Second session : Requirements from service providers for OCEAN services

Introduction to OCEAN requirements

Joint EBU – OCEAN Workshop on Internet Content Delivery
EBU Headquarters, Geneva, 7 September 2010

www.ict-ocean.eu

OCEAN Services
Reminder

Focus on 5 Service Use Cases:

- Free short video clips (incl. free UGC)
- Free long format video (a.k.a Streaming platforms) (e.g. Megavideo)
- Catch-up TV
- Premium VOD
- Live streaming

Internet TV (also referred by some players as connected TV) is not addressed as a specific use case, but taken in account a particular implementation in each of these use cases.

Requirements for OCEAN services
Outline

- Delivery Mode, Protocol, Codec and Encapsulation
- Quality of Service (QoS/QoE)
- Bit rate requirements
- Non-delivery related requirements

Requirements for OCEAN services

Delivery Mode, Protocol, Codec and Encapsulation

- Delivery Mode
  - Adaptive streaming as the preferred option

    Delivering the best possible quality to the user, in function of SLA with the user, and of server, client and network conditions.

    Optimal use of the available network resources, thereby protecting itself against congestion conditions.

  - By the way, alternative options could be promoted

    E.g. Progressive download for some VoD premium services

    Only in cases where getting a perfect and guaranteed audio/video quality is an absolute must have, even at the expense of – possibly very long – initial waiting time

Requirements for OCEAN services

Delivery Mode, Protocol, Codec and Encapsulation

- Delivery Protocol
  - Potential options include
    - HTTP (progressive download and adaptive streaming),
    - RTSP/RTP
    - And other proprietary protocols (e.g. Adobe RTMP, RTMPT, RTMPe)
  - OCEAN would favor standardized solutions and solutions to be standardized

Requirements for OCEAN services

Delivery Mode, Protocol, Codec and Encapsulation

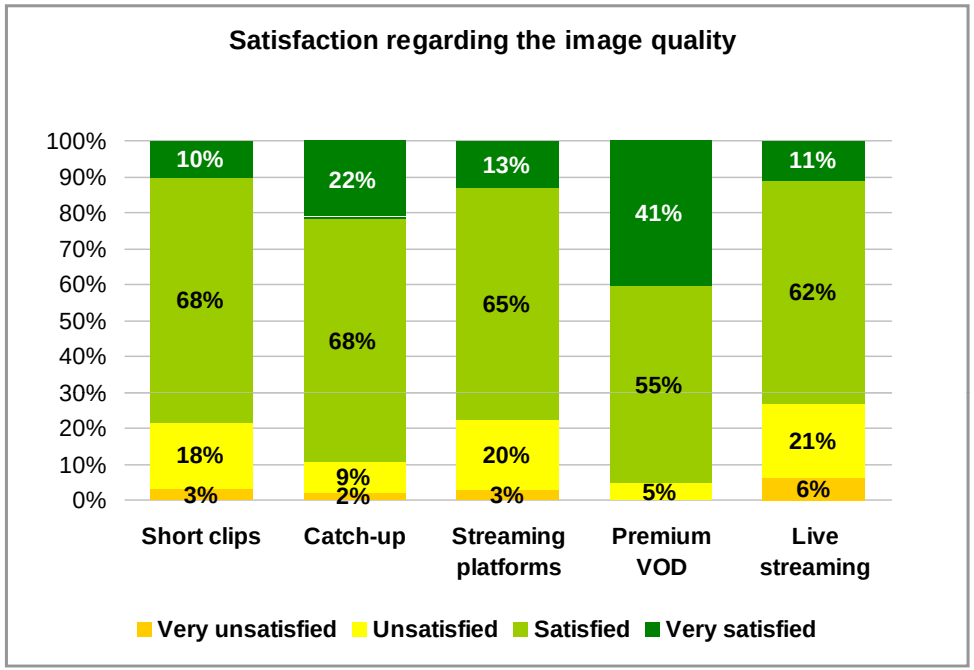
- Video Codec and Encapsulation

	Potential options	Prefered options
Video Codec	H.264/AVC, SVC, MPEG-4 part 2, MPEG-2, H.263, VP6, VC1, SVQ, WMV, Theora, etc.	H.264/AVC, SVC
Encapsulation	MP4, , MPEG TS MOV, FLV, F4V, WMV, MKV, OGG, etc.	MP4, MPEG TS

Source. "Preliminary Requirements for OCEAN". OCEAN Milestone MS2.1. May 2010.

