

**HIGHLIGHTS**

- Enables wide range of services such as VOD, Pause Live TV, nPVR, Start Over, Targeted Advertising, Progressive Download, Broadcast Playout and Digital Ad Insertion
- Supports progressive download or adaptive streaming of Apple 3.x and Microsoft Smooth Streaming to Internet-enabled devices (iPhone, PC, smartphones, MID and IP set-top box)
- Cost-effective scalability from small to large deployments in distributed, centralized or hybrid architectures
- Server cluster as a virtual server with optimization on streaming, storage and network resources
- Optimal combination of Disk and Flash storage models
- High stream density of up to 8 Gbps in 2-RU model
- Integrated with Harmonic's leading video processing product families to enable quick turn-key end-to-end video workflow solution

The Harmonic StreamLiner™ 3000 server family provides the industry's most flexible, reliable and cost-effective solution for delivering personalized video services to a variety of distribution platforms, ranging from traditional walled-garden networks owned by operators to public Internet or mobile http-based delivery networks. Designed to meet the demands of the highly competitive content delivery market, StreamLiner is a software architecture that transforms off-the-shelf hardware into specialized, high-performance video servers that ingest, process, store and deliver video programming on demand.



**UNIFIED DELIVERY PLATFORM**

Convergence of video delivery over different delivery networks is a growing trend, and many operators now offer multi-screen applications in their service. Content delivery on multiple networks triggers ever-growing demand for video processing and creates the need to support new content formats and delivery mechanisms as technology evolves.

In addition to streaming to traditional cable or IPTV set-top boxes, the same StreamLiner 3000 server can support progressive download or adaptive streaming of Apple 3.x and Microsoft Smooth Streaming to Internet-enabled devices such as the iPhone, PCs, smartphones, MIDs and IP STB. Rather than maintaining a separate delivery platform for each protocol, the StreamLiner 3000 enables a single unified delivery network supporting multi-screen applications.

**ADVANCED VIDEO PROCESSING**

The StreamLiner 3000 can ingest content once in MPEG-2 TS format from live and offline sources, then dynamically encapsulate it upon streaming to the necessary container format. This greatly reduces the complexity and cost of transcoding the same content into different formats, while also lowering the associated storage cost.

**FLEXIBILITY**

The StreamLiner 3000 server family provides the server models to scale as a virtual server in a distributed, centralized or hybrid architecture. The same platform can support content delivery to cable, telco, Internet and mobile networks at the same time, allowing the operator to extend their service offerings for multi-screen applications. The high performance media processor enables operators to introduce new processing-intensive video solutions without the need to upgrade platform hardware.

**COST-EFFECTIVE SCALABILITY**

Harmonic Armada® technology manages a distributed network as a virtual server with optimization on storage, streaming and network resources. This virtual server can consist of different specialized building blocks. The StreamLiner 3000 server family consists of several server models with different configurations to address different market segments and varying server requirements driven by subscriber demand in a distributed network.

Streaming, storage, ingest or processing capacity can be scaled independently without service interruption by adding the StreamLiner 3000 server to the network. Content storage can be centralized in library servers for minimizing storage and content replication at the edge server. Dynamic replication of popular content to the edge server optimizes the usage of the streaming and network resources at the edge site. This enables operators to scale their system cost-effectively in a distributed, centralized or hybrid architecture.

**MULTI-PURPOSE, MULTI SCREEN STREAMING SERVERS**

StreamLiner 3000 offers flexibility in system design with the choice of configurations to address a target market. There are four generic server models in this server family for content delivery, as summarized in the following table. All these generic models consist of the high performance media processor for supporting convergence applications.

Model	Rack Units	Concurrent Streams/Sessions	Concurrent Ingest	Content Storage	Description
STL-3210E	2-RU	Up to 500 UDP streams, or Up to 1000 TCP sessions 1 Gbps throughput	Up to 50 channels 100 Mbps ingest	438 GB (disk)	Edge server for video ingest, processing and delivery
STL-3220E	2-RU	Up to 2000 UDP streams, or Up to 4000 TCP sessions 3.45 Gbps throughput	Up to 100 channels 150 Mbps ingest	1.46 TB (Disk)	Edge server for video ingest, processing and delivery
STL-3250E	2-RU	Up to 8000 UDP streams, or Up to 16000 TCP sessions 8 Gbps	Up to 100 channels 150 Mbps ingest	640 GB (Flash)	Edge server for video ingest, processing and delivery
STI- 3200L	4-RU	Up to 3000 UDP streams, or Up to 6000 TCP sessions 5.67 Gbps throughput	Up to 100 channels 150 Mbps ingest	10 TB (Disk)	Library server for video ingest, processing and delivery

**RELIABILITY**

The StreamLiner 3000 server family is designed for reliable and fault-tolerant operation. Each server supports redundancy on power, cooling, network interfaces and RAID protection on disk storage. High performance flash storage used for streaming in edge server further improves the reliability of the server by reducing reliance on streaming from disks. A solid-state boot device is used in servers to ensure reliable boot-up processes.

To simplify maintenance, the system automatically detects the addition and removal of servers. The Harmonic Armada technology dynamically load-balances requests on healthy servers and provides fault-tolerance against server failure. All these mechanisms provide the high availability required as the operator scales the system.

