

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
21 April 2005 (21.04.2005)

PCT

(10) International Publication Number
WO 2005/036367 A3

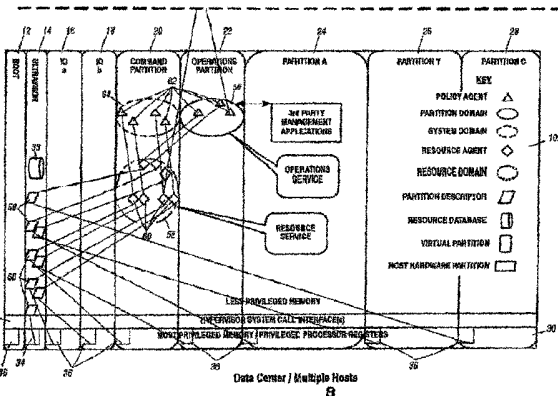
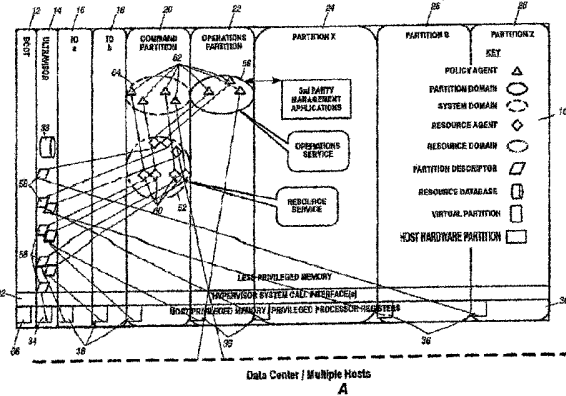
- (51) International Patent Classification:
G06F 15/16 (2006.01) G06F 15/173 (2006.01)
G06F 15/167 (2006.01)
- (21) International Application Number:
PCT/US2004/033450
- (22) International Filing Date: 7 October 2004 (07.10.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/509,581 8 October 2003 (08.10.2003) US
- (71) Applicant (for all designated States except US): UNISYS CORPORATION [US/US]; Unisys Way, MS/E8-114, Blue Bell, PA 19424-0001 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): LANDIS, John, A. [US/US]; 7124 Old Easton Road, Pipersville, PA 18947 (US). POWDERLY, Terrence, V. [US/US]; 10 Crown Lane, East Fallowfield, PA 19320 (US). SUBRAHMANIAN, Rajagopalan [IN/US]; 731 Parkview Drive,

Phoenixville, PA 19460 (US). PUTHIYAPARAMBIL, Aravindh [IN/US]; 715 Parkview Drive, Phoenixville, PA 19460 (US).

- (74) Agents: STARR, Mark, T. et al.; Unisys Corporation, Unisys Way, MS/E8-114, Blue Bell, PA 19424-0001 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,

[Continued on next page]

(54) Title: VIRTUAL DATA CENTER THAT ALLOCATES AND MANAGES SYSTEM RESOURCES ACROSS MULTIPLE NODES



(57) Abstract: The present invention provides a virtualization infrastructure that allows multiple guest/user partitions (24, 26, 28) to run within a host hardware partition (10). The host system (10) is divided into distinct logical or virtual partitions and special infrastructure partitions (12-22) implemented to control resource management and to control physical I/O device drivers (16, 18) that are, in turn, used by operating systems in other distinct logical or virtual guest/user partitions (24, 26, 28). Host hardware resource management runs as a tracking application in a resource management "ultravisor" partition (14), while host resource management decisions are performed in a higher-level command partition (20) based on policies maintained in a separate operations partition (22). The ultravisor partition (14) maintains a master database (33) of the hardware resource allocations, and virtual partition monitors (34, 36) are provided in each partition to constrain the guest/user operating system to the assigned resources.

WO 2005/036367 A3



FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:

22 June 2006

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/33450

A. CLASSIFICATION OF SUBJECT MATTER
 IPC: **G06F 15/16**(2006.01),**15/167**(2006.01),**15/173**(2006.01)

 USPC: 709/200,215,226
 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)
 U.S. : 709/200, 215, 226

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 practicable, search terms used)
 EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P --- Y	US 6,725,289 b1 (WALDSPURGER et al) 20 April 2004 (20.04.2004), column 3 line 64- column 11 line 42.	1 and 15 ----- 2-14 and 16-27
Y	US 5,555,385 (OSISEK) 10 September 1996 (10.09.1996), column 3 line 20-column 10 line 61 and figures 1a, 3, 4c and 5a-5k.	2, 3 and 16
Y	US 6,199,179 B1 (KAUFFMAN et al) 6 March 2001 (06.03.2001), column 2 line 37-column 36 line 38.	4-14 and 17-27

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	"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
"E" earlier application or patent published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search: 21 March 2006 (21.03.2006)
 Date of mailing of the international search report: 02 MAY 2006

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer <i>Rupal Dharia</i> Rupal Dharia Telephone No. 571-272-3880
---	---