Requirements for OCEAN services
Quality of Service (QoS/QoE)

- QoS satisfaction (1/3)



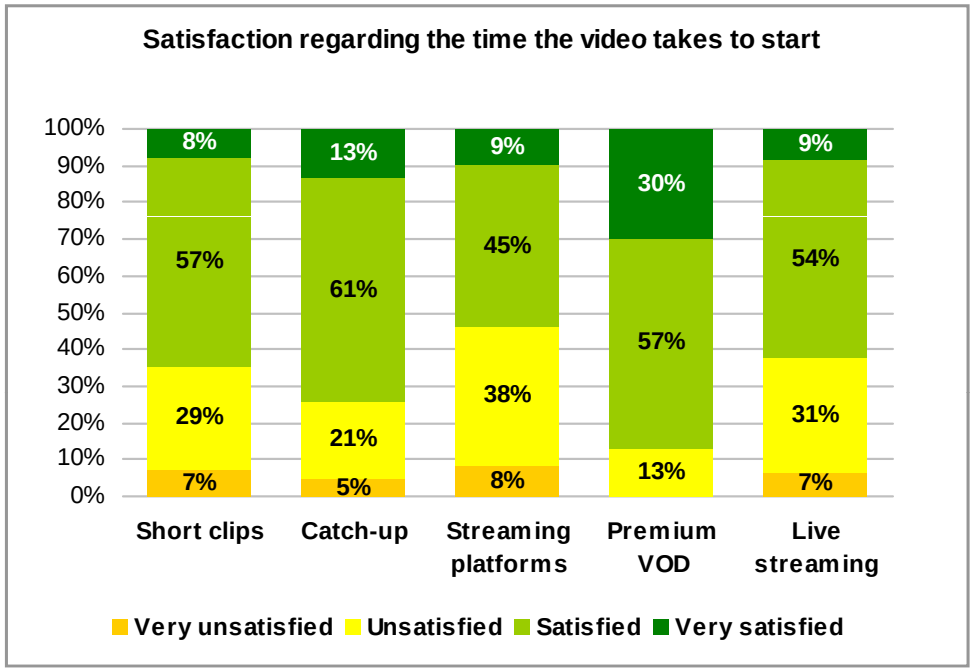
Base: for each use case, people consuming such videos

When you are viewing videos online, to what extent are you satisfied with the image quality?

Source. End-user demand survey. OCEAN project. June 2010.

Requirements for OCEAN services
Quality of Service (QoS/QoE)

- QoS satisfaction (2/3)



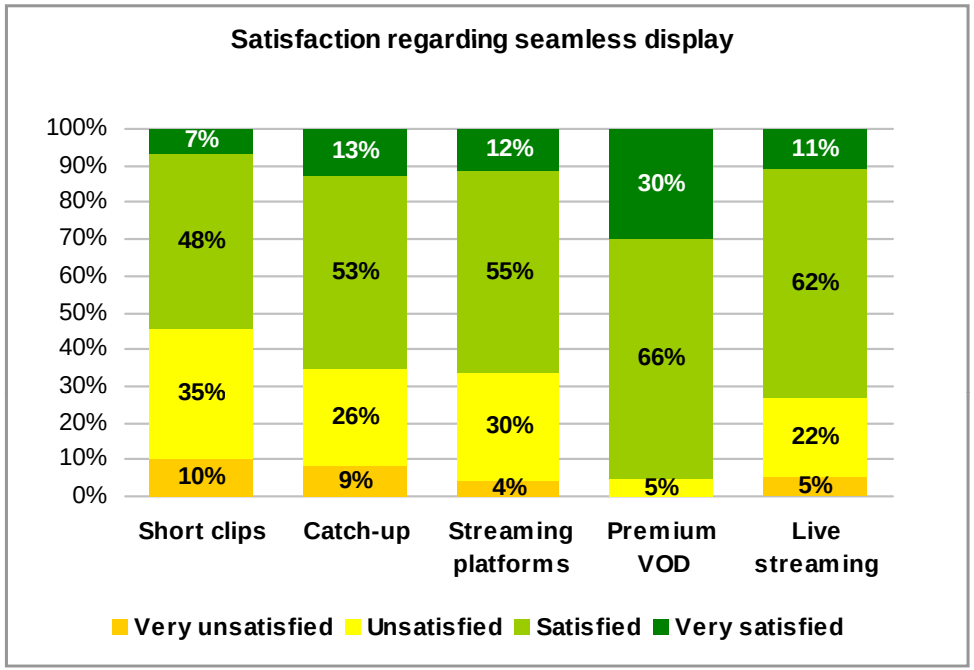
Base: for each use case, people consuming such videos

When you are viewing videos online, to what extent are you satisfied with the time it takes to start?

