

Products: nabiTV™ Stream

“Real time streaming from RTP-E.S Packet & multimedia file to IPTV devices on the public internet for OTT/VOD service ”



Functions

- Transports the real-time streaming of Video On Demand
- Transports the real-time streaming of Live broadcasting
- Transports the real-time streaming of Schedule broadcasting
- LIVE & nVoD real-time streaming relay to Remote streaming server

Features

- Internet protocol supports to RTSP, RTP-ES, SDP, RTCP
- Instantly watching IPTV (not need waiting time of buffering)
- Trickle play IPTV (Low(x0.5, x0.7) & Fast(x1.25 ~ x4) speed play)
- Jog-shuttle IPTV (Real-time Searching of Forward/Backward Random Speed)
- Mass access IPTV (Concurrent users 6,000 per 1 server)

International Standard of IPTV

- International Standard of IPTV Technologies by ISO (ITU-T)
 - . Digital Media Compression CODEC/MUX Parts (7 Cases)
 - . Digital Media Real-time Transport Protocol Parts (64 Cases)
- Internet Streaming Media Alliance (ISMA) profile 0 ~ 4
 - . Closed caption v. 1.0, 2.0
 - . Encryption v. 1.0, 2.0

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► Specification

Inputs

Video -RTSP over RTP-E.S Announced unicasting

Audio -RTSP over RT-E.S Announced unicasting

Media -MPEG(ES/PS/TS/PVA/MP3)/AVI
-MP4/MKV
-Raw Audio(AAC/AC3/A52)

CODEC (Video) -MPEG-4 SP, ASP, AVC
-DivX, XVID, On2VP

CODEC (Audio) -MPEG Layer 1/2/3,
-MPEG-4 part 3/AAC, HE-AAC
-AC3, A/52(Dolby), E-AC-3(Dolby plus)

Format -.mp3
-.mp4
-.3gp
-.3gp2

Subtitles, Concurrent users

Subtitle -Closed captions(SMPTE-334M),

LD -for mobile
-256Kbps ~ 512Kbps
-Concurrent users 300 per System
-Concurrent users 3000 per System
-Concurrent users 6000 per System

SD -for Standard Definition
-1.5Mbps ~ 3.0Mbps
-Concurrent users 100 per System
-Concurrent users 500 per System
-Concurrent users 5000 per System

HD -for High Definition
-3.0Mbps ~ 6.0Mbps
-Concurrent users 300 per System
-Concurrent users 3000 per System

FHD -for Full High Definition
-6.0Mbps ~ 9.0Mbps
-Concurrent users 150 per System
-Concurrent users 1500 per System

Hardware

Host -Dual core 2 CPU over
-2GB + (3MB x Users) = Memory

Capture NONE

Outputs

CODEC -MPEG-4 Part10/H.264/AVC
-MPEG-4 Part3/AAC, HE-AAC
-AC3

Multiplexing -Instant-on with DRM .mp4,
-ISMA profile 0,1,2,3,4

Level 3.0, 3.1, 3.2, 4.0, 4.1, 5.0, 5.1

Resolution 320x240, 352x240, 432x240, 512x288,
512x384, 640x480, 720x480, 720x576,
1280x720, 1440x1080, 1920x1080

