CSAR Service - Management Report

April 2001

This report documents the quality of the CSAR service during the month of April 2001.

A more comprehensive report is provided quarterly, which additionally covers wider aspects of the Service such as information on Training, Application Support and Value-Added services.

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

1. Introduction

April has seen the T3E workload remain very high and the Origin 2000 (Fermat) with a high utilisation.

April also saw the introduction of the first Origin 3000 (Green).

The percentage of jobs larger than 64 PE's was 53%.

This document gives information on Service Quality and on actual usage of the CSAR Service during the reporting period of April 2001. The information, in particular, covers the availability and usage of the following two main CSAR Service High Performance Computing (HPC) systems:

- Cray T3E-1200E/776 (Turing)
- SGI Origin2000/128 (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
Fujitsu Service 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
Help Desk						
Non In-depth Queries - Max Time to resolve 50% of all queries (working days)	< 1/4	< 1/2	< 1	< 2	< 4	4 or more
Non In-depth Queries - Max Time to resolve 95% of all queries (working days)	< 1/2	< 1	< 2	< 3	< 5	5 or more
Administrative Queries - Max 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 (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 April 1st to 30th inclusive.
Overall, the CPARS Performance Achievement in April was satisfactory (see Table 3); i.e. Green measured against the CPARS performance targets.
The Fujitsu availability figures are included in Table 2, but not Table 3 as they have zero weighting in CPARS terms.

CSAR Service - Service Quality Report - Actual Performance Achievement

Service Quality Measure											2000/1	
	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April
HPC Services Availability												
Availability in Core Time (% of time)	100%	99.70%	100%	100%	100%	100%	100%	94.90%	99.70%	99.70%	100%	100%
Availability out of Core Time (% of time)	99.40	99.40	100%	100%	100%	100%	99.40	98.49%	99.50%	99.40	99.40	99.40
Number of Failures in month	1	2	0	0	0	0	2	4	1	1	1	1
Mean Time between failures in 52 week rolling period (hours)	515	461	461	626	730	1095	673	584	584	626	674	674
Fujitsu Service Availability												
Availability in Core Time (% of time)	100%	100%	100%	98.4%	100%	100%	100%	100%	100%	100%	100%	100%
Availability out of Core Time (% of time)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Help Desk												
Non In-depth Queries - Max Time to resolve 50% of all queries	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Non In-depth Queries - Max Time to resolve 95% of all queries	<2	<1	<2	<2	<2	<1	<3	<3	<5	<5	<3	<5
Administrative Queries - Max Time to resolve 95% of all queries	<2	<0.5	<0.5	<2	<2	<0.5	<0.5	<5	<2	<2	<3	<0.5
Help Desk Telephone - % of calls answered within 2 minutes	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Others												
Normal Media Exchange Requests - average response time	0	0	0	0	<0.5	0	<0.5	<0.5	<0.5	<0.5	0	0
New User Registration Time (working days)	0	0	0	0	0	0	0	0	0	0	0	0
Management Report Delivery Times (working days)	10	10	10	10	10	10	10	10	10	10	10	12
System Maintenance - no. of sessions taken per system in the mont	1	2	2	2	2	1	2	1	0	2	1	2

Table 2

Notes:

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

$$[\text{ Turing availability } \times 122 / (122 + 3.5)] + [\text{ Fermat availability } \times 3.5 / (122 + 3.5) \times 1.556]$$

2 Mean Time between failures for Service Credits is formally calculated based on a rolling 12 month period.

Table 3 gives Service Credit values for the month of April. 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.

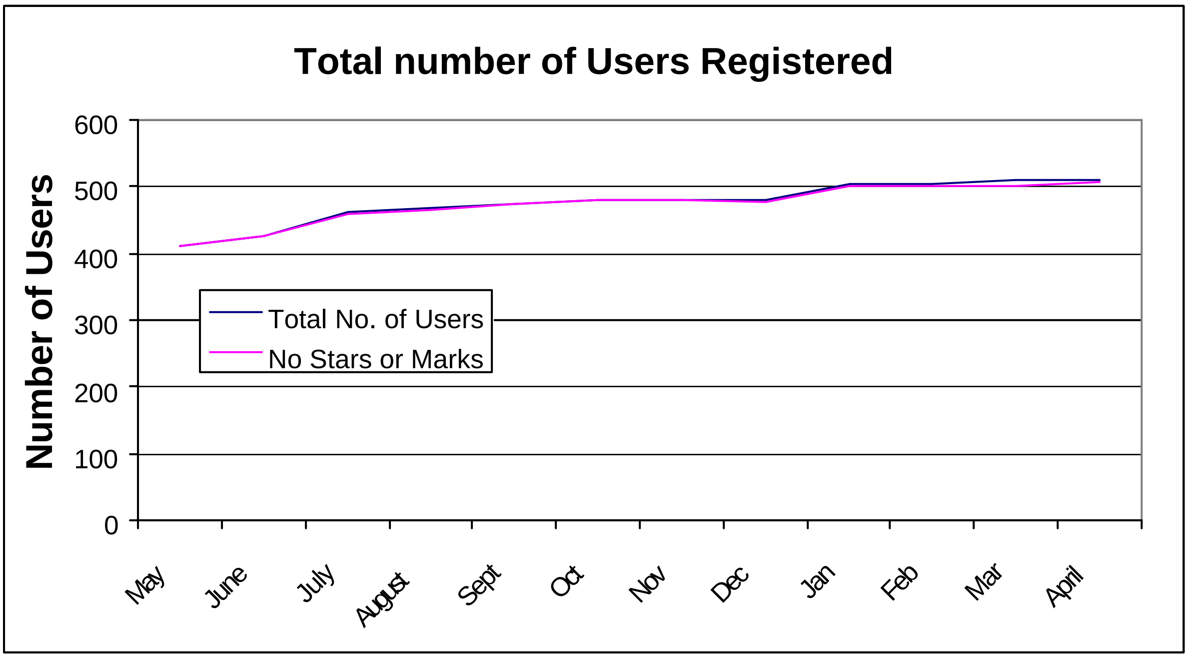
CSAR Service - Service Quality Report - Service Credits

	2000/1											
Service Quality Measure	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**March**	**April**
HPC Services Availability												
Availability in Core Time (% of time)	-0.058	-0.039	-0.058	-0.058	-0.058	-0.058	-0.058	0.195	-0.039	-0.039	-0.058	-0.058
Availability out of Core Time (% of time)	0	0	-0.047	-0.047	-0.047	-0.047	0	0	-0.039	0.000	0	0
Number of Failures in month	-0.008	0	-0.009	-0.009	-0.009	-0.009	0	0	-0.008	-0.008	-0.008	-0.008
Mean Time between failures in 52 week rolling period (hours)	-0.008	0	0	-0.008	-0.008	-0.009	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
Help Desk												
Non In-depth Queries - Max Time to resolve 50% of all queries	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019
Non In-depth Queries - Max Time to resolve 95% of all queries	0	-0.016	0	0	0	-0.016	0.016	0.016	0.031	0.031	0.016	0.031
Administrative Queries - Max Time to resolve 95% of all queries	0	-0.019	-0.019	0	0	-0.019	-0.019	0.046	0	0	0.016	-0.019
Help Desk Telephone - % of calls answered within 2 minutes	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
Others												
Normal Media Exchange Requests - average response time	0	0	0	0	-0.002	0	-0.002	-0.002	-0.002	-0.002	0	0
New User Registration Time (working days)	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019
Management Report Delivery Times (working days)	0	0	0	0	0	0	0	0	0	0	0	0.003
System Maintenance - no. of sessions taken per system in the mont	-0.003	0	0	0	0	-0.003	0	-0.003	-0.004	0	-0.003	-0.003
Monthly Total & overall Service Quality Rating for each period:	-0.06	-0.06	-0.09	-0.08	-0.08	-0.10	-0.06	0.11	-0.05	-0.03	-0.04	-0.05

Table 3

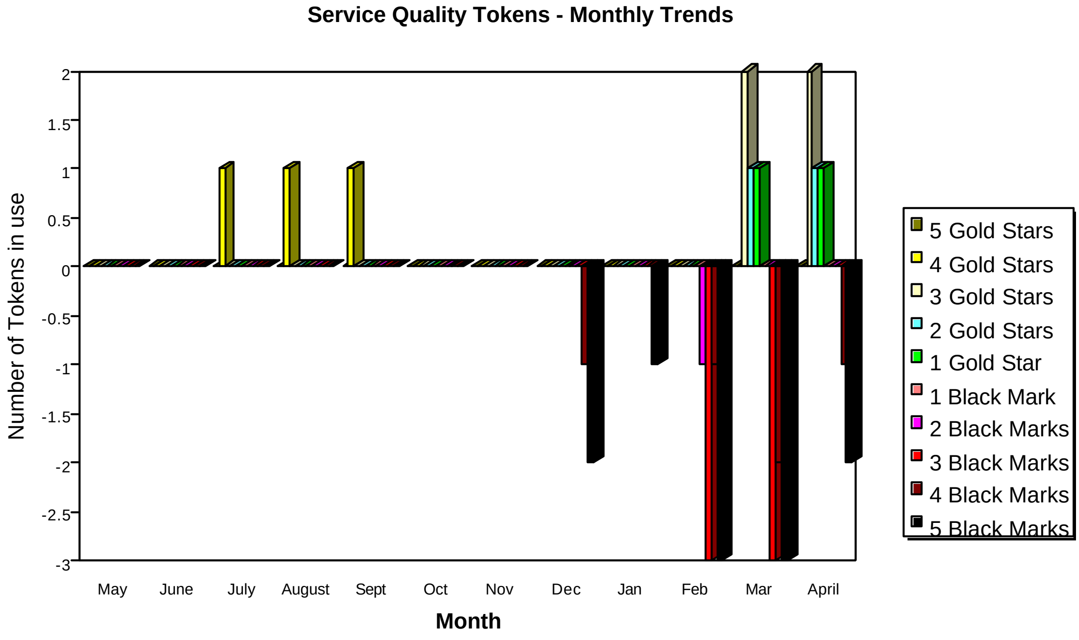
2.2 Service Quality Tokens

The current position at the end of April 2001 is that twelve of the 509 registered users of the CSAR Service had used Service Quality Tokens.



The graph below shows the total number of registered users on the CSAR Service and the number of users holding a neutral view of the service.

The graph below illustrates the monthly usage trend of quality tokens:



The current status of the Stendahl tokens, is that there are eight users with outstanding black marks against the system, due to the queue times being long on the Turing system, and four users issuing Gold stars for improved job turnaround.

SUMMARY OF SERVICE QUALITY TOKEN USAGE

No of Stars or Marks	Consortia	Date Allocated	Reason Given
3 Gold Stars	CSN003	12/03/01	Service greatly improved
3 Gold Stars	CSN006	15/03/01	Now achieving good throughput
2 Gold Stars	CSN006	12/03/01	Improved turnaround times on Queues
1 Gold Star	CSN003	12/03/01	Problems resolved
4 Black Marks	CSE006	08/03/01	Excessive Queue times
5 Black Marks	CSE006	08/03/01	Excessive Queue times
5 Black Marks	CSE006	09/03/01	Excessive Queue times

2.3 Throughput Target against Baseline

The Baseline Target for throughput was fully achieved this month due to plenty of work over the period. The actual usage figure was 163% of Baseline capacity.

