

DAVVI: a prototype for the next generation multimedia entertainment platform

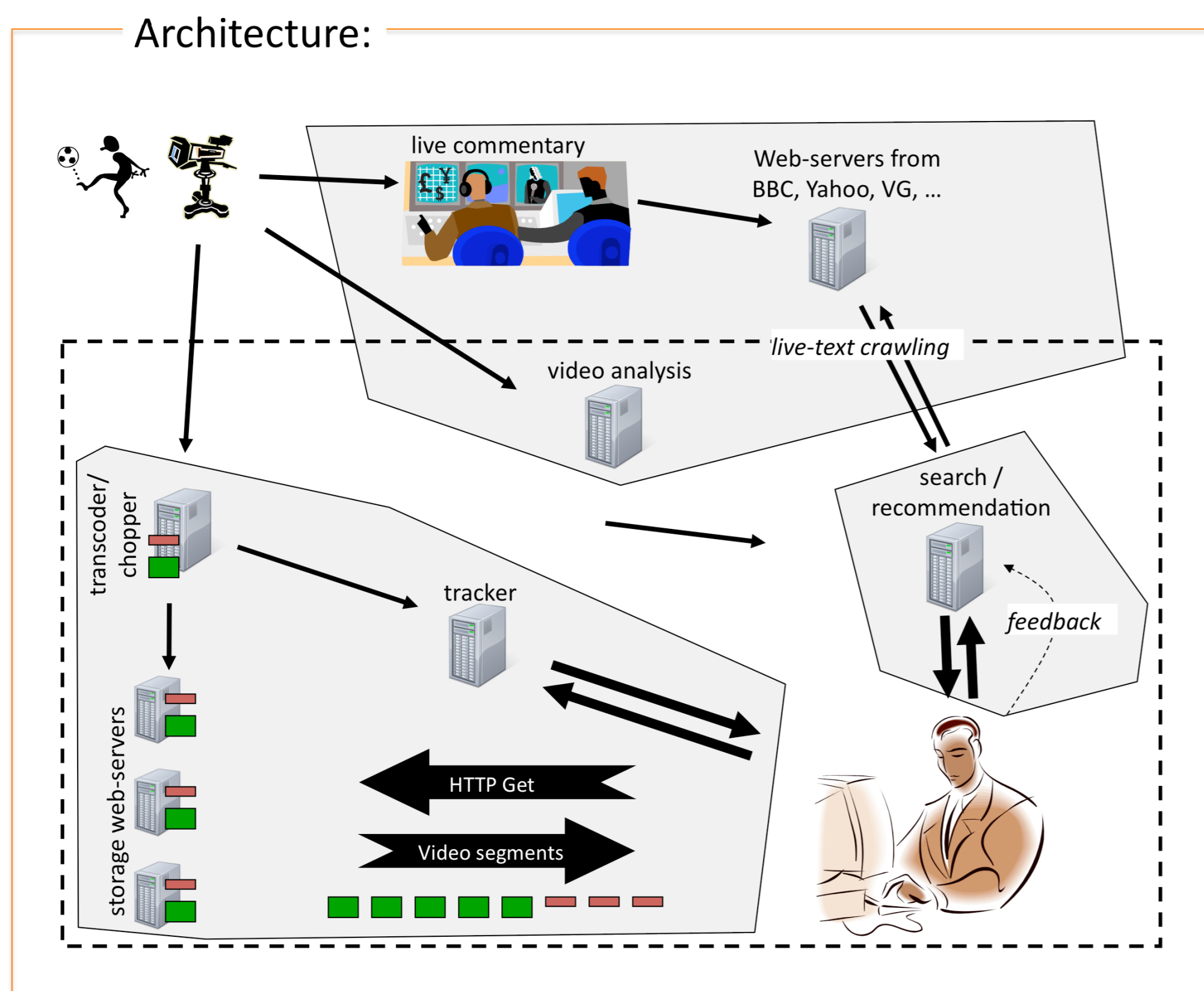
Dag Johansen, Håvard Johansen, Tjalve Aarflot, Joseph Hurley, Åge Kvalnes, Cathal Gurrin, Sorin Sav, Bjørn Olstad, Erik Aaberg, Tore Endestad, Haakon Riiser, Carsten Griwodz, Pål Halvorsen



Netview

[simula . research laboratory]

DAVVI is a prototype of the next generation multimedia entertainment platform. It delivers multi-quality video content over HTTP in a torrent-similar way like known systems from Move Networks, Microsoft and Apple do. However, it also provides a brand new, personalized user experience. Through applied search, personalization and recommendation technologies, end-users can efficiently search and retrieve highlights and combine arbitrary events in a customized manner using drag and drop resulting in a personalized video composition and playout.