Frame rate 23.976p, 24p, 25p, 29.97p, 30p, 50i/p,
59.94i/p, 60i

Bit rate -Video : 250Kbps ~ 35Mbps
-Audio : 24Kbps ~ 256Kbps

Sampling rate 32KHz, 44.1KHz, 48KHz

Protocol -RTSP, RTP-ES
-RTCP, SDP

Concurrent users -MAX 6,000 per System

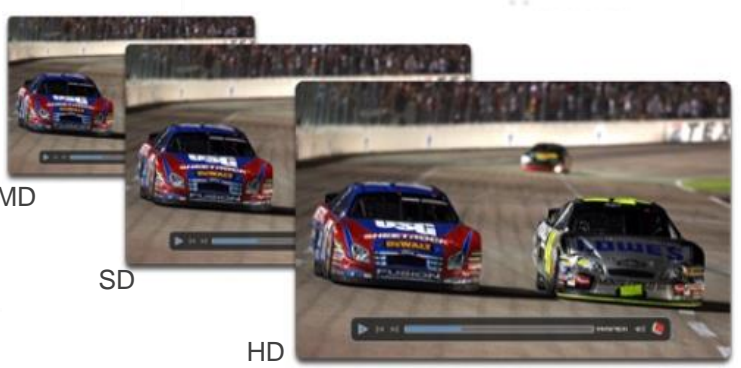
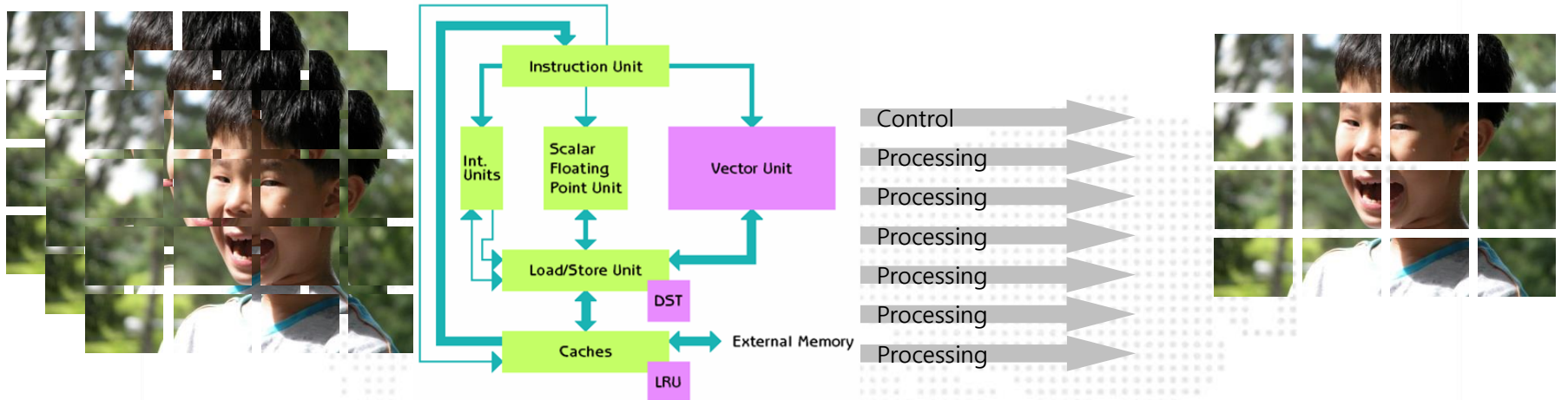
ETC., -instant-on
-Trick play
-Jog-shuttle
-Mass Access

Storage

HDD -SSD DAS or NAS
-SAN Storage

Patent of Products

“Encoding acceleration: patented for real-time encoding of HD media on the general workstation ”



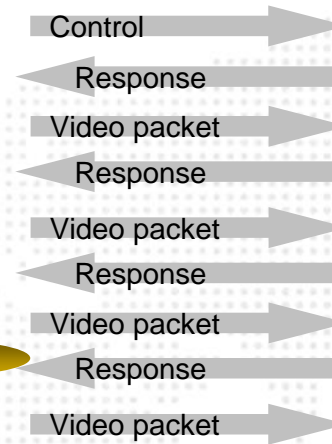
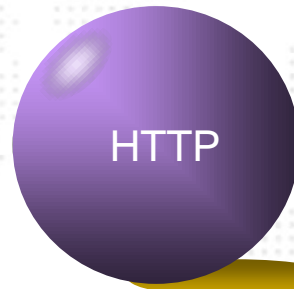
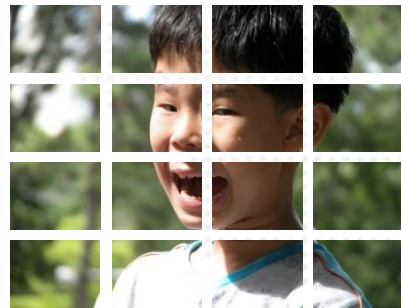
- High-speed Encoding on low-specification system even
- With SIMD, Higher-performance Encoding on identical-specification systems
- Substitution of extravagant High-specification systems for Encoding → Cost Reduction

