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[Continued on next page]

(54) Title: COLLECTOR DEVICE AND SYSTEM UTILIZING STANDARDIZED UTILITY METERING PROTOCOL

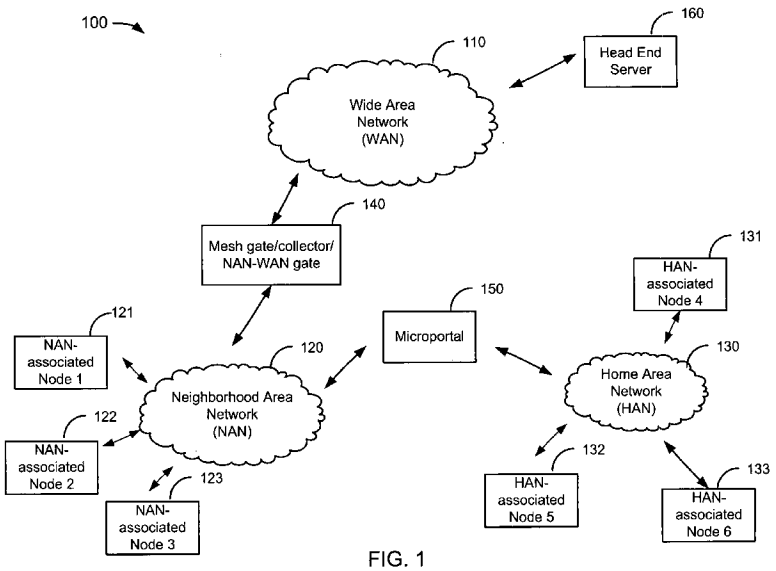

FIG. 1

(57) Abstract: A device-agnostic collector is capable of accepting information pushed from a node for aggregation and subsequent transmission to the head end server. As a receiver of pushed information, the device-agnostic collector does not require information about the type of meter at the node or the type of data structures transmitted by the node.

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MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 08/13032

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 15/16 (2009.01)
USPC - 709/229
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(8)- G06F 15/16 (2009.01)
USPC- 709/229

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)
PubWest (US Patent, PgPub: class. best fit), DialogClassic (Derwent, EPO, USPTO, WIPO/PCT fulltexts: keyword), GoogleScholar; search terms: ami, advanc?, meter?, manag?, infra?, mesh?, network?, utilit?, gas, electricity, water, push?, data?, information?, device?, platform?, independent?, agnostic?

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 2005/0065742 (RODGERS) 24 March 2005 (24.03.2005), Figure 3b, 5; para [0011]-[0031], [0050], [0057]-[0064], [0069]-[0071], [0078], [0090]-[0093], [0106], [0111], [0115]-[0117], [0131]	1-14, 16-26, 28-54, 56-72, 74, 75 ---------- 15, 27, 55, 73
Y	US 2007/0001868 A1 (BOAZ) 04 January 2007 (04.01.2007), para [0003], [0005], [0049]-[0088]	15, 27, 55, 73
P, X	WO 2008/092268 A1 (SALTER et al.) 07 August 2008 (07.08.2008), entire document	1-75
P, X	WO 2008/033287 A2 (GARRISON STUBER et al.) 20 March 2008 (20.03.2008), entire document	1-75
P, X	WO 2008/033514 A2 (PICARD et al.) 20 March 2008 (20.03.2008), entire document	1-75
A	US 7,200,633 B2 (SEKIGUCHI et al.) 03 April 2007 (03.04.2007), entire document	1-75
A	US 7,248,861 B2 (LAZARIDIS et al.) 24 July 2007 (24.07.2007), entire document	1-75
A	US 7,020,701 B1 (GELVIN et al.) 28 March 2006 (26.03.2006), entire document	1-75
A	WO 01/26334 A2 (GELVIN et al.) 12 April 2001 (12.04.2001), entire document	1-75

☐ Further documents are listed in the continuation of Box C. ☐

* 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 another 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	Date of mailing of the international search report
08 March 2009 (08.03.2009)	12 MAY 2009
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: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 08/13032

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 1: claims 1-75
Group 2: claims 76-82, 89-93, and 109
Group 3: claims 83-85, 94-101, and 110
Group 4: claims 86-88, 102-108, and 111
Group 5: claims 112-117, 122-124, and 130
Group 6: claims 118-121, 125-129, and 131
Group 7: claims 132-160
Group 8: claims 161-201 and 215-225
Group 9: claims 202-214 and 226

-----continued on supplemental box-----

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 additional fees, this Authority did not invite payment of additional fees.

