



CONNECTING PEOPLE TO
THE CONTENT THEY LOVE



Pinterest-Kudelski Discussion Confidential- Subject to NDA

May 5, 2020

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The Group's DNA...



Entrepreneurship
Drive



Obsession with
Outstanding Experience

Initiated an Exciting Journey...



1951

Revolutionize
film audio



1989

Foundational role
in PayTV



2001

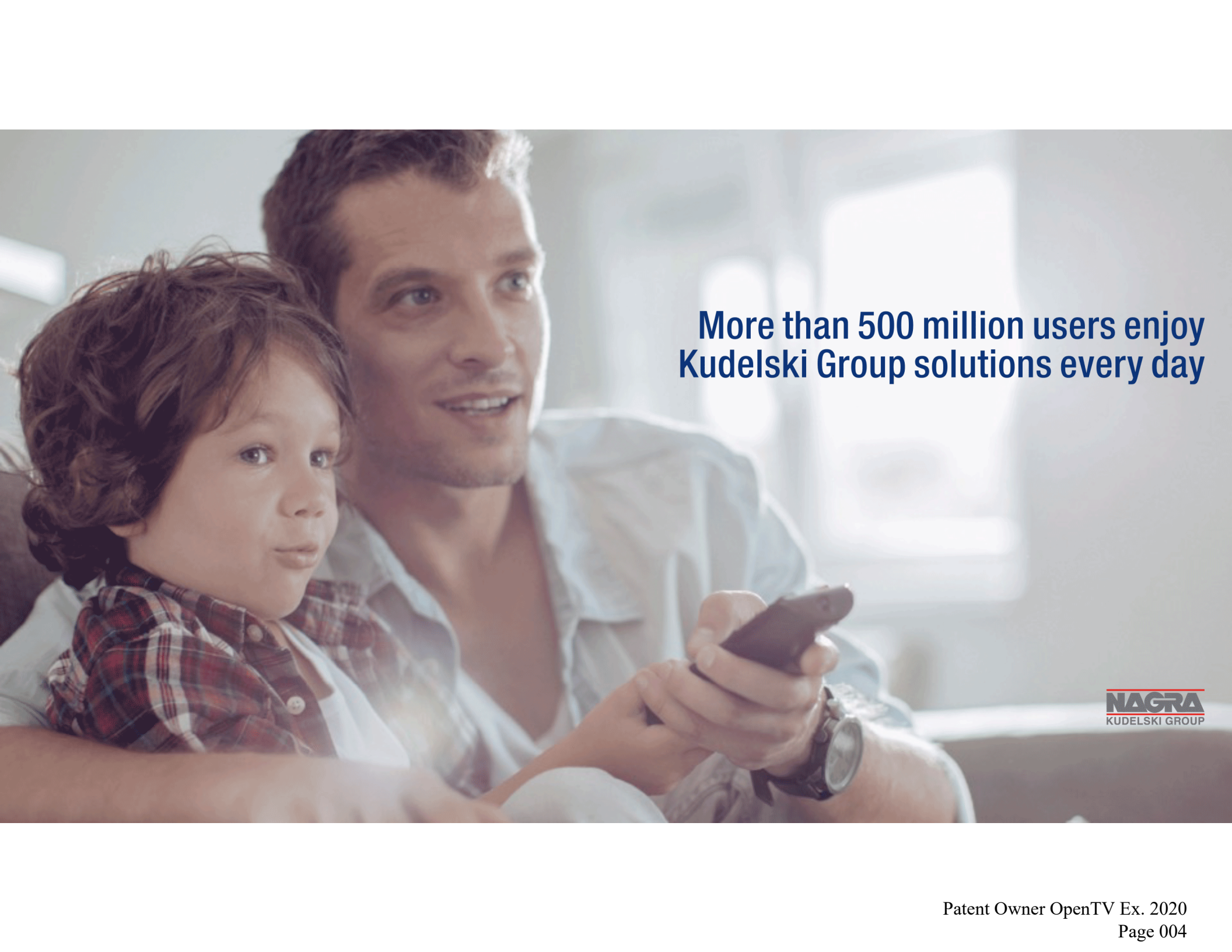
Intuitive solutions
for physical access

Connecting Consumers to an Experience

SUBJECT TO NDA

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NAGRA
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A photograph of a man and a young child sitting together, looking at a smartphone held by the man. The man is smiling and looking at the phone, while the child looks on with interest. The background is a bright, out-of-focus indoor setting.

**More than 500 million users enjoy
Kudelski Group solutions every day**

NAGRA
KUDELSKI GROUP

A Global Technology Leader



63 sites in
33 countries



3800 employees
2600 in digital TV



Highly skilled, creative and dedicated talent close to customers

Kudelski Group Activities

DIGITAL TELEVISION



SECURE COMPELLING EFFICIENT
TV SOLUTIONS

\$90B Content Value
555 Operators
300 Million Devices

CYBER SECURITY

KUDELSKI
SECURITY



END-TO-END
ECOSYSTEM SECURITY

Finance
Defence, Government
practices

SUBJECT TO NDA

PUBLIC ACCESS

SKIDATA®
KUDELSKI GROUP

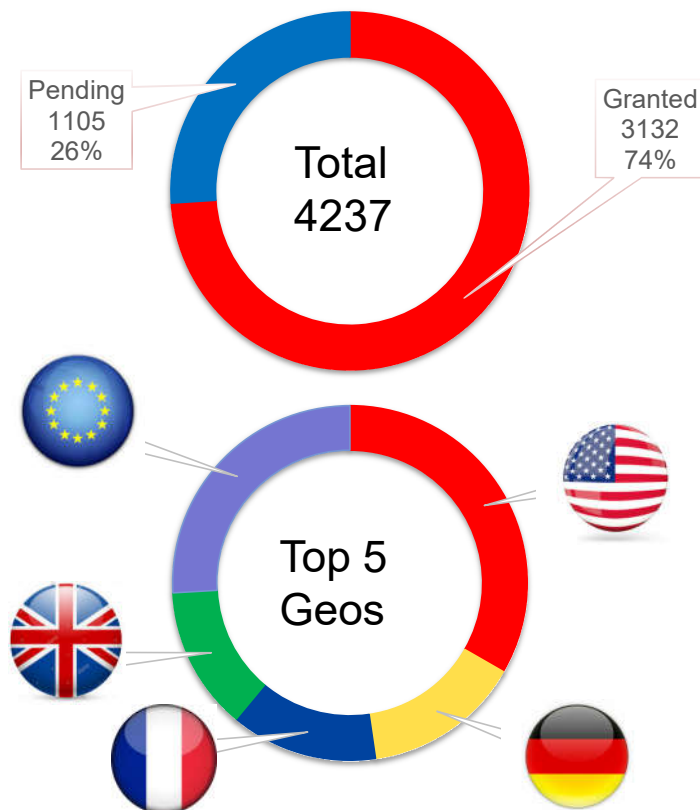


PARKING (#1), MOUNTAINS (#1),
ARENAS, ATTRACTIONS

>10'000 locations
>90 countries

World Class Patent Portfolio Validated by the Video Market

Kudelski Patent Portfolio



Kudelski Patent Licensees

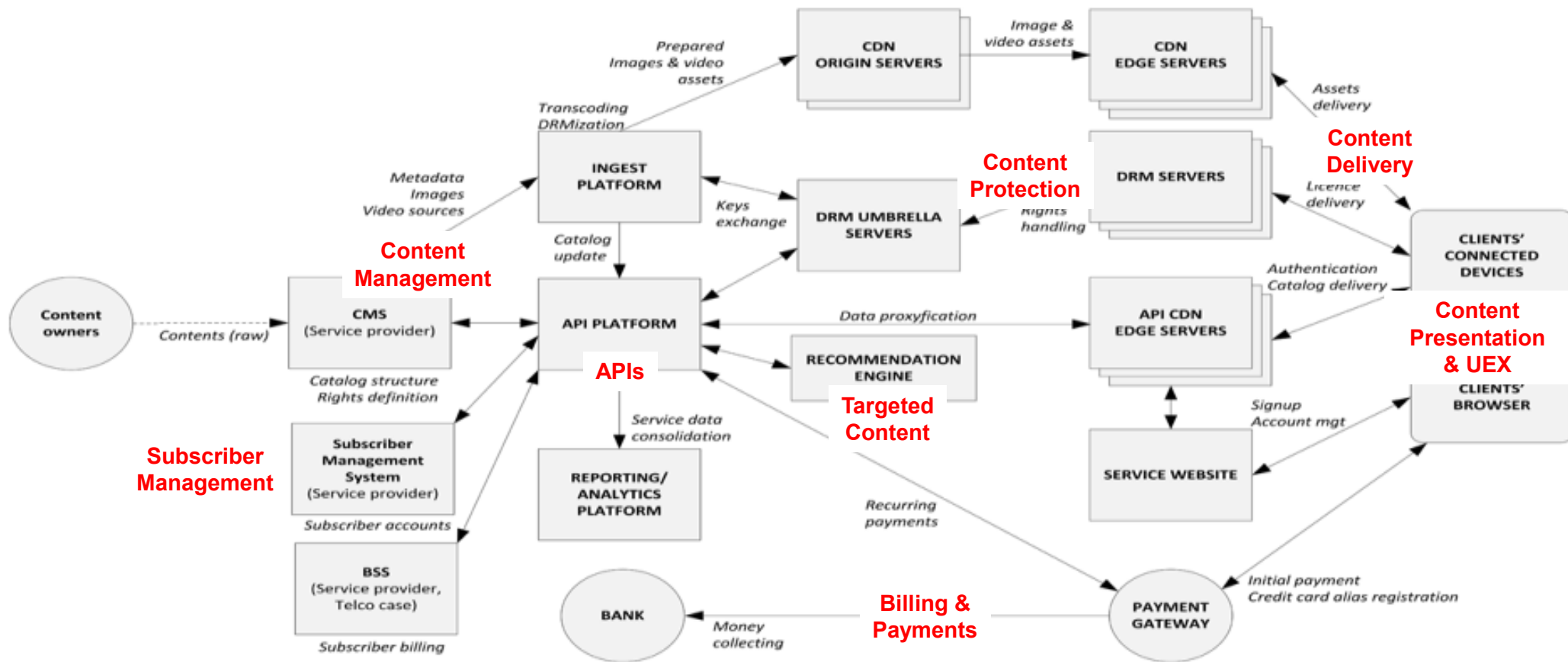
sky 2009 - British Sky Broadcasting - Litigation Settlement - Per box rate	FOXTEL 2013 - License to MWAU patents - Per box rate	CISCO 2014 - Litigation Settlement - Multi-Year X-License - Lump sum to Kudelski	vevo 2014 - Worldwide X-License - Lump sum to Kudelski
2015 - License to some EU patents - Lump sum to Kudelski	NETFLIX 2015 - Business Partnership - Litigation Settlement - Lump sum to Kudelski	Google 2015 - Worldwide X-License - Lump sum to Kudelski	Disney 2015 - Worldwide X-License - Lump sum to Kudelski
Bloomberg 2015 - Worldwide X-License - Lump sum to Kudelski	verizon Aol. 2016 - Litigation Settlement - Lump sum to Kudelski	YAHOO! 2016 - Litigation Settlement - Lump sum to Kudelski	Fortune 50 U.S. Co. 2016 - Worldwide License - Lump sum to Kudelski
2016 - Litigation Settlement - Lump sum to Kudelski	RPX 2016 - Sub license rights for named cos - Lump sum to Kudelski	hulu 2016 - Litigation Settlement - Lump sum to Kudelski	2017 - License + patent sale - Lump sum to Kudelski
turner 2017 - Worldwide X-License - Lump sum to Kudelski	CONDÉ NAST scripps networks 2017 - Worldwide License - Lump sum to Kudelski	ARRIS 2017 & 2020 - Worldwide License - Payments to Kudelski	AT&T 2017 - Worldwide X-License - Payments to Kudelski
Roku 2017 - Worldwide X-License - Payments to Kudelski	2018 - Worldwide License - Lump sum to Kudelski	ENDEAVOR 2018 - Worldwide License - Lump sum to Kudelski	NASCAR 2018 - Worldwide License - Payments to Kudelski
fubo TV 2020 - Worldwide License - Lump sum to Kudelski	philo 2020 - Worldwide License - Lump sum to Kudelski	DAZN 2020 - Worldwide License - Payments to Kudelski	STARZ 2020 - Worldwide License - Payments to Kudelski
2020 - Worldwide License - Lump sum to Kudelski	MIRROR 2020 - Worldwide License - Lump sum to Kudelski	FOX tubi 2021 - Worldwide License - Lump sum to Kudelski	

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Core Licensing Program in OTT

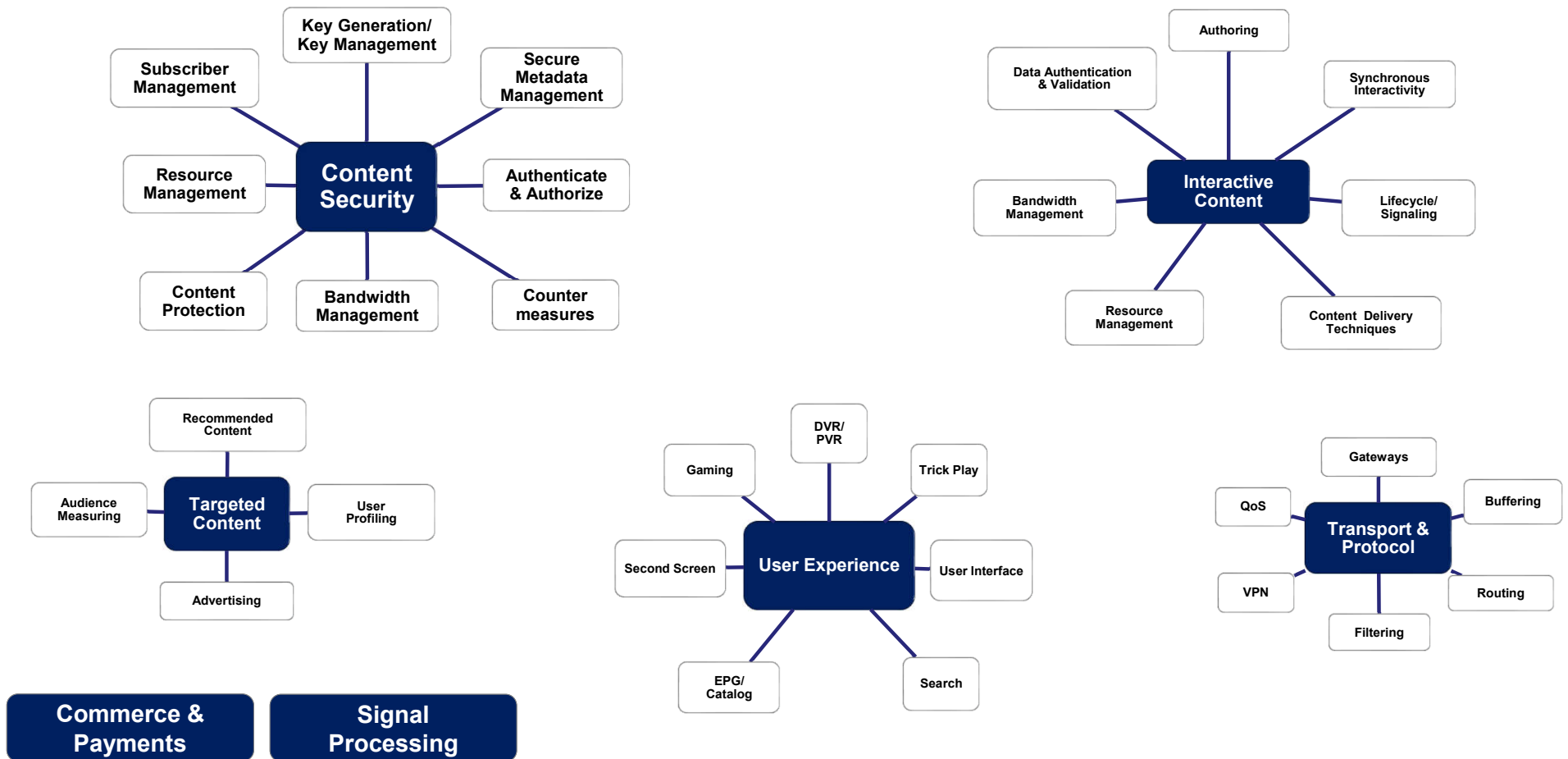


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Kudelski patents span the OTT technology ecosystem

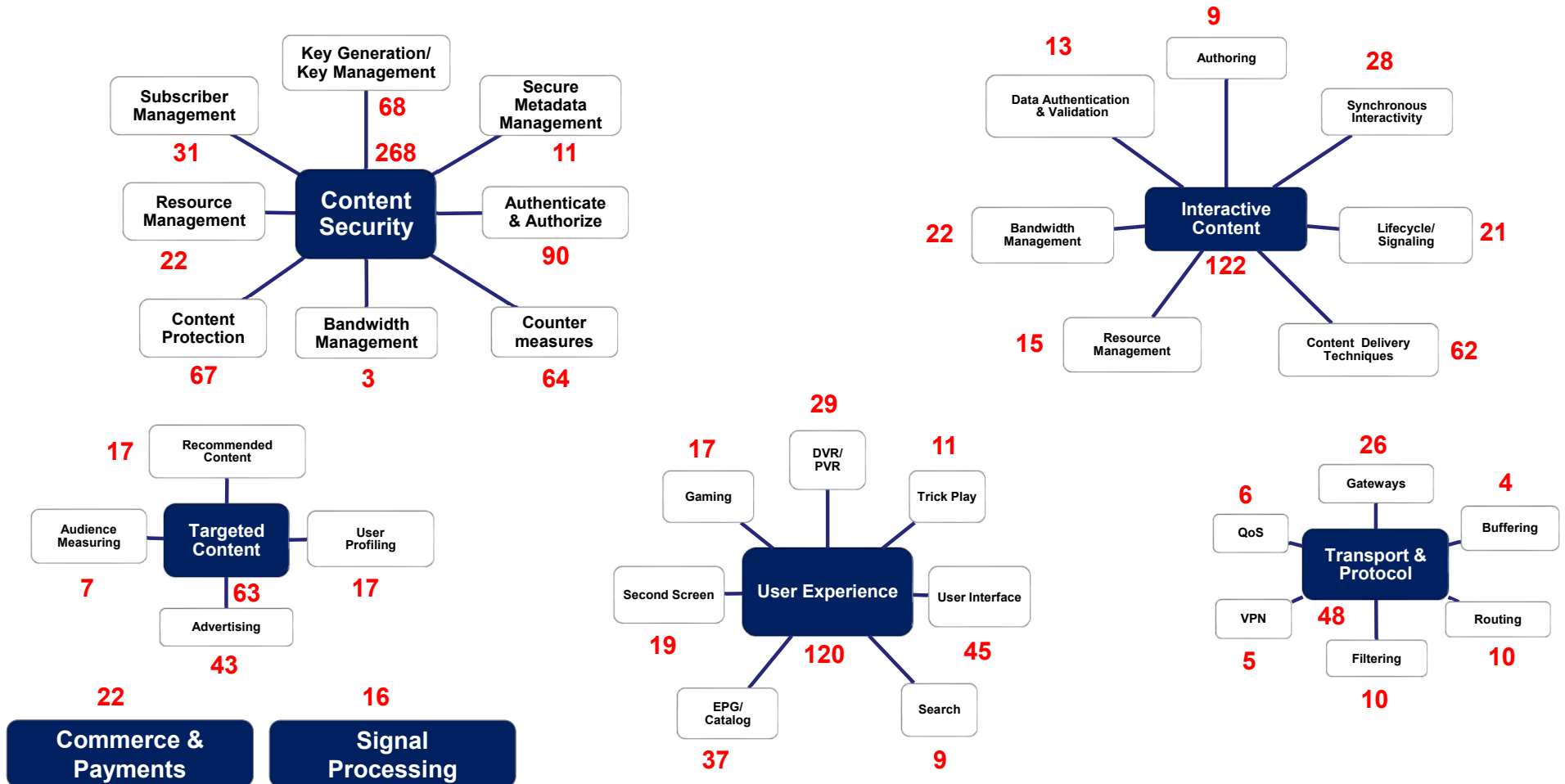


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NAGRA
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Kudelski patents span the OTT technology ecosystem

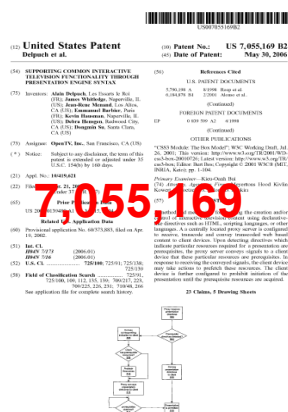


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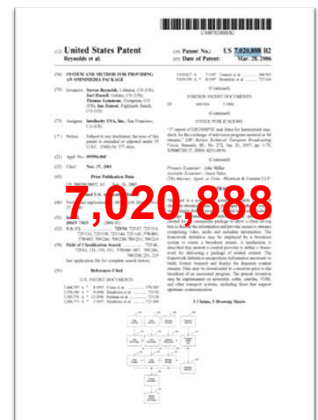
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Overview of Selected Patents for Pinterest



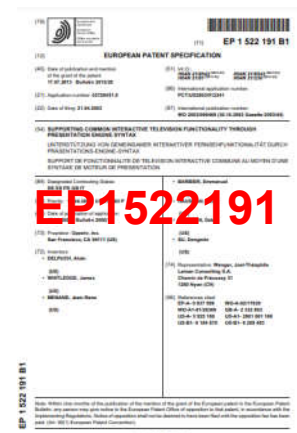
7,055,169

OTT Adaptive Streaming



7,020,888

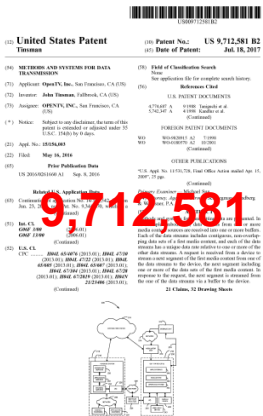
Combining Media Sources for Efficient Delivery and Management of Media Content



EP1522191

OTT Adaptive Streaming

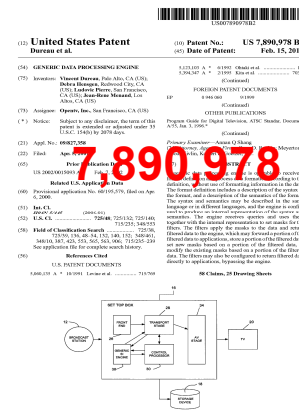
Overview of Selected Patents for Pinterest



Intelligent caching of content in an edge device

[illegible]

Metadata Instruction for Enhanced User Interface



Format Definition for Efficient Data Delivery

U.S. Patent No. 7,055,169

US97/055169B2

(12) United States Patent
Delpuch et al.