High-speed & High-quality Encoding

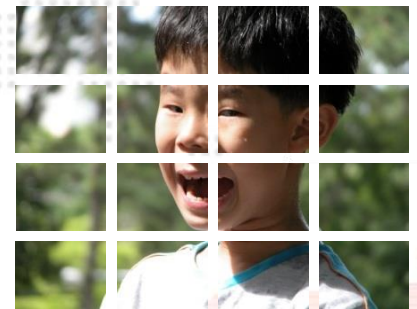
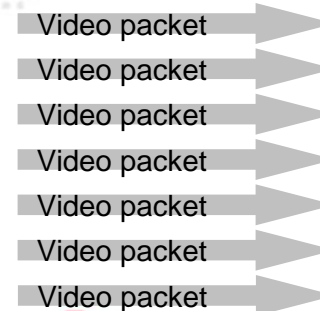
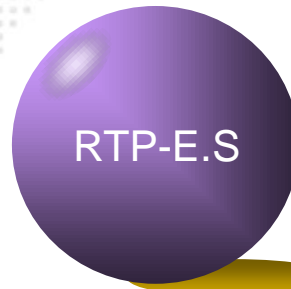
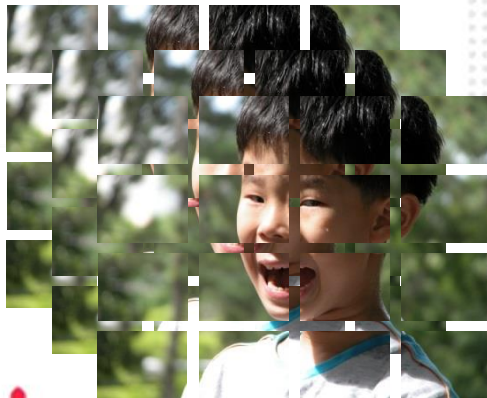


Patents of Products

“Instantly watching IPTV: Patented for immediate viewing to give satisfying IPTV service on the public internet”



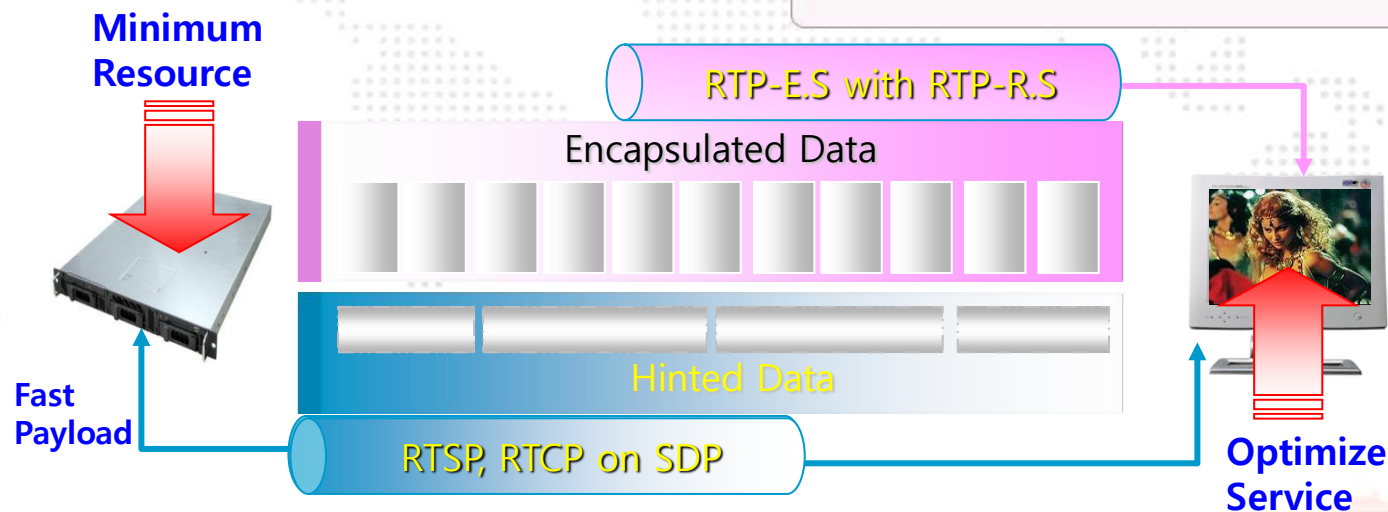
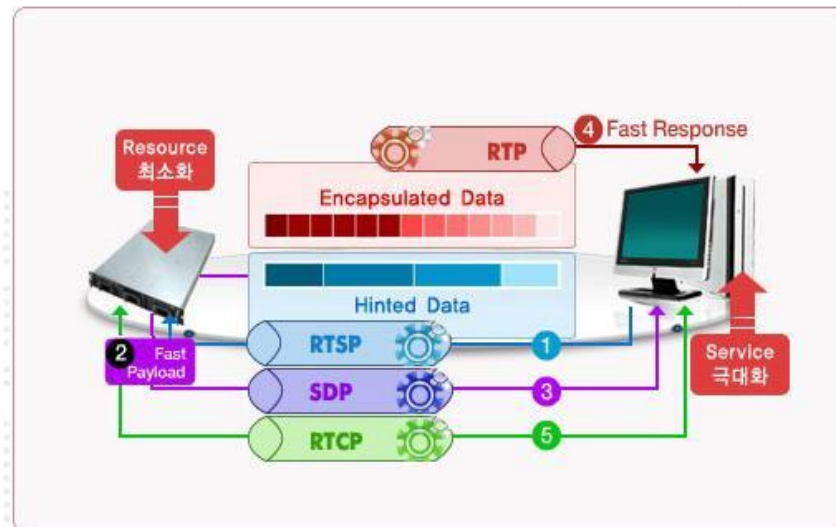
- Digital multimedia compression : ISMA + Instant-on
- Digital multimedia transmission : RTP-Elementary Stream
- Digital multimedia transmission : RTP multi ports(#6950 ~ #6999)