**SPECIALIZED SERVERS FOR VOD, AD INSERTION AND BROADCAST PAYOUT ONLY**

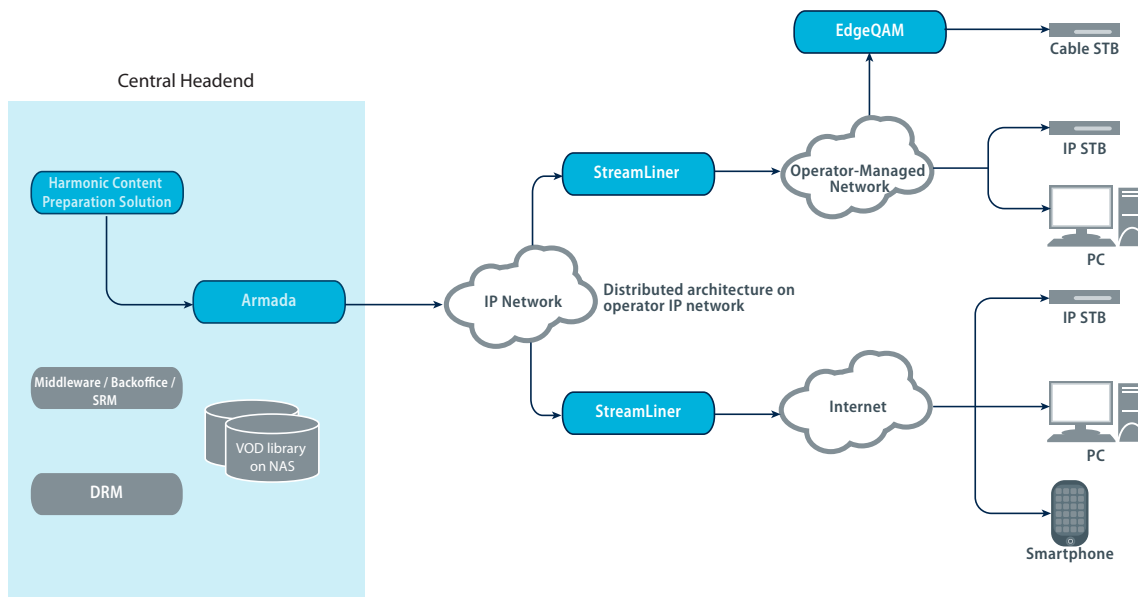
The StreamLiner 3000 server family also includes two specialized server models. STL-3100S is the server model specialized for ad servers or broadcast payout applications such as NVOD, broadcast time delay or barker channels. STL-3100LU is the server model for UDP-based streaming to cable or IPTV set-top boxes, for those operators with no plan for convergence applications

Model	Rack Units	Concurrent Streams/Channels	Concurrent Ingest	Content Storage	Description
STL-3100S	1-RU	Up to 64 channels 960 Mbps throughput	Up to 64 channels 100 Mbps ingest	438 GB (disk)	Specialized server for broadcast payout, digital ad insertion
STL-3100LU	4-RU	Up to 2000 streams 5.67 Gbps throughput	Up to 100 channels 150 Mbps ingest	10 TB (disk)	Library server that only supports UDP-based streaming and broadcast payout applications requiring large storage capacity

**TECHNICAL SPECIFICATIONS**

Applications for the StreamLiner 3000 include:

- VOD streaming server, serving cable, IP STB or Internet-enabled devices such as the iPhone and PCs
- Live streaming server, delivering live broadcast channels to Internet-enabled devices such as the iPhone and PCs
- Live ingest platform, capturing live channels for further workflow operations such as cutting, editing, transcoding and delivery.
- Ad server, for digital ad insertion applications or Broadcast Payout Server for applications like nVOD or barker channels



**Harmonic StreamLiner-Powered Unified Delivery Platform**

**VOD SERVER**

Applications	Video Formats	Streaming/Session Control	Target Device
Video on Demand Pause Live TV nPVR Catchup TV Start Over Live HTTP Streaming (using Apple HTTP / Silverlight)	<b>UDP VOD Streaming</b>		
	MPEG-2 SD/HD MPEG-4 AVC/H.264 SD/HD	NGOD ISA LSCP/RTSP	Cable set-top boxes
		RTSP (RFC2326)	IP set-top boxes
	<b>Adaptive VOD Streaming</b>		
	MPEG-4 AVC/H.264 SD/HD (Multi bit-rate)	Apple HTTP Streaming	iPhone, iPod Touch (iPhone OS 3.0 or later) QuickTime player (10.0 or later) IP set-top boxes
	Single copy of TS for Apple HTTP Streaming, Microsoft Smooth Streaming and Adobe Flash Streaming	Microsoft Smooth Streaming	SilverLight 3 or later player
Progressive Download	<b>Progressive Download</b>		
	Any video format	HTTP Progressive Download	PVR IP
	MPEG-4 AVC/H.264 SD		iPhone 2.0 or later
Adobe ®Flash® Video	Progressive Download	Flash 9 or later	

**LIVE INGEST**

Applications	Video Formats	Scheduling Interface	Export Interface
Live ingest for VOD export	MPEG-2 SD/HD MPEG-4 AVC/H.264 SD/HD	EPG	ADI 1.1 FTP
Live ingest for workflow operations	TS Encapsulation	SOAP scheduling API	NAS accessible by MediaPrism™

**AD SERVER AND BROADCAST PAYOUT SERVER**

Applications	Video Format	Scheduling Interface	Supported Splicer
Digital Ad Insertion	MPEG-2 SD/HD MPEG-4 AVC/H.264 SD/HD	Traffic and billing system with CCMS interface	Harmonic ProStream™ 1000 Harmonic ProStream 2000
NVOD Broadcast Time Delay	TS Encapsulation	Web scheduling GUI XML scheduling API	N/A