Source. End-user demand survey. OCEAN project. June 2010.

Requirements for OCEAN services
Quality of Service (QoS/QoE)

- QoS satisfaction (3/3)



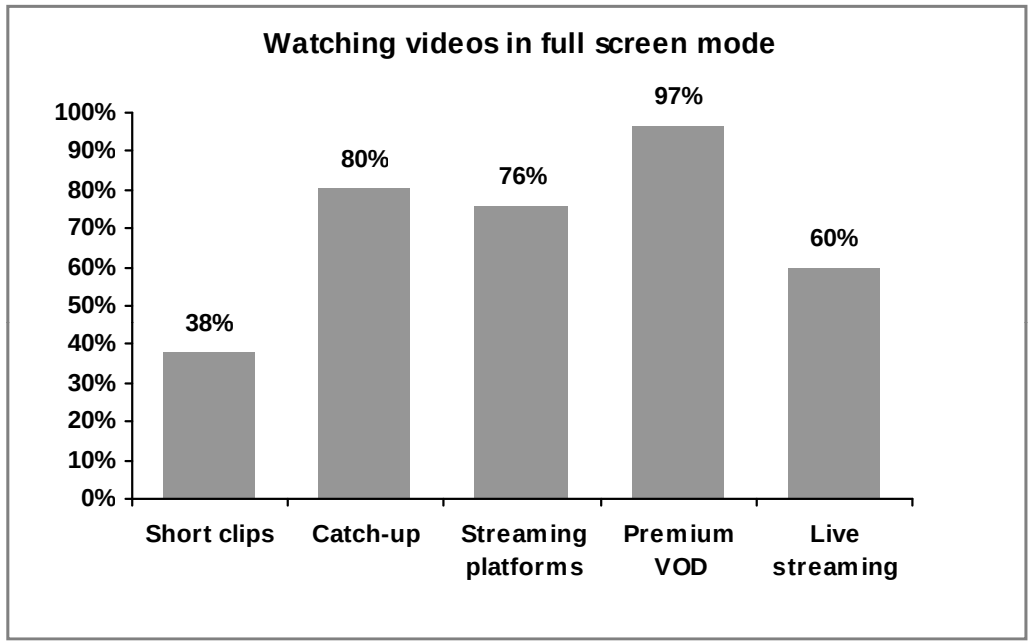
Base: for each use case, people consuming such videos

When you are viewing videos online, to what extent are you satisfied with the seamless display?

Source. End-user demand survey. OCEAN project. June 2010.

Requirements for OCEAN services
Bit Rate Requirements

- Screen size



Base: for each use case, people consuming such videos

Source. End-user demand survey. OCEAN project. June 2010.

