Doc Code: PD.TO.AUTH
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AUTHORIZATION TO PERMIT ACCESS TO APPLICATION BY PARTICIPATING OFFICES

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COMPLETE IF KNOWN	
Application Number	
Filing Date	
First Named Inventor	Robert Drew Major
Attorney Docket Number	066.0141C1_P2004-04-01.2
Title (Required)	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

The undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified patent application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h).

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the above-identified application with respect to: 1) the above-identified patent application-as-filed; 2) any foreign application to which the above-identified patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the above-identified patent application; and 3) any U.S. application-as-filed from which benefit is sought in the above-identified patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

This written authorization should be submitted prior to the filing of a subsequent foreign application, in which priority is claimed to the above-identified patent application, with any intellectual property office (e.g., the EPO, JPO, KIPO, or DAS Accessing Office). However, if applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the above-identified patent application is filed to have access to the above-identified patent application, this written authorization should not be filed.

No fee will be charged under 37 CFR 1.19(b)(1) for providing a participating intellectual property office with an electronic copy of the above-identified patent application.

This form must be signed by an authorized party in accordance with 37 CFR 1.14(c).

/BRETT A. CARLSON/	October 16, 2014
Signature	Date
Brett A. Carlson	480.385.5060
Printed or Typed Name	Telephone Number
Attorney of Record	39928
Title	Registration Number, if applicable

This collection of information is required by 37 CFR 1.14(h). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process an application). Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	11116783
Filing Date	2005-04-28
First Named Inventor	R. Drew Major
Art Unit	2444
Examiner Name	Ninos Donabed
Attorney Docket Number	066.0141 (P2004-04-01.1)

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	1	1298931	EP	A2	2003-04-02	Oplayo Oy		☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	11116783
	Filing Date	2005-04-28
	First Named Inventor	R. Drew Major
	Art Unit	2444
	Examiner Name	Ninos Donabed
	Attorney Docket Number	066.0141 (P2004-04-01.1)

	1	Canadian Intellectual Property Office, Office Action, dated September 10, 2014 for Canadian Application No. 2564861.	☐

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Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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(Not for submission under 37 CFR 1.99)

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Filing Date	2005-04-28
First Named Inventor	R. Drew Major
Art Unit	2444
Examiner Name	Ninos Donabed
Attorney Docket Number	066.0141 (P2004-04-01.1)

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/BRETT A. CARLSON/	Date (YYYY-MM-DD)	2014-10-08
Name/Print	Brett A. Carlson	Registration Number	39928

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Application Number	11116783
Filing Date	2005-04-28
First Named Inventor	R. Drew Major
Art Unit	2444
Examiner Name	Donabed, Ninos J.
Attorney Docket Number	066.0141 (P2004-04-01.1)

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7523181	B2	2009-04-21	Swildens et al.	
	2	6976090	B2	2005-12-13	Ben-Shaul et al.	
	3	7240100	B1	2007-07-03	Wein et al.	
	4	6850965	B2	2005-02-01	Allen	
	5	7334044	B1	2008-02-19	Allen	
	6	7760801	B2	2010-07-20	Ghanbari et al.	
	7	7099954	B2	2006-08-29	Li et al.	
	8	7054911	B1	2006-05-30	Lango et al.	

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Receipt date: 08/20/2014	Application Number	11116783	11116783 - GAU: 2444
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2005-04-28	
	First Named Inventor	R. Drew Major	
	Art Unit	2444	
	Examiner Name	Donabed, Ninos J.	
	Attorney Docket Number	066.0141 (P2004-04-01.1)	

	9	7349358	B2	2008-03-25	Hennessey et al.	
	10	7797439	B2	2010-09-14	Cherkasova et al.	
	11	7477688	B1	2009-01-13	Zhang et al.	
	12	7054774	B2	2006-05-30	Batterberry et al.	
	13	6760772	B2	2004-07-06	Zou et al.	
	14	5168356		1992-12-01	Acampora et al.	
	15	7546355	B2	2009-06-09	Kalnitsky	
	16	7174385	B2	2007-02-06	Li	
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	18	7719985	B2	2010-05-18	Lee et al.	
	19	8683066	B2	2014-03-25	Hurst et al.	

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	Art Unit	2444	
	Examiner Name	Donabed, Ninos J.	
	Attorney Docket Number	066.0141 (P2004-04-01.1)	

	20	5768527		1998-06-16	Zhu et al.	
	21	7274740	B2	2007-09-25	van Beek et al.	
	22	6185736	B1	2001-02-06	Ueno	
	23	6845107	B1	2005-01-18	Kitazawa et al.	
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	26	7599307	B2	2009-10-06	Seckni et al.	
	27	7788395	B2	2010-08-31	Bowra et al.	
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	29	7412531	B2	2008-08-12	Lango et al.	
	30	7295520	B2	2007-11-13	Lee et al.	

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	Examiner Name	Donabed, Ninos J.	
	Attorney Docket Number	066.0141 (P2004-04-01.1)	

	31	6795863	B1	2004-09-21	Doty, Jr.	
	32	7609652	B2	2009-10-27	Kellerer et al.	
	33	7325073	B2	2008-01-29	Shao et al.	
	34	6374289	B2	2002-04-16	Delaney et al.	
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	40	7310678	B2	2007-12-18	Gunaseelan et al.	
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	42	6618752	B1	2003-09-09	Moore et al.	
	43	6721723	B1	2004-04-13	Gibson et al.	
	44	6859839	B1	2005-02-22	Zahorjan et al.	
	45	7779135	B2	2010-08-17	Hudson et al.	
	46	7369610		2008-05-06	Xu et al.	
	47	7330908		2008-02-12	Jungck	
	48	7577750		2009-08-18	Shen et al.	
	49	7328243		2008-02-05	Yeager et al.	
	50	7116894		2006-10-03	Chatterton	
	51	7653735		2010-01-26	Mandato et al.	
	52	8135852	B2	2012-03-13	Nilsson et al.	

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	53	5841432		1998-11-24	Carmel et al.	
	54	5404446		1995-04-04	Bowater et al.	
	55	6449719	B1	2002-09-10	Baker	
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	57	8209429	B2	2012-06-26	Jacobs et al.	
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	59	7660906	B1	2010-02-09	Armour	
	60	8036265	B1	2011-10-11	Reynolds et al.	
	61	5267334		1993-11-30	Normille et al.	
	62	8370514	B2	2013-02-05	Hurst et al.	
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	64	6654790	B2	2003-11-25	Ogle et al.	
	65	6675199	B1	2004-01-06	Mohammed et al.	
	66	6697072	B2	2004-02-24	Russell et al.	
	67	6792449	B2	2004-09-14	Colville et al.	
	68	6801947	B1	2004-10-05	Li	
	69	6885471	B1	2005-04-26	Minowa et al.	
	70	7031700	B1	2006-04-18	Weaver et al.	
	71	7046805	B2	2006-05-16	Fitzhardinge et al.	
	72	7111044	B2	2006-09-19	Lee	
	73	7124164	B1	2006-10-17	Chemtob	
	74	7176957	B2	2007-02-13	Ivashin et al.	

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	75	7177642	B2	2007-02-13	Sanchez Herrero et al.	
	76	7190670	B2	2007-03-13	Varsa et al.	
	77	7313236	B2	2007-12-25	Amini et al.	
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	80	7555464	B2	2009-06-30	Candelore	
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	82	7631039	B2	2009-12-08	Eisenberg	
	83	7761609	B1	2010-07-20	Srinivasan et al.	
	84	7873040	B2	2011-01-18	Karlsgodt	
	85	7818444	B2	2010-10-19	Brueck et al.	

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(Not for submission under 37 CFR 1.99)	First Named Inventor	R. Drew Major	
	Art Unit	2444	
	Examiner Name	Donabed, Ninos J.	
	Attorney Docket Number	066.0141 (P2004-04-01.1)	

	86	8402156	B2	2013-03-19	Brueck et al	

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	1	20040083283	A1	2004-04-29	Sundaram et al.	
	2	20080219151	A1	2008-09-11	Ma et al.	
	3	20020152318	A1	2002-10-17	Menon et al.	
	4	20060080718	A1	2006-04-13	Gray et al.	
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	6	20040103444	A1	2004-05-27	Weinberg et al.	
	7	20050188051	A1	2005-08-25	Sneh	
	8	20030154239	A1	2003-08-14	Davis et al.	

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	Attorney Docket Number	066.0141 (P2004-04-01.1)	

	9	20080133766	A1	2008-06-05	Luo	
	10	20070079325	A1	2007-04-05	de Heer	
	11	20030014684	A1	2003-01-16	Kashyap	
	12	20060206246	A1	2006-09-14	Walker	
	13	20050076136	A1	2005-04-07	Cho et al.	
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	15	20040030599	A1	2004-02-12	Sie et al.	
	16	20050262257	A1	2005-11-24	Major et al.	
	17	20030140159	A1	2003-07-24	Campbell et al.	
	18	20010047423	A1	2001-11-29	Shao et al.	
	19	20030021166	A1	2003-01-30	Soloff	

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Receipt date: 08/20/2014	Application Number	11116783	11116783 - GAU: 2444
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2005-04-28	
	First Named Inventor	R. Drew Major	
	Art Unit	2444	
	Examiner Name	Donabed, Ninos J.	
	Attorney Docket Number	066.0141 (P2004-04-01.1)	

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Receipt date: 08/20/2014	Application Number	11116783	11116783 - GAU: 2444
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2005-04-28	
(Not for submission under 37 CFR 1.99)	First Named Inventor	R. Drew Major	
	Art Unit	2444	
	Examiner Name	Donabed, Ninos J.	
	Attorney Docket Number	066.0141 (P2004-04-01.1)	

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	1	USPTO "International Search Report" mailed December 12, 2008; International Appln. No. PCT/US2008/061035, filed April 21, 2008.	☐
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Receipt date: 08/20/2014	Application Number	11116783	11116783 - GAU: 2444
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	First Named Inventor	R. Drew Major	
	Art Unit	2444	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2005-04-28
	First Named Inventor	R. Drew Major
	Art Unit	2444
	Examiner Name	Donabed, Ninos J.
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	Art Unit	2444	
	Examiner Name	Donabed, Ninos J.	
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Examiner Signature	/Ninos Donabed/	Date Considered	08/21/2014

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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	Art Unit	2444	
	Examiner Name	Donabed, Ninos J.	
	Attorney Docket Number	066.0141 (P2004-04-01.1)	

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/BRETT A. CARLSON/	Date (YYYY-MM-DD)	2014-08-20
Name/Print	Brett A. Carlson	Registration Number	39928

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Substitute for form 1449A/PTO	*Complete if Known*	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*	**Application Number**	11/116,783
	Filing Date	April 28, 2005
	First Named Inventor	Major, R. Drue
	Group Art Unit	2444
	Examiner Name	Donabed, Ninos J.
Sheet 1 of 1	Attorney Docket No: 8532P001	

US PATENT DOCUMENTS					
Examiner Initial *	**Cite No [1]**	**USP Document Number**	**Publication or Issue Date MM-DD-YYYY**	**Name of Patentee or Applicant of cited Document**	**Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear**
		US-20030204519A1	10/30/2003	Sirivara, et al.	
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EXAMINER	/Ninos Donabed/	**DATE CONSIDERED**	03/09/2011

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Application Number	11/116,783
				Filing Date	April 28, 2005
				First Named Inventor:	Major, R. Drew
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Examiner Initials*	Cite No[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T[2]
		Final Office Action for 11/673,483, February 4, 2010, 21 pages.	
		Advisory Action for 11/673,483, April 9, 2010, 3 pages.	
		Advisory Action for 11/673,483, May 26, 2010, 3 pages.	

Examiner Signature	/Ninos Donabed/	Date Considered	03/09/2011

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Substitute for Form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Application Number	11/116,783
				Filing Date	April 28, 2005
				First Named Inventor:	Major, R. Drew
				Art Unit	2444
				Examiner Name	Donnabed, Ninos J.
Sheet	1	**of**	1	Attorney Docket Number	8532P001

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (If known)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-	6,389,473	05/14/2002	Carmel et al.	
		US-	7,818,444	10/19/2010	Brueck, et al.	
		US-				
		US-				

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T[2]
		Notice of Allowance for 11/673,483, August 5, 2010, 7 pages.	

Examiner Signature	/Ninos Donabed/	Date Considered	03/09/2011

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Application Number	11/116,783
				Filing Date	April 28, 2005
				First Named Inventor:	R. Drew Major
				Art Unit	2444
				Confirmation No.	5535
				Examiner Name	Donabed, Ninos J.
Sheet	**1**	**of**	**1**	Attorney Docket Number	8532P001

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (If known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-			
		US-			
		US-			
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		WICKER, Stephen B., "ERROR CONTROL SYSTEMS for Digital Communication and Storage", Prentice-Hall, Inc., New Jersey, USA, 1995 (Book: see NPL's Parts 1-6)	

Examiner Signature	/Ninos Donabed/	Date Considered	02/04/2010

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Application Number	11/116,783
				Filing Date	April 28, 2005
				First Named Inventor:	R. Drew Major
				Art Unit	2444
				Examiner Name	Donabed, Ninos J
Sheet	1	**of**	1	Attorney Docket Number	8532P001

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T[2]
		PCT Notification of Transmittal of the International Search Report and Written Opinion of the International Searching Authority, for PCT/US05/15091, October 29, 2007, 8 pages.	
		PCT Notification of Transmittal of International Preliminary Report on Patentability, for PCT/US05/15091, October 29, 2007, 6 pages.	
		Office Action for 11/673,483, July 9, 2009, 14 pages.	
		Office Action for 11/673,483, February 3, 2009, 9 pages.	
		ALBANESE, Andres, et al. "Priority Encoding Transmission", TR-94-039, August 1994, 36 pages, International Computer Science Institute, Berkeley, California.	
		PURI, Rohit, et al. "Multiple Description Source Coding Using Forward Error Correction Codes", October 1999, 5 pages, Department of Electrical Engineering and Computer Science, University of California, Berkeley, California.	
		GOYAL, Vivek K., "Multiple Description Coding: Compression Meets the Network", September 2001, pages 74-93, IEEE Signal Processing Magazine.	

Examiner Signature	/Ninos Donabed/	Date Considered	02/04/2010

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Substitute for form 1449A/PTO	*Complete if Known*	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*	**Application Number**	11/116,783
	Filing Date	April 28, 2005
	First Named Inventor	Major, R. Drew
	Group Art Unit	2444
	Examiner Name	Donabed, Ninos
Sheet 1 of 1	Attorney Docket No: 8532P001	

US PATENT DOCUMENTS					
Examiner Initial *	Cite No [1]	USP Document Number	Publication or Issue Date MM-DD-YYYY	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-20030005455A1	01/02/2003	Bowers	
		US-20040054551A1	03/18/2004	Ausubel, et al.	
		US-20040143672A1	07/22/2004	Padmanabham, et al.	
		US-20040170392	09/02/2004	Lu, et al.	
		US-20080162713	07/03/2008	Bowra, et al.	
		US-6486803B1	11/26/2002	Luby, et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No [1]	Foreign Patent Document Country Code/Number/Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T [2]

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS			
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EXAMINER	/Ninos Donabed/	DATE CONSIDERED	02/04/2010

Based on PTO/SB/08A(09-06) - Substitute Disclosure Statement Form (PTO-1449) as modified by BSTZ 03/26/07

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Substitute for Form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Application Number	11/116,783
				Filing Date	April 28, 2005
				First Named Inventor:	R. Drew Major
				Art Unit	2144
				Examiner Name	Donabed, Ninos J
Sheet	**1**	**Of**	**1**	Attorney Docket Number	8532P001

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (If known)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-	2002/0174434 A1	11-21-2002	Lee et al.	
		US-	2003/0067872 A1	04-10-2003	Harrell et al.	
		US-	2004/0030797 A1	02-12-2004	Akinlar et al.	

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Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
		WO 00/67469	11-09-2000	Hannuksela (Nokia Mobil Phones Ltd.)		
		CA 2466482	05-22-2003	Doron et al. (Musicmatch, Inc.)		

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Examiner Initials*			T[2]
		Supplemental European Search Report, September 30, 2008, (3 pages)	

Examiner Signature	/Ninos Donabed/	Date Considered	02/13/2009

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Substitute for Form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Application Number:	11/116,783
				Filing Date:	April 28, 2005
				First Named Inventor:	R. Drew Major
				Art Unit:	2144
				Examiner Name:	Donabed, Ninos J
Sheet	**1**	**of**	**2**	Attorney Docket Number:	8532.P001

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (If known)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-	6,091,775	07-18-2000	Hibi et al.	
		US-	6,091,777	07-18-2000	Guetz et al.	
		US-	6,510,553 B1	01-21-2003	Hazra	
		US-	6,731,600 B1	05-04-2004	Patel et al.	
		US-	6,732,183 B1	05-04-2004	Graham	
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		US-	7,075,986 B2	07-11-2006	Girod et al.	
		US-	7,349,976 B1	03-25-2008	Glaser et al.	
		US-	2002/0073167 A1	06-13-2002	Powell et al.	
		US-	2005/0123058 A1	06-09-2005	Greenbaum et al.	
		US-	2007/0024705 A1	02-01-2007	Richter et al.	
		US-	2008/0028428 A1	01-31-2008	Jeong et al.	
		US-	2008/0056373 A1	03-06-2008	Newlin et al.	
		US-	2008/0195744 A1	08-14-2008	Bowra et al.	
		US-	2008/0195745 A1	08-14-2008	Bowra et al.	
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Examiner Signature	/Ninos Donabed/	Date Considered	02/13/2009

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Substitute for Form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Application Number	11/116,783
				Filing Date	April 28, 2005
				First Named Inventor:	R. Drew Major
				Art Unit	2144
				Examiner Name	Donabed, Ninos J
Sheet	**2**	**of**	**2**	Attorney Docket Number	8532.P001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document: Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
		EP 0 711 077 A2	05-08-1996	Haskell et al. (AT&T Corp)		
		EP 0 919 952 A1	06-02-1999	Mattavelli et al. (Ecole Poly.)		
		EP 1 641 271 A2	03-29-2006	Klemets et al. (Microsoft Corp.)		
		EP 1 670 256 A2	06-14-2006	Klemets et al. (Microsoft Corp.)		
		EP 1 777 969 A1	04-25-2007	__ (British Telecommunications)		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T[2]
		PATHAN, Al-Mukaddim, et al., "A Taxonomy and Survey of Content Delivery Networks", Australia, February 2007. Available at http://www.gridbus.org/reports/CDN-Taxonomy.pdf	
		On2 Technologies, Inc., "TrueMotion VP7 Video Codec", White Paper, Document Version 1.0, January 10, 2005, (13 pages).	

Examiner Signature	/Ninos Donabed/	Date Considered	02/13/2009

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	11116783
Filing Date	2005-04-28
First Named Inventor	R. Drew Major
Art Unit	2143
Examiner Name	
Attorney Docket Number	2082.2.1

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4535355		1985-08-13	Arn et al.	
	2	5953506		1999-09-14	Kalra et al.	
	3	6490627	B1	2002-12-03	Kalra et al.	
	4	6574591	B1	2003-06-03	Kleiman et al.	
	5	6604118	B2	2003-08-05	Kleiman et al.	

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Page 41

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	11116783
Filing Date	2005-04-28
First Named Inventor	R. Drew Major
Art Unit	2143
Examiner Name	
Attorney Docket Number	2082.2.1

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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FORM PTO-1449 **LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT** (use several sheets if necessary)	SERIAL NO. 11/116,783	ATTORNEY DOCKET NO. 2082.2.1
	FILING DATE April 28, 2005	GROUP ART UNIT 2155
	APPLICANT(S): R. Drew Major	

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	A1	6,195,680	02/27/2001	Goldszmidt et al.	709/203	07/23/1998
	A2	6,366,614	04/02/2002	Pian et al.	375/240.02	10/11/1996
	A3	2003/0151753	08/14/2003	Li et al.	358/1.9	06/27/2002
	A4	2005/0108414	05/19/2005	Taylor et al.	709/231	11/15/2004

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION	
						YES	NO

NON-PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT (Including Author, Title, Source, and Pertinent Pages

EXAMINER /Ninos Donabed/	**DATE CONSIDERED** 05/08/2008

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant(s).

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.D./

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Robert Drew Major
Art Unit	
Examiner Name	
Attorney Docket Number	066.0141C1_P2004-04-01.2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7096271	B1	2006-08-22	Omoigui et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20040031054	A1	2004-02-12	Dankworth et al.	
	2	20040003101	A1	2004-01-01	Roth et al.	
	3	20030135631	A1	2003-07-17	Li et al.	
	4	20020188745	A1	2002-12-12	Hughes et al.	
	5	20040093420	A1	2004-05-13	Gamble	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Robert Drew Major
	Art Unit	
	Examiner Name	
	Attorney Docket Number	066.0141C1_P2004-04-01.2

	6	20020144276	A1	2002-10-03	Radford et al.	
	7	20040071209	A1	2004-04-15	Burg et al.	
	8	20030152036	A1	2003-08-14	Quigg Brown et al.	
	9	20030107994	A1	2003-06-12	Jacobs et al.	
	10	20030081582	A1	2003-05-01	Jain et al.	
	11	20050033855	A1	2005-02-10	Moradi et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Robert Drew Major
	Art Unit	
	Examiner Name	
	Attorney Docket Number	066.0141C1_P2004-04-01.2

	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Robert Drew Major
	Art Unit	
	Examiner Name	
	Attorney Docket Number	066.0141C1_P2004-04-01.2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/BRETT A. CARLSON/	Date (YYYY-MM-DD)	2014-10-16
Name/Print	Brett A. Carlson	Registration Number	39928

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Filer:	Brett Carlson
Attorney Docket Number:	066.0141C1_P2004-04-01.2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1600**

Electronic Acknowledgement Receipt

EFS ID:	20433562
Application Number:	14516303
International Application Number:	
Confirmation Number:	4898
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Customer Number:	70560
Filer:	Brett Carlson/Sharron Castillo
Filer Authorized By:	Brett Carlson
Attorney Docket Number:	066.0141C1_P2004-04-01.2
Receipt Date:	16-OCT-2014
Filing Date:	
Time Stamp:	17:50:41
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1600
RAM confirmation Number	4427
Deposit Account	502091
Authorized User	CARLSON, BRETT A.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	20141016_ADS_P2004-04-01-2.pdf	1882303 099ee074d1cf717bf2e3b67dc9d6a8e245e6a3c5	no	6
Warnings:					
Information:					
2		20141016_Application_P2004-04-01-2.pdf	9087527 f16b6283c1025273887675a130b85a0f91ca3c67	yes	28

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	22
Claims	23	27
Abstract	28	28

Warnings:					
Information:					
3	Drawings-only black and white line drawings	20141016_Drawings_P2004-04-01-2.pdf	3440182 4e18d7575db1645f68bbafb6862674628438e9d2	no	7
Warnings:					
Information:					
4	Oath or Declaration filed	20141016_Declaration_P2004-04-01-2.pdf	139903 ddc28bb6951b7f8fddc5923272acebe7294d161f	no	2
Warnings:					
Information:					
5	Authorization to access Appl. by Trilateral Office	20141016_AuthToPermit_P2004-04-01-2.pdf	80712 e781eb5ef76ae49bba81201aa399639b626e7cc2	no	2
Warnings:					
Information:					
6	Power of Attorney	20141016_POA_P2004-04-01-2.pdf	215530 a5d3e4b207001e00c24cf8b583050148b6d4615b	no	2
Warnings:					
Information:					
7	Information Disclosure Statement (IDS) Form (SB08)	20141016_IDS1_P2004-04-01-2.pdf	1512167 f65ae7d95625ae20fcf9b125483f221922f61d4f	no	41

Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
8	Information Disclosure Statement (IDS) Form (SB08)	20141016_IDS2_P2004-04-01-2.pdf	612635 556c561614db58ec10c1747d2e1bb065b5f7a1ff	no	5
Warnings:					
Information:					
9	Fee Worksheet (SB06)	fee-info.pdf	33326 3798409c868ce52782079cdb26d49fb1e8a8098b	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	17004285	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	066.0141C1_P2004-04-01.2
	Application Number	
Title of Invention	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Robert	Drew	Major	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Orem	State/Province	UT	Country of Residence	US

Mailing Address of Inventor:

Address 1	863 West 600 South		
Address 2			
City	Orem	State/Province	UT
Postal Code	84058	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Mark	B.	Hurst	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Cedar Hills	State/Province	UT	Country of Residence	US

Mailing Address of Inventor:

Address 1	10639 North Avalon		
Address 2			
City	Cedar Hills	State/Province	UT
Postal Code	84062	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

PTO/AIA/14 (08-12)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	066.0141C1_P2004-04-01.2
	Application Number	
Title of Invention	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT	

☐ **An Address is being provided for the correspondence Information of this application.**			
Customer Number	70560		
Email Address	docketing@ifllaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT		
Attorney Docket Number	066.0141C1_P2004-04-01.2	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	7	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for thr Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	70560		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	11116783	2005-04-28

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	066.0141C1_P2004-04-01.2
	Application Number	
Title of Invention	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT	

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11116783	non provisional of	60566831	2004-04-30

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country i	Filing Date (YYYY-MM-DD)	Priority Claimed
			○ Yes ◉ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Authorization to Permit Access:

☐ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	066.0141C1_P2004-04-01.2
	Application Number	
Title of Invention	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT	

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Remove

○ Assignee	○ Legal Representative under 35 U.S.C. 117
◉ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Assignee is an Organization check here. ☒

Organization Name	ECHOSTAR TECHNOLOGIES L.L.C.		
Mailing Address Information:			
Address 1	100 Inverness Terrace East		
Address 2			
City	Englewood	**State/Province**	CO
Country [i]	US	Postal Code	80112
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications

Signature	/BRETT A. CARLSON/			Date (YYYY-MM-DD)	2014-10-16
First Name	Brett	Last Name	Carlson	Registration Number	39928

Additional Signature may be generated within this form by selecting the Add button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	066.0141C1_P2004-04-01.2
	Application Number	
Title of Invention	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application claims benefit of United States Provisional Patent Application Number 60/566,831 entitled "APPARATUS, SYSTEM, AND METHOD FOR DYNAMIC RATE SHIFTING OF STREAMING CONTENT" and filed on April 30, 2004 for R. Drew Major and Mark B. Hurst, which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0002] The invention relates to video streaming over packet switched networks such as the Internet, and more particularly relates to adaptive-rate shifting of streaming content over such networks.

DESCRIPTION OF THE RELATED ART

[0003] The Internet is fast becoming a preferred method for distributing media files to end users. It is currently possible to download music or video to computers, cell phones, or practically any network capable device. Many portable media players are equipped with network connections and enabled to play music or videos. The music or video files (hereinafter "media files") can be stored locally on the media player or computer, or streamed or downloaded from a server.

[0004] "Streaming media" refers to technology that delivers content at a rate sufficient for presenting the media to a user in real time as the data is received. The data may be stored in memory temporarily until played and then subsequently deleted. The user has the immediate satisfaction of viewing the requested content without waiting for the media file to completely download. Unfortunately, the audio/video quality that can be received for real time presentation is constrained by the available bandwidth of the user's network

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connection. Streaming may be used to deliver content on demand (previously recorded) or from live broadcasts.

[0005] Alternatively, media files may be downloaded and stored on persistent storage devices, such as hard drives or optical storage, for later presentation. Downloading complete media files can take large amounts of time depending on the network connection. Once downloaded, however, the content can be viewed repeatedly anytime or anywhere. Media files prepared for downloading usually are encoded with a higher quality audio/video than can be delivered in real time. Users generally dislike this option, as they tend to want to see or hear the media file instantaneously.

[0006] Streaming offers the advantage of immediate access to the content but currently sacrifices quality compared with downloading a file of the same content. Streaming also provides the opportunity for a user to select different content for viewing on an ad hoc basis, while downloading is by definition restricted to receiving a specific content selection in its entirety or not at all. Downloading also supports rewind, fast forward, and direct seek operations, while streaming is unable to fully support these functions. Streaming is also vulnerable to network failures or congestion.

[0007] Another technology, known as "progressive downloads," attempts to combine the strengths of the above two technologies. When a progressive download is initiated, the media file download begins, and the media player waits to begin playback until there is enough of the file downloaded that playback can begin with the hope that the remainder of the file will be completely downloaded before playback "catches up." This waiting period before playback can be substantial depending on network conditions, and therefore is not a complete or fully acceptable solution to the problem of media presentation over a network.

[0008] Generally, three basic challenges exist with regard to data transport streaming over a network such as the Internet that has a varying amount of data loss. The first challenge is reliability. Most streaming solutions use a TCP connection, or "virtual circuit," for transmitting data. A TCP connection provides a guaranteed delivery mechanism

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so that data sent from one endpoint will be delivered to the destination, even if portions are lost and retransmitted. A break in the continuity of a TCP connection can have serious consequences when the data must be delivered in real-time. When a network adapter detects delays or losses in a TCP connection, the adapter "backs off" from transmission attempts for a moment and then slowly resumes the original transmission pace. This behavior is an attempt to alleviate the perceived congestion. Such a slowdown is detrimental to the viewing or listening experience of the user and therefore is not acceptable.

[0009] The second challenge to data transport is efficiency. Efficiency refers to how well the user's available bandwidth is used for delivery of the content stream. This measure is directly related to the reliability of the TCP connection. When the TCP connection is suffering reliability problems, a loss of bandwidth utilization results. The measure of efficiency sometimes varies suddenly, and can greatly impact the viewing experience.

[0010] The third challenge is latency. Latency is the time measure form the client's point-of-view, of the interval between when a request is issued and the response data begins to arrive. This value is affected by the network connection's reliability and efficiency, and the processing time required by the origin to prepare the response. A busy or overloaded server, for example, will take more time to process a request. As well as affecting the start time of a particular request, latency has a significant impact on the network throughput of TCP.

[0011] From the foregoing discussion, it should be apparent that a need exists for an apparatus, system, and method that alleviate the problems of reliability, efficiency, and latency. Additionally, such an apparatus, system, and method would offer instantaneous viewing along with the ability to fast forward, rewind, direct seek, and browse multiple streams. Beneficially, such an apparatus, system, and method would utilize multiple connections between a source and destination, requesting varying bitrate streams depending upon network conditions.

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SUMMARY OF THE INVENTION

[0012] The present invention has been developed in response to the present state of the art, and in particular, in response to the problems and needs in the art that have not yet been fully solved by currently available content streaming systems. Accordingly, the present invention has been developed to provide an apparatus, system, and method for adaptive-rate content streaming that overcome many or all of the above-discussed shortcomings in the art.

[0013] The apparatus for adaptive-rate content streaming is provided with a logic unit containing a plurality of modules configured to functionally execute the necessary steps. These modules in the described embodiments include an agent controller module configured to simultaneously request a plurality of streamlets, the agent controller module further configured to continuously monitor streamlet requests and subsequent responses, and accordingly request higher or lower quality streamlets, and a staging module configured to stage the streamlets and arrange the streamlets for playback on a content player.

[0014] The apparatus is further configured, in one embodiment, to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates. Each streamlet may further comprise a portion of a content file. Additionally, the agent controller module may be configured to generate a performance factor according to responses from streamlet requests.

[0015] In a further embodiment, the agent controller module is configured to upshift to a higher quality streamlet when the performance factor is greater than a threshold, and the agent controller module determines the higher quality playback can be sustained according to a combination of factors. The factors may include an amount of contiguously available streamlets stored in the staging module, a minimum safety margin, and a current read ahead margin.

