

To: MTB Distribution  
From: Jim Homan  
Subject: A Multics Usage and Revenue Report  
Date: 05/18/76

A program which produces daily and monthly versions of a "Multics Usage and Revenue Report" has been in use at MIT for about two years. The report has been useful to the installation management, but the program was written to fill MIT's specific needs at the time and is not easily adaptable to the changing needs at MIT or to the needs of other Multics installations. For these reasons the program is being rewritten to be more flexible and general. The major change is the use of a control file to specify the makeup of the report groups. From one to nine groups may be specified. Some reformatting of the report is also done to permit the use of a variable number of groups.

The remainder of this MTB consists of (1) MPM documentation for the new report, (2) a copy of the new daily report, and (3) selected pages of the monthly report.

Comments and/or suggestions should be sent to Jim Homan, Room 39-551, MIT or by Multics mail on the MIT system to Homan.PDO.

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usage\_and\_revenue

name: usage\_and\_revenue

The usage\_and\_revenue command prints out a report of system usage and revenue broken down by groups of users.

Usage

usage\_and\_revenue control data -data2-

- 1) control is the pathname of an ASCII file which defines the groups of users for the report.
- 2) data is the pathname of a copy of the system use\_totals month-to-date statistical database.
- 3) data2 is the pathname of an earlier copy of the system use\_totals month-to-date statistical database.

Notes

If both the data and data2 arguments are given, a daily report will be produced showing the incremental system usage between the time data2 was created and the time data was created. If only the data argument is given then a monthly report will be produced showing the month-to-date usage at the time data was created.

The control file may specify up to 9 groups of users to be shown in the report. Each group consists of 1 or more of the usage bins in the use\_totals database. The groups will appear in the report in the same order in which they appear in the control file. Each line of the control file specifies one of the groups (except that lines beginning with a "\*" are ignored). The format of the lines is:

Group title:users1,users2,...,usersn

Where

Group title is the title which will be used to identify the group in the report. The maximum length is 24.

usersn are either

- 1) the titles of the usage bins in use\_totals which are to be included in this group.

These are the titles specified in the control file for `reset_use_totals`. (See the MPM description of `reset_use_totals`.)

or

2) if `usersn` is enclosed in quotes, then it specifies another group defined in the control file and all the bins which go into that group will also go into this group.

**Example:**

If `use_totals` has bins labelled "Staff", "Users" and "Other", the control file

```
Staff Use:Staff
Non-Staff Use:Users,Other
Total:"Staff Use","Non-Staff Use"
```

would result in a report with 3 groups, one containing one bin's usage (Staff), one containing 2 bins' usages (Users+Other), and one containing 3 bins' usages (Staff+Users+Other).

A facility is provided to add notes or messages to the report. If a segment named `usage_and_revenue_footnote` exists in the caller's working directory, its contents will be printed at the end of the report.

M a s s a c h u s e t t s   I n s t i t u t e   o f   T e c h n o l o g y  
I n f o r m a t i o n   P r o c e s s i n g   C e n t e r

Multics Usage and Revenue Report

For 05/15/76 1601 Sat to 05/16/76 1604 Sun

Current System: 28.5a

Revenue Summary

	Connect Hours	CPU Hours	Memory Kmu	Terminal I/O	Unit Records	Disk Page-Days	Devices	Misc.	Total Charges	Month Charges
MIT Users										
Usage	163.55	1.64	72.23	0	24,611	71,873				
\$Charges	117.04	193.77	404.46	0.00	37.16	1,437.46	0.00	0.00	2,189.89	52,057.84
Buyback										
Usage	20.88	0.55	23.49	0	56,679	92,205				
\$Charges	18.40	59.92	130.62	0.00	86.16	1,844.09	0.00	0.00	2,139.19	43,178.88
System										
Usage	131.97	1.27	90.51	0	42,611	22,027				
\$Charges	8.98	180.74	542.23	0.00	117.60	440.55	0.00	0.00	1,290.08	35,358.16
IPC/PDO Use										
Usage	17.55	0.53	32.30	0	18,721	52,681				
\$Charges	14.58	53.34	159.17	0.00	28.13	1,053.62	0.00	0.00	1,308.84	24,544.76
Billable Total										
Usage	184.43	2.20	95.72	0	81,290	164,078				
\$Charges	135.44	253.68	535.08	0.00	123.32	3,281.56	0.00	0.00	4,329.08	95,236.71
Nonbillable Total										
Usage	149.52	1.80	122.81	0	61,332	74,708				
\$Charges	23.56	234.08	701.40	0.00	145.73	1,494.17	0.00	0.00	2,598.93	59,902.91
Grand Total										
Usage	333.95	4.00	218.53	0	142,622	238,786				
\$Charges	159.00	487.76	1,236.48	0.00	269.05	4,775.73	0.00	0.00	6,928.00	155,139.63