Job Throughput Against Baseline CSAR Service Provision

Period: 1st to 30th April 2001

	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?	347,855	569,050	**163.59%**
	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?	347,855	571,987	Yes
		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?		12	Yes
		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 above 90% of the Baseline during period?		127%	Yes
	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 jobs from Users for more than 97% during period?	4	73.0%	No

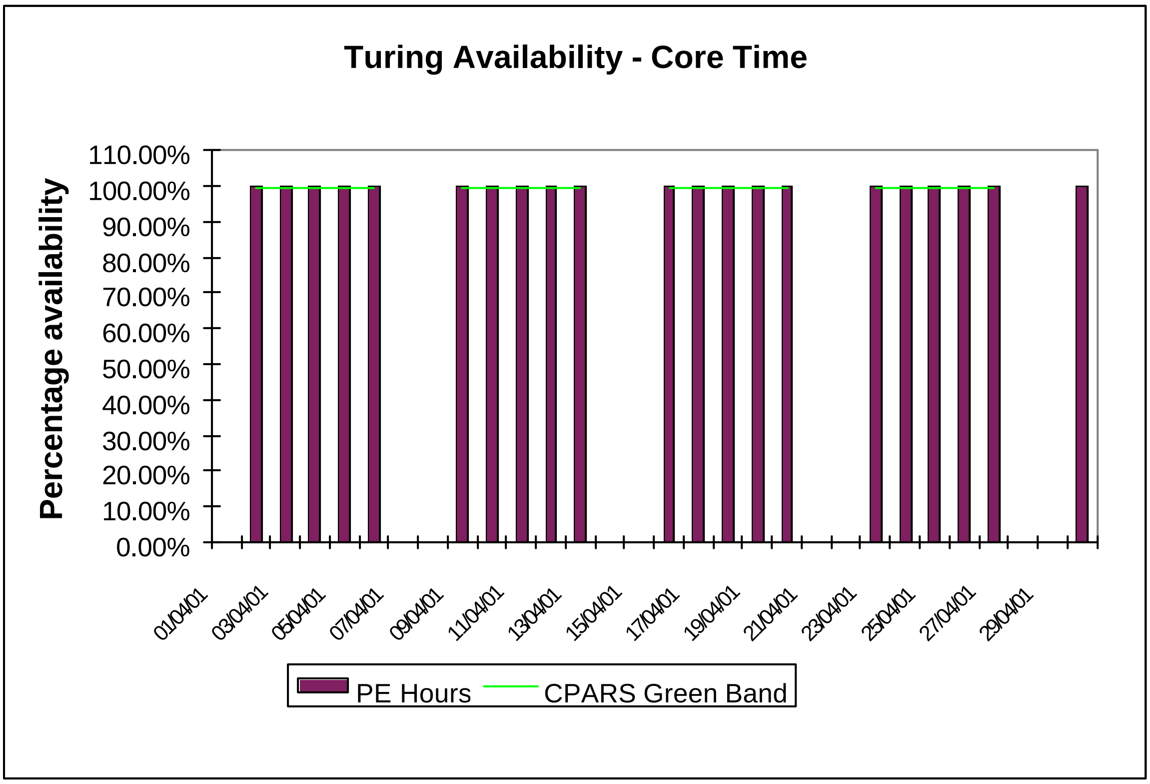
3. System Availability

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.

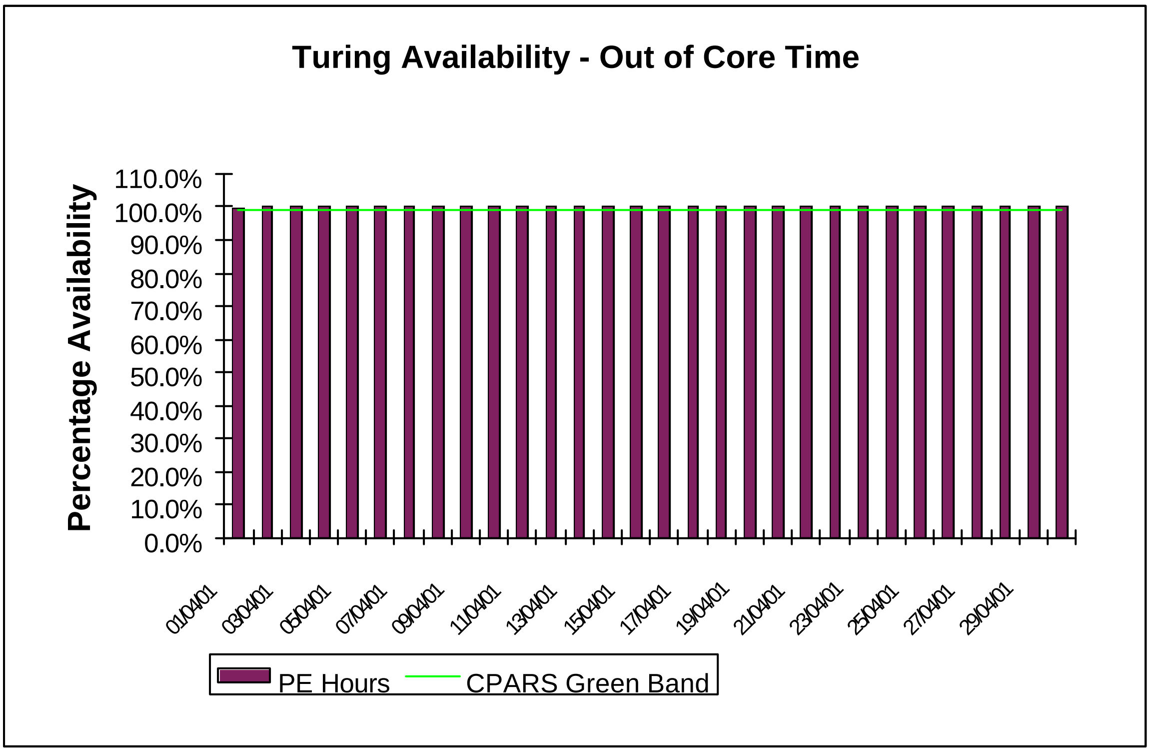
3.1 Cray T3E-1200E System (Turing)

The following graphs show the availability of Turing both in core time and out of core time respectively during the period of 1st to 30th April.

Turing availability for April:



Availability of Turing in core time during April was good.

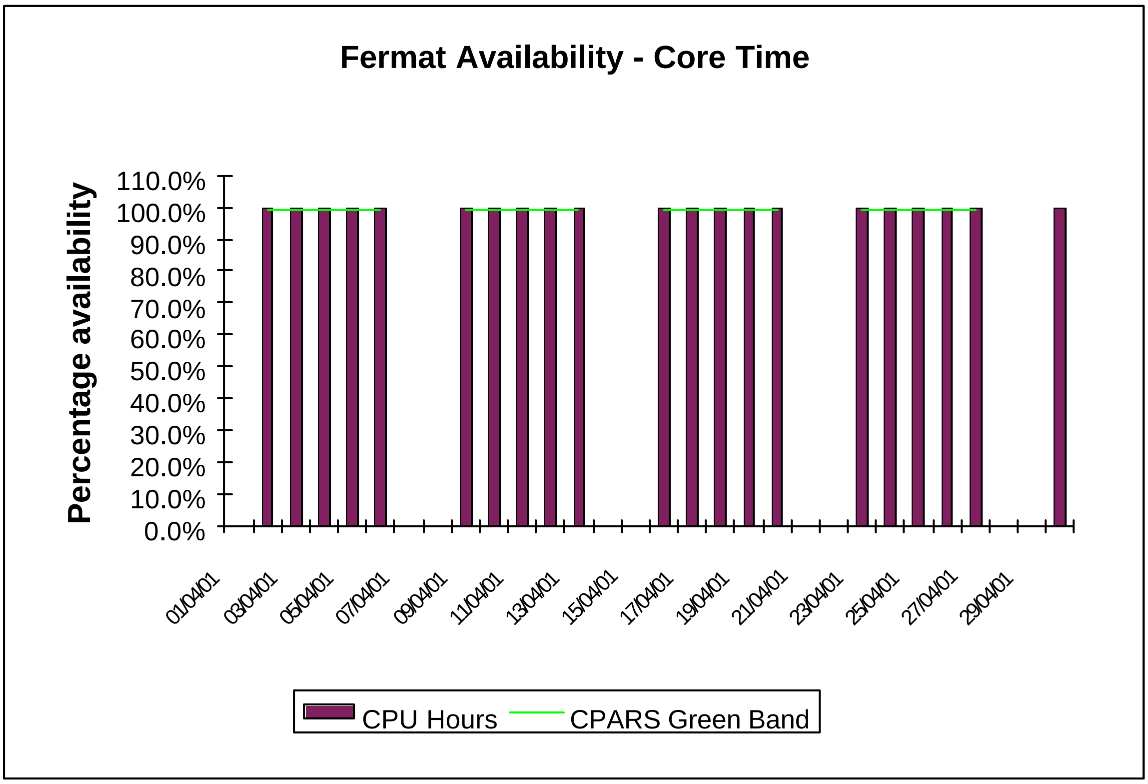


Availability of Turing out of core time during April was good. There was an incident on the 1st which resulted in the T3E being rebooted. It was not due to a T3E problem but was a failure of the environmental cooling systems.

3.2 SGI Origin2000 System (Fermat)

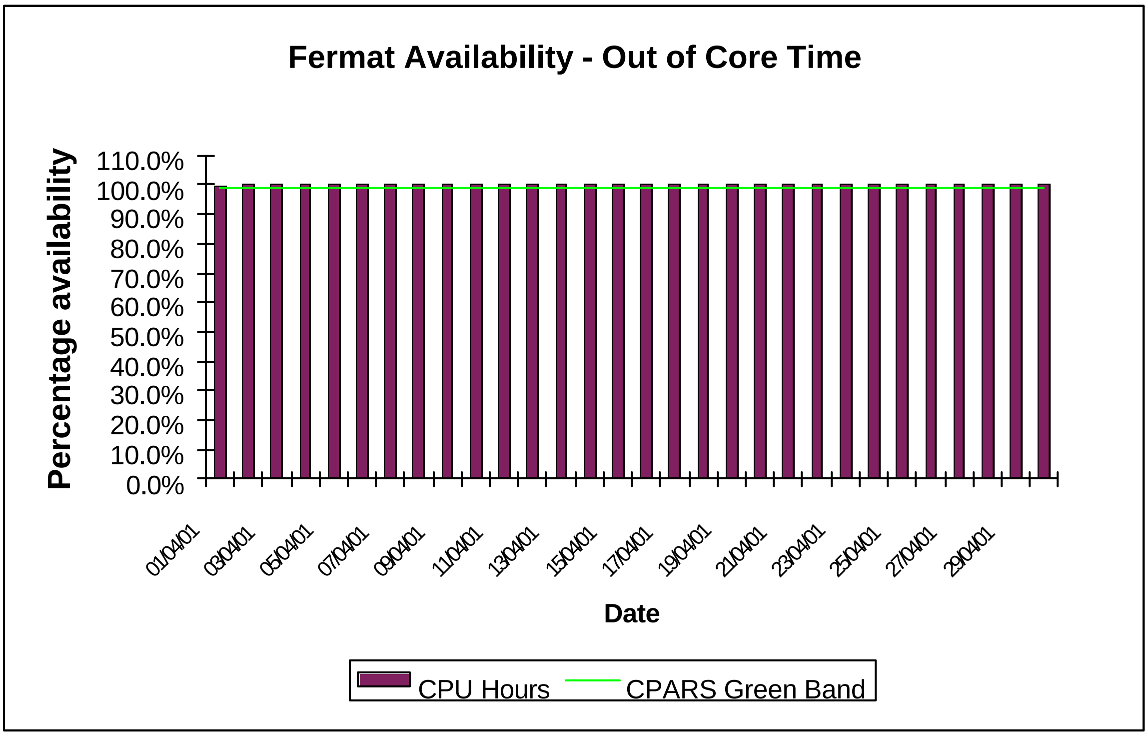
The following graphs show the availability of Fermat both in core time and out of core time respectively.

Availability of Fermat in core time during April was good.



Fermat had to be rebooted for the same incident that brought about the Turing reboot.

Availability of Fermat out of core time during April was good.



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 April 1st to 30th is provided by Project/User Group, totalled by Research Council and overall. This covers:

??	CPU usage	Turing: 547,942 PE Hours	Fermat (Batch): 67730.61 Hours
??		Fermat (Interactive): 604.33 CPU Hours	
??		Green (Batch) 9,579.02 Hours	
??	Fujitsu CPU usage	Fuji: 2,396.86 CPU Hours	
??	User Disk allocation	Turing: 67.11 GB Years	Fermat: 28.08 GB Years
??	HSM/tape usage	1085.76 GB Years	

In addition, the following graphs are provided to illustrate usage per month, historically:

a) MPP (T3E/Origin) Usage by month, showing usage each month of CPU (MFOP Years as perNPB), split by Research Council and by system. The Baseline and the overall Capacity are shown by overlaid horizontal lines.

