CSAR Service - Management Report

December 1998

This report covers the first full month of production since the service went live on the 16th November 1998.

A more comprehensive report will be provided quarterly, which will additionally cover wider aspects of the Service such as information on Training, Application Support and Value-Added services. The first quarterly report will be published in February 1999.

These and other such reports will be made available through the Web to authorised staff within EPSRC and the other Research Councils, to CfS staff and CSAR Service users. The reports will be indexed in a similar way to which other useful information and news is listed for selection.

1. Introduction

This month has seen a high volume of work through the system with a shift in emphasis towards the large jobs over the Christmas period. This was done to address some issues raised by the users, which is covered in more detail later in the report. We have also seen more movement on the Stendahl tokens this month, which is proving to be a good management tool in the gauging of the quality of the service as perceived by the users.

This document gives information on Service Quality and on actual usage of the CSAR Service during the reporting period of December 1998. The information, in particular, covers the availability and usage of the following two main CSAR Service High Performance Computing (HPC) systems:

- Cray T3E-1200E/576 (Turing)
- SGi Origin2000/16 (Fermat).

The information is provided in both textual and graphical form, so that it is easier to see trends and variances.

2. Service Quality

This section covers overall Customer Performance Assessment Ratings (CPARS), HPC System availability and usage, Service Quality Tokens and other information concerning issues, progress and plans for the CSAR Service.

2.1 CPARS

Table 1 gives the measure by which the quality of the CSAR Service is judged. It identifies the metrics and performance targets, with colour coding so that different levels of achievement against targets can be readily identified. Unsatisfactory actual performance will trigger corrective action.

CSAR Service - Service Quality Report - Performance Targets

Service Quality Measure	Performance Targets					
	White	Blue	Green	Yellow	Orange	Red
HPC Services Availability						
Availability in Core Time (% of time)	> 99.9%	> 99.5%	> 99.2%	> 98.5%	> 95%	95% or less
Availability out of Core Time (% of time)	> 99.8%	> 99.5%	> 99.2%	> 98.5%	> 95%	95% or less
Number of Failures in month	0	1	2 to 3	4	5	> 5
Mean Time between failures in 52 week rolling period (hours)	>750	>500	>300	>200	>150	otherwise
Help Desk						
Non In-depth Queries - Maximum Time to resolve 50% of all queries (working days)	< 1/4	< 1/2	< 1	< 2	< 4	4 or more
Non In-depth Queries - Maximum Time to resolve 95% of all queries (working days)	< 1/2	< 1	< 2	< 3	< 5	5 or more
Administrative Queries - Maximum Time to resolve 95% of all queries (working days)	< 1/2	< 1	< 2	< 3	< 5	5 or more
Help Desk Telephone - % of calls answered within 2 minutes	>98%	> 95%	> 90%	> 85%	> 80%	80% or less
Others						
Normal Media Exchange Requests - average response time in month (working days)	< 1/2	< 1	< 2	< 3	< 5	5 or more
New User Registration Time (working days)	< 1/2	< 1	< 2	< 3	< 4	otherwise
Management Report Delivery Times (working days)	< 1	< 5	< 10	< 12	< 15	otherwise
System Maintenance - no. of scheduled sessions taken per system in the month	0	1	2	3	4	otherwise

Table 1

Table 2 gives actual performance information for the period of December 1st to 31st inclusive. Overall, the CPARS Performance Achievement was yellow (see Table 3).

CSAR Service - Service Quality Report - Actual Performance Achievement

Service Quality Measure	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
HPC Services Availability								
Availability in Core Time (% of time)							99.99%	97.20%
Availability out of Core Time (% of time)							98.53%	98.41%
Number of Failures in month							2	5
Mean Time between failures in 52 week rolling period (hours)							400	174.1
Help Desk								
Non In-depth Queries - Maximum Time to resolve 50% of all queries (working days)							1	<0.25
Non In-depth Queries - Maximum Time to resolve 95% of all queries (working days)							4	5
Administrative Queries - Maximum Time to resolve 95% of all queries (working days)							2	<1
Help Desk Telephone - % of calls answered within 2 minutes							100%	100%
Others								
Normal Media Exchange Requests - average response time in month (working days)							0.5	0
New User Registration Time (working days)							2	0
Management Report Delivery Times (working days)							10	10
System Maintenance - no. of scheduled sessions taken per system in the month							4	1

Table 2

Notes:

1. HPC Services Availability has been calculated using the following formulae, based on the relative NPB performance of Turing and Fermat:

[Turing availability x 122 / (122 + 3.5)] + [Fermat availability x 3.5 / (122 + 3.5)]

Table 3 gives Service Credit values for the December period. These will be accounted on a quarterly basis, formally from the Go-Live Date. The values are calculated according to agreed Service Credit Ratings and Weightings.

CSAR Service - Service Quality Report - Service Credits

Service Quality Measure	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
HPC Services Availability								
Availability in Core Time (% of time)							-0.015	0.020
Availability out of Core Time (% of time)							0.000	0.010
Number of Failures in month							0.000	0.004
Mean Time between failures in 52 week rolling period (hours)							0.000	0.004
Help Desk								
Non In-depth Queries - Maximum Time to resolve 50% of all queries (working days)							0.000	-0.005
Non In-depth Queries - Maximum Time to resolve 95% of all queries (working days)							0.008	0.012
Administrative Queries - Maximum Time to resolve 95% of all queries (working days)							0.000	-0.004
Help Desk Telephone - % of calls answered within 2 minutes							-0.001	-0.001
Others								
Normal Media Exchange Requests - average response time in month (working days)							0.000	0.000
New User Registration Time (working days)							0.000	0.000
Management Report Delivery Times (working days)							0.000	0.000
System Maintenance - no. of scheduled sessions taken per system in the month							0.002	-0.001
Monthly Total & overall Service Quality Rating for each period:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02

Table 3

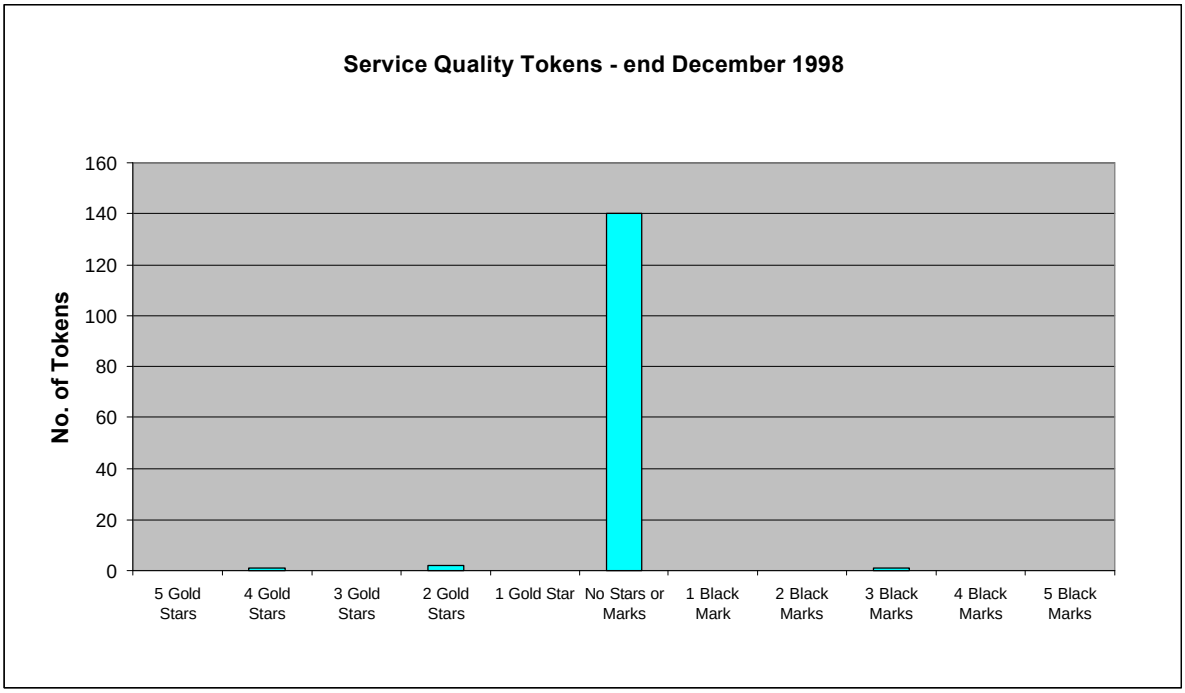
2.2 Service Quality Tokens

The current position at the end of December 1998 was that four of the 144 registered users of the CSAR Service had used Service Quality Tokens. See below:

Service Quality Tokens

	Current Position - end November '98											
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
5 Gold Stars											0	0
4 Gold Stars											0	1
3 Gold Stars											0	0
2 Gold Stars											0	2
1 Gold Star											0	0
No Stars or Marks											0	140
1 Black Mark											0	0
2 Black Marks											0	0
3 Black Marks											0	1
4 Black Marks											0	0
5 Black Marks											0	0
Total No. of Users											40	144

In the form of a bar chart, the current statistics are:



The beginning of December saw the first entry of Stendahl tokens from Patrick Briddon, who CfS were pleased to see entered four gold stars , and commented: "The consortium cse006 is extremely pleased with the throughput of work on the new service and we are pleased with the extremely rapid response to straightforward service queries". However we also saw four black marks awarded by Paul Kent of the consortium cse007 and Phil Lindan of the consortium cse002. Also Mike Gillan of the consortium cse002 awarded the service three black marks. The issues that concerned the above users were all raised at the meetings held on the 17th and 18th of December. The main issue was that of the throughput of large jobs, which has in part been addressed by changes made to the scheduling policy.

The period over Christmas and New Year was more biased towards larger jobs. This has obviously satisfied some of the issues raised as both Phil Lindan and Paul Kent have both changed their black marks to two gold stars. This response encourages CfS to maintain its standards and to continue to monitor the movement of quality tokens.

2.3 Throughput Target Against Baseline

This was the first complete month of production which again saw the baseline achieved, and over the course of the month the Baseline Capacity Level of the T3E MPP was exceeded on average by 3%, equal to 0.297 GFLOP-Years of PE usage.

Job Throughput Against Baseline CSAR Service Provision

Period: 1st to 31st December 1998

	Baseline Capacity for Period (T3E PE Hours)	Actual Usage in Period (T3E PE Hours)	Actual % Utilisation c/w Baseline during Period
1. Has CfS failed to deliver Baseline MPP Computing Capacity for EPSRC?	361,804	374,087	**103.40%**
	Baseline Capacity for Period (T3E PE Hours)	**Job Time Demands in Period**	**Job Demand above 110% of Baseline during Period (Yes/No)?**
2. Have Users submitted work demanding > 110% of the Baseline during period?	361,804	396,958	No
		Number of Jobs at least 4 days old at end Period	**Number of Jobs at least 4 days old at end Period is not zero (Yes/No)?**
3. Are there User Jobs oustanding at the end of the period over 4 days old?		0	No
		Minimum Job Time Demands as % of Baseline during Period	**Minimum Job Time Demand above 90% of Baseline during Period (Yes/No)?**
4. Have Users submitted work demands dropped below 90% of the Baseline during period?		0%	No
	Number of standard Job Queues (ignoring priorities)	**Average % of time each queue contained jobs in the Period**	**Average % of time each queue contained jobs in the Period is > 97%?**
5. Majority of Job Queues contained runnable jobs from Users for more than 97% during period?	4	83.2%	No

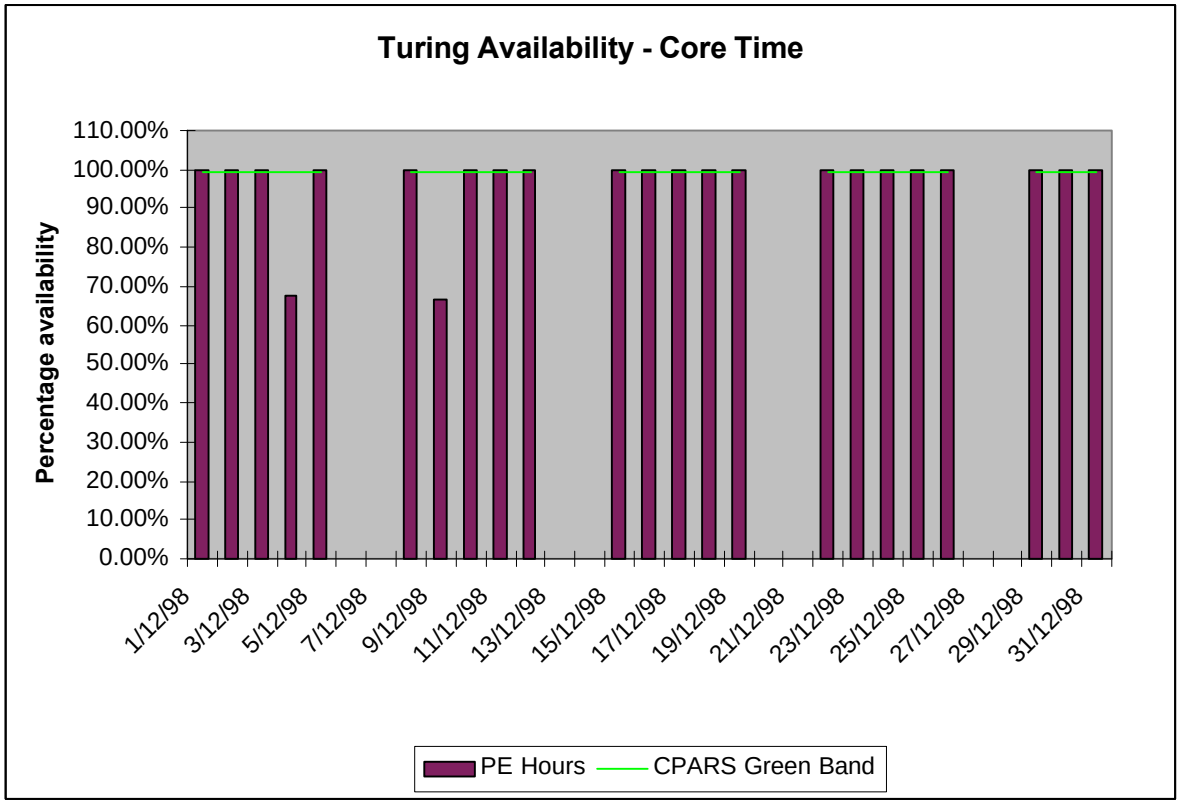
Baseline Fee reduction due (%) if the answer to item 1 is < 100% and the answers to items 2 - 5 inclusive are "Yes": **0.00%**