Interactive Summary: CPU Hours

		MIT Users	Buyback	System	IPC/PDO Use	Billable Total	Nonbillable Total	Grand Total
Shift 2:	Usage	0.46	0.13	0.06	0.03	0.59	0.10	0.68
	\$Charges	54.77	15.61	7.67	3.98	70.39	11.65	82.04
Shift 3:	Usage	0.41	0.00	0.12	0.24	0.41	0.35	0.76
	\$Charges	30.46	0.00	8.69	17.69	30.46	26.38	56.84
Shift 4:	Usage	0.67	0.16	0.87	0.16	0.83	1.03	1.86
	\$Charges	99.94	24.71	130.92	23.38	124.65	154.30	278.95
Total:	Usage	1.53	0.29	1.05	0.42	1.82	1.48	3.30
	\$Charges	185.17	40.32	147.28	45.05	225.50	192.33	417.83

Interactive Summary: Connect Hours

		MIT Users	Buyback	System	IPC/PDO Use	Billable Total	Nonbillable Total	Grand Total
Shift 2:	Usage	63.03	9.93	35.56	4.95	72.97	40.51	113.48
	\$Charges	42.77	7.45	4.17	3.71	50.22	7.88	58.11
Shift 3:	Usage	41.32	0.00	41.75	4.93	41.32	46.68	88.00
	\$Charges	21.45	0.00	0.10	3.21	21.45	3.31	24.76
Shift 4:	Usage	50.20	10.95	54.66	7.66	70.15	62.32	132.47
	\$Charges	52.81	10.95	4.71	7.66	63.76	12.37	76.13
Total:	Usage	163.55	20.88	131.97	17.55	184.43	149.52	333.95
	\$Charges	117.04	18.40	8.98	14.58	135.44	23.56	159.00

Interactive Summary: Memory Kmv

		MIT Users	Buyback	System	IPC/PDO Use	Billable Total	Nonbillable Total	Grand Total
Shift 2:	Usage	24.38	6.00	6.97	3.24	30.38	10.20	40.59
	\$Charges	146.29	36.02	41.79	19.42	182.31	61.21	243.52
Shift 3:	Usage	5.01	0.00	6.04	10.74	5.01	16.78	21.79
	\$Charges	20.04	0.00	24.15	42.98	20.04	67.12	87.17
Shift 4:	Usage	33.39	11.73	68.24	11.07	45.12	79.30	124.42
	\$Charges	200.36	70.37	409.43	66.40	270.72	475.83	746.55
Total:	Usage	62.79	17.73	81.24	25.05	80.52	106.29	186.80
	\$Charges	366.69	106.38	475.37	128.80	473.07	604.16	1,077.24

## Interactive Summary: Total Interactive Charges

		MIT Users	Buyback	System	IPC/P00 Use	Billable Total	Nonbillable Total	Grand Total
Shift 2:	\$Charges	243.84	59.08	53.63	27.11	302.92	80.75	383.66
	\$/Hour	3.87	5.95	1.51	5.48	4.15	1.99	3.38
Shift 3:	\$Charges	71.96	0.00	32.93	63.88	71.96	96.81	168.77
	\$/Hour	1.74	0.00	0.79	12.95	1.74	2.07	1.92
Shift 4:	\$Charges	353.11	106.02	545.05	97.44	459.14	642.49	1,101.63
	\$/Hour	5.96	9.69	9.97	12.71	6.55	10.31	8.32
Total:	\$Charges	668.91	165.10	631.62	188.43	834.01	820.05	1,654.06
	\$/Hour	4.09	7.91	4.79	10.74	4.52	5.48	4.95
	Sessions	156	19	14	13	175	27	202
	\$/Session	4.29	8.69	45.12	14.49	4.77	30.37	8.19
	Hr/Session	1.05	1.10	9.43	1.35	1.05	5.54	1.65