(10) Patent No.: US 7,055,169 B2
(45) Date of Patent: May 30, 2006

**(54) SUPPORTING COMMON INTERACTIVE
TELEVISION FUNCTIONALITY THROUGH
PRESENTATION ENGINE SYNTAX**

(56) References Cited
U.S. PATENT DOCUMENTS

(75) Inventors: **Alain Delpuch**, Les Essarts le Roi
(FR); **James Whitledge**, Naperville, IL
(US); **Jean-René Meunier**, Les Alloues,
CA (US); **Emanuel Barlier**, Paris
(FR); **Kevin Hansen**, Naperville, IL
(US); **Debra Hengen**, Redwood City,
CA (US); **Douglas Su**, Santa Clara,
CA (US)

(73) Assignee: **OpenTV, Inc.**, San Francisco, CA (US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 160 days.

(21) Appl. No.: 10/419,621

(22) Filed: Apr. 21, 2003
(Under 37 CFR 1.47)

(65) Prior Publication Data
US 2004/0139490 A1 Jul. 15, 2004

Related U.S. Application Data

**(60) Provisional application No. 60/373,883, filed on Apr.
19, 2002.**

(51) Int. Cl.
H04N 7/27 (2006.01)
H04N 7/16 (2006.01)
(52) U.S. Cl. 725/106; 725/91; 725/138;
725/139
(58) Field of Classification Search 725/91;
725/100, 106, 112, 135, 139, 709/217, 223,
709/225, 226, 231; 710/48, 266

See application file for complete search history.

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26, 2001; This version: [http://www.w3.org/TR/2001/WD-
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css3-box-20010726); Latest version: [http://www.w3.org/TR/
css3-box/](http://www.w3.org/TR/
css3-box/); Editor: Ian Hick; Copyright © 2001 W3C® (MIT,
INRIA, Keio); pp. 1-104.

Privacy Overview—Kiss-Orth Bui

(74) Attorney, Agent, or Firm—Meyerrose Hood Kivlin
Kosow & Goodell, P.C.; Rory D. Rankin

(57) ABSTRACT

A method and mechanism for enabling the creation and/or
control of interactive television content using declarative-
like directives such as HTML, scripting languages, or other
languages. A centrally located proxy server is configured to
receive, transcode and convey transcoded web based
content to client devices. Upon receiving directives which
indicate particular resources required for a presentation are
prerequisites, the proxy server conveys signals to a client
device that these particular resources are prerequisites. In
response to receiving the conveyed signals, the client device
may take actions to prefetch these resources. The client
device is further configured to prohibit initiation of the
presentation until the prerequisite resources are acquired.

23 Claims, 5 Drawing Sheets

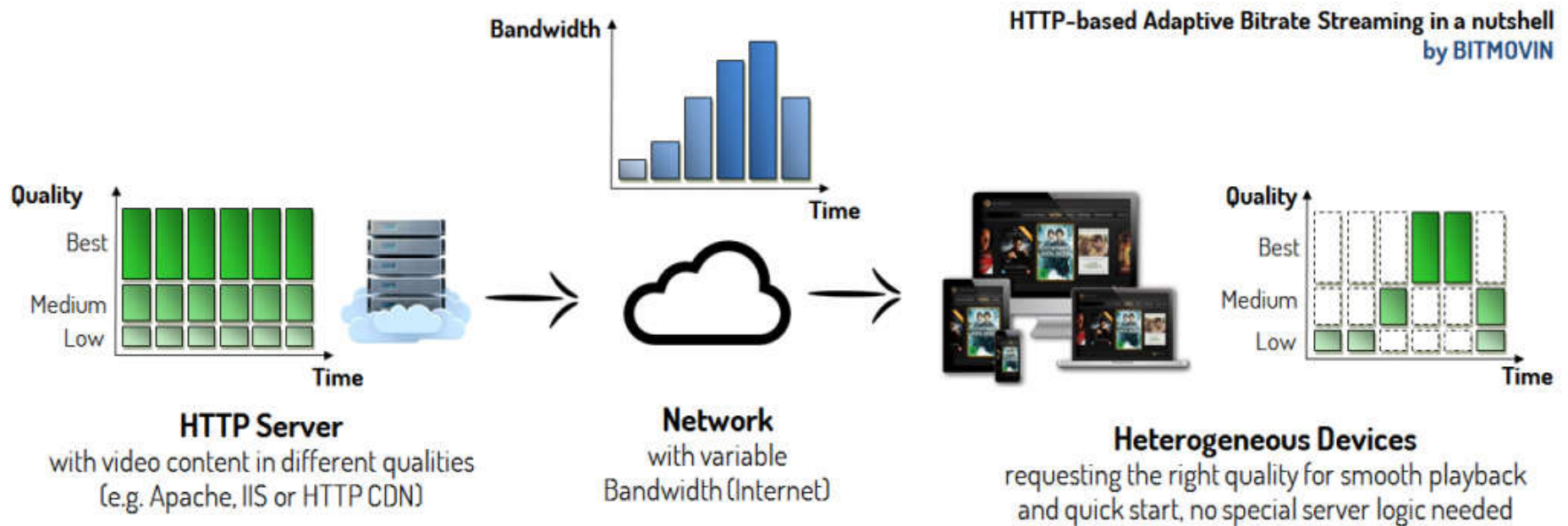
- **Inventors:** A. Delpuch, J. Whitley, J.R. Menand, E. Barbier, K. Hausman, D. Hensgen, D. Su
- **Priority Date:** April 19, 2002
- **Expiration Date:** September 28, 2023
- **Summary of Technology:** Prohibiting initiation and presentation of content until a set of prerequisite resources are acquired for Adaptive Streaming
- **Representative Claim Mapping:** Pinterest's-Adaptive Streaming Content Delivery Platform
- **Kudelski Litigations:** Asserted against Netflix in case filed Dec. 2012 (**settled**) and against Apple in case filed May 2015 (**settled**) and against Verizon in case filed October 2015 (**settled**). '169 Patent at issue in Yahoo! DJ filed January 2016 (**settled**). Asserted against NFLE in case filed May 2017 (**settled**).
- **Foreign Counterparts:**



US 7,055,169 – Kudelski’s Claim Construction in NFLE

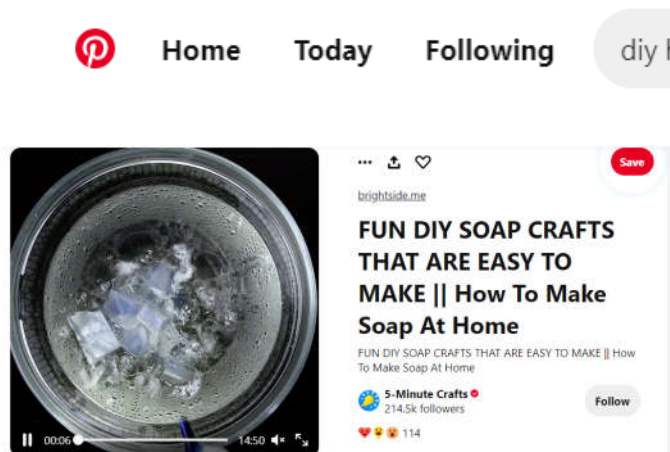
1 M. ELIZABETH DAY (SBN 177125)
2 eday@feinday.com
3 MARC BELLOLI (SBN 244290)
4 mbelloli@feinday.com
5 DAVID ALBERTI (SBN 220265)
6 dalberti@feinday.com
7 **FEINBERG DAY ALBERTI LIM &**
8 **BELLOLI LLP**
9 1600 El Camino Real, Suite 280
10 Menlo Park, CA 94025
11 Tel: 650.618.4360
12 Fax: 650.618.4368
13
14 Attorneys for Nagravision SA and
15 OpenTV, Inc.
16
17 UNITED STATES DISTRICT COURT
18 CENTRAL DISTRICT OF CALIFORNIA
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20 NAGRAVISION SA and OPENTV,
21 INC.,
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23 Plaintiffs,
24 v.
25 NFL ENTERPRISES, LLC,
26 Defendant.
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US 7,055,169 – Adaptive Streaming



Pinterest Infringes U.S. 7,055,169 Patent, Claim 1*

Claim 1. A method comprising: **receiving one or more directives [A]**, wherein said directives are indicative of an audio, video and/or graphic presentation which requires a set of resources;



[A] Adaptive Streaming Directives:
Pinterest supports adaptive streaming through a set of directives specified in a ".m3u8" file for its video programming

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF: BANDWIDTH=1498365, AVERAGE-BANDWIDTH=465068, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=360x360, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_360w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=889854, AVERAGE-BANDWIDTH=288136, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=240x240, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_240w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=2205666, AVERAGE-BANDWIDTH=667486, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=480x480, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_480w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=2775488, AVERAGE-BANDWIDTH=973867, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=640x640, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_640w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=3202197, AVERAGE-BANDWIDTH=1099034, CODECS="avc1.64001f, mp4a.40.5", RESOLUTION=720x720, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_720w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=4437250, AVERAGE-BANDWIDTH=1626983, CODECS="avc1.64001f, mp4a.40.5", RESOLUTION=960x960, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_960w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=7743872, AVERAGE-BANDWIDTH=2845127, CODECS="avc1.640020, mp4a.40.5", RESOLUTION=1080x1080, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_1280w.m3u8
```

* Representative claim illustrated

<https://help.pinterest.com/en/article/video-on-pinterest>

SUBJECT TO NDA

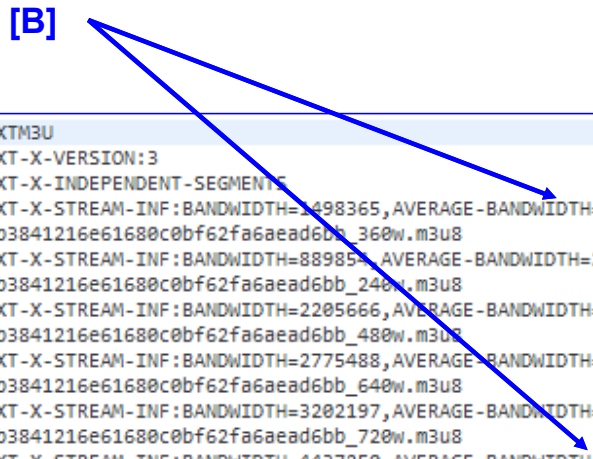
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NAGRA
KUDELSKI

Pinterest Infringes U.S. 7,055,169 Patent, Claim 1

Claim 1. A method comprising: receiving one or more directives, wherein said directives are **indicative of an audio, video and/or graphic presentation which requires a set of resources [B]**;

[B]



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#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=1498365,AVERAGE-BANDWIDTH=465068,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=360x360,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_360w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=889854,AVERAGE-BANDWIDTH=288136,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=240x240,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_240w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2205666,AVERAGE-BANDWIDTH=667486,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=480x480,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_480w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2775488,AVERAGE-BANDWIDTH=973867,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=640x640,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_640w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=3202197,AVERAGE-BANDWIDTH=1099034,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=720x720,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_720w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=4437250,AVERAGE-BANDWIDTH=1626983,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=960x960,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_960w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=7743872,AVERAGE-BANDWIDTH=2845127,CODECS="avc1.640020,mp4a.40.5",RESOLUTION=1080x1080,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_1280w.m3u8
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Pinterest Infringes U.S. 7,055,169 Patent, Claim 1

determining whether said one or more directives includes a prerequisite directive which indicates that acquisition of a subset of said set of resources is a prerequisite for initiating the presentation [C];

[C] Pinterest's platform determines in real time the user's bandwidth and adapts the streaming quality to use the highest bitrate possible.

Status	Method	Domain	File	Initiator	Type	Transferred	Size
200	GET	www.pinterest...	/resource/NewsHubBadgeResource/get/?source_url=	2-8367110b059ff...	json	291 B	291 B
200	GET	www.pinterest...	/resource/UserExperienceResource/get/?source_url=	2-8367110b059ff...	json	768 B	768 B
	OPTIO...	sessions.bugs...	/	xhr	plain	0 B	0 B
200	GET	s.pinimg.com	366-8ac75ec2ac8a02d7b1c8.mjs	runtime-c91c60a2...	js	cached	0 B
200	GET	v.pinimg.com	26b3841216e61680c0bf62fa6ead6bb.m3u8	6-5937bc1283c4b...	x-mpe...	cached	1.23 KB
200	GET	s.pinimg.com	logo_trans_144x144-5e37c0c6.png	FaviconLoader.js...	png	cached	2.56 KB
200	GET	s.pinimg.com	favicon-54a5b2af.png	FaviconLoader.js...	png	cached	743 B
	POST	www.pinterest...	/_/report/browser_extension/	2-8367110b059ff...	plain	2.43 KB	0 B
200	GET	s.pinimg.com	122-6ea77ae126e584cf4eda.mjs	runtime-c91c60a2...	js	cached	0 B
200	GET	s.pinimg.com	147-c5df08b1d24f72b34964.mjs	runtime-c91c60a2...	js	cached	0 B
200	GET	s.pinimg.com	PinSaveButtonCommon-64a62d25dde0ba8175b4.mjs	runtime-c91c60a2...	js	cached	0 B
200	POST	www.pinterest...	/resource/ContextLogResource/create/	2-8367110b059ff...	json	997 B	2.49 KB
200	GET	s.pinimg.com	bestOutline-1f1b1a21.png	ClosureActionPa...	png	cached	896 B

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#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=1498365,AVERAGE-BANDWIDTH=465068,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=360x360,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_360w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=889854,AVERAGE-BANDWIDTH=288136,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=240x240,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_240w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2205666,AVERAGE-BANDWIDTH=667486,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=480x480,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_480w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2775488,AVERAGE-BANDWIDTH=973867,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=640x640,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_640w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=3202197,AVERAGE-BANDWIDTH=1099034,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=720x720,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_720w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=4437250,AVERAGE-BANDWIDTH=1626983,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=960x960,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_960w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=7743872,AVERAGE-BANDWIDTH=2845127,CODECS="avc1.640020,mp4a.40.5",RESOLUTION=1080x1080,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_1280w.m3u8
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Prerequisite directive for high definition streams Indicative of segment size

Pinterest Infringes U.S. 7,055,169 Patent, Claim 1

initiating said presentation, in response to determining the one or more directives do not include said prerequisite directive [D];

Status	Method	Domain	File	Initiator	Type	Transferred	Size	Headers	Cookies	Request	Response	Timings	Stack Trace
200	GET	www.pinterest.com	/resource/NewsHubBadgeResource/get/?source_url=/pin	2-8367110b059f68...	json	291 B	291 B						
200	GET	v.pinimg.com	26b3841216e61680c0bf62fa6aeadd6bb_1280w.m3u8	6-5937bc1283c4ba0...	x-mpeg...	1.35 KB	17.31 KB						
200	GET	v.pinimg.com	26b3841216e61680c0bf62fa6aeadd6bb_240w.m3u8	6-5937bc1283c4ba0...	x-mpeg...	1.35 KB	17.10 KB						
200	POST	www.pinterest.com	/resource/StatsLogResource/create/	3-1bdf54884389ecb...									
200	GET	www.gstatic.com	recaptcha_en.js	enterprisejs:1 (script)	js	cached	0 B						
200	GET	www.google.com	anchor?ar=1&k=6Ldx7ZkUAAAF3S205DRL2Kdh911tCa	recaptcha_en.js:88...	html	10.75 KB	19.75 KB						
200	GET	v.pinimg.com	26b3841216e61680c0bf62fa6aeadd6bb_240w_20200716T090841_00001.ts	6-5937bc1283c4ba0...	mp2t	198.28 KB	198.28 KB						
200	GET	www.gstatic.com	recaptcha_en.js	script	js	cached	0 B						
200	GET	www.google.com	lkt9V9PFFnuM-dbt05H91JhFayj11JO3HqHlUubNQ.js	recaptcha_en.js:33...	js	cached	0 B						
200	GET	www.google.com	webworker.js?hl=en&v=YStQ3IKwn1XL5hGgZ1kR4-1	recaptcha_en.js:28...	js	112 B	102 B						
200	POST	www.google.com	reload?k=6Ldx7ZkUAAAF3S205DRL2Kdh911tCa3q	recaptcha_en.js:54...	json	7.47 KB	10.10 KB						
200	POST	www.pinterest.com	/resource/StatsLogResource/create/	3-1bdf54884389ecb...									
200	GET	www.gstatic.com	recaptcha_en.js	webworker.js:1 (scr...	js	cached	339.71 KB						
200	GET	www.pinterest.com	fb.html	_client-authdeskt...	service worker								
200	GET	www.googletag...	js?id=AW-519016158	_client-authdeskt...	js	cached	90.49 KB						
200	POST	www.pinterest.com	/resource/ApiResponse/update/	2-8367110b059f68...									

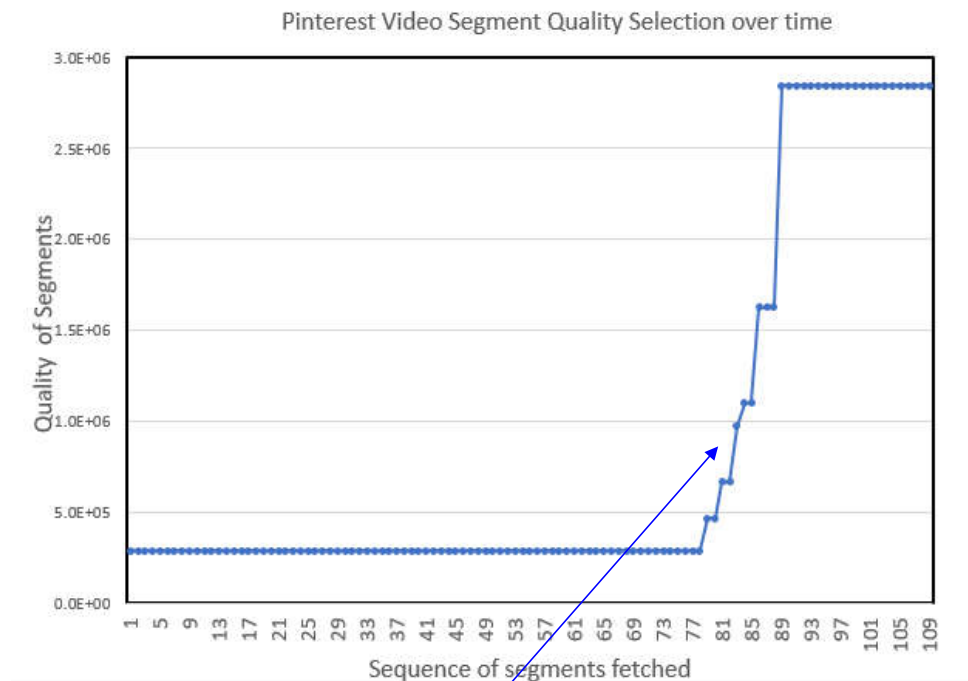
461 requests | 192.14 MB / 190.43 MB transferred | Finish: 21.47 min | DOMContentLoaded: 406 ms | load: 27.34 s

[D] Pinterest's platform selects the lowest quality segments to the exclusion of other available segment qualities.

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#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF: BANDWIDTH=1498365, AVERAGE-BANDWIDTH=465068, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=360x360, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_360w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=889854, AVERAGE-BANDWIDTH=288136, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=240x240, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_240w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=667486, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=480x480, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_480w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=2775488, AVERAGE-BANDWIDTH=973867, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=640x640, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_640w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=1099034, CODECS="avc1.64001f, mp4a.40.5", RESOLUTION=720x720, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_720w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=4437250, AVERAGE-BANDWIDTH=1626983, CODECS="avc1.64001f, mp4a.40.5", RESOLUTION=960x960, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_960w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=2845127, CODECS="avc1.640020, mp4a.40.5", RESOLUTION=1080x1080, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_1280w.m3u8
```

Pinterest Infringes U.S. 7,055,169 Patent, Claim 1

and prohibiting initiation of said presentation until said subset of resources are acquired, in response to determining the one or more directives include said prerequisite directive [E].



