Alternative Data Service

J-GATE System Stats Data

Specification

Version 1.1

October 2022

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Revision history

#	Date	Chapter	Change description	Remark
1	2021/9/21	-	Initial version.	Version 1.0
2	2022/10/31	4 5	Added GW/TAP stats file and PTP offset stats file.	Version 1.1

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1   About This Specification

1.1   Introduction

This is a specification document for "J-GATE System Stats Data", one of datasets of the Alternative Data Service ("the Service"). It mainly describes information necessary for users of the Service to handle the dataset.

It is prohibited to redistribute this document.

2　　Service Details

2.1　　Data Overview

J-GATE System Stats Data is a set of CSV files containing information of hardware resources in each server composing J-GATE, captured at one-second interval and printed in a chronological order.

It mainly uses Linux sysstat package (sar, vmstat, etc.) to capture usage status of CPU, memory, NIC, and other resources.

CSV files are separate for each resource type and server type.

One file basically records usage status from 6:00 a.m. to 6:00 a.m. of the following day. However, NIC usage status (NicStats*.csv) covers from 0:00 a.m. to 0:00 a.m. of the following day.

GW/TAP stats file and PTP offset stats file are explained in more detail in Chapters 4 and 5.

2.2   Resources to Be Provided

Data type	File name
CPU context switch count per second	CpuContextSwitch_<nodetype>_<nodenumber>_yyyymmdd.csv
Queued task count	CpuQueueLength_<nodetype>_<nodenumber>_yyyymmdd.csv
Total CPU usage rate per core	CpuUsageTotal_<nodetype>_<nodenumber>_yyyymmdd.csv
CPU usage rate related to interruption requests per core	CpuUsageIrq_<nodetype>_<nodenumber>_yyyymmdd.csv
CPU usage rate at system level (kernel) per core	CpuUsageKernel_<nodetype>_<nodenumber>_yyyymmdd.csv
CPU usage rate at user level (application) per core	CpuUsageUser_<nodetype>_<nodenumber>_yyyymmdd.csv
Active memory usage (KB)	MemActive_<nodetype>_<nodenumber>_yyyymmdd.csv
Memory usage excluding buffer and cache (KB)	MemUsed_<nodetype>_<nodenumber>_yyyymmdd.csv
Inactive memory usage (KB)	MemInactive_<nodetype>_<nodenumber>_yyyymmdd.csv
Major page fault count per second	MemMajorFault_<nodetype>_<nodenumber>_yyyymmdd.csv
Memory usage including buffer and cache (KB)	MemUsedTotal_<nodetype>_<nodenumber>_yyyymmdd.csv
Byte size and packet count of NIC send and receive (I/F for backend segment and frontend segment) *1 *2	NicStats_BE1_<nodetype>_<nodenumber>_yyyymmdd.csv NicStats_BE2_<nodetype>_<nodenumber>_yyyymmdd.csv NicStats_FE1_<nodetype>_<nodenumber>_yyyymmdd.csv NicStats_FE2_<nodetype>_<nodenumber>_yyyymmdd.csv

*1: The backend segment refers to the network between Gateway server and Matching Engine server, while the frontend segment is the network between Gateway server and a client system. Both segments use two NICs for redundancy. The bonding mode for the frontend is Active-Standby, whereas the backend in Active-Active, however, I/F to be used for backend communications is fixed per partition.

*2: Data for the frontend segment is not provided because Matching Engine server does not belong to the frontend segment.

The CSV file is created and provided per host type (nodetype) and host number (nodenumber).

For host types and host numbers, please see "2.3 Servers to Be Provided".

2.3 Servers to Be Provided

Host type (nodetype)	Host number (nodenumber)	Overview
ME	1	Matching Engine server (Partition 1)
ME	3	Matching Engine server (Partition 2,3)
ME	5	Matching Engine server (Partition 4,5)
ITCH	11	ITCH Dissemination server Feed 1 (Multicast group 1)
ITCH	12	ITCH Dissemination server Feed 2 (Multicast group 1)
ITCH	21	ITCH Dissemination server Feed 1 (Multicast group 2)
ITCH	22	ITCH Dissemination server Feed 2 (Multicast group 2)
ITCH	31	ITCH Dissemination server Feed 1 (Multicast group 3,4,5)
ITCH	32	ITCH Dissemination server Feed 2 (Multicast group 3,4,5)
ITCH	41	ITCH Dissemination server Feed 1 (Multicast group 6,7)
ITCH	42	ITCH Dissemination server Feed 2 (Multicast group 6,7)
ITCH	51	ITCH Dissemination server Feed 1 (Multicast group 8)
ITCH	52	ITCH Dissemination server Feed 2 (Multicast group 8)
OUCH	11～15	OUCH Gateway server (Partition 1)
OUCH	21～24	OUCH Gateway server (Partition 2)
OUCH	31～33	OUCH Gateway server (Partition 3)
OUCH	41～43	OUCH Gateway server (Partition 4)
OUCH	51～53	OUCH Gateway server (Partition 5)