[0016] The agent controller module may be configured to downshift to a lower quality streamlet when the performance factor is less than a second threshold. Also, the agent controller module is further configured to anticipate streamlet requests and pre-request

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streamlets to enable fast-forward, skip randomly, and rewind functionality. In one embodiment, the agent controller module is configured to initially request low quality streamlets to enable instant playback of the content file, and subsequent upshifting according to the performance factor.

[0017] A system of the present invention is also presented to adaptive-rate content streaming. In particular, the system, in one embodiment, includes a data communications network, and a content server coupled to the data communications network and having a content module configured to process content and generate a plurality of high and low quality streams. In one embodiment, each of the high and low quality streams may include a plurality of streamlets.

[0018] In a further embodiment, the system also includes an agent controller module configured to simultaneously request a plurality of streamlets, the agent controller module further configured to continuously monitor streamlet requests and subsequent responses, and accordingly request higher or lower quality streamlets, and a staging module configured to stage the streamlets and arrange the streamlets for playback on a content player.

[0019] A method of the present invention is also presented for adaptive-rate content streaming. The method in the disclosed embodiments substantially includes the steps necessary to carry out the functions presented above with respect to the operation of the described apparatus and system. In one embodiment, the method includes simultaneously requesting a plurality of streamlets, continuously monitoring streamlet requests and subsequent responses, and accordingly requesting higher or lower quality streamlets, and staging the streamlets and arranging the streamlets for playback on a content player.

[0020] In a further embodiment, the method may include establishing multiple Transmission Control Protocol (TCP) connections with a content server, and requesting streamlets of varying bitrates. Also, the method may include generating a performance factor according to responses from streamlet requests, upshifting to a higher quality streamlet when the performance factor is greater than a threshold, and determining if the higher quality

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playback can be sustained. Furthermore, the method may include downshifting to a lower quality streamlet when the performance factor is less than a second threshold.

[0021] In one embodiment, the method includes anticipating streamlet requests and pre-requesting streamlets to enable fast-forward, skip randomly, and rewind functionality. The method may also comprise initially requesting low quality streamlets to enable instant playback of a content file, and subsequent upshifting according to the performance factor.

[0022] Reference throughout this specification to features, advantages, or similar language does not imply that all of the features and advantages that may be realized with the present invention should be or are in any single embodiment of the invention. Rather, language referring to the features and advantages is understood to mean that a specific feature, advantage, or characteristic described in connection with an embodiment is included in at least one embodiment of the present invention. Thus, discussion of the features and advantages, and similar language, throughout this specification may, but do not necessarily, refer to the same embodiment.

[0023] Furthermore, the described features, advantages, and characteristics of the invention may be combined in any suitable manner in one or more embodiments. One skilled in the relevant art will recognize that the invention may be practiced without one or more of the specific features or advantages of a particular embodiment. In other instances, additional features and advantages may be recognized in certain embodiments that may not be present in all embodiments of the invention.

[0024] These features and advantages of the present invention will become more fully apparent from the following description and appended claims, or may be learned by the practice of the invention as set forth hereinafter.

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BRIEF DESCRIPTION OF THE DRAWINGS

[0025] In order that the advantages of the invention will be readily understood, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments that are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the invention and are not therefore to be considered to be limiting of its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawings, in which:

[0026] Figure 1 is a schematic block diagram illustrating one embodiment of a system for adaptive rate shifting of streaming content in accordance with the present invention;

[0027] Figure 2a is a schematic block diagram graphically illustrating one embodiment of a content file in accordance with the present invention;

[0028] Figure 2b is a schematic block diagram illustrating one embodiment of a plurality of streams having varying degrees of quality and bandwidth in accordance with the present invention;

[0029] Figure 2c is a schematic block diagram illustrating one embodiment of a stream divided into a plurality of streamlets in accordance with the present invention;

[0030] Figure 3 is a schematic block diagram illustrating one embodiment of a content module in accordance with the present invention;

[0031] Figure 4 is a schematic block diagram graphically illustrating one embodiment of a client module in accordance with the present invention;

[0032] Figure 5 is a schematic flow chart diagram illustrating one embodiment of a method for processing content in accordance with the present invention;

[0033] Figure 6 is a schematic flow chart diagram illustrating one embodiment of a method for playback of a plurality of streamlets in accordance with the present invention; and

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[0034] Figure 7 is a schematic flow chart diagram illustrating one embodiment of a method for requesting streamlets within an adaptive-rate content streaming environment in accordance with the present invention.

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DETAILED DESCRIPTION OF THE INVENTION

[0035] Many of the functional units described in this specification have been labeled as modules, in order to more particularly emphasize their implementation independence. For example, a module may be implemented as a hardware circuit comprising custom VLSI circuits or gate arrays, off-the-shelf semiconductors such as logic chips, transistors, or other discrete components. A module may also be implemented in programmable hardware devices such as field programmable gate arrays, programmable array logic, programmable logic devices or the like.

[0036] Modules may also be implemented in software for execution by various types of processors. An identified module of executable code may, for instance, comprise one or more physical or logical blocks of computer instructions which may, for instance, be organized as an object, procedure, or function. Nevertheless, the executables of an identified module need not be physically located together, but may comprise disparate instructions stored in different locations which, when joined logically together, comprise the module and achieve the stated purpose for the module.

[0037] Indeed, a module of executable code may be a single instruction, or many instructions, and may even be distributed over several different code segments, among different programs, and across several memory devices. Similarly, operational data may be identified and illustrated herein within modules, and may be embodied in any suitable form and organized within any suitable type of data structure. The operational data may be collected as a single data set, or may be distributed over different locations including over different storage devices, and may exist, at least partially, merely as electronic signals on a system or network.

[0038] Reference throughout this specification to "one embodiment," "an embodiment," or similar language means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases "in one embodiment," "in an

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embodiment," and similar language throughout this specification may, but do not necessarily, all refer to the same embodiment.

[0039] Reference to a signal bearing medium may take any form capable of generating a signal, causing a signal to be generated, or causing execution of a program of machine-readable instructions on a digital processing apparatus. A signal bearing medium may be embodied by a transmission line, a compact disk, digital-video disk, a magnetic tape, a Bernoulli drive, a magnetic disk, a punch card, flash memory, integrated circuits, or other digital processing apparatus memory device.

[0040] Furthermore, the described features, structures, or characteristics of the invention may be combined in any suitable manner in one or more embodiments. In the following description, numerous specific details are provided, such as examples of programming, software modules, user selections, network transactions, database queries, database structures, hardware modules, hardware circuits, hardware chips, etc., to provide a thorough understanding of embodiments of the invention. One skilled in the relevant art will recognize, however, that the invention may be practiced without one or more of the specific details, or with other methods, components, materials, and so forth. In other instances, well-known structures, materials, or operations are not shown or described in detail to avoid obscuring aspects of the invention.

[0041] Figure 1 is a schematic block diagram illustrating one embodiment of a system 100 for dynamic rate shifting of streaming content in accordance with the present invention. In one embodiment, the system 100 comprises a content server 102 and an end user 104. The content server 102 and the end user station 104 may be coupled by a data communications network. The data communications network may include the Internet 106 and connections 108 to the Internet 106. Alternatively, the content server 102 and the end user 104 may be located on a common local area network, wireless area network, cellular network, virtual local area network, or the like. The end user station 104 may comprise a

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personal computer (PC), an entertainment system configured to communicate over a network, or a portable electronic device configured to present content.

[0042] In the depicted embodiment, the system 100 also includes a publisher 110, and a web server 116. The publisher 110 may be a creator or distributor of content. For example, if the content to be streamed were a broadcast of a television program, the publisher 110 may be a television or cable network channel such as NBC®, or MTV®. Content may be transferred over the Internet 106 to the content server 102, where the content is received by a content module 112. The content module 112 may be configured to receive, process, and store content. In one embodiment, processed content is accessed by a client module 114 configured to play the content on the end user station 104. In a further embodiment, the client module 114 is configured to receive different portions of a content stream from a plurality of locations simultaneously. For example, the client module 114 may request and receive content from any of the plurality of web servers 116.

[0043] Figure 2a is a schematic block diagram graphically illustrating one embodiment of a content file 200. In one embodiment, the content file 200 is distributed by the publisher 110. The content file 200 may comprise a television broadcast, sports event, movie, music, concert, etc. The content file 200 may also be live or archived content. The content file 200 may comprise uncompressed video and audio, or alternatively, video or audio. Additionally, the content file 200 may be compressed. Examples of a compressed content file 200 include, but are not limited to, DivX®, Windows Media Video 9®, Quicktime 6.5 Sorenson 3®, or Quicktime 6.5/ MPEG-4® encoded content.

[0044] Figure 2b is a schematic block diagram illustrating one embodiment of a plurality of streams 202 having varying degrees of quality and bandwidth. In one embodiment, the plurality of streams 202 comprises a low quality stream 204, a medium quality stream 206, and a high quality stream 208. Each of the streams 204, 206, 208 is a copy of the content file 200 encoded and compressed to varying bit rates. For example, the low quality stream 204 may be encoded and compressed to a bit rate of 100 kilobits per

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second (kbps), the medium quality stream 206 may be encoded and compressed to a bit rate of 200 kbps, and the high quality stream 208 may be encoded and compressed to 600 kbps.

[0045] Figure 2c is a schematic block diagram illustrating one embodiment of a stream 210 divided into a plurality of streamlets 212. As used herein, streamlet refers to any sized portion of the content file 200. Each streamlet 212 may comprise a portion of the content contained in stream 210, encapsulated as an independent media object. The content in a streamlet 212 may have a unique time index in relation to the beginning of the content contained in stream 210. In one embodiment, the content contained in each streamlet 212 has a duration of two seconds. For example, streamlet 0 may have a time index of 00:00 representing the beginning of content playback, and streamlet 1 may have a time index of 00:02, and so on. Alternatively, the time duration of the streamlets 212 may be any duration smaller than the entire playback duration of the content in stream 210. In a further embodiment, the streamlets 212 may be divided according to file size instead of a time index.

[0046] Figure 3 is a schematic block diagram illustrating in greater detail one embodiment of the content module 112 in accordance with the present invention. The content module 112 may comprise a stream module 302, a streamlet module 304, an encoder module 306, a streamlet database 308, and the web server 116. In one embodiment, the stream module 302 is configured to receive the content file 200 from the publisher 110 and generate the plurality of streams 202 of varying qualities. The original content file 200 from the publisher may be digital in form and may comprise content having a high bit rate such as, for example, 2mbps. The content may be transferred from the publisher 110 to the content module 112 over the Internet 106. Such transfers of data are well known in the art and do not require further discussion herein. Alternatively, the content may comprise a captured broadcast.

[0047] In the depicted embodiment, the plurality of streams 202 may comprise the low quality stream 204, the medium quality stream 206, and the high quality stream 208. Alternatively, the plurality of streams 202 may comprise any number of streams deemed

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necessary to accommodate end user bandwidth. The streamlet module 304 may be configured to receive the plurality of streams 202 from the stream module and generate a plurality of streams 312, each stream comprising a plurality of streamlets 212. As described with reference to Figure 2c, each streamlet 212 may comprise a pre-defined portion of the stream. The encoder module 306 is configured to encode each streamlet from the plurality of streams 312 and store the streamlets in the streamlet database 308. The encoding module 306 may utilize encoding schemes such as DivX®, Windows Media Video 9®, Quicktime 6.5 Sorenson 3®, or Quicktime 6.5/ MPEG-4®. Alternatively, a custom encoding scheme may be employed.

[0048] The content module 112 may also include a metadata module 312 and a metadata database 314. In one embodiment, metadata comprises static searchable content information. For example, metadata includes, but is not limited to, air date of the content, title, actresses, actors, length, and episode name. Metadata is generated by the publisher 110, and may be configured to define an end user environment. In one embodiment, the publisher 100 may define an end user navigational environment for the content including menus, thumbnails, sidebars, advertising, etc. Additionally, the publisher 110 may define functions such as fast forward, rewind, pause, and play that may be used with the content file 200. The metadata module 312 is configured to receive the metadata from the publisher 110 and store the metadata in the metadata database 314. In a further embodiment, the metadata module 312 is configured to interface with the client module 114, allowing the client module 114 to search for content based upon at least one of a plurality of metadata criteria. Additionally, metadata may be generated by the content module 112 through automated process(es) or manual definition.

[0049] Once the streamlets 212 have been received and processed, the client module 114 may request streamlets 212 using HTTP from the web server 116. Such use of client side initiated requests requires no additional configuration of firewalls. Additionally, since the client module 114 initiates the request, the web server 116 is only required to retrieve and

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serve the requested streamlet. In a further embodiment, the client module 114 may be configured to retrieve streamlets 212 from a plurality of web servers 310. Each web server 116 may be located in various locations across the Internet 106. The streamlets 212 are essentially static files. As such, no specialized media server or server-side intelligence is required for a client module 114 to retrieve streamlets 212. Streamlets 212 may be served by the web server 116 or cached by cache servers of Internet Service Providers (ISPs), or any other network infrastructure operators, and served by the cache server. Use of cache servers is well known to those skilled in the art, and will not be discussed further herein. Thus, a highly scalable solution is provided that is not hindered by massive amounts of client module 114 requests to the web server 116 at any specific location.

[0050] Figure 4 is a schematic block diagram graphically illustrating one embodiment of a client module 114 in accordance with the present invention. The client module 114 may comprise an agent controller module 402, a streamlet cache module 404, and a network controller module 406. In one embodiment, the agent controller module 402 is configured to interface with a viewer 408, and transmit streamlets 212 to the viewer 408. In a further embodiment, the client module 114 may comprise a plurality of agent controller modules 402. Each agent controller module 402 may be configured to interface with one viewer 408. Alternatively, the agent controller module 402 may be configured to interface with a plurality of viewers 408. The viewer 408 may be a media player (not shown) operating on a PC or handheld electronic device.

[0051] The agent controller module 402 is configured to select a quality level of streamlets to transmit to the viewer 408. The agent controller module 402 requests lower or higher quality streams based upon continuous observation of time intervals between successive receive times of each requested streamlet. The method of requesting higher or lower quality streams will be discussed in greater detail below with reference to Figure 7.

[0052] The agent controller module 402 may be configured to receive user commands from the viewer 408. Such commands may include play, fast forward, rewind,

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pause, and stop. In one embodiment, the agent controller module 402 requests streamlets 212 from the streamlet cache module 404 and arranges the received streamlets 212 in a staging module 409. The staging module 409 may be configured to arrange the streamlets 212 in order of ascending playback time. In the depicted embodiment, the streamlets 212 are numbered 0, 1, 2, 3, 4, etc. However, each streamlet 212 may be identified with a unique filename.

[0053] Additionally, the agent controller module 402 may be configured to anticipate streamlet 212 requests and pre-request streamlets 212. By pre-requesting streamlets 212, the user may fast-forward, skip randomly, or rewind through the content and experience no buffering delay. In a further embodiment, the agent controller module 402 may request the streamlets 212 that correspond to time index intervals of 30 seconds within the total play time of the content. Alternatively, the agent controller module 402 may request streamlets at any interval less than the length of the time index. This enables a "fast-start" capability with no buffering wait when starting or fast-forwarding through content file 200. In a further embodiment, the agent controller module 402 may be configured to pre-request streamlets 212 corresponding to specified index points within the content or within other content in anticipation of the end user 104 selecting new content to view.

[0054] In one embodiment, the streamlet cache module 404 is configured to receive streamlet 212 requests from the agent controller module 402. Upon receiving a request, the streamlet cache module 404 first checks a streamlet cache 410 to verify if the streamlet 212 is present. In a further embodiment, the streamlet cache module 404 handles streamlet 212 requests from a plurality of agent controller modules 402. Alternatively, a streamlet cache module 404 may be provided for each agent controller module 402. If the requested streamlet 212 is not present in the streamlet cache 410, the request is passed to the network controller module 406. In order to enable fast forward and rewind capabilities, the streamlet cache module 404 is configured to store the plurality of streamlets 212 in the streamlet cache

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410 for a specified time period after the streamlet 212 has been viewed. However, once the streamlets 212 have been deleted, they may be requested again from the web server 116.

[0055] The network controller module 406 may be configured to receive streamlet requests from the streamlet cache module 404 and open a connection to the web server 116 or other remote streamlet 212 database (not shown). In one embodiment, the network controller module 406 opens a TCP/IP connection to the web server 116 and generates a standard HTTP GET request for the requested streamlet 212. Upon receiving the requested streamlet 212, the network controller module 406 passes the streamlet 212 to the streamlet cache module 404 where it is stored in the streamlet cache 410. In a further embodiment, the network controller module 406 is configured to process and request a plurality of streamlets 212 simultaneously. The network controller module 406 may also be configured to request a plurality of streamlets, where each streamlet 212 is subsequently requested in multiple parts.

[0056] In a further embodiment, streamlet requests may comprise requesting pieces of any streamlet file. Splitting the streamlet 212 into smaller pieces or portions beneficially allows for an increased efficiency potential, and also eliminates problems associated with multiple full-streamlet requests sharing the bandwidth at any given moment. This is achieved by using parallel TCP/IP connections for pieces of the streamlets 212. Consequently, efficiency and network loss problems are overcome, and the streamlets arrive with more useful and predictable timing.

[0057] In one embodiment, the client module 114 is configured to use multiple TCP connections between the client module 114 and the web server 116 or web cache. The intervention of a cache may be transparent to the client or configured by the client as a forward cache. By requesting more than one streamlet 212 at a time in a manner referred to as "parallel retrieval," or more than one part of a streamlet 212 at a time, efficiency is raised significantly and latency is virtually eliminated. In a further embodiment, the client module allows a maximum of three outstanding streamlet 212 requests. The client module 114 may maintain additional open TCP connections as spares to be available should another

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connection fail. Streamlet 212 requests are rotated among all open connections to keep the TCP flow logic for any particular connection from failing into a slow-start or close mode. If the network controller module 406 has requested a streamlet 212 in multiple parts, with each part requested on mutually independent TCP/IP connections, the network controller module 406 reassembles the parts to present a complete streamlet 212 for use by all other components of the client module 114.

[0058] When a TCP connection fails completely, a new request may be sent on a different connection for the same streamlet 212. In a further embodiment, if a request is not being satisfied in a timely manner, a redundant request may be sent on a different connection for the same streamlet 212. If the first streamlet request's response arrives before the redundant request response, the redundant request can be aborted. If the redundant request response arrives before the first request response, the first request may be aborted.

[0059] Several streamlet 212 requests may be sent on a single TCP connection, and the responses are caused to flow back in matching order along the same connection. This eliminates all but the first request latency. Because multiple responses are always being transmitted, the processing latency of each new streamlet 212 response after the first is not a factor in performance. This technique is known in the industry as "pipelining." Pipelining offers efficiency in request-response processing by eliminating most of the effects of request latency. However, pipelining has serious vulnerabilities. Transmission delays affect all of the responses. If the single TCP connection fails, *all* of the outstanding requests and responses are lost. Pipelining causes a serial dependency between the requests.

[0060] Multiple TCP connections may be opened between the client module 114 and the web server 116 to achieve the latency-reduction efficiency benefits of pipelining while maintaining the independence of each streamlet 212 request. Several streamlet 212 requests may be sent concurrently, with each request being sent on a mutually distinct TCP connection. This technique is labeled "virtual pipelining" and is an innovation of the present invention. Multiple responses may be in transit concurrently, assuring that communication

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bandwidth between the client module 114 and the web server 116 is always being utilized. Virtual pipelining eliminates the vulnerabilities of traditional pipelining. A delay in or complete failure of one response does not affect the transmission of other responses because each response occupies an independent TCP connection. Any transmission bandwidth not in use by one of multiple responses (whether due to delays or TCP connection failure) may be utilized by other outstanding responses.

[0061] A single streamlet 212 request may be issued for an entire streamlet 212, or multiple requests may be issued, each for a different part or portion of the streamlet. If the streamlet is requested in several parts, the parts may be recombined by the client module 114 streamlet.

[0062] In order to maintain a proper balance between maximized bandwidth utilization and response time, the issuance of new streamlet requests must be timed such that the web server 116 does not transmit the response before the client module 114 has fully received a response to one of the previously outstanding streamlet requests. For example, if three streamlet 212 requests are outstanding, the client module 114 should issue the next request slightly before one of the three responses is fully received and "out of the pipe." In other words, request timing is adjusted to keep three responses in transit. Sharing of bandwidth among four responses diminishes the net response time of the other three responses. The timing adjustment may be calculated dynamically by observation, and the request timing adjusted accordingly to maintain the proper balance of efficiency and response times.

[0063] The schematic flow chart diagrams that follow are generally set forth as logical flow chart diagrams. As such, the depicted order and labeled steps are indicative of one embodiment of the presented method. Other steps and methods may be conceived that are equivalent in function, logic, or effect to one or more steps, or portions thereof, of the illustrated method. Additionally, the format and symbols employed are provided to explain the logical steps of the method and are understood not to limit the scope of the method.

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Although various arrow types and line types may be employed in the flow chart diagrams, they are understood not to limit the scope of the corresponding method. Indeed, some arrows or other connectors may be used to indicate only the logical flow of the method. For instance, an arrow may indicate a waiting or monitoring period of unspecified duration between enumerated steps of the depicted method. Additionally, the order in which a particular method occurs may or may not strictly adhere to the order of the corresponding steps shown.

[0064] Figure 5 is a schematic flow chart diagram illustrating one embodiment of a method 500 for processing content in accordance with the present invention. In one embodiment the method 500 starts 502, and the content module 112 receives 504 content from the publisher 110. Receiving content 504 may comprise receiving 504 a digital copy of the content file 200, or digitizing a physical copy of the content file 200. Alternatively, receiving 504 content may comprise capturing a radio or television broadcast. Once received 504, the stream module 302 generates 506 a plurality of streams 202, each stream 202 having a different quality. The quality may be predefined, or automatically set according to end user bandwidth, or in response to pre-designated publisher guidelines

[0065] The streamlet module 304 receives the streams 202 and generates 508 a plurality of streamlets 212. In one embodiment, generating 508 streamlets comprises dividing the stream 202 into a plurality of two second streamlets 212. Alternatively, the streamlets may have any length less than or equal to the length of the stream 202. The encoder module 306 then encodes 510 the streamlets according to a compression algorithm. In a further embodiment, the algorithm comprises a proprietary codec such as WMV9®. The encoder module 306 then stores 512 the encoded streamlets in the streamlet database 308. Once stored 512, the web server 116 may then serve 514 the streamlets. In one embodiment, serving 514 the streamlets comprises receiving streamlet requests from the client module 114, retrieving the requested streamlet from the streamlet database 308, and subsequently transmitting the streamlet to the client module 114. The method 500 then ends 516.

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[0066] Figure 6 is a schematic flow chart diagram illustrating one embodiment of a method 600 for viewing a plurality of streamlets in accordance with the present invention. The method 600 starts and an agent control module 402 is provided 604 and associated with a viewer 408 and provided with a staging module 409. The agent controller module 402 then requests 606 a streamlet from the streamlet cache module 404. Alternatively, the agent controller module 402 may simultaneously request 606 a plurality of streamlets from the streamlet cache module 404. If the streamlet is stored 608 locally in the streamlet cache 410, the streamlet cache module 404 retrieves 610 the streamlet and sends the streamlet to the agent controller module 402. Upon retrieving 610 or receiving a streamlet, the agent controller module 402 makes 611 a determination of whether or not to shift to a higher or lower quality stream 202. This determination will be described below in greater detail with reference to Figure 7.

[0067] In one embodiment, the staging module 409 then arranges 612 the streamlets into the proper order, and the agent controller module 402 delivers 614 the streamlets to the viewer 408. In a further embodiment, delivering 614 streamlets to the end user comprises playing video and or audio streamlets on the viewer 408. If the streamlets are not stored 608 locally, the streamlet request is passed to the network controller module 406. The network controller module 406 then requests 616 the streamlet from the web server 116. Once the streamlet is received, the network controller module 406 passes the streamlet to the streamlet cache module 404. The streamlet cache module 404 archives 618 the streamlet. Alternatively, the streamlet cache module 404 then archives 618 the streamlet and passes the streamlet to the agent controller module 402, and the method 600 then continues from operation 610 as described above.

[0068] Referring now to Figure 7, shown therein is a schematic flow chart diagram illustrating one embodiment of a method 700 for requesting streamlets within a adaptive-rate shifting content streaming environment in accordance with the present invention. The method 700 may be used in one embodiment as the operation 611 of Figure 6. The method

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700 starts and the agent controller module 402 receives 704 a streamlet as described above with reference to Figure 6. The agent controller module 402 then monitors 706 the receive time of the requested streamlet. In one embodiment, the agent controller module 402 monitors the time intervals Δ between successive receive times for each streamlet response. Ordering of the responses in relation to the order of their corresponding requests is not relevant.

[0069] Because network behavioral characteristics fluctuate, sometimes quite suddenly, any given Δ may vary substantially from another. In order to compensate for this fluctuation, the agent controller module 402 calculates 708 a performance ratio r across a window of n samples for streamlets of playback length S. In one embodiment, the performance ratio r is calculated using the equation

$$r = S \frac{n}{\sum_{i=1}^{n} \Delta_i},$$

[0070] Due to multiple simultaneous streamlet processing, and in order to better judge the central tendency of the performance ratio r, the agent control module 402 may calculate a geometric mean, or alternatively an equivalent averaging algorithm, across a window of size m, and obtain a performance factor φ:

$$\varphi_{current} = \left(\prod_{j=1}^{m} r_j \right)^{\frac{1}{m}}.$$

[0071] The policy determination about whether or not to upshift 710 playback quality begins by comparing $\varphi_{current}$ with a trigger threshold Θ_{up}. If $\varphi_{current} \geq \Theta_{up}$, then an up shift to the next higher quality stream may be considered 716. In one embodiment, the trigger threshold Θ_{up} is determined by a combination of factors relating to the current read ahead margin (i.e. the amount of contiguously available streamlets that have been sequentially arranged by the staging module 409 for presentation at the current playback time index), and

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a minimum safety margin. In one embodiment, the minimum safety margin may be 24 seconds. The smaller the read ahead margin, the larger Θ_{up} is to discourage upshifting until a larger read ahead margin may be established to withstand network disruptions. If the agent controller module 402 is able to sustain 716 upshift quality, then the agent controller module 402 will upshift 717 the quality and subsequently request higher quality streams. The determination of whether use of the higher quality stream is sustainable 716 is made by comparing an estimate of the higher quality stream's performance factor, φ_{higher}, with Θ_{up}. If $\varphi_{higher} \geq \Theta_{up}$ then use of the higher quality stream is considered sustainable. If the decision of whether or not the higher stream rate is sustainable 716 is "no," the agent control module 402 will not attempt to upshift 717 stream quality. If the end of the stream has been reached 714, the method 618 ends 716.

[0072] If the decision on whether or not to attempt upshift 710 is "no", a decision about whether or not to downshift 712 is made. In one embodiment, a trigger threshold Θ_{down} is defined in a manner analogous to Θ_{up}. If $\varphi_{current} > \Theta_{down}$ then the stream quality may be adequate, and the agent controller module 402 does not downshift 718 stream quality. However, if $\varphi_{current} \leq \Theta_{down}$, the agent controller module 402 does downshift 718 the stream quality. If the end of the stream has not been reached 714, the agent controller module 402 begins to request and receive 704 lower quality streamlets and the method 618 starts again. Of course, the above described equations and algorithms are illustrative only, and may be replaced by alternative streamlet monitoring solutions.

[0073] The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

[0074] What is claimed is:

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1. An apparatus for adaptive-rate content streaming, the apparatus comprising:

an agent controller module configured to simultaneously request at least portions of a plurality of streamlets;

the agent controller module further configured to continuously monitor the progress of subsequent responses to streamlet requests, and in accordance with the progress of the responses, request higher or lower quality streamlets; and

a staging module configured to stage the streamlets and arrange the streamlets for playback on a content player.

2. The apparatus of claim 1, wherein the agent controller module is configured to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates.

3. The apparatus of claim 1, wherein each streamlet further comprises a portion of a content file.

4. The apparatus of claim1, wherein the streamlet comprises a Hyper Text Transfer Protocol file.

5. The apparatus of claim 3, wherein the agent controller module is configured to generate a performance factor according to the responses to streamlet requests.

6. The apparatus of claim 4, wherein the agent controller module is configured to upshift to a higher quality streamlet when the performance factor is greater than a selected threshold and the agent controller module determines the higher quality playback can be sustained according to a combination of factors.

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7. The apparatus of claim 5, wherein the combination of factors is selected from the group consisting of an amount of contiguously available streamlets stored in the staging module, a minimum safety margin, and a current read ahead margin.

8. The apparatus of claim 4, wherein the agent controller module is configured to downshift to a lower quality streamlet when the performance factor is less than a second selected threshold.

9. The apparatus of claim 1, wherein the agent controller module is further configured to anticipate streamlet requests and pre-request streamlets to enable fast-forward, skip randomly, and rewind functionality.

10. The apparatus of claim 1, wherein the agent controller module is configured to initially request low quality streamlets to enable instant playback of the content file, and subsequent upshifting according to the performance factor.

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11. A system for adaptive-rate content streaming, the system comprising:

a data communications network;

a content server coupled to the data communications network and having a content module configured to process content and generate a plurality of high and low quality streams;

each of the high and low quality streams comprising a plurality of streamlets;

an agent controller module configured to simultaneously request at least portions of a plurality of streamlets;

the agent controller module further configured to continuously monitor the progress of subsequent responses to streamlet requests, and in accordance with the progress of the responses, request higher or lower quality streamlets; and

a staging module configured to stage the streamlets and arrange the streamlets for playback on a content player.

12. The system of claim 11, wherein the agent controller module is configured to establish multiple Transmission Control Protocol (TCP) connections with the content server, and request streamlets of varying bitrates.

13. The system of claim 11, wherein each streamlet further comprises a portion of a content file.

14. The apparatus of claim 13, wherein the agent controller module is configured to generate a performance factor according to the responses to streamlet requests.

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15. The system of claim 14, wherein the agent controller module is configured to upshift to a higher quality streamlet when the performance factor is greater than a selected threshold and the agent controller module determines the higher quality playback can be sustained according to a combination of factors.

16. The system of claim 15, wherein the combination of factors is selected from the group consisting of an amount of contiguously available streamlets stored in the staging module, a minimum safety margin, and a current read ahead margin.

17. The system of claim 14, wherein the agent controller module is configured to downshift to a lower quality streamlet when the performance factor is less than a second selected threshold.

18. The system of claim 11, wherein the agent controller module is further configured to anticipate streamlet requests and pre-request streamlets to enable fast-forward, skip randomly, and rewind functionality.

19. The system of claim 11, wherein the agent controller module is configured to initially request low quality streamlets to enable instant playback of the content file, and subsequent upshifting according to the performance factor.

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20. A method for presenting rate-adaptive streams, the method comprising:

simultaneously requesting at least portions of a plurality of streamlets;

continuously monitoring the progress of subsequent responses to streamlet requests, and in accordance with the progress of the responses, requesting higher or lower quality streamlets; and

staging the streamlets and arranging the streamlets for playback on a content player.

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APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

ABSTRACT OF THE DISCLOSURE

An apparatus for adaptive-rate shifting of streaming content includes an agent controller module configured to simultaneously request at least portions of a plurality of streamlets. The agent controller module is further configured to continuously monitor streamlet requests and subsequent responses, and accordingly request higher or lower quality streamlets. A staging module is configured to stage the streamlets and arrange the streamlets for playback on a content player. A system includes a data communications network, a content server coupled to the data communications network and having a content module configured to process content and generate a plurality of high and low quality streams, and the apparatus. A method includes simultaneously requesting at least portions of a plurality of streamlets, continuously monitoring streamlet requests and subsequent responses, and accordingly requesting higher or lower quality streamlets, and staging the streamlets and arranging the streamlets for playback on a content player.