2. System Availability

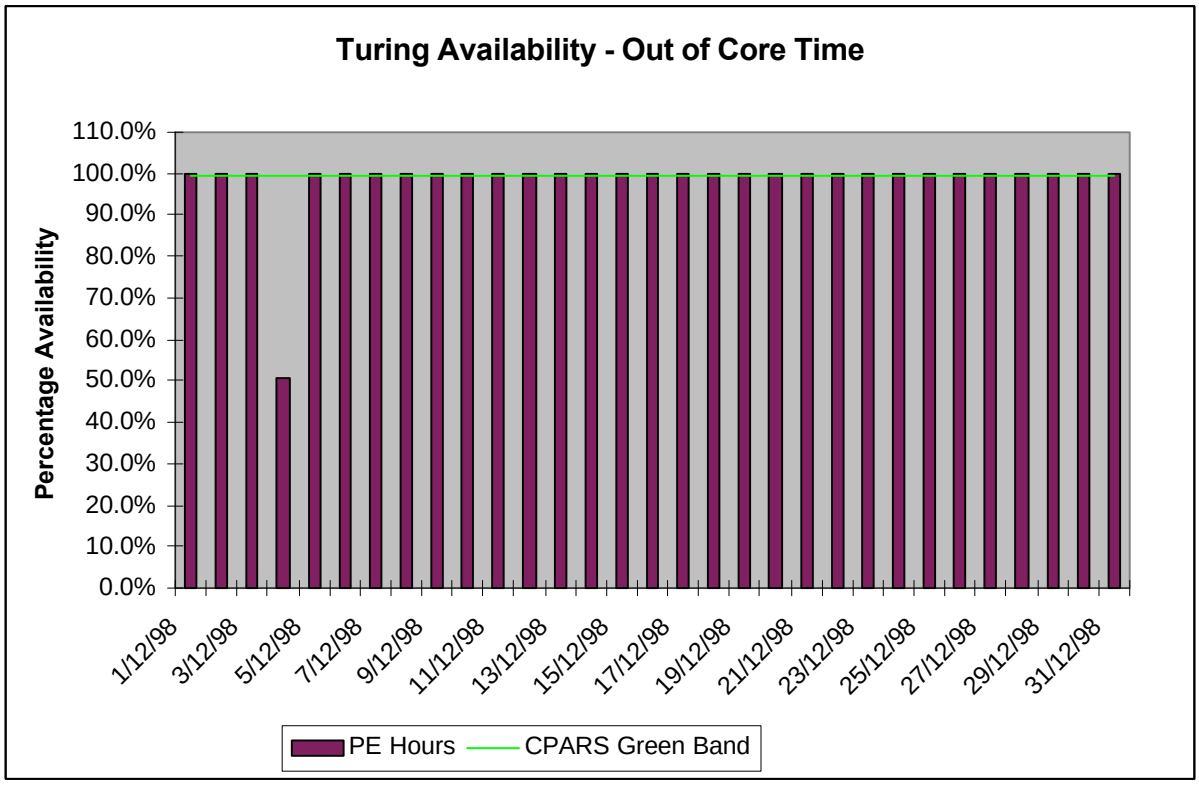
Service availability each reporting period is calculated as a percentage of actual availability time over theoretical maximum time, after accounting for planned breaks in service for preventative maintenance.

3.1 Cray T3E-1200E System (Turing)

The following graphs show the availability of Turing both in core time and out of core time respectively during the period of 1st to 31st December. There was unplanned unavailability in core time on December 4th and 9th also out of core time on the 4th of December.



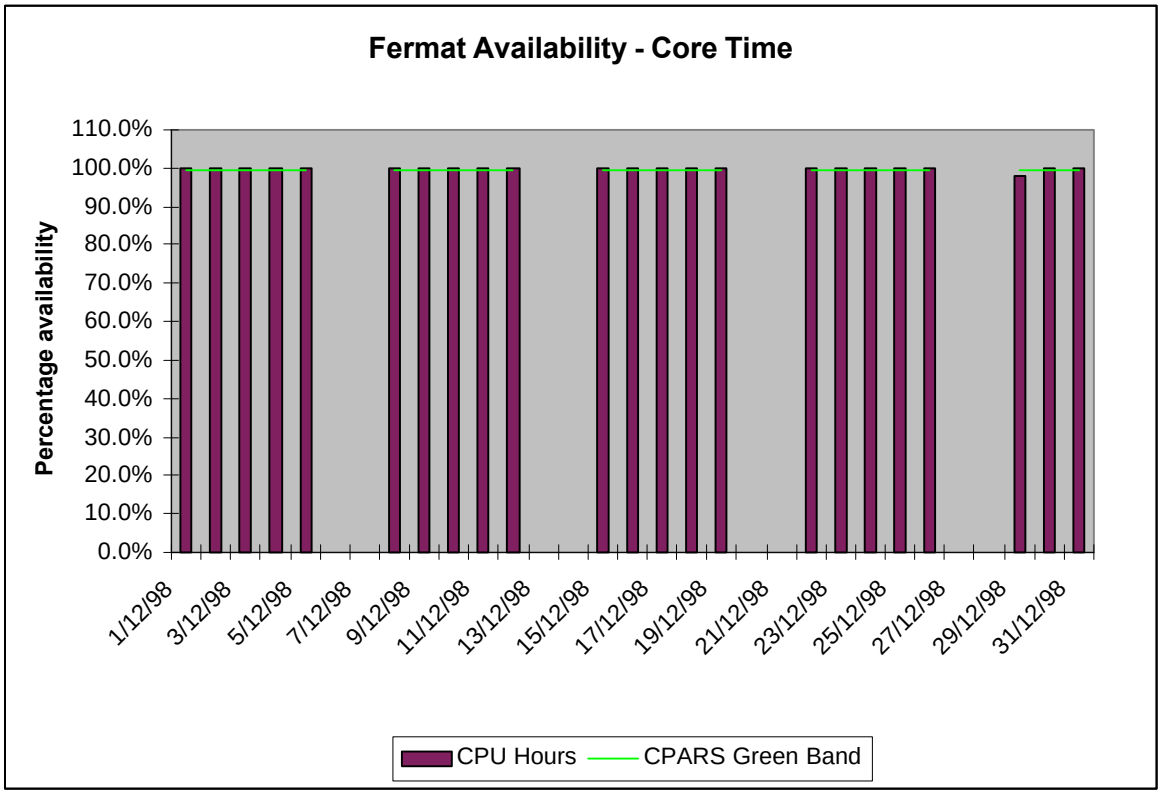
Availability of Turing in core time during December was good for the majority of the month with the exception of the early part of December due mainly to hardware failures.



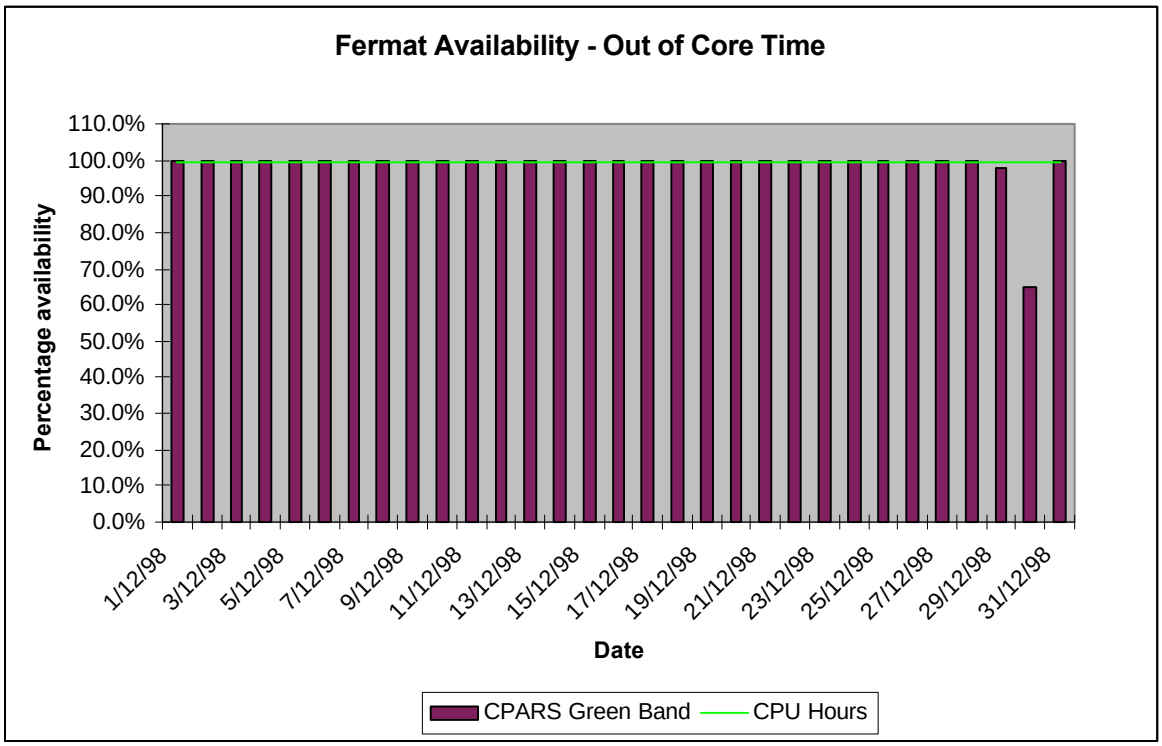
Availability of Turing out of core time during December was on the whole good apart from one incident early in the month.