[E] Higher quality streams are not available until prerequisite bandwidth is available.

EP1522191

(19)  (11)  **EP 1 522 191 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent: 17.07.2013 Bulletin 2013/29 (51) Int. Cl.: H04N 21/0542 (2011.01) H04N 21/0543 (2011.01) H04N 21/07 (2011.01) H04N 21/236 (2011.01)

(21) Application number: 03728451.0 (86) International application number: PCT/US2003/012241

(22) Date of filing: 21.04.2003 (87) International publication number: WO 2003/090468 (30.10.2003 Gazette 2003/44)

(54) **SUPPORTING COMMON INTERACTIVE TELEVISION FUNCTIONALITY THROUGH PRESENTATION ENGINE SYNTAX**
 UNTERSTÜTZUNG VON GEMEINSAMER INTERAKTIVER FERNSEHFUNKTIONALITÄT DURCH PRÄSENTATIONS-ENGINE-SYNTAX
 SUPPORT DE FONCTIONNALITÉ DE TÉLÉVISION INTERACTIVE COMMUNE AU MOYEN D'UNE SYNTAXE DE MOTEUR DE PRÉSENTATION

(84) Designated Contracting States: DE ES FR GB IT • BARBIER, Emmanuel (US) • HAUSSMAN, Kevin (US) • HENSGEN, Debra (US) • SU, Dongmin (US)

(30) Priority: 19.04.2002 US 373883 P (74) Representative: Wenger, Joël-Thiophèle Leman Consulting S.A. Chemin de Précosey 31 1260 Nyon (CH)

(43) Date of publication of application: 13.04.2005 Bulletin 2005/15 (56) References cited: EP-A- 0 837 599 WO-A-02/17639 WO-A1-01/26369 GB-A- 2 332 863 US-A- 5 925 160 US-A1- 2001 001 160 US-B1- 6 104 878 US-B1- 6 269 493

(72) Inventors: • DELPUCH, Alain (US) • WHITLEY, James (US) • MENAND, Jean-Rene (US)

EP 1 522 191 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Printed by Jouve TSOE1 PARIS (FR)

- **Inventors:** A. Delpuch, J. Whitley, J.R. Menand, E. Barbier, K. Hausman, D. Hensgen, D. Su
- **Priority Date:** April 19, 2002
- **Expiration Date:** April 21, 2023
- **Summary of Technology:** Prohibiting initiation and presentation of content until a set of prerequisite resources are acquired for Adaptive Streaming
- **Representative Claim Mapping:** Pinterest's-Adaptive Streaming Content Delivery Platform
- **Relevant Validated Countries:**



SUBJECT TO NDA

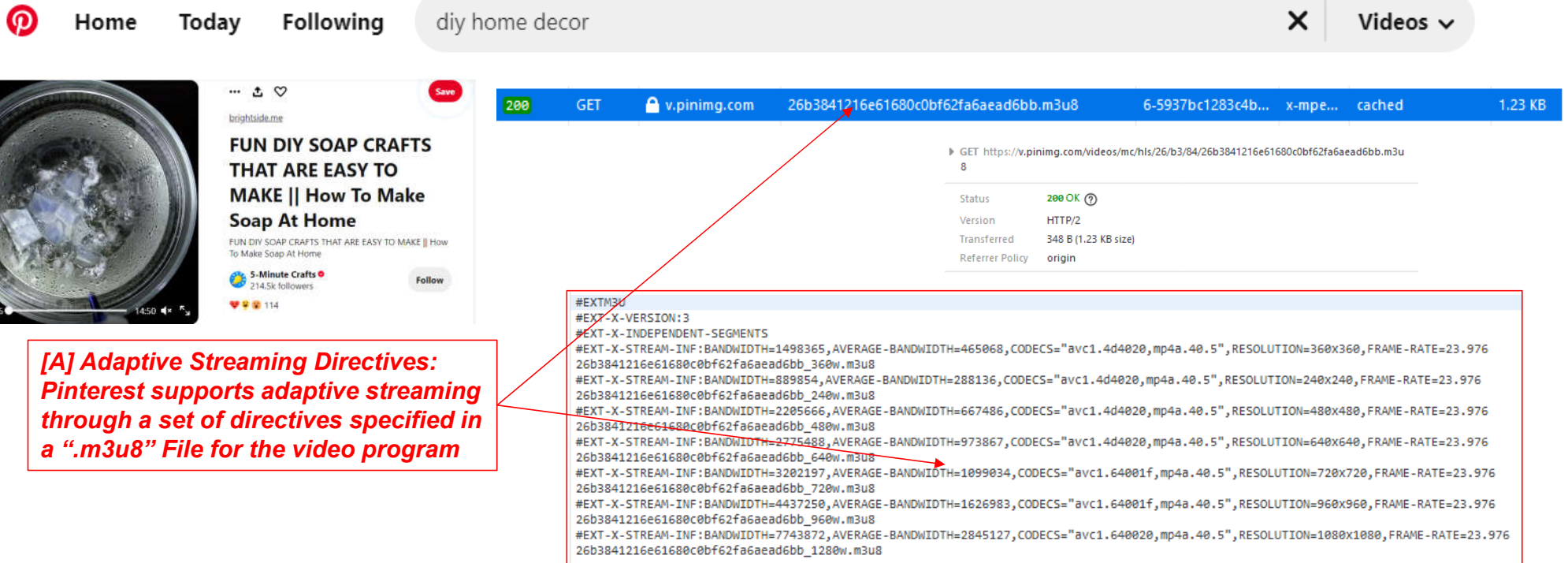
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NAGRA
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Pinterest Infringes EP1522191, Claim 1*

Claim 1. A method for presentation on a client device (30, 1002, 404), the method comprising:

receiving one or more directives by a device [A] (21) comprising a transmission medium for transmitting signals to the client device (30,1002,404), wherein said directives are provided in a form of textual information to create and/or control an audio, video and/or graphic presentation which requires a set of resources;



Home Today Following diy home decor X Videos v

[A] Adaptive Streaming Directives:
Pinterest supports adaptive streaming through a set of directives specified in a ".m3u8" File for the video program

200 GET v.pining.com 26b3841216e61680c0bf62fa6ae6bb.m3u8 6-5937bc1283c4b... x-mpe... cached 1.23 KB

GET https://v.pining.com/videos/mc/hls/26/b3/84/26b3841216e61680c0bf62fa6ae6bb.m3u8

Status 200 OK
Version HTTP/2
Transferred 348 B (1.23 KB size)
Referrer Policy origin

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=1498365,AVERAGE-BANDWIDTH=465068,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=360x360,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_360w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=889854,AVERAGE-BANDWIDTH=288136,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=240x240,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_240w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2205666,AVERAGE-BANDWIDTH=667486,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=480x480,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_480w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2775488,AVERAGE-BANDWIDTH=973867,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=640x640,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_640w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=3202197,AVERAGE-BANDWIDTH=1099034,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=720x720,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_720w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=4437250,AVERAGE-BANDWIDTH=1626983,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=960x960,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_960w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=7743872,AVERAGE-BANDWIDTH=2845127,CODECS="avc1.640020,mp4a.40.5",RESOLUTION=1080x1080,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_1280w.m3u8
```

* Representative claim illustrated

<https://help.pinterest.com/en/article/video-on-pinterest>

SUBJECT TO NDA

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Pinterest Infringes EP1522191, Claim 1

Claim 1. A method for presentation on a client device (30, 1002, 404), the method comprising:
receiving one or more directives by a device [A] (21) comprising a transmission medium for transmitting signals to the client device (30,1002,404), wherein said **directives are provided in a form of textual information to create and/or control an audio, video and/or graphic presentation which requires a set of resources [B]**;

[B]

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=1498368,AVERAGE-BANDWIDTH=465068,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=360x360,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_360w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=889854,AVERAGE-BANDWIDTH=288136,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=240x240,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_240w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2205666,AVERAGE-BANDWIDTH=667486,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=480x480,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_480w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2775488,AVERAGE-BANDWIDTH=973867,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=640x640,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_640w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=3202197,AVERAGE-BANDWIDTH=1099034,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=720x720,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_720w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=4437250,AVERAGE-BANDWIDTH=1626983,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=960x960,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_960w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=7743872,AVERAGE-BANDWIDTH=2845127,CODECS="avc1.640020,mp4a.40.5",RESOLUTION=1080x1080,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_1280w.m3u8
```

Pinterest Infringes EP1522191, Claim 1

determining by said device (21) whether said one or more directives include a prerequisite directive which indicates that acquisition of a subset of said set of resources is a prerequisite for initiating the presentation (504);[C]

[C] Pinterest's platform determines in real time the user's bandwidth and adapts the streaming quality to use the highest bitrate possible.

Status	Method	Domain	File	Initiator	Type	Transferred	Size
200	GET	www.pinterest...	/resource/NewsHubBadgeResource/get/?source_url=	2-8367110b059ff...	json	291 B	291 B
200	GET	www.pinterest...	/resource/UserExperienceResource/get/?source_url=	2-8367110b059ff...	json	768 B	768 B
	OPTIO...	sessions.bugs...	/	xhr	plain	0 B	0 B
200	GET	s.piniimg.com	366-8ac75ec2ac8a02d7b1c8.mjs	runtime-c91c60a2...	js	cached	0 B
200	GET	v.piniimg.com	26b3841216e61680c0bf62fa6ead6bb.m3u8	6-5937bc1283c4b...	x-mpe...	cached	1.23 KB
200	GET	s.piniimg.com	logo_trans_144x144-5e37c0c6.png	FaviconLoader.js...	png	cached	2.56 KB
200	GET	s.piniimg.com	favicon-54a5b2af.png	FaviconLoader.js...	png	cached	743 B
	POST	www.pinteres...	/_/report/browser_extension/	2-8367110b059ff...	plain	2.43 KB	0 B
200	GET	s.piniimg.com	122-6ea77ae126e584cf4eda.mjs	runtime-c91c60a2...	js	cached	0 B
200	GET	s.piniimg.com	147-c5df08b1d24f72b34964.mjs	runtime-c91c60a2...	js	cached	0 B
200	GET	s.piniimg.com	PinSaveButtonCommon-64a62d25dde0ba8175b4.mjs	runtime-c91c60a2...	js	cached	0 B
200	POST	www.pinteres...	/resource/ContextLogResource/create/	2-8367110b059ff...	json	997 B	2.49 KB
200	GET	s.piniimg.com	bestOutline-1f1b1a21.png	CloseActionRe...	png	cached	896 B

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=1498365,AVERAGE-BANDWIDTH=465068,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=360x360,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_360w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=889854,AVERAGE-BANDWIDTH=288136,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=240x240,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_240w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2205666,AVERAGE-BANDWIDTH=667486,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=480x480,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_480w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2775488,AVERAGE-BANDWIDTH=973867,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=640x640,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_640w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=3202197,AVERAGE-BANDWIDTH=1099034,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=720x720,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_720w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=4437250,AVERAGE-BANDWIDTH=1626983,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=960x960,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_960w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=7743872,AVERAGE-BANDWIDTH=2845127,CODECS="avc1.640020,mp4a.40.5",RESOLUTION=1080x1080,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_1280w.m3u8
```

Prerequisite directive for high definition streams Indicative of segment size

Pinterest Infringes EP1522191, Claim 1

initiating said presentation by a control unit (1030), linked to the client device, prior to receiving all of said set of resources, in response to determining the one or more directives do not include said prerequisite directive (518) [D];

Status	Method	Domain	File	Initiator	Type	Transferred	Size
200	GET	www.pinterest.c...	/resource/NewsHubBadgeResource/get/?source_url=/pin	2-8367110b059ff68...	json	291 B	291 B
200	GET	v.pinning.com	26b3841216e61680c0bf62fa6aeadd6bb_1280w.m3u8	6-5937bc1283c4ba0...	x-mpeg...	1.35 KB	17.31 KB
200	GET	v.pinning.com	26b3841216e61680c0bf62fa6aeadd6bb_240w.m3u8	6-5937bc1283c4ba0...	x-mpeg...	1.35 KB	17.10 KB
200	POST	www.pinterest.com	/resource/StatsLogResource/create/	3-1bdf54884389ecb...			
200	GET	www.gstatic.com	recaptcha_en.js	enterprise.js:1 (scrip)	Js	cached	0 B
200	GET	www.google.com	anchor?ar=1&=6Ldx7ZkUAAAF3S205DRL2Kdh911tCa:	recaptcha_en.js:88...	html	10.75 KB	19.75 KB
200	GET	v.pinning.com	26b3841216e61680c0bf62fa6aeadd6bb_240w_202007...	6-5937bc1283c4ba0...	mp2t	198.28 KB	198.28 KB
200	GET	www.gstatic.com	recaptcha_en.js	script	Js	cached	0 B
200	GET	www.google.com	lrkf9V9FFNuM-dbt05tH91JhFayj11JO3tHqHlUbNQjs	recaptcha_en.js:33...	Js	cached	0 B
200	GET	www.google.com	webworker.js?hl=en&v=YStQ3lKwn1Xl5hGgZ1kR4-1	recaptcha_en.js:28...	Js	112 B	102 B
200	POST	www.google.com	reload?k=6Ldx7ZkUAAAF3S205DRL2Kdh911tCa3q:	recaptcha_en.js:54...	Js	7.47 KB	10.10 KB
200	POST	www.pinterest.com	/resource/StatsLogResource/create/	3-1bdf54884389ecb...			
200	GET	www.gstatic.com	recaptcha_en.js	webworker.js:1 (scr...	Js	cached	339.71 KB
200	GET	www.pinterest.com	fb.html	_client-authdesko...	service worker		
200	GET	www.googletag...	js?id=AW-819016158	_client-authdesko...	Js	cached	90.49 KB
200	POST	www.pinterest.com	/resource/ApiResponse/update/	2-8367110b059ff68...			
461 requests 192.14 MB / 190.43 MB transferred Finish: 21.47 min DOMContentLoaded: 406 ms Load: 27.34 s							

Headers

Filter Headers: Block: Resend

GET

Scheme: https

Host: v.pinning.com

Filename: /Videos/mc/hls/26/b3/84/26b3841216e61680c0bf62fa6aeadd6bb_240w_20200716T090841_00001.ts

Address: 184.28.246.225:443

Status: 200 OK

Version: HTTP/2

Transferred: 198.28 KB (198.28 KB size)

Referrer Policy: origin

Response Headers (492 B)

accept-ranges: bytes

access-control-allow-credentials: false

access-control-allow-methods: GET

access-control-allow-origin: https://www.pinterest.com

access-control-expose-headers: X-CDN

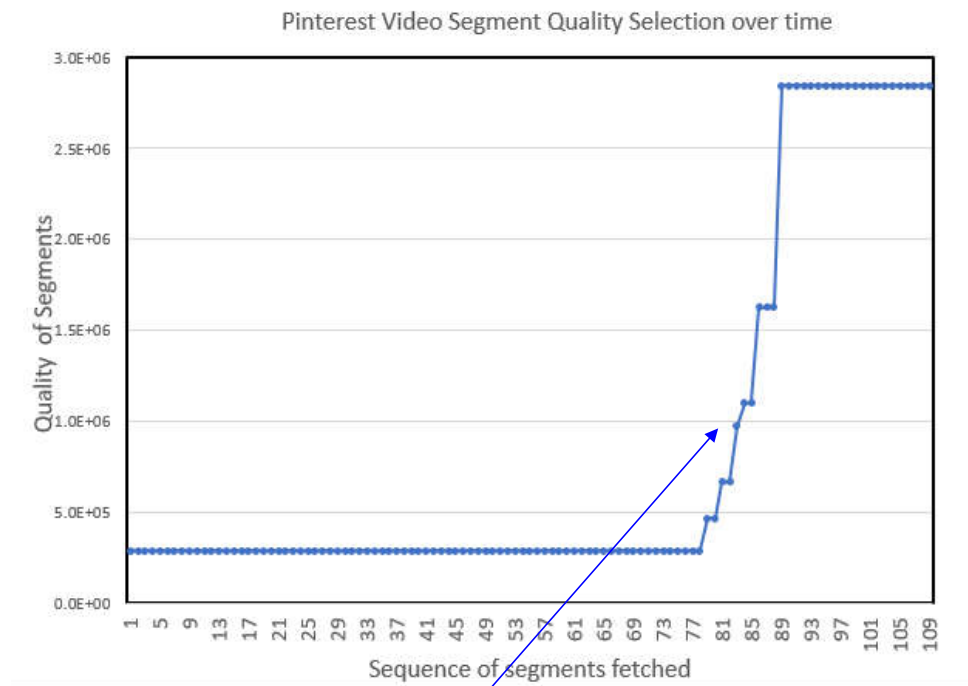
access-control-max-age: 86400

[D] Pinterest's platform selects the best quality segments to the exclusion of other available segment qualities.

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF: BANDWIDTH=1498365, AVERAGE-BANDWIDTH=465068, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=360x360, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_360w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=288136, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=240x240, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_240w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=667486, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=480x480, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_480w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=2775488, AVERAGE-BANDWIDTH=973867, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=640x640, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_640w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=1099034, CODECS="avc1.64001f, mp4a.40.5", RESOLUTION=720x720, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_720w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=1626983, CODECS="avc1.64001f, mp4a.40.5", RESOLUTION=960x960, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_960w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=2845127, CODECS="avc1.640020, mp4a.40.5", RESOLUTION=1080x1080, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6aeadd6bb_1280w.m3u8
```

Pinterest Infringes EP1522191, Claim 1

in response to determining the one or more directives include said prerequisite directive (514), determining by the control unit (1030) whether the client device (30, 1002, 404) has said subset of resources and prohibiting initiation of said presentation until said subset of resources are acquired [E],



[E] Higher quality streams are not available until prerequisite bandwidth is available.

Pinterest Infringes EP1522191, Claim 1

further comprising enhancing a root entity in DTD according to ATSC DASE [F] to add a showstopper attribute, said showstopper attribute comprising an indication that acquisition of particular resources of the set of resources are a prerequisite to initiating said presentation.

[F] Equivalent to ATSC DASE, Pinterest's implementation of HLS delivers a text-based root entity in the form of an .m3u8 manifest file, which is enhanced to indicate particular resources that are a prerequisite to initiating the presentation.

ATSC DASE-1 Introduction, Architecture, and Common Facilities 09 Mar 2003

application root entity: a specific element of an application entity collection which is processed before all other elements in the collection during application initialization processing.