Patents of Products

“Trick play & jog-shuttle IPTV: Patented for trick play and forward & rewind A/V search with no extra bandwidth”

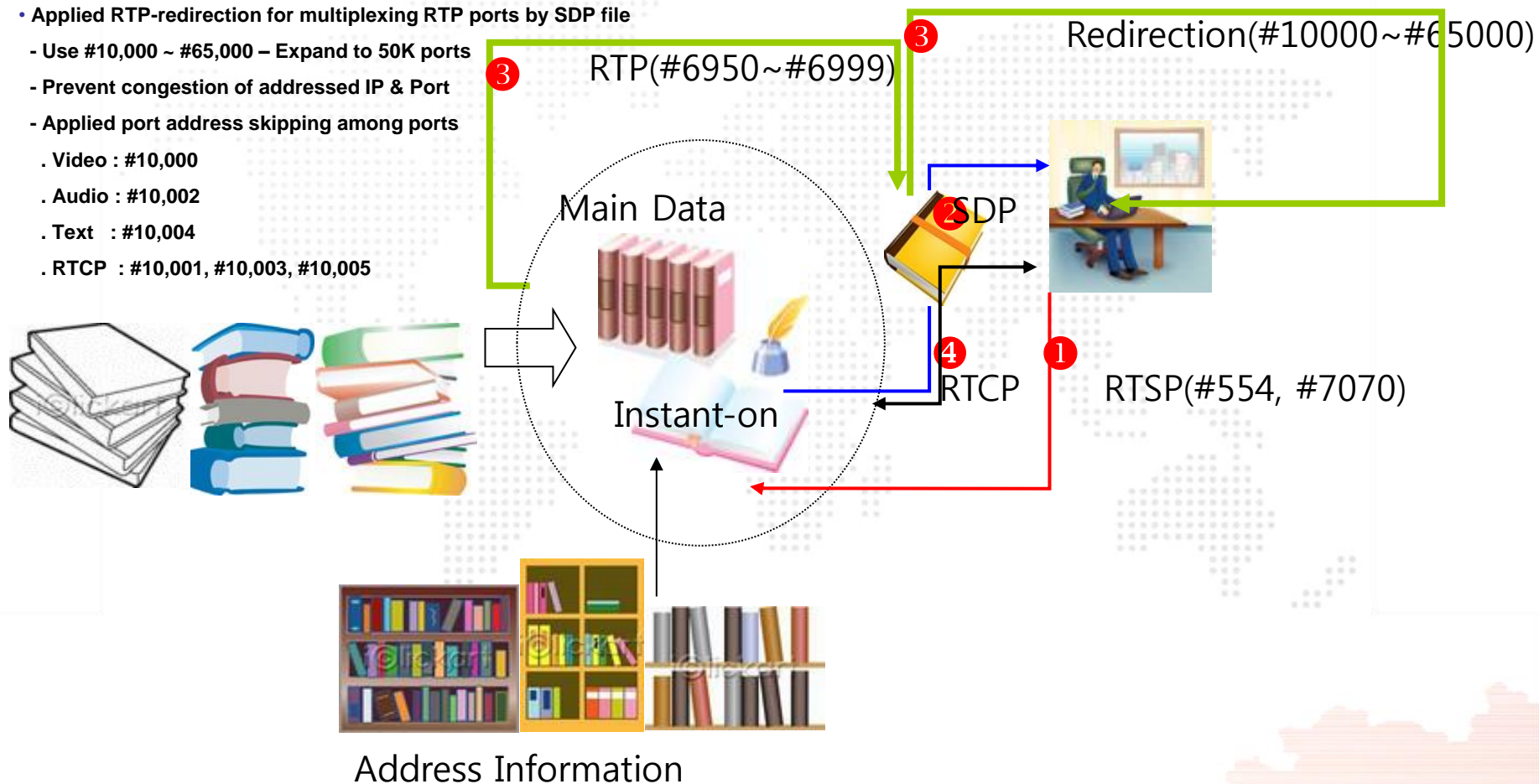
- Instant-on + RTP-E.S/SDP/RTSP/RTCP
 - Real-time streaming ports : RTSP(#554, #7070)
 - Multimedia HDD address extraction & application : SDP file
 - Multi ports for mass transport : RTP(#6,950 ~ #6,999)
 - Interactive controlling port in real-time : RTCP(#RTP + 1)
- i-frame Skip-Protection : No need of extra bandwidth



