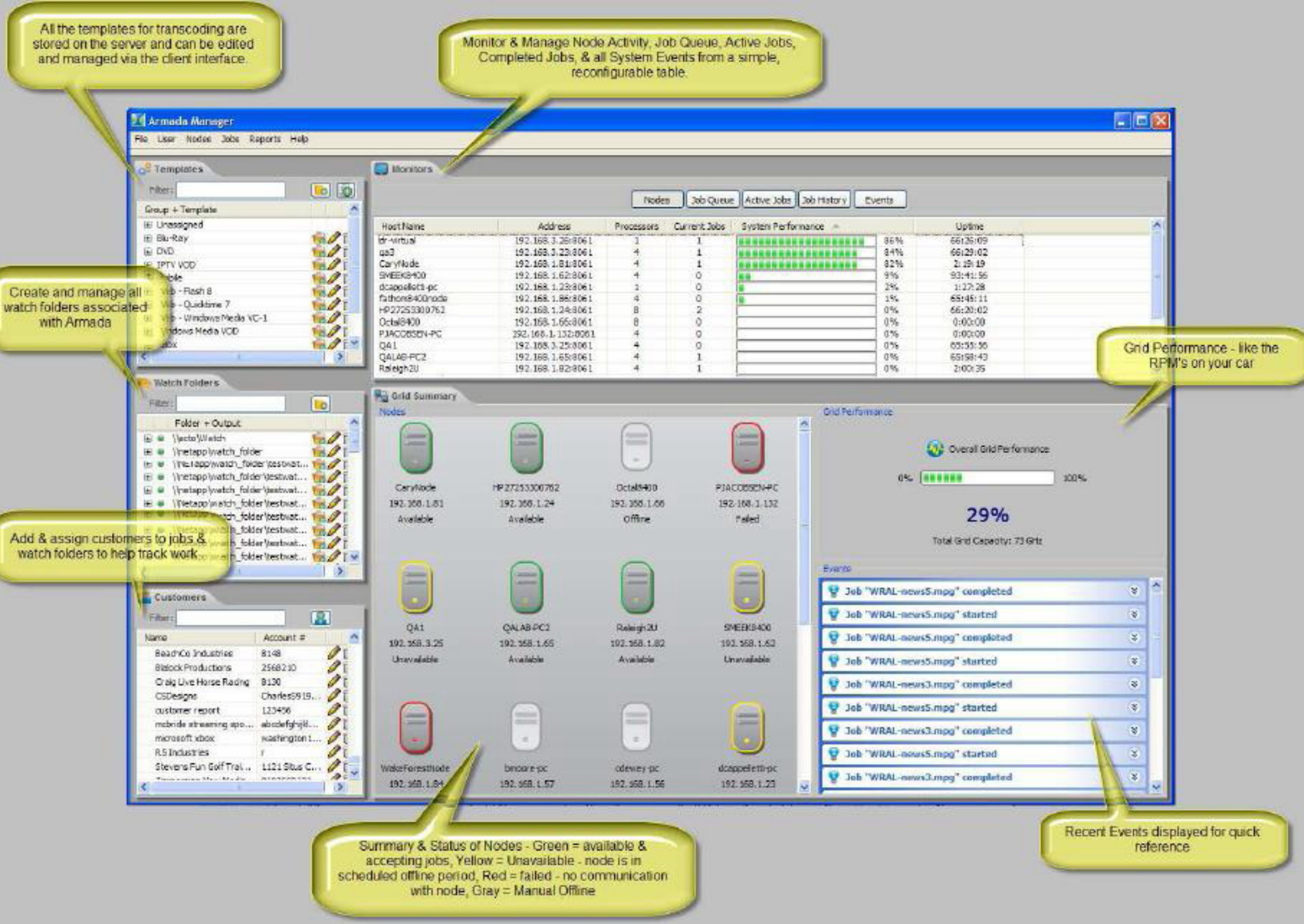
- Use HD source even for SD output
- Interleave encoders for redundancy