6.1 Application Metadata Content

This facility consists of an application metadata content type. Application metadata content is used to specify essential information about a DASE Application which is required or useful in the instantiation and processing of the application.

The root entity of a DASE Application shall take the form of this content type.

6.5 Streaming Video Content

Streaming video content comprises content types that represent one or more image frames to be progressively presented in a synchronous fashion and, optionally, one or more accompanying audio channels. Streaming video content shall adhere to one of the following content types as specified below:

Table 11 Streaming Video Content Types

video/mpeg	MPEG-2 Video Program
video/mpv	MPEG-2 Video Elementary Stream

If an entity of a DASE Application takes the form of a streaming video content type other than one of the above specified types, and the entity is processed, then a DASE System shall not abort the application.

An entity which takes the form of a streaming video content type is designated as an implied resource. The content of this entity is not required to be made manifest (exposed) directly to the DASE System or a DASE Application.

Informational
Internet-Draft
Intended status: Informational
Expires: May 22, 2016

HTTP Live Streaming
draft-pantos-http-live-streaming-18

Abstract

Status of This Memo

Copyright Notice

#EXTM3U
#EXT-X-TARGETDURATION:10

#EXTINF:9.009,
http://media.example.com/first.ts
#EXTINF:9.009,
http://media.example.com/second.ts
#EXTINF:3.003,
http://media.example.com/third.ts

The first line is the format identifier tag #EXTM3U. The line containing #EXT-X-TARGETDURATION says that all Media Segments will be 10 seconds long or less. Then three Media Segments are declared. The first and second are 9.009 seconds long; the third is 3.003 seconds.

To play this Playlist, the client first downloads it and then downloads and plays each Media Segment declared within it. The client reloads the Playlist as described in this document to discover any added segments. Data SHOULD be carried over HTTP [RFC7230], but in general a URI can specify any protocol that can reliably transfer the specified resource on demand.

A more complex presentation can be described by a Master Playlist. A Master Playlist provides a set of Variant Streams, each of which describes a different version of the same content.

Each Media Segment MUST be formatted as an MPEG-2 Transport Stream [ISO_13818], a WebVTT [WebVTT] file, or a Packed Audio file, which is a file containing packed encoded audio samples and ID3 tags, such as AAC with ADTS framing [ISO_13818_7], MP3 [ISO_13818_3], AC-3 [AC_3], or Enhanced AC-3 [AC_3]. Transport of other media file formats is not defined.

Pantos & May

Expires May 22, 2016

[Page 1]

Pinterest Infringes EP1522191, Claim 1

further comprising enhancing a root entity in DTD according to ATSC DASE to add a showstopper attribute, said showstopper attribute comprising an indication that acquisition of particular resources of the set of resources are a prerequisite to initiating said presentation [G].

Informational
Internet-Draft
Intended status: Informational
Expires: May 22, 2016

R. Pantos, Ed.
M. May
Apple Inc.
November 19, 2015

HTTP Live Streaming
draft-pantos-http-live-streaming-18

Abstract

This document describes a protocol for transferring unbounded streams of multimedia data. It specifies the data format of the files and the actions to be taken by the server (sender) and the clients (receivers) of the streams. It describes version 7 of this protocol.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <http://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on May 22, 2016.

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This Informational Internet Draft is submitted as an RFC Editor Contribution and/or non-IETF Document (not as a Contribution, IETF

Pantos & May

Expires May 22, 2016

[Page 1]

BANDWIDTH

The value is a decimal-integer of bits per second. It represents the peak segment bit rate of the Variant Stream.

If all the Media Segments in a Variant Stream have already been created, the BANDWIDTH value MUST be the largest sum of peak segment bit rates that is produced by any playable combination of Renditions. (For a Variant Stream with a single Media Playlist, this is just the peak segment bit rate of that Media Playlist.) An inaccurate value can cause playback stalls or prevent clients from playing the variant.

The peak segment bit rate of a Media Playlist is the largest bit rate of any contiguous set of segments whose total duration is between 0.5 and 1.5 times the target duration. The bit rate of a set is calculated by dividing the sum of the segment sizes by the sum of the segment durations.

maxStarvationDelay

(default 4s)

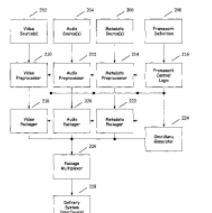
ABR algorithm will always try to choose a quality level that should avoid rebuffering. In case no quality level with this criteria can be found (lets say for example that buffer length is 1s but fetching a fragment at lowest quality is predicted to take around 2s - ie we can forecast around 1s of rebuffering ...) then ABR algorithm will try to find a level that should guarantee less than maxStarvationDelay of buffering.

Pinterest's script file indicates that a minimum amount of program segment data must be buffered to initiate the presentation.

```
e,y=(v-s.loaded)/h,E=(o.BufferHelper.bufferInfo(t,m,e.config.maxBufferHole).end-  
m)/d;if(E<2*r.duration/d&&y>E){var _=void 0,T=void 0;for(T=r.level-1;T>a;T--){var  
s=f(T).realBitrate*Math.max(f(T).realBitrate,f(T).bitrate),f(T).bitrate;if((r.duration*(6.4*h)-E)break}  
_<y&&(u.logger.warn("loading too slow, abort fragment loading and switch to level  
"+T+":"+fragLoadedDelay["+T+"]<fragLoadedDelay["+r.level-  
1+"]"),bufferStarvationDelay="toFixed(1)"+E.toFixed(1)+"E.toFixed(1),e.nextLoadLevel=this._b  
wEstimator.sample(l,s.loaded),i.abort(),this.clearTimer(),e.trigger(n.default.FRAG_LOAD_EMERGENCY_A  
BORTED,{frag:r,stats:s}))))},r.prototype.onFragLoaded=function(t){var  
r=t.frag;if("main"===r.type&&e.isFinite(r.sn)){if(this.clearTimer(),this.lastLoadedFragLevel=r.level,this_n
```

[J] Pinterest's implementation of HLS indicates that a minimum amount of program segment data must be buffered to initiate the presentation.

U.S. Patent No. 7,020,888

 US00702088B2	
(12) United States Patent Reynolds et al.	
(10) Patent No.: US 7,020,888 B2 (45) Date of Patent: Mar. 28, 2006	
(54) SYSTEM AND METHOD FOR PROVIDING AN OMNIMEDIA PACKAGE	
(75) Inventors: Steven Reynolds, Littleton, CO (US); Joel Hassell, Golden, CO (US); Thomas Lemmons, Evergreen, CO (US); Ian Zenoni, Highlands Ranch, CO (US)	5,650,827 A 7/1997 Tsunori et al. 348:565 5,659,350 A * 8/1997 Hendricks et al. 725:116 (Continued) FOREIGN PATENT DOCUMENTS EP 1003304 5/2000 (Continued) OTHER PUBLICATIONS "1st report of EBU/SMPTE task force for harmonized standards for the exchange of television program material as bit streams," <i>EBU Review Technical, European Broadcasting Union</i> , Brussels, BE, No. 272, Jan. 21, 1997, pp. 1-73, XP000720137, ISSN: 0251-0936. (Continued)
(73) Assignee: Intellicity USA, Inc., San Francisco, CA (US)	
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 377 days.	
(21) Appl. No.: 09/996,068	
(22) Filed: Nov. 27, 2001	
(65) Prior Publication Data US 2002/0138852 A1 Sep. 26, 2002	
Related U.S. Application Data (60) Provisional application No. 60/253,168, filed on Nov. 27, 2000.	
(51) Int. Cl. H04N 7/025 (2006.01)	
(52) U.S. Cl. 725/34; 725/67; 725/114; 725/116; 725/138; 725/144; 725/146; 370/486; 370/487; 709/246; 709/230; 709/231; 709/219	
(58) Field of Classification Search 725/46; 725/61; 131; 139; 151; 370/486-487; 709/246; 709/230; 231; 219 See application file for complete search history.	
(56) References Cited U.S. PATENT DOCUMENTS 5,444,707 A * 8/1995 Cerna et al. 370:389 5,539,549 A * 9/1996 Hendricks et al. 725:50 5,583,576 A * 12/1996 Perlman et al. 725:28 5,600,573 A * 2/1997 Hendricks et al. 725:109	
5 Claims, 5 Drawing Sheets	
	

- **Inventor:** S. Reynolds, J. Hassell, T. Lemmons, I. Zenoni
- **Priority Date:** November 27, 2000
- **Expiration Date:** December 9, 2021
- **Summary of Technology:** Combining media sources for efficient delivery and management of media content
- **Representative Claim Mapping:** Deploying of Omnimedia package with respect to Pinterest
- **Kudelski Litigation:** Asserted against NFLE in case filed May 2017 (**settled**)

U.S. 7,020,888 - Kudelski's Claim Construction in NFLE

B. “framework definition”

Plaintiffs’ Construction

“a designation of the input and output content and metadata formats necessary to build and format various audio, video and metadata streams to enable their delivery and display across multiple receivers with differing capabilities”

C. “broadcast stream”

Plaintiffs’ Construction

“a flow of related data created in accordance with the framework definition that contains audio, video and metadata content for a broadcast program”

1 M. ELIZABETH DAY (SBN 177125)

2 eday@feinday.com

3 MARC BELLOLI (SBN 244290)

4 mbelloli@feinday.com

5 DAVID ALBERTI (SBN 220265)

6 dalberti@feinday.com

7 **FEINBERG DAY ALBERTI LIM &**

8 **BELLOLI LLP**

9 1600 El Camino Real, Suite 280

10 Menlo Park, CA 94025

11 Tel: 650.618.4360

12 Fax: 650.618.4368

13 Attorneys for Nagravision SA and

14 OpenTV, Inc.

15 UNITED STATES DISTRICT COURT

16 CENTRAL DISTRICT OF CALIFORNIA

17 NAGRAVISION SA and OPENTV,
18 INC.,

19 Plaintiffs,

20 v.

21 NFL ENTERPRISES, LLC,

22 Defendant.

23 CASE NO. 2:17-CV-03919-AB-SK

24 **PLAINTIFFS’ OPENING CLAIM
25 CONSTRUCTION BRIEF**

26 Date: July 20, 2018

27 Time: 10:00 a.m.

28 Courtroom: 7B

Judge: Hon. Andre Birotte Jr.

OPENING CLAIM CONSTRUCTION BRIEF – 2:17-CV-3919

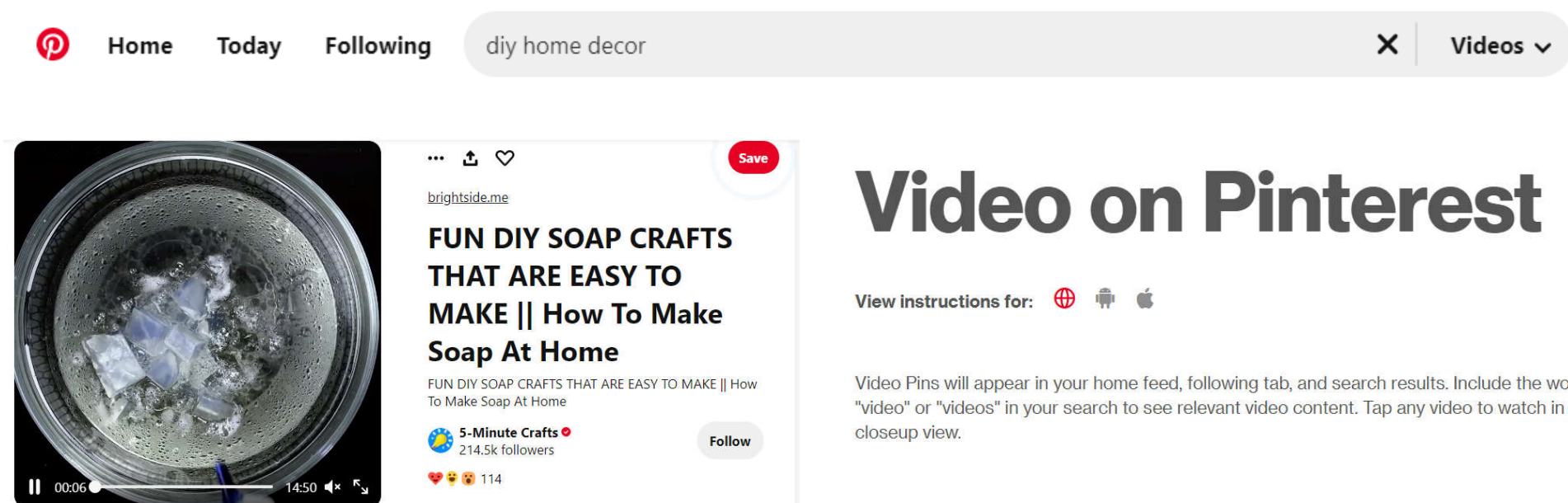
SUBJECT TO NDA

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NAGRA
KUDELSKI

Pinterest Infringes U.S. 7,020,888 Patent, Claim 1*

1. A method for **producing a broadcast stream [A]** that contains various stream types of audio content, video content, and metadata content comprising:



[A] Pinterest allows search, upload and viewing of videos that are capable of supporting on-demand streaming for delivery to multiple types of devices

* Representative claim illustrated

Pinterest Infringes U.S. 7,020,888 Patent, Claim 1

1. A method for producing a broadcast stream that contains various stream types of **audio content**, **video content [B]**, and metadata content comprising:

[B] Pinterest streams audio, video data

Pinterest apps for mobile phones and tablet computers are somewhat limited because Pinterest doesn't offer developers a robust, third-party development platform, but the company does offer official mobile apps for both Android and Apple iOS devices.

For a long time, Pinterest offered only one official mobile app, and that was for iPhones. But in August 2012 it rolled out new apps for Android devices as well as one for Apple iPad tablets. Both programs are downloadable via the Pinterest mobile apps page.

Android users had been clamoring for several years to get an application dedicated to one of the biggest mobile computing platforms in the U.S. Pinterest finally delivered its mobile Android app, which is available in the Google Play store. It is one of only three official mobile apps for the image-sharing network.



Source: <https://www.lifewire.com/guide-to-pinterest-apps-for-mobile-phones-2655100>

Pinterest Infringes U.S. 7,020,888 Patent, Claim 1

1. A method for producing a broadcast stream that contains various stream types of audio content, video content, and **metadata content [C]** comprising:



```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF: BANDWIDTH=1498365, AVERAGE-BANDWIDTH=465068, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=360x360, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_360w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=889854, AVERAGE-BANDWIDTH=288136, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=240x240, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_240w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=2205666, AVERAGE-BANDWIDTH=667486, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=480x480, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_480w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=2775488, AVERAGE-BANDWIDTH=973867, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=640x640, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_640w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=3202197, AVERAGE-BANDWIDTH=1099034, CODECS="avc1.64001f, mp4a.40.5", RESOLUTION=720x720, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_720w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=4437250, AVERAGE-BANDWIDTH=1626983, CODECS="avc1.64001f, mp4a.40.5", RESOLUTION=960x960, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_960w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=7743872, AVERAGE-BANDWIDTH=2845127, CODECS="avc1.640020, mp4a.40.5", RESOLUTION=1080x1080, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_1280w.m3u8
```

[C] Pinterest's platform delivers metadata with audio/video content including audio/video stream information and data related to the content

Pinterest Infringes U.S. 7,020,888 Patent, Claim 1

creating a **framework definition [D]** that identifies said various stream types in said audio content, said video content and said metadata content associated with a broadcast and attributes of said various stream types including the format of said various stream types;

Building Pinterest's video platform



Create Video Pins

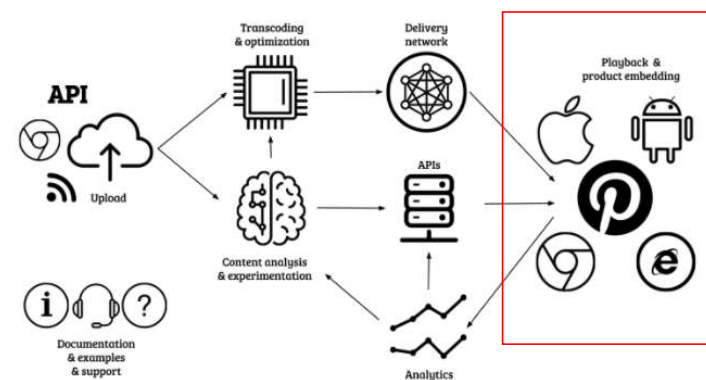
File type	.mp4, .mov or .m4v.
Encoding	H.264 or H.265.
Max file size	Up to 2GB.
Video length	Minimum 4 seconds, maximum 15 minutes.
Aspect ratio	Shorter than 1:2 (width:height), taller than 1:1:1. We recommend making your videos square (1:1) or vertical (2:3 or 9:16).

Video & audio codecs

	Video codecs	Audio codecs
No container	• DVDR/VIDEO • AVC (H.264) • HEVC (H.265) • MPEG-1 • MPEG-2	• PCM
Audio video interleave (AVI)	• Uncompressed • Cinepak PG • DivX/True • DVDR/VIDEO	• Dolby Digital (AC3) • Dolby Digital Plus (EAC3) • Dolby E (frames carried in PCM streams) • MP2 • MPEG Audio • PCM
Adobe Flash	• AVC (H.264) • Flash 3 File • H.263	• AAC
Matroska	• AVC (H.264) • PCM • MPEG-2 • MPEG-A part 2	• AAC • Dolby Digital (AC3) • Dolby Digital Plus (EAC3) • WMA

Under the hood

Our video platform has multiple moving pieces that work together to make our video experience great. We'll talk about each of them in more detail in subsequent posts, but here's a brief summary.



[D] Pinterest's platform deploys encoding which defines a framework in which various attributes for input and output data formats are specified for audio, video, and other player attributes

<https://medium.com/pinterest-engineering/building-pinterests-video-platform-2338dd1d213>
<https://help.pinterest.com/en/business/article/video-pins>

Pinterest Infringes U.S. 7,020,888 Patent, Claim 1

comparing an audio format of said audio content with an audio transmission format and converting said audio content to said audio transmission format if said audio format and said audio transmission format differ;

comparing a video format of said video content with a Video transmission format and converting said video content to said video transmission format if said video format and said video transmission format differ;

comparing a metadata format of said metadata content with a metadata transmission format and converting said metadata content to said metadata transmission format if said metadata format and said metadata transmission format differ [F];

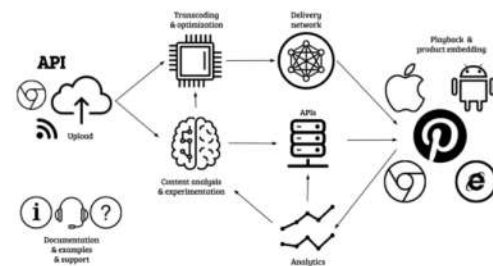
Video delivery & playback

Pinners access video in different circumstances. For example, some watch videos during their daily commute, on 3G connections and tiny screens, while others watch it on 4K displays with fast broadband access. We optimize video streams for multiple scenarios by using [Adaptive Bitrate Streaming](#) and collecting information about playback performance from both video players and content delivery networks.

