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- Published:
- with international search report (Art. 21(3))
 - before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

[Continued on next page]

(54) Title: PROVIDING A BUFFERLESS TRANSPORT METHOD FOR MULTI-DIMENSIONAL MESH TOPOLOGY

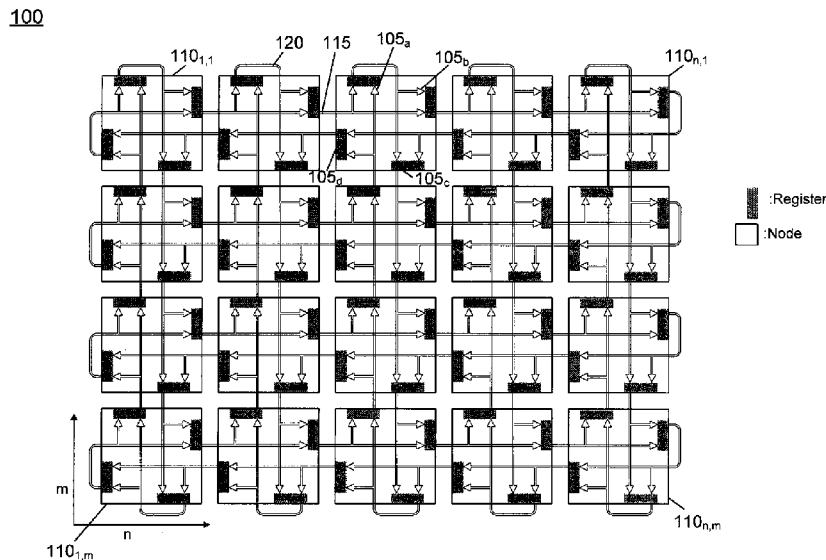


FIG. 1

(57) Abstract: In one embodiment, the present invention includes a method for determining whether a packet received in an input/output (I/O) circuit of a node is destined for the node and if so, providing the packet to an egress queue of the I/O circuit and determining whether one or more packets are present in an ingress queue of the I/O circuit and if so, providing a selected packet to a first or second output register according to a global schedule that is independent of traffic flow. Other embodiments are described and claimed.

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12 April 2012

A. CLASSIFICATION OF SUBJECT MATTER**H04L 12/28(2006.01)i, H04L 12/56(2006.01)i, G06F 13/14(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04L 12/28; G06F 9/46; H04B 10/00; H03K 19/177; G06F 13/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: on chip, mesh, buffer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 7185138 B1 (P. GALICKI) 27 February 2007 See abstract, Column 70 line 43 - Column 71 line 52.	1-20
A	US 2006-0200825 A1 (K. POTTER) 07 September 2006 See abstract, paragraphs [0004]-[0012].	1-20
PA	US 2011-0103799 A1 (A. SHACHAM et al.) 05 May 2011 See abstract, paragraphs [0002]-[0008],[0026]-[0027],[0052]-[0055].	1-20
A	US 2004-0187087 A1 (M. ENEBOE et al.) 23 September 2004 See abstract, Fig. 1c, paragraphs [0035]-[0049].	1-20
A	US 2008-0164907 A1 (M. MERCALDI-KIM et al.) 10 July 2008 See abstract, paragraphs [0023]-[0036],[0127]-[0137].	1-20
A	US 2008-0198867 A1 (L. MOLL et al.) 21 August 2008 See abstract, paragraphs [0005]-[0016],[0024]-[0030].	1-20

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

31 JANUARY 2012 (31.01.2012)

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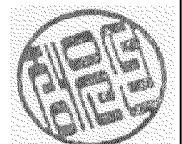
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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Group I(Claims 1-10) relates to a system comprising a mesh system including a plurality of nodes and a plurality of interconnections each to couple a pair of the plurality of nodes.

Group II(Claims 11-20) relates to receiving a packet in a node and providing the packet to an egress queue of the node.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2 they lack the same or corresponding special features; they are separate inventions with distinct fields of search.

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/042431

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7185138 B1	27.02.2007	None	
US 2006-0200825 A1	07.09.2006	AU 2004-220640 A1 AU 2004-220640 B2 CA 2517156 A1 CA 2517156 C CN 1759379 A CN 1759379 C0 EP 1602030 A2 US 2004-0187112 A1 US 7039914 B2 US 7287255 B2 WO 2004-080149 A2 WO 2004-080149 A3 WO 2004-080149 A3	23.09.2004 08.07.2010 23.09.2004 24.05.2011 12.04.2006 04.06.2008 07.12.2005 23.09.2004 02.05.2006 23.10.2007 23.09.2004 28.07.2005 23.09.2004
US 2011-0103799 A1	05.05.2011	WO 2008-080122 A2 WO 2008-080122 A3 WO 2008-080122 A3 WO 2008-080122 A9	03.07.2008 14.08.2008 03.07.2008 09.10.2008
US 2004-0187087 A1	23.09.2004	None	
US 2008-0164907 A1	10.07.2008	None	
US 2008-0198867 A1	21.08.2008	None	