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 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.

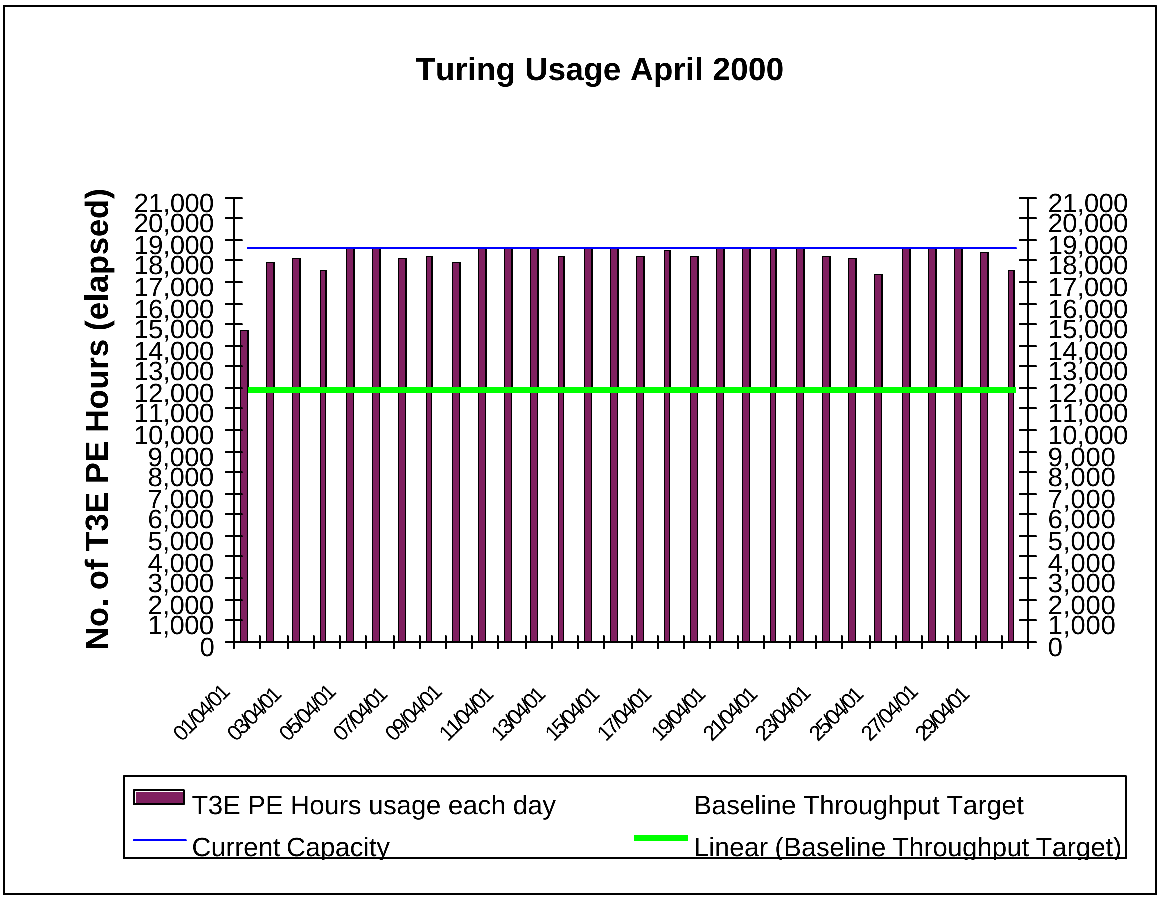
d) Medium Performance Disk (Origin) allocated for User Data by month, showing the allocated space each month in GBytes, split by Research Council. The Baseline Capacity (1.5 Terabytes) is shown by an overlaid horizontal line.

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 April 2001. 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.

Turing usage for April:



The above usage graph for the Turing system shows that the overall workload was variable.

The graph also indicates the workload reached 100% of maximum theoretical capacity for a large part of the month.

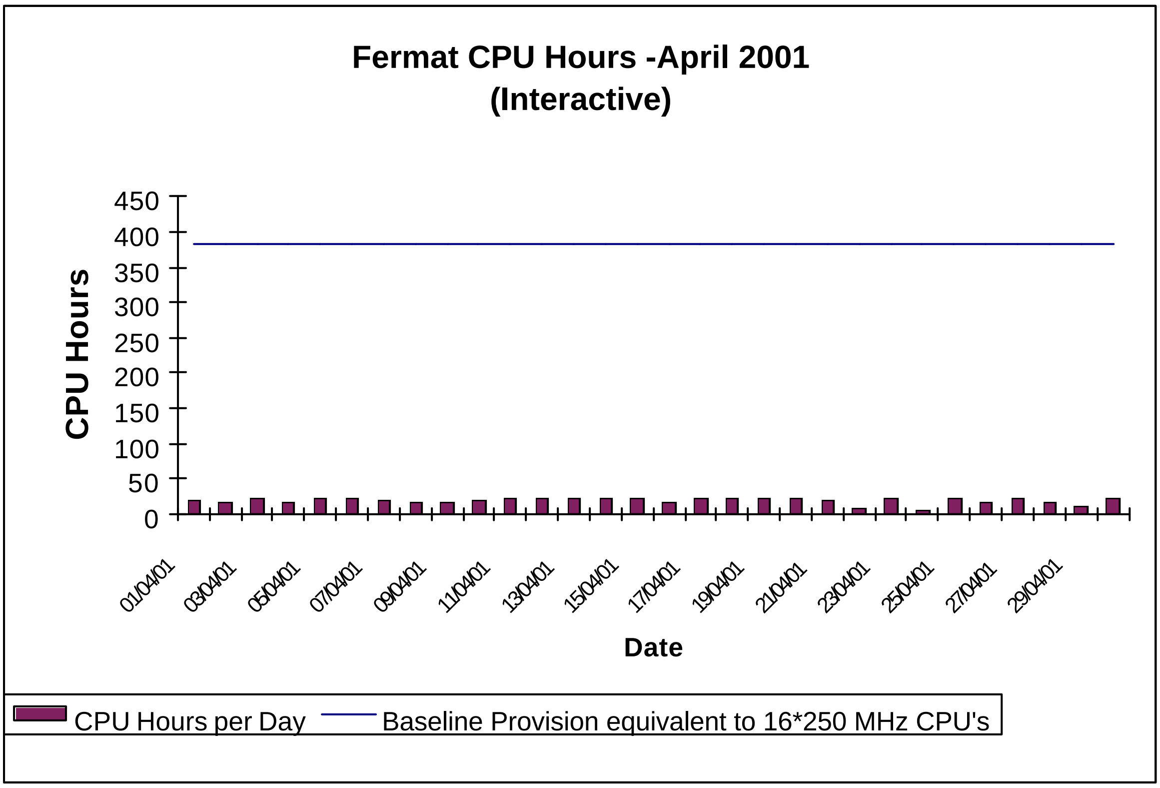
Fine tuning of the CfS scheduling system will continue to ensure minimal wasting of PE resource, in order to fit in a number of different sized jobs (e.g. 32, 64, 128, 256) thus facilitating maximised job throughput.

In particular, Turing will continue to start large jobs above 256 PEs, including 512 PEs, every night they are queued subject to the overall workload.

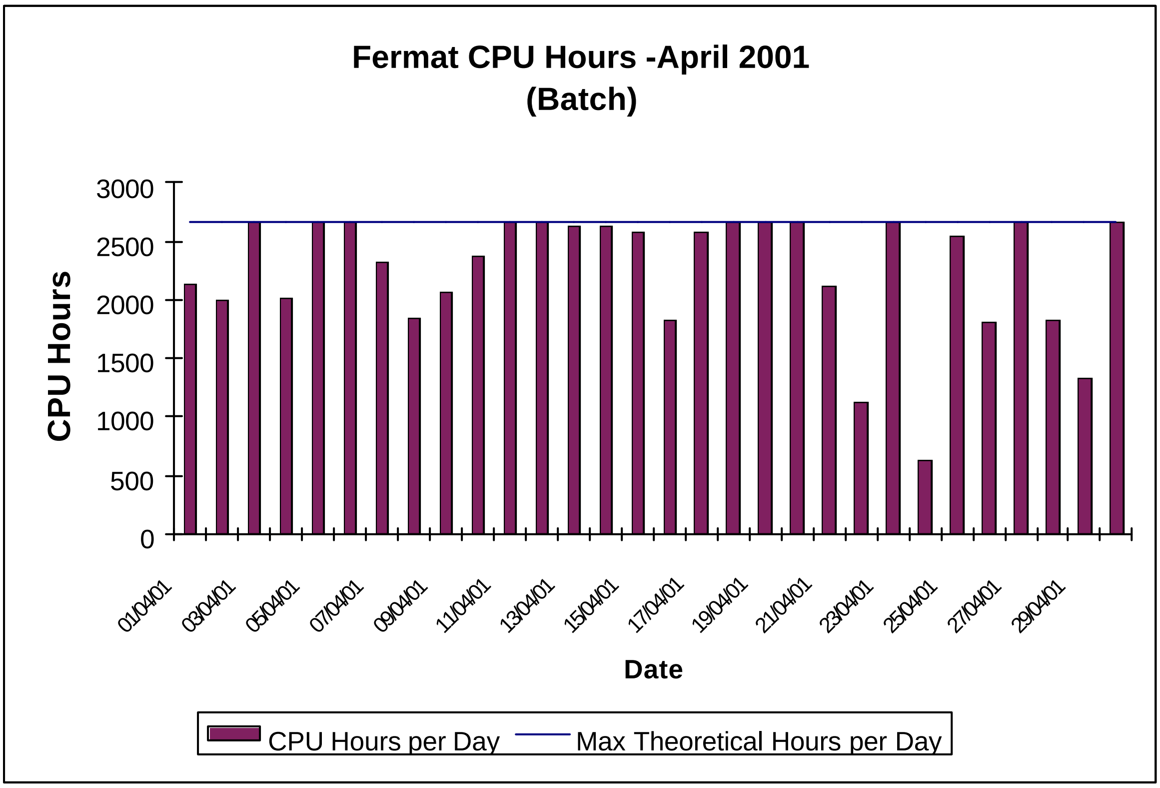
In an effort to minimise the effect of the long queues CfS have been man managing work through on a priority basis, where requested.

4.2 SGI Origin2000 System (Fermat)

The usage of the Origin system was low at the beginning of the month but grew with the new batch queuing system and release of processors for batch work. The groups most heavily using the Fermat system are CSE006 (Briddon), CSN006 (Price), CSN015 (Proctor) and HPCI Daresbury.

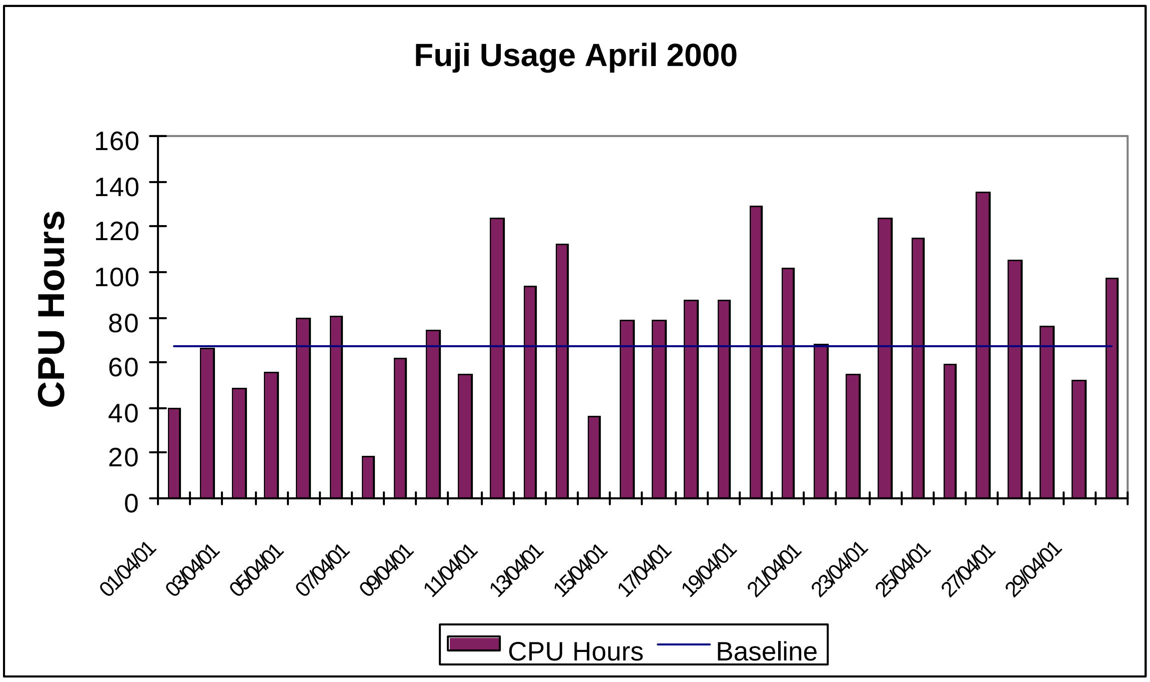


The graph above shows the interactive usage of the upgraded Origin 2000 (Fermat).