Patents of Products

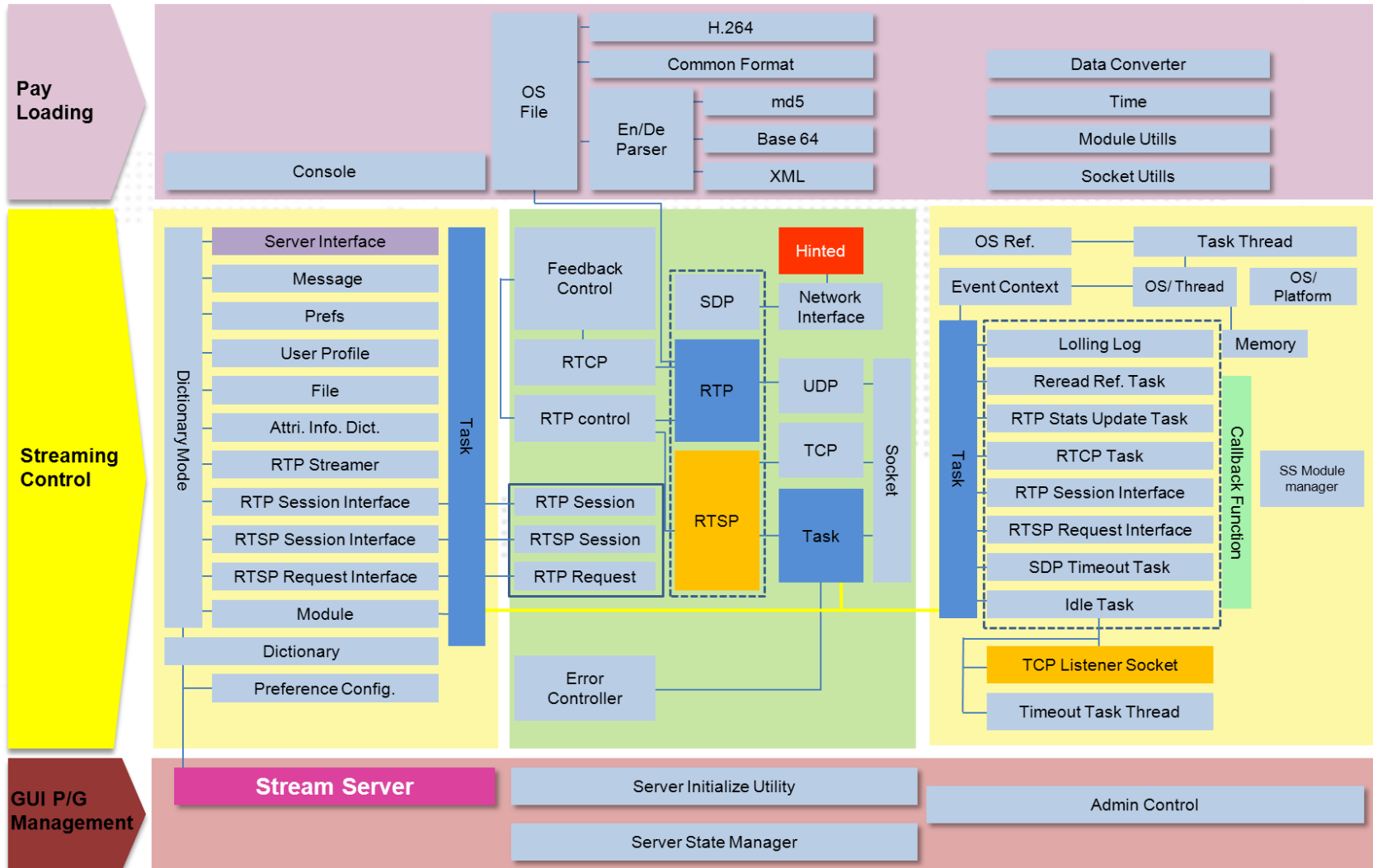
“Mass access IPTV: Patented for 6,000 concurrency on the general server system”