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF: BANDWIDTH=1498365, AVERAGE-BANDWIDTH=465068, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=360x360, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_360w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=889854, AVERAGE-BANDWIDTH=288136, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=240x240, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_240w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=2205666, AVERAGE-BANDWIDTH=667486, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=480x480, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_480w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=2775488, AVERAGE-BANDWIDTH=973867, CODECS="avc1.4d4020, mp4a.40.5", RESOLUTION=640x640, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_640w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=3202197, AVERAGE-BANDWIDTH=1099034, CODECS="avc1.64001f, mp4a.40.5", RESOLUTION=720x720, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_720w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=4437250, AVERAGE-BANDWIDTH=1626983, CODECS="avc1.64001f, mp4a.40.5", RESOLUTION=960x960, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_960w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=7743872, AVERAGE-BANDWIDTH=2845127, CODECS="avc1.640020, mp4a.40.5", RESOLUTION=1080x1080, FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ead6bb_1080w.m3u8
#EXT-X-STREAM-INF: BANDWIDTH=1280w.m3u8
```

Under the hood

Our video platform has multiple moving pieces that work together to make our video experience great. We'll talk about each of them in more detail in subsequent posts, but here's a brief summary.



[F] Pinterest transcodes each content type into formats suitable for transmission to wide range of devices

Pinterest Infringes U.S. 7,020,888 Patent, Claim 1

creating a menu describing said audio content, said video content, and said metadata content [G];

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=1498365,AVERAGE-BANDWIDTH=465068,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=360x360,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_360w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=889854,AVERAGE-BANDWIDTH=288136,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=240x240,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_240w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2205666,AVERAGE-BANDWIDTH=667486,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=480x480,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_480w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2775488,AVERAGE-BANDWIDTH=973867,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=640x640,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_640w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=3202197,AVERAGE-BANDWIDTH=1039034,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=720x720,FRAME-RATE=23.976
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26b3841216e61680c0bf62fa6ae6bb_960w.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=7743872,AVERAGE-BANDWIDTH=2845127,CODECS="avc1.640020,mp4a.40.5",RESOLUTION=1080x1080,FRAME-RATE=23.976
26b3841216e61680c0bf62fa6ae6bb_1280w.m3u8
```

[G] Pinterest's manifest file contains information about several streams

```
▶ GET https://v.pinimg.com/videos/mc/hts/26/b3/84/26b3841216e61680c0bf62fa6ae6bb.m3u8
Transferred 1.23 KB (1.23 KB size)
Referrer Policy origin
Request Headers (427 B) Raw
Accept: video/webm,video/ogg,video/*;q=0.9,application/ogg;q=0.7,audio/*;q=0.6,*/*;q=0.5
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.5
Connection: keep-alive
Host: v.pinimg.com
Range: bytes=0-
Referer: https://www.pinterest.com/
```

Pinterest Infringes U.S. 7,020,888 Patent, Claim 1

combining said audio content, said video content, and said metadata content into a broadcast stream for transmission to a plurality of receivers that are capable of checking said various stream types to determine which streams of said various stream types may be used by said receivers [H];

```
▶ 26b3841216e61680c0bf62fa6ead6bb_960w_20200716T090841_00001.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w.m3u8
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090845_00002.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090848_00003.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090852_00004.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090856_00005.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090858_00006.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090901_00007.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090904_00008.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090907_00009.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090910_00010.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090913_00011.ts
▶ 26b3841216e61680c0bf62fa6ead6bb_1280w_20200716T090916_00012.ts
```

```
▶ GET https://v.pinimg.com/videos/mc/hts/26/b3/84/26b3841216e61680c0bf62fa6ead6bb_960w_20200716T090841_00001.ts

Status: 200 OK ⓘ
Version: HTTP/2
Transferred: 1.12 MB (1.12 MB size)
Referrer Policy: origin

▼ Response Headers (493 B) Raw
ⓘ accept-ranges: bytes
ⓘ access-control-allow-credentials: false
ⓘ access-control-allow-methods: GET
ⓘ access-control-allow-origin: https://www.pinterest.com
ⓘ access-control-expose-headers: X-CDN
ⓘ access-control-max-age: 86400
```

Pinterest Infringes U.S. 7,020,888 Patent, Claim 1

transmitting said menu to a plurality of receivers that are capable of checking said stream type to determine which streams may be used by said receivers; and transmitting said broadcast stream [I].

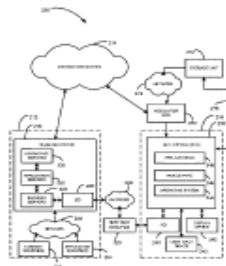
[I] The manifest file is transmitted to the user in one or more manifest files and the broadcast stream is transmitted in a format designed for the receiver

Q nimg.com/videos/mc/hls/26/b3/84/26b3841216e61680c0bf62fa6aead6bb		Aa	GET v.pini...	26b3841216e61680c0b...	6-593...	Block...	Response Payload
26b3841216e61680c0bf62fa6aead6bb.m3u8			GET v....	26b3841216e61680c0b...	media	v... 1.23 KB	1.2
26b3841216e61680c0bf62fa6aead6bb_960w.m3u8			200 GET v....	26b3841216e61680c0b...	6-593...	x... cached	1.2
Url https://v.pinimg.com/videos/mc/hls/26/b3/84/26b3841216e61680c0bf62fa6...			200 GET v....	26b3841216e61680c0b...	6-593...	x... cached	17.
26b3841216e61680c0bf62fa6aead6bb_960w_20200716T090841_00001.ts			200 GET v....	26b3841216e61680c0b...	6-593...	x... cached	17.
26b3841216e61680c0bf62fa6aead6bb_1280w.m3u8			200 GET v....	26b3841216e61680c0b...	6-593...	x... cached	17.
26b3841216e61680c0bf62fa6aead6bb_1280w_20200716T090845_00002.ts			200 GET v....	26b3841216e61680c0b...	6-593...	x... 1.35 KB	17.
26b3841216e61680c0bf62fa6aead6bb_1280w_20200716T090848_00003.ts			200 GET v....	26b3841216e61680c0b...	6-593...	x... 1.87 KB	17.
26b3841216e61680c0bf62fa6aead6bb_1280w_20200716T090852_00004.ts							
26b3841216e61680c0bf62fa6aead6bb_1280w_20200716T090856_00005.ts							
26b3841216e61680c0bf62fa6aead6bb_1280w_20200716T090858_00006.ts							
26b3841216e61680c0bf62fa6aead6bb_1280w_20200716T090901_00007.ts							
26b3841216e61680c0bf62fa6aead6bb_1280w_20200716T090904_00008.ts							
26b3841216e61680c0bf62fa6aead6bb_1280w_20200716T090907_00009.ts							
26b3841216e61680c0bf62fa6aead6bb_1280w_20200716T090910_00010.ts							
			</				

U.S. Patent No. 9,712,581



United States Patent Tinsman		(10) Patent No.: US 9,712,581 B2
		(45) Date of Patent: Jul. 18, 2017
(54) METHODS AND SYSTEMS FOR DATA TRANSMISSION	(58) Field of Classification Search None See application file for complete search history.	
(71) Applicant: OpenTV, Inc., San Francisco, CA (US)	(56) References Cited	
(72) Inventor: John Tinsman, Fallbrook, CA (US)	U.S. PATENT DOCUMENTS	
(73) Assignee: OPENTV, INC., San Francisco, CA (US)	4,754,887 A 9/1988 Toraguchi et al.	
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.	5,742,347 A 4/1998 Kowlik et al. (Continued)	
(21) Appl. No.: 15/156,603	FOREIGN PATENT DOCUMENTS	
(22) Filed: May 16, 2016	WO 08/0828015 A2 7/2008	
(65) Prior Publication Data US 2016/0261660 A1 Sep. 8, 2016	WO 2016/0180570 A2 10/2016 (Continued)	
Related U.S. Application Data	OTHER PUBLICATIONS	
(63) Continuation of application No. 14/312,542, filed on Jan. 23, 2014, now Pat. No. 9,344,470, which is a (Continued)	*U.S. Appl. No. 11/531,728, Final Office Action mailed Apr. 15, 2009*, 23 pgs. (Continued)	
(51) Int. Cl. G06F 3/06 (2006.01) G06F 15/00 (2006.01) (Continued)	ABSTRACT Methods and systems for transmitting data are presented. In an example embodiment, data streams from one or more media content sources are received into one or more buffers. Each of the data streams includes contiguous, non-overlapping data sets of a first media content, and each of the data streams has a unique data rate relative to one or more of the other data streams. A request is received from a device to stream a next segment of the first media content from one of the data streams to the device; the next segment including one or more of the data sets of the first media content. In response to the request, the next segment is streamed from the one of the data streams via a buffer to the device.	
(52) U.S. Cl. CPC H04L 65/4076 (2013.01); H04L 47/10 (2013.01); H04L 47/22 (2013.01); H04L 65/605 (2013.01); H04L 65/607 (2013.01); H04L 67/104 (2013.01); H04L 67/20 (2013.01); H04L 67/2819 (2013.01); H04N 21/23406 (2013.01); (Continued)	21 Claims, 32 Drawing Sheets	

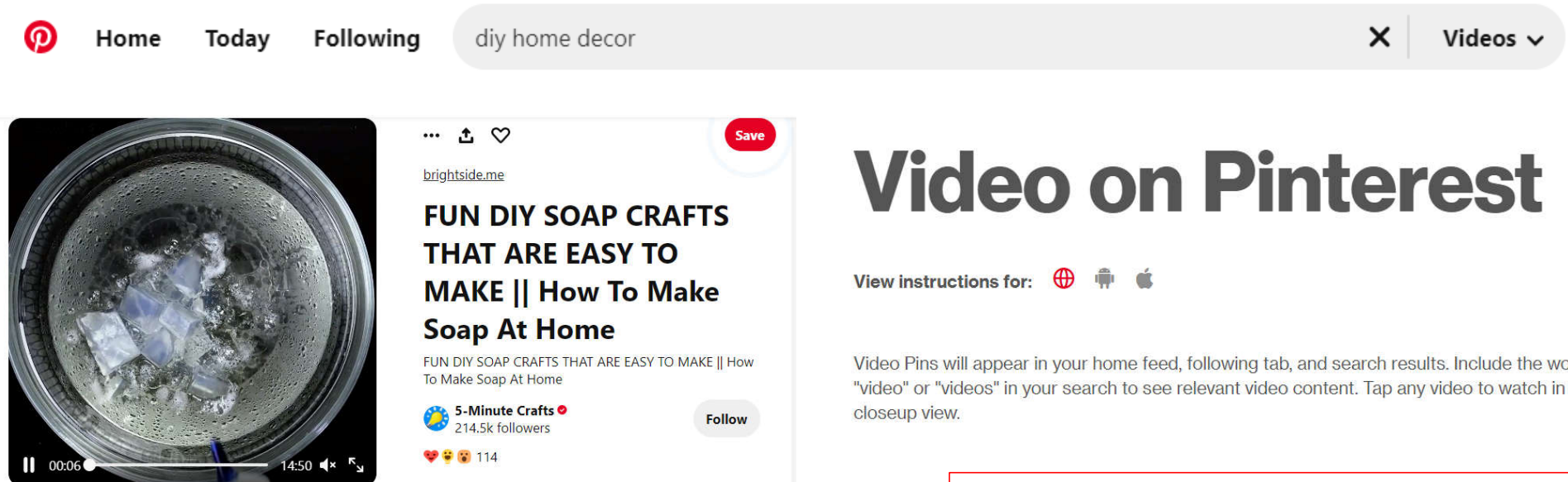


- **Inventors:** Tinsman, John
- **Priority Date:** Sept. 14, 2006
- **Expiration Date:** Sept. 14, 2026
- **Summary of Technology:** Intelligent caching of content in an edge device
- **Representative Claim Mapping:** Pinterest's video Pins
- **Relevant Foreign Counterparts:**



Pinterest Infringes The 9,712,581 Patent, Claim 1

Claim 1. A method for **transmitting media content [A]**, the method comprising:



Video on Pinterest

View instructions for:   

Video Pins will appear in your home feed, following tab, and search results. Include the words "video" or "videos" in your search to see relevant video content. Tap any video to watch in a closeup view.

[A] Pinterest streams video pins capable of supporting on-demand streaming for delivery to multiple types of devices

Android devices

1. Open the Pinterest app in the [Google Play Store](#)  or [Amazon Appstore](#)  with your Android device
2. Tap **Update**

iOS devices

1. Open the [App Store](#)  with your iPhone or iPad
2. Search for the Pinterest app
3. Tap **Update**

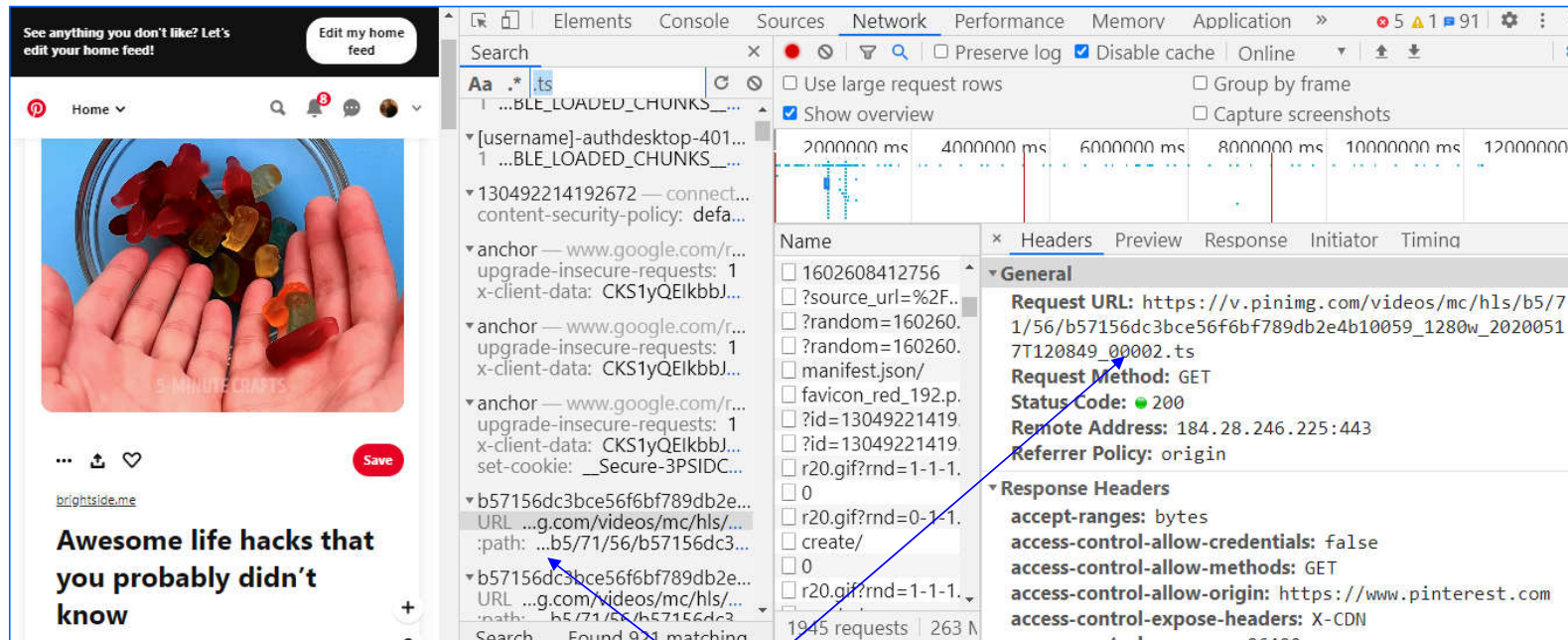
SUBJECT TO NDA

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Pinterest Infringes The 9,712,581 Patent, Claim 1

receiving a plurality of data streams originating from one or more media content sources [B] into one or more buffers of a router,



[B] Pinterest generates multiple data streams for each media content source, as demonstrated by the sample of a segment received at the client.

Pinterest Infringes The 9,712,581 Patent, Claim 1

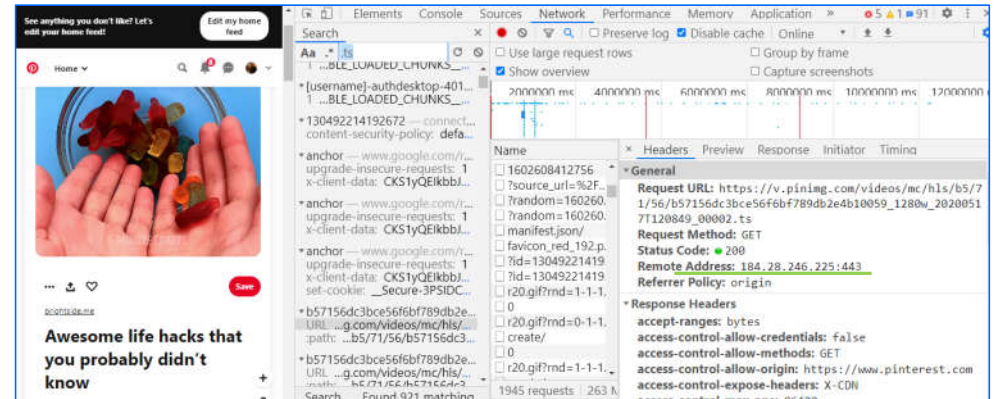
receiving a plurality of data streams originating from one or more media content sources **into one or more buffers [C]** of a router,

Enter a host name or an IP address:

184.28.246.225

Related Tools: [DNS Traversal](#) [Traceroute](#) [Vector Trace](#) [Ping](#) [WHOIS Lookup](#)

```
Source: whois.arin.net
IP Address: 184.28.246.225
Name: AKAMAI
Handle: NET-184-24-0-0-1
Registration: 10/11/10
Date:
Range: 184.24.0.0-184.31.255.255
Org: Akamai Technologies, Inc.
Org Handle: AKAMAI
Address: 145 Broadway
City: Cambridge
State/Province: MA
Postal Code: 02142
Country: United States
Name Servers:
```



Prefetching

The concept of prefetching allows Akamai to predict and fetch a media object on Akamai's Edge right before it will be requested by the player. By pre-positioning content at the Edge, streaming becomes less reactive thereby improves the cache-hit rate as well as video segment "Download Speed or Throughput" and "Time To First Byte" (TTFB). The overall percent improvements however is a function of the last mile latency, the latency between player and Edge. The larger the latency, the larger the performance improvement.

[C] Pinterest, through the CDNs it employs (e.g. Akamai) to deliver the multiple data streams used in HLS, receives content into one or more buffers

Source: <https://blogs.akamai.com/2019/10/optimizing-video-streaming-performance-with-origin-assisted-prefetching.html>

<https://www.ultratools.com/tools/ipWhoisLookupResult>

Pinterest Infringes The 9,712,581 Patent, Claim 1

receiving a plurality of data streams originating from one or more media content sources into one or more **buffers of a router [D]**,

When a user makes a request, Akamai dynamically maps this to the closest available edge server. The edge server applies the business rules that the content provider has specified, before using the best available route between all other edge servers within the Akamai network to fetch content from the origin.

Source: <https://www.freecodecamp.org/news/an-introduction-to-the-akamai-content-delivery-network-806aa16d8781/>

[D] CDN servers commonly map requests to closest available edge server. CDN servers also commonly employ a hierarchy of servers, routing a content request from the edge server to a regional edge cache if the content is not immediately available at the edge.

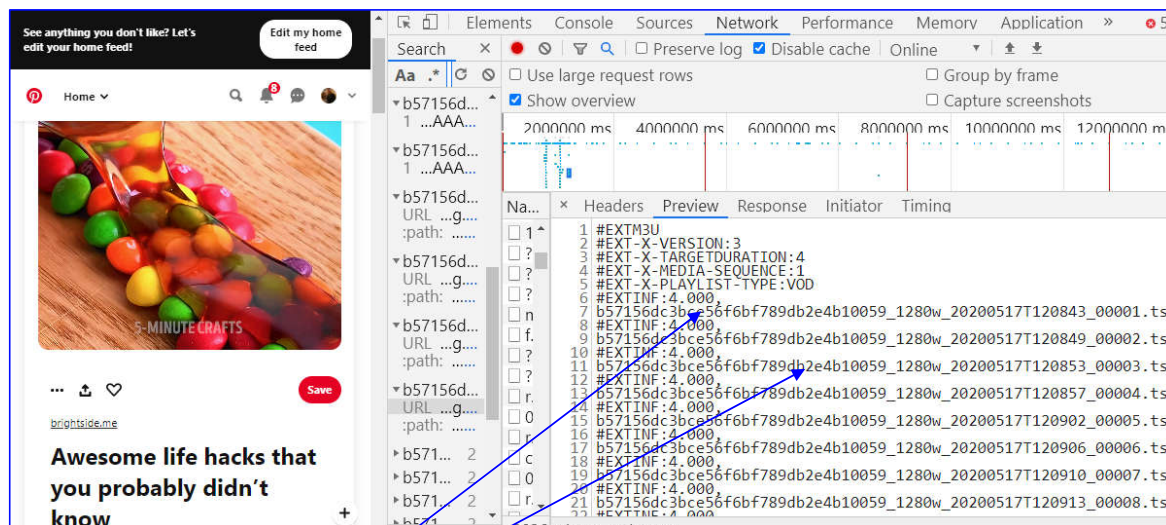
Pinterest Infringes The 9,712,581 Patent, Claim 1

each of the plurality of data streams comprising a plurality of contiguous, non-overlapping data sets of a first media content [E],

Each Media Segment MUST carry the continuation of the encoded bitstream from the end of the segment with the previous Media Sequence Number, where values in a series such as timestamps and Continuity Counters MUST continue uninterrupted. The only exceptions are the first Media Segment ever to appear in a Media Playlist and Media Segments that are explicitly signaled as discontinuities (Section 4.3.2.3). Unmarked media discontinuities can trigger playback errors.