Requirements for OCEAN services
Bit Rate Requirements

- OCEAN preliminary option

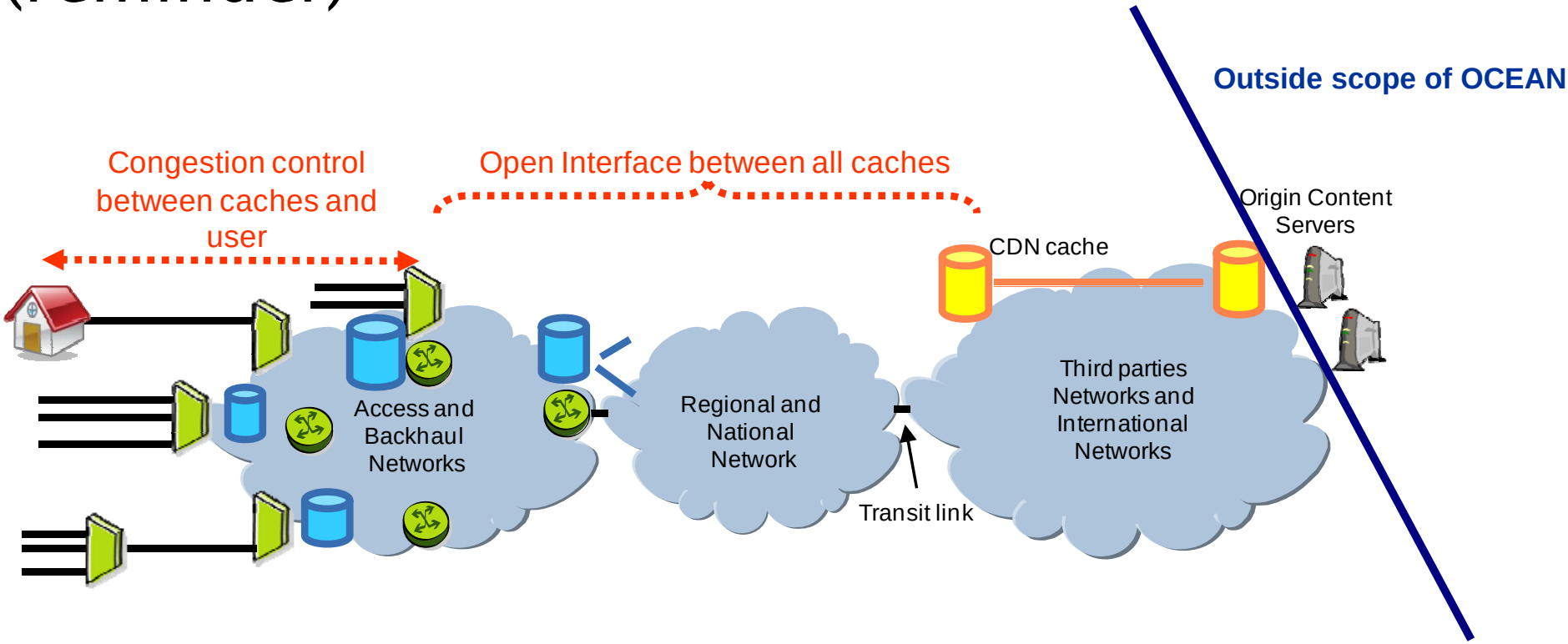
Service use case	Average bitrate encoding
1 - Free short clip (incl. free UGC, Youtube)	400kbps (mix of HD and non-HD)
2 - Free long video / Streaming platforms (based on Megavideo in France)	600 to 700 kbps
3 - Catch-up TV (based on Hulu)	1,5 Mbps
4 - Premium VOD (based on Netflix)	1,5 Mbps
5 - Live streaming (based on a few events in France)	700 kbps (up to 2 Mbps)

Source. "Preliminary Requirements for OCEAN". OCEAN Milestone MS2.1. May 2010.

- Multi layer/bitrate encoding

Requirements for OCEAN services
Non-delivery related Requirements

- (reminder)



Requirements for OCEAN services

Non-delivery related Requirements

Requirements	Main features	Free short clip	Free Long format video	Catch-up TV	Premium VOD	Live streaming
Content creation (content capture, content encoding/transcoding, content post-production)	Content capture	Optional	Optional	Optional	Optional	Optional
	Content encoding/ transcoding	Optional	Optional	Recommen-ded	Recommen-ded	Recommen-ded
	Content post-production	Optional	Optional	Optional	Optional	Optional
Content manage-ment (content publishing, content security/DRM, geographic rights management, billing and payment)	Content publishing	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory
	Content security/DRM	No	Optional	Recommen-ded	Recommen-ded	Recommen-ded
	Geographic rights management / geoblocking	Optional	Optional	Mandatory	Mandatory	Recommen-ded
	Billing and payment	No	No	No	Recommen-ded	Optional
Hosting		Mandatory	Mandatory	Mandatory	Mandatory	No
Consumption-related services (reporting, tracking, analytics, customization)	Reporting	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory
	Tracking	Optional	Optional	Optional	Optional	Optional
	Analytics	Mandatory	Mandatory	Mandatory	Recommen-ded	Recommen-ded
	Customization	Optional	Optional	Optional	Optional	Optional

Source. "Preliminary Requirements for OCEAN". OCEAN Milestone MS2.1. May 2010.

Open questions for discussion

- Other requirements in general ?
- QoS related requirements:
  - Similar or other metrics available ?
  - Similar feedback from end users on QoS/QOE?
  - How translated into service provider requirements?
- Bit rate requirements:
  - Which evolution from current situation?
- Non-delivery related requirements:
  - Feedback on mentioned options?
  - Other relevant requirements?
- Requirements on delivery mode:
  - Views on adaptive streaming?