- Minimize required memory per access (30MB → 3MB) : Instant-on
- Applied RTP-redirection for multiplexing RTP ports by SDP file
 - Use #10,000 ~ #65,000 – Expand to 50K ports
 - Prevent congestion of addressed IP & Port
 - Applied port address skipping among ports
 - . Video : #10,000
 - . Audio : #10,002
 - . Text : #10,004
 - . RTCP : #10,001, #10,003, #10,005



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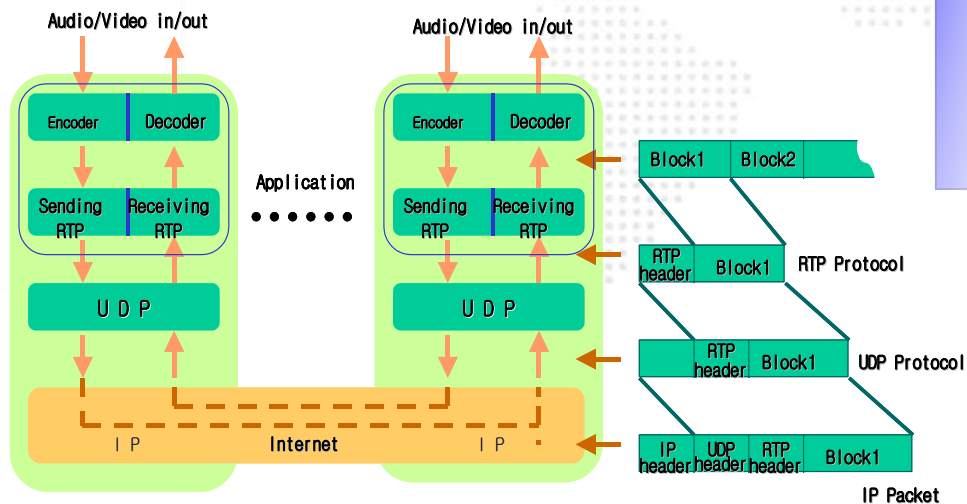
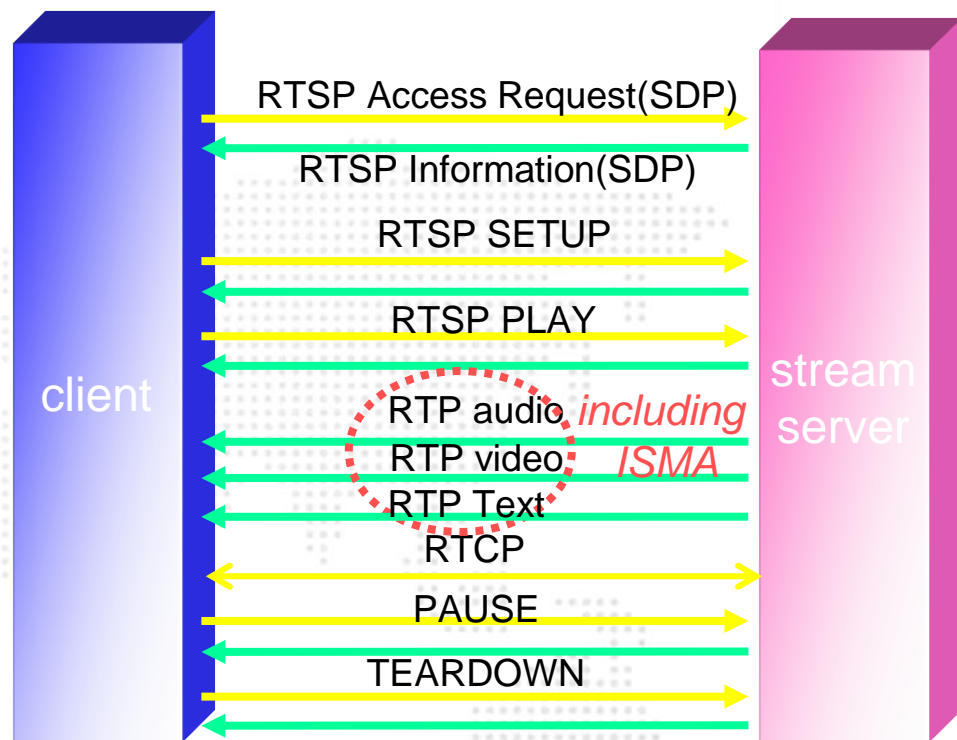
► Architecture



