



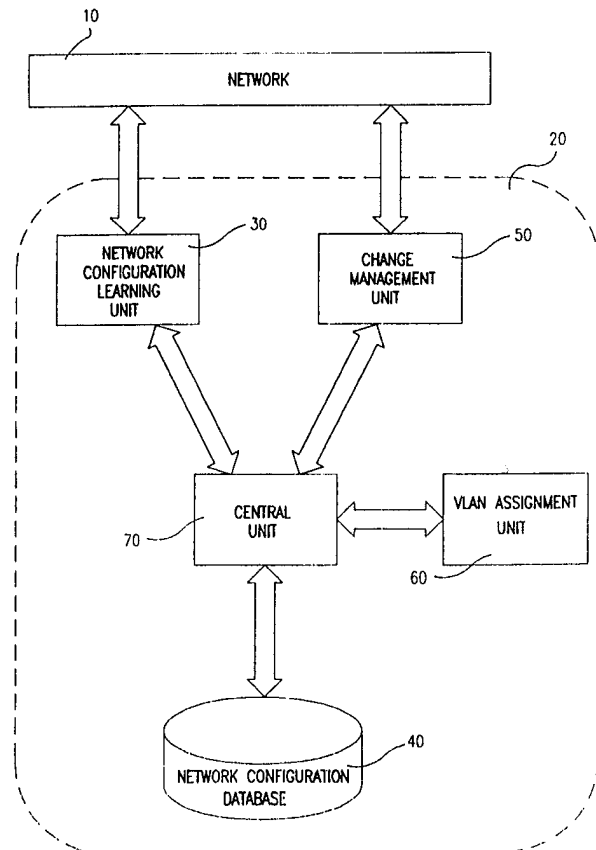
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>6</sup> : <b>H04L 12/46, 12/24</b></p>	<p><b>A3</b></p>	<p>(11) International Publication Number: <b>WO 98/05146</b> (43) International Publication Date: 5 February 1998 (05.02.98)</p>
<p>(21) International Application Number: PCT/IL97/00258 (22) International Filing Date: 29 July 1997 (29.07.97) (30) Priority Data: 118984 30 July 1996 (30.07.96) IL (71) Applicant: MADGE NETWORKS (ISRAEL) LTD. [IL/IL]; Building 3, Atidim Technology Park, 61131 Tel Aviv (IL). (72) Inventors: BERLOVITCH, Albert; Benyamin Fine Street 4, 75237 Rishon le Zion (IL). SHURMAN, Michael; Greenspan Street 4221, 93806 Jerusalem (IL). SHOUA, Menachem; Hapodim Street 30, 52574 Ramat Gan (IL). (74) Agents: COLB, Sanford, T. et al.; Sanford T. Colb &amp; Co., P.O. Box 2273, 76122 Rehovot (IL).</p>	<p>(81) Designated States: CN, JP, KR, SG, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>  (88) Date of publication of the international search report: 30 April 1998 (30.04.98)</p>	

(54) Title: APPARATUS AND METHOD FOR ASSIGNING VIRTUAL LANs

(57) Abstract

This invention discloses an apparatus (20) for managing a switched routed network (10) including a network configuration learning unit (30) operative to learn a configuration of the switched routed network, a VLAN assignment unit (60) for generating a division of the network into virtual LANs (VLANs) based on the learned configuration of the network, and a change manager (50) operative to detect a change in the configuration of the network and to modify the division of the network into VLANs. A method for generating a division of a switched routed network into virtual LANs (VLANs) based on a learned configuration of the network is also disclosed.



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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IL 97/00258

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 H04L12/46 H04L12/24

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)  
IPC 6 H04L

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

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, vol. 13, no. 5, 1 June 1995, pages 839-849, XP000499090 MYLES A ET AL: "A MOBILE HOST PROTOCOL SUPPORTING ROUTE OPTIMIZATION AND AUTHENTICATION" see paragraph 2B-2D see paragraph 5-5B see paragraph 6C see paragraph 8</p> <p style="text-align: center;">---</p> <p style="text-align: center;">-/--</p>	1,2

Further documents are listed in the continuation of box C.

Patent family members are listed in 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 document 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 another citation or other special reason (as specified)
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- \*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.
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Date of the actual completion of the international search  <p style="text-align: center; font-size: 1.2em;">1 December 1997</p>	Date of mailing of the international search report  <p style="text-align: center; font-size: 1.2em;">25. 02. 98</p>
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  <p style="text-align: center; font-size: 1.2em;">Dupuis, H</p>

INTERNATIONAL SEARCH REPORT

Internal Application No  
PCT/IL 97/00258

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 615 362 A (HEWLETT PACKARD CO) 14 September 1994	26
Y	see column 1, line 43-45 see column 3, line 2 - column 4, line 24 see column 8, line 2 - column 9, line 13 see column 12, line 29 - column 13, line 56 see column 19, line 57 - column 20, line 52 ---	27-29
Y	DATA COMMUNICATIONS, vol. 23, no. 12, 1 September 1994, pages 66-70, 72, 74, 76, 78, 80, XP000462385 "SWITCHED VIRTUAL NETWORKS INTERNETWORKING MOVES BEYOND BRIDGES AND ROUTERS"	27-29
A	see page 70, right-hand column, line 53 - page 74, left-hand column, line 5; figures 3,4 see page 76, left-hand column, line 23 - middle column, line 35 -----	1,26

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL 97/00258

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

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

see annexed sheet

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.:

1, 2, 26-29

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

1. Claims 1,2,26-29: An apparatus for managing a switched routed network, comprising a network configuration learning unit, a VLAN assignment unit and a change manager, wherein the network configuration learning unit comprises a diagnostic unit for analysing and diagnosing the existing division of the network into VLANs.
2. Claims 3-19,25: An apparatus and method for learning the configuration and generating a division into VLAN of a switched routed network, the network comprising at least one switching hub and a plurality of endstations each having a unique physical address and connected to a specific port of a switching hub.
3. Claims 20-24,30-35: A method for detecting a change in the configuration of a switched routed network comprising: detecting at least one event at an individual network element, and categorizing at least one event as a problematic event or a non-problematic event.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IL 97/00258

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0615362 A	14-09-94	JP 6348622 A US 5712981 A	22-12-94 27-01-98
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