Ocean

Question & Answers

Thank you

Backup. Not to be disseminated.

“Preliminary Requirements for OCEAN”. OCEAN Milestone MS2.1. May 2010.

OCEAN Service Use Cases
Delivery mode

Service Use Case	Delivery mode	
	Potential options	**preferred options**
1 - Free short clip	progressive download, streaming, adaptive streaming	adaptive streaming
2 - Free long video	progressive download, streaming, adaptive streaming	adaptive streaming
3 - Catch-up TV	progressive download, streaming, adaptive streaming	adaptive streaming
4 - Premium VOD	progressive download, streaming, adaptive streaming	adaptive streaming (mainstream option) progressive download (only in cases where getting a perfect and guaranteed audio/video quality is an absolute must have, even at the expense of - possibly very long – initial waiting time)
5 - Live streaming	streaming, adaptive streaming	adaptive streaming

OCEAN Service Use Cases
Delivery protocol

Service Use Case	Delivery protocols	
	Potential options	**Preferred options** (given that adaptive streaming is the mainstream delivery mode in OCEAN)
1 - Free short clip	HTTP, RTSP/RTP, Proprietary protocols	HTTP, RTSP/RTP
2 - Free long video	HTTP, RTSP/RTP, Proprietary protocols	HTTP, RTSP/RTP
3 - Catch-up TV	HTTP, RTSP/RTP, Proprietary protocols	HTTP, RTSP/RTP
4 - Premium VOD	HTTP, RTSP/RTP, Proprietary protocols	HTTP, RTSP/RTP
5 - Live streaming	HTTP, RTSP/RTP, Proprietary protocols	HTTP, RTSP/RTP

OCEAN Service Use Cases

Video codec and encapsulation

Service Use Case	Video codecs		Encapsulation	
	Potential options	Preferred options	Potential options	Preferred options
1 - Free short clip	H.264/AVC, SVC, MPEG-4 part 2, MPEG-2, H.263, VP6, VC1, WMV, Theora, etc.	H.264/AVC, SVC	MP4, MOV, FLV, F4V, WMV, MKV, OGG, etc.	MP4, MPEG TS
2 - Free long video	H.264/AVC, SVC, MPEG-4 part 2, MPEG-2, H.263, VP6, VC1, WMV, Theora, etc.	H.264/AVC, SVC	MP4, MOV, FLV, F4V, WMV, MKV, OGG, etc.	MP4, MPEG TS
3 - Catch-up TV	H.264/AVC, SVC, MPEG-4 part 2, MPEG-2, H.263, VP6, VC1, WMV, Theora, etc.	H.264/AVC, SVC	MP4, MOV, FLV, F4V, WMV, MKV, OGG, etc.	MP4, MPEG TS
4 - Premium VOD	H.264/AVC, SVC, MPEG-4 part 2, MPEG-2, H.263, VP6, VC1, WMV, Theora, etc.	H.264/AVC, SVC	MP4, MOV, FLV, F4V, WMV, MKV, OGG, etc.	MP4, MPEG TS
5 - Live streaming	H.264/AVC, SVC, MPEG-4 part 2, MPEG-2, H.263, VP6, VC1, SVQ, WMV, Theora, etc.	H.264/AVC, SVC	MP4, MOV, FLV, F4V, WMV, MKV, OGG, etc.	MP4, MPEG TS