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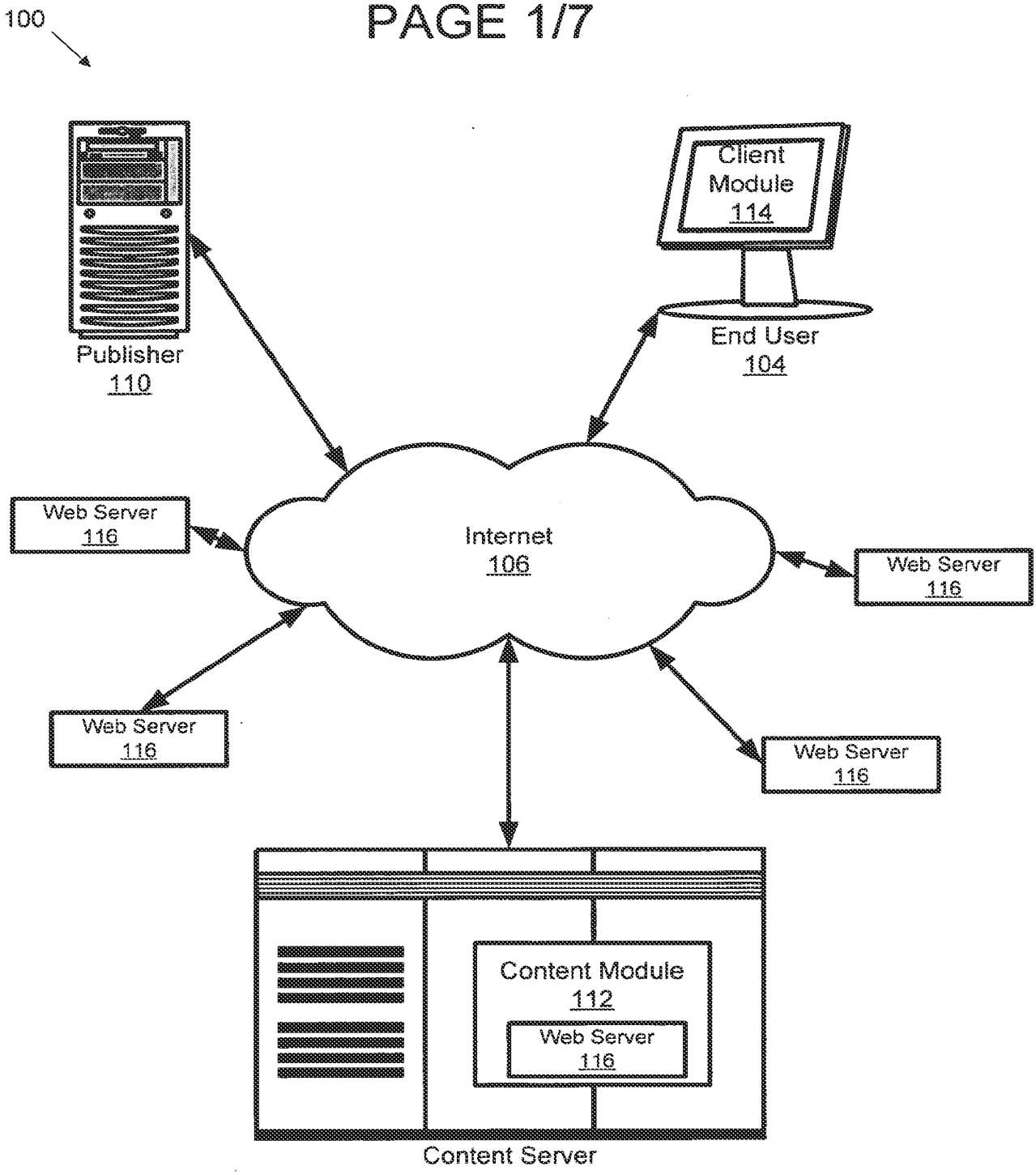

100
Publisher
110
Client
Module
114
End User
104
Internet
106
Web Server
116
Web Server
116
Web Server
116
Web Server
116
Content Module
112
Web Server
116
Content Server

FIG. 1

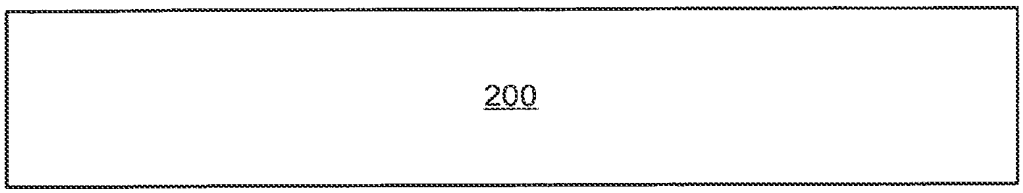


FIG. 2a

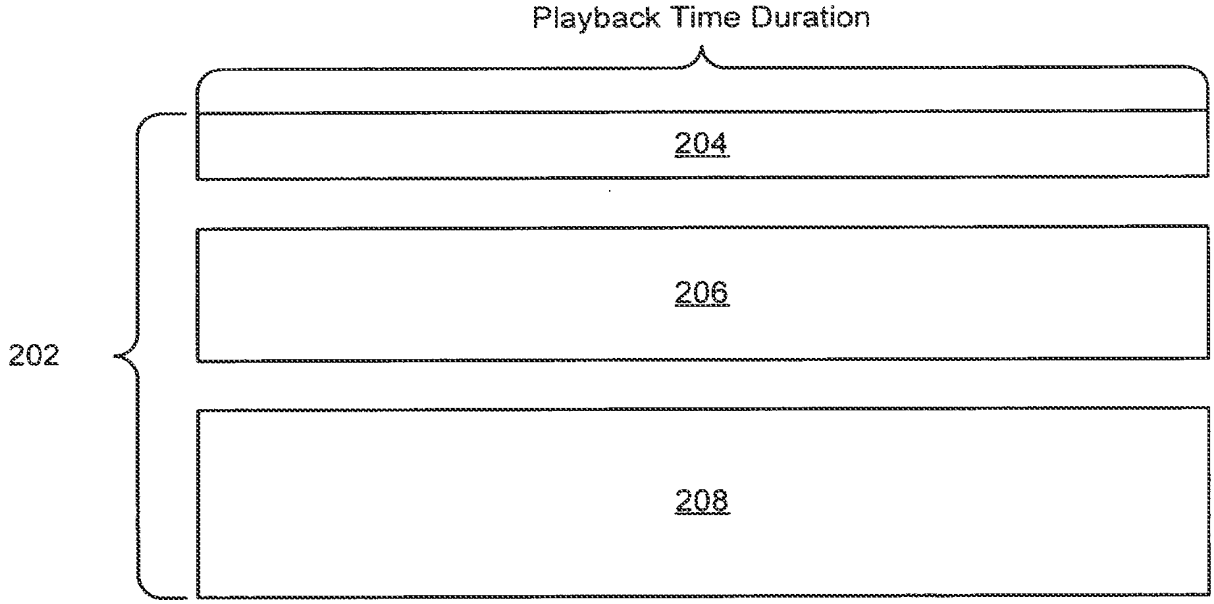


FIG. 2b

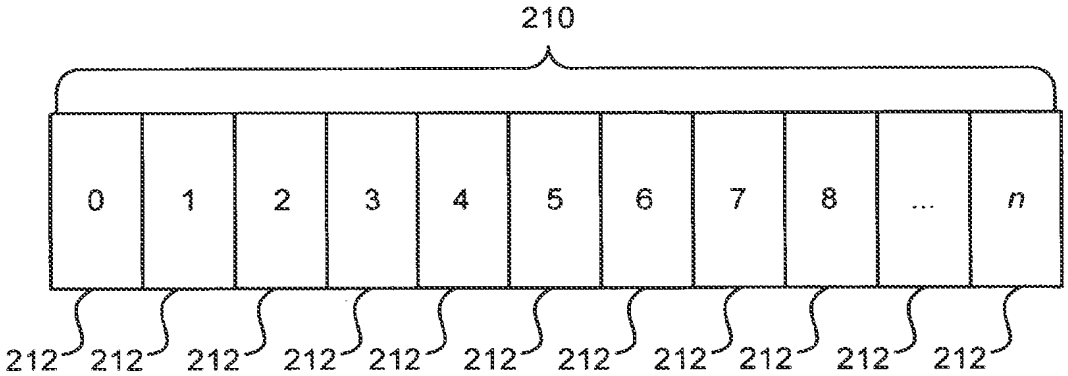


FIG. 2c

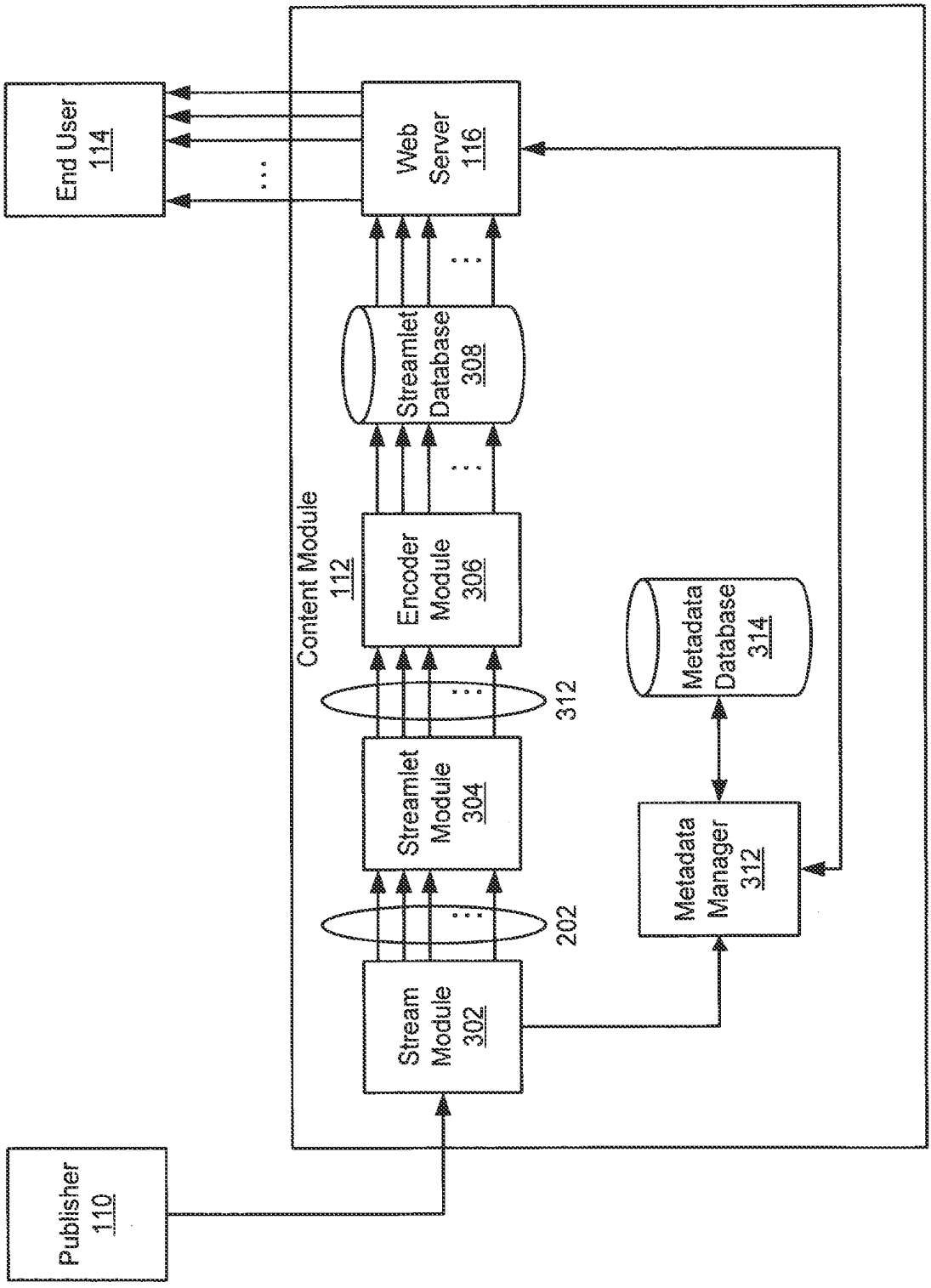

End User
114
Web
Server
116
Streamlet
Database
308
Content Module
112
Encoder
Module
306
312
Streamlet
Module
304
202
Stream
Module
302
Metadata
Database
314
Metadata
Manager
312
Publisher
110

FIG. 3

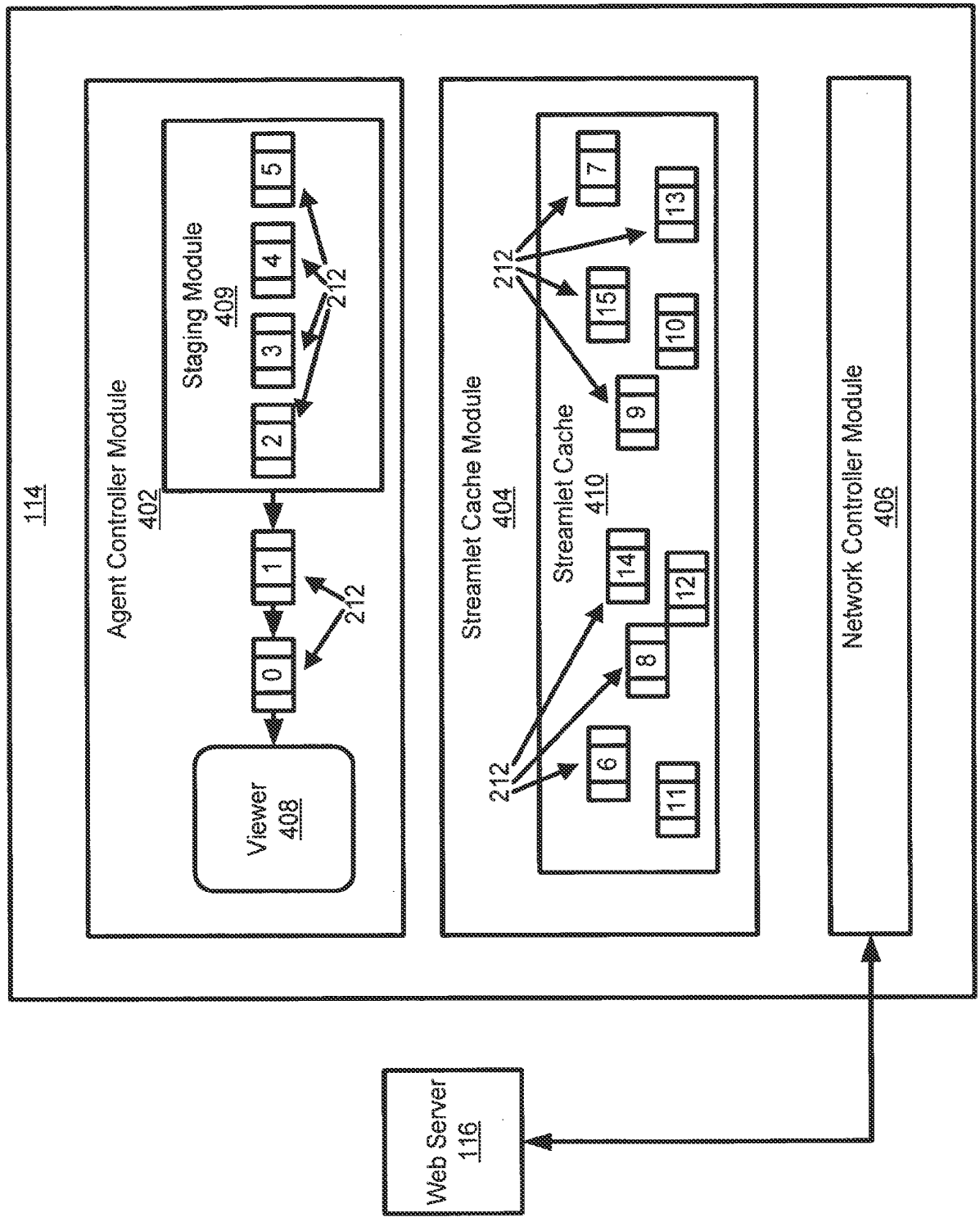

114
Agent Controller Module
402
Staging Module
409
0
1
2
3
4
5
212
212
Viewer
408
Streamlet Cache Module
404
Streamlet Cache
410
6
7
8
9
10
11
12
13
14
15
212
212
Network Controller Module
406
Web Server
116

FIG. 4

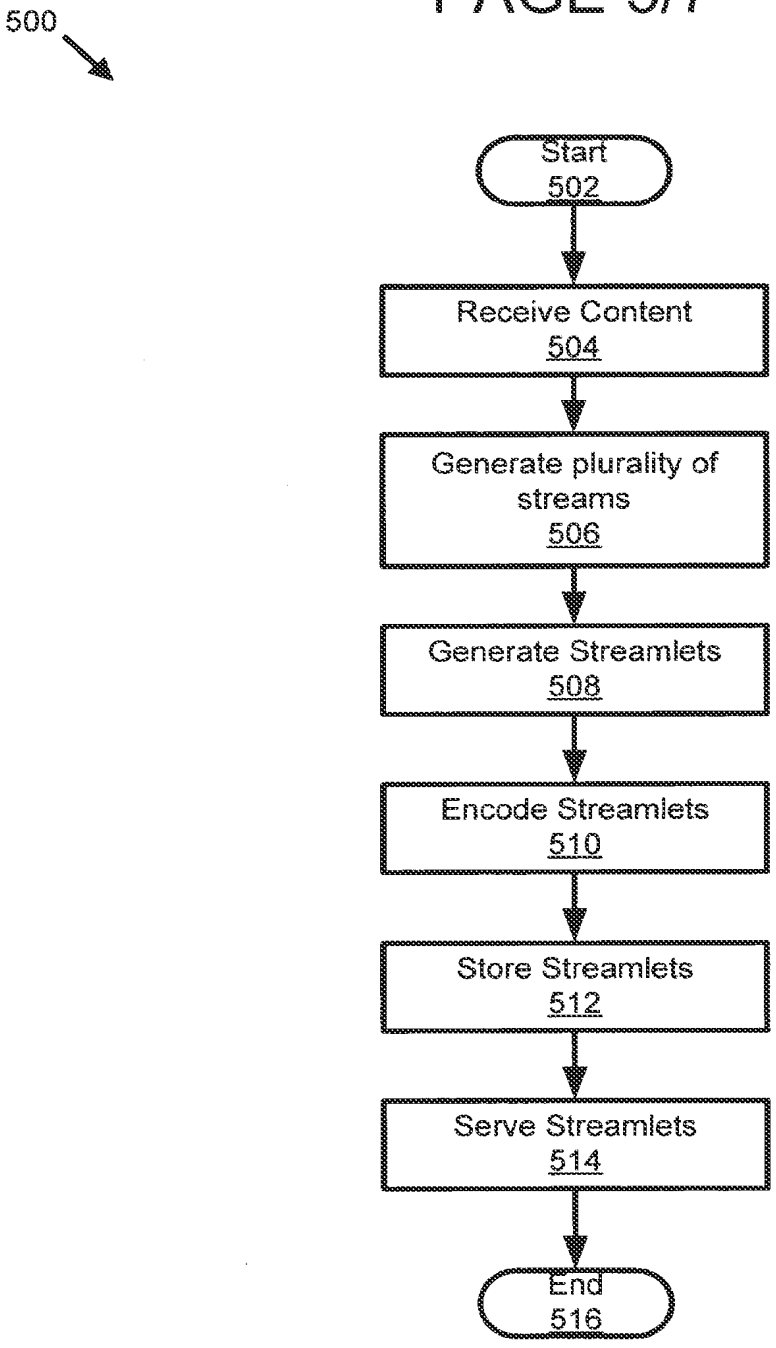

500
Start
502
Receive Content
504
Generate plurality of streams
506
Generate Streamlets
508
Encode Streamlets
510
Store Streamlets
512
Serve Streamlets
514
End
516

FIG. 5

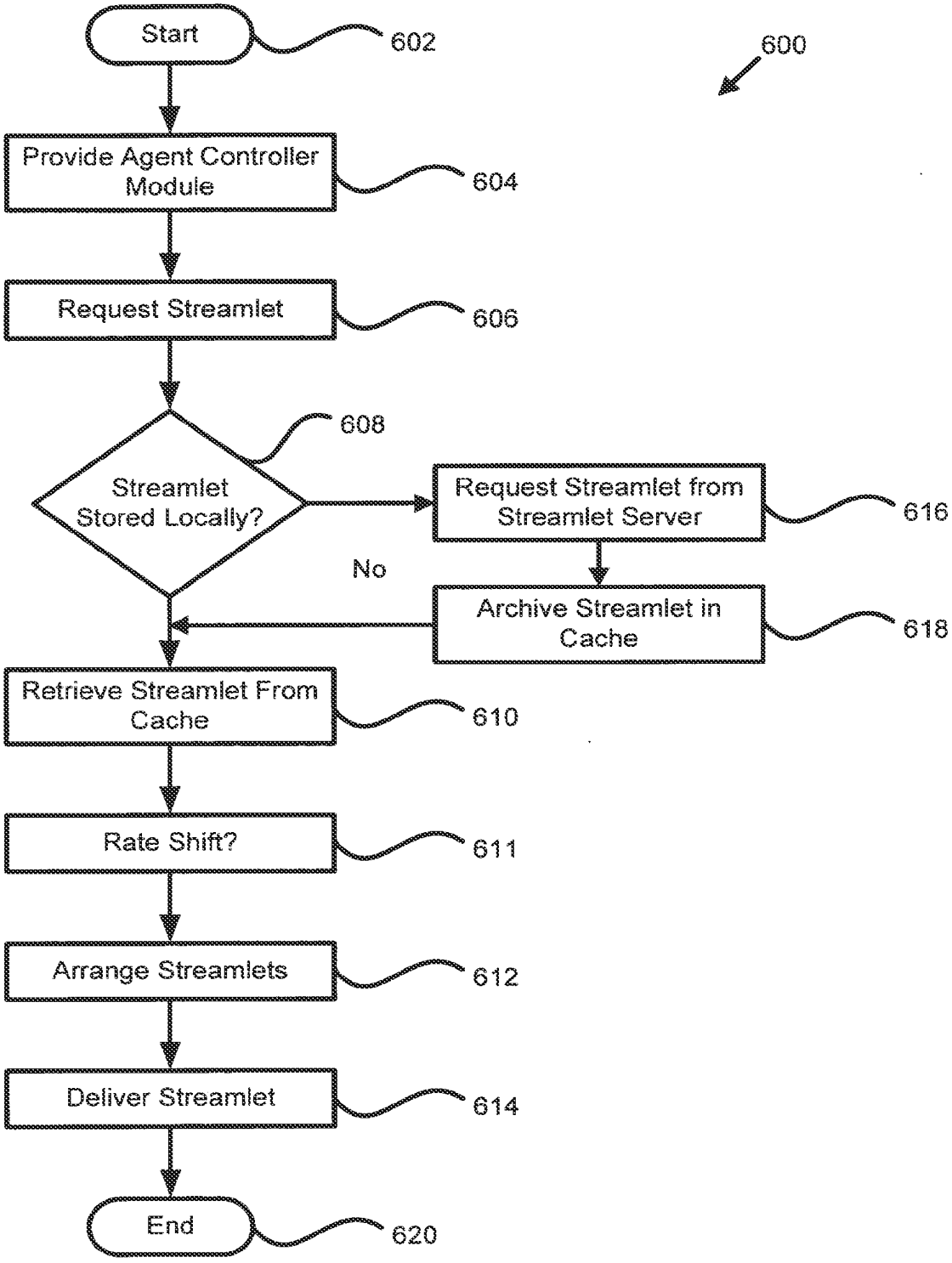

Start
602
600
Provide Agent Controller Module
604
Request Streamlet
606
608
Streamlet Stored Locally?
Request Streamlet from Streamlet Server
616
No
Archive Streamlet in Cache
618
Retrieve Streamlet From Cache
610
Rate Shift?
611
Arrange Streamlets
612
Deliver Streamlet
614
End
620

FIG. 6

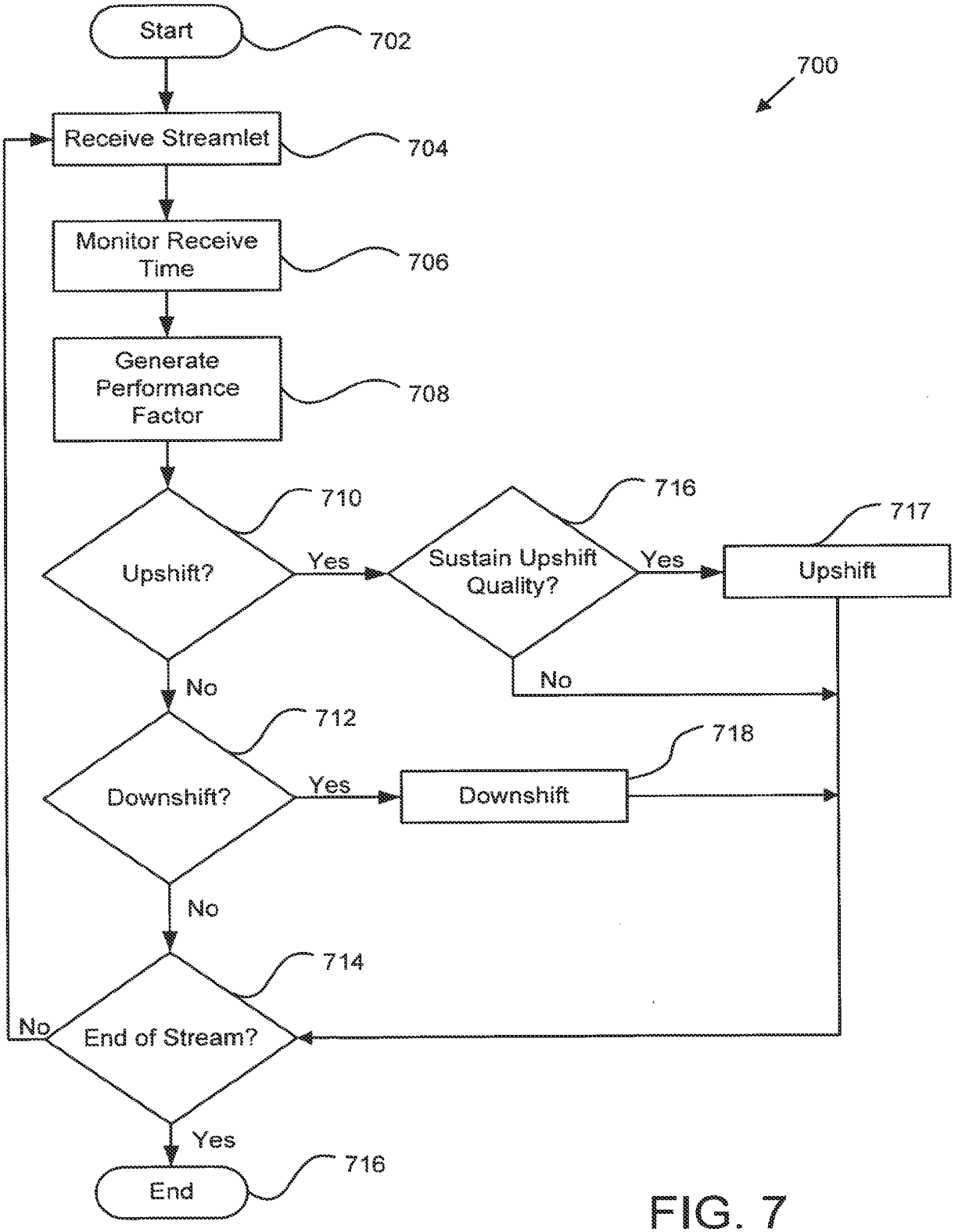

Start
702
700
Receive Streamlet
704
Monitor Receive Time
706
Generate Performance Factor
708
710
Upshift?
Yes
716
Sustain Upshift Quality?
Yes
717
Upshift
No
No
712
Downshift?
Yes
718
Downshift
No
714
End of Stream?
No
Yes
End
716

FIG. 7

DECLARATION (37 CFR §1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR §1.76)

Title of Invention: **APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT**

As the below named inventor, I hereby declare that:

This declaration is directed to:
[X] the attached application, or
[ ] United States application or PCT international application number _____ filed on _____
(I hereby authorize the subsequent insertion of the United States application or PCT international application number and corresponding filing date).

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the application, including the claims, as amended by any amendment.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR §1.56.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 USC §1001 by fine or imprisonment of not more than five (5) years, or both.

LEGAL NAME OF INVENTOR

Inventor: Robert Drew Major Date (Optional): 12/3/14

Signature: Robert Drew Major

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DECLARATION (37 CFR §1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR §1.76)

Title of Invention: **APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT**

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[ ] United States application or PCT international application number _____ filed on _____
(I hereby authorize the subsequent insertion of the United States application or PCT international application number and corresponding filing date).

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the application, including the claims, as amended by any amendment.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR §1.56.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 USC §1001 by fine or imprisonment of not more than five (5) years, or both.

LEGAL NAME OF INVENTOR

Inventor: Mark B. Hurst Date (Optional): 10/3/2004

Signature: _____

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Exhibit 1002
Page 96

Electronic Acknowledgement Receipt

EFS ID:	20433562
Application Number:	14516303
International Application Number:	
Confirmation Number:	4898
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Customer Number:	70560
Filer:	Brett Carlson/Sharron Castillo
Filer Authorized By:	Brett Carlson
Attorney Docket Number:	066.0141C1_P2004-04-01.2
Receipt Date:	16-OCT-2014
Filing Date:	
Time Stamp:	17:50:41
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1600
RAM confirmation Number	4427
Deposit Account	502091
Authorized User	CARLSON, BRETT A.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	20141016_ADS_P2004-04-01-2.pdf	1882303 099ee074d1cf717bf2e3b67dc9d6a8e245e6a3c5	no	6
Warnings:					
Information:					
2		20141016_Application_P2004-04-01-2.pdf	9087527 f16b6283c1025273887675a130b85a0f91ca3c67	yes	28

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	22
Claims	23	27
Abstract	28	28

Warnings:					
Information:					
3	Drawings-only black and white line drawings	20141016_Drawings_P2004-04-01-2.pdf	3440182 4e18d7575db1645f68bbafb6862674628438e9d2	no	7
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5	Authorization to access Appl. by Trilateral Office	20141016_AuthToPermit_P2004-04-01-2.pdf	80712 e781eb5ef76ae49bba81201aa399639b626e7cc2	no	2
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Warnings:					
Information:					
			Total Files Size (in bytes):	17004285	

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National Stage of an International Application under 35 U.S.C. 371
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New International Application Filed with the USPTO as a Receiving Office
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Document Description: Power of Attorney

PTO/AIA/82A (07-12)

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Application Number	
Filing Date	
First Named Inventor	Robert Drew Major
Title	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
Art Unit	
Examiner Name	
Attorney Docket Number	066.0141C1_P2004-04-01.2

SIGNATURE of Applicant or Patent Practitioner

Signature	/BRETT A. CARLSON/	Date	October 16, 2014
Name	Brett A. Carlson	Telephone	480.385.5060
Registration Number	39928		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications.

[X] *Total of 1 forms are submitted.

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I hereby revoke all previous powers of attorney given in the application identified in the attached transmittal letter.