3 System Stats File

3.1 File Specification

File name	Format	Character code	Line feed code	Delimiter	Header
CpuContextSwitch_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
CpuQueueLength_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
CpuUsageTotal_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
CpuUsageIrq_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
CpuUsageKernel_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
CpuUsageUser_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
MemActive_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
MemUsed_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
MemInactive_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
MemMajorFault_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
MemUsedTotal_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
NicStats_BE1_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
NicStats_BE2_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
NicStats_FE1_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present
NicStats_FE2_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8-	LF	, (comma)	Present

3.2   List of Columns

File name	List of columns
CpuContextSwitch_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP cswch/s
CpuQueueLength_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP runq-sz
CpuUsageTotal_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP %USE_RATE(CPU[X]) *1
CpuUsageIrq_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP %irq(CPU[X]) *1
CpuUsageKernel_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP %sys(CPU[X]) *1
CpuUsageUser_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP %usr(CPU[X]) *1
MemActive_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP Active
MemUsed_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP kbmemused-kbbuffers-kbcached
MemInactive_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP Inactive
MemMajorFault_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP majflt/s
MemUsedTotal_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP Kbmemused
NicStats_BE1_<nodetype>_<nodenumber>_yyyymmdd.csv NicStats_BE2_<nodetype>_<nodenumber>_yyyymmdd.csv NicStats_FE1_<nodetype>_<nodenumber>_yyyymmdd.csv NicStats_FE2_<nodetype>_<nodenumber>_yyyymmdd.csv	TIME_STAMP port_rx_packets port_rx_bytes port_tx_packets port_tx_bytes

*1: The number of columns in CPU[X] is variable depending on the number of CPU cores in each server.

4 GW/TAP Stats File

4.1 File Specification

File name	Format	Character code	Line feed code	Delimiter	Header
TransactionPerGateway_yyyymmdd.csv	CSV	UTF-8	LF	, (comma)	Present

One file records transaction request volume (*) by OAPI and OUCH for each GW and TAP from 6:00 a.m. to 6:00 a.m. of the following day.

(*) For OAPI, order transactions are counted in.

4.2 List of Columns

#	Item name	Header name	Example value	Description
1	Host type	host_category	(OAPI) OAPI_Primary (OUCH) OUCH11	Type of destination host. (OAPI) Primary or Backup (OUCH) Per GW
2	TAP	tap	(OAPI) ALL (OUCH) 1	Destination TAP. (OAPI) Total of all TAPs (OUCH) Per TAP
3	P1	P1	23183198	Transaction volume in Partition 1.
4	P2	P2	32219373	Transaction volume in Partition 2.
5	P3	P3	24729538	Transaction volume in Partition 3.
6	P4	P4	4807866	Transaction volume in Partition 4.
7	P5	P5	1032670	Transaction volume in Partition 5.

5 PTP Offset Stats File

5.1 File Specification

File name	Format	Character code	Line feed code	Delimiter	Header
Offset-GM-NIC_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8	LF	, (comma)	Present
Offset-NIC-SysClock_<nodetype>_<nodenumber>_yyyymmdd.csv	CSV	UTF-8	LF	, (comma)	Present

The data captures minute-by-minute PTP offset values in each of Matching Engine servers and OUCH servers from 6:00 a.m. to 6:00 a.m. of the following day.

Offset-GM-NIC file records offset values between the PTP grand master and a server's NIC.

Offset-NIC-SysClock file records offset values between a server's NIC and a server's system clock.

5.2 List of Columns

#	Header name	Description
1	mean	Average offset in one minute (nanosecond).
2	min	Minimum offset in one minute (nanosecond).
3	max	Maximum offset in one minute (nanosecond).
4	std-dev	Standard deviation of offset in one minute (nanosecond).
5	samples	Number of PTP packets in one minute.
6	start-date	Date at the start of the given minute.
7	start-time	Time at the start of the given minute.
8	end-date	Date at the end of the given minute.
9	end-time	Time at the end of the given minute.
10	min-date	Date when a PTP synchronization message registering min (minimum offset) was transmitted.
11	min-time	Time when a PTP synchronization message registering min (minimum offset) was transmitted.

12	max-date	Date when a PTP synchronization message registering max (maximum offset) was transmitted.
13	max-time	Time when a PTP synchronization message registering max (maximum offset) was transmitted.
14	qual	Indicates reliability of the data. If it is yes, the values #1 through #13 above are reliable.