3.2 SGi Origin2000 System (Fermat)

The following graphs show the availability of Fermat both in core time and out of core time respectively.



Availability of Fermat in core time during December was good.



Availability of Fermat out of core time during December was good until we suffered three breaks due to a software bug in the XLV software which is under investigation with SGI.

4. HPC Services Usage

Usage information is given in tabular form, in Appendices, and in graphical format. The system usage information for the period of December 1st to 31st is provided by Project/User Group, totalled by Research Council and overall. This covers:

- CPU usage Turing: 374,087 PE Hours
- User Disk allocation Turing: 55.81 GB Years Fermat: 33.84 GB Years
- HSM/tape usage 0.05 GB Years

(for the UGAMP project, currently held in UoM & CSC support areas).

Since this is the first full month of Service, usage is graphically shown for each day in December 1998. In addition, the following graphs are provided to illustrate usage per month:

a) MPP (T3E) Usage by month, showing usage each month of CPU (T3E PE Elapsed Hours), split by Research Council and giving the equivalent GFLOP-Years as per NPB. The Baseline Capacity (103 GFLOP-Years) is shown by an overlaid horizontal line.

b) SMP (Origin) Usage by month, showing usage each month in CPU Hours, split by Research Council and giving the equivalent GFLOP-Years as per NPB. The Baseline Capacity (3.5 GFLOP-Years) is shown by an overlaid horizontal line.

c) High Performance Disk (T3E) allocated for User Data by month, showing the allocated space each month in GBytes, split by Research Council. The Baseline Capacity (1 Terabyte) is shown by an overlaid horizontal line.

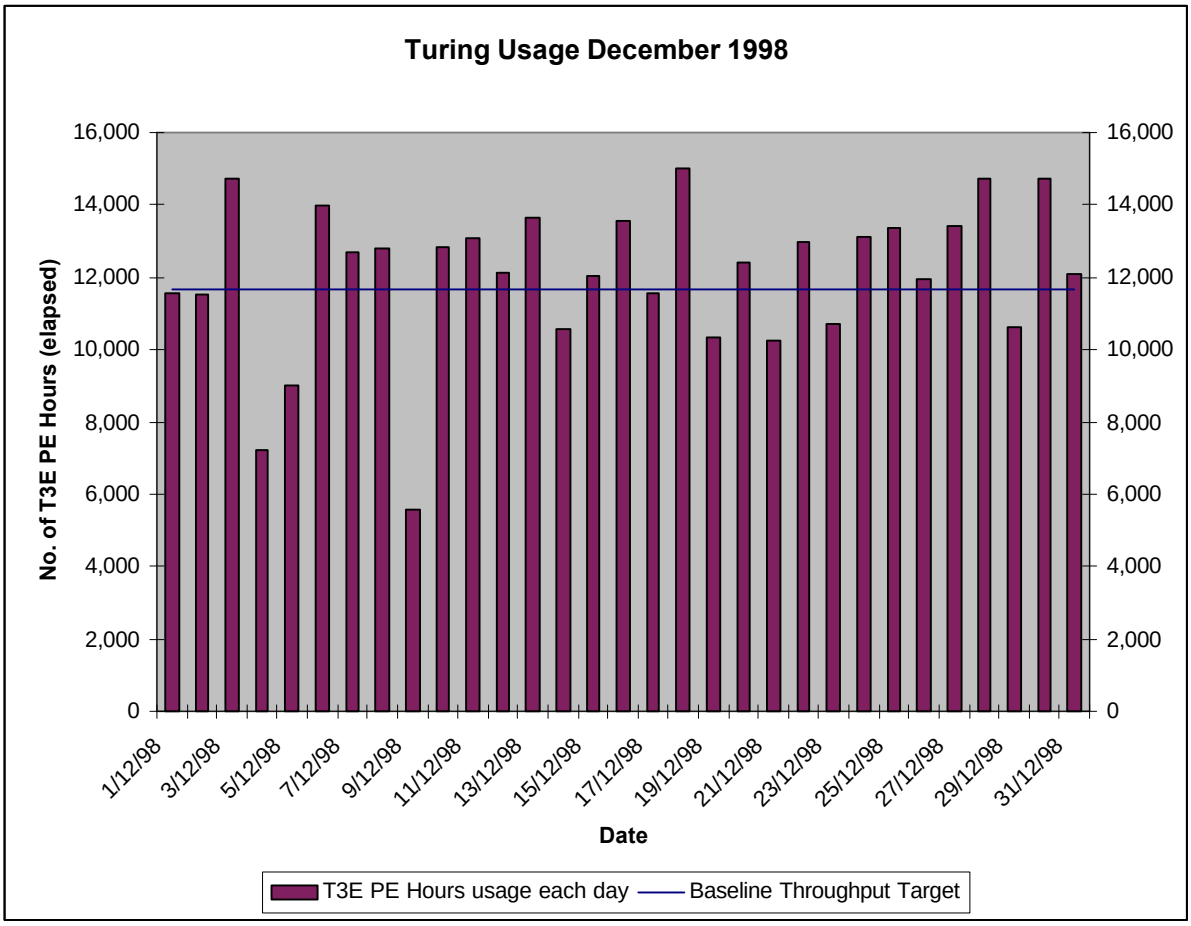
d) Medium Performance Disk (Origin) allocated for User Data by month, showing the allocated space each month in GBytes, split by Research Council. The Baseline Capacity (1.5 Terabytes) is shown by an overlaid horizontal line.

e) HSM/Tape Usage (T3E) by month, showing the volumes held each in GBytes, split by Research Council. The Baseline Capacity (16 Terabytes) available will be shown by an overlaid horizontal line.

4.1 Cray T3E-1200E System (Turing)

The following graph shows the usage of Turing during each day of December 1998. Note that there is some variance on a day-to-day basis as the accounts record job times, and thus CPU usage figures, at the time of job completion – which could be the second actual day for large jobs. At present, there is a 12 hour limit on jobs, so that they are check-pointed, and computational time lost due to any failure is well managed.

During December the scheduling policy was changed so that the emphasis was more on the larger jobs, thus the daily variance on usage is more apparent.



Turing has been fully loaded for virtually the whole month with a variety of job sizes. This has resulted in good throughput despite suffering five (pro rata) breaks this month. When fully loaded the Baseline Throughput requirement is being achieved on average (24 x 103 x 576 /122 PE Hours each day).