OCEAN Service Use Cases

Typical Current Traffic Characteristics

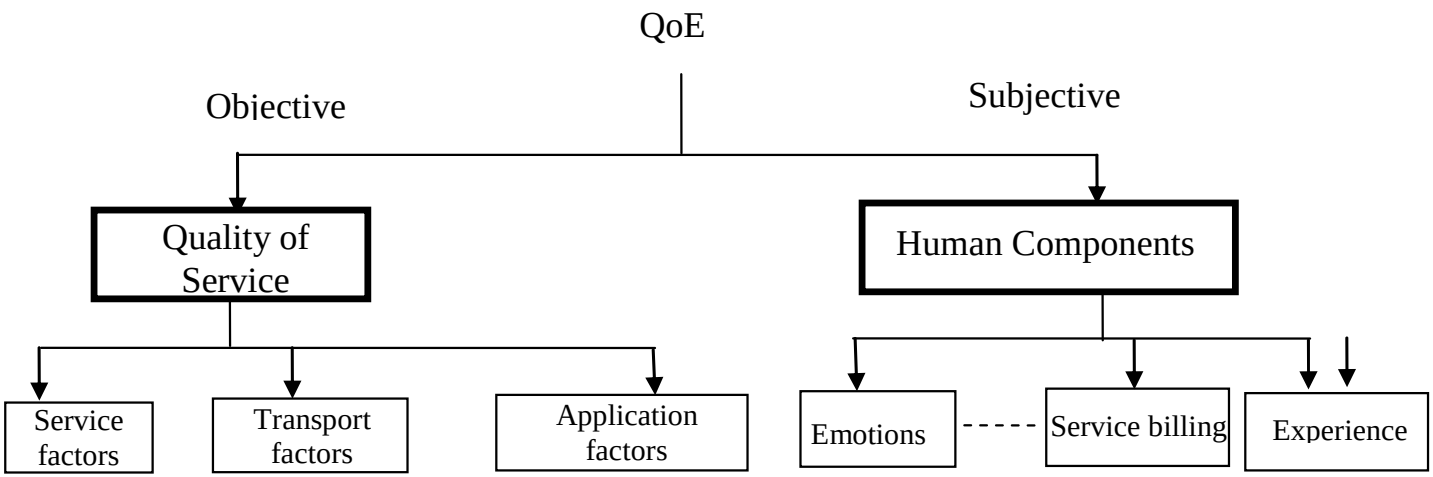
Service use case	Average duration	Videos viewed per user of the service	Average bitrate encoding
1 - Free short clip (based on Youtube)	2 to 3 minutes clips	100 to 150 clips/month	400kbps (mix of HD and non-HD)
2 - Free long video (based on Megavideo in France)	20 minutes per video	38 videos per user per month	600 to 700 kbps
3 - Catch-up TV (based on Hulu)	6 minutes of actual consumption	27 videos/Internet user	1,5 Mbps
4 - Premium VOD (based on Netflix)	90 minutes	6 views/month per subscriber	1,5 Mbps
5 - Live streaming (based on a few events in France)	10 to 15 min per session (olympics) 65 min per day (Roland Garros)	A few sessions per month	700 kbps (up to 2 Mbps)

OCEAN Service Use Cases
Expected Traffic Evolution

Service Use Case	Overall growth (2010-2015)
1 - Free short clip	+50%/year
2 - Free long video	+50-60%/year
3 - Catch-up TV	+60%/year
4 - Premium VOD	+ 100%/year
5 - Live streaming	+ 100%/year

OCEAN Service Use Cases
Quality

- Quality dimensions



	QoE	QoS
Metrics	• Audio/video quality: audio and video 'picture' quality • Interaction (i.e. EPG, GUI, remote control device) • Interactive responsiveness (channel change delay, VOD delay, trick mode delay) • Contents (i.e. popularity, value) • Reliability (i.e. availability, consistency) • Security (i.e. contents, privacy) • Sense of simplicity/comfort • Desire • Social value	• Minimum guaranteed bandwidth and measured bandwidth • Application layer video encoding and decoding (Constant Bit Rate versus Variable Bit Rate) • Packet latency • Packet jitter • Packet loss