Absentee Summary: CPU Hours

		MIT Users	Buyback	System	IPC/PDO Use	Billable Total	Nonbillable Total	Grand Total
Queue 1:	Usage	0.00	0.00	0.19	0.00	0.00	0.20	0.20
	\$Charges	0.00	0.53	31.16	0.27	0.53	31.43	31.95
Queue 2:	Usage	0.00	0.00	0.01	0.00	0.00	0.01	0.01
	\$Charges	0.00	0.00	0.83	0.52	0.00	1.35	1.35
Queue 3:	Usage	0.11	0.25	0.02	0.10	0.37	0.12	0.49
	\$Charges	8.59	19.07	1.47	7.50	27.66	8.98	36.64
Total:	Usage	0.11	0.26	0.22	0.11	0.37	0.33	0.70
	\$Charges	8.59	19.59	33.46	8.29	28.19	41.75	69.94

Absentee Summary: Memory KMB

		MIT Users	Buyback	System	IPC/PDO Use	Billable Total	Nonbillable Total	Grand Total
Queue 1:	Usage	0.00	0.30	7.09	0.25	0.30	7.34	7.65
	\$Charges	0.00	2.42	56.74	2.00	2.42	58.74	61.16
Queue 2:	Usage	0.00	0.00	0.70	0.18	0.00	0.88	0.88
	\$Charges	0.00	0.00	4.21	1.07	0.00	5.28	5.28
Queue 3:	Usage	9.44	5.45	1.48	6.83	14.90	8.30	23.20
	\$Charges	37.77	21.82	5.91	27.30	59.59	33.22	92.80
Total:	Usage	9.44	5.76	9.27	7.25	15.20	16.53	31.73
	\$Charges	37.77	24.24	66.87	30.37	62.01	97.24	159.24

Absentee Summary: Total Absentee Charges

		MIT Users	Buyback	System	IPC/PDO Use	Billable Total	Nonbillable Total	Grand Total
Queue 1:	\$Charges	0.00	2.95	87.89	2.27	2.95	90.17	93.11
	Jobs	0	2	2	1	2	3	5
	\$/Job	0.00	1.47	43.95	2.27	1.47	30.06	18.62
Queue 2:	\$Charges	0.00	0.00	5.04	1.59	0.00	6.63	6.63
	Jobs	0	0	4	2	0	6	6
	\$/Job	0.00	0.00	1.26	0.79	0.00	1.10	1.10
Queue 3:	\$Charges	46.36	40.88	7.39	34.80	87.25	42.19	129.44
	Jobs	10	12	4	18	22	22	44
	\$/Job	4.64	3.41	1.85	1.93	3.97	1.92	2.94
Total:	\$Charges	46.36	43.83	100.32	38.66	90.19	138.99	229.18
	Jobs	10	14	10	21	24	31	55
	\$/Job	4.64	3.13	10.03	1.84	3.76	4.48	4.17

## I/O Daemon Summary Lines

		MIT Users	Buyback	System	IPC/P00 Use	Billable Total	Nonbillable Total	Grand Total
Queue 1:	Usage	0	0	19,980	0	0	19,980	19,980
	\$Charges	0.00	0.00	69.93	0.00	0.00	69.93	69.93
Queue 2:	Usage	175	917	10,975	41	1,092	11,016	12,108
	\$Charges	0.48	2.52	30.18	0.11	3.00	30.29	33.30
Queue 3:	Usage	24,451	55,762	11,656	18,680	80,213	30,336	110,549
	\$Charges	36.68	83.64	17.48	28.02	120.32	45.50	165.82
Total:	Usage	24,611	56,679	42,611	18,721	81,290	61,332	142,622
	\$Charges	37.16	86.16	117.60	28.13	123.32	145.73	269.05