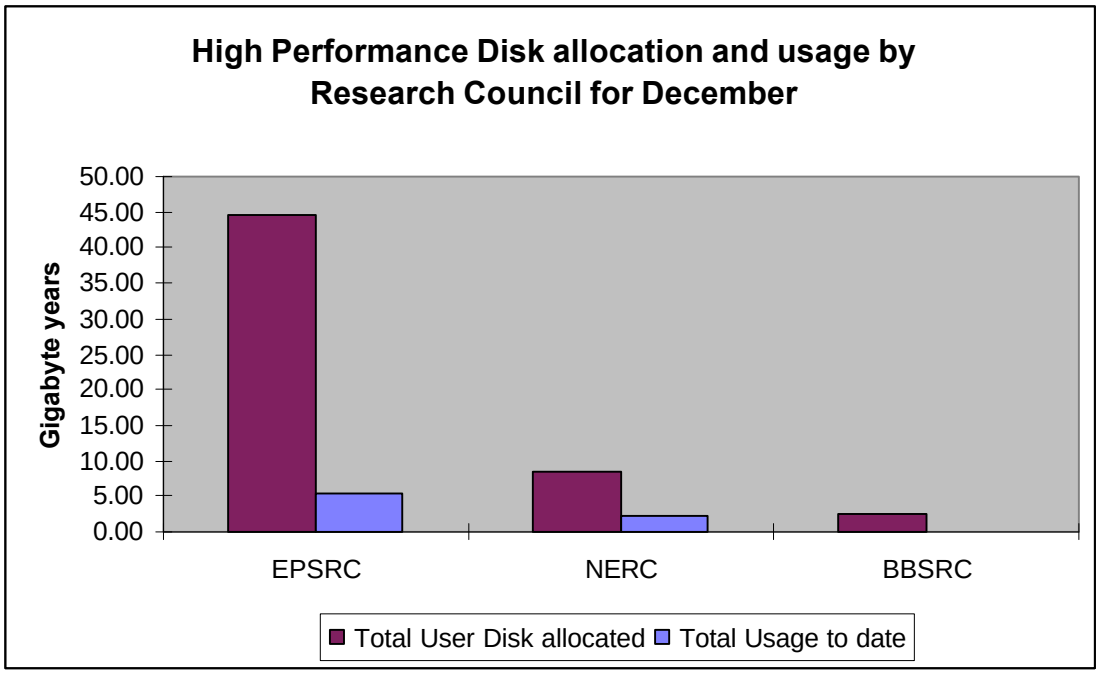
Fine tuning of the CfS scheduling system will continue to ensure minimal wasting of PE resource, in order to fit in a number of different sized jobs (e.g. 32, 64, 128, 256) thus facilitating maximised job throughput.

4.2 SGi Origin2000 System (Fermat)

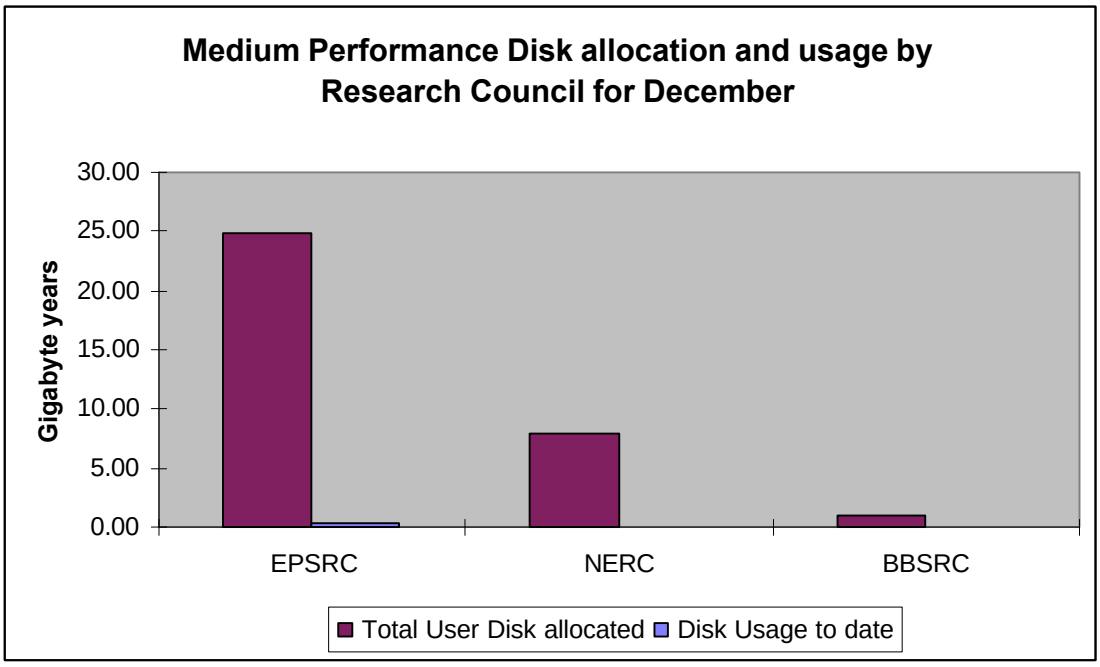
The usage graph for Fermat is unavailable for this month, as upon inspection it was found that the CPU usage figures apparently contained some serious miscalculations. This was reported to SGI who advised that the Irix 6.5.1 operating system contains a serious kernel level bug, which is scheduled to be fixed in 6.5.3. However this version will not be released until March 1999. This means that we are unable to report Fermat CPU usage. Until such time as this problem is fixed CfS has no choice but to report zero CPU usage on Fermat.

4.3 Disk/HSM Usage Charts

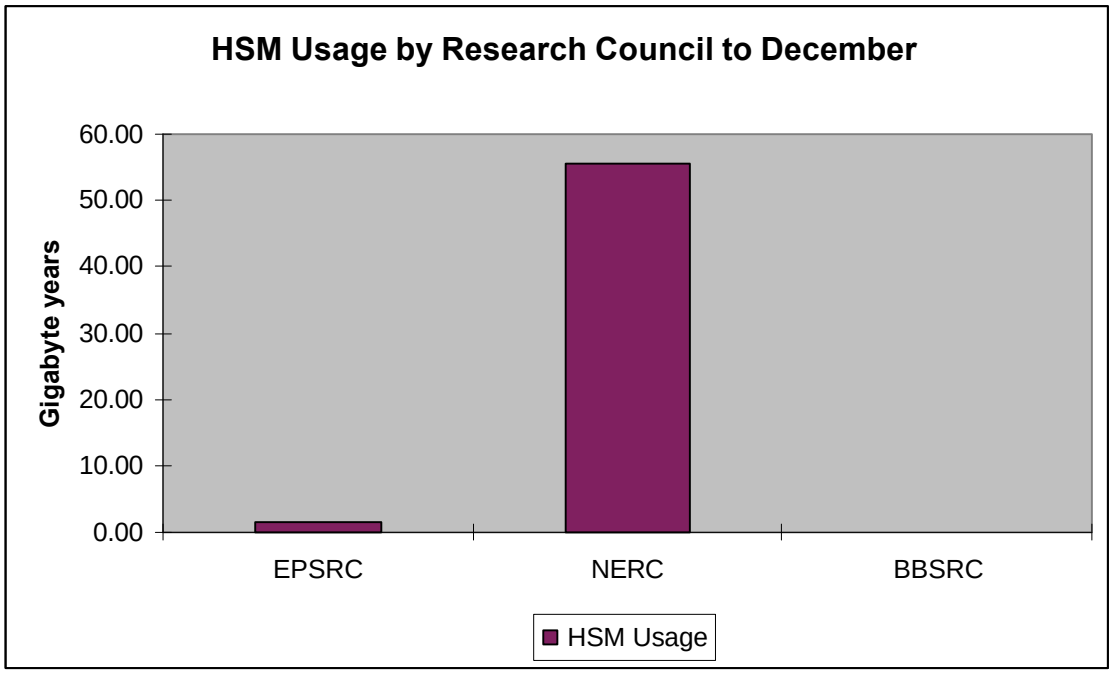
The graphs below show current disk and HSM allocations and usage.