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.:
1-75

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

International application No.
PCT/US 08/13032

Box No. III, Observations where unity of invention is lacking:

(ii) Reasons for lack of Unity of Invention:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group 1, claims 1-75, drawn to a system/method/computer program product for communicating data from a node to a head end server comprising a collector for ereciving data from a node over a first network and transmitting data to the head end server over a second network.

Group 2, claims 76-82, 89-93, and 109, drawn to a system/method/computer program product for transmitting a report from a node to a head end server by assigning ports of a collector device to receive particlualr types of reports.

Group 3, claims 83-85, 94-101, and 110, drawn to a system/method/computer program product for transmitting data from a smart meter to a communication card for transmission to the collector by stoiring lists of adata structure and a sequence number for each list in the register of the smart meter.

Group 4, claims 86-88, 102-108, and 111, drawn to a system/method/computer program product for using a reporting list at a node for transmission to a collector based on last-transferred pointer to determine reports that have not been received by collector.

Group 5, claims 112-117, 122-124, and 130, drawn to a node device/method/computer program product for initiating transmission of data to a collector by using a data input/output module for collecting the data.

Group 6, claims 118-121, 125-129, and 131, drawn to a collector/method/computer program product for receiving a data packet/report initiated from a node over a first network and transmissting the data packet/report to a head end server overa second network.

Group 7, claims 132-160, drawn to a system/method/computer program product for communicating between a plurality of nodes and a collector using checkpoints by transmitting data packets from each node to the collector at the nodes substantially generated random time slot within the prescheduled reporting time window.

Group 8, claims 161-201 and 215-225, drawn to a system/method/computer program product for synchronizing a data request between a head end server and a collector/recovering data loss at head end server by transmitting read request from the head end server to a collector for a table having elements corresponding to nodes serviced by the collector.

Group 9, claims 202-214 and 226, drawn to a system/method/computer program product for recovering froma collector failure by seeking a new collector by a node associated with the failed collector.

The inventions listed as Groups 1-9 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 technical features for the following reasons: The special technical feature of the Group 1 invention is communicating data from a node to a head end server comprising a collector for ereciving data from a node over a first network and transmitting data to the head end server over a second network. The special technical feature of the Group 2 invention is transmitting a report from a node to a head end server by assigning ports of a collector device to receive particlualr types of reports. The special technical feature of the Group 3 invention is transmitting data from a smart meter to a communication card for transmission to the collector by stoiring lists of adata structure and a sequence number for each list in the register of the smart meter. The special technical feature of the Group 4 invention is using a reporting list at a node for transmission to a collector based on last-transferred pointer to determine reports that have not been received by collector. The special technical feature of the Group 5 invention is initiating transmission of data to a collector by using a data input/output module for collecting the data. The special technical feature of the Group 6 invention is receiving a data packet/report initiated from a node over a first network and transmissting the data packet/report to a head end server overa second network. The special technical feature of the Group 7 invention is communicating between a plurality of nodes and a collector using checkpoints by transmitting data packets from each node to the collector at the nodes substantially generated random time slot within the prescheduled reporting time window. The special technical feature of the Group 8 invention is synchronizing a data request between a head end server and a collector/recovering data loss at head end server by transmitting read request from the head end server to a collector for a table having elements corresponding to nodes serviced by the collector. The special technical feature of the Group 9 invention is recovering from a collector failure by seeking a new collector by a node associated with the failed collector. None of these special technical features are common to the other groups, nor do they correspond to a special technical feature in the other groups. Therefore, unity of invention is lacking.

(iii) The following appears to be typographical error:

Claim 261 should be renumbered/ read as claim 161.