Annotation:

- Many online TV-stations and newspapers provide **live text commentaries**
- DAVVI uses a semi-automatic live-text crawler and parser to improve the automatic annotations – and add a LOT of extra searchable metadata

[news.bbc.co.uk:](http://news.bbc.co.uk)
31:01 GOAL - Fernando Torres
Liverpool 1 - Tottenham 0
 Dirk Kuyt crosses the ball, Fernando Torres grabs a headed goal from deep inside the penalty box. Liverpool 1-0 Tottenham. Assist by Dirk Kuyt.

29:49
 Foul by Didier Zokora on Steven Gerrard, free kick awarded. Free kick taken by Daniel Agger.

28:27
 Free kick awarded for a foul by Steven Gerrard on Luka Modric. Gareth Bale crosses the ball in from the free kick, clearance by Jamie Carragher.

26:33
 Drilled right-footed shot by Fernando Torres. Heurlho Gomes makes a save.

25:52
 Shot by Jermaine Jenas from 30 yards. Jose Reina makes a save.

21:52
 Benoit Assou-Ekotto has an effort at goal from 30 yards. Save made by Jose Reina.

19:29
 Free kick awarded for an unfair challenge on Fabio Aurelio by Jermain Defoe. Fabio Aurelio takes the free kick.

14:44
 Shot by Steven Gerrard. Clearance made by Vedran Corliuka.

14:23
 Inswinging corner taken right-footed by Steven Gerrard, Vedran Corliuka makes a clearance.

12:31
 Luka Modric fouled by Fabio Aurelio, the ref awards a free kick. Alan Hutton takes the free kick.

10:43
 Jamie Carragher challenges Gareth Bale unfairly and gives away a free kick. Didier Zokora restarts play with the free kick.

[uk.eurosport.yahoo.com:](http://uk.eurosport.yahoo.com)
GOAL FOR LIVERPOOL! TORRES WITH THE HEADER!! Gerrard exchanged passes with Kuyt and led Aurelio on the left, his ball was superb to the near post, where the striker headed past Cech brilliantly. It is his first goal at Anfield this season. So much for a goalless draw!

88'
 This match is heading for a goalless draw. Beforehand you said to your mates it would end all-square, but when the whistle went to start it off you wanted it to be more interesting than that, unfortunately it seems not to be.

85'
 Chelsea change: Miroslav Stoch on for Kalou.

83'
 Pool sub: Ryan Babel on for Mascherano. An attacking move from Rafa for once...

83'
 Israel Benayoun watches the ball drop and unleashes a dipping volley just over the bar. He is a man in form.

81'
 Cole with a great challenge to dispossess Kuyt as Liverpool attacked space on the right. It has not been pretty from Chelsea, but they have fought for a draw.

80'
 Benayoun comes inside and strikes towards the far corner, parried away by Cech - who has been infinitely busier than Reina.

78'
 Torres flies through the air as a cross comes in, but he cannot get anything on the ball. Strange acrobatic effort.

Video segmentation:

- Based on experiments, we use 2-second segments (one soccer game → 2700+ small, indexed videos)
- FFMPEG encoded:
 - H.264 (GOP = IP⁴⁹)
 - MP3
 - Custom made container
- To support adaptation to available resources, each segment is coded in many quality levels

The diagram shows a 'segmenter' receiving input from a soccer game and outputting segments. Below it is a graph with 'quality' on the y-axis and 'playout time' on the x-axis. The graph shows a series of blue bars representing segments, with a red line indicating the quality level of each segment over time.

Video delivery:

- Downloads segments
- Tracker manages information about segment locations
- The user contacts the tracker for segment locations
- User sends **HTTP GET requests** to download **video segments**

The diagram shows a user at a computer interacting with a 'tracker'. The tracker is connected to a cloud of 'web-servers'. Red arrows indicate the flow of information from the tracker to the web-servers and back. A blue arrow shows the user sending an HTTP GET request to the tracker to download video segments.

Results

- Personalized video playout
- Arbitrary clip ordering
- Faster response times compared to Move and SmoothHD

System (storage location)	Latency (ms)
SmoothHD (demo [4], Akamai Oslo)	320, 533, 880
SmoothHD (Tromsø/arctic Norway)	400, 956, 1500
Move Networks (demo [2]), Level 3, California)	560, 716, 800
Move Networks (VG live [5], Level 3, California)	640, 1022, 1400
DAVVI (Tromsø/arctic Norway)	280, 328, 360
DAVVI (Oslo)	320, 328, 360