The preceding graph shows actual usage against the current allocation of disk on the Turing system.



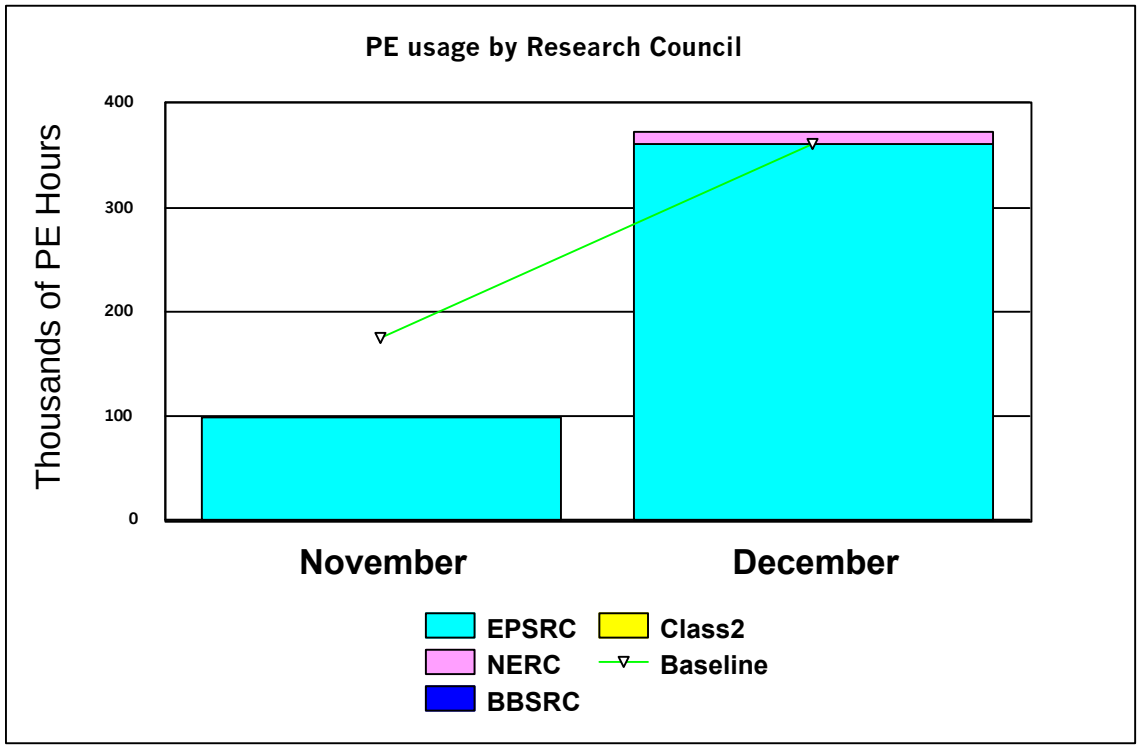
The above graph shows the disk allocations against usage of the disk on Fermat.



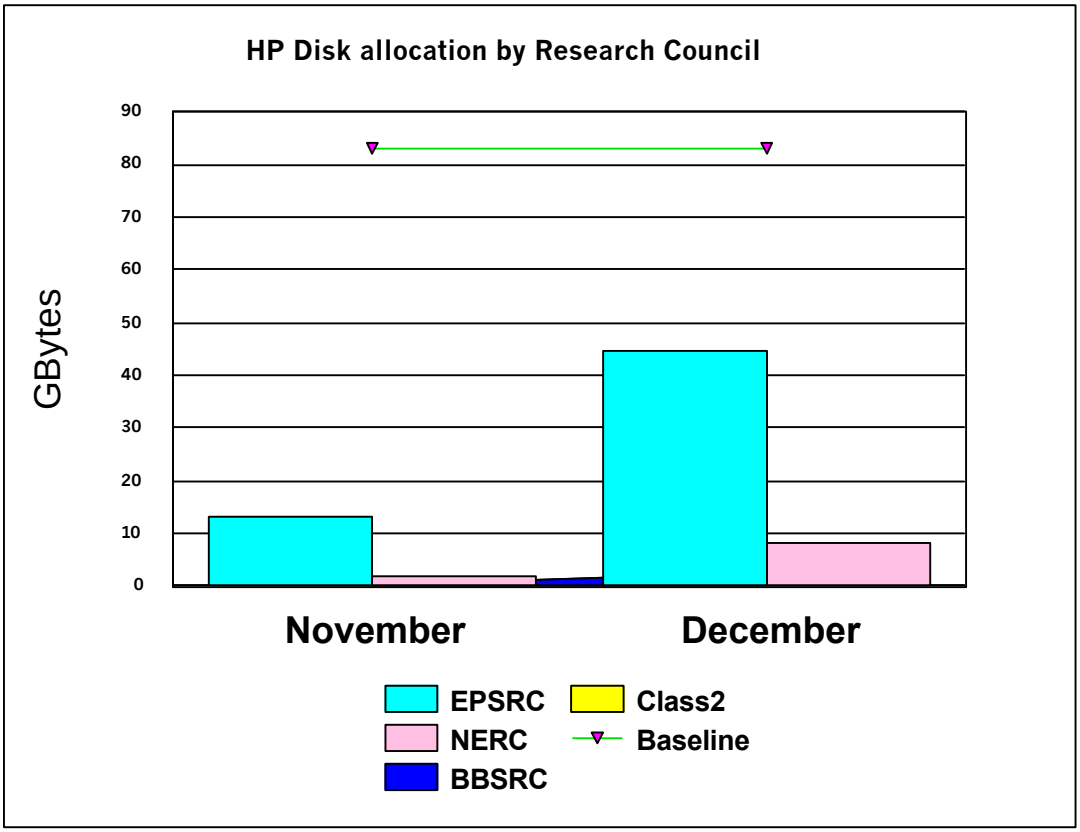
The above graph shows the total usage of the HSM facility by Research Council.

4.4 Historical Usage Charts

The graph below shows the PE hours utilisation on Turing by Research Council for November and December. The reduced Baseline in November 1998 represents half a month.

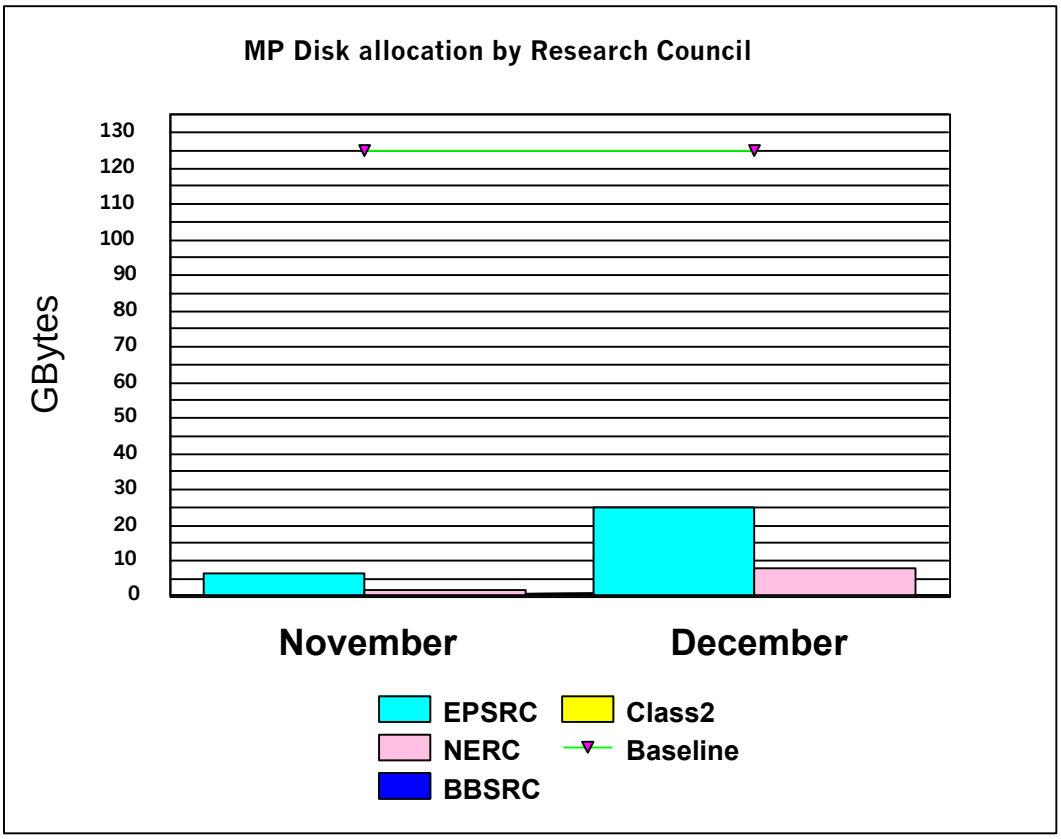


The next series of graphs illustrates the increasing usage of the disk and HSM resources of the system.