The above graph to a different scale shows the growing batch utilisation of the Origin 128.

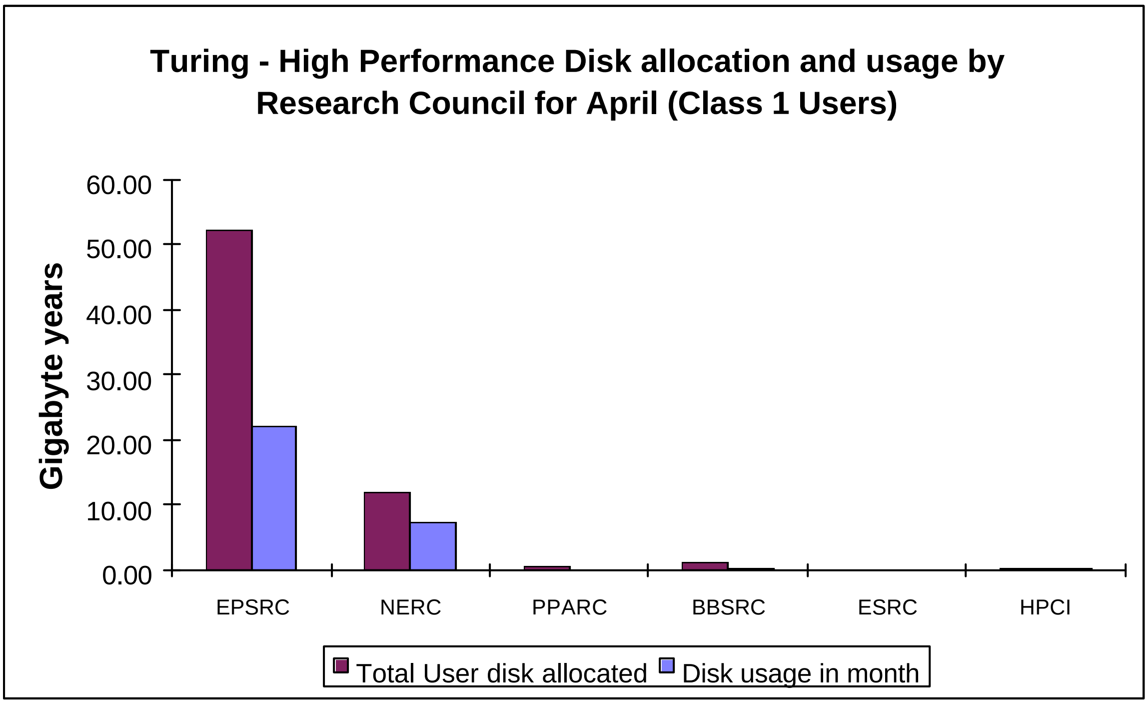
4.2.1 Fujitsu VPP 300/8 System (Fuji)



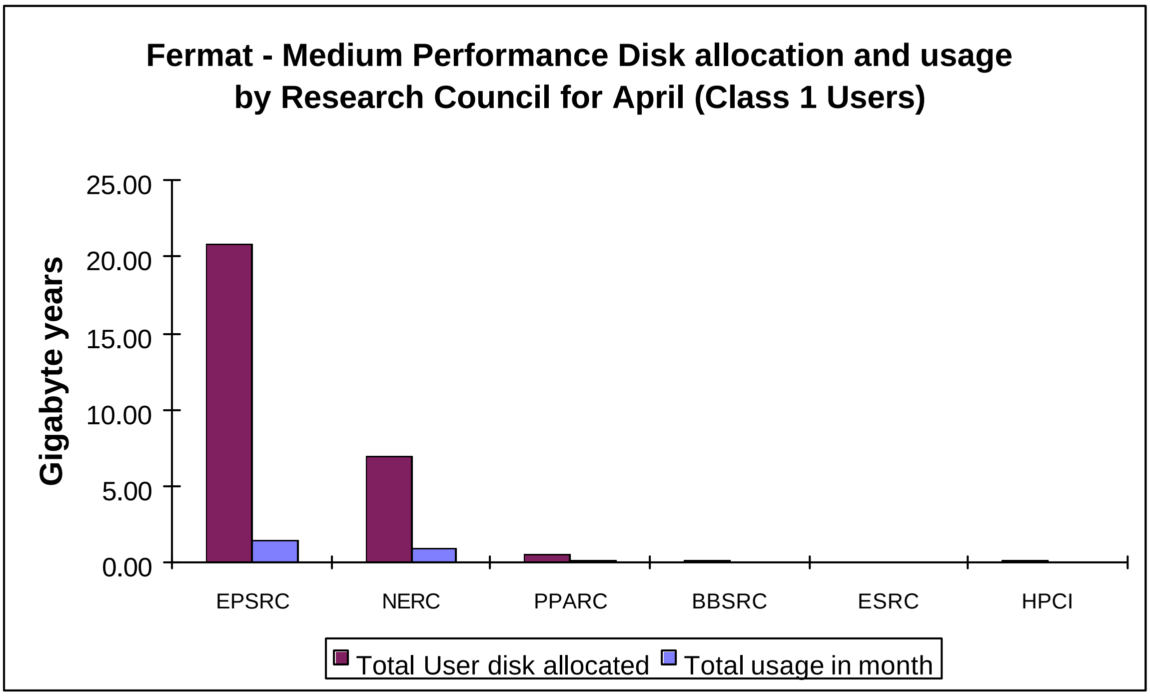
Fuji utilisation was again variable over the month with the overall position resulting in usage above baseline.

4.3 Disk/HSM Usage Charts

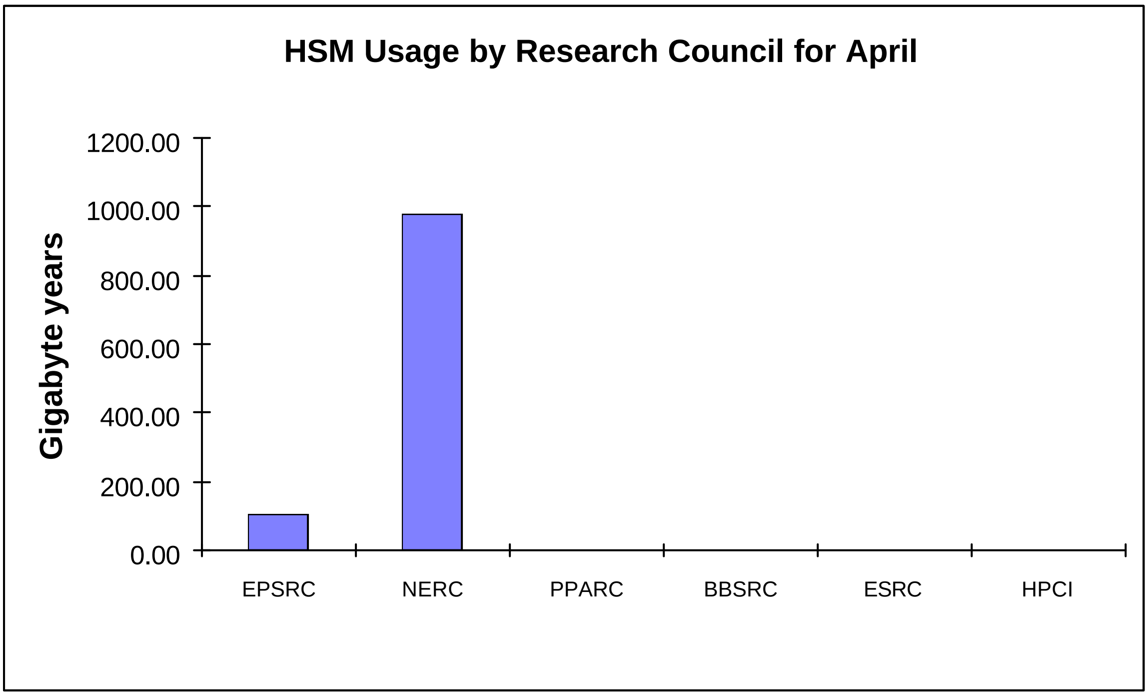
The graphs below show current disk and HSM allocations and usage.



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

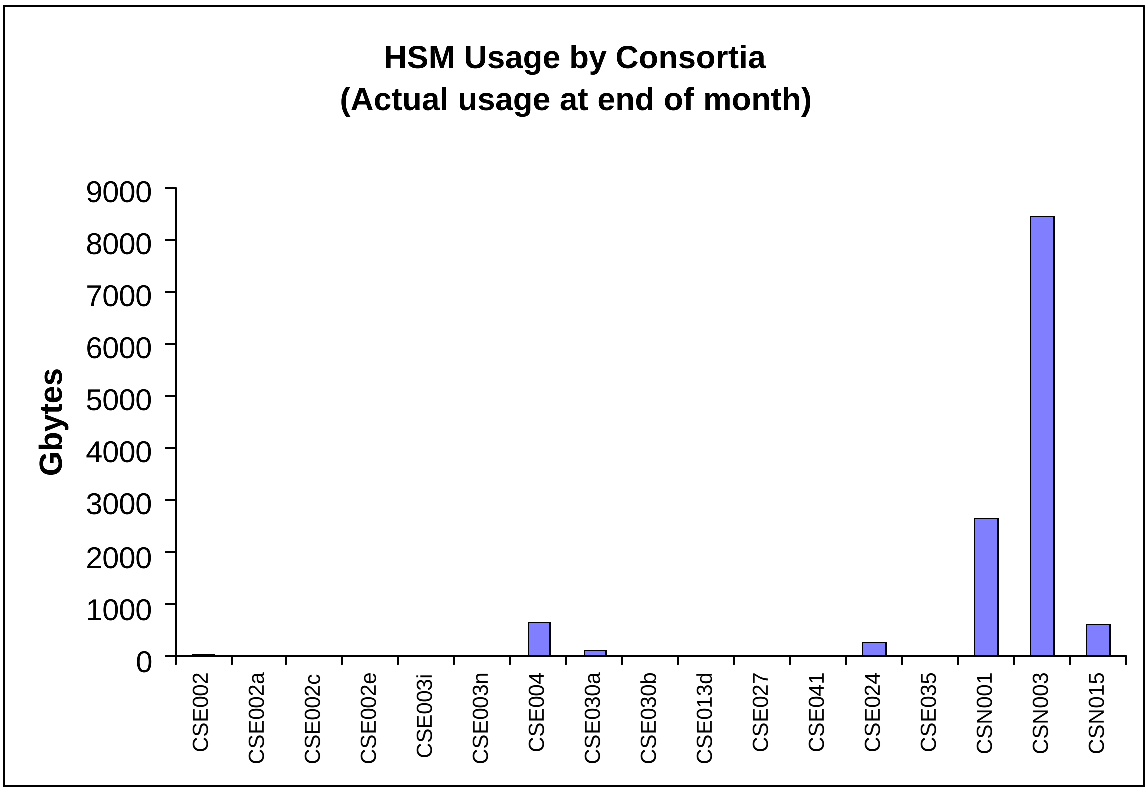


The above graph shows the disk allocations against usage on average of the disk on Fermat.