System Performance and Availability

	Today	Month
Starts	1	43
Crashes	0	23
Mean Time Between Failures	20.81	14.32
Hours Available	20.81	343.75
CPU Hours	22.53	626.95
Two-CPU Hours	1.72	283.19
Virtual CPU Hours Billed	4.00	176.97
% CPU Overhead	9.07	20.02
% Idle	73.17	51.75
% Zero Idle	65.16	33.53
% Multiprogramming Idle	0.05	0.66
% Nonmultiprogramming Idle	7.97	17.56
Maximum Load Units	30.00	80.00
Reconfigurations	3	47

Disk Statistics: Use of >udd Storage

	Quota	Used
MIT Users	139,528	40,553
Buyback	95,508	52,621
System	22,560	12,625
IPC/PDO Use	47,750	30,269
Billable Total	235,036	93,174
Nonbillable Total	70,310	42,894
Grand Total	305,346	136,068

Disk Statistics: Space on Logical Volumes

LV Name	Records	Free Records	VTOCE's	Free VTOCE's
ldd	18,322	1,952( 10.7%)	4,695	2,910( 62.0%)
public	256,508	15,625( 6.1%)	65,730	17,782( 27.1%)
root	34,246	9,368( 27.4%)	9,725	927( 9.5%)

Lines Available Today

From	To	Length of Uptime	Reason Down	Length of Downtime
05/15/76 1546 Sat	05/16/76 0824 Sun	16 Hr 38 Min	shutdown	3 Hr 12 Min
05/16/76 1136 Sun				

Massachusetts Institute of Technology  
Information Processing Center

\*\*\*\* Monthly Multics Usage and Revenue Report \*\*\*\*

For 03/30/76 1025 Tue to 04/28/76 2205 Wed

Current System: 28.4b

Revenue Summary

	Connect Hours	CPU Hours	Memory Kmu	Terminal I/O	Unit Records	Disk Page-Days	Devices	Misc.	Total Charges
MIT Users									
Usage	6,455.91	73.77	3,799.14	0	1,571,887	1,326,463			
\$Charges	5,673.97	10,950.37	29,007.15	0.00	2,587.89	26,529.27	0.00	6,824.32	81,580.61
Buyback									
Usage	2,756.09	87.70	3,184.88	0	3,810,946	1,376,658			
\$Charges	2,921.94	13,382.78	25,250.02	0.00	6,689.02	27,533.16	0.00	15,655.00	91,431.84
System									
Usage	4,681.35	70.05	3,586.35	0	3,085,638	360,505			
\$Charges	631.98	10,673.79	27,772.02	0.00	8,141.25	7,210.11	0.00	37.00	54,465.94
IPC/PDO Use									
Usage	1,859.66	31.84	1,713.49	0	2,142,673	784,266			
\$Charges	2,008.93	4,997.87	13,271.95	0.00	4,142.26	15,685.33	0.00	6,899.02	47,005.31
Billable Total									
Usage	9,212.00	161.48	6,984.02	0	5,382,833	2,703,121			
\$Charges	8,595.91	24,333.15	54,257.17	0.00	9,276.91	54,062.42	0.00	22,479.32	173,012.45
Nonbillable Total									
Usage	6,541.00	101.89	5,299.84	0	5,227,111	1,144,772			
\$Charges	2,640.91	15,671.67	41,043.96	0.00	12,283.51	22,895.43	0.00	6,936.02	101,471.25
Grand Total									
Usage	15,753.00	263.37	12,283.86	0	10,609,944	3,847,893			
\$Charges	11,236.82	40,004.82	95,301.14	0.00	21,560.42	76,957.85	0.00	29,415.34	274,483.70

System Performance and Availability

	Daily Average	Month
Starts	2.41	71
Crashes	1.25	37
Mean Time Between Failures		16.10
Hours Available	20.74	611.64
CPU Hours	38.54	1,136.51
Two-CPU Hours	17.80	524.87
Virtual CPU Hours Billed	8.93	263.37
% CPU Overhead		16.02
% Idle		63.83
% Zero Idle		41.67
% Multiprogramming Idle		6.65
% Nonmultiprogramming Idle		18.49
Maximum Load Units	55.52	80.00
Reconfigurations	2.81	83