OCEAN Service Use Cases

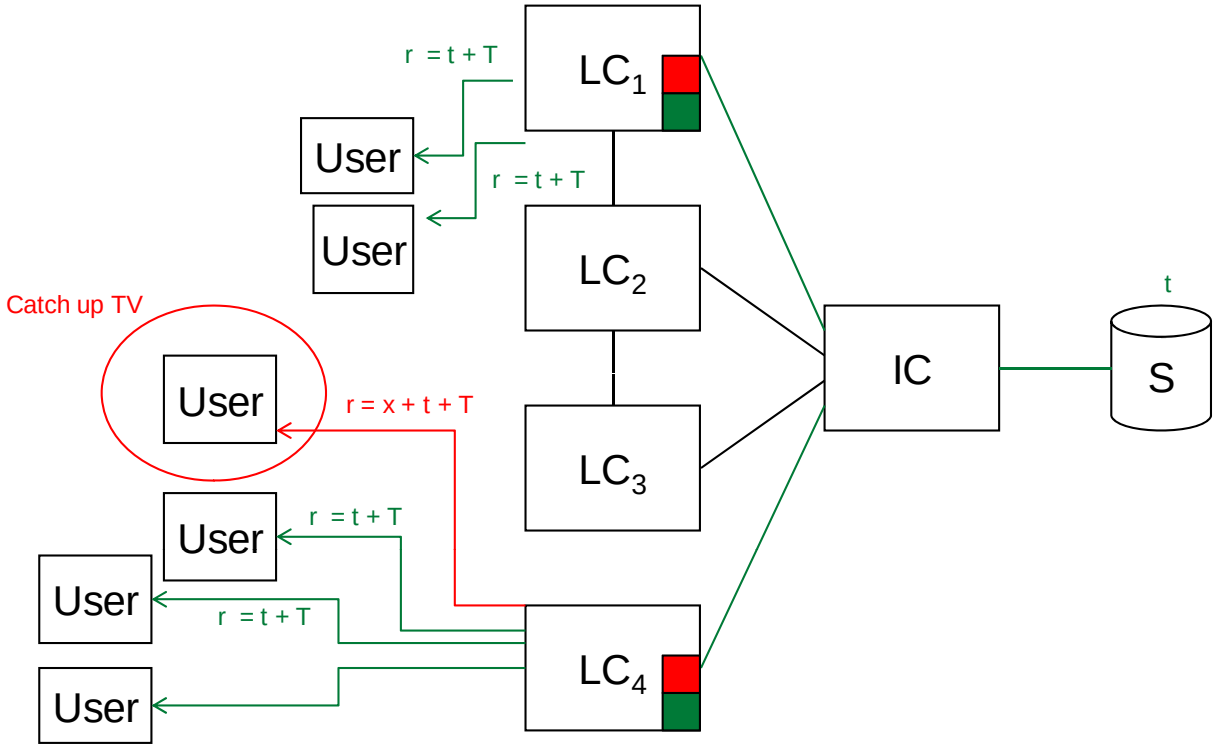
Quality – Video Service Layer – Control plane Recommendations

- Maximum recommended delays for control plane actions

OCEAN Service Use Cases	User interface actions	Channel Change	System start-up time
1 - Free short clip	Responsive / 1 s	NA	Timely / 10 s
2 - Free long video	Interactive / 200 ms	NA	Timely / 10 s
3 - Catch-up TV	Interactive / 200 ms	NA	Timely / 10 s
4 - Premium VOD	Interactive / 200 ms	NA	Timely / 10 s
5 - Live streaming	Interactive / 200 ms	Responsive / 2 s	Timely / 10 s

OCEAN Service Use Cases

Requirements on the delay with Live (live streaming use case)



Typical content delivery configuration as considered in OCEAN project

- T should be kept low, under 10s.

OCEAN Service Use Cases

Quality – Video Service Layer – Dependability plane

- Service Availability Targets

Application	Availability (Typical annual)	Notes
1 - Free short clip	99.70% (= around 1 day of unavailability/year)	
2 - Free long video	Close to free content	
3 - Catch-up TV	99.85% (13 hrs = 800 min unavailability/year)	Same order as current medium IPTV quality
4 - Premium VOD	99,96% (210 min unavailability/year) 99,986% (75 min unavailability/year)	Same order as current high IPTV quality
5 - Live streaming	99,96% (210 min unavailability/year) 99,986% (75 min unavailability/year)	Same order as current high IPTV quality

OCEAN Service Use Cases

Quality – Application Layer — Data plane

- OCEAN targets on screen resolution

Terminal type	Target display resolution	Framerate	Average bit rate	Peak bit rate
Mobile, TV Set, PC, Laptop	320x240 (QVGA)	25p	-	-
	640x480 (VGA)	25p	-	-
TV Set, PC, Laptop	1280x720 (720p50)	50p	-	-
	1920x1080 (1080p50)	50p	-	-

OCEAN Service Use Cases

Quality – Application Layer — Video Transport Layer QoE

- Requirements from Broadband Forum TR-126

Quality level	Transport layer Latency	Transport layer Jitter	Maximum duration of a single error	Loss Distance
SDTV Services as defined in BB Forum TR-126	<200 ms	<50 ms	<= 16 ms	1 error event per hour
HDTV Services as defined in BB Forum TR-126	<200 ms	<50 ms	<= 16 ms	1 error event per 4 hours

Requirements for OCEAN services

Non-delivery related Requirements

Requirements	Main features	Free short clip	Free Long format video	Catch-up TV	Premium VOD	Live streaming
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	Content encoding/ transcoding	Optional	Optional	Recommen-ded	Recommen-ded	Recommen-ded
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