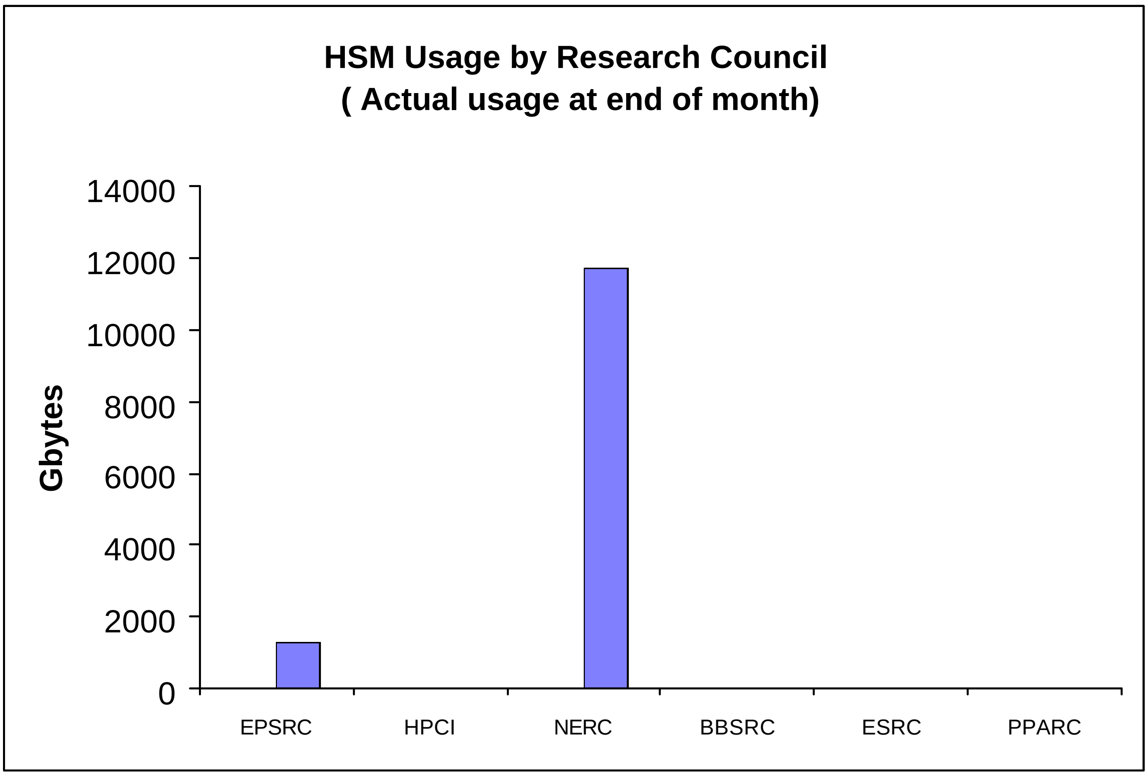


The above graph shows the total usage of the HSM facility by Research Council.

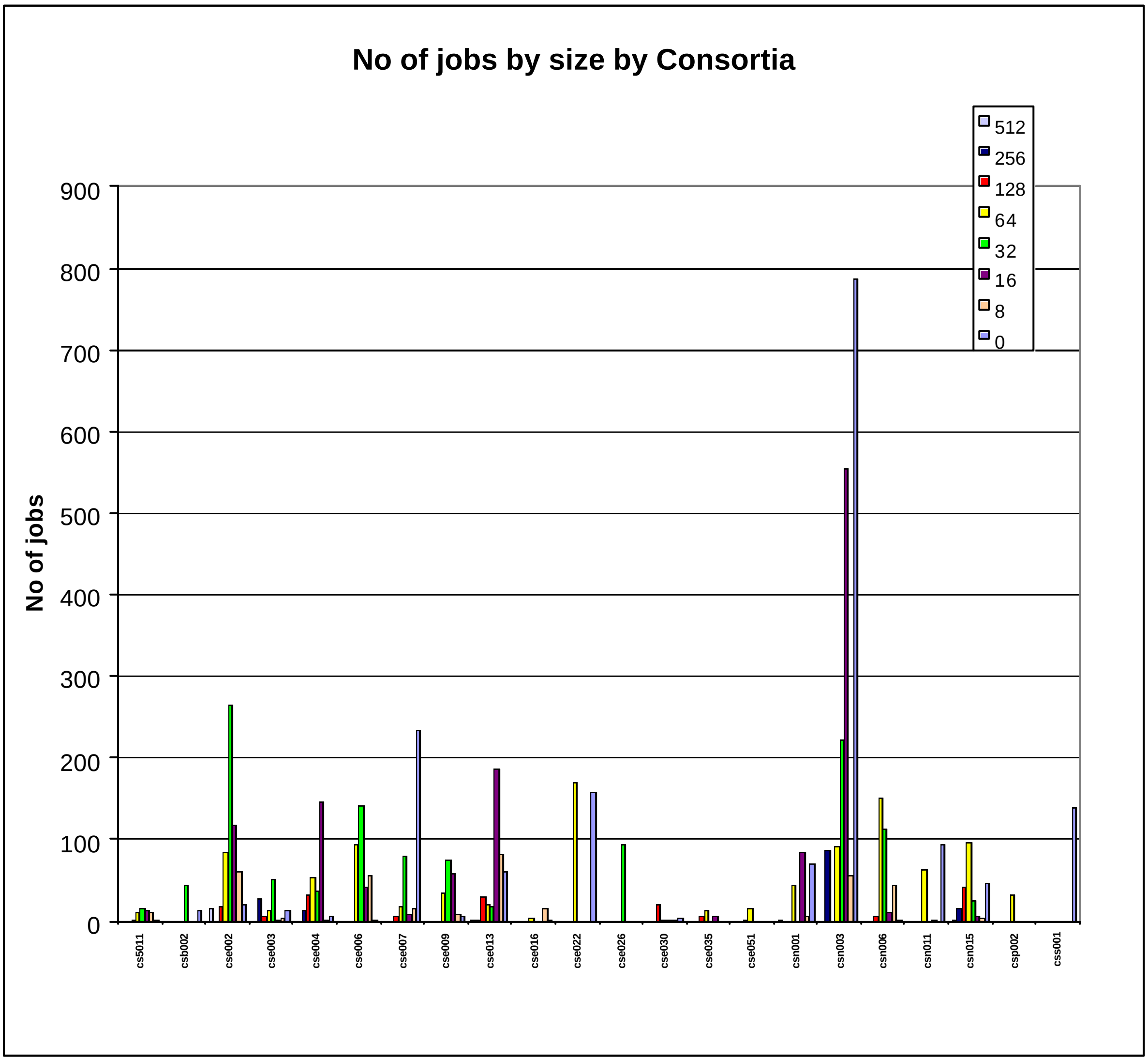
The next two graphs give actual usage of HSM by Research Council and by Consortium.



CSE002 (Gillan), CSE004 (Sandham), CSE024 (Tennyson), CSN001 (Webb), CSN003 (O'Neill) & CSN015 (Proctor) were the major users of HSM resource.

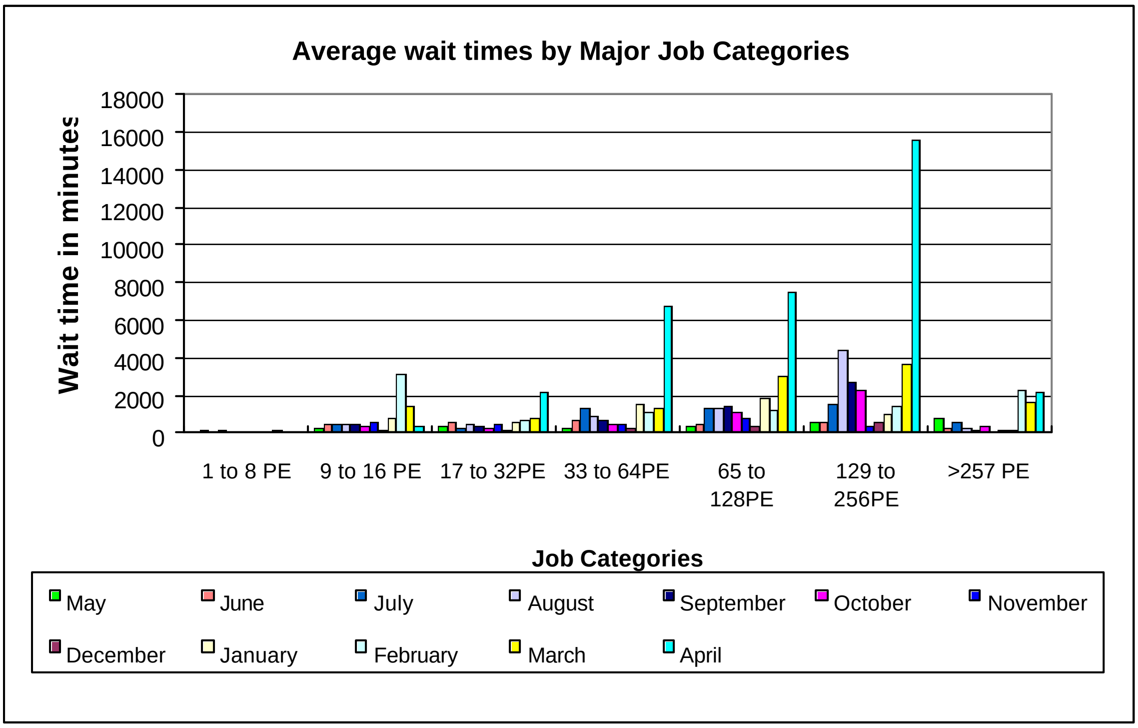


Job statistics for Turing:

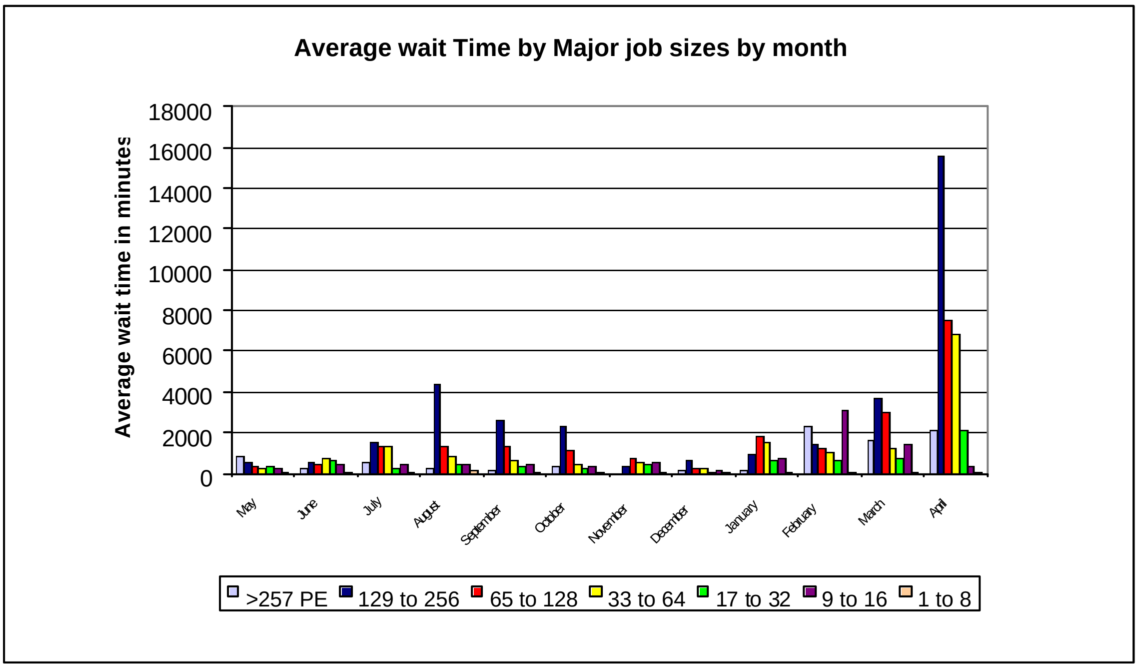


The above graph shows the number of jobs of the major sizes run in the period 1st to 30th April 2001.