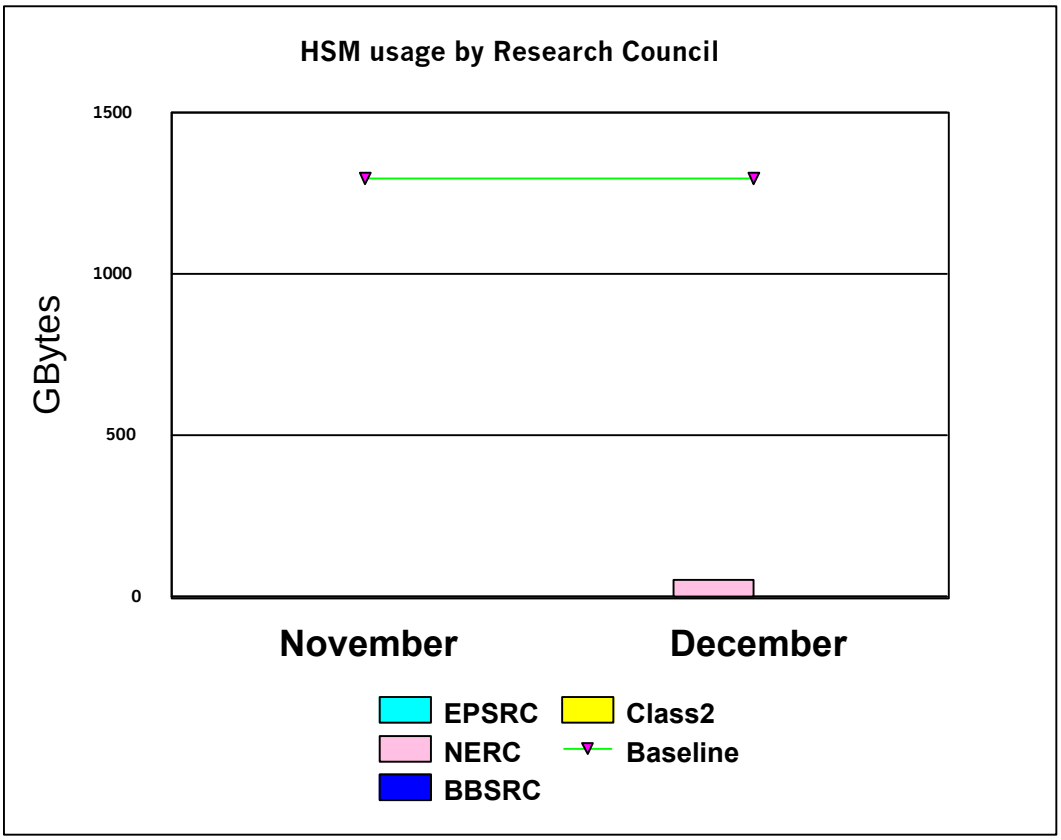


The graph above illustrates the current allocation of the High Performance Disk on Turing.

The graph below illustrates the current allocation of the Medium Performance Disk on Fermat.



The graph below shows the current HSM usage by Research Council funded projects. The primary usage is for NERC.



5. Service Status, Issues and Plans

5.1 Status

The reliability of the system has proved to be mixed in December with Turing suffering five breaks between the 4th and the 14th of December. The first two incidents, on the 4th, were both related to a T3E PE link failure which resulted in a whole PE node being mapped out of the system. The third problem occurred on the 9th and was a software problem related to scheduling. This problem was quickly resolved, however later that same day, two fuses in one of Turing's power supplies blew resulting in a system outage. Finally on the 14th, a disk power supply blew resulting in Turing being rebooted in order that the disks be re-established into the system.

Fermat suffered three outages, two on the 29th, and one on the 30th of December. These would appear to have been caused by a problem in the XLV software which SGI are currently investigating.

The User Steering Group and the User Forum were held on the 17th and 18th of December at the University of Manchester. The meetings were both very positive in that feedback on the system performance was readily given. All of the proffered feedback has been taken away to be evaluated with a view to improving the service in line with best practice, and taking careful account of the user feedback

5.2 Issues

The throughput of work has been more biased towards the larger jobs in December. This has in part met the requirements of a large number of users. Improvements to the system will continue so as to enable the most effective fit and maximum job throughput in line with the fair sharing policy on the machine.

5.3 Plans

The Fujitsu from RAL is due to be incorporated into the service from Tuesday the 12th of January 1999. This will not formally be part of the CSAR service but will work in conjunction with elements of the existing system. The integration should be transparent to all current users.

6. Conclusion

December 1998 was overall a good month for the Service despite the number of system breaks. The two user group meetings provided a very useful forum for all parties.

Continued management attention will be given to maximise the throughput of the Service, whilst balancing as fairly as practicable the shares between Projects and jobs of the varying sizes.