<https://tools.ietf.org/html/rfc8216>, section 3

[E] Pinterest uses HLS to deliver media content divided into contiguous, non-overlapping segments.



Pinterest Infringes The 9,712,581 Patent, Claim 1

and each of the plurality of data streams having a unique data rate relative to one or more other data streams of the plurality of data streams [F];

×	Headers	Preview	Response	Initiator	Timing
1	#EXTM3U				
2	#EXT-X-VERSION:3				
3	#EXT-X-INDEPENDENT-SEGMENTS				
4	#EXT-X-STREAM-INF:BANDWIDTH=755008,AVERAGE-BANDWIDTH=441409,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=360x360				
5	b57156dc3bce56f6bf789db2e4b10059_360w.m3u8				
6	#EXT-X-STREAM-INF:BANDWIDTH=427136,AVERAGE-BANDWIDTH=291274,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=240x240				
7	b57156dc3bce56f6bf789db2e4b10059_240w.m3u8				
8	#EXT-X-STREAM-INF:BANDWIDTH=1135144,AVERAGE-BANDWIDTH=617141,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=480x480				
9	b57156dc3bce56f6bf789db2e4b10059_480w.m3u8				
10	#EXT-X-STREAM-INF:BANDWIDTH=1724712,AVERAGE-BANDWIDTH=872865,CODECS="avc1.4d4020,mp4a.40.5",RESOLUTION=640x640				
11	b57156dc3bce56f6bf789db2e4b10059_640w.m3u8				
12	#EXT-X-STREAM-INF:BANDWIDTH=1927000,AVERAGE-BANDWIDTH=973722,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=720x720				
13	b57156dc3bce56f6bf789db2e4b10059_720w.m3u8				
14	#EXT-X-STREAM-INF:BANDWIDTH=2882040,AVERAGE-BANDWIDTH=1466503,CODECS="avc1.64001f,mp4a.40.5",RESOLUTION=960x960				
15	b57156dc3bce56f6bf789db2e4b10059_960w.m3u8				
16	#EXT-X-STREAM-INF:BANDWIDTH=5185040,AVERAGE-BANDWIDTH=2642734,CODECS="avc1.640020,mp4a.40.5",RESOLUTION=1080x1080				
17	b57156dc3bce56f6bf789db2e4b10059_1280w.m3u8				
18					

[F] As is common with HLS content encoding, Pinterest encodes each representation of a given program at unique data rate relative to the other representations for the same program.

Pinterest Infringes The 9,712,581 Patent, Claim 1

receiving a request from a device to stream a next segment of the first media content from one of the plurality of data streams to the device, the next segment comprising one or more of the plurality of data sets of the first media content [G];

The screenshot displays a web browser's developer tools interface. On the left, a list of video segments is shown, each with a checkbox and a filename. The segment `b57156dc3bce56f6bf789db2e4b10059_960w_20200517T120843_00001.ts` is selected. On the right, the 'Headers' tab is active, showing the request headers for the selected segment. The headers include:

- `:path: /videos/mc/hls/b5/71/56/b57156dc3bce56f6bf789db2e4b10059_960w_20200517T120843_00001.ts`
- `:scheme: https`
- `accept: */*`
- `accept-encoding: gzip, deflate, br`
- `accept-language: en-US,en;q=0.9`
- `cache-control: no-cache`
- `origin: https://www.pinterest.com`
- `pragma: no-cache`
- `referer: https://www.pinterest.com/`
- `sec-fetch-dest: empty`
- `sec-fetch-mode: cors`
- `sec-fetch-site: cross-site`
- `user-agent: Mozilla/5.0 (Windows NT 10.0; Win6`

At the bottom of the developer tools, a summary bar shows: 2038 requests, 266 MB transferred, 295 MB resources, and a finish time of 4.3 hrs. A red arrow points from the selected segment in the list to the 'path' header in the 'Headers' tab.

[G] The Pinterest's CDN servers receive successive device requests to stream the next segment of content for a given bit rate

Pinterest Infringes The 9,712,581 Patent, Claim 1

and streaming, in response to the request, from a buffer of the one or more buffers of the router to the device, the next segment of the first media content from the one of the plurality of data streams [H].

The screenshot displays a web browser's developer tools interface. On the left, a list of network requests is shown, including several .m3u8 files and .ts files. On the right, the 'Headers' tab is selected, showing the 'General' section for a specific request. The 'Request URL' is 'https://v.pinimg.com/videos/mc/hls/b5/71/56/b57156dc3bce56f6bf789db2e4b10059_960w_20200517T120843_00001.ts'. The 'Request Method' is 'GET'. The 'Status Code' is '200'. The 'Remote Address' is '184.28.246.225:443'. The 'Referrer Policy' is 'origin'. The 'Response Headers' section shows 'accept-ranges: bytes', 'access-control-allow-credentials: false', 'access-control-allow-methods: GET', and 'access-control-allow-origin: https://www.pinterest.com'. A blue arrow points from the 'Status Code: 200' to a text box below.

[H] The Pinterest CDN servers receive device requests to stream the next segment of content for a given bit rate, and respond with a status code and supply the data in response over a period of time

U.S. Patent 7,950,033



US007950033B2

(12) **United States Patent**
Pierre et al.

(10) **Patent No.:** **US 7,950,033 B2**
(45) **Date of Patent:** **May 24, 2011**

(54) **UTILIZATION OF RELATIONAL METADATA IN A TELEVISION SYSTEM**

(75) **Inventors:** **Ludovic Pierre**, San Francisco, CA (US); **Steven Szymanski**, Mountain View, CA (US); **Debra Hensgen**, Redwood City, CA (US)

(73) **Assignee:** **OpenTV, Inc.**, San Francisco, CA (US)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1809 days.

(21) **Appl. No.:** **09/974,142**

(22) **Filed:** **Oct. 10, 2001**

(65) **Prior Publication Data**
US 2003/0070183 A1 Apr. 10, 2003

(51) **Int. Cl.**
H04N 5/445 (2011.01)

(52) **U.S. Cl.** **725/39; 725/40; 725/44; 348/465; 709/219**

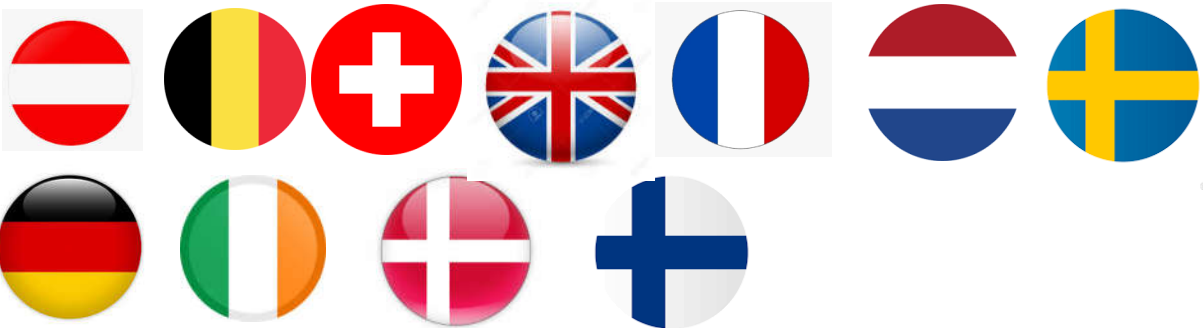
(58) **Field of Classification Search** **725/135; 725/136; 120; 37-61; 131-134; 139-142; 348/465; 468; 473; 476; 722; 709/217-231**
See application file for complete search history.

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2005/0160457 A1 *	7/2005	Rui et al.	725/45

- **Inventors:** Ludovic Pierre, Steven Szymanski, Debra Hensgen
- **Priority Date:** Oct. 10, 2001
- **Expiration Date:** Sept. 9, 2026
- **Summary of Technology:** Use of metadata to enhance the viewing experience of a video program
- **Representative Claim Mapping:** Pinterest's Video Pins
- **Litigation:** Asserted against NFLE in case filed May 2017 (Settled)
- **Broad Geographic Presence:** AT, BE, CH, DE, DK, FI, FR, GB, IE, NL



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US 7,950,033–Kudelski’s Claim Construction in NFLE

B. “relational metadata”

Plaintiffs’ Construction

“data describing a relationship between two different data sets, where each data set is a program or part of a program”

C. “the relationship of the second data to the first data is selected from [a / the] group consisting of: a summary, a correction, a repeat, a highlight, more detailed content, related text, and a related icon”

Plaintiffs’ Construction

“the relationship of the second data to the first data must be at least one of: a summary, a correction, a repeat, a highlight, more detailed content, related text, or a related icon”

OPENING CLAIM CONSTRUCTION BRIEF – 2:17-CV-00000

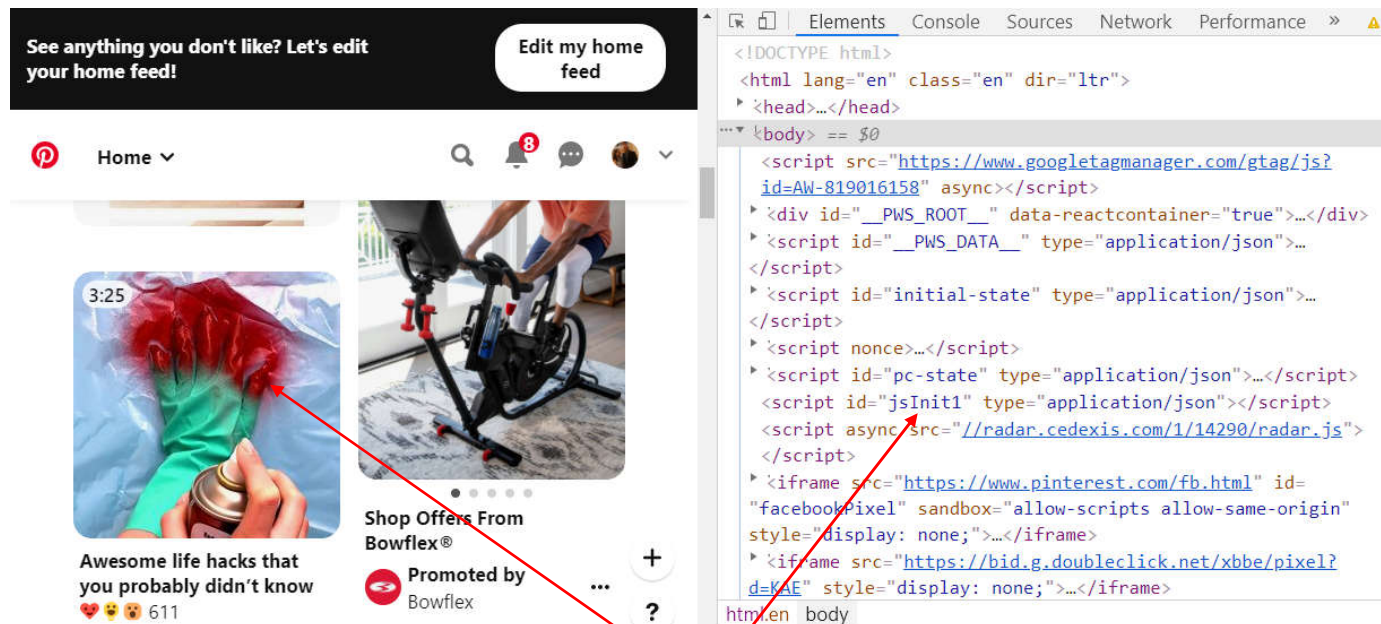
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Pinterest Infringes US7,950,033 Patent, Claim 27

1. A computer readable storage medium comprising **program instructions [A]**, wherein the program instructions are executable to: receive relational metadata corresponding to a broadcast signal,...

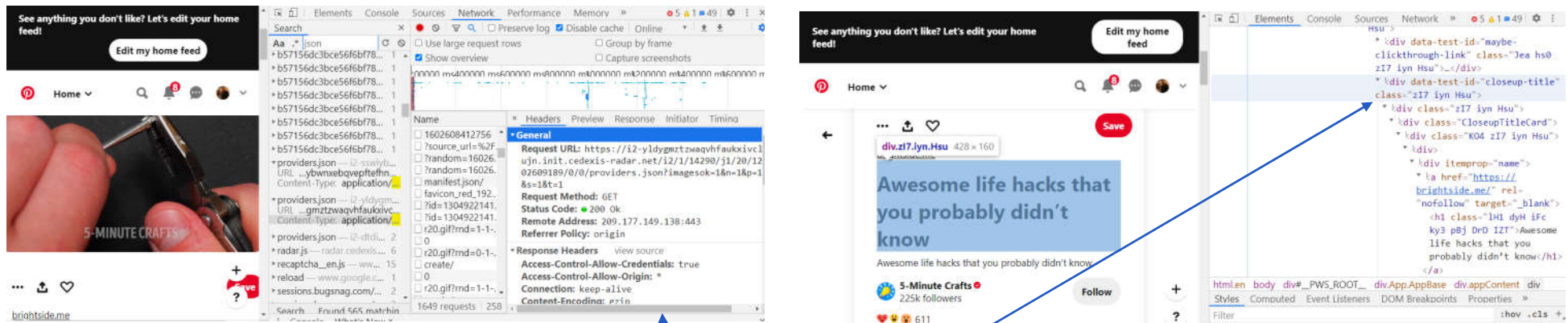


[A] Pinterest user interface executes instructions display video Pins

Source: <https://www.Pinterest.com>

Pinterest Infringes US7,950,033 Patent, Claim 27

1. A computer readable storage medium comprising program instructions, wherein the program instructions are executable to: **receive relational metadata[B]** corresponding to a broadcast signal,...



[B] Pinterest's application receives metadata by executing instruction as shown above.

Pinterest Infringes US7,950,033 Patent, Claim 27

wherein the relational metadata includes a relational metadata instruction[C] with at least a relationship identifier and a dataset element, ...

[C] Relational metadata instruction response to input from the user

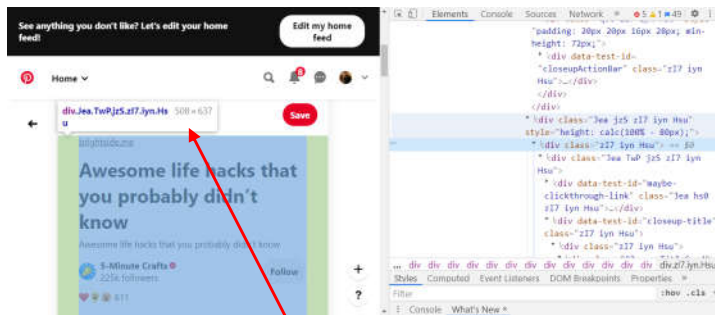
SUBJECT TO NDA

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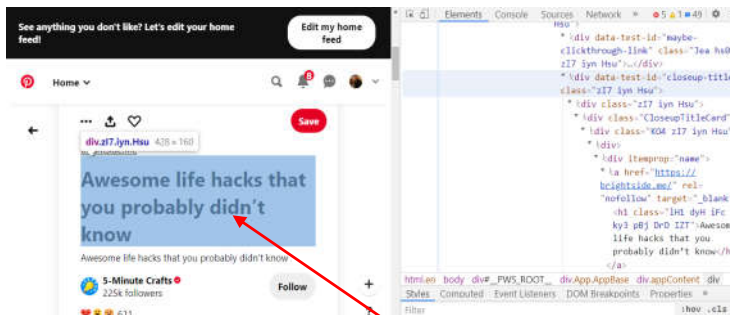
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Pinterest Infringes US7,950,033 Patent, Claim 27

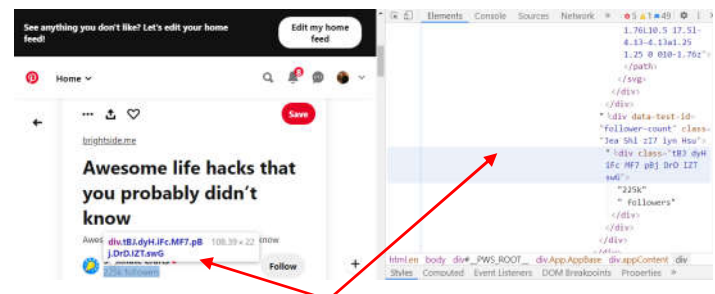
wherein said **relationship identifier** specifies a type of relationship between a first data and a second data [D], and



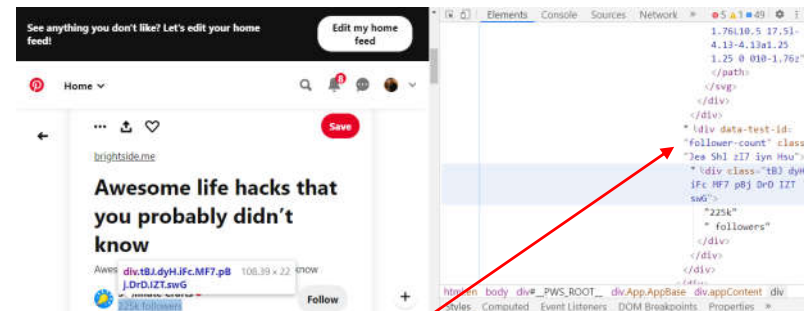
“Div. Jea...” defines information to be displayed for the user



First Data is the title of the program displayed when user clicks to play the video



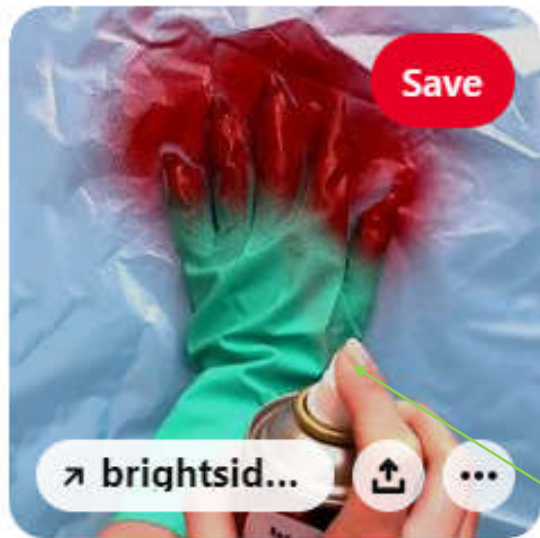
Second data is the location and text of the related text to be placed when user plays the video



Relationship identifier defines relationship between title and the text that follows as –“related text”

Pinterest Infringes US7,950,033 Patent, Claim 27

identify an **action[E]** corresponding to the relational metadata instruction; and initiate the action in response to the identifying;



Awesome life hacks that you...