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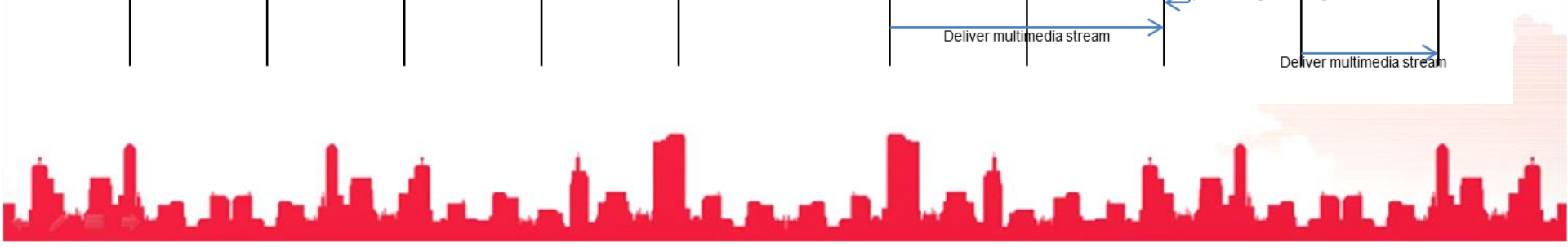
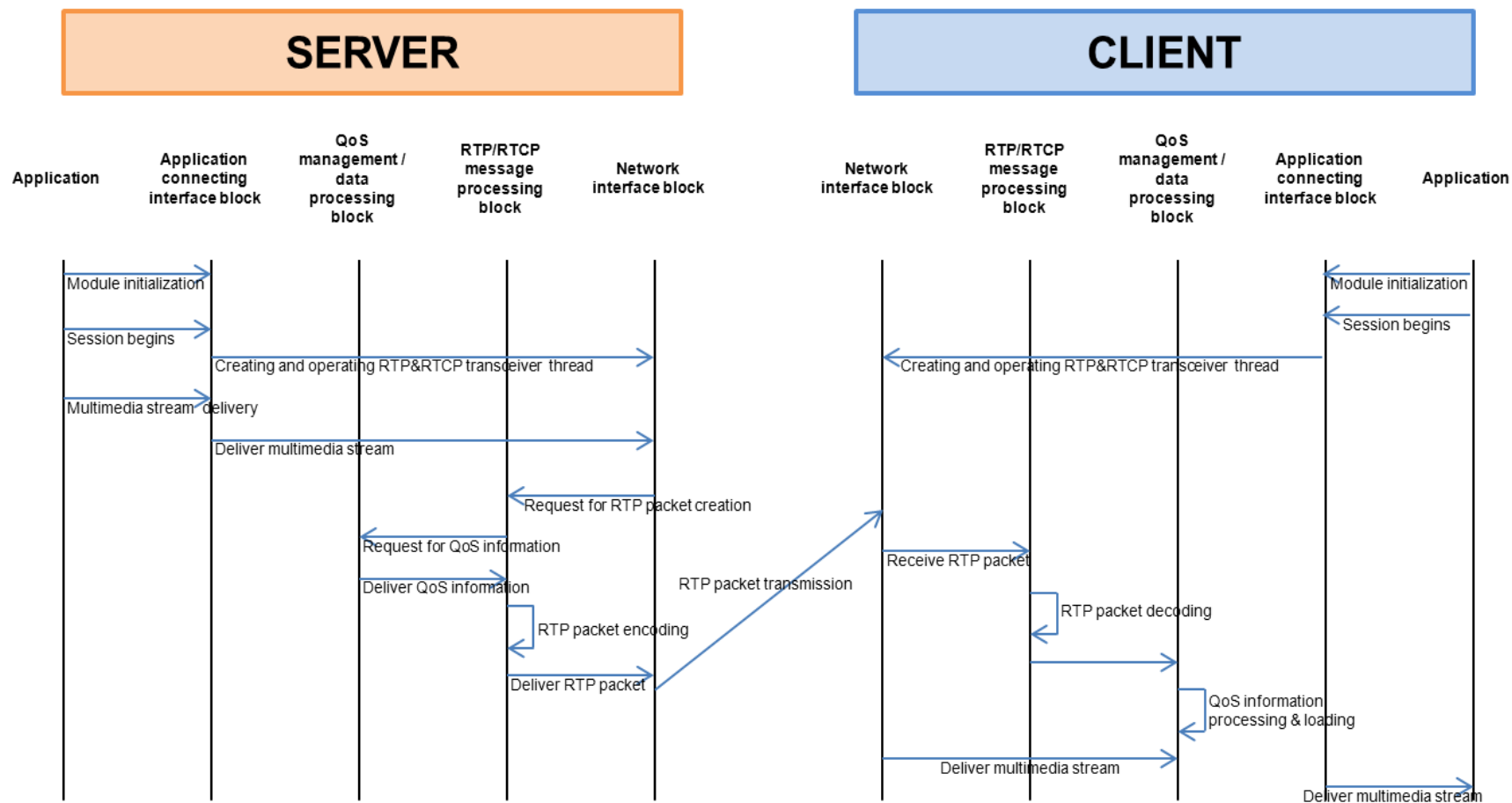
► Design