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

70560

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☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

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Telephone		Email			

I am the Applicant:

☐ Inventor or Joint Inventor

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor

☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (*e.g.*, a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

Signature		Date	10/11/2012
Name	Dean A. Manson	Telephone	303.706.4564
Title and Company	Title: Executive Vice President, General Counsel and Secretary	Company: Echostar Technologies L.L.C.	

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms for more than one signature, see below *.

☒ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/516,303	10/16/2014	2447	1600	066.0141C1_P2004-04-01.2	20	3

CONFIRMATION NO. 4898

70560
INGRASSIA FISHER & LORENZ, P.C. (EchoStar)
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253

FILING RECEIPT

OC000000071522422

Date Mailed: 10/27/2014

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Robert Drew Major, Orem, UT;
Mark B. Hurst, Cedar Hills, UT;

Applicant(s)

ECHOSTAR TECHNOLOGIES L.L.C., Englewood, CO

Power of Attorney: The patent practitioners associated with Customer Number 70560

Domestic Priority data as claimed by applicant

This application is a CON of 11/116,783 04/28/2005 PAT 8868772
which claims benefit of 60/566,831 04/30/2004

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 10/23/2014
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/516,303**
Projected Publication Date: 02/05/2015
Non-Publication Request: No
Early Publication Request: No

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Exhibit 1002
Page 102

Title

APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

Preliminary Class

709

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Exhibit 1002
Page 103

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/516,303

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Robert Drew Major
Art Unit	
Examiner Name	
Attorney Docket Number	066.0141C1_P2004-04-01.2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20030093790	A1	2003-05-15	Logan et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Robert Drew Major
	Art Unit	
	Examiner Name	
	Attorney Docket Number	066.0141C1_P2004-04-01.2

	1	U.S. Patent and Trademark Office, Non-FInal Office Action, dated October 24, 2014 for U.S. Patent Application No. 14/222,245.	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Robert Drew Major
	Art Unit	
	Examiner Name	
	Attorney Docket Number	066.0141C1_P2004-04-01.2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/BRETT A. CARLSON/	Date (YYYY-MM-DD)	2014-11-12
Name/Print	Brett A. Carlson	Registration Number	39928

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IDS CERTIFICATION STATEMENTS

I. THIS IDS IS BEING FILED UNDER 37 C.F.R. 1.97(b): (check one box)

☐ Within three months of the filing date of a national application other than a continued prosecution application under 1.53(d).

☐ Within three months of the date of entry of the national stage as set forth in 1.491 in an international application.

☒ Before the mailing date of a first Office Action on the merits. In the event that a first Office Action on the merits has been mailed, please consider this IDS under 37 C.F.R. 1.97(c) and see the statement under 1.97(e) **or** charge deposit account 50-2091 the fee specified by 37 C.F.R. 1.17(p) if such statement is not selected in Section IV.

☐ Before the mailing of a first Office Action after the filing of a request for continued examination under 1.114.

II. THIS IDS IS BEING FILED UNDER 37 C.F.R. 1.97(c):

☐ After the period specified in 37 C.F.R. 1.97(b) and before the mailing date of any of a final action under 1.113, a notice of allowance under 1.311 or an action that otherwise closes prosecution in the application, and accompanied by:

- ☐ a statement specified in 1.97(e) as subsequently provided in this IDS; or
- ☐ the fee set forth in 1.17(p).

III. THIS IDS IS BEING FILED UNDER 37 C.F.R. 1.97(d):

☐ After the period specified in 37 C.F.R. 1.97(c) and on or after the mailing date of any of a final action under 1.113, a notice of allowance under 1.311 or an action that otherwise closes prosecution in the application, but before or simultaneous with payment of the issue fee, and accompanied by a statement specified in 1.97(e) as subsequently provided in this IDS **and** the fee set forth in 1.17(p).

IV. Statement under 37 C.F.R. 1.97(e) (check only one box)

The undersigned hereby states that:

☐ Each item of information contained in the IDS was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS.

☐ No item of information contained in the IDS was cited in a communication from a foreign patent office in a counterpart foreign application, and, to knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the IDS was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this IDS.

V. Statement under 37 C.F.R. §1.704(d) :

☐ The undersigned hereby states that each item of information contained in the information disclosure statement: (i) was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and this communication was not received by any individual designated in § 1.56(c) more than thirty days prior to the filing of the information disclosure statement; or (ii) is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in § 1.56(c) more than thirty days prior to the filing of the information disclosure statement..

VI. CONCLUSION

It is respectfully submitted that the claims presently on file patently distinguish the present invention from each of the references cited in this IDS. The references cited in this IDS are being cited only in the interest of candor and without any admission that they constitute statutory prior art or contain matter which anticipates the invention or which would render the same obvious, either singly or in a combination, to a person of ordinary skill in the art. Furthermore the filing of this IDS should not be construed to be an admission that the information cited in this IDS is, or is considered to be, material to patentability as defined in 1.56(b). In addition, the filing of this IDS should not be construed as a representation that a search has been made.

If the Examiner has any questions concerning this IDS, the Examiner is requested to contact the undersigned at the telephone number associated with Customer No. 70560. If it is determined that this IDS has been filed under the wrong rule, the PTO is requested to consider this IDS under the proper rule, with a petition if necessary, and charge the appropriate fee to Deposit Account No. 50-2091.

Electronic Acknowledgement Receipt

EFS ID:	20672041
Application Number:	14516303
International Application Number:	
Confirmation Number:	4898
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Customer Number:	70560
Filer:	Brett Carlson/Sharron Castillo
Filer Authorized By:	Brett Carlson
Attorney Docket Number:	066.0141C1_P2004-04-01.2
Receipt Date:	12-NOV-2014
Filing Date:	16-OCT-2014
Time Stamp:	12:55:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20141112_IDS_P2004-04-01-2.pdf	612266 aa6c5eaef3894954f0a399a60d17bf59135c4d3d	no	4

Warnings:	
Information:	

2	Transmittal Letter	20141112_IDSCert_P2004-04-01-2.pdf	82319 864e5fb3a2ad368056e458d720a79a6484dd60ea	no	1
Warnings:					
Information:					
3	Non Patent Literature	NPL_OA20141024_14222245.pdf	3128961 7d9bb2ce98daec86067392f169e76f95bb135828	no	72
Warnings:					
Information:					
			Total Files Size (in bytes):	3823546	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/516,303	10/16/2014	Robert Drew Major	066.0141C1_P2004-04-01.2

CONFIRMATION NO. 4898

70560
INGRASSIA FISHER & LORENZ, P.C. (EchoStar)
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253

PUBLICATION NOTICE

OC00000073236417

Title:APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

Publication No.US-2015-0039782-A1
Publication Date:02/05/2015

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14516303
Filing Date	2014-10-16
First Named Inventor	Robert Drew Major
Art Unit	2447
Examiner Name	not yet assigned
Attorney Docket Number	066.0141C1_P2004-04-01.2

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	1	20060010003	A1	2006-01-12	Kruse	

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	Application Number	14516303
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	Attorney Docket Number	066.0141C1_P2004-04-01.2

	1	USPTO, Notice of Allowance and Fee(s) Due for U.S. Patent Application No. 14/106,051 mailed February 24, 2015 (066.0141X1C3).	☐
	2	USPTO, Final Office Action for U.S. Patent Application No. 14/222,245 mailed March 18, 2015 (066.0143C1).	☐

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CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/BRETT A. CARLSON/	Date (YYYY-MM-DD)	2015-03-26
Name/Print	Brett A. Carlson	Registration Number	39928

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IDS CERTIFICATION STATEMENTS

I. THIS IDS IS BEING FILED UNDER 37 C.F.R. 1.97(b): (check one box)

☐ Within three months of the filing date of a national application other than a continued prosecution application under 1.53(d).

☐ Within three months of the date of entry of the national stage as set forth in 1.491 in an international application.

☑ Before the mailing date of a first Office Action on the merits. In the event that a first Office Action on the merits has been mailed, please consider this IDS under 37 C.F.R. 1.97(c) and see the statement under 1.97(e) **or** charge deposit account 50-2091 the fee specified by 37 C.F.R. 1.17(p) if such statement is not selected in Section IV.

☐ Before the mailing of a first Office Action after the filing of a request for continued examination under 1.114.

II. THIS IDS IS BEING FILED UNDER 37 C.F.R. 1.97(c):

☐ After the period specified in 37 C.F.R. 1.97(b) and before the mailing date of any of a final action under 1.113, a notice of allowance under 1.311 or an action that otherwise closes prosecution in the application, and accompanied by:

- ☐ a statement specified in 1.97(e) as subsequently provided in this IDS; or
- ☐ the fee set forth in 1.17(p).

III. THIS IDS IS BEING FILED UNDER 37 C.F.R. 1.97(d):

☐ After the period specified in 37 C.F.R. 1.97(c) and on or after the mailing date of any of a final action under 1.113, a notice of allowance under 1.311 or an action that otherwise closes prosecution in the application, but before or simultaneous with payment of the issue fee, and accompanied by a statement specified in 1.97(e) as subsequently provided in this IDS **and** the fee set forth in 1.17(p).

IV. Statement under 37 C.F.R. 1.97(e) (check only one box)

The undersigned hereby states that:

☐ Each item of information contained in the IDS was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS.

☐ No item of information contained in the IDS was cited in a communication from a foreign patent office in a counterpart foreign application, and, to knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the IDS was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this IDS.

V. Statement under 37 C.F.R. §1.704(d) :

☐ The undersigned hereby states that each item of information contained in the information disclosure statement: (i) was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and this communication was not received by any individual designated in § 1.56(c) more than thirty days prior to the filing of the information disclosure statement; or (ii) is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in § 1.56(c) more than thirty days prior to the filing of the information disclosure statement..

VI. CONCLUSION

It is respectfully submitted that the claims presently on file patently distinguish the present invention from each of the references cited in this IDS. The references cited in this IDS are being cited only in the interest of candor and without any admission that they constitute statutory prior art or contain matter which anticipates the invention or which would render the same obvious, either singly or in a combination, to a person of ordinary skill in the art. Furthermore the filing of this IDS should not be construed to be an admission that the information cited in this IDS is, or is considered to be, material to patentability as defined in 1.56(b). In addition, the filing of this IDS should not be construed as a representation that a search has been made.

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Electronic Acknowledgement Receipt

EFS ID:	21882436
Application Number:	14516303
International Application Number:	
Confirmation Number:	4898
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Customer Number:	70560
Filer:	Brett Carlson/Misty Standridge
Filer Authorized By:	Brett Carlson
Attorney Docket Number:	066.0141C1_P2004-04-01.2
Receipt Date:	26-MAR-2015
Filing Date:	16-OCT-2014
Time Stamp:	13:05:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20150326_IDS_066-0141C1.pdf	612406 2d312d6bdb9ea85010bfc0c6e8d554bf4f72f04f	no	4

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2	Miscellaneous Incoming Letter	20150326_IDSCert_066-0141C1.pdf	132136 2cf6bab029eab9b6a66e000cdd155dd72b1eb4fc	no	1
Warnings:					
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3	Non Patent Literature	NPL_20150224_NOA_14106051_066-0141X1C3.pdf	1086526 9731a09ca8156b3530eee9708128e22dd9d48b7c	no	21
Warnings:					
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4	Non Patent Literature	NPL_20150318_FOA_14222245_066-0143C1.pdf	526925 d47dd1e0d879f2764524c2e2b1e7e752e5acb359	no	15
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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PLUS Search Results for S/N 14516303, Searched Wed May 20 11:36:06 EDT 2015

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8868772 99
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Application Number	14516303
Filing Date	2014-10-16
First Named Inventor	Robert Drew Major
Art Unit	2444
Examiner Name	DONABED, NINOS
Attorney Docket Number	066.0141C1_P2004-04-01.2

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	2	8880721	B2	2014-11-04	Hurst et al.	

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	1	20050251832	A1	2005-11-10	Chiueh	
	2	20100262711	A1	2010-10-14	Bouazizi	
	3	20150058496	A1	2015-02-26	Hurst et al.	

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	USPTO, Office Action for U.S. Patent Application No. 14/531,804, mailed May 11, 2015 (066.0141X2CC).	☐

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Signature	/BRETT A. CARLSON/	Date (YYYY-MM-DD)	2015-06-16
Name/Print	Brett A. Carlson	Registration Number	39,928

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IDS CERTIFICATION STATEMENTS

I. THIS IDS IS BEING FILED UNDER 37 C.F.R. 1.97(b): (check one box)

☐ Within three months of the filing date of a national application other than a continued prosecution application under 1.53(d).

☐ Within three months of the date of entry of the national stage as set forth in 1.491 in an international application.

☑ Before the mailing date of a first Office Action on the merits. In the event that a first Office Action on the merits has been mailed, please consider this IDS under 37 C.F.R. 1.97(c) and see the statement under 1.97(e) **or** charge deposit account 50-2091 the fee specified by 37 C.F.R. 1.17(p) if such statement is not selected in Section IV.

☐ Before the mailing of a first Office Action after the filing of a request for continued examination under 1.114.

II. THIS IDS IS BEING FILED UNDER 37 C.F.R. 1.97(c):

☐ After the period specified in 37 C.F.R. 1.97(b) and before the mailing date of any of a final action under 1.113, a notice of allowance under 1.311 or an action that otherwise closes prosecution in the application, and accompanied by:

- ☐ a statement specified in 1.97(e) as subsequently provided in this IDS; or
- ☐ the fee set forth in 1.17(p).

III. THIS IDS IS BEING FILED UNDER 37 C.F.R. 1.97(d):

☐ After the period specified in 37 C.F.R. 1.97(c) and on or after the mailing date of any of a final action under 1.113, a notice of allowance under 1.311 or an action that otherwise closes prosecution in the application, but before or simultaneous with payment of the issue fee, and accompanied by a statement specified in 1.97(e) as subsequently provided in this IDS **and** the fee set forth in 1.17(p).

IV. Statement under 37 C.F.R. 1.97(e) (check only one box)

The undersigned hereby states that:

☐ Each item of information contained in the IDS was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS.

☐ No item of information contained in the IDS was cited in a communication from a foreign patent office in a counterpart foreign application, and, to knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the IDS was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this IDS.

V. Statement under 37 C.F.R. §1.704(d) :

☐ The undersigned hereby states that each item of information contained in the information disclosure statement: (i) was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and this communication was not received by any individual designated in § 1.56(c) more than thirty days prior to the filing of the information disclosure statement; or (ii) is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in § 1.56(c) more than thirty days prior to the filing of the information disclosure statement..

VI. CONCLUSION

It is respectfully submitted that the claims presently on file patently distinguish the present invention from each of the references cited in this IDS. The references cited in this IDS are being cited only in the interest of candor and without any admission that they constitute statutory prior art or contain matter which anticipates the invention or which would render the same obvious, either singly or in a combination, to a person of ordinary skill in the art. Furthermore the filing of this IDS should not be construed to be an admission that the information cited in this IDS is, or is considered to be, material to patentability as defined in 1.56(b). In addition, the filing of this IDS should not be construed as a representation that a search has been made.

If the Examiner has any questions concerning this IDS, the Examiner is requested to contact the undersigned at the telephone number associated with Customer No. 70560 . If it is determined that this IDS has been filed under the wrong rule, the PTO is requested to consider this IDS under the proper rule, with a petition if necessary, and charge the appropriate fee to Deposit Account No. 50-2091.

Electronic Acknowledgement Receipt

EFS ID:	22649137
Application Number:	14516303
International Application Number:	
Confirmation Number:	4898
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Customer Number:	70560
Filer:	Brett Carlson/Brent Frazier
Filer Authorized By:	Brett Carlson
Attorney Docket Number:	066.0141C1_P2004-04-01.2
Receipt Date:	16-JUN-2015
Filing Date:	16-OCT-2014
Time Stamp:	16:52:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	20150616_IDS_P2004-04-01-2.pdf	612517 9252fe8ffd5706efc868c299dca57ccd5296c838	no	4

Warnings:	
Information:	

2	Transmittal Letter	20150616_IDSCert_P2004-04-01-2.pdf	183917 14dfb51f43599b3f415784ef745276c38e30aad9	no	1
Warnings:					
Information:					
3	Non Patent Literature	NPL_20150511_OA_14531804_066-0141X2CC.pdf	2764068 b10512f9dc85afa4e10d7643f06a1359130daa43	no	66
Warnings:					
Information:					
		Total Files Size (in bytes):	3560502		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/516,303	10/16/2014	Robert Drew Major	066.0141C1_P2004-04-01.2	4898

70560 7590 06/19/2015

INGRASSIA FISHER & LORENZ, P.C. (EchoStar)
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253

EXAMINER
DONABED, NINOS

ART UNIT	PAPER NUMBER
2444	

NOTIFICATION DATE	DELIVERY MODE
06/19/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@ifllaw.com
IPDEPT@echostar.com

Office Action Summary	Application No. 14/516,303	Applicant(s) MAJOR ET AL.	
	Examiner NINOS DONABED	Art Unit 2444	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/16/2014*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-20* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-20* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *10/16/2014* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

1. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-21 of U.S. Patent No. 8868772. Although the claims at issue are not identical, they are not patentably distinct from each other because the limitations of the independent claims when taken in light of the dependent claims of the patent are either the same or obvious variations of the instant application.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. When considering subject matter eligibility under 35 U.S.C. 101, it must be determined whether the claim is directed to one of the four statutory categories of invention, i.e., process, machine, manufacture, or composition of matter. If the claim does fall within one of the statutory categories, it must then be determined whether the claim is directed to a judicial exception (i.e., law of

nature, natural phenomenon, and abstract idea), and if so, it must additionally be determined whether the claim is a patent-eligible application of the exception. If an abstract idea is present in the claim, any element or combination of elements in the claim must be sufficient to ensure that the claim amounts to significantly more than the abstract idea itself. Examples of abstract ideas include fundamental economic practices; certain methods of organizing human activities; an idea itself; and mathematical relationships/formulas. *Alice Corporation Pty. Ltd. v. CLS Bank International, et al.*, 573 U.S. ____ (2014).

The claim(s) is/are directed to the abstract idea of adaptive rate shifting of streaming content. The additional element(s) or combination of elements in the claim(s) other than the abstract idea per se amount(s) to no more than: (i) mere instructions to implement the idea on a computer, and/or (ii) recitation of generic computer structure that serves to perform generic computer functions that are well-understood, routine, and conventional activities previously known to the pertinent industry. Viewed as a whole, these additional claim element(s) do not provide meaningful limitation(s) to transform the abstract idea into a patent eligible application of the abstract idea such that the claim(s) amounts to significantly more than the abstract idea itself. Therefore, the claim(s) are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter.

The claim as a whole, does not amount to significantly more than the abstract idea itself. This is because the claim does not affect an improvement to another technology or technical field; the claim does not amount to an improvement to the

functioning of a computer itself; and the claim does not move beyond a general link of the use of an abstract idea to a particular technological environment.

The instant claims are rejected under 35 USC 101 in view of The Decision in *Alice Corporation Ply. Ltd. v. CLS Bank International, et al.* in a unanimous decision, the Supreme Court held that the patent claims in *Alice Corporation Pty. Ltd. v. CLS Bank International, el al. ("Alice Corp.* ") are not patent-eligible under 35 U.S.C. § 101.

Claim Rejections - 35 USC § 112

2. Claims 1-20 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claim element "an agent controller module configured to simultaneously request" (Claims 1, 11), "the agent controller module further configured to continuously monitor" (claims 1, 11), "staging module configured to stage the streamlets" (Claims 1, 11), "agent controller module is configured to establish" (claims 2, 12), "agent controller module is configured to generate" (claims 5, 14), "the agent controller module is configured to upshift" (claims 6, 15), "the agent controller module is configured to downshift" (Claims 8, 17), "the agent controller module is further configured to anticipate" (Claims 9, 18), "the agent controller module is configured to initially request" (Claims 10, 19) are limitations that invokes 35 U.S.C. 112, sixth paragraph. However, the written description fails to disclose the corresponding structure, material, or acts for the claimed function.

Applicant may:

(a) Amend the claim so that the claim limitation will no longer be interpreted as a limitation under 35 U.S.C. 112, sixth paragraph; or

(b) Amend the written description of the specification such that it expressly recites what structure, material, or acts perform the claimed function without introducing any new matter (35 U.S.C. 132(a)).

If applicant is of the opinion that the written description of the specification already implicitly or inherently discloses the corresponding structure, material, or acts so that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function, applicant should clarify the record by either:

(a) Amending the written description of the specification such that it expressly recites the corresponding structure, material, or acts for performing the claimed function and clearly links or associates the structure, material, or acts to the claimed function, without introducing any new matter (35 U.S.C. 132(a)); or

(b) Stating on the record what the corresponding structure, material, or acts, which are implicitly or inherently set forth in the written description of the specification, perform the claimed function. For more information, see 37 CFR 1.75(d) and MPEP §§ 608.01(o) and 2181.

Regarding claims 1, 11, 20, the phrase “simultaneously request at least portions of a plurality of streamlets” is vague and unclear. The reason for this is that the claim does not state what the request is being done simultaneously with.

Regarding claim 1-20, the phrase “streamlet” is unclear as to what makes up a streamlet. For the furthering of prosecution, the phrase will be taken to mean a packet or a segment.

Regarding Claims 7 and 16 the phrase "a minimum safety margin” and “a current read ahead margin" are vague and unclear because they are not defined by the original disclosure nor would one of ordinary skill in the art know what the scope of the terms.

Claim 17 recites the limitation "second selected threshold” in the claim. There is insufficient antecedent basis for this limitation in the claim. There is no "first selected threshold”.

Claims 1, 11, 20 recite the limitations “the progress of subsequent responses” in the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3-11, 13-20 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Radford (U.S. App Pub 20020144276) in view of Bill Birney (“Intelligent Streaming”).

Regarding claim 1,

Radford teaches a apparatus for adaptive-rate content streaming, the apparatus comprising: **(See abstract and claim 1, Radford)**

an agent controller module configured to simultaneously request at least portions of a plurality of streamlets; **(See figure 1, paragraphs [0018] - [0021], claim 1, Radford teaches "request 110 is made by the client device for content to a listing server for streaming audio/video content. In such an embodiment, the user can request the streaming content through a single action, for example, clicking on a hyperlink (e.g., a button on a web page), by a keystroke, or through a voice command, or through multiple actions, for example, selection followed by a confirmation.")**

the agent controller module further configured to continuously monitor the progress of subsequent responses to streamlet requests, **(See figures 1-3, paragraphs [0029] – [0032], claim 1, Radford teaches "The user interface allows a user to dynamically change the quality level of streamed data received during display of the streamed data. For example, if the network or ISP becomes congested and the quality of the streamed data deteriorates or is marred by interruptions (typically such interruptions are required to cache the streaming data), a user might wish to switch to a lower quality level (i.e., one requiring less bandwidth).")**

a staging module configured to stage the streamlets and arrange the streamlets for playback on a content player. **(See figures 1-3, paragraphs [0029] – [0032], claim 1, Radford teaches "Initial content is then delivered to the client device and**

displayed to the user. A user interface also is provided. The user interface is displayed to the user along with the content being displayed.")

Radford does not explicitly teach the agent controller module further configured to continuously monitor the progress of subsequent responses to streamlet requests, and in accordance with the progress of the responses, request higher or lower quality streamlets.

Birney teaches the agent controller module further configured to continuously monitor the progress of subsequent responses to streamlet requests, and in accordance with the progress of the responses, request higher or lower quality streamlets. **(See page 2, Birney teaches "Intelligent streaming uses a series of strategies to modify the bit rate of the stream so it plays continuously on the client regardless of the current bandwidth. As bandwidth fluctuates between server and client, the server detects the changes and adopts the best strategy. The strategies are as follows: 1. The server and client automatically determine the current available bandwidth, and then the server selects and delivers the stream with the most appropriate bit rate. 2. During transmission, if the bandwidth decreases, the server automatically detects the change and switches to a stream with a lower bit rate. If bandwidth improves, the server switches to stream")**

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have known to combine the teachings of Birney with Radford because both deal with data streaming techniques. The advantage of incorporating the agent controller module further configured to continuously monitor the progress of

subsequent responses to streamlet requests, and in accordance with the progress of the responses, request higher or lower quality streamlets of Birney into Radford is that Birney teaches the interplay between client and server takes place behind the scenes, if you have added multiple-bit-rate streaming, the server can intelligently adjust the bit rate according to the current bandwidth, so the user receives a high-quality presentation, therefore making the overall system more robust and efficient. **(See page 7, Birney)**

Regarding claim 3,

Radford and Birney teach the apparatus of claim 1, wherein each streamlet comprises a portion of a content file. **(See paragraphs [0008] - [0011], Radford)**

Regarding claim 4,

Radford and Birney teach the apparatus of claim 1, wherein the streamlet comprises a Hyper Text Transfer Protocol file. **(See paragraphs [0018], [0019], [0023], Radford)**

Regarding claim 5,

Radford and Birney teach the apparatus of claim 3, wherein the agent controller module is configured to generate a performance factor according to the responses to streamlet requests. **(See paragraphs [0008] – [0011], Radford)**

Regarding claim 6,

Radford and Birney teach the apparatus of claim 4, wherein the agent controller module is configured to upshift to a higher quality streamlet when the performance factor is greater than a selected threshold and the agent controller module determines the higher quality playback can be sustained according to a combination of factors. **(See figure 1 and paragraphs [0024] – [0027], Radford.)**

Regarding claim 7,

Radford and Birney teach the apparatus of claim 5, wherein the combination of factors is selected from the group consisting of an amount of contiguously available streamlets stored in the staging module, a minimum safety margin, and a current read ahead margin. **(See figure 1 and paragraphs [0022] – [0026], Radford.)**

Regarding claim 8,

Radford and Birney teach the apparatus of claim 4, wherein the agent controller module is configured to downshift to a lower quality streamlet when the performance factor is less than a second selected threshold. **(See figure 1 and paragraphs [0024] – [0026], Radford.)**

Regarding claim 9,

Radford and Birney teach the apparatus of claim 1, wherein the agent controller module is further configured to anticipate streamlet requests and pre-request streamlets

to enable fast-forward, skip randomly, and rewind functionality. **(See figure 2 and paragraphs [0030] - [0033], Radford.)**

Regarding claim 10,

Radford and Birney teach the apparatus of claim 1, wherein the agent controller module is configured to initially request low quality streamlets to enable instant playback of the content file, and subsequent upshifting according to the performance factor. **(See figure 1 and paragraphs [0008] – [0012], Radford.)**

Regarding claim 11,

Claim 11 list all the same elements of claim 1, but in system form rather than apparatus form. Therefore, the supporting rationale of the rejection to claim 1 applies equally as well to claim 11. Further regarding the limitations of "Radford teaches a system for adaptive-rate content streaming, the system comprising: a data communications network; **(See abstract and claim 1, Radford)** a content server coupled to the data communications network and having a content module configured to process content and generate a plurality of high and low quality streams; each of the high, and low quality streams comprising a plurality of streamlets. **(See figure 1 and paragraphs [0024] – [0026], Radford.)**

Claims 13-19 list all the same elements of claims 3-10, but in system form rather than method form. Therefore, the supporting rationale of the rejection to claims 3-10 applies equally as well to claims 13-19.

Claim 20 list all the same elements of claim 1, but in method form rather than apparatus form. Therefore, the supporting rationale of the rejection to claim 1 applies equally as well to claim 20.

5. Claims 2 and 12 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Radford (U.S. App Pub 20020144276) in view of Bill Birney ("Intelligent Streaming") in view of Quinn-Brown (U.S. Patent App Pub 20030152036).

Regarding claim 2,

Radford and Birney teach the apparatus of claim 1.

Radford and Birney do not explicitly teach wherein the agent controller module is configured to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates.

Quinn-Brown teaches wherein the agent controller module is configured to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates. **(See paragraphs [0028] – [0030], Quinn-Brown)**

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have known to combine the teachings of Quinn-Brown with Radford and Birney because both deal with streaming media. The advantage of incorporating wherein the agent controller module is configured to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates of Quinn-Brown into Radford and Birney is that Quinn-Brown improves the data transfer rate by transferring the packets in parallel through the network, therefore making the overall system more robust and efficient. **(See paragraphs [0004] - [0006], Quinn-Brown)**

Claim 12 list all the same elements of claim 2, but in system form rather than apparatus form. Therefore, the supporting rationale of the rejection to claim 2 applies equally as well to claim 12.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and located in the PTO-892 form.