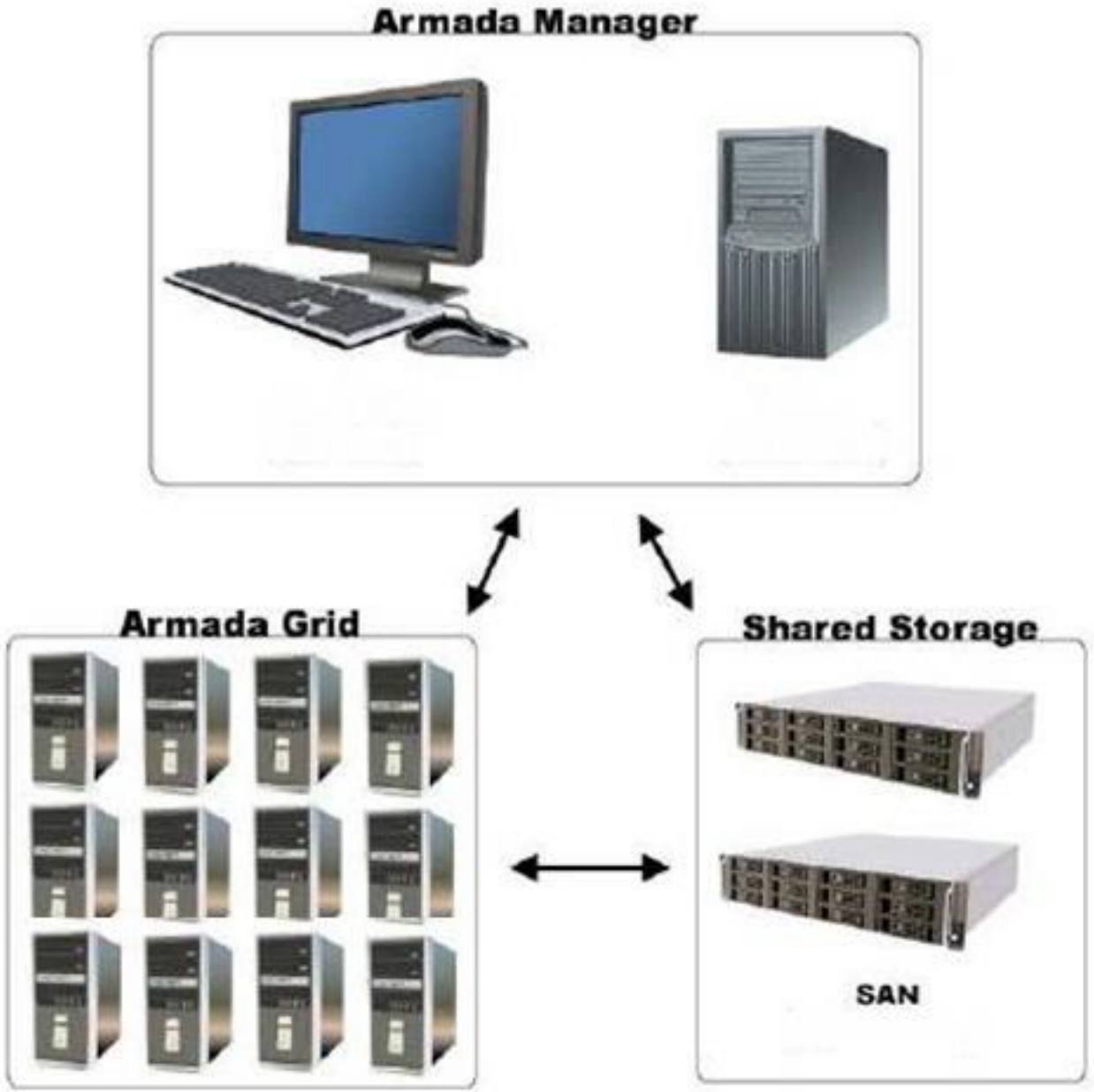


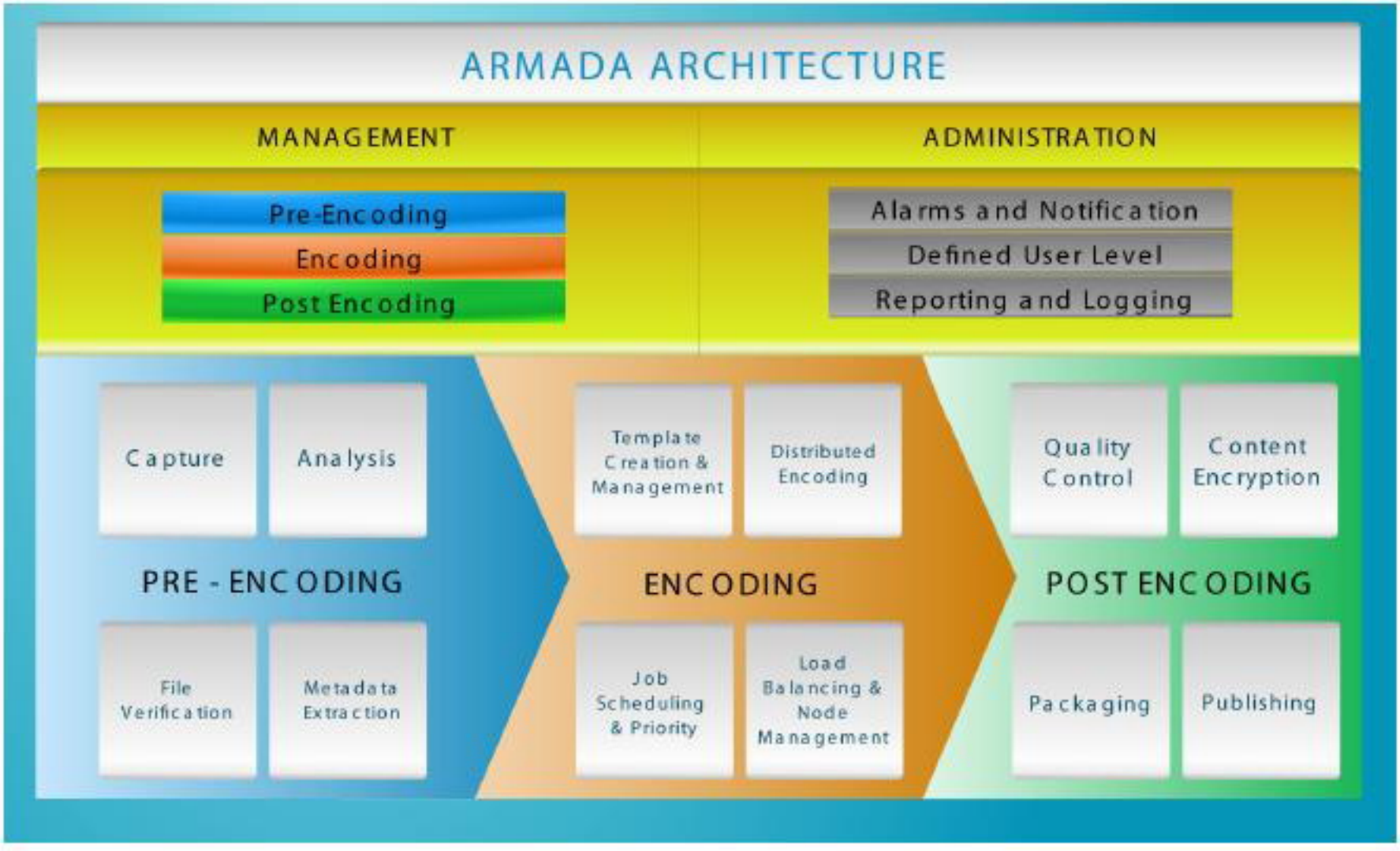
- For multiple encoder setup time code is required



- Publish to multiple IIS servers for redundancy
- Consider data rate between encoders and IIS Servers
- Do a dry run
- Sit back and enjoy


All the templates for transcoding are stored on the server and can be edited and managed via the client interface.
Monitor & Manage Node Activity, Job Queue, Active Jobs, Completed Jobs, & all System Events from a simple, reconfigurable table.
Armada Manager
File User Nodes Jobs Reports Help
Templates
Monitors
Nodes
Job Queue
Active Jobs
Job History
Events
Host Name
Address
Processors
Current Jobs
System Performance
Uptime
Create and manage all watch folders associated with Armada
Watch Folders
Grid Summary
Nodes
Grid Performance
Grid Performance - like the RPM's on your car
Overall Grid Performance
29%
Total Grid Capacity: 73 GHz
Add & assign customers to jobs & watch folders to help track work
Customers
Events
Job "WRAL-news5.mpg" completed
Job "WRAL-news5.mpg" started
Job "WRAL-news3.mpg" completed
Summary & Status of Nodes - Green = available & accepting jobs, Yellow = Unavailable - node is in scheduled offline period, Red = failed - no communication with node, Gray = Manual Offline
Recent Events displayed for quick reference


Armada Manager
Armada Grid
Shared Storage
SAN
Ethernet or
Fibre Channel


ARMADA ARCHITECTURE
MANAGEMENT
ADMINISTRATION
Pre-Encoding
Encoding
Post Encoding
Alarms and Notification
Defined User Level
Reporting and Logging
Capture
Analysis
PRE - ENCODING
File Verification
Metadata Extraction
Template Creation & Management
Distributed Encoding
ENCODING
Job Scheduling & Priority
Load Balancing & Node Management
Quality Control
Content Encryption
POST ENCODING
Packaging
Publishing