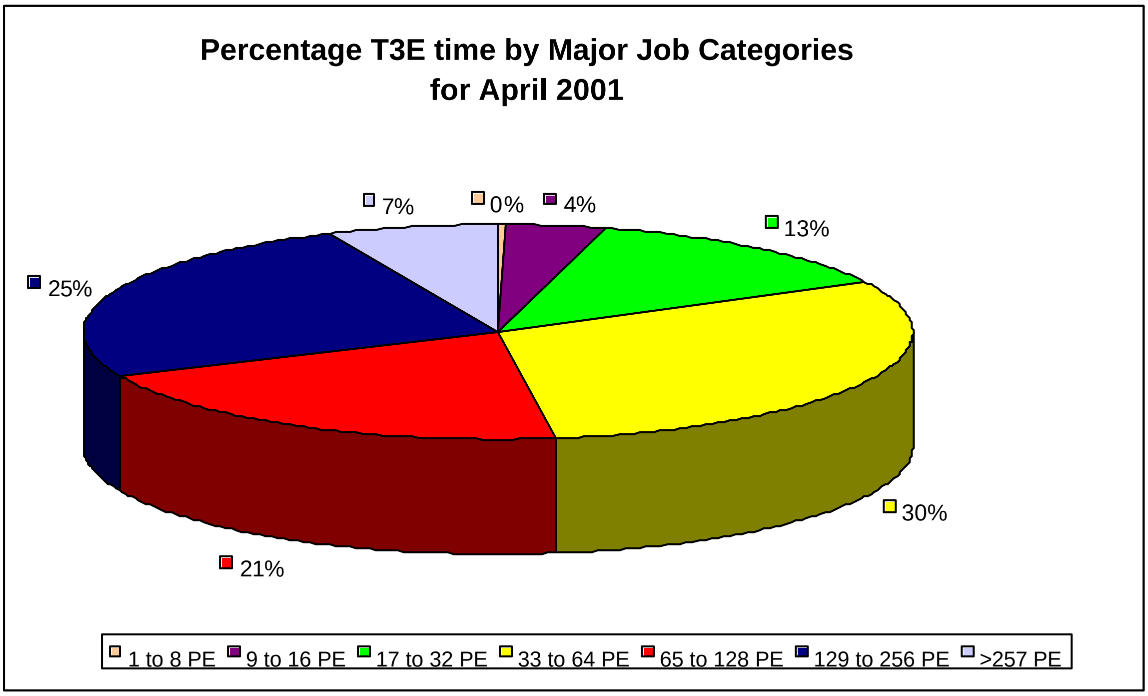
The next graph shows the wait times in minutes for the major categories of jobs.



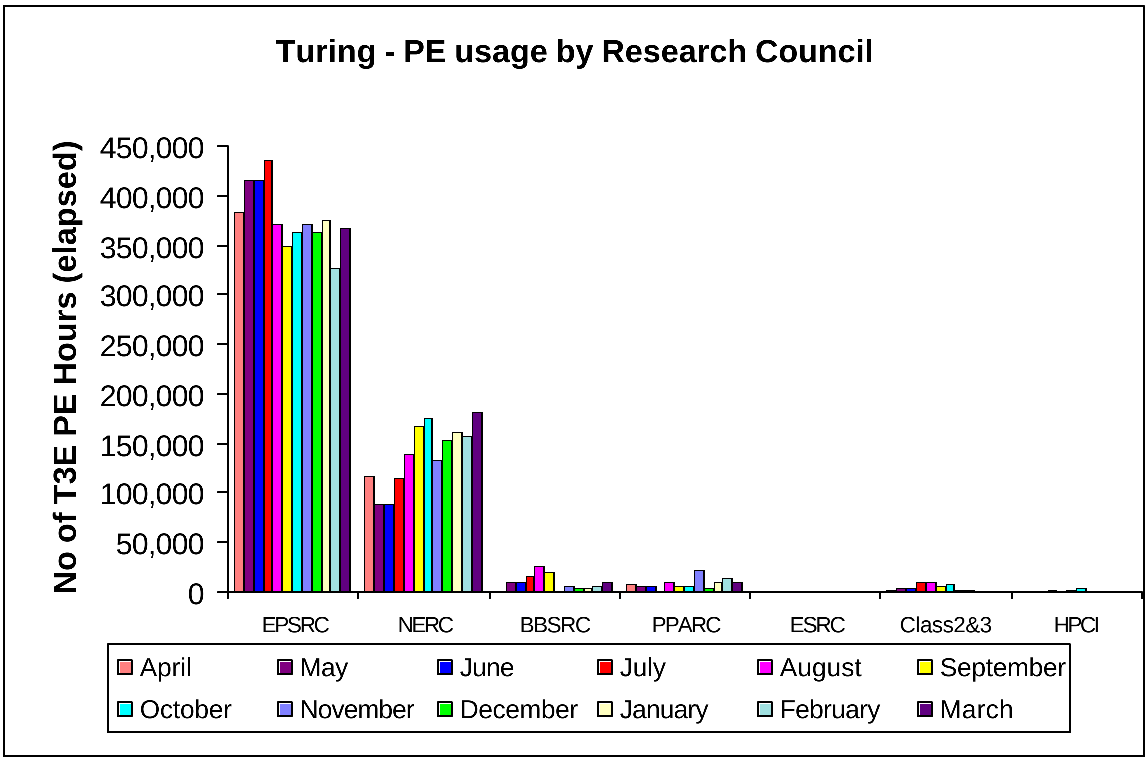
The chart above shows the average wait time trend over the last 12 months. Wait times for all jobs currently remain high due to the heavy workload on the system.



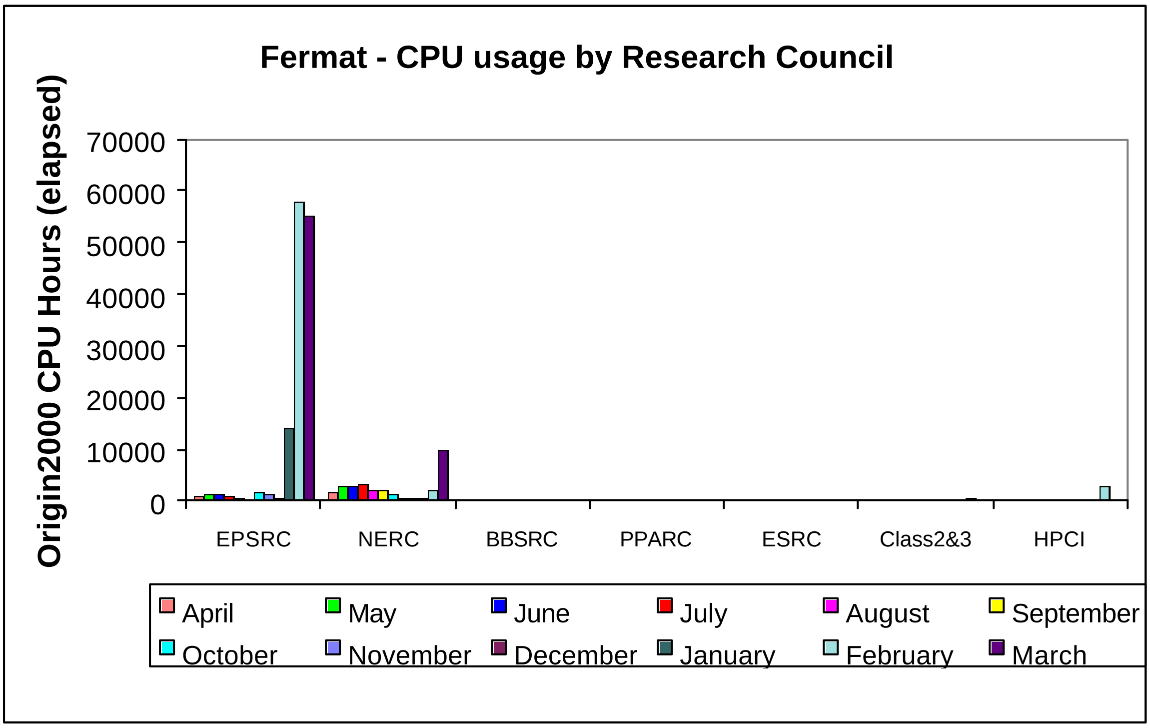
It can be seen from the above graph that enhancements to the scheduling on Turing did reduce the average wait times in November/December, however the times have again started to climb due to the volumes of work on Turing.



The largest proportion of the workload on Turing, 53%, was greater than 64 PEs in size.



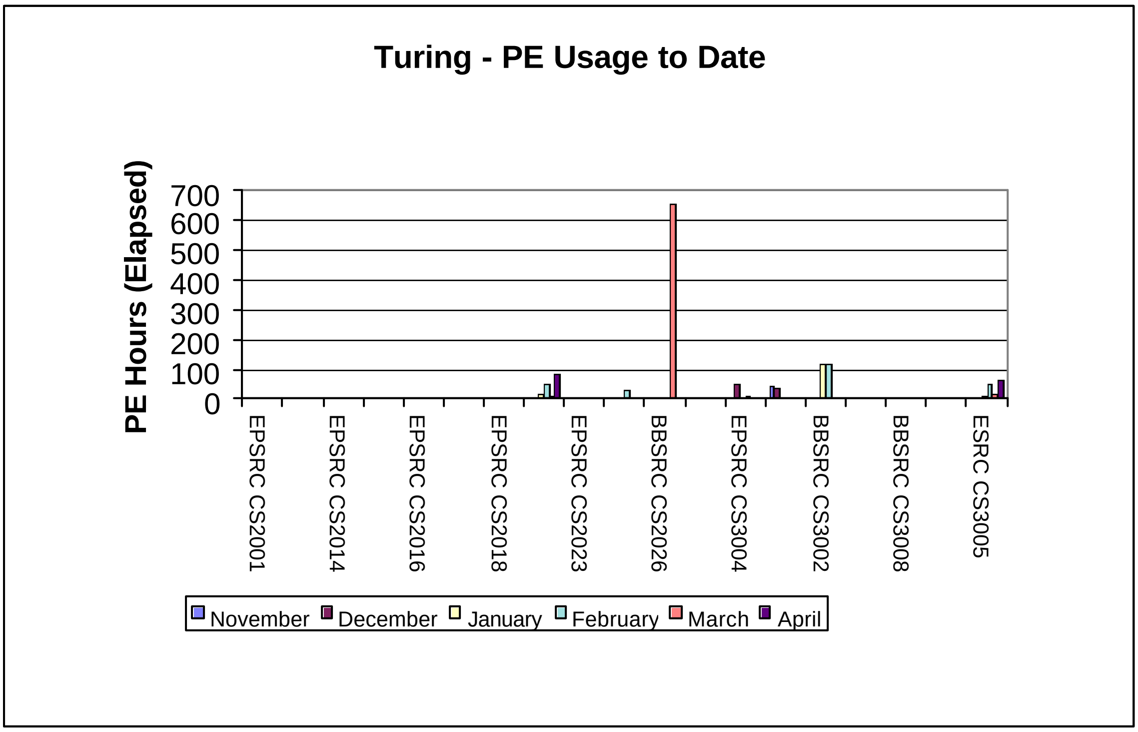
Turing PE usage is shown by Research Council during the past 12 months of service in the above chart.