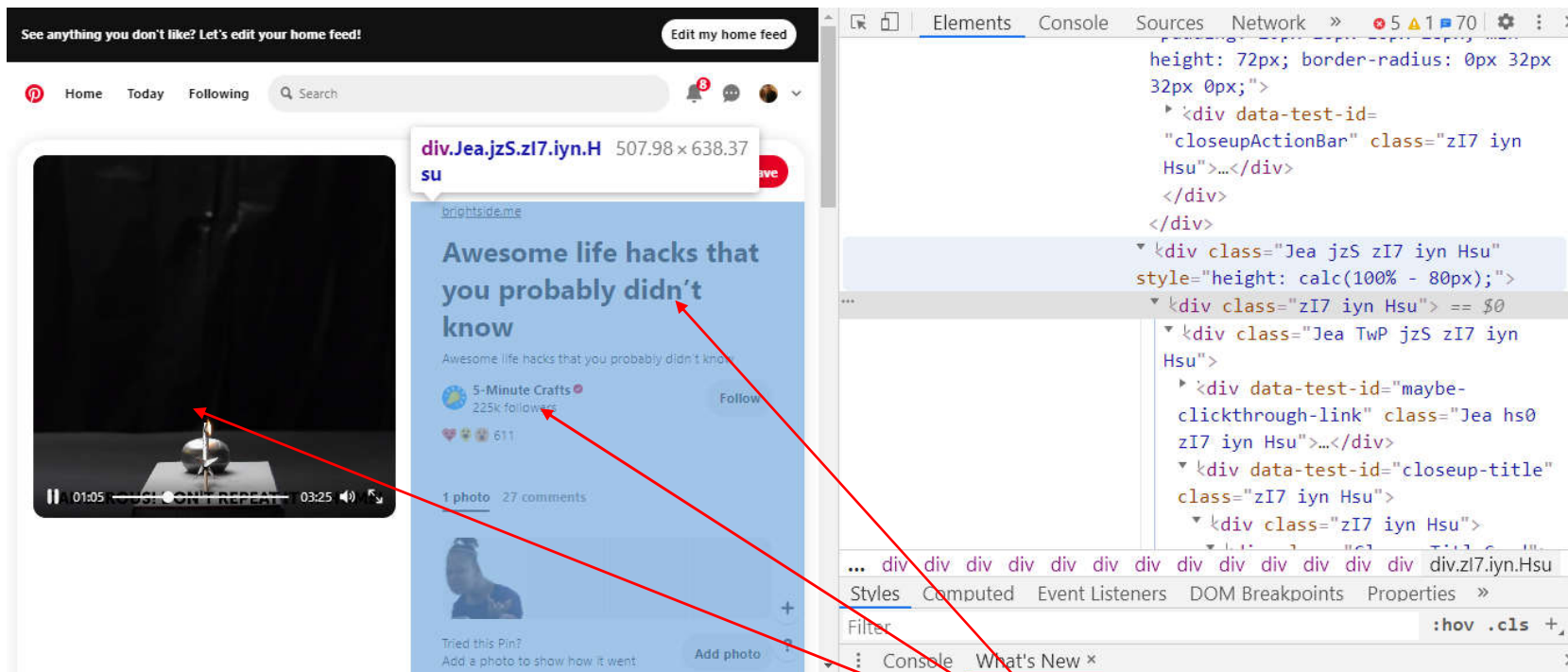
5-Minute Crafts

611

[E] In response to a user's video selection, program runs instruction to display title and related text

Pinterest Infringes US7,950,033 Patent, Claim 27

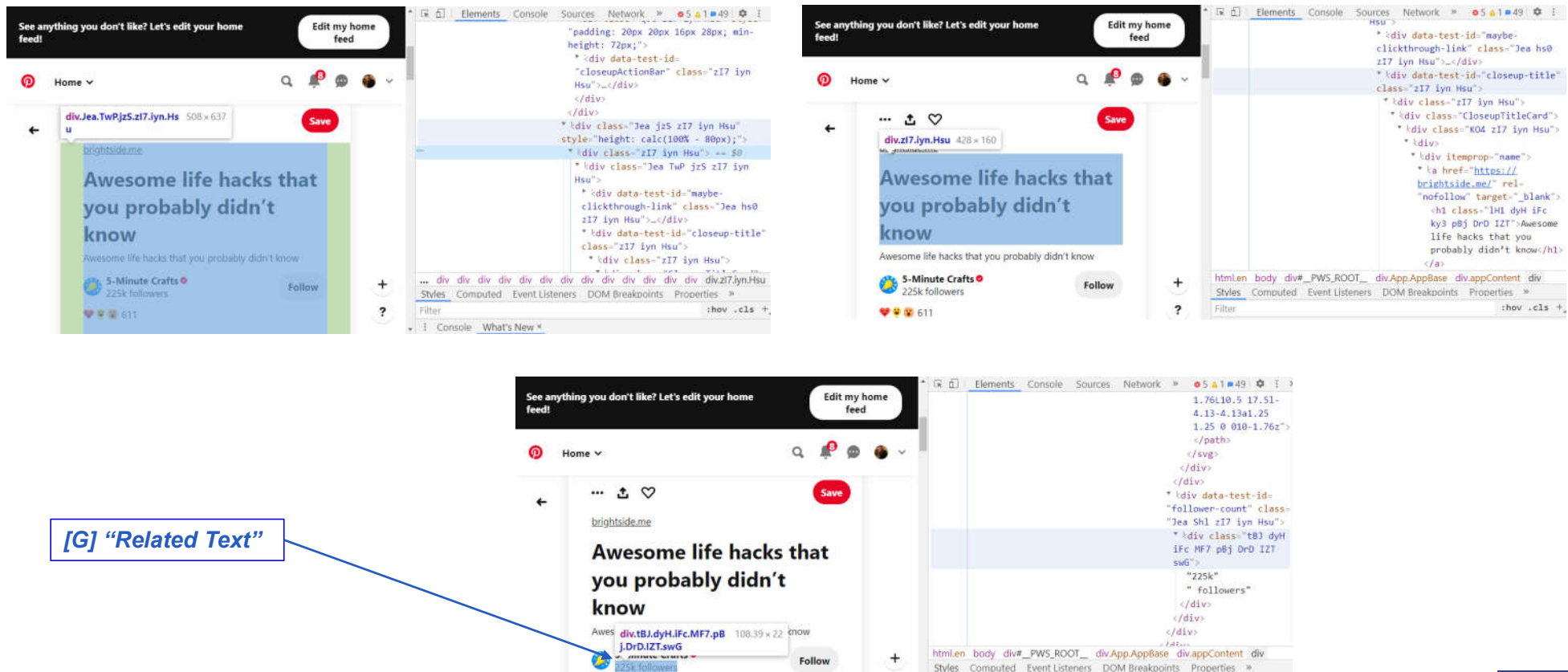
identify an action corresponding to the relational metadata instruction; and **initiate[F]** the action in response to the identifying;



[F] In response to the user's click to play a video from "Awesome life...", action is taken to display information related to the video

Pinterest Infringes US7,950,033 Patent, Claim 27

wherein the relationship of the second data to the first data is selected from the group consisting of: a summary, a correction, a repeat, a highlight, more detailed content, **related text [G]**, and a related icon.



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U.S. Patent No. 7,890,978


US007890978B2

(12) **United States Patent**
Dureau et al.

(10) **Patent No.:** **US 7,890,978 B2**
(45) **Date of Patent:** **Feb. 15, 2011**

(54) **GENERIC DATA PROCESSING ENGINE**
(75) **Inventors:** **Vincent Dureau**, Palo Alto, CA (US);
Debra Hensgen, Redwood City, CA (US); **Ludovic Pierre**, San Francisco, CA (US); **Jean-Rene Menand**, Los Altos, CA (US)
(73) **Assignee:** **OpenTV, Inc.**, San Francisco, CA (US)
(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 2078 days.
(21) **Appl. No.:** **09/827,358**
(22) **Filed:** **Apr. 5, 2001**
(65) **Prior Publication Data**
US 2002/0015093 A1 Feb. 7, 2002
Related U.S. Application Data
(60) Provisional application No. 60/195,579, filed on Apr. 6, 2000.
(51) **Int. Cl.** **H04N 5/445** (2006.01)
(52) **U.S. Cl.** **725/48; 725/132; 725/140; 715/235; 348/553**
(58) **Field of Classification Search** **725/38; 725/39; 136; 48-54; 132; 140; 152; 348/461; 348/10; 387; 423; 553; 565; 563; 906; 715/235-239**
See application file for complete search history.
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OTHER PUBLICATIONS
Program Guide for Digital Television, ATSC Standard, Document A/55, Jan. 3, 1996.*
(Continued)
Primary Examiner—Annan Q Shang
(74) **Attorney, Agent, or Firm**—Rory D. Rankin; Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C.
(57) **ABSTRACT**
A generic data processing engine is operable to receive a format definition and process data formatted according to the definition, without use of formatting information in the data. The format definition includes a description of the syntax of the format, and a description of the semantics of the format. The syntax and semantics may be described in the same language or in different languages, and the engine is configured to produce an internal representation of the syntax and semantics. The engine receives queries and uses them together with the internal representation to set masks for the filters. The filters apply the masks to the data and return filtered data to the engine, which may forward a portion of the filtered data to applications, store a portion of the filtered data, set new masks based on a portion of the filtered data, or modify the existing masks based on a portion of the filtered data. The filters may also be configured to return filtered data directly to applications, bypassing the engine.

58 Claims, 25 Drawing Sheets

- **Inventors:** Vincent Dureau, Debra Hensgen, Ludovic Pierre, Jean-Rene Menand
- **Priority Date:** April 6, 2000
- **Expiration Date:** December 14, 2025
- **Summary of Technology:** Format definition designed to efficiently deliver and exchange data.
- **Representative Claim Mapping:** Pinterest's Implementation of GraphQL
- **Representative Foreign Counterparts:**

57

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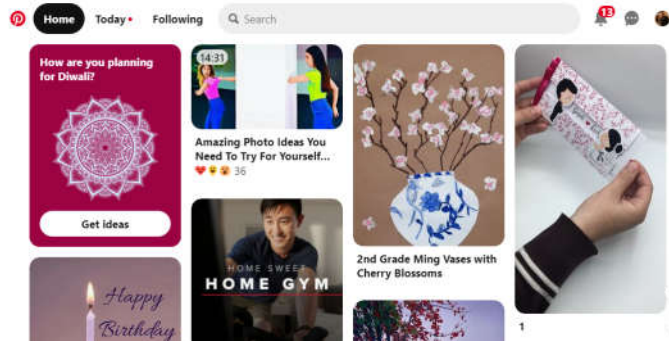
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Patent Owner OpenTV Ex. 2020
Page 057

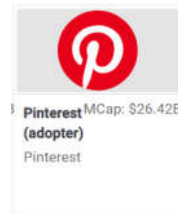
Pinterest Infringes The 7,890,978 Patent, Claim 58

Claim 58. A receiver for processing data, wherein said receiver comprises: **a front end configured to receive a broadcast signal including a format definition [A]**, wherein said format definition comprises a description of a grammar which defines a Syntax of a target language...

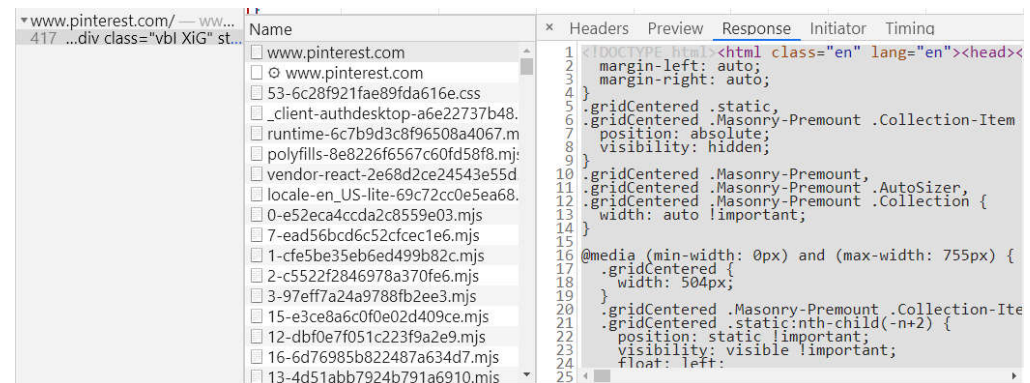


Who's using GraphQL?

GraphQL is used by teams of all sizes in many different environments and languages to power mobile apps, websites, and APIs.



<https://graphql.org/users/>
<https://medium.com/hackernoon/an-introduction-to-graphql-2c3f7d8fb4e0>

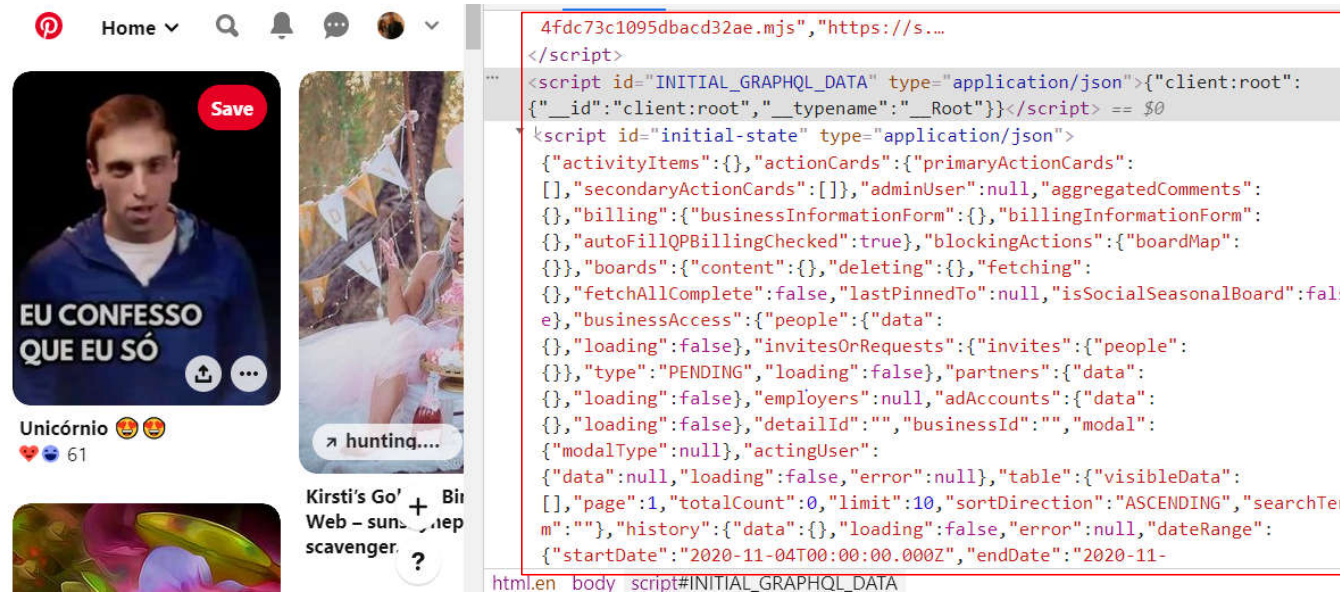


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6292f794ec9534dbdf74.mjs", "https://s.pinimg.com/webapp/style/www/[username]-authdesktop-78a2f51fdd4c7a508f1a.css", "https://s.pinimg.com/webapp/js/www/[username]-authdesktop-d7c3e2d38265bfe20710.mjs"]}], "site": "www"}</script><script id="INITIAL_GRAPHQL_DATA" type="application/json">{"client:root":{"__id":"client:root","__typename":"__Root"}}</script><script id="initial-state">
```

[A] Pinterest's interface receives broadcast signals delivered in conjunction with a format definition that allows GraphQL queries.

Pinterest Infringes The 7,890,978 Patent, Claim 58

Claim 58. A receiver for processing data, wherein said receiver comprises: **a front end configured to receive a broadcast signal including a format definition [A]**, wherein said format definition comprises a description of a grammar which defines a Syntax of a target language...



[A] Pinterest's interface receives broadcast signals delivered in conjunction with a format definition that allows GraphQL queries.

Pinterest Infringes The 7,890,978 Patent, Claim 58

Claim 58. A receiver for processing data, wherein said receiver comprises: **a front end configured to receive a broadcast signal including a format definition [A]**, wherein said format definition comprises a description of a grammar which defines a Syntax of a target language...

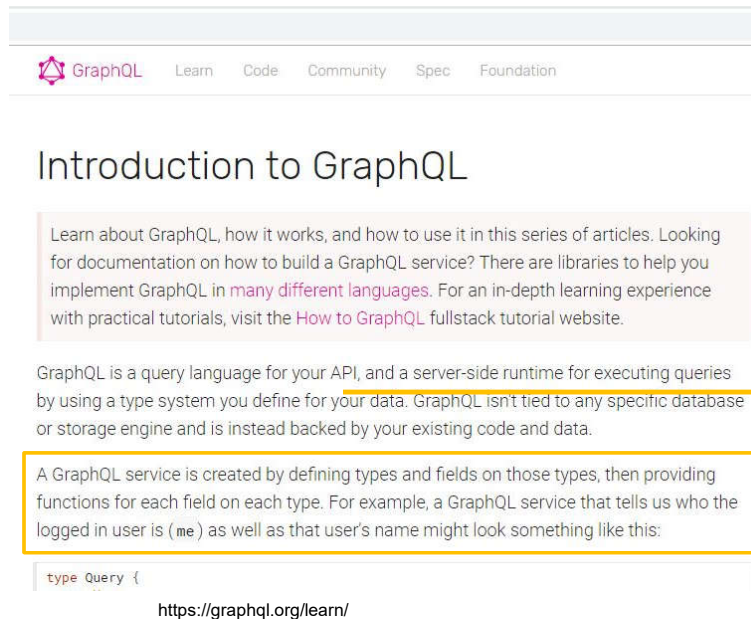
GraphQL

June 2018 Edition

Introduction

This is the specification for GraphQL, a query language and execution engine originally created at Facebook in 2012 for describing the capabilities and requirements of data models for client-server applications. The development of this open standard started in 2015.

GraphQL spec, pg 1: <https://facebook.github.io/graphql/June2018/#sec-Data>



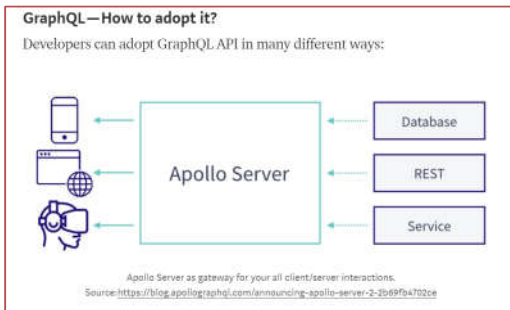
The screenshot shows the GraphQL website's introduction page. At the top is a navigation bar with the GraphQL logo and links for Learn, Code, Community, Spec, and Foundation. The main heading is "Introduction to GraphQL". Below it is a paragraph explaining that GraphQL is a query language and execution engine, originally created at Facebook in 2012. A yellow box highlights the text "a query language and execution engine". Another yellow box highlights the text "A GraphQL service is created by defining types and fields on those types, then providing functions for each field on each type. For example, a GraphQL service that tells us who the logged in user is (me) as well as that user's name might look something like this:". Below this is a code block showing a GraphQL query:

```
type Query {
```

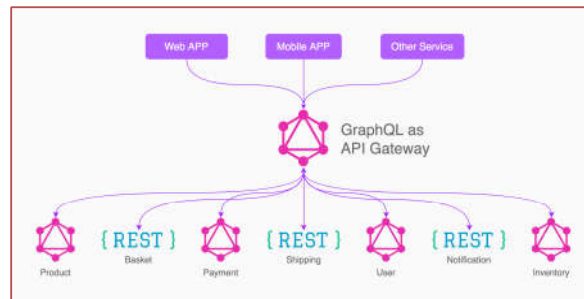
. At the bottom is a link to <https://graphql.org/learn/>.

Pinterest Infringes The 7,890,978 Patent, Claim 58

Claim 58. A receiver for processing data, wherein said receiver comprises: a front end configured to receive a broadcast signal including a format definition, **wherein said format definition comprises a description of a grammar which defines a Syntax of a target language [B]...**



<https://medium.com/@wtr/selecting-database-as-data-source-for-graphql-server-e3281cfefb2>



Every GraphQL service defines a set of types which completely describe the set of possible data you can query on that service. Then, when queries come in, they are validated and executed against that schema.

Type language

GraphQL services can be written in any language. Since we can't rely on a specific programming language syntax, like JavaScript, to talk about GraphQL schemas, we'll define our own simple language. We'll use the "GraphQL schema language" - it's similar to the query language, and allows us to talk about GraphQL schemas in a language-agnostic way.

<https://labs.getninja.com.br/sharing-data-in-a-microservices-architecture-using-graphql-97db59357602>

*This article only touches on **plain GraphQL** functionality — there's no notion of a network layer defining **how** the server communicates with a client. The focus is on the inner workings of a "GraphQL execution engine" and the query resolution process. To learn about the network layer, check out the [next article](#).*

The GraphQL schema defines the server's API

Defining schemas: The Schema Definition Language

GraphQL has its own type language that's used to write GraphQL schemas: The Schema Definition Language (SDL). In its simplest form, GraphQL SDL can be used to define types looking like this:

```
type User {  
  id: ID!  
  name: String  
}
```

<https://www.prisma.io/blog/graphql-server-basics-the-schema-ac5e2950214e>

Pinterest Infringes The 7,890,978 Patent, Claim 58

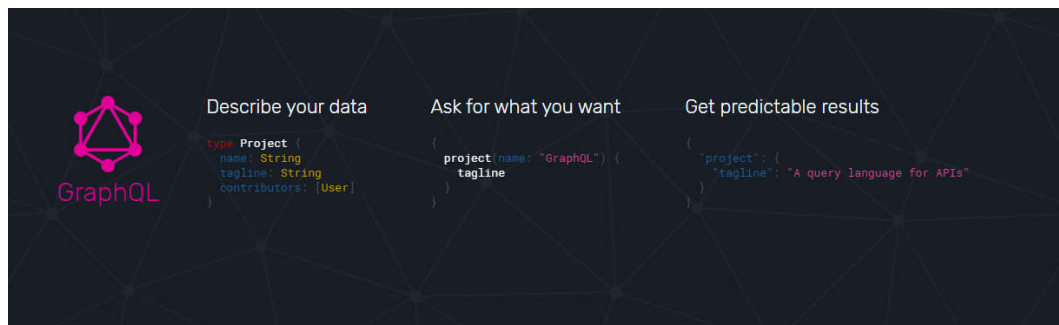
Claim 58. A receiver for processing data, wherein said receiver comprises: **a generic data processing engine configured to: receive said format definition [C]...**



[C] Pinterest interface includes a generic processing engine that allows it receive a GraphQL format definition.

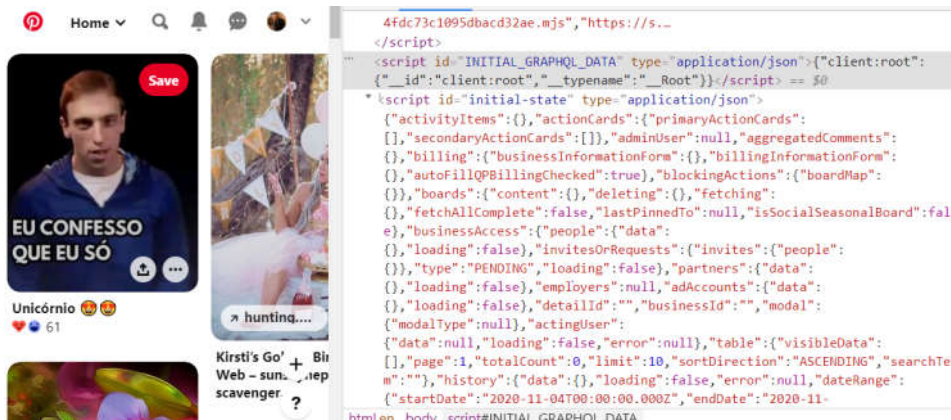
Pinterest Infringes The 7,890,978 Patent, Claim 58

Claim 58. A receiver for processing data, wherein said receiver comprises: **utilize said format definition to generate a decoder operable to decode said target language [D]...**



[D] Pinterest is configured to generate GraphQL queries designed based on the GraphQL target language.

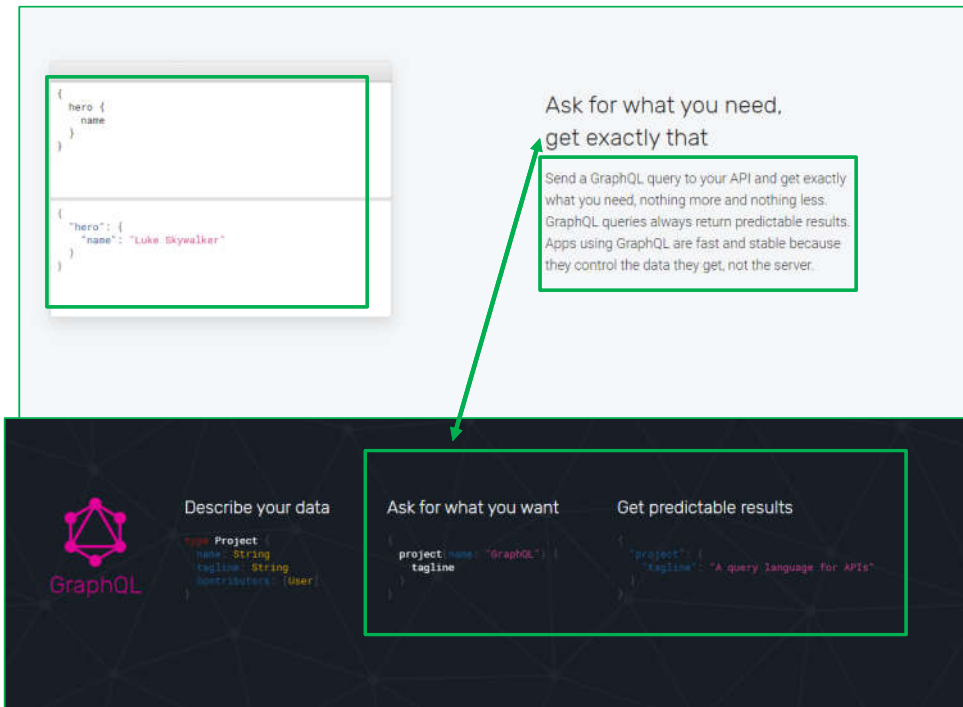
<https://graphql.org/>



```
[{"description":"","link":"","title":"","board":null,"descriptionError":null,
"linkError":null,"titleError":null,"entryPoint":null,"closeUpImageSignatu
re":null,"pinEditorPinDraft":null,"pins":{"864128247248628390":
{"shopping_flags":[],"title":"Unicórnio 🐉
🐉","id":"864128247248628390","created_at":"Tue, 10 Nov 2020 21:12:56
+0000","aggregated_pin_data":
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salvos/","image_thumbnail_url":"https://i.pinimg.com/upload/8641283159413653
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05_41492_60.jpg","id":"864128315941365377","type":"board","name":"Meus Pins
salvos","followed_by_me":false,"is_promoted":false,"embed":null,"type":"pin
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córnio 🐉🐉","access":[],"is_native":true,"link":null,"image_crop":
{"min_y":0,"max_y":1},"product_pin_data":null,"buyable_product":null,"promot
ed_is_removable":false,"reaction_counts":
```

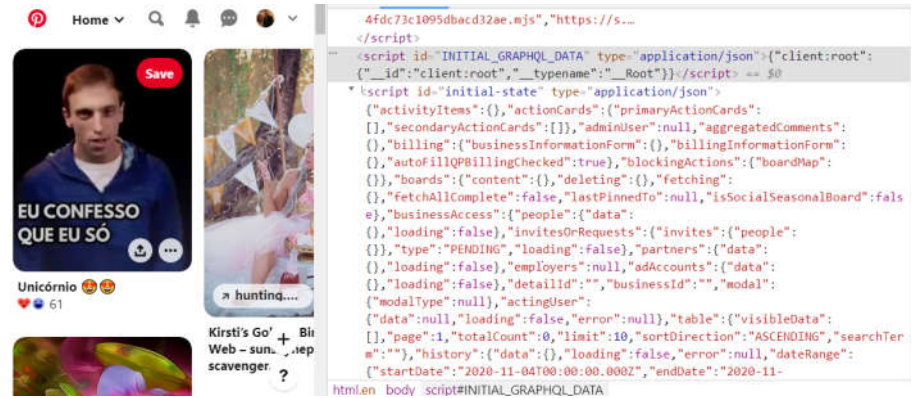
Pinterest Infringes The 7,890,978 Patent, Claim 58

Claim 58. A receiver for processing data, wherein said receiver comprises: **receive additional data which conforms to the target language [E]**; and...



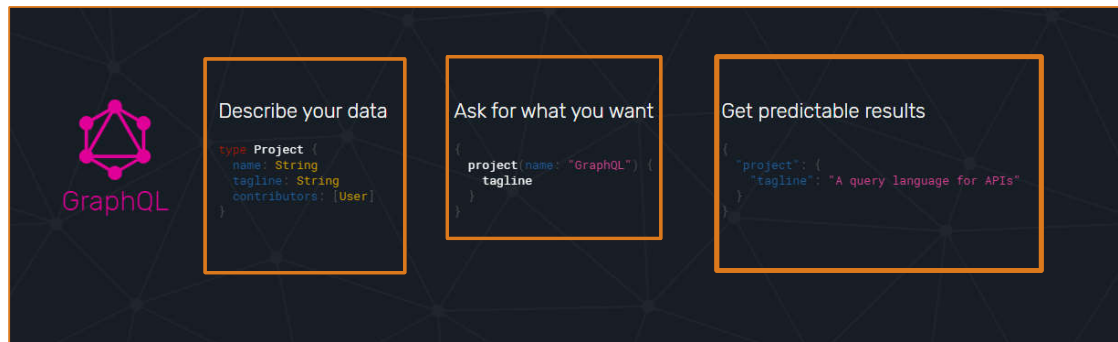
<https://graphql.org/>

[E] Pinterest generates GraphQL queries and receives additional data which conform to the target language



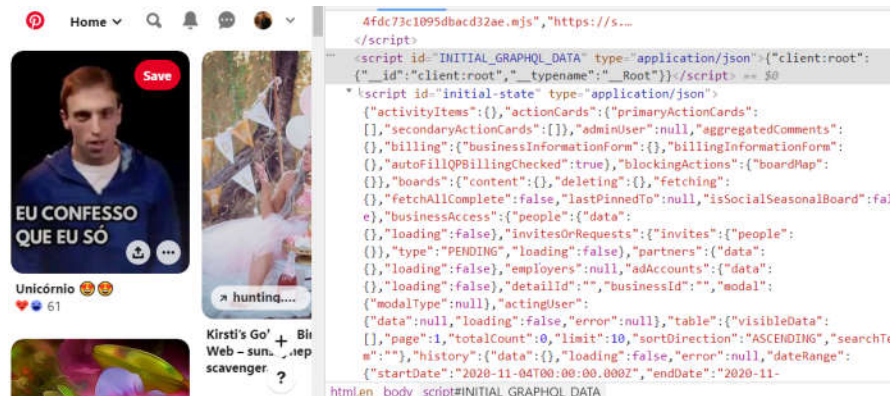
Pinterest Infringes The 7,890,978 Patent, Claim 58

Claim 58. A receiver for processing data, wherein said receiver comprises: **process the additionally received data in accordance with the format definition using said decoder [F].**



[F] Pinterest's implementation of GraphQL processes the query (formatted based on the schema definition) sent from the client and receives additional data that conforms to the format definition for decoding.

<https://graphql.org/>



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Pinterest's User Base Growing Substantially

"We welcomed over 100 million additional monthly active users to Pinterest in 2020, more than any other year in our history, and now we reach more than 450 million monthly active users around the world. I'm proud of our company and the inspiration we've been able to bring to so many lives during a trying year," said Ben Silbermann, CEO and co-founder, Pinterest. "As we look to the future, our focus will continue to be delivering more inspiring and shoppable content and helping advertisers realize the value and positivity of our platform."

"Q4 capped a remarkable year of growth for Pinterest. Continued product innovation, execution and an earlier and longer holiday season helped us deliver 76% year-over-year revenue growth," said Todd Morgenfeld, CFO and Head of Business Operations, Pinterest. "As we start 2021, we'll be building on this momentum by continuing to invest in the success of our advertisers as well as a first-class Pinner experience around the globe."

[pins-ex992-20201231 \(q4cdn.com\)](#)

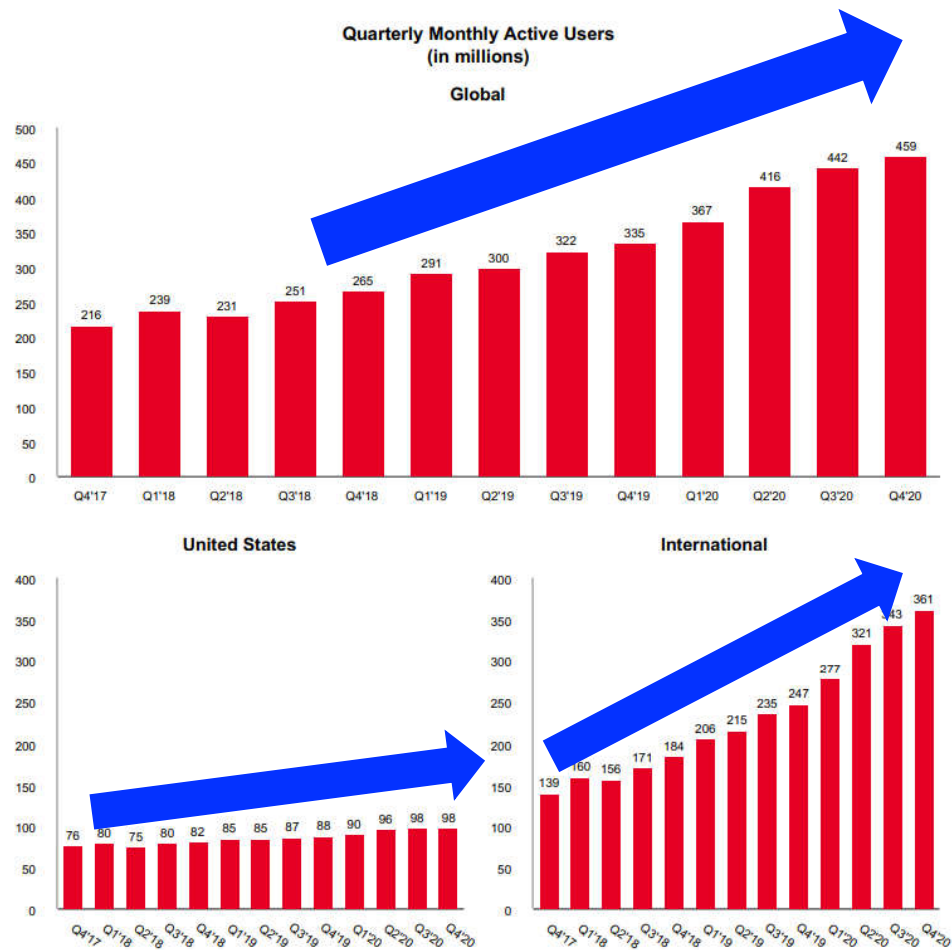
In 2021, our focus will be on the following core priorities:

- **Delivering more inspiring content:** Our top priority is to make Pinterest home to more inspiring content and, increasingly, more inspiring creators. This means continuing to invest in video to provide our users with more dynamic experiences—like "how-to" tutorials and engaging storytelling from brands. We are also taking important first steps to build a creator ecosystem around Story Pins where a new generation of creators can create great content to enrich the lives of Pinner.

[Pinterest-Q4-Shareholder-Letter.pdf \(q4cdn.com\)](#)

Pinterest Users and Revenue

	Year Ended December	
	2020	2019
<i>(in thousands, except per share amounts)</i>		
Consolidated Statements of Operations Data:		
Revenue	\$ 1,692,658	\$ 1,142,761
Costs and expenses ⁽¹⁾ :		
Cost of revenue	449,358	358,903
Research and development	606,194	1,207,059
Sales and marketing	442,807	611,590
General and administrative	336,803	354,075
Total costs and expenses	1,835,162	2,531,627
Loss from operations	(142,504)	(1,388,866)
Interest income	16,119	30,164
Interest expense and other income (expense), net	(635)	(2,137)
Loss before provision for income taxes	(127,020)	(1,360,839)
Provision for income taxes	1,303	532
Net loss	\$ (128,323)	\$ (1,361,371)
Net loss per share attributable to common stockholders, basic and diluted	\$ (0.22)	\$ (3.24)
Weighted-average shares used in computing net loss per share attributable to common stockholders, basic and diluted	596,264	420,473
Adjusted EBITDA ⁽²⁾	\$ 305,004	\$ 16,706



Q4-20 Financials (q4cdn.com)

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Pinterest's big jumps in ARPU can be correlated with video

Pinterest



July 10, 2019
News, Product

Today, we're introducing new video features for creators and businesses to reach the audiences including an improved uploader, video tab, lifetime analytics, and Pin scheduling.

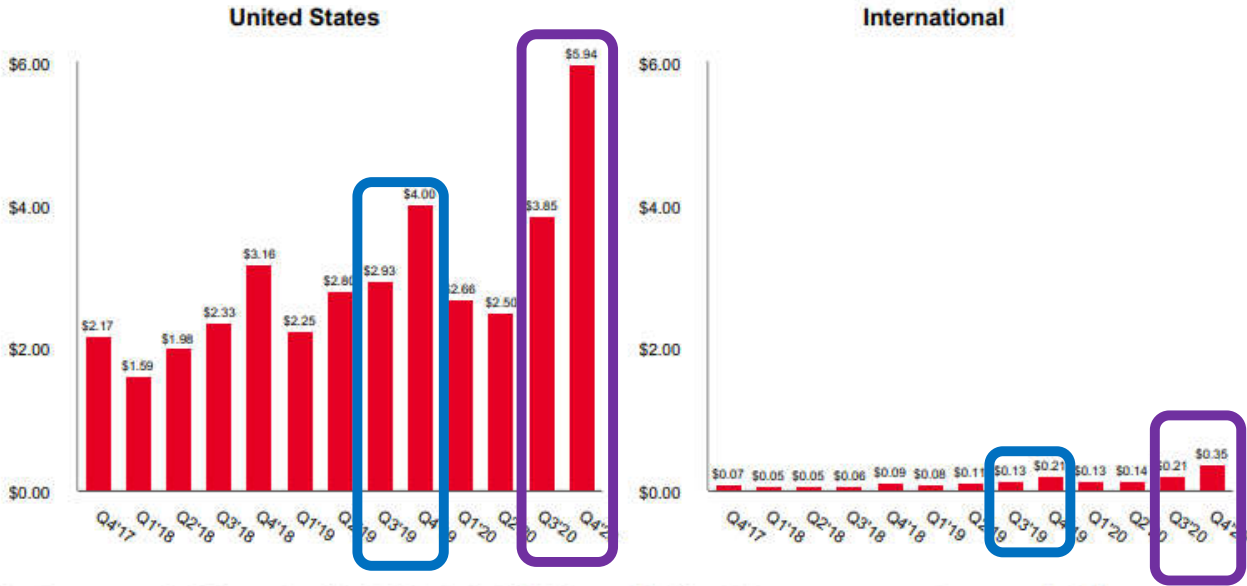
[Pinterest Newsroom](#)



September 23, 2020
Company, News, Product

Introducing Story Pins and new ways for creators to build and grow with Pinterest

Story Pins is an all new type of Pin and publishing option that gives creators a way to tell dynamic and visual stories with videos, voiceover and image and text overlay. We're making it easier for creators who are eager to share their talent, passions and creativity to flow back directly into Pinterest without the need for a website. For Pinners, this means the ideas within a Pin will be more engaging and actionable.



For the year ended December 31, 2020, global ARPU was \$4.26, which represents an increase of 12% compared to the year ended December 31, 2019. For the year ended December 31, 2020, U.S. ARPU was \$15.34 and international ARPU was \$0.88, which represent increases of 27% and 62%, respectively, compared to the year ended December 31, 2019.

[Q4-20 Financials \(q4cdn.com\)](#)

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- **Monthly active users:** 478 million vs. 480.5 million forecast by FactSet
- **Average revenue per user:** \$1.04 vs. \$0.99 forecast by FactSet

Pinterest noted a strong correlation between user engagement and pandemic lockdowns throughout 2020, the company said in a letter to shareholders. Now user growth is slowing and engagement is lowering as a result of easing Covid-19 restrictions, the company said.

“Starting in mid-March, the easing of pandemic restrictions slowed US MAU growth and lowered engagement year over year as people spent less time online,” the company wrote in the letter. “In Q1, we saw good retention of the MAUs we gained during 2020, but we still don’t know if or how long this retention will last. Our understanding of future engagement levels is similarly limited.”

The company reported revenue of \$485 million for the quarter, which was up 78% compared with a year prior. Pinterest’s net loss shrunk 85% to \$21.7 million, from a loss of \$141.2 million a year ago.

[Pinterest \(PINS\) earnings Q1 2021 \(cnbc.com\)](https://www.cnbc.com/2021/04/28/pinterest-q1-2021-earnings.html)

Pinterest also provided a Q2 revenue growth estimate of 105% year to year. That was ahead of Refinitiv expectations of 95% year-to-year revenue growth for the upcoming quarter.

Proposed Deal Framework for Pinterest

□ Key License Terms

- Pinterest receives a non exclusive, life of patent license to claim charted Kudelski patents and their foreign counterparts
- Pinterest receives a non exclusive, worldwide license to the rest of Kudelski's portfolio (all other patents and apps owned by Kudelski as of the effective date) for 5 years in the streaming FOU
- Kudelski receives a 5 year CNS from Pinterest
- Mutual release for the past
- Licenses and releases do not extend to entities acquired after the effective date

□ Financial terms

- Upfront, non refundable payment of \$8M (covers estimated \$300M+ annual revenue and all past revenue) due to Kudelski within 15 days of the effective date of a final agreement