Disk Statistics: Use of Quota Storage

	Quota	Used
MTT Users	148,183	42,258
buyback	93,258	44,000
System	22,560	13,039
IPC/PDO Use	47,300	29,577
Billable Total	241,441	86,258
Nonbillable Total	69,860	42,616
Grand Total	311,301	128,874

Disk Statistics: Space on Logical Volumes

LV Name	Records	Free Records	VTOCE's	Free VTOCE's
ldd	18,322	2,433( 13.3%)	4,695	2,944( 62.7%)
public	256,508	19,045( 7.4%)	65,730	17,508( 26.6%)
root	34,246	9,200( 26.9%)	9,725	924( 9.5%)

Composition of the Groups in this Report

"MIT Users" consists of 169 projects with 1553 users. The projects are all projects not otherwise specified.

"Buyback" consists of 31 projects with 204 users. The projects are Multics, DDLJOD, RLS, NALNPL, SCP, MSORT, HPL-NPL, P1UTIL, P7S200EML, MCOBOL, MCOBOLST, FAS, L2COBOL, CE1STGRP, AOS, Study, WFSO, MPM, MPLS, HURuid, SUPPORT, NMC0BOL, NMLHOST, NMLSPPI, NMRPG, FILETRAN, LIS, L64TSTNG, BALTRANS, COBTRANS, CONVER, P6CONV, ADAPT, REACT and HStorage.

"System" consists of 9 projects with 61 users. The projects are DartBasic, SysMaint, Terminals, TOLIS, HFED, SysAdmin, Operator, SysDaemon and Daemon.

"IPC/PDO Use" consists of 16 projects with 145 users. The projects are PDO, RDMS, TICS, PDO1, Consult, IAPRDMS, IPCAS, IPCPubs, IPCTS, IPCUS, HINT, Dynamo, IPCBMD, IPCAdmin, Admap, CLASS, HPDO, SysLib and TEKADG.

"Billable Total" consists of 200 projects with 1757 users. The projects are those projects included in the group(s) MIT Users and Buyback.

"Nonbillable Total" consists of 25 projects with 206 users. The projects are those projects included in the group(s) System and IPC/PDO Use.

"Grand Total" consists of 225 projects with 1963 users. The projects are those projects included in the group(s) Billable Total and Nonbillable Total.

The following prices are currently in effect:

Interactive Rates

	CPU	Connect	Memory	Terminal I/O
Shift 1:	\$225.00/Hr	\$1.25/Hr	\$11.00/Kmu	\$0.00/K
Shift 2:	\$120.00/Hr	\$0.75/Hr	\$6.00/Kmu	\$0.00/K
Shift 3:	\$75.00/Hr	\$0.65/Hr	\$4.00/Kmu	\$0.00/K
Shift 4:	\$150.00/Hr	\$1.00/Hr	\$6.00/Kmu	\$0.00/K

Absentee Rates

	CPU	Memory
Queue 1:	\$160.00/Hr	\$8.00/Kmu
Queue 2:	\$125.00/Hr	\$6.00/Kmu
Queue 3:	\$75.00/Hr	\$4.00/Kmu

I/O Daemon Rates

	Lines
Queue 1:	\$3.50/K
Queue 2:	\$2.75/K
Queue 3:	\$1.50/K

Device Rates

	tape	setup	csa	tty
Shift 1:	\$25.00/Hr	\$1.00/Hr	\$2.00/Hr	\$1.00/Hr
Shift 2:	\$25.00/Hr	\$1.00/Hr	\$2.00/Hr	\$1.00/Hr
Shift 3:	\$25.00/Hr	\$1.00/Hr	\$2.00/Hr	\$1.00/Hr
Shift 4:	\$25.00/Hr	\$1.00/Hr	\$2.00/Hr	\$1.00/Hr

Other Rates

\$0.60/disk-page per month ( 2.31481e-007/page-second )

The current shift schedule is:

Shift	Hours	Days
1	1100-1800	Mon, Tue, Wed, Thu, Fri
2	0900-1100	Mon, Tue, Wed, Thu, Fri, Sat, Sun
	1800-2400	Mon, Tue, Wed, Thu, Fri, Sat, Sun
3	0000-0900	Mon, Tue, Wed, Thu, Fri, Sat, Sun
4	1100-1800	Sat, Sun