- . OPTIONS : Get the method provided by the server
- . DESCRIBE : Get the description of media objects
- . SETUP : Set up the Transport connection for transmission of media stream
- . PLAY : After receiving the response,
- . RTP : Play by receiving stream through channel
- . PAUSE : Stream transmission interruption
- . TEARDOWN: Eliminate the session completely



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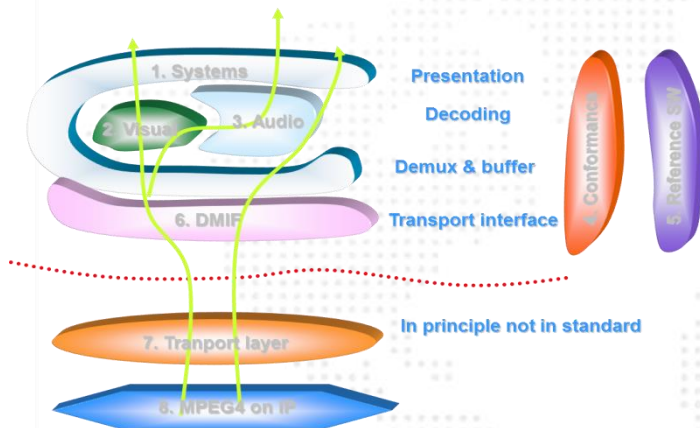
► QoE & QoS



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▶ Interactivity

❖ MPEG-4 object-oriented media



❖ RTP-E.S.(Elementary Streaming)