Examiner's Note: Examiner has cited particular paragraphs or columns and line numbers in the reference(s) as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the reference(s) in its entirety as potentially

teaching of all or part of the claimed invention. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NINOS DONABED whose telephone number is (571)272-8757. The examiner can normally be reached on Monday-Friday, 7:30 AM-5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter-Anthony Pappas can be reached on (571) 272-7646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NINOS DONABED/
Primary Examiner, Art Unit 2444

Notice of References Cited	Application/Control No. 14/516,303	Applicant(s)/Patent Under Reexamination MAJOR ET AL.	
	Examiner NINOS DONABED	Art Unit 2444	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2002/0188745 A1	12-2002	Hughes et al.	709/231
*	B	US-2003/0195977 A1	10-2003	Liu et al.	709/231
*	C	US-2004/0199655 A1	10-2004	Davies et al.	709/231
*	D	US-2004/0267956 A1	12-2004	Leon et al.	709/231
*	E	US-7,558,869 B2	07-2009	Leon et al.	709/231
*	F	US-7,707,303 B2	04-2010	Albers et al.	709/231
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14516303	MAJOR ET AL.
	Examiner	Art Unit
	NINOS DONABED	2444

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/19/2015								
	1	✓								
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	"20030152036" and (rewind$3 forward$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:02
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L8	0	"20020144276" and monitor$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:29
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		709/231.ccls.	DERWENT			
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S3	38	((Mark) near2 (Hurst)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/18 20:38
S4	141	(S2 S3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:39
S5	21	(S2 S3) and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:51
S6	2	"20150039782"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:53

S7	1739	echostar.as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:53
S8	1542	(echostar adj2 technologies).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:54
S9	23	(S8 S2 S3) and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:54
S10	2	(S8 S2 S3) and (simultaneous$4 and streamlet).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:54
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S13	2	("20150039782").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 11:12
S14	3	"20110296053"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 11:55
S15	1	("20150039782").PN. and (margin)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 13:31
S16	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:12

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S18	1	("20150039782").PN. and (streamlet) and packet	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:22
S19	1	("20150039782").PN. and packet	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:22
S20	1	("20150039782").PN. and segment	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:25
S21	49	(dish adj digital).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 14:27
S22	18	(dish adj digital).as. and streamlet	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 14:28
S23	9	(dish adj digital).as. and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 14:28
S24	1	"20020144276" and request$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:45
S25	0	"20020144276" and (upshift$5 downshift$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:49
S26	1	"20020144276" and (upshift$5 high$4 downshift$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:49
S27	0	"20020144276" and (upshift$5 high$4 downshift$5) same monitor$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:50
S28	1	"20020144276" and (upshift$5 high$4 downshift$5) same track$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:50
S29	1	"20020144276" and dynamic$5	US-PGPUB; USPAT;	OR	ON	2015/05/19 19:51

			USOCR; DERWENT			
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S31	0	(Stream$5 near6 (upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:55
S32	86	(Stream$5 near6 (upshift$4 downshift up$5 down$5) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:56
S33	122	(Stream$5 near8 (upshift$4 downshift up$5 down$5) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:56
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S35	2	"20020144276" and (display$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:04
S36	1	"20020144276" and (monitor$5 track$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:09
S37	1	"20020144276" and (high$5 low$4)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:10
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S45	0	((upshift$4 downshift$3 up-shift$5 down-shift$5) with (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:17
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S51	8	709/231.ccls. and @AD<"20040505" and (seamless$4 with (qos quality))	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:21
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S57	85	(intelligent adj2 stream$5).ti,ab.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:36
S58	11	(intelligent adj2 stream$5).ti,ab. and @ad<"20040505"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:37
S59	3	"20030152036" and (tcp http)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:40

EAST Search History (Interference)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Robert Drew Major
Art Unit	
Examiner Name	
Attorney Docket Number	066.0141C1_P2004-04-01.2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1	20030093790	A1	2003-05-15	Logan et al.	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.D./

Receipt date: 11/12/2014	Application Number	14516303 - GAU: 2444
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	
	First Named Inventor	Robert Drew Major
	Art Unit	
	Examiner Name	
	Attorney Docket Number	066.0141C1_P2004-04-01.2

	1	U.S. Patent and Trademark Office, Non-FInal Office Action, dated October 24, 2014 for U.S. Patent Application No. 14/222,245.	☐

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EXAMINER SIGNATURE

Examiner Signature	/Ninos Donabed/	Date Considered	05/19/2015

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.D./

Receipt date: 11/12/2014	Application Number	14516303 - GAU: 2444
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	
	First Named Inventor	Robert Drew Major
	Art Unit	
	Examiner Name	
	Attorney Docket Number	066.0141C1_P2004-04-01.2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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Name/Print	Brett A. Carlson	Registration Number	39928

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Multimedia proxy caching mechanism for quality **adaptive streaming** applications in the internet

R Rejaie, H Yu, M Handley... - ... 2000. Nineteenth Annual ..., 2000 - ieeexplore.ieee.org

Absrrmr-The Internet has witnessed a rapid growth in deployment of Web-based **streaming** applications during recent years. In these applications, server should be able to perform end-to-end congestion control and quality adaptation to match the delivered stream quality to **...**

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Quality-**adaptive** media **streaming** by priority drop

C Krasic, J Walpole, W Feng - ... of the 13th international workshop on ..., 2003 - dl.acm.org

Abstract This paper presents a general design strategy for **streaming** media applications in best effort computing and networking environments. Our target application is video on demand using personal computers and the Internet. In this scenario, where resource **...**

Cited by 124 Related articles All 18 versions Cite Save

A survey of application layer techniques for **adaptive streaming** of multimedia

B Vandalore, W Feng, R Jain, S Fahmy - Real-Time Imaging, 2001 - Elsevier

Though the integrated services model and resource reservation protocol (RSVP) provide support for quality of service, in the current Internet only best-effort traffic is widely supported. New high-speed technologies such as ATM (asynchronous transfer mode), gigabit **...**

Cited by 95 Related articles All 8 versions Cite Save

Real-time content-based **adaptive streaming** of sports videos

SF Chang, D Zhong, R Kumar - Content-Based Access of ..., 2001 - ieeexplore.ieee.org

Abstract In this paper, we present a real-time software system for filtering live video content and then adaptively **streaming** the video over resource limited networks or devices. The rate adaptation is content-based and dynamically varied according to the event structure and **...**

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Method and system for indexing and content-based **adaptive streaming** of digital video content

SF Chang, D Zhong, R Kumar... - US Patent App. 10/ ..., 2001 - Google Patents

The present invention discloses systems and methods for automatically parsing digital video content into segments corresponding to fundamental semantic units, events, and camera views, and **streaming** parsed digital video content to users for display and browsing. The **...**

Cited by 111 Related articles All 4 versions Cite Save

Adaptive streaming of stored video in a TCP-friendly context: Multiple versions or multiple layers?

P de Cuetos, D Saparilla, KW Ross - in Proc. Packet Video Workshop, 2001 - Citeseer

Abstract Video transmission over the current best-effort Internet should be made fair to competing TCP traffic. Because the available bandwidth to a TCP-friendly stream changes significantly over medium and long time scales, it is desirable to adapt the **streaming** rate **...**

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3GPP compliant **adaptive** wireless video **streaming** using H. 264/AVC

T Schierl, T Wiegand... - Image Processing, 2005. ..., 2005 - ieeexplore.ieee.org

Abstract—In 3GPP a standard for multimedia **streaming** over mobile networks called PSS (Packet-switched **Streaming** Service) has been specified. In order to deal with changing transmission characteristics like varying link bit-rate or handover, **adaptive streaming ...**

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On performance bounds for the integration of elastic and **adaptive streaming** flows

T Bonald, A Proutière - ACM SIGMETRICS Performance Evaluation ..., 2004 - dl.acm.org

Abstract We consider a network model where bandwidth is fairly shared by a dynamic number of elastic and **adaptive streaming** flows. Elastic flows correspond to data transfers while **adaptive streaming** flows correspond to audio/video applications with variable rate **...**

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Layer-encoded video in scalable **adaptive streaming**

M Zink, J Schmitt, R Steinmetz - Multimedia, IEEE Transactions ..., 2005 - ieeexplore.ieee.org

Abstract—Combining the concepts of caching and transmis-sion control protocol (TCP)-friendly **streaming** of layer-encoded video bears the problem that those videos might not be cached in full quality. Therefore, we focus in this work on the scheduling of **...**

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Adaptive live video **streaming** by priority drop

J Huang, C Krasic, J Walpole - 2003 - pdxscholar.library.pdx.edu

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Page 159

Abstract In this paper we explore the use of Priority-progress **streaming** (PPS) for video surveillance applications. PPS is an **adaptive streaming** technique for the delivery of continuous media over variable bit-rate channels. It is based on the simple idea of **...**
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Global messaging with distributed **adaptive streaming** control

YJ Lee, CA Chao, R Ngai, MC Chiang... - US Patent App. 09/ ..., 2000 - Google Patents
A software implementable approach capable of creating, delivering, reassembling, rendering, and storing asynchronous and synchronous multimedia message. This approach integrates video/audio **streaming** with existing Internet/Intranet e-mail messaging and **...**
Cited by 55 Related articles All 2 versions Cite Save

Implementation of **adaptive streaming** of stored MPEG-4 FGS video over TCP

P de Cuetos, P Guillotel, KW Ross... - Multimedia and Expo, ..., 2002 - ieeexplore.ieee.org
ABSTRACT This paper presents an implementation of an end-to-end application for **streaming** stored MPEG-4 Fine-Grained Scalable (FGS) videos over the best-effort Intemet. Our current implementation ms over TCP but can also be run over TCP-friendly RTPNDP **...**
Cited by 37 Related articles All 2 versions Cite Save

Adaptive streaming and rendering of large terrains using strip masks

J Pouderoux, JE Marvie - ... of the 3rd international conference on ..., 2005 - dl.acm.org
Abstract Terrain rendering is an important factor in the rendering of virtual scenes. If they are large and detailed, digital terrains can represent a huge amount of data and therefore of graphical primitives to render in real-time. In this paper we present an efficient technique **...**
Cited by 43 Related articles All 9 versions Cite Save

System and method for **adaptive streaming** of predictive coded video data

C Anantharamu, D Manoranjan - US Patent App. 09/761,770, 2001 - Google Patents
This invention provides an **adaptive** transcoder which streams predictive coded video data over variable bandwidth networks and to devices having varying processing capabilities. The invention dynamically and continuously determines an available network bandwidth **...**
Cited by 41 Related articles All 2 versions Cite Save

of Sports Videos

SF Chang, D Zhong, R Kumar, RTCBA **Streaming** - ... of the IEEE Workshop on Content ..., 2001
Cited by 16 Related articles Cite Save

Adaptive streaming of high-quality video over wireless LANs

P Van Beek, S Deshpande... - Electronic ..., 2004 - proceedings.spiedigitallibrary.org
abstract We address the problem of robust **streaming** of high-quality video over wireless local area networks in a home environment. By robust **streaming**, we mean maintaining the highest possible video quality and preventing interruptions to the video under varying **...**
Cited by 33 Related articles All 8 versions Cite Save

Securing media for **adaptive streaming**

C Venkatramani, P Westerink, O Verscheure... - Proceedings of the ..., 2003 - dl.acm.org
Abstract This paper describes the ARMS system which enables secure and **adaptive** rich media **streaming** to a large-scale, heterogeneous client population. The secure **streaming** algorithms ensure end-to-end security while the content is adapted and streamed via **...**
Cited by 22 Related articles All 11 versions Cite Save

Channel sharing by rate-**adaptive streaming** applications

N Argiriou, L Georgiadis - Performance Evaluation, 2004 - Elsevier
There are various techniques for adapting the transmission rate of an application while maintaining the perceived quality at the receiver at acceptable levels. Shared-channel systems can use this rate adaptation capability to increase the number of concurrent **...**
Cited by 25 Related articles All 9 versions Cite Save

Streaming multimedia data with **adaptive** QoS characteristics

C Bouras, A Gkamas - Protocols for Multimedia Systems, 2000 - ru6.cti.gr
ABSTRACT In this paper, we describe the design and the implementation of an **adaptive streaming** architecture, which is based on real time protocols. The **adaptive streaming** application, which we have developed, can be used for **streaming** multimedia data over **...**
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System and method for providing an **adaptive streaming** flow control mechanism between the TCP and IP

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layers of the TCP/IP suite of protocols

JP Marce, P Thubert, D Esteve... - US Patent 6,880,017, 2005 - Google Patents

In a data communication network operated under the TCP/IP suite of protocols the invention adds an **adaptive streaming** (AS) layer, inserted between the IP and the TCP protocol layers, in which the received data packets of each open TCP connection are temporarily queued **...**

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14516303	MAJOR ET AL.
	Examiner	Art Unit
	NINOS DONABED	2444

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Conducted 112 2nd paragraph analysis	5/19/2015	nd
Conducted 112 6th paragraph claim analysis	5/19/2015	nd
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East Search	5/19/2015	nd
Plus Search	5/19/2015	nd
NPL Seach (Google, Google Scholar)	5/19/2015	nd
((H04L29/06027 OR H04L29/06 OR H04L65/80 OR H04L65/4084 OR H04L69/329 OR H04L65/607 OR H04L47/10 OR H04L65/608 OR H04N7/17318 OR H04L65/4076 OR H04L65/4092 OR G06Q30/02 OR H04L67/06 OR H04N21/4126 OR H04N21/434 OR H04N21/6125 OR H04N21/8456).CPC. + text searche)d	5/19/2015	nd

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Application Number	14516303
Filing Date	2014-10-16
First Named Inventor	Robert Drew Major
Art Unit	2447
Examiner Name	not yet assigned
Attorney Docket Number	066.0141C1_P2004-04-01.2

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Receipt date: 03/26/2015	Application Number	14516303	14516303 - GAU: 2444
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	First Named Inventor	Robert Drew Major	
	Art Unit	2447	
	Examiner Name	not yet assigned	
	Attorney Docket Number	066.0141C1_P2004-04-01.2	

	1	USPTO, Notice of Allowance and Fee(s) Due for U.S. Patent Application No. 14/106,051 mailed February 24, 2015 (066.0141X1C3).	☐
	2	USPTO, Final Office Action for U.S. Patent Application No. 14/222,245 mailed March 18, 2015 (066.0143C1).	☐

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Name/Print	Brett A. Carlson	Registration Number	39928

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Application Number	11116783
Filing Date	2005-04-28
First Named Inventor	R. Drew Major
Art Unit	2444
Examiner Name	Ninos Donabed
Attorney Docket Number	066.0141 (P2004-04-01.1)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2005-04-28
	First Named Inventor	R. Drew Major
	Art Unit	2444
	Examiner Name	Ninos Donabed
	Attorney Docket Number	066.0141 (P2004-04-01.1)

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	First Named Inventor	R. Drew Major
	Art Unit	2444
	Examiner Name	Ninos Donabed
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Name/Print	Brett A. Carlson	Registration Number	39928

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	11116783
Filing Date	2005-04-28
First Named Inventor	R. Drew Major
Art Unit	2444
Examiner Name	Donabed, Ninos J.
Attorney Docket Number	066.0141 (P2004-04-01.1)

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	Art Unit	2444
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	Attorney Docket Number	066.0141 (P2004-04-01.1)

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	5	2004054930	JP		2004-02-19	Microsoft Corporation		☒
	6	2001067264	WO	A1	2001-09-13	Streamcenter, Inc.		☐
	7	2003003760	WO	A2	2003-01-09	Burst.com		☐
	8	2003027876	WO	A1	2003-04-03	Reynolds et al.		☐

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Receipt date: 08/26/2014	Application Number	11116783 14516383 - GAU: 2444
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2005-04-28
	First Named Inventor	R. Drew Major
	Art Unit	2444
	Examiner Name	Donabed, Ninos J.
	Attorney Docket Number	066.0141 (P2004-04-01.1)

	9	2004025405	WO	A2	2004-03-25	Thomson Licensing S.A.		☐
	10	1298931	EP	A2	2003-02-04	Oplayo		☐
	11	1202487	EP	A2	2001-10-31	Kabushiki Kaisha Toshiba		☐
	12	1395014	EP	A1	2002-08-27	Matsushita Electric Industrial Co.		☐
	13	2367219	GB	A	2000-09-20	Vintage Global		☐
	14	2011004225	JP	A	2011-01-06	NEC Infronta Corp.		☒
	15	2000201343	JP	A	2000-07-18	Toshiba Corp.		☒

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	1	USPTO "International Search Report" mailed December 12, 2008; International Appln. No. PCT/US2008/061035, filed April 21, 2008.	☐
	2	AUSTRALIAN GOVERNMENT "Examiner's First Report" dated October 17, 2011; Australian Patent Appln. No. 2011213730.	☐

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Receipt date: 08/26/2014	Application Number	11116783 14516383 - GAU: 2444
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	First Named Inventor	R. Drew Major
	Art Unit	2444
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	Attorney Docket Number	066.0141 (P2004-04-01.1)

	3	KOREAN INTELLECTUAL PROPERTY OFFICE "Official Notice of Preliminary Rejection" issued July 28, 2011; Korean Patent Appln. No. 10-2006-7025274.	☒
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	5	FUJISAWA, HIROSHI ET AL. "Implementation of Efficient Access Mechanism for Multiple Mirror-Servers" IPSJ SIG Technical Report, vol. 2004, no. 9 (2004-DPS-116), January 30, 2004, Information Processing Society of Japan, pp. 37-42	☒
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	7	USPTO INTERNATIONAL SEARCHING AUTHORITY "International Search Report and Written Opinion," mailed November 5, 2008; International Appln. No. PCT/US2008/009281, filed August 1, 2008.	☐
	8	ZHANG, XINYAN ET AL. "CoolStreaming/DONet: A Data-Driven Overlay Network for Peer-to-Peer Live Media Streaming" IEEE 2005.	☐
	9	GUO, YANG "DirectStream: A Directory-Based Peer-To-Peer Video Streaming Service" LexisNexis, Elsevier B.V. 2007.	☐
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	11	REJAIE, REZA ET AL. "Architectural Considerations for Playback of Quality Adaptive Video Over the Internet" University of Southern California, Information Sciences Institute, 1998.)	☐
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	Attorney Docket Number	066.0141 (P2004-04-01.1)

	14	KOZAMERNIK, FRANC "Media Streaming Over the Internet - An Over of Delivery Technologies" EBU Technical Review, October 2002.	☐
	15	LIENHART, RAINER ET AL. "Challenges in Distributed Video Management and Delivery" Intel Corporation, EECS Dept., UC Berkeley, 2000-2002.	☐
	16	JAPAN PATENT OFFICE "Final Office Action" mailed February 28, 2012 in Patent Application No. 2007-511070 filed on October 26, 2006.	☒
	17	JAPAN PATENT OFFICE "Interrogation" mailed November 06, 2012 in Patent Application No. 2007-511070 filed on October 26, 2006.	☒
	18	CANADIAN INTELLECTUAL PROPERTY OFFICE "Office Action" mailed September 09, 2013 in Patent Application No. 2,564,861 filed on October 30, 2006.	☐
	19	USPTO "Office Action" mailed September 13, 2013 in Patent Application No. 13/757,571 filed on February 01, 2013.	☐
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	21	EUROPEAN PATENT OFFICE "Extended Search Report" dated July 10, 2014 in Patent Application No. 12154559.4 filed on September 20, 2002.	☐
	22	NGUYEN, Thinh, "Multiple Sender Distributed Video Streaming" in IEEE Transactions on Multimedia, Volume 6, No. 2, Published April 2, 2004.	☐
	23	WEBLIO, The Meaning of Performance Factor --- English-Japanese Weblio Dictionary, [online], February 24, 2012; retrieved from the internet - URL:http://ejje, weblio.jp/content/performance+factor	☐
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	First Named Inventor	R. Drew Major
	Art Unit	2444
	Examiner Name	Donabed, Ninos J.
	Attorney Docket Number	066.0141 (P2004-04-01.1)

	25	TAKESHI YOSHIMURA ET AL., Mobile Streaming Media CDN Enabled by Dynamic SMIL, WWW2002, May 7-11, 2002; retrieved from the Internet at http://www2002.org/CDROM/refereed/515/	☐
	26	CANADIAN INTELLECTUAL PROPERTY OFFICE, Office Action, mailed October 15, 2012 for Patent Application No. 2,564,861.	☐
	27	CLEMENT, B., Move Networks Closes $11.3 Million on First Round VC Funding, Page One PR, Move Networks, Inc. Press Releases, February 7, 2007, http://www.move.tv/press/press20070201.html.	☐
	28	MOVE NETWORKS, INC., The Next Generation Video Publishing System, April 11, 2007; http://www.movenetworks.com/wp-content/uploads/move-networks-publishing-system.pdf.	☐
	29	U.S. Patent and Trademark Office, Non-Final Office Action, dated August 7, 2014 for U.S. Patent Application No. 14/106,051.	☐

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	First Named Inventor	R. Drew Major
	Art Unit	2444
	Examiner Name	Donabed, Ninos J.
	Attorney Docket Number	066.0141 (P2004-04-01.1)

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

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☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/BRETT A. CARLSON/	Date (YYYY-MM-DD)	2014-08-20
Name/Print	Brett A. Carlson	Registration Number	39928

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*	**Application Number**	11/116,783
	Filing Date	April 28, 2005
	First Named Inventor	Major, R. Drue
	Group Art Unit	2444
	Examiner Name	Donabed, Ninos J.
Sheet 1 of 1	Attorney Docket No: 8532P001	

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Examiner Initial *	**Cite No [1]**	**USP Document Number**	**Publication or Issue Date MM-DD-YYYY**	**Name of Patentee or Applicant of cited Document**	**Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear**
		US-20030204519A1	10/30/2003	Sirivara, et al.	
		US-7408984B2	08/05/2008	Lu, et al.	

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				First Named Inventor:	Major, R. Drew
				Art Unit	2444
				Examiner Name	Donnabed, Ninos J.
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		Final Office Action for 11/673,483, February 4, 2010, 21 pages.	
		Advisory Action for 11/673,483, April 9, 2010, 3 pages.	
		Advisory Action for 11/673,483, May 26, 2010, 3 pages.	

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Application Number	11/116,783
Filing Date	April 28, 2005
First Named Inventor:	Major, R. Drew
Art Unit	2444
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		US-	6,389,473	05/14/2002	Carmel et al.	
		US-	7,818,444	10/19/2010	Brueck, et al.	
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Substitute for Form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Application Number	11/116,783
				Filing Date	April 28, 2005
				First Named Inventor:	R. Drew Major
				Art Unit	2444
				Confirmation No.	5535
				Examiner Name	Donabed, Ninos J.
Sheet	**1**	**of**	**1**	Attorney Docket Number	8532P001

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		WICKER, Stephen B., "ERROR CONTROL SYSTEMS for Digital Communication and Storage", Prentice-Hall, Inc., New Jersey, USA, 1995 (Book: see NPL's Parts 1-6)	

Examiner Signature	/Ninos Donabed/	Date Considered	02/04/2010

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(use as many sheets as necessary)				Filing Date	April 28, 2005
				First Named Inventor:	R. Drew Major
				Art Unit	2444
				Examiner Name	Donabed, Ninos J
Sheet	1	of	1	Attorney Docket Number	8532P001

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		PCT Notification of Transmittal of the International Search Report and Written Opinion of the International Searching Authority, for PCT/US05/15091, October 29, 2007, 8 pages.	
		PCT Notification of Transmittal of International Preliminary Report on Patentability, for PCT/US05/15091, October 29, 2007, 6 pages.	
		Office Action for 11/673,483, July 9, 2009, 14 pages.	
		Office Action for 11/673,483, February 3, 2009, 9 pages.	
		ALBANESE, Andres, et al. "Priority Encoding Transmission", TR-94-039, August 1994, 36 pages, International Computer Science Institute, Berkeley, California.	
		PURI, Rohit, et al. "Multiple Description Source Coding Using Forward Error Correction Codes", October 1999, 5 pages, Department of Electrical Engineering and Computer Science, University of California, Berkeley, California.	
		GOYAL, Vivek K., "Multiple Description Coding: Compression Meets the Network", September 2001, pages 74-93, IEEE Signal Processing Magazine.	

Examiner Signature	/Ninos Donabed/	Date Considered	02/04/2010

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[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English Translation is attached.

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Substitute for form 1449A/PTO	Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*	**Application Number**	11/116,783
	Filing Date	April 28, 2005
	First Named Inventor	Major, R. Drew
	Group Art Unit	2444
	Examiner Name	Donabed, Ninos
Sheet 1 of 1	Attorney Docket No: 8532P001	

US PATENT DOCUMENTS

Examiner Initial *	Cite No [1]	USP Document Number	Publication or Issue Date MM-DD-YYYY	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-20030005455A1	01/02/2003	Bowers	
		US-20040054551A1	03/18/2004	Ausubel, et al.	
		US-20040143672A1	07/22/2004	Padmanabham, et al.	
		US-20040170392	09/02/2004	Lu, et al.	
		US-20080162713	07/03/2008	Bowra, et al.	
		US-6486803B1	11/26/2002	Luby, et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No [1]	Foreign Patent Document — Country Code/Number/Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T [2]

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No [1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T [2]

EXAMINER /Ninos Donabed/ **DATE CONSIDERED** 02/04/2010

Based on PTO/SB/08A(09-06) - Substitute Disclosure Statement Form (PTO-1449) as modified by BSTZ 03/26/07

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Substitute for Form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Complete if Known	
Application Number	11/116,783
Filing Date	April 28, 2005
First Named Inventor:	R. Drew Major
Art Unit	2144
Examiner Name	Donabed, Ninos J
Attorney Docket Number	8532P001

Sheet	**1**	**Of**	**1**

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (If known)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-	2002/0174434 A1	11-21-2002	Lee et al.	
		US-	2003/0067872 A1	04-10-2003	Harrell et al.	
		US-	2004/0030797 A1	02-12-2004	Akinlar et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
		WO 00/67469	11-09-2000	Hannuksela (Nokia Mobil Phones Ltd.)		
		CA 2466482	05-22-2003	Doron et al. (Musicmatch, Inc.)		

NON-PATENT LITERATURE

Examiner Initials*			T[2]
		Supplemental European Search Report, September 30, 2008, (3 pages)	

Examiner Signature	/Ninos Donabed/	Date Considered	02/13/2009

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Complete if Known	
Application Number:	11/116,783
Filing Date:	April 28, 2005
First Named Inventor:	R. Drew Major
Art Unit:	2144
Examiner Name:	Donabed, Ninos J
Attorney Docket Number:	8532.P001

Sheet	**1**	**of**	**2**

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (If known)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-	6,091,775	07-18-2000	Hibi et al.	
		US-	6,091,777	07-18-2000	Guetz et al.	
		US-	6,510,553 B1	01-21-2003	Hazra	
		US-	6,731,600 B1	05-04-2004	Patel et al.	
		US-	6,732,183 B1	05-04-2004	Graham	
		US-	6,968,387 B2	11-22-2005	Lanphear	
		US-	7,075,986 B2	07-11-2006	Girod et al.	
		US-	7,349,976 B1	03-25-2008	Glaser et al.	
		US-	2002/0073167 A1	06-13-2002	Powell et al.	
		US-	2005/0123058 A1	06-09-2005	Greenbaum et al.	
		US-	2007/0024705 A1	02-01-2007	Richter et al.	
		US-	2008/0028428 A1	01-31-2008	Jeong et al.	
		US-	2008/0056373 A1	03-06-2008	Newlin et al.	
		US-	2008/0195744 A1	08-14-2008	Bowra et al.	
		US-	2008/0195745 A1	08-14-2008	Bowra et al.	
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Examiner Signature	/Ninos Donabed/	Date Considered	02/13/2009

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Substitute for Form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				Application Number	11/116,783
				Filing Date	April 28, 2005
				First Named Inventor:	R. Drew Major
				Art Unit	2144
				Examiner Name	Donabed, Ninos J
Sheet	2	of	2	Attorney Docket Number	8532.P001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document: Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
		EP 0 711 077 A2	05-08-1996	Haskell et al. (AT&T Corp)		
		EP 0 919 952 A1	06-02-1999	Mattavelli et al. (Ecole Poly.)		
		EP 1 641 271 A2	03-29-2006	Klemets et al. (Microsoft Corp.)		
		EP 1 670 256 A2	06-14-2006	Klemets et al. (Microsoft Corp.)		
		EP 1 777 969 A1	04-25-2007	__ (British Telecommunications)		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T[2]
		PATHAN, Al-Mukaddim, et al., "A Taxonomy and Survey of Content Delivery Networks", Australia, February 2007. Available at http://www.gridbus.org/reports/CDN-Taxonomy.pdf	
		On2 Technologies, Inc., "TrueMotion VP7 Video Codec", White Paper, Document Version 1.0, January 10, 2005, (13 pages).	

Examiner Signature	/Ninos Donabed/	Date Considered	02/13/2009

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(Not for submission under 37 CFR 1.99)

Application Number	11116783
Filing Date	2005-04-28
First Named Inventor	R. Drew Major
Art Unit	2143
Examiner Name	
Attorney Docket Number	2082.2.1

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4535355		1985-08-13	Arn et al.	
	2	5953506		1999-09-14	Kalra et al.	
	3	6490627	B1	2002-12-03	Kalra et al.	
	4	6574591	B1	2003-06-03	Kleiman et al.	
	5	6604118	B2	2003-08-05	Kleiman et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Application Number	11116783
Filing Date	2005-04-28
First Named Inventor	R. Drew Major
Art Unit	2143
Examiner Name	
Attorney Docket Number	2082.2.1

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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FORM PTO-1449 **LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT** (use several sheets if necessary)	SERIAL NO. 11/116,783	ATTORNEY DOCKET NO. 2082.2.1
	FILING DATE April 28, 2005	GROUP ART UNIT 2155
	APPLICANT(S): R. Drew Major	

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	A1	6,195,680	02/27/2001	Goldszmidt et al.	709/203	07/23/1998
	A2	6,366,614	04/02/2002	Pian et al.	375/240.02	10/11/1996
	A3	2003/0151753	08/14/2003	Li et al.	358/1.9	06/27/2002
	A4	2005/0108414	05/19/2005	Taylor et al.	709/231	11/15/2004

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION	
						YES	NO

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EXAMINER INITIAL		DOCUMENT (Including Author, Title, Source, and Pertinent Pages

EXAMINER /Ninos Donabed/	**DATE CONSIDERED** 05/08/2008

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Robert Drew Major
Art Unit	
Examiner Name	
Attorney Docket Number	066.0141C1_P2004-04-01.2

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7096271	B1	2006-08-22	Omoigui et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20040031054	A1	2004-02-12	Dankworth et al.	
	2	20040003101	A1	2004-01-01	Roth et al.	
	3	20030135631	A1	2003-07-17	Li et al.	
	4	20020188745	A1	2002-12-12	Hughes et al.	
	5	20040093420	A1	2004-05-13	Gamble	

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Receipt date: 10/16/2014	Application Number	14516303 - GAU: 2444
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	
	First Named Inventor	Robert Drew Major
	Art Unit	
	Examiner Name	
	Attorney Docket Number	066.0141C1_P2004-04-01.2

	6	20020144276	A1	2002-10-03	Radford et al.	
	7	20040071209	A1	2004-04-15	Burg et al.	
	8	20030152036	A1	2003-08-14	Quigg Brown et al.	
	9	20030107994	A1	2003-06-12	Jacobs et al.	
	10	20030081582	A1	2003-05-01	Jain et al.	
	11	20050033855	A1	2005-02-10	Moradi et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Receipt date: 10/16/2014	Application Number	14516303 - GAU: 2444
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	
	First Named Inventor	Robert Drew Major
	Art Unit	
	Examiner Name	
	Attorney Docket Number	066.0141C1_P2004-04-01.2

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Examiner Signature	/Ninos Donabed/	Date Considered	05/19/2015

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	
	First Named Inventor	Robert Drew Major
	Art Unit	
	Examiner Name	
	Attorney Docket Number	066.0141C1_P2004-04-01.2

CERTIFICATION STATEMENT

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☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/BRETT A. CARLSON/	Date (YYYY-MM-DD)	2014-10-16
Name/Print	Brett A. Carlson	Registration Number	39928

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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.D./

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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BIB DATA SHEET

CONFIRMATION NO. 4898

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/516,303	10/16/2014	709	2444	066.0141C1_P2004-04-01.2

APPLICANTS
ECHOSTAR TECHNOLOGIES L.L.C., Englewood, CO

INVENTORS
Robert Drew Major, Orem, UT;
Mark B. Hurst, Cedar Hills, UT;

**** CONTINUING DATA ***************************
This application is a CON of 11/116,783 04/28/2005 PAT 8868772
which claims benefit of 60/566,831 04/30/2004

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
10/23/2014

Foreign Priority claimed ❑ Yes ☑ No 35 USC 119(a-d) conditions met ❑ Yes ☑ No Verified and Acknowledged // Examiner's Signature	❑ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		UT	7	20	3

ADDRESS
INGRASSIA FISHER & LORENZ, P.C. (EchoStar)
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253
UNITED STATES

TITLE
APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

FILING FEE RECEIVED		
1600	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	❑ All Fees ❑ 1.16 Fees (Filing) ❑ 1.17 Fees (Processing Ext. of time) ❑ 1.18 Fees (Issue) ❑ Other _____ ❑ Credit

Doc Code: DIST.E.FILE **Document Description: Electronic Terminal Disclaimer - Filed**	PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT**
Application Number	14516303
Filing Date	16-Oct-2014
First Named Inventor	Robert Major
Attorney Docket Number	066.0141C1_P2004-04-01.2
Title of Invention	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
Echostar Technologies L.L.C.	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

8868772

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

◉ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

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Page 214

○ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status: ○ Small Entity ○ Micro Entity ◉ Regular Undiscounted I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application Registration Number 39928 ○ A sole inventor ○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ○ A joint inventor; all of whom are signing this request	
Signature	/Brett A. Carlson/
Name	Brett A. Carlson

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	14516303
Filing Date:	16-Oct-2014
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Filer:	Brett Carlson/Brent Frazier
Attorney Docket Number:	066.0141C1_P2004-04-01.2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Statutory or Terminal Disclaimer	1814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**160**

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 14516303

Filing Date: 16-Oct-2014

Applicant/Patent under Reexamination: Major et al.