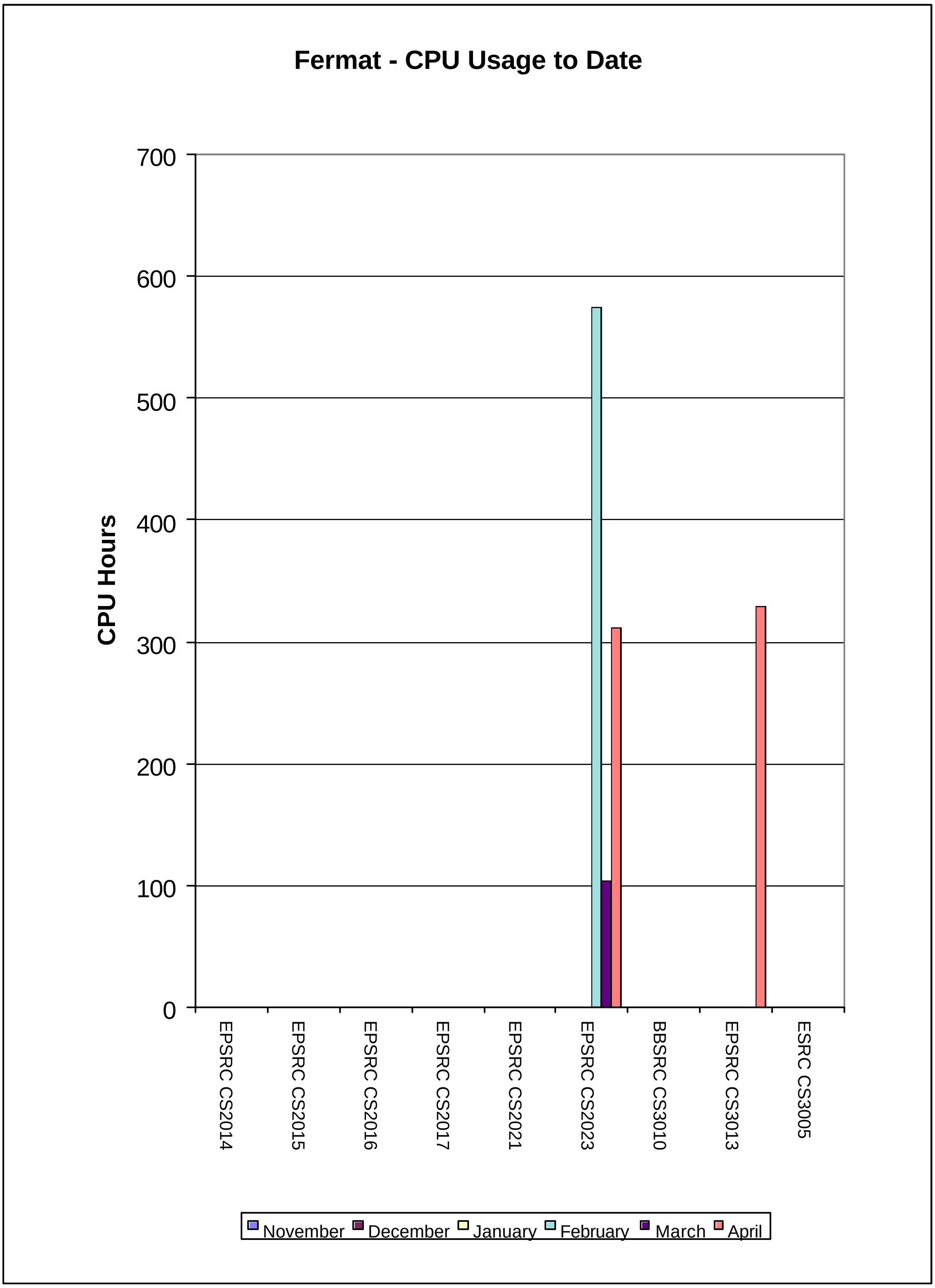
Origin 2000 CPU usage is shown by Research Council during the past 12 months of service in the above chart.

4.4 Class 2 & 3 Usage Charts

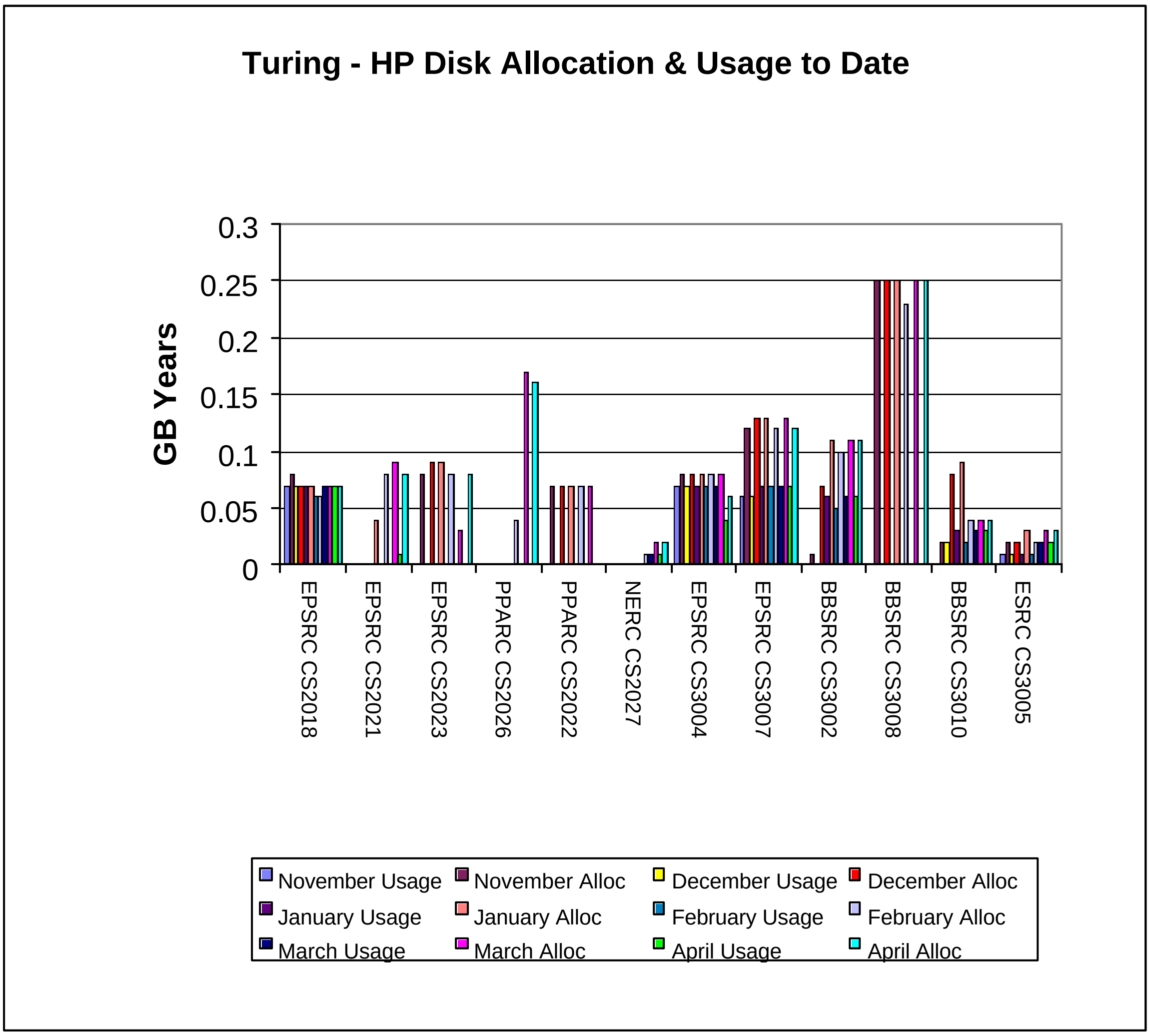
The next series of charts show the usage of the system by the class 2 & class 3 users. The usage is shown by project and identifies the Research Council of the individual projects.



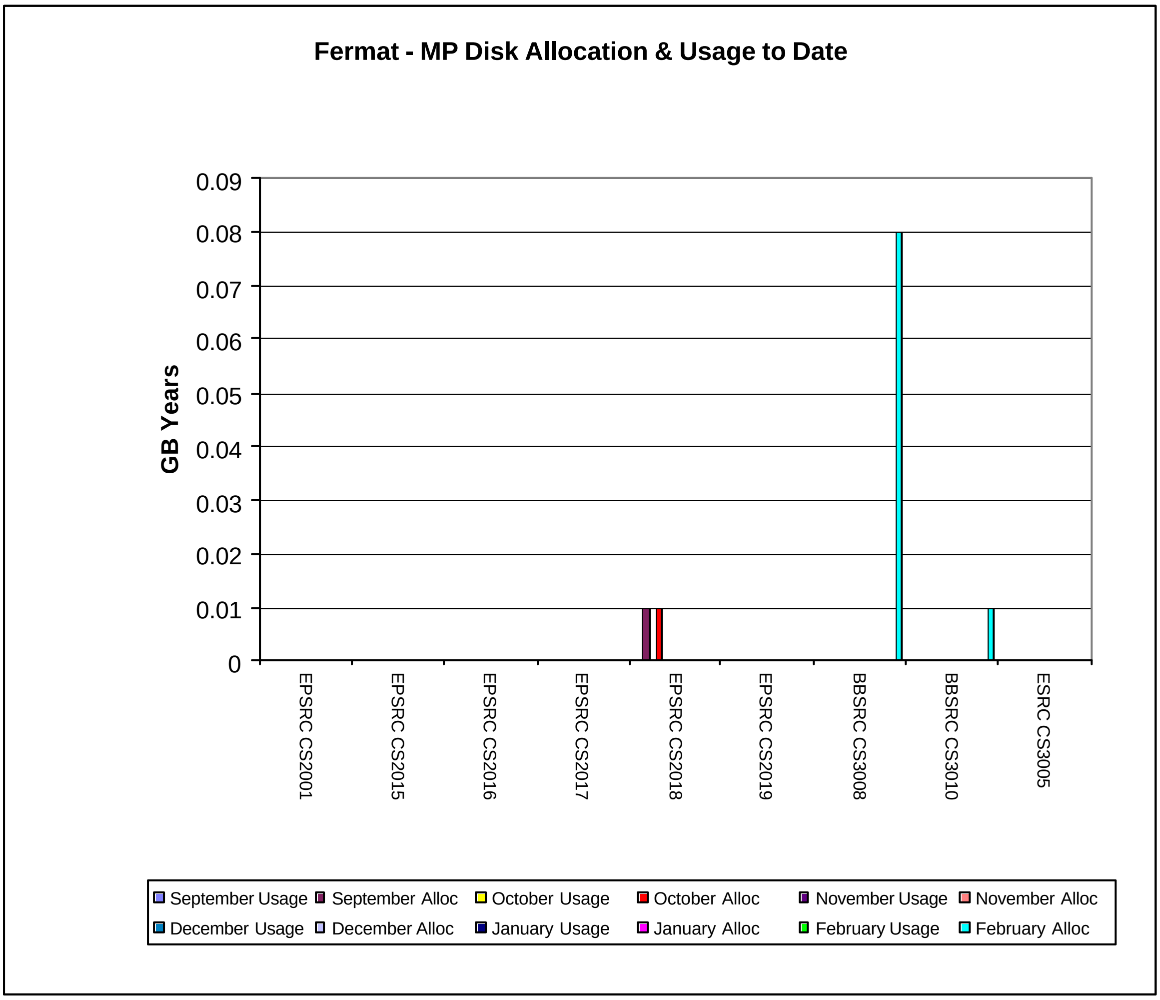
The above chart shows the most significant PE usage of the Turing system by class 2 and class 3 users.



The above chart shows the CPU usage of the Fermat system by class 2 and class 3 users.



The above chart shows the most significant disk allocations on the Turing system for class 2 and class 3 users.



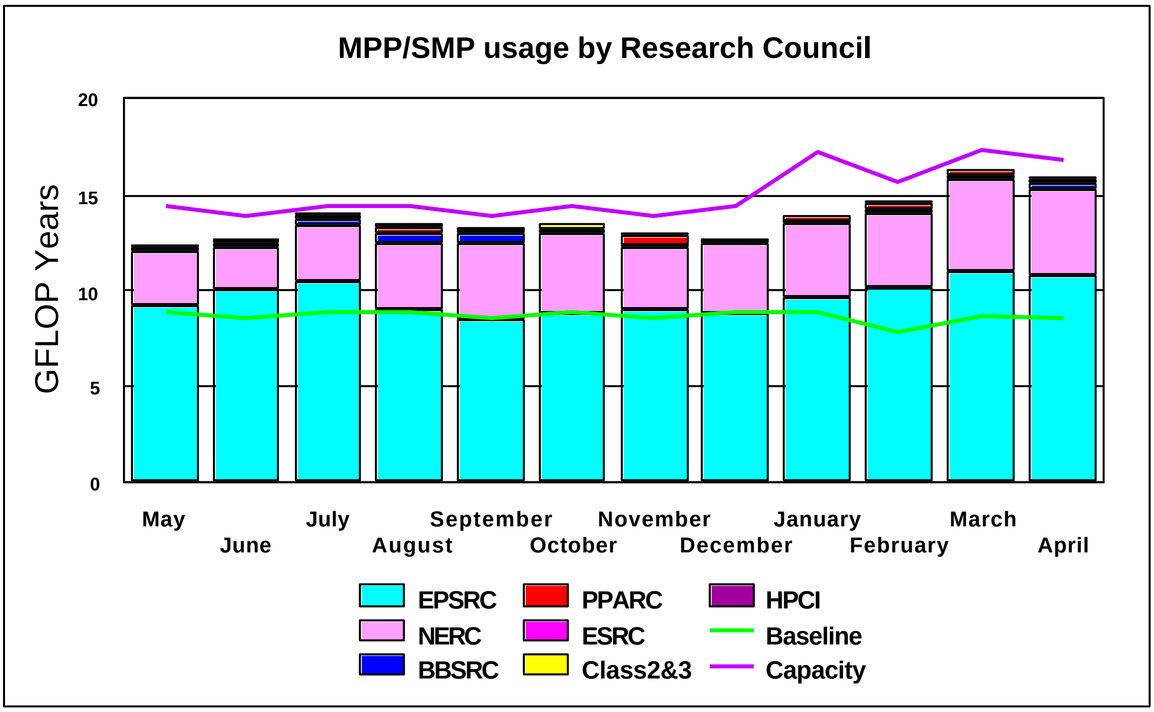
The above chart shows the most significant disk allocations on the Fermat system for class 2 and class 3 users.

There is currently no HSM usage by class 2 and class 3 users.

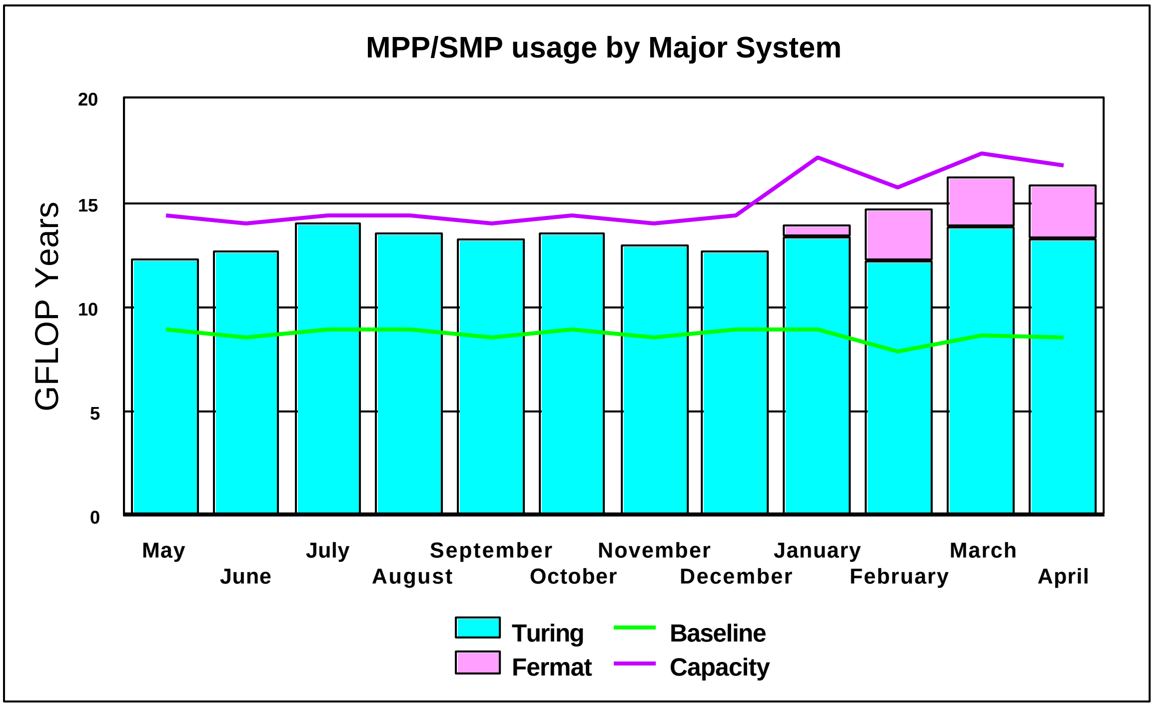
4.5 Charts of Historical Usage

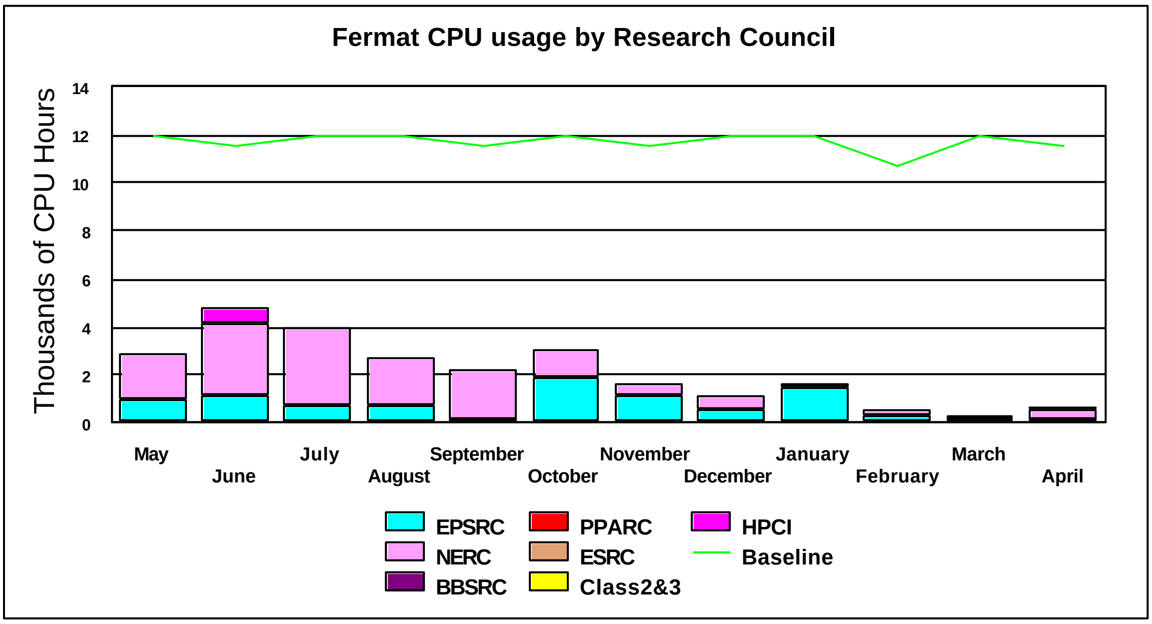
In all the Usage Charts, the baseline varies dependant on the number of days in each month, within a 365-day year.

The graph below shows the GFLOP Year utilisation on Turing and Fermat by Research Council for the previous 12 months.



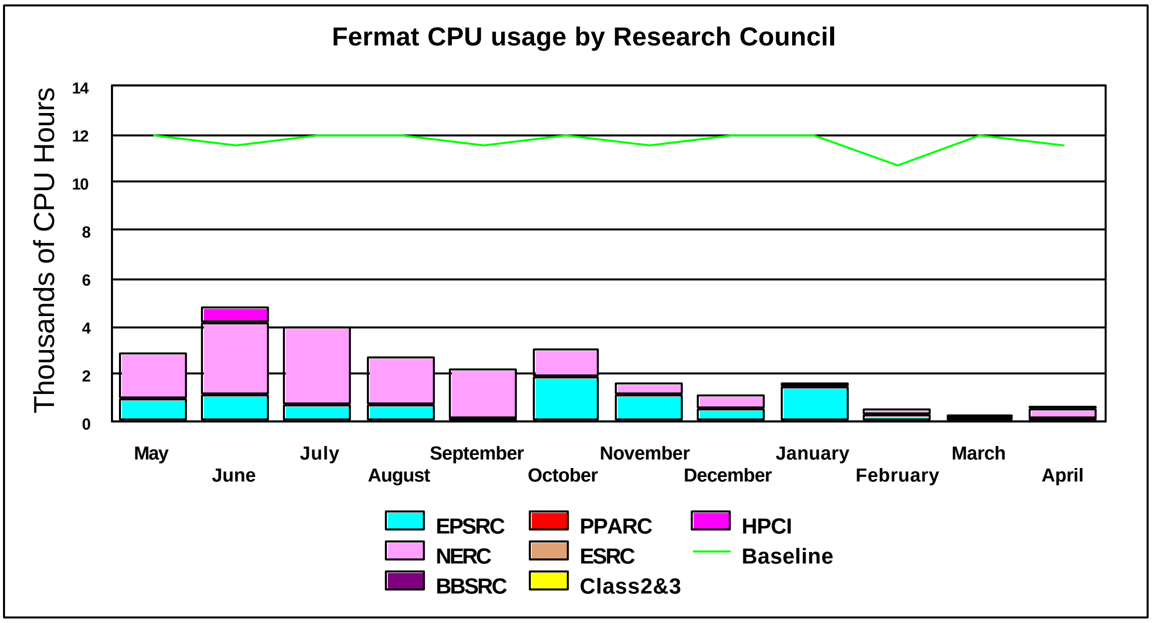
The graph below shows the historic SMP/MPP usage on the major systems commencing in January 2001.



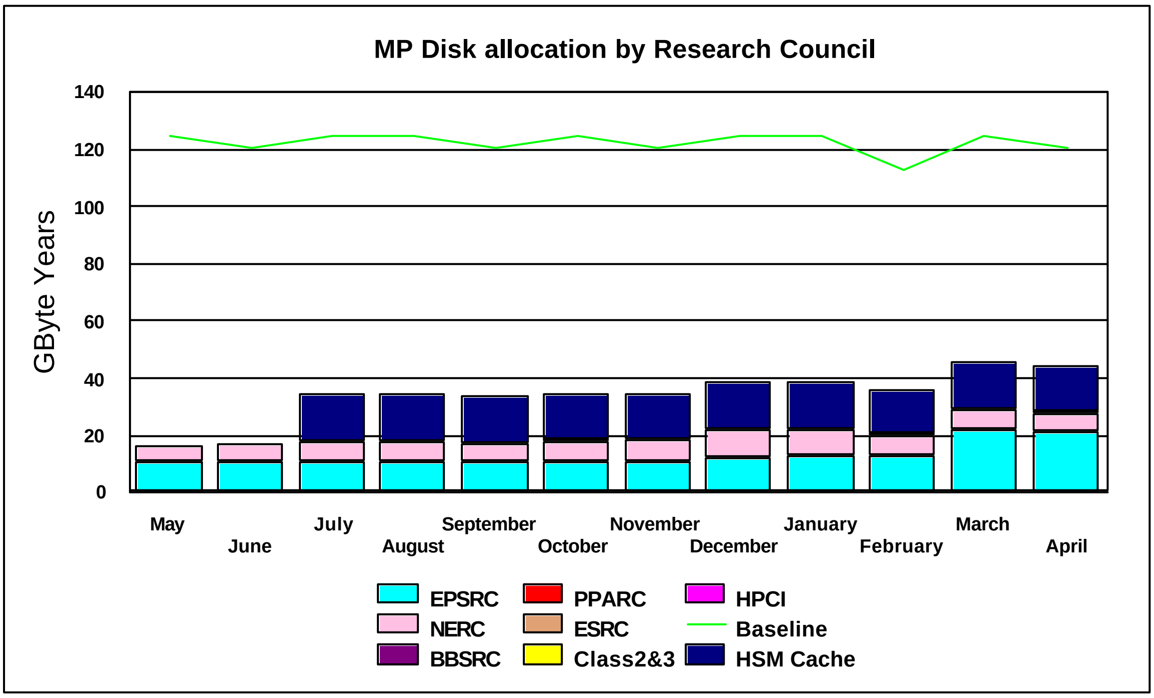


The above graph shows the historic interactive usage of the 'Baseline' Fermat system (equivalent to 16@250Mhz CPU's)

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