Appendix 1 contains the accounts for December 1998

Appendix 1

CfS Supercomputer Service

Usage report for Research Council Projects

From Tuesday 1-Dec-98 to Thursday 31-Dec-98

Account		CPU Usage (Hours) Inter Priority	Normal	Low	Total	Storage (GB-Years) D-Usage	D-Allocn	HSM
CSE001 Admin users	turing	-	-	-	-	0.00	0.01	-
	fermat	-	-	-	-	0.00	-	-
Total for Subject EPSRC Administration	turing	-	-	-	-	0.00	0.01	-
	fermat	-	-	-	-	0.00	-	-
CSE002 gr/m01753 Gillan	turing	81.59	11918.22	98364.07	23418.75	133782	1.76	10.44	-
	fermat	6123.08	-	-	-	6123.08	0.17	13.15	0.00
CSE003 gr/m01784 Taylor	turing	51.33	-	10373.37	-	10424.70	0.49	3.07	-
	fermat	32.40	-	-	-	32.40	0.01	3.07	-
CSE006 gr/m05201 Briddon	turing	516.20	661.68	51483.82	-	52661.70	0.06	3.07	-
	fermat	-	-	-	-	-	0.00	0.01	-
CSE007 gr m05348 Foulkes	turing	47.48	108.55	32367.92	-	32523.96	0.09	0.31	-
	fermat	-	-	-	-	-	0.00	0.31	-
Total for Subject Physics	turing	696.61	12688.45	192589	23418.75	229392	2.40	16.88	-
	fermat	6155.48	-	-	-	6155.48	0.18	16.53	0.00
CSE004 gr/m08424 Sandham	turing	41.54	-	27845.42	-	27886.96	1.14	3.07	-
	fermat	4.52	-	-	-	4.52	0.18	3.07	1.62
CSE010 gr/l04108 Williams	turing	-	-	-	-	-	0.00	0.09	-
	fermat	-	-	-	-	-	0.00	0.09	-
CSE011 gr/k52317 Williams	turing	0.13	-	2453.85	-	2453.98	0.94	7.04	-
	fermat	-	-	-	-	-	0.00	0.09	-
cse013 gr/k43902 Leschzine	turing	-	-	-	-	-	0.00	0.88	-
	fermat	136.58	-	-	-	136.58	0.00	0.88	-
CSE016 GR/K96519 Cant	turing	-	-	-	-	-	0.00	0.06	-
	fermat	-	-	-	-	-	0.00	0.06	-
cse021 GR/L95427 Staunton	turing	-	-	-	-	-	0.00	0.09	-
	fermat	-	-	-	-	-	0.00	0.09	-
cse022 GR/L98527 Jones	turing	0.29	-	7.83	-	8.13	0.01	0.60	-
	fermat	-	-	-	-	-	0.00	-	-
Total for Subject Engineering	turing	41.97	-	30307.11	-	30349.07	2.09	11.82	-
	fermat	141.10	-	-	-	141.10	0.18	4.27	1.62
CSE008 GR/M07624 Hillier	turing	23.05	3909.19	41353.54	-	45285.78	0.01	3.07	-
	fermat	-	-	-	-	-	0.00	0.00	-
CSE009 gr/m07441 Catlow	turing	304.79	7558.89	36261.07	-	44124.74	0.82	7.01	-
	fermat	1017.48	-	-	-	1017.48	0.01	0.88	-
cse017 GR/L58699 Luo	turing	0.61	-	5284.51	-	5285.12	0.03	0.09	-
	fermat	0.05	-	-	-	0.05	0.00	0.09	0.01
cse018 GR/L68353 Cant	turing	-	-	-	-	-	0.00	0.06	-
	fermat	-	-	-	-	-	0.00	0.06	-
Total for Subject Chemistry	turing	328.46	11468.08	82899.11	-	94695.64	0.86	10.23	-
	fermat	1017.53	-	-	-	1017.53	0.01	1.02	0.01
CSE019 cr/l73104 Berzins	turing	9.47	-	7.45	-	16.92	0.02	0.08	-
	fermat	1.78	-	-	-	1.78	0.00	0.08	-

CfS Supercomputer Service

Account		Inter	Priority	Normal	Low	Total	D-Usage	D-Allocn	HSM
		---------- CPU Usage (Hours) ----------					--- Storage (GB-Years) ---		
cse024 GR/M44453 Tennyson	turing	19.46	5081.54	1355.51	-	6456.51	0.03	2.78	-
	fermat	-	-	-	-	-	0.00	2.78	-
Total for Subject									
Information Technology	turing	28.92	5081.54	1362.96	-	6473.43	0.05	2.86	-
	fermat	1.78	-	-	-	1.78	0.00	2.86	-
HPCI Southampton	turing	31.98	-	8.76	-	40.74	0.04	2.83	-
	fermat	-	-	-	-	-	0.00	0.08	-
HPCI Daresbury	turing	37.75	339.59	357.54	-	734.88	0.01	0.08	-
	fermat	-	-	-	-	-	0.00	0.08	-
HPCI Edinburgh	turing	0.00	-	-	-	0.00	0.00	0.06	-
	fermat	-	-	-	-	-	0.00	-	-
Total for Subject									
unspecified subject	turing	69.74	339.59	366.30	-	775.63	0.05	2.97	-
	fermat	-	-	-	-	-	0.00	0.16	-
Total for Council									
EPSRC	turing	1165.69	29577.66	307524	23418.75	361686	5.45	44.77	-
	fermat	7315.90	-	-	-	7315.90	0.37	24.85	1.63
SOC Core Strategic Webb	turing	13.69	87.73	9591.00	-	9692.42	2.05	4.38	-
	fermat	3.42	-	-	-	3.42	0.06	4.38	8.36
badc	turing	-	-	-	-	-	-	-	-
	fermat	8.77	-	-	-	8.77	0.02	-	47.05
csn003 UGAMP O'Neill	turing	0.36	1.11	713.77	-	715.25	0.13	0.61	-
	fermat	0.08	-	-	-	0.08	0.00	0.61	-
csn005 GR9/2909 Davies	turing	0.24	-	0.00	-	0.24	0.00	0.58	-
	fermat	-	-	-	-	-	0.00	0.58	-
csn006 GR9/3550 Price	turing	0.01	-	-	-	0.01	0.00	2.37	-
	fermat	-	-	-	-	-	0.00	2.37	-
csn007 GST/02/1454 Price	turing	0.00	-	-	-	0.00	0.00	0.44	-
	fermat	-	-	-	-	-	-	-	-
Total for Council									
NERC	turing	14.29	88.84	10304.78	-	10407.91	2.18	8.38	-
	fermat	12.27	-	-	-	12.27	0.08	7.94	55.42
CSB001 27/B07117 Goodfello	turing	-	-	-	-	-	0.00	1.05	-
	fermat	-	-	-	-	-	0.00	1.05	-
CSB002 86/B10059 Danson	turing	0.00	-	-	-	0.00	0.00	1.58	-
	fermat	-	-	-	-	-	-	-	-
Total for Council									
BBSRC	turing	0.00	-	-	-	0.00	0.00	2.63	-
	fermat	-	-	-	-	-	0.00	1.05	-
cs2001 CompApps3D Jain	turing	0.02	-	-	-	0.02	0.00	0.03	-
	fermat	-	-	-	-	-	0.00	-	-
Total for Council									
Class 2	turing	0.02	-	-	-	0.02	0.00	0.03	-
	fermat	-	-	-	-	-	0.00	-	-
euukcp	turing	0.20	-	1098.04	-	1098.23	1.30	-	-
	fermat	-	-	-	-	-	-	-	-
eugamp	turing	0.01	-	-	-	0.01	0.10	-	-
	fermat	-	-	-	-	-	-	-	-

CfS Supercomputer Service

Account		CPU Usage (Hours) Inter	Priority	Normal	Low	Total	Storage (GB-Years) D-Usage	D-Allocn	HSM
euqub	turing	0.03	-	-	-	0.03	0.19	-	-
	fermat	-	-	-	-	-	-	-	-
euocam	turing	0.03	-	-	-	0.03	0.15	-	-
	fermat	-	-	-	-	-	-	-	-
euqmw	turing	12.79	-	870.19	-	882.98	2.80	-	-
	fermat	-	-	-	-	-	-	-	-
euhpci	turing	5.40	-	-	-	5.40	0.18	-	-
	fermat	-	-	-	-	-	-	-	-
euston	turing	0.00	-	-	-	0.00	0.03	-	-
	fermat	-	-	-	-	-	-	-	-
eural	turing	5.86	-	-	-	5.86	2.27	-	-
	fermat	-	-	-	-	-	-	-	-
eubbk	turing	0.01	-	-	-	0.01	0.07	-	-
	fermat	-	-	-	-	-	-	-	-
earlyu	turing	-	-	-	-	-	-	-	-
	fermat	3.23	-	-	-	3.23	0.13	-	1.60
dummy	turing	-	-	-	-	-	0.00	-	-
	fermat	-	-	-	-	-	0.00	-	-
Total for Subject eu accounts	turing	24.33	-	1968.22	-	1992.55	7.09	-	-
	fermat	3.23	-	-	-	3.23	0.13	-	1.60
Total for Council Research	turing	24.33	-	1968.22	-	1992.55	7.09	-	-
	fermat	3.23	-	-	-	3.23	0.13	-	1.60

Account		Inter	Priority	Normal	Low	Total	D-Usage	D-Allocn	HSM
Total Research Councils	turing	1204.34	29666.50	319797	23418.75	374087	14.72	55.81	-
	fermat	7331.40	-	-	-	7331.40	0.58	33.84	58.64