Electronic Terminal Disclaimer filed on December 21, 2015

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	24433974
Application Number:	14516303
International Application Number:	
Confirmation Number:	4898
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Customer Number:	70560
Filer:	Brett Carlson/Brent Frazier
Filer Authorized By:	Brett Carlson
Attorney Docket Number:	066.0141C1_P2004-04-01.2
Receipt Date:	21-DEC-2015
Filing Date:	16-OCT-2014
Time Stamp:	19:17:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$160
RAM confirmation Number	7048
Deposit Account	502091
Authorized User	CARLSON, BRETT A.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Electronic Terminal Disclaimer-Filed	eTerminal-Disclaimer.pdf	33477 fd4753c5570fc6fac79da2beae611a336b1a16c8	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30781 a078ae161486d68fcfa6333b8cd76af6e24cb761	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	64258		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial. No.:	14/516,303	Confirmation No.:	4898
Filed:	October 16, 2014	Customer No.:	54583
Art Unit:	2444		
Examiner:	Ninos Donabed		
Title:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT		

Attorney Docket No.: 066.0141C1 (P2004-04-01.2)

RESPONSE TO OFFICE ACTION
FILED UNDER 37 C.F.R. § 1.111

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

FILED ELECTRONICALLY USING THE PTO-EFS SYSTEM

Commissioner:

This paper is responsive to the Office Action mailed on June 19, 2015 (See MPEP 710.05). Please continue to examine the above-referenced application by entering the following amendments and by considering the remarks that follow.

Amendments to the Claims begin on the following page (page 2).

Remarks begin on page 7 of this paper.

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LISTING OF CLAIMS

PLEASE AMEND THE CLAIMS WITHOUT PREJUDICE OR DISCLAIMER TO READ AS FOLLOWS:

Claims 1-10 (Cancelled).

11 (Currently Amended). An end user station ~~system~~ for adaptive-rate content streaming of digital content from a video server over a data communications network, the ~~system~~ end user station comprising:

~~a data communications network;~~

~~a content server coupled to the data communications network and having a content module configured to process content and to generate a plurality of high and low quality streams;~~

~~each of the high, and low quality streams comprising a plurality of streamlets;~~

~~an agent controller module configured to simultaneously request at least portions of a plurality of streamlets;~~

~~the agent controller module further configured to continuously monitor the progress of subsequent responses to streamlet requests, and in accordance with the progress of the responses, request higher or lower-quality streamlets; and~~

~~a staging module configured to stage the streamlets and arrange the streamlets for playback on a content player~~

a media player operating on the end user station configured to stream a video from the video server, wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files, wherein each of the files yields a different portion of the video on playback, wherein the files across the different copies yield the same portions of the video on playback, and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the media player streams the video by:

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requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;

automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time; and

presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

12 (Currently Amended). The ~~system~~ end user station of claim 11, wherein the ~~agent controller module~~ media player is configured to establish multiple Transmission Control protocol (TCP) connections with the content server~~, and to request streamlets of varying bitrates~~.

13 (Cancelled).

14 (Currently Amended). The ~~apparatus~~ end user station of ~~claim 13~~ claim 11, wherein ~~the agent controller module~~ media player is configured to generate a performance factor according to the responses to ~~streamlet~~ segment requests.

15 (Currently Amended). The ~~system~~ end user station of claim 14, wherein the ~~agent controller module~~ media player is configured to upshift to a higher quality ~~streamlet~~ copy of files when the performance factor is greater than a selected threshold and the ~~agent controller module~~ media player determines the higher quality playback can be sustained according to a combination of factors.

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16 (Currently Amended). The end user station of claim 14 wherein the media player is configured to upshift to a higher quality segment when the performance factor is greater than a selected threshold and the media player determines that the higher quality playback can be sustained according to ~~system of claim 15, wherein the combination of factors is selected from the group consisting of~~ an amount of contiguously available ~~streamlets~~ files stored ~~in the staging module, a minimum safety margin, and a current read ahead margin~~ by the media player.

17 (Currently Amended). The ~~system~~ end user station of claim 14, wherein the ~~agent controller module~~ media player is configured to downshift to a lower quality ~~streamlet~~ copy of the video when the performance factor is less than a ~~second~~ selected threshold.

18 (Currently Amended). The ~~system~~ end user station of claim 11, wherein the ~~agent controller module~~ media player is further configured to anticipate ~~streamlet~~ file requests and to pre-request ~~streamlets~~ files to enable fast-forward, skip randomly, and rewind functionality.

19 (Currently Amended). The ~~system~~ end user station of claim 11, wherein the ~~agent controller module~~ media player is configured to initially request low quality ~~streamlets~~ files to enable instant playback of the ~~content file~~ video, and to subsequently upshift~~ing~~ to a better quality copy of the video according to the performance factor.

20 (Currently Amended). A method executable by an end user station to present ~~for presenting~~ rate-adaptive streams, the method comprising;

~~simultaneously requesting at least portions of a plurality of streamlets;~~

~~continuously monitoring the progress of subsequent responses to streamlet requests, and in accordance with the progress of the responses, requesting higher or lower quality streamlets; and~~

~~staging the streamlets and arranging the streamlets for playback on a content player~~

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streaming by a media player operating on the end user station a video from a video server, wherein multiple different copies of the video encoded at different bit rates are stored as multiple sets of files on the server, wherein each of the files yields a different portion of the video on playback, wherein the files across the different copies yield the same portions of the video on playback, and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the streaming comprises:

requesting by the media player a plurality of sequential files of one of the copies from the server based on the time indexes;

automatically requesting by the media player from server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the factor relates to the performance of the network; and

making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time; and

presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

21 (New). The method of claim 20, wherein said requesting the plurality of sequential files includes requesting sub-parts of the files over a plurality of different TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts.

22 (New). The method of claim 20, wherein said making the successive determinations to shift comprises:

upshifting to a higher quality one of the different copies when the at least one factor is greater than a first threshold; and

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determining if the higher quality playback can be sustained.

23 (New). The method of claim 22, wherein said making the successive determinations to shift comprises downshifting to a lower quality one of the different copies when the at least one factor is less than a second threshold.

24 (New). The method of claim 20, wherein said automatically requesting includes requesting sub-parts of the files over different ones of a plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts, and wherein the factor is indicative of the available bandwidth of the plurality of TCP connections.

25 (New). The method of claim 20, wherein the factor is indicative of latency of the requested files, wherein the latency is a time measure between when one of the requests is issued and a time that response data of the request begins to arrive at the end user station.

26 (New). The method of claim 20, wherein the factor is indicative of time intervals between successive receive times for each response to the requested files.

27 (New). The method of claim 20, wherein the factor is indicative of delays or losses in one or more of the plurality of TCP connections.

28 (New). The method of claim 20, wherein the server is a web server, and wherein the files are requested from the web server using Hyper Text Transfer Protocol (HTTP).

29 (New). The method of claim 20, wherein the server comprises a cache server of a network infrastructure operator.

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REMARKS

In response to the latest Office Action, we hereby request reconsideration in view of the following remarks. No new matter has been added, and support for the amendments can be found in the originally-filed application.

Double Patenting Rejections

The Office Action rejects our claims as double patenting of the issued parent (Patent No. 8,868,772) to this application, noting that the rejection could be overcome with a Terminal Disclaimer. The requisite Terminal Disclaimer and associated fee are being filed contemporaneously with this Response, so the rejection is believed to be moot.

Although the fee will be paid with the Terminal Disclaimer, if there are any issues with payment of the Terminal Disclaimer fee, the Office is requested to charge our Deposit Account No. 50-2091 for any fees that may be due. If the Terminal Disclaimer or its associated fee are found to be deficient in any way or if any additional disclaimers are required, the Examiner is requested to contact the undersigned at 480.385.5069 prior to issuing another Office Action for resolution of any issues.

Section 101 Rejections

The Office Action rejects our claims under Section 101 as being "directed to the abstract idea of adaptive rate shifting of streaming content". We respectfully traverse the rejections because our claims relate to patentable devices and processes rather than impermissible abstract ideas under the current state of the law.

In preparing this response, we have reviewed the USPTO's Interim Examination Guidelines relating to Section 101 examination following the Alice Corp. decision, including the July 2015 updates. These guidelines provide a specific framework for analyzing Section 101 issues, as well as examples of permissible and impermissible claims.[1] In particular, if the claim relates to a statutory category (such as a process), then the Office considers whether a judicial exception (such as an abstract idea or fundamental building block) applies (step 2A). If the claim is found to recite an abstract idea or the like, then the claim is nevertheless further analyzed to determine whether the features unambiguously improve an existing technical process that would transform the

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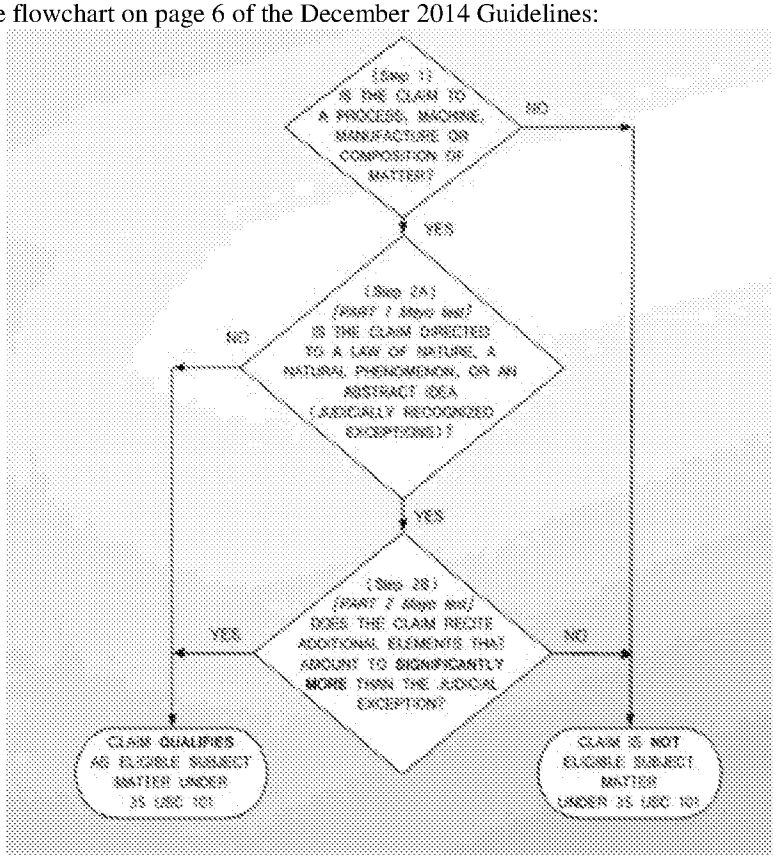
claim into eligible subject matter (step 2B). If the claim does not recite a judicial exception on its face, however, then there is no need to proceed to step 2B at all.[2]

In the present case, our claims facially recite a process to adaptively deliver data files representing video content from servers to client devices over a computer network. This is a distinctly technical invention in that it only rises in the realms of digital video streaming over computer networks. The invention has no meaning apart from the technical realm; it certainly could not be performed by a human operator or by anything other than manufactured computing machinery. Our claims therefore relate to technical innovations and processes rather than just broad business practices. Our claims are rooted in computer technology for solving a particular problem that only arises in the context of video streaming over data networks: our inventions are processes and devices that are inherently technical in nature. To that end, the instant claims do not contemplate fundamental building blocks, nor do they recite an abstract idea under any reasonable interpretation of Alice Corp.

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[1] See, e.g., http://www.uspto.gov/patents/law/exam/abstract_idea_examples.pdf

[2] See, for example, the flowchart on page 6 of the December 2014 Guidelines:



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Nonetheless, assuming, *arguendo*, that the pending claims did recite fundamental building blocks or an abstract idea (they do not), the additional claimed features unambiguously improve an existing technological process, and thus transform the claimed device and method into patent eligible subject matter.

The claimed invention addresses the technology-centric challenge of adaptively streaming video content between devices communicating via a network. This is addressed through the use of multiple copies of the video content that share a common index, and by the other features of our claims. These are meaningful limitations that add more than generally linking the use of an abstract idea (the general concept of video streaming) to the network, because they solve a technology-centric problem with a claimed solution that is necessarily rooted in computer technology, similar to the additional elements in the Federal Circuit's DDR Holdings case. Our claims recite additional limitations that when considered as an ordered combination demonstrates a technologically rooted solution to a technology-centric problem, thus amounting to significantly more than a fundamental economic practice, a method of organizing human activity, an idea of itself, or a mathematical relationship/formula.

Because our claims make no attempt to cover an abstract idea or other judicially-created exception to Section 101, our claims recite patentable subject matter under Step 2A of the USPTO's framework. We respectfully request reconsideration of the Section 101 rejections, especially in view of our amended claims.

Section 112 Rejections

The Office Action rejects our claims under Section 112 for several reasons. While we do not consent to the rejections and we expressly reserve the right to revisit the original claims at a later date (or in a continuing application), we have made numerous changes to our claims in the interest of expediting prosecution. These amendments have removed much of the language that was rejected by the Examiner, so we respectfully request reconsideration of the Section 112 rejections in view of the amended claims.

We do respectfully dispute that the word "streamlet" is vague and unclear. It is axiomatic that applicant is allowed to be his own lexicographer, and the word "streamlet" is consistently used throughout our specification to refer to a segment of a video stream. See, e.g., FIG. 2C and accompanying text. While we have amended our

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claim to refer to files rather than "streamlets" in the interest of advancing prosecution, a person skilled in the art would have been able to easily construe the "streamlet" language, as the Examiner has done in the Office Action.

We also dispute that the "modules" are unclear. Paragraph 0038 of our Specification clearly states that "modules" may be implemented in software for execution by various types of processors. Each of the specific modules referenced in our originally-filed claims find support in the originally-filed specification.

Please note that we do not intend any of our claim elements to be interpreted in view of 35 USC § 112, paragraph 6 or its post-AIA equivalent. A detailed Section 112 analysis of the originally-filed claims is moot in view of the claim amendments. We do not consent to the rejections or to the Section 112 paragraph 6 interpretation, however, and we expressly reserve the right to revisit the original language at a later date.

At present, however, we respectfully request reconsideration of the Section 112 rejections in view of the amended claims.

Prior Art Rejections

The Office Action requests clarification of the differences between our claims and the combined teachings of US Patent Publication No. 2002/0144276 ("Radford") in view of the "Intelligent Streaming" publication by Bill Birney ("Birney"). We respectfully request reconsideration of the rejections in view of the information pointed out below.

The Office Action acknowledges that the primary Radford reference does not teach the previously-claimed features relating to continuously monitoring the progress of subsequent responses to streamlet requests and, in accordance with the progress of the responses, to request higher or lower quality streamlets. This feature is alleged to be taught by the Birney publication.

Our claims have been amended by this response, and the Examiner is requested to kindly reconsider the new claim langauge after entry of the foregoing amendments. Additionally, the Examiner is requested to review the Board Decision dated July 23, 2014 in the parent to this application, which held that the Birney reference failed to disclose at least that "each of a plurality of different copies of the video encoded at different bit rates is stored as multiple files". See page 4 of the Board Decision. Our independent claims now recite similar features.

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The prior art rejections set forth in the Office Action are no longer believed to be relevant, especially after entry of the foregoing amendments. We therefore respectfully request reconsideration of the various prior art rejections that are set forth in the Office Action.

Conclusion

Should the Examiner have any suggestions that would advance prosecution, we would welcome a telephone call at (480) 385-5069. *The Examiner is authorized to communicate with the undersigned via email for informal correspondence or to exchange draft documents, including proposed amendments.*

If any time extension or additional fee is required to consider this response or the associated Terminal Disclaimer, or to otherwise prevent abandonment of this application, please consider this as a request for an extension of time and as authorization to charge Deposit Account No. 50-2091 for any fees that may be due.

Respectfully submitted,

INGRASSIA, FISHER & LORENZ P.C.

Dated: Monday, December 21, 2015
(See MPEP 710.05)

By: /Brett A. Carlson /
Brett A. Carlson
Reg. No. 39,928

Customer No. 70560
480-385-5060

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Page 231

Electronic Patent Application Fee Transmittal

Application Number:	14516303
Filing Date:	16-Oct-2014
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Filer:	Brett Carlson/Brent Frazier
Attorney Docket Number:	066.0141C1_P2004-04-01.2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	1253	1	1400	1400
Miscellaneous:				
			Total in USD ($)	**1400**

Electronic Acknowledgement Receipt

EFS ID:	24433946
Application Number:	14516303
International Application Number:	
Confirmation Number:	4898
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Customer Number:	70560
Filer:	Brett Carlson/Brent Frazier
Filer Authorized By:	Brett Carlson
Attorney Docket Number:	066.0141C1_P2004-04-01.2
Receipt Date:	21-DEC-2015
Filing Date:	16-OCT-2014
Time Stamp:	19:20:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1400
RAM confirmation Number	7098
Deposit Account	502091
Authorized User	CARLSON, BRETT A.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		20151221_Response_P2004-04-01-2.pdf	154661 0a34f748f7f71c9f3d84608eb6a11877a3b5bb97	yes	11

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	6
Applicant Arguments/Remarks Made in an Amendment	7	11

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30941 75f8b92e8158c6065c4c9a565b5dd4ec5dbbe3e3	no	2

Warnings:

Information:

Total Files Size (in bytes):	185602

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/516,303	Filing Date 10/16/2014	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **12/21/2015**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/CHERYL CLARK/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PLUS Search Results for S/N 14516303, Searched Fri Mar 18 13:55:12 EDT 2016

The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

8868772 99
20050262257 99
20150039782 99
7818444 90
8402156 90
8612624 90
8683066 90
9071668 90
9100585 90
20080195743 90
20090043906 90
20100106847 90
20100107206 90
20110035507 90
20130013800 90
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20140207966 90
20150256585 90
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6757894 74
7051315 74
7197570 74
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4157250 61
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4505724 61
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20030235523 61
20040255605 61
20060242903 61
20120311174 59
3800053 57
4004594 57
4346524 57
4452256 57

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/516,303	Filing Date 10/16/2014	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **03/21/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/DONNA 1. SMALLS LOGAN/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

70560 7590 03/31/2016

INGRASSIA FISHER & LORENZ, P.C. (EchoStar)
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253

EXAMINER
DONABED, NINOS

ART UNIT	PAPER NUMBER
2444	

DATE MAILED: 03/31/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/516,303	10/16/2014	Robert Drew Major	066.0141C1_P2004-04-01.2	4898

TITLE OF INVENTION: APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/30/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

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Exhibit 1002
Page 239

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

70560 7590 03/31/2016
INGRASSIA FISHER & LORENZ, P.C. (EchoStar)
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/516,303	10/16/2014	Robert Drew Major	066.0141C1_P2004-04-01.2	4898

TITLE OF INVENTION: APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/30/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
DONABED, NINOS	2444	709-231000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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Exhibit 1002
Page 240

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/516,303	10/16/2014	Robert Drew Major	066.0141C1_P2004-04-01.2	4898

70560 7590 03/31/2016

INGRASSIA FISHER & LORENZ, P.C. (EchoStar)
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253

EXAMINER	
DONABED, NINOS	

ART UNIT	PAPER NUMBER
2444	

DATE MAILED: 03/31/2016

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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Exhibit 1002
Page 241

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/516,303	Applicant(s) MAJOR ET AL.	
	Examiner NINOS DONABED	Art Unit 2444	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amnedment dated 12/21/2015 and interview 3/17/2016*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *11, 12, 14-16, 18-22, 24-29*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☒ Interview Summary (PTO-413), Paper No./Mail Date *3/17/2016* .
5. ☒ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/NINOS DONABED/
Primary Examiner, Art Unit 2444

1. The present application is being examined under the pre-AIA first to invent provisions.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Brett Carlson #39928 on 3/17/2016.

The application has been amended as follows:

11 (Previously Presented). An end user station for adaptive-rate content streaming of digital content from a video server over a ~~data communications~~ network, the end user station comprising:

a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network, wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files, wherein each of the files yields a different portion of the video on playback, wherein the files across the different copies yield the same portions of the video on playback, and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the media player streams the video by:

requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;

automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and

presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

12 (Currently Amended). The end user station of claim 11, wherein the at least one TCP connection comprises ~~media player is configured to establish~~ multiple Transmission Control protocol (TCP) connections with the content server.

13 (Cancelled).

14 (Currently Amended). The end user station of claim 11, wherein the media player is configured to generate ~~a performance~~ the factor according to the responses to segment requests.

15 (Currently Amended). The end user station of ~~claim 14~~ claim 11, wherein the media player is configured to upshift to [[a]] the higher quality copy ~~of files~~ when the ~~performance~~ factor is greater than ~~a selected~~ the first threshold and the media player determines the higher quality playback can be sustained according to a combination of factors.

16 (Previously Presented). The end user station of ~~claim 14~~ claim 11 wherein the media player is configured to upshift to [[a]] the higher quality ~~segment~~ copy when the performance factor is greater than ~~a selected~~ the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player.

17 (Cancelled).

18 (Previously Presented). The end user station of claim 11, wherein the media player is further configured to anticipate file requests and to pre-request files to enable fast-forward, skip randomly, and rewind functionality.

19 (Previously Presented). The end user station of claim 11, wherein the media player is configured to initially request low quality files to enable instant playback of the video, and to subsequently upshift to a better quality copy of the video according to the performance factor.

20 (Currently Amended). A method executable by an end user station to present rate-adaptive streams received via at least one transmission control protocol (TCP) connection with a server over a network, the method comprising;

streaming, by a media player operating on the end user station, a video from [[a]] the ~~video~~ server via the at least one TCP connection over the network, wherein multiple different copies of the video encoded at different bit rates are stored as multiple sets of files on the server, wherein each of the files yields a different portion of the video on playback, wherein the files across the different copies yield the same portions of the video on playback, and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the streaming comprises:

requesting by the media player a plurality of sequential files of one of the copies from the server based on the time indexes;

automatically requesting by the media player from the server subsequent portions of the video by requesting for each such portion one of the files from one of the

copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the factor relates to the performance of the network; and

making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time, wherein the making the successive determinations to shift comprises upshifting to a higher quality one of the different copies when the at least one factor is greater than a first threshold and downshifting to a lower quality one of the different copies when the at least one factor is less than a second threshold; and

presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

21 (Currently Amended). The method of claim 20, wherein ~~said~~ the at least one TCP connection comprises a plurality of different TCP connections, and wherein the requesting the plurality of sequential files includes requesting sub-parts of the files over [[a]] different ones of the plurality of different TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts.

22 (Currently Amended). The method of claim 20, wherein said making the successive determinations to shift comprises:

~~upshifting to a higher quality one of the different copies when the at least one factor is greater than a first threshold; and~~

determining if the higher quality playback can be sustained.

23 (**Cancelled**).

24 (Currently Amended). The method of claim 20, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the ~~said~~ automatically requesting includes requesting sub-parts of the files over different ones of [[a]] the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts, and wherein the factor is indicative of the available bandwidth of the plurality of TCP connections.

25 (Previously Presented). The method of claim 20, wherein the factor is indicative of latency of the requested files, wherein the latency is a time measure between when one of the requests is issued and a time that response data of the request begins to arrive at the end user station.

26 (Previously Presented). The method of claim 20, wherein the factor is indicative of time intervals between successive receive times for each response to the requested files.

27 (Currently Amended). The method of claim 20, wherein the factor is indicative of delays or losses in one or more of the ~~plurality of TCP connections~~ at least one TCP connection.

28 (Currently Amended). The method of claim 20, wherein the server is a web server, and wherein the files are requested from the web server using Hyper Text Transfer Protocol (HTTP) messages sent via the at least one TCP connection.

29 (Previously Presented). The method of claim 20, wherein the server comprises a cache server of a network infrastructure operator.

Please cancel claims 1-10, 13, 17, 23.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance: Claims 11-12, 14-16, 18-22, 24-29 are allowable over the prior art of record: the closest prior art of record : the closest prior art of record (Birney "Intelligent Streaming") does not teach or suggest in detail "stream a video from the video server via at least one transmission control protocol (TCP) connection over the network, wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of

files, wherein each of the files yields a different portion of the video on playback, wherein the files across the different copies yield the same portions of the video on playback, and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the media player streams the video by:requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network; making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time" in combination with all the elements of the independent claim as argued by the Applicant.

Birney teaches multiple copies of the same stream being stored on a server at different bit rates with the same time index used to switch between the streams based on network bandwidth limitations. Whereas, stated above, Applicant's claimed invention states "stream a video from the video server via at least one transmission control protocol (TCP) connection over the network, wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files, wherein each of the files yields a different portion of the video on playback, wherein the files across the different copies yield the same portions of the video on playback, and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the media player streams the video by:requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network; making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player

upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time". So as indicated in the above statements. Applicant's arguments have been considered persuasive, in light of the claims limitation as well as the enabling portions of the specification.

Examiner has also reviewed current independent claim language against the allowed and patented independent claim languages of parent case 8868772. Examiner has reviewed the search strategies and results of parent case. Examiner finds those search strategies and results are still applicable to current claimed invention. Examiner has performed further text and interference searches on current independent claim language. Examiner has found that there is no sufficient evidence to suggest or indicate how to combine elements of prior arts as searched and identified in fully mapping into applicant's current independent claims. Applicant's claimed inventions are thus allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NINOS DONABED whose telephone number is

(571)272-8757. The examiner can normally be reached on Monday-Friday, 7:30 AM-5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter-Anthony Pappas can be reached on (571) 272-7646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ninos Donabed/
Examiner, Art Unit 2444

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	14/516,303	MAJOR ET AL.	
	Examiner	Art Unit	
	NINOS DONABED	2444	

All participants (applicant, applicant's representative, PTO personnel):

(1) *NINOS DONABED*.

(3) *Brett Carlson*.

(2) _____.

(4) _____.

Date of Interview: *17 March 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☒101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *20*.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Examiner contacted the Applicant to try and expedite the case. Examiner asked if Applicant would be willing to roll claims 23 and 22 into claim 20 and make all other independent claims parallel. The Applicant agreed to these changes. The changes can be seen in the Examiner's Amendment..

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/NINOS DONABED/ Primary Examiner, Art Unit 2444	

Notice of References Cited	Application/Control No. 14/516,303	Applicant(s)/Patent Under Reexamination MAJOR ET AL.	
	Examiner NINOS DONABED	Art Unit 2444	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2002/0161908 A1	10-2002	Benitez, Manuel Enrique	G06F8/65	709/231
*	B	US-2002/0188745 A1	12-2002	Hughes, David A.	H04L29/06027	709/231
*	C	US-2003/0021282 A1	01-2003	Hospodor, Andrew D.	H04L12/5695	370/401
*	D	US-2003/0195977 A1	10-2003	Liu, Tianming	H04L29/06027	709/231
*	E	US-2004/0179032 A1	09-2004	Huang, Ho-Chao	H04N19/61	715/723
*	F	US-2004/0199655 A1	10-2004	Davies, Neil James	H04L47/10	709/231
*	G	US-2004/0221088 A1	11-2004	Lisitsa, Rafael S.	H04L29/06027	710/316
*	H	US-2004/0267956 A1	12-2004	Leon, David	H04L12/5602	709/231
*	I	US-7,558,869 B2	07-2009	Leon; David	H04L29/06027	370/235
*	J	US-7,707,303 B2	04-2010	Albers; Bastian	H04L1/1835	709/231
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Bill Birney, Intellegent Streaming, May 2003, all pages
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Intelligent streaming framework
RS Lisitsa, DA Sather, C Hagiu - US Patent 6,766,407, 2004 - Google Patents
The present invention analyzes a user's or client application's requirements and searches for a solution based on the end-to-end latency requirements (requested or derived), data formats, control protocols, timing and synchronization, local **streaming**, and resource ...
Cited by 41 Related articles All 2 versions Cite Save

[PDF] IIS smooth **streaming** technical overview [PDF] from bogotobogo.com
A Zambelli - Microsoft Corporation, 2009 - bogotobogo.com
... 3 Windows Media Stream Thinning, MBR and **Intelligent Streaming** ..... 3 The ... Web. A Brief History of Multiple Bit Rate **Streaming** Windows Media Stream Thinning, MBR and **Intelligent Streaming** The ...
Cited by 265 Related articles All 6 versions Cite Save More

[CITATION] **Intelligent streaming**
B Birney - Microsoft Corp, 2003
Cited by 30 Related articles Cite Save

Measurements of the congestion responsiveness of windows **streaming** media [PDF] from wpi.edu
J Nichols, M Claypool, R Kinicki, M Li - ... support for digital audio and video, 2004 - dl.acm.org
... WSM supports **Intelligent Streaming** [1], an application level means of reducing the **streaming** bitrate. **Intelligent Streaming** lowers the bitrate of the stream in mid-playout during network congestion and then switch back to a higher bitrate when congestion abates. ...
Cited by 36 Related articles All 10 versions Cite Save

Intelligent streaming framework
RS Lisitsa, DA Sather, C Hagiu - US Patent 7,073,011, 2006 - Google Patents
The present invention analyzes a user's or client application's requirements and searches for a solution based on the end-to-end latency requirements (requested or derived), data formats, control protocols, timing and synchronization, local **streaming**, and resource ...
Cited by 9 Related articles All 4 versions Cite Save

Intelligent network **streaming** and execution system for conventionally coded applications
ME Benitez, AM Holler, LV Shah, DT Arai ... - US Patent ..., 2006 - Google Patents
An **intelligent** network **streaming** and execution system for conventionally coded applications provides a system that partitions an application program into page segments by observing the manner in which the application program is conventionally installed. A minimal portion ...
Cited by 130 Related articles All 4 versions Cite Save

Method and apparatus for generating and marketing video e-mail and an **intelligent** video **streaming** server
A Moradi, A Jalali - US Patent App. 10/634,733, 2003 - Google Patents
A method and apparatus for generating and sending video emails containing video and graphics, and optionally text, animation, sound, attachments and links. The graphics are produced as a skin on the computer screen and the video plays in a defined location on ...
Cited by 68 Related articles All 2 versions Cite Save

smt-SPRINTS: software precomputation with **intelligent streaming** for resource-constrained SMTs [PDF] from vt.edu
T Wang, CD Antonopoulos, ... - Euro-Par 2005 Parallel ... , 2005 - Springer
Abstract We present SPRINTS, a source-level speculative precomputation framework for scientific applications running on SMTs with two execution contexts. Our framework targets memory-bound applications and reduces memory latency by prefetching long streams of ...
Cited by 5 Related articles All 10 versions Cite Save

[PDF] **Intelligent** control for adaptive video **streaming** [PDF] from researchgate.net
V Menkovski, A Liotta - Proceedings of the International ..., 2013 - researchgate.net
Abstract---We present an autonomous learning agent for adaptive video **streaming** in best effort networks. The agent learns an optimal control strategy in regards to the delivered quality of experience without the need for implementation of a complex heuristics.
Cited by 23 Related articles All 4 versions Cite Save More

Extended **intelligent** video **streaming** system
A Moradi, A Jalali - US Patent App. 11/087,363, 2005 - Google Patents
A system for transmitting and displaying large media files uses an online **streaming** service to upload full-length movies and other video and audio files to a wide array of viewers. The system includes a robust, scalable, and fast upload technique that allows files of any size ...
Cited by 28 Related articles All 2 versions Cite Save

CoolStreaming/DONet: a data-driven overlay network for peer-to-peer live media **streaming** [PDF] from psu.edu
X Zhang, J Liu, B Li, TSP Yum - INFOCOM 2005. 24th Annual ..., 2005 - ieeexplore.ieee.org
... We propose a scalable membership and partnership management algorithm together with

an **intelligent** scheduling algorithm, which enable efficient and continuous **streaming** of medium- to high-bandwidth con- tents with low control overhead. **...**
Cited by 2136 Related articles All 30 versions Cite Save

Gigavoxels: Ray-guided **streaming** for efficient and detailed voxel rendering [PDF] from inria.fr
C Crassin, F Neyret, S Lefebvre... - Proceedings of the 2009 ..., 2009 - dl.acm.org
... Volume data can require large amounts of memory, thus limiting the scene's extent and resolution of details. The fact that the scene can no longer be held entirely in memory implies the need for **intelligent** data **streaming** from larger, but slower memory units. **...**
Cited by 198 Related articles All 37 versions Cite Save

System for capability based multimedia **streaming** over a network
A Sahai, RK Gupta, J Kothari - US Patent 6,594,699, 2003 - Google Patents
... greater than 32 MB of memory. Currently there is no way to distinguish between different clients, their hardware and software capabilities, and use that information to do **intelligent streaming** of multimedia data by the server. **...**
Cited by 264 Related articles All 2 versions Cite Save

Content provider for pull based **intelligent** caching system
G Burns, PJ Leach - US Patent 6,275,496, 2001 - Google Patents
... Intelligent network **streaming** and execution system for conventionally coded applications. US7085848, Mar 15, 2002, Aug 1, 2006, Microsoft Corporation, Time-window-constrained multicast using connection scheduling. US7191168, Sep 25, 2002, Mar 13, 2007, At&T Corp. **...**
Cited by 138 Related articles All 2 versions Cite Save

End-to-end security in the presence of **intelligent** data adapting proxies: The case of authenticating transcoded **streaming** media
C Gentry, A Hevia, R Jain, T Kawahara... - Selected Areas in ..., 2005 - ieeexplore.ieee.org
Abstract—We consider the problem of maintaining end-to-end security in the presence of **intelligent** proxies that may adaptively modify data being transmitted across a network. The video coding community considers this problem in the context of transcoding media **...**
Cited by 22 Related articles All 4 versions Cite Save

[PDF] Minimizing partial reconfiguration overhead with fully **streaming** DMA engines and **intelligent** ICAP controller [PDF] from psu.edu
S Liu, RN Pittman, A Forin - FPGA, 2010 - Citeseer
ABSTRACT Configuration overheads seriously limits the usefulness of FPGA partial reconfiguration. In this paper, we propose a combination of two techniques to minimize the overhead. First, we design and implement fully **streaming** DMA engines to saturate the **...**
Cited by 22 Related articles All 9 versions Cite Save More

Delving into internet **streaming** media delivery: a quality and resource utilization perspective [PDF] from gmu.edu
L Guo, E Tan, S Chen, Z Xiao, O Spatscheck... - Proceedings of the 6th ..., 2006 - dl.acm.org
... MBR encoding also enables dynamic stream switch among streams of different rates encoded in the object during a user session, in order to adapt to the current bandwidth, which is called **Intelligent Streaming** [4] in the Windows media service and SureStream [7] in the **...**
Cited by 94 Related articles All 18 versions Cite Save

Intelligent network **streaming** and execution system for conventionally coded applications
DT Arai, S Panwar, ME Benitez, AM Holler... - US Patent ..., 2013 - Google Patents
An **intelligent** network **streaming** and execution system for conventionally coded applications provides a system that partitions an application program into page segments by observing the manner in which the application program is conventionally installed. A minimal portion **...**
Cited by 20 Related articles All 5 versions Cite Save

Cloud-assisted adaptive video **streaming** and social-aware video prefetching for mobile users
X Wang, TT Kwon, Y Choi, H Wang... - Wireless ..., 2013 - ieeexplore.ieee.org
... user demands. Therefore, we are motivated to design a new framework of mobile adaptive video **streaming** by using virtual agents in the cloud. **INTELLIGENT STREAMING** WITH LITTLE BUFFERING DELAY Regarding the **...**
Cited by 27 Related articles All 4 versions Cite Save

Intelligent caching scheme for **streaming** file systems
D Mahashin, M Jeanson, J Su, J Alves - US Patent 7,574,560, 2009 - Google Patents
A Hard Disk Drive (HDD) is provided two FATs and two cluster sizes, a regular cluster and a "Supercluster". In one example, each Supercluster is the size of four regular clusters. A second Supercluster FAT is added (FAT2) which works in a similar manner to the original **...**
Cited by 17 Related articles All 4 versions Cite Save

Create alert

Webgroup CZ a.s.
Exhibit 1002
Page 258

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 4898

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/516,303	10/16/2014	709	2444	066.0141C1_P2004-04-01.2

APPLICANTS
ECHOSTAR TECHNOLOGIES L.L.C., Englewood, CO

INVENTORS
Robert Drew Major, Orem, UT;
Mark B. Hurst, Cedar Hills, UT;

**** CONTINUING DATA ***************************
This application is a CON of 11/116,783 04/28/2005 PAT 8868772
which claims benefit of 60/566,831 04/30/2004

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
10/23/2014

Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	☐ Yes ☑ No	/NINOS DONABED/ Examiner's Signature	☐ Initials	UT	7	~~20~~ 16	3

ADDRESS

INGRASSIA FISHER & LORENZ, P.C. (EchoStar)
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253
UNITED STATES

TITLE

APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

FILING FEE RECEIVED		
1600	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14516303	MAJOR ET AL.
	Examiner	Art Unit
	NINOS DONABED	2444

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
Conducted 101 claim analysis	5/19/2015	nd
Conducted 112 2nd paragraph analysis	5/19/2015	nd
Conducted 112 6th paragraph claim analysis	5/19/2015	nd
Conducted double patenting search (EAST, eDAN, PALM) *Inventor **Assignee	5/19/2015	nd
East Search	5/19/2015	nd
Plus Search	5/19/2015	nd
NPL Seach (Google, Google Scholar)	5/19/2015	nd
((H04L29/06027 OR H04L29/06 OR H04L65/80 OR H04L65/4084 OR H04L69/329 OR H04L65/607 OR H04L47/10 OR H04L65/608 OR H04N7/17318 OR H04L65/4076 OR H04L65/4092 OR G06Q30/02 OR H04L67/06 OR H04N21/4126 OR H04N21/434 OR H04N21/6125 OR H04N21/8456).CPC. + text searche)d	5/19/2015	nd
Updated East Search	3/18/2016	nd
((H04L29/06027 OR H04L29/06 OR H04L65/80 OR H04L65/4084 OR H04L69/329 OR H04L65/607 OR H04L47/10 OR H04L65/608 OR H04N7/17318 OR H04L65/4076 OR H04L65/4092 OR G06Q30/02 OR H04L67/06 OR H04N21/4126 OR H04N21/434 OR H04N21/6125 OR H04N21/8456).CPC. + text searche)d	3/18/2016	nd

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SEARCH NOTES

Search Notes	Date	Examiner
Updated double patenting search (EAST, eDAN, PALM) *Inventor **Assignee	3/18/2016	nd
Updated NPL Seach (Google, Google Scholar)	3/18/2016	nd
Updated 112 2nd paragraph analysis	3/18/2016	nd
Updated 112 6th paragraph claim analysis	3/18/2016	nd
Updated 101 claim analysis	3/18/2016	nd
Plus Search	3/18/2016	nd
Conducted allowability analysis	3/18/2016	nd

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	Conducted Interference Search - See EAST Search History	3/18/2016	nd

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14516303	MAJOR ET AL.
	Examiner	**Art Unit**
	NINOS DONABED	2444

CPC						
Symbol					**Type**	**Version**
H04L		47	/	25	F	2013-01-01
H04N		21	/	25808	I	2013-01-01
H04N		21	/	2662	I	2013-01-01
H04N		21	/	643	I	2013-01-01
H04N		21	/	64769	I	2013-01-01
H04N		21	/	64792	I	2013-01-01
H04N		21	/	84	I	2013-01-01
H04N		21	/	845	I	2013-01-01
H04L		65	/	60	I	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	16	
/NINOS DONABED/ Primary Examiner.Art Unit 2444	03/18/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	11	7

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14516303	MAJOR ET AL.
	Examiner	**Art Unit**
	NINOS DONABED	2444

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
		H	0	4	L	12 / 853 (2013.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	16	
/NINOS DONABED/ Primary Examiner.Art Unit 2444	03/18/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	11	7

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14516303	MAJOR ET AL.
	Examiner	**Art Unit**
	NINOS DONABED	2444

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
-	1	-	17												
-	2	6	18												
-	3	7	19												
-	4	8	20												
-	5	9	21												
-	6	10	22												
-	7	-	23												
-	8	11	24												
-	9	12	25												
-	10	13	26												
1	11	14	27												
2	12	15	28												
-	13	16	29												
3	14														
4	15														
5	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 16	
/NINOS DONABED/ Primary Examiner.Art Unit 2444 (Primary Examiner)	03/18/2016 (Date)	O.G. Print Claim(s) 11	O.G. Print Figure 7

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	530	("20020152318" | "20040103444" | "20040220926" | "20060206246" | "20060282540" | "20060288099" | "20080046939" | "20080263180" | "20080281803" | "7240100" | "7260640" | "7376747" | "7391717" | "20030135631" | "20050033855" | "20010013128" | "20020178330" | "20050055425" | "20050066063" | "20050120107" | "20050204385" | "20060165166" | "20060168295" | "20060218264" | "6760772" | "6801947" | "6859839" | "6874015" | "7054774" | "7174385" | "7295520" | "7330908" | "7873040" | "8135852" | "20030081582" | "20020176418" | "20030037103" | "20040098748" | "20050009520" | "20050223087" | "20060047779" | "20060133809" | "20060184668" | "20070030833" | "20070037599" | "20070094405" | "20080037527" | "20090055471" | "20090055547" | "20090132599" | "20090132721" | "20100098103" | "5768527" | "6449719" | "6552227" | "7176957" | "7334044" | "7609652" | "7631039" | "7719985" | "7760801" | "8612624" | "20020178138" | "20020184391" | "20030014684" | "20030204602" | "20040010613" | "20040030547" | "20040030599" | "20050050152" | "20050084166" | "20050262257" | "20060130118" | "20060277564" | "20070079325" | "20080060029" | "20090049186" | "6374289" | "6654790" | "7046805" | "7093001" | "7099954" | "7116894" | "7124164" | "7177642" | "7369610" | "7477688" | "7733830" | "7797439" | "7818444" | "8370514" | "8402156" | "8683066" | "20040093420" | "20020087634" | "20020146102" | "20020194608" | "20030078972" | "20050204046" | "20080091838" | "20080205291" | "20100158101" | "5404446" | "6721723" | "6850965" | "6885471" | "7054911" | "7190670" | "7274740" | "7313236" | "7523181" | "7761609" | "20030093790" | "20020133547" | "20020161898" | "20020161911" | "20030065803" | "20030154239" | "20030220972" | "20040049780" | "20050015509" | "20060059223" | "20060168290" |	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49

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L2	105	((R) near2 (Major)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/03/18 11:49
L3	44	((Mark) near2 (Hurst)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/03/18 11:49
L4	147	(L2 L3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L5	23	(L2 L3) and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L6	3	"20150039782"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2016/03/18 11:49

			IBM_TDB			
L7	2060	echostar.as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L8	1812	(echostar adj2 technologies).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L9	25	(L8 L2 L3) and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L10	2	(L8 L2 L3) and (simultaneous$4 and streamlet).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L11	2	"8868772".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L12	2	("20150039782").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L13	3	("20150039782").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L14	3	"20110296053"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L15	1	("20150039782").PN. and (margin)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L16	2	"20020144276"	US-PGPUB; USPAT;	OR	ON	2016/03/18 11:49

			USOCR; DERWENT			
L17	2	("20150039782").PN. and (streamlet)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L18	1	("20150039782").PN. and (streamlet) and packet	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L19	1	("20150039782").PN. and packet	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L20	1	("20150039782").PN. and segment	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L21	49	(dish adj digital).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L22	18	(dish adj digital).as. and streamlet	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L23	9	(dish adj digital).as. and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L24	1	"20020144276" and request$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L25	0	"20020144276" and (upshift$5 downshift$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L26	1	"20020144276" and (upshift$5 high$4 downshift$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L27	0	"20020144276" and (upshift$5 high$4 downshift$5) same monitor$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L28	1	"20020144276" and (upshift$5 high$4 downshift$5) same track$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49

L29	1	"20020144276" and dynamic$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L30	1	"20020144276" and (automatic$5 dynamic$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L31	0	(Stream$5 near6 (upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L32	85	(Stream$5 near6 (upshift$4 downshift up$5 down$5) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L33	121	(Stream$5 near8 (upshift$4 downshift up$5 down$5) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L34	4	"20020188745" "20030135631"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L35	2	"20020144276" and (display$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L36	1	"20020144276" and (monitor$5 track$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L37	1	"20020144276" and (high$5 low$4)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L38	0	"20020144276" and (high$5 low$4) not user	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L39	3	"20030152036"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L40	0	(Stream$5 near8 (upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L41	0	((upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L42	0	((upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L43	0	((upshift$4 downshift$3 up-shift$5 down-shift$5) near7 (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR;	OR	ON	2016/03/18 11:49

			DERWENT			
L44	0	((upshift$4 downshift$3 up-shift$5 down-shift$5) with (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L45	0	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L46	1	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L47	16	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L48	1	"20020188745" and shift$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L49	8	709/231.ccls. and @AD<"20040505" and (seamless$4 with (qos quality))	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L50	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L51	0	"20020144276" and (fast rewind)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L52	0	"20020144276" and (forward$3 rewind$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L53	1	"20020144276" and (play$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L54	3	"20030152036"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L55	140	(intelligent adj2 stream$5).ti,ab.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L56	11	(intelligent adj2 stream$5).ti,ab. and @ad<"20040505"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L57	3	"20030152036" and (tcp http)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L58	0	"20030152036" and (rewind$3 forward$3)	US-PGPUB;	OR	ON	2016/03/18

			USPAT; USOCR; DERWENT			11:49
L59	0	"20030152036" and (rewind$3 forward$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L60	1	("20150039782").PN. and (read or safety)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L61	0	"20030152036" and (buffer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L62	0	"20030152036" and (buffer)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L63	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L64	1	"20020144276" and (hypertext http)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L65	0	"20020144276" and monitor$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L66	1	"20020144276" and (low$3 high$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L67	2822	709/231.ccls. and @AD<"20040505"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L68	16	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L69	12	L68 and ((H04L29/06027 OR H04L29/06 OR H04L65/80 OR H04L65/4084 OR H04L69/329 OR H04L65/607 OR H04L47/10 OR H04L65/608 OR H04N7/17318 OR H04L65/4076 OR H04L65/4092 OR G06Q30/02 OR H04L67/06 OR H04N21/4126 OR H04N21/434 OR H04N21/6125 OR H04N21/8456).CPC.)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L70	1	("20150039782").PN. and hypertext	US-PGPUB; USPAT;	OR	ON	2016/03/18 11:49

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			USOCR; DERWENT			
L71	1	("20150039782").PN. and http	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L72	2	"20030152036" and web	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L73	1	"20020144276" and web	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L74	2	"20020144276" and (server page site)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L75	2	"20020144276" and (network$4 page site)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L76	5	("7522639".pn. "20090150373")	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L77	3	("7522639".pn. "20090150373") and bluetooth	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L78	3	("7522639".pn. "20090150373") and bluetooth and synch$6	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L79	1	(portion different files across media stream yield automatic$5 copi$5 present$4 order).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2016/03/18 12:11
S1	532	("20020152318" | "20040103444" | "20040220926" | "20060206246" | "20060282540" | "20060288099" | "20080046939" | "20080263180" | "20080281803" | "7240100" | "7260640" | "7376747" | "7391717" | "20030135631" | "20050033855" | "20010013128" | "20020178330" | "20050055425" | "20050066063" | "20050120107" | "20050204385" | "20060165166" | "20060168295" | "20060218264" | "6760772" | "6801947" | "6859839" | "6874015" | "7054774" | "7174385" | "7295520" | "7330908" | "7873040" | "8135852" | "20030081582" | "20020176418" | "20030037103" | "20040098748" | "20050009520" | "20050223087" | "20060047779" | "20060133809" | "20060184668" |	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:36

		"20070030833" | "20070037599" | "20070094405" | "20080037527" | "20090055471" | "20090055547" | "20090132599" | "20090132721" | "20100098103" | "5768527" | "6449719" | "6552227" | "7176957" | "7334044" | "7609652" | "7631039" | "7719985" | "7760801" | "8612624" | "20020178138" | "20020184391" | "20030014684" | "20030204602" | "20040010613" | "20040030547" | "20040030599" | "20050050152" | "20050084166" | "20050262257" | "20060130118" | "20060277564" | "20070079325" | "20080060029" | "20090049186" | "6374289" | "6654790" | "7046805" | "7093001" | "7099954" | "7116894" | "7124164" | "7177642" | "7369610" | "7477688" | "7733830" | "7797439" | "7818444" | "8370514" | "8402156" | "8683066" | "20040093420" |				
		"20020087634" | "20020146102" | "20020194608" | "20030078972" | "20050204046" | "20080091838" | "20080205291" | "20100158101" | "5404446" | "6721723" | "6850965" | "6885471" | "7054911" | "7190670" | "7274740" | "7313236" | "7523181" | "7761609" | "20030093790" |				
		"20020133547" | "20020161898" | "20020161911" | "20030065803" | "20030154239" | "20030220972" | "20040049780" | "20050015509" | "20060059223" | "20060168290" | "20060236219" | "20060270404" | "20070067480" | "20070078768" | "20080133766" | "20090006538" | "20090055417" | "20090210549" | "20140207966" | "6185736" | "6675199" | "6792449" | "6795863" | "6845107" | "7031700" | "7349358" | "7558472" | "7653735" | "7660906" | "8209429" | "20040003101" | "20040071209" | "7096271" | "20010047423" |				
		"20020122491" | "20020131496" | "20020152317" | "20030018966" | "20040153458" | "20040168052" | "20050188051" | "20050254508" | "20060080718" | "20070083283" | "20070204310" | "6122660" | "6697072" | "6976090" | "7054365" | "7111044" | "7194549" | "7310678" | "7529541" | "7536469" | "7577750" | "7599307" | "7779135" | "7817985" | "8036265" | "20020144276" | "20020188745" | "20030107994" | "20030152036" | "20040031054" | "20020091840" | "20020097750" | "20020118809" | "20020136406" | "20020138619" | "20020169926" | "20030007464" | "20030021166" | "20030140159" | "20040117427" | "20040260701" | "20050024487" | "20050076136" | "20050195578" | "20060242315" |				

		"20070280255" | "20080219151" | "5168356" | "5267334" | "5841432" | "6618752" | "7325073" | "7328243" | "7412531" | "7546355" | "7555464" | "7593333" | "7788395" | "20060010003").PN.				
S2	105	((R) near2 (Major)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/18 20:38
S3	38	((Mark) near2 (Hurst)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/18 20:38
S4	141	(S2 S3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:39
S5	21	(S2 S3) and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:51
S6	2	"20150039782"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:53
S7	1739	echostar.as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:53
S8	1542	(echostar adj2 technologies).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:54
S9	23	(S8 S2 S3) and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:54
S10	2	(S8 S2 S3) and (simultaneous$4 and streamlet).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:54

S11	2	"8868772".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 10:53
S12	2	("20150039782").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 11:12
S13	2	("20150039782").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 11:12
S14	3	"20110296053"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 11:55
S15	1	("20150039782").PN. and (margin)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 13:31
S16	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:12
S17	2	("20150039782").PN. and (streamlet)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:22
S18	1	("20150039782").PN. and (streamlet) and packet	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:22
S19	1	("20150039782").PN. and packet	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:22
S20	1	("20150039782").PN. and segment	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:25
S21	49	(dish adj digital).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 14:27
S22	18	(dish adj digital).as. and streamlet	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2015/05/19 14:28

			EPO; JPO; DERWENT; IBM_TDB			
S23	9	(dish adj digital).as. and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 14:28
S24	1	"20020144276" and request$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:45
S25	0	"20020144276" and (upshift$5 downshift$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:49
S26	1	"20020144276" and (upshift$5 high$4 downshift$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:49
S27	0	"20020144276" and (upshift$5 high$4 downshift$5) same monitor$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:50
S28	1	"20020144276" and (upshift$5 high$4 downshift$5) same track$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:50
S29	1	"20020144276" and dynamic$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:51
S30	1	"20020144276" and (automatic$5 dynamic$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:53
S31	0	(Stream$5 near6 (upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:55
S32	86	(Stream$5 near6 (upshift$4 downshift up$5 down$5) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:56
S33	122	(Stream$5 near8 (upshift$4 downshift up$5 down$5) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:56
S34	4	"20020188745" "20030135631"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:57
S35	2	"20020144276" and (display$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:04
S36	1	"20020144276" and (monitor$5 track$5)	US-PGPUB;	OR	ON	2015/05/19

			USPAT; USOCR; DERWENT			20:09
S37	1	"20020144276" and (high$5 low$4)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:10
S39	0	"20020144276" and (high$5 low$4) not user	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:12
S40	3	"20030152036"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:15
S41	0	(Stream$5 near8 (upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:15
S42	0	((upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:16
S43	0	((upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:16
S44	0	((upshift$4 downshift$3 up-shift$5 down-shift$5) near7 (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:16
S45	0	((upshift$4 downshift$3 up-shift$5 down-shift$5) with (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:17
S46	0	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:17
S47	1	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:18
S48	15	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:18
S49	1	"20020188745" and shift$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:19
S51	8	709/231.ccls. and @AD<"20040505" and (seamless$4 with (qos quality))	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:21
S52	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:29

S53	0	"20020144276" and (fast rewind)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:30
S54	0	"20020144276" and (forward$3 rewind$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:30
S55	1	"20020144276" and (play$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:30
S56	3	"20030152036"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:34
S57	85	(intelligent adj2 stream$5).ti,ab.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:36
S58	11	(intelligent adj2 stream$5).ti,ab. and @ad<"20040505"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:37
S59	3	"20030152036" and (tcp http)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:40
S60	0	"20030152036" and (rewind$3 forward$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:02
S61	0	"20030152036" and (rewind$3 forward$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 22:02
S62	1	("20150039782").PN. and (read or safety)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:06
S63	0	"20030152036" and (buffer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 22:07
S64	0	"20030152036" and (buffer)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:07
S65	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:10
S66	1	"20020144276" and (hypertext http)	US-PGPUB;	OR	ON	2015/05/19

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			USPAT; USOCR; DERWENT			22:11
S67	0	"20020144276" and monitor$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:29
S68	1	"20020144276" and (low$3 high$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:29
S69	2682	709/231.ccls. and @AD<"20040505"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:56
S70	15	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:58
S71	11	S70 and ((H04L29/06027 OR H04L29/06 OR H04L65/80 OR H04L65/4084 OR H04L69/329 OR H04L65/607 OR H04L47/10 OR H04L65/608 OR H04N7/17318 OR H04L65/4076 OR H04L65/4092 OR G06Q30/02 OR H04L67/06 OR H04N21/4126 OR H04N21/434 OR H04N21/6125 OR H04N21/8456).CPC.)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:58
S72	1	("20150039782").PN. and hypertext	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:26
S73	1	("20150039782").PN. and http	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:26
S74	2	"20030152036" and web	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:27
S75	1	"20020144276" and web	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:27
S76	2	"20020144276" and (server page site)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:28
S77	2	"20020144276" and (network$4 page site)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:28
S78	5	("7522639".pn. "20090150373")	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 15:05
S79	3	("7522639".pn. "20090150373") and bluetooth	US-PGPUB; USPAT; USOCR;	OR	ON	2015/05/20 15:06

			DERWENT			
S80	3	("7522639".pn. "20090150373") and bluetooth and synch$6	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 15:06

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L80	1	(portion different files across media stream yield automatic$5 copi$5 present$4 order).clm.	US-PGPUB; USPAT	AND	ON	2016/03/18 12:12
L81	1	(portion different files across media stream playback tcp copi$5 present$4 order).clm.	US-PGPUB; USPAT	AND	ON	2016/03/18 12:12
L82	1	(portion different files across media stream playback copi$5 present$4 order).clm.	US-PGPUB; USPAT	AND	ON	2016/03/18 12:12
L83	1	(portion different files across media playback copi$5 present$4 order).clm.	US-PGPUB; USPAT	AND	ON	2016/03/18 12:12

3/18/2016 12:13:12 PM
C:\Users\ndonabed\Documents\EAST\Workspaces\14516303.wsp

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Quality of experience estimation for **adaptive** HTTP/TCP video **streaming** using H. 264/AVC [PDF] from inria.fr
KD Singh, Y Hadjadj-Aoul... - ... Conference (CCNC), 2012 ..., 2012 - ieeexplore.ieee.org
ABSTRACT Video services are being adopted widely in both mobile and fixed networks. For their successful deployment, the content providers are increasingly becoming interested in evaluating the performance of such traffic from the final users' perspective, that is, their **...**
Cited by 57 Related articles All 14 versions Cite Save

On performance bounds for the integration of elastic and **adaptive streaming** flows [PDF] from researchgate.net
T Bonald, A Proutière - ACM SIGMETRICS Performance Evaluation ..., 2004 - dl.acm.org
Abstract We consider a network model where bandwidth is fairly shared by a dynamic number of elastic and **adaptive streaming** flows. Elastic flows correspond to data transfers while **adaptive streaming** flows correspond to audio/video applications with variable rate **...**
Cited by 57 Related articles All 6 versions Cite Save

Adaptive streaming of audiovisual content using MPEG DASH
TC Thang, QD Ho, JW Kang... - ... , IEEE Transactions on, 2012 - ieeexplore.ieee.org
Abstract—HTTP **streaming** has become a cost effective means for multimedia delivery nowadays. In this paper, we study the use of MPEG DASH standard to stream audiovisual content. We first describe a novel estimation method for connection throughput. Then, **...**
Cited by 61 Related articles All 2 versions Cite Save

Server-based traffic shaping for stabilizing oscillating **adaptive streaming** players [PDF] from psu.edu
S Akhshabi, L Anantakrishnan, C Dovrolis... - Proceeding of the 23rd ..., 2013 - dl.acm.org
Abstract Prior work has shown that two or more **adaptive streaming** players can be unstable when they compete for bandwidth. The root cause of the instability problem is that, in Steady-State, a player goes through an ON-OFF activity pattern in which it overestimates the **...**
Cited by 51 Related articles All 6 versions Cite Save

Layer-encoded video in scalable **adaptive streaming** [PDF] from researchgate.net
M Zink, J Schmitt, R Steinmetz - Multimedia, IEEE Transactions ..., 2005 - ieeexplore.ieee.org
Abstract---Combining the concepts of caching and transmis-sion control protocol (TCP)-friendly **streaming** of layer-encoded video bears the problem that those videos might not be cached in full quality. Therefore, we focus in this work on the scheduling of **...**
Cited by 56 Related articles All 9 versions Cite Save

Adaptive streaming of stored video in a TCP-friendly context: Multiple versions or multiple layers?
P de Cuetos, D Saparilla, KW Ross - in Proc. Packet Video Workshop, 2001 - Citeseer
Abstract Video transmission over the current best-effort Internet should be made fair to competing TCP traffic. Because the available bandwidth to a TCP-friendly stream changes significantly over medium and long time scales, it is desirable to adapt the **streaming** rate **...**
Cited by 37 Related articles Cite Save More

A comparison of quality scheduling in commercial **adaptive** HTTP **streaming** solutions on a 3G network [PDF] from uio.no
H Riiser, HS Bergsaker, P Vigmostad... - Proceedings of the 4th ..., 2012 - dl.acm.org
Abstract There are many available commercial **streaming** solutions that perform quality adaption. An important issue with respect to users' perceived quality is how the system schedules the quality levels to match the available network resources. In this study, we **...**
Cited by 47 Related articles All 12 versions Cite Save

The mpeg-dash standard for multimedia **streaming** over the internet [PDF] from sfu.ca
I Sodagar - IEEE MultiMedia, 2011 - computer.org
Editor's Note MPEG has recently finalized a new standard to enable dynamic and **adaptive streaming** of media over HTTP. This **...** phones. MPEG-Dynamic **Adaptive Streaming** (DASH) was developed to do just that. **...**
Cited by 294 Related articles All 9 versions Cite Save

3GPP compliant **adaptive** wireless video **streaming** using H. 264/AVC [PDF] from psu.edu
T Schierl, T Wiegand... - Image Processing, 2005. ..., 2005 - ieeexplore.ieee.org
Abstract---In 3GPP a standard for multimedia **streaming** over mobile networks called PSS (Packet-switched **Streaming** Service) has been specified. In order to deal with changing transmission characteristics like varying link bit-rate or handover, **adaptive streaming ...**
Cited by 43 Related articles All 4 versions Cite Save

Adaptive scalable video **streaming** in wireless networks [PDF] from uvic.ca
S Xiang, L Cai, J Pan - Proceedings of the 3rd multimedia systems ..., 2012 - dl.acm.org
Abstract In this paper, we investigate the optimal **streaming** strategy for dynamic **adaptive streaming** over HTTP (DASH). Specifically, we focus on the rate adaptation algorithm for **streaming** scalable video (H. 264/SVC) in wireless networks. We model the rate **...**
Cited by 49 Related articles All 2 versions Cite Save

Towards network-wide QoE fairness using openflow-assisted **adaptive** video **streaming** [PDF] from lancs.ac.uk
P Georgopoulos, Y Elkhatib, M Broadbent... - Proceedings of the ..., 2013 - dl.acm.org

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Exhibit 1002
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Abstract Video **streaming** is an increasingly popular way to consume media content. **Adaptive** video **streaming** is an emerging delivery technology which aims to increase user QoE and maximise connection utilisation. Many implementations naively estimate **...**
Cited by 48 Related articles All 12 versions Cite Save

Adaptive live video **streaming** by priority drop [PDF] from pdx.edu
J Huang, C Krasic, J Walpole - 2003 - pdxscholar.library.pdx.edu
Abstract In this paper we explore the use of Priority-progress **streaming** (PPS) for video surveillance applications. PPS is an **adaptive streaming** technique for the delivery of continuous media over variable bit-rate channels. It is based on the simple idea of **...**
Cited by 46 Related articles All 14 versions Cite Save

Implementation of **adaptive streaming** of stored MPEG-4 FGS video over TCP
P de Cuetos, P Guillotel, KW Ross... - Multimedia and Expo, ..., 2002 - ieeexplore.ieee.org
ABSTRACT This paper presents an implementation of an end-to-end application for **streaming** stored MPEG-4 Fine-Grained Scalable (FGS) videos over the best-effort Internet. Our current implementation ms over TCP but can also be run over TCP-friendly RTPNDP **...**
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Using scalable video coding for dynamic **adaptive streaming** over HTTP in mobile environments [PDF] from epfl.ch
C Müller, D Renzi, S Lederer, S Battista... - ..., 2012 Proceedings of ..., 2012 - ieeexplore.ieee.org
ABSTRACT Dynamic **Adaptive Streaming** over HTTP (DASH) is a convenient approach to transfer videos in an **adaptive** and dynamic way to the user. As a consequence, this system provides high bandwidth flexibility and is especially suitable for mobile use cases where **...**
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Adaptive streaming and rendering of large terrains using strip masks [PDF] from archives-ouvertes.fr
J Pouderoux, JE Marvie - ... of the 3rd international conference on ..., 2005 - dl.acm.org
Abstract Terrain rendering is an important factor in the rendering of virtual scenes. If they are large and detailed, digital terrains can represent a huge amount of data and therefore of graphical primitives to render in real-time. In this paper we present an efficient technique **...**
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[PDF] IIS smooth **streaming** technical overview [PDF] from bogotobogo.com
A Zambelli - Microsoft Corporation, 2009 - bogotobogo.com
... 6 HTTP-Based **Adaptive Streaming**..... 7 **...** Introduction In October 2008, Microsoft announced that Internet Information Services (IIS) 7.0 would feature a new HTTP-based **adaptive streaming** extension: Smooth **Streaming**. **...**
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Adaptive systems for improved media **streaming** experience [PDF] from epfl.ch
J Chakareski, P Frossard - Communications Magazine, IEEE, 2007 - ieeexplore.ieee.org
ABSTRACT Supporting **streaming** media applications over current packet network infrastructures represents a challenging task in many regards. For one, the lack of quality of service (QoS) guarantees in existing networks such as the Internet means that time- **...**
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[BOOK] Multimedia over IP and wireless networks: compression, networking, and systems [PDF] from elsevier.com
M Van der Schaar, PA Chou - 2011 - books.google.com
... Coding and Error Concealment Strategies for Audio Communication 59 Dinei Florêncio Mechanisms for Adapting Compressed Multimedia to Varying Bandwidth Conditions 81 Antonio Ortega and Huisheng Wang Scalable Video Coding for **Adaptive Streaming** Applications 117 **...**
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Client intelligence for **adaptive streaming** solutions
D Jarnikov, T Özcelebi - Signal Processing: Image Communication, 2011 - Elsevier
In state-of-the-art **adaptive streaming** solutions, to cope with varying network conditions, the client side can switch between several video copies encoded at different bit-rates during **streaming**. Each video copy is divided into chunks of equal duration. To achieve **...**
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Exhibit 1002
Page 282

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14516303
Filing Date	2014-10-16
First Named Inventor	Robert Drew Major
Art Unit	2444
Examiner Name	DONABED, NINOS
Attorney Docket Number	066.0141C1_P2004-04-01.2

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7657644	B1	2010-02-02	Zheng	
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	1	20050251832	A1	2005-11-10	Chiueh	
	2	20100262711	A1	2010-10-14	Bouazizi	
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Receipt date: 06/16/2015	Application Number	14516303	14516303 - GAU: 2444
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2014-10-16	
	First Named Inventor	Robert Drew Major	
	Art Unit	2444	
	Examiner Name	DONABED, NINOS	
	Attorney Docket Number	066.0141C1_P2004-04-01.2	

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	1	USPTO, Office Action for U.S. Patent Application No. 14/531,804, mailed May 11, 2015 (066.0141X2CC).	☐

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Receipt date: 06/16/2015	Application Number	14516303	14516303 - GAU: 2444
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2014-10-16	
	First Named Inventor	Robert Drew Major	
	Art Unit	2444	
	Examiner Name	DONABED, NINOS	
	Attorney Docket Number	066.0141C1_P2004-04-01.2	

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/BRETT A. CARLSON/	Date (YYYY-MM-DD)	2015-06-16
Name/Print	Brett A. Carlson	Registration Number	39,928

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	530	("20020152318" | "20040103444" | "20040220926" | "20060206246" | "20060282540" | "20060288099" | "20080046939" | "20080263180" | "20080281803" | "7240100" | "7260640" | "7376747" | "7391717" | "20030135631" | "20050033855" | "20010013128" | "20020178330" | "20050055425" | "20050066063" | "20050120107" | "20050204385" | "20060165166" | "20060168295" | "20060218264" | "6760772" | "6801947" | "6859839" | "6874015" | "7054774" | "7174385" | "7295520" | "7330908" | "7873040" | "8135852" | "20030081582" | "20020176418" | "20030037103" | "20040098748" | "20050009520" | "20050223087" | "20060047779" | "20060133809" | "20060184668" | "20070030833" | "20070037599" | "20070094405" | "20080037527" | "20090055471" | "20090055547" | "20090132599" | "20090132721" | "20100098103" | "5768527" | "6449719" | "6552227" | "7176957" | "7334044" | "7609652" | "7631039" | "7719985" | "7760801" | "8612624" | "20020178138" | "20020184391" | "20030014684" | "20030204602" | "20040010613" | "20040030547" | "20040030599" | "20050050152" | "20050084166" | "20050262257" | "20060130118" | "20060277564" | "20070079325" | "20080060029" | "20090049186" | "6374289" | "6654790" | "7046805" | "7093001" | "7099954" | "7116894" | "7124164" | "7177642" | "7369610" | "7477688" | "7733830" | "7797439" | "7818444" | "8370514" | "8402156" | "8683066" | "20040093420" | "20020087634" | "20020146102" | "20020194608" | "20030078972" | "20050204046" | "20080091838" | "20080205291" | "20100158101" | "5404446" | "6721723" | "6850965" | "6885471" | "7054911" | "7190670" | "7274740" | "7313236" | "7523181" | "7761609" | "20030093790" | "20020133547" | "20020161898" | "20020161911" | "20030065803" | "20030154239" | "20030220972" | "20040049780" | "20050015509" | "20060059223" | "20060168290" |	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49

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L3	44	((Mark) near2 (Hurst)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2016/03/18 11:49
L4	147	(L2 L3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
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L6	3	"20150039782"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2016/03/18 11:49

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L14	3	"20110296053"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
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L25	0	"20020144276" and (upshift$5 downshift$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L26	1	"20020144276" and (upshift$5 high$4 downshift$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L27	0	"20020144276" and (upshift$5 high$4 downshift$5) same monitor$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L28	1	"20020144276" and (upshift$5 high$4 downshift$5) same track$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49

L29	1	"20020144276" and dynamic$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L30	1	"20020144276" and (automatic$5 dynamic$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L31	0	(Stream$5 near6 (upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
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L33	121	(Stream$5 near8 (upshift$4 downshift up$5 down$5) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
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L37	1	"20020144276" and (high$5 low$4)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L38	0	"20020144276" and (high$5 low$4) not user	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
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L42	0	((upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L43	0	((upshift$4 downshift$3 up-shift$5 down-shift$5) near7 (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR;	OR	ON	2016/03/18 11:49

			DERWENT			
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L46	1	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L47	16	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L48	1	"20020188745" and shift$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L49	8	709/231.ccls. and @AD<"20040505" and (seamless$4 with (qos quality))	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L50	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L51	0	"20020144276" and (fast rewind)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L52	0	"20020144276" and (forward$3 rewind$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L53	1	"20020144276" and (play$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L54	3	"20030152036"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L55	140	(intelligent adj2 stream$5).ti,ab.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L56	11	(intelligent adj2 stream$5).ti,ab. and @ad<"20040505"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L57	3	"20030152036" and (tcp http)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L58	0	"20030152036" and (rewind$3 forward$3)	US-PGPUB;	OR	ON	2016/03/18

			USPAT; USOCR; DERWENT			11:49
L59	0	"20030152036" and (rewind$3 forward$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L60	1	("20150039782").PN. and (read or safety)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L61	0	"20030152036" and (buffer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/03/18 11:49
L62	0	"20030152036" and (buffer)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L63	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L64	1	"20020144276" and (hypertext http)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L65	0	"20020144276" and monitor$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L66	1	"20020144276" and (low$3 high$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L67	2822	709/231.ccls. and @AD<"20040505"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L68	16	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L69	12	L68 and ((H04L29/06027 OR H04L29/06 OR H04L65/80 OR H04L65/4084 OR H04L69/329 OR H04L65/607 OR H04L47/10 OR H04L65/608 OR H04N7/17318 OR H04L65/4076 OR H04L65/4092 OR G06Q30/02 OR H04L67/06 OR H04N21/4126 OR H04N21/434 OR H04N21/6125 OR H04N21/8456).CPC.)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L70	1	("20150039782").PN. and hypertext	US-PGPUB; USPAT;	OR	ON	2016/03/18 11:49

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			USOCR; DERWENT			
L71	1	("20150039782").PN. and http	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L72	2	"20030152036" and web	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L73	1	"20020144276" and web	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L74	2	"20020144276" and (server page site)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L75	2	"20020144276" and (network$4 page site)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L76	5	("7522639".pn. "20090150373")	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L77	3	("7522639".pn. "20090150373") and bluetooth	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L78	3	("7522639".pn. "20090150373") and bluetooth and synch$6	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/03/18 11:49
L79	1	(portion different files across media stream yield automatic$5 copi$5 present$4 order).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	AND	ON	2016/03/18 12:11
S1	532	("20020152318" | "20040103444" | "20040220926" | "20060206246" | "20060282540" | "20060288099" | "20080046939" | "20080263180" | "20080281803" | "7240100" | "7260640" | "7376747" | "7391717" | "20030135631" | "20050033855" | "20010013128" | "20020178330" | "20050055425" | "20050066063" | "20050120107" | "20050204385" | "20060165166" | "20060168295" | "20060218264" | "6760772" | "6801947" | "6859839" | "6874015" | "7054774" | "7174385" | "7295520" | "7330908" | "7873040" | "8135852" | "20030081582" | "20020176418" | "20030037103" | "20040098748" | "20050009520" | "20050223087" | "20060047779" | "20060133809" | "20060184668" |	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:36

		"20070030833" | "20070037599" | "20070094405" | "20080037527" | "20090055471" | "20090055547" | "20090132599" | "20090132721" | "20100098103" | "5768527" | "6449719" | "6552227" | "7176957" | "7334044" | "7609652" | "7631039" | "7719985" | "7760801" | "8612624" | "20020178138" | "20020184391" | "20030014684" | "20030204602" | "20040010613" | "20040030547" | "20040030599" | "20050050152" | "20050084166" | "20050262257" | "20060130118" | "20060277564" | "20070079325" | "20080060029" | "20090049186" | "6374289" | "6654790" | "7046805" | "7093001" | "7099954" | "7116894" | "7124164" | "7177642" | "7369610" | "7477688" | "7733830" | "7797439" | "7818444" | "8370514" | "8402156" | "8683066" | "20040093420" |				
		"20020087634" | "20020146102" | "20020194608" | "20030078972" | "20050204046" | "20080091838" | "20080205291" | "20100158101" | "5404446" | "6721723" | "6850965" | "6885471" | "7054911" | "7190670" | "7274740" | "7313236" | "7523181" | "7761609" | "20030093790" |				
		"20020133547" | "20020161898" | "20020161911" | "20030065803" | "20030154239" | "20030220972" | "20040049780" | "20050015509" | "20060059223" | "20060168290" | "20060236219" | "20060270404" | "20070067480" | "20070078768" | "20080133766" | "20090006538" | "20090055417" | "20090210549" | "20140207966" | "6185736" | "6675199" | "6792449" | "6795863" | "6845107" | "7031700" | "7349358" | "7558472" | "7653735" | "7660906" | "8209429" | "20040003101" | "20040071209" | "7096271" | "20010047423" |				
		"20020122491" | "20020131496" | "20020152317" | "20030018966" | "20040153458" | "20040168052" | "20050188051" | "20050254508" | "20060080718" | "20070083283" | "20070204310" | "6122660" | "6697072" | "6976090" | "7054365" | "7111044" | "7194549" | "7310678" | "7529541" | "7536469" | "7577750" | "7599307" | "7779135" | "7817985" | "8036265" | "20020144276" | "20020188745" | "20030107994" | "20030152036" | "20040031054" | "20020091840" | "20020097750" | "20020118809" | "20020136406" | "20020138619" | "20020169926" | "20030007464" | "20030021166" | "20030140159" | "20040117427" | "20040260701" | "20050024487" | "20050076136" | "20050195578" | "20060242315" |				

		"20070280255" | "20080219151" | "5168356" | "5267334" | "5841432" | "6618752" | "7325073" | "7328243" | "7412531" | "7546355" | "7555464" | "7593333" | "7788395" | "20060010003").PN.				
S2	105	((R) near2 (Major)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/18 20:38
S3	38	((Mark) near2 (Hurst)).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2015/05/18 20:38
S4	141	(S2 S3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:39
S5	21	(S2 S3) and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:51
S6	2	"20150039782"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:53
S7	1739	echostar.as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:53
S8	1542	(echostar adj2 technologies).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:54
S9	23	(S8 S2 S3) and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:54
S10	2	(S8 S2 S3) and (simultaneous$4 and streamlet).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/18 20:54

S11	2	"8868772".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 10:53
S12	2	("20150039782").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 11:12
S13	2	("20150039782").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 11:12
S14	3	"20110296053"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 11:55
S15	1	("20150039782").PN. and (margin)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 13:31
S16	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:12
S17	2	("20150039782").PN. and (streamlet)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:22
S18	1	("20150039782").PN. and (streamlet) and packet	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:22
S19	1	("20150039782").PN. and packet	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:22
S20	1	("20150039782").PN. and segment	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 14:25
S21	49	(dish adj digital).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 14:27
S22	18	(dish adj digital).as. and streamlet	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2015/05/19 14:28

			EPO; JPO; DERWENT; IBM_TDB			
S23	9	(dish adj digital).as. and streamlet.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 14:28
S24	1	"20020144276" and request$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:45
S25	0	"20020144276" and (upshift$5 downshift$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:49
S26	1	"20020144276" and (upshift$5 high$4 downshift$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:49
S27	0	"20020144276" and (upshift$5 high$4 downshift$5) same monitor$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:50
S28	1	"20020144276" and (upshift$5 high$4 downshift$5) same track$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:50
S29	1	"20020144276" and dynamic$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:51
S30	1	"20020144276" and (automatic$5 dynamic$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:53
S31	0	(Stream$5 near6 (upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:55
S32	86	(Stream$5 near6 (upshift$4 downshift up$5 down$5) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:56
S33	122	(Stream$5 near8 (upshift$4 downshift up$5 down$5) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:56
S34	4	"20020188745" "20030135631"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 19:57
S35	2	"20020144276" and (display$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:04
S36	1	"20020144276" and (monitor$5 track$5)	US-PGPUB;	OR	ON	2015/05/19

			USPAT; USOCR; DERWENT			20:09
S37	1	"20020144276" and (high$5 low$4)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:10
S39	0	"20020144276" and (high$5 low$4) not user	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:12
S40	3	"20030152036"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:15
S41	0	(Stream$5 near8 (upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:15
S42	0	((upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:16
S43	0	((upshift$4 downshift) near7 (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:16
S44	0	((upshift$4 downshift$3 up-shift$5 down-shift$5) near7 (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:16
S45	0	((upshift$4 downshift$3 up-shift$5 down-shift$5) with (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:17
S46	0	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:17
S47	1	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/230.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:18
S48	15	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:18
S49	1	"20020188745" and shift$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:19
S51	8	709/231.ccls. and @AD<"20040505" and (seamless$4 with (qos quality))	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:21
S52	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:29

S53	0	"20020144276" and (fast rewind)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:30
S54	0	"20020144276" and (forward$3 rewind$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:30
S55	1	"20020144276" and (play$5)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:30
S56	3	"20030152036"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:34
S57	85	(intelligent adj2 stream$5).ti,ab.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:36
S58	11	(intelligent adj2 stream$5).ti,ab. and @ad<"20040505"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:37
S59	3	"20030152036" and (tcp http)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 20:40
S60	0	"20030152036" and (rewind$3 forward$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:02
S61	0	"20030152036" and (rewind$3 forward$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 22:02
S62	1	("20150039782").PN. and (read or safety)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:06
S63	0	"20030152036" and (buffer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/05/19 22:07
S64	0	"20030152036" and (buffer)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:07
S65	2	"20020144276"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:10
S66	1	"20020144276" and (hypertext http)	US-PGPUB;	OR	ON	2015/05/19

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			USPAT; USOCR; DERWENT			22:11
S67	0	"20020144276" and monitor$5	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:29
S68	1	"20020144276" and (low$3 high$3)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:29
S69	2682	709/231.ccls. and @AD<"20040505"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:56
S70	15	((upshift$4 downshift$3 up-shift$5 down-shift$5 shift$5) with (qos quality-of-service quality)) and @ad<"20040430" and 709/231.ccls.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:58
S71	11	S70 and ((H04L29/06027 OR H04L29/06 OR H04L65/80 OR H04L65/4084 OR H04L69/329 OR H04L65/607 OR H04L47/10 OR H04L65/608 OR H04N7/17318 OR H04L65/4076 OR H04L65/4092 OR G06Q30/02 OR H04L67/06 OR H04N21/4126 OR H04N21/434 OR H04N21/6125 OR H04N21/8456).CPC.)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/19 22:58
S72	1	("20150039782").PN. and hypertext	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:26
S73	1	("20150039782").PN. and http	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:26
S74	2	"20030152036" and web	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:27
S75	1	"20020144276" and web	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:27
S76	2	"20020144276" and (server page site)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:28
S77	2	"20020144276" and (network$4 page site)	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 11:28
S78	5	("7522639".pn. "20090150373")	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 15:05
S79	3	("7522639".pn. "20090150373") and bluetooth	US-PGPUB; USPAT; USOCR;	OR	ON	2015/05/20 15:06

			DERWENT			
S80	3	("7522639".pn. "20090150373") and bluetooth and synch$6	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2015/05/20 15:06

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L80	1	(portion different files across media stream yield automatic$5 copi$5 present$4 order).clm.	US-PGPUB; USPAT	AND	ON	2016/03/18 12:12
L81	1	(portion different files across media stream playback tcp copi$5 present$4 order).clm.	US-PGPUB; USPAT	AND	ON	2016/03/18 12:12
L82	1	(portion different files across media stream playback copi$5 present$4 order).clm.	US-PGPUB; USPAT	AND	ON	2016/03/18 12:12
L83	1	(portion different files across media playback copi$5 present$4 order).clm.	US-PGPUB; USPAT	AND	ON	2016/03/18 12:12

3/18/2016 12:14:02 PM
C:\Users\ndonabed\Documents\EAST\Workspaces\14516303.wsp

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Dynamic **adaptive streaming** over HTTP--: standards and design principles [PDF] from uni-klu.ac.at
T Stockhammer - Proceedings of the second annual ACM conference on ..., 2011 - dl.acm.org
Abstract In this paper, we provide some insight and background into the Dynamic **Adaptive Streaming** over HTTP (DASH) specifications as available from 3GPP and in draft version also from MPEG. Specifically, the 3GPP version provides a normative description of a **...**
Cited by 511 Related articles All 10 versions Cite Save

An experimental evaluation of rate-adaptation algorithms in **adaptive streaming** over HTTP [PDF] from gatech.edu
S Akhshabi, AC Begen, C Dovrolis - Proceedings of the second annual ..., 2011 - dl.acm.org
Abstract **Adaptive** (video) **streaming** over HTTP is gradually being adopted, as it offers significant advantages in terms of both user-perceived quality and resource utilization for content and network service providers. In this paper, we focus on the rate-adaptation **...**
Cited by 363 Related articles All 18 versions Cite Save

Multimedia proxy caching mechanism for quality **adaptive streaming** applications in the internet [PDF] from researchgate.net
R Rejaie, H Yu, M Handley... - ... 2000. Nineteenth Annual ..., 2000 - ieeexplore.ieee.org
Absrimr-The Internet has witnessed a rapid growth in deployment of Web-based **streaming** applications during recent years. In these applications, server should be able to perform end-to-end congestion control and quality adaptation to match the delivered stream quality to **...**
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Dynamic **adaptive streaming** over HTTP dataset [PDF] from uni-klu.ac.at
S Lederer, C Müller, C Timmerer - Proceedings of the 3rd Multimedia ..., 2012 - dl.acm.org
Abstract The delivery of audio-visual content over the Hypertext Transfer Protocol (HTTP) got lot of attention in recent years and with dynamic **adaptive streaming** over HTTP (DASH) a standard is now available. Many papers cover this topic and present their research results. **...**
Cited by 141 Related articles All 4 versions Cite Save

Quality of experience for HTTP **adaptive streaming** services [PDF] from sarabjotsingh.com
O Oyman, S Singh - Communications Magazine, IEEE, 2012 - ieeexplore.ieee.org
ABSTRACT The growing consumer demand for mobile video services is one of the key drivers of the evolution of new wireless multimedia solutions requiring exploration of new ways to optimize future wireless networks for video services towards delivering enhanced **...**
Cited by 139 Related articles All 7 versions Cite Save

An evaluation of dynamic **adaptive streaming** over HTTP in vehicular environments [PDF] from uni-klu.ac.at
C Müller, S Lederer, C Timmerer - Proceedings of the 4th Workshop on ..., 2012 - dl.acm.org
Abstract MPEGs' Dynamic **Adaptive Streaming** over HTTP (MPEG-DASH) is an emerging standard designed for media delivery over the top of existing infrastructures and able to handle varying bandwidth conditions during a **streaming** session. This requirement is very **...**
Cited by 120 Related articles All 3 versions Cite Save

What happens when HTTP **adaptive streaming** players compete for bandwidth? [PDF] from gatech.edu
S Akhshabi, L Anantakrishnan, AC Begen... - Proceedings of the 22nd ... , 2012 - dl.acm.org
Abstract With an increasing demand for high-quality video content over the Internet, it is becoming more likely that two or more **adaptive streaming** players share the same network bottleneck and compete for available bandwidth. This competition can lead to three **...**
Cited by 120 Related articles All 7 versions Cite Save

Quality-**adaptive** media **streaming** by priority drop [PDF] from psu.edu
C Krasic, J Walpole, W Feng - ... of the 13th international workshop on ..., 2003 - dl.acm.org
Abstract This paper presents a general design strategy for **streaming** media applications in best effort computing and networking environments. Our target application is video on demand using personal computers and the Internet. In this scenario, where resource **...**
Cited by 127 Related articles All 18 versions Cite Save

Method and system for indexing and content-based **adaptive streaming** of digital video content
SF Chang, D Zhong, R Kumar... - US Patent App. 10/ ..., 2001 - Google Patents
The present invention discloses systems and methods for automatically parsing digital video content into segments corresponding to fundamental semantic units, events, and camera views, and **streaming** parsed digital video content to users for display and browsing. The **...**
Cited by 166 Related articles All 2 versions Cite Save

A survey of application layer techniques for **adaptive streaming** of multimedia [PDF] from psu.edu
B Vandalore, W Feng, R Jain, S Fahmy - Real-Time Imaging, 2001 - Elsevier
Though the integrated services model and resource reservation protocol (RSVP) provide support for quality of service, in the current Internet only best-effort traffic is widely supported. New high-speed technologies such as ATM (asynchronous transfer mode), gigabit **...**
Cited by 96 Related articles All 8 versions Cite Save

Adaptive streaming of MPEG video over IP networks [PDF] from psu.edu

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Page 303

RS Ramanujan, JA Newhouse... - Local Computer ..., 1997 - ieeexplore.ieee.org
Abstract We present the design of an **adaptive** service for **streaming** MPEG video over a best-effort IP network environment. The **adaptive** video **streaming** service exploits the inherent adaptiveness of video applications to peiform controlled and graceful adjustments to the ...
Cited by 98 Related articles All 7 versions Cite Save

Adaptation algorithm for **adaptive streaming** over HTTP [PDF] from tu-berlin.de
K Miller, E Quacchio, G Gennari... - Packet Video Workshop ..., 2012 - ieeexplore.ieee.org
Abstract---Internet video makes up a significant part of the Internet traffic and its fraction is constantly growing. In order to guarantee best user experience throughout different network access technologies with dynamically varying network conditions, it is fundamental to ...
Cited by 94 Related articles All 3 versions Cite Save

A VLC media player plugin enabling dynamic **adaptive streaming** over HTTP [PDF] from uni-klu.ac.at
C Müller, C Timmerer - Proceedings of the 19th ACM international ..., 2011 - dl.acm.org
Abstract This paper describes the implementation of a VLC media player plugin enabling Dynamic **Adaptive Streaming** over HTTP (DASH). DASH is an emerging ISO/IEC MPEG and 3GPP standard for HTTP **streaming**. It aims to standardize formats enabling segmented ...
Cited by 70 Related articles All 2 versions Cite Save

Real-time content-based **adaptive streaming** of sports videos
SF Chang, D Zhong, R Kumar - Content-Based Access of ..., 2001 - ieeexplore.ieee.org
Abstract In this paper, we present a real-time software system for filtering live video content and then adaptively **streaming** the video over resource limited networks or devices. The rate adaptation is content-based and dynamically varied according to the event structure and ...
Cited by 77 Related articles All 5 versions Cite Save

Adaptive streaming within the 3GPP packet-switched **streaming** service
P Fröjdh, U Horn, M Kampmann, A Nohlgren... - Network, ..., 2006 - ieeexplore.ieee.org
Abstract The 3GPP Packet-Switched **Streaming** Service (PSS) is a standard for audio and video **streaming** to handheld 2.5 G and 3G terminals and provides a complete **streaming** and download framework for commercial content. This article gives an overview of the ...
Cited by 64 Related articles All 5 versions Cite Save

Global messaging with distributed **adaptive streaming** control
YJ Lee, CA Chao, R Ngai, MC Chiang... - US Patent App. 09/ ..., 2000 - Google Patents
A software implementable approach capable of creating, delivering, reassembling, rendering, and storing asynchronous and synchronous multimedia message. This approach integrates video/audio **streaming** with existing Internet/Intranet e-mail messaging and ...
Cited by 84 Related articles All 2 versions Cite Save

[BOOK] An experimental investigation of the Akamai **adaptive** video **streaming** [PDF] from uni-klu.ac.at
L De Cicco, S Mascolo - 2010 - Springer
Abstract Akamai offers the largest Content Delivery Network (CDN) service in the world. Building upon its CDN, it recently started to offer High Definition (HD) video distribution using HTTP-based **adaptive** video **streaming**. In this paper we experimentally investigate ...
Cited by 65 Related articles All 13 versions Cite Save

iDASH: improved dynamic **adaptive streaming** over HTTP using scalable video coding [PDF] from mines-telecom.fr
Y Sánchez de la Fuente, T Schierl, C Hellge... - Proceedings of the ..., 2011 - dl.acm.org
Abstract HTTP-based delivery for Video on Demand (VoD) has been gaining popularity within recent years. Progressive Download over HTTP, typically used in VoD, takes advantage of the widely deployed network caches to relieve video servers from sending ...
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System and method for **adaptive streaming** of predictive coded video data
C Anantharamu, D Manoranjan - US Patent App. 09/761,770, 2001 - Google Patents
This invention provides an **adaptive** transcoder which streams predictive coded video data over variable bandwidth networks and to devices having varying processing capabilities. The invention dynamically and continuously determines an available network bandwidth ...
Cited by 65 Related articles All 2 versions Cite Save

Quality of experience estimation for **adaptive** HTTP/TCP video **streaming** using H. 264/AVC [PDF] from inria.fr
KD Singh, Y Hadjadj-Aoul... - ... Conference (CCNC), 2012 ..., 2012 - ieeexplore.ieee.org
ABSTRACT Video services are being adopted widely in both mobile and fixed networks. For their successful deployment, the content providers are increasingly becoming interested in evaluating the performance of such traffic from the final users' perspective, that is, their ...
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/516,303	10/16/2014	Robert Drew Major	066.0141C1_P2004-04-01.2	4898

TITLE OF INVENTION: APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	06/30/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
DONABED, NINOS	2444	709-231000

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Typed or printed name Brett A. Carlson Registration No. 39,928

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Application Number	14/516,303
Filing Date	October 16, 2014
First Named Inventor	Robert Drew Major
Art Unit	2444
Examiner Name	Ninos Donabed
Attorney Docket Number	066.0141C1 (P2004-04-01.2)

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Electronic Patent Application Fee Transmittal

Application Number:	14516303
Filing Date:	16-Oct-2014
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Filer:	Brett Carlson/Brent Frazier
Attorney Docket Number:	066.0141C1_P2004-04-01.2

Filed as Large Entity

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Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
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Claims:				
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Patent-Appeals-and-Interference:				
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Utility Appl Issue Fee	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**960**

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EFS ID:	26202830
Application Number:	14516303
International Application Number:	
Confirmation Number:	4898
Title of Invention:	APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT
First Named Inventor/Applicant Name:	Robert Drew Major
Customer Number:	70560
Filer:	Brett Carlson/Brent Frazier
Filer Authorized By:	Brett Carlson
Attorney Docket Number:	066.0141C1_P2004-04-01.2
Receipt Date:	28-JUN-2016
Filing Date:	16-OCT-2014
Time Stamp:	18:55:40
Application Type:	Utility under 35 USC 111(a)

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PATENT NUMBER (if known)	APPLICATION NUMBER
	14/516,303

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/Brett A. Carlson/
Signature

☑ Attorney or Agent of record 39,928 (Reg. No.)

Brett A. Carlson
Typed or printed name

☐ Assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

480-385-5060
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June 28, 2016
Date

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/516,303	08/02/2016	9407564	066.0141C1_P2004-04-01.2	4898

54583 7590 07/13/2016

EchoStar Technologies, L.L.C.
Legal Department
100 Inverness Terrace East
ENGLEWOOD, CO 80112

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Robert Drew Major, Orem, UT;
ECHOSTAR TECHNOLOGIES L.L.C., Englewood, CO
Mark B. Hurst, Cedar Hills, UT;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the District of Delaware on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
	1/25/2019	for the District of Delaware

PLAINTIFF	DEFENDANT
DISH TECHNOLOGIES L.L.C. and SLING TV L.L.C.	UNIVISION COMMUNICATIONS INC.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	7,818,444 B2	October 19, 2010	DISH Technologies L.L.C.
2	8,402,156 B2	March 19, 2013	DISH Technologies L.L.C.
3	9,071,668 B2	June 30, 2015	DISH Technologies L.L.C.
4	9,407,564 B2	August 2, 2016	DISH Technologies L.L.C.
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

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Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

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Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court District of Colorado on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
21-cv-00740-STV	3/12/2021	District of Colorado

PLAINTIFF	DEFENDANT
THE TEACHING COMPANY, LLC; COMCAST CABLE COMMUNICATIONS MANAGEMENT, LLC d/b/a COMCAST TECHNOLOGY SOLUTIONS; and COMCAST CABLE COMMUNICATIONS, LLC	SLING TV L.L.C; and DISH TECHNOLOGIES L.L.C

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	7,818,444	10/19/2010	Move Networks, Inc.
2	8,402,156	3/19/2013	DISH Digital L.L.C.
3	9,071,668	6/30/2015	EchoStar Technologies L.L.C.
4	9,407,564	8/2/2016	EchoStar Technologies L.L.C.
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the District of Delaware on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
	4/13/2021	for the District of Delaware

PLAINTIFF	DEFENDANT
DISH Technologies L.L.C. and Sling TV L.L.C.	ICON Health & Fitness, Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	US 9,407,564 B2	8/2/2016	DISH Technologies L.L.C.
2	US 10,469,554 B2	11/5/2019	DISH Technologies L.L.C.
3	US 10,469,555 B2	11/5/2019	DISH Technologies L.L.C.
4	US 10,757,156 B2	8/25/2020	DISH Technologies L.L.C.
5	US 10,951,680 B2	3/16/2021	DISH Technologies L.L.C.

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:21-cv-00132	4/13/2021	Eastern District of Texas

PLAINTIFF	DEFENDANT
DISH TECHNOLOGIES L.L.C. and SLING TV L.L.C.	PELOTON INTERACTIVE, INC.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,407,564	8/2/2016	DISH Technologies L.L.C.
2	10,469,554	11/5/2019	DISH Technologies L.L.C.
3	10,469,555	11/5/2019	DISH Technologies L.L.C.
4	10,757,156	8/25/2020	DISH Technologies L.L.C.
5	10,951,680	3/16/2021	DISH Technologies L.L.C.

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
	4/13/2021	for the District of Delaware

PLAINTIFF	DEFENDANT
DISH Technologies L.L.C. and Sling TV L.L.C.	lululemon athletica inc. and Curiouser Products Inc. (d/b/a MIRROR)

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	US 9,407,564 B2	8/2/2016	DISH Technologies L.L.C.
2	US 10,469,554 B2	11/5/2019	DISH Technologies L.L.C.
3	US 10,469,555 B2	11/5/2019	DISH Technologies L.L.C.
4	US 10,757,156 B2	8/25/2020	DISH Technologies L.L.C.
5	US 10,951,680 B2	3/16/2021	DISH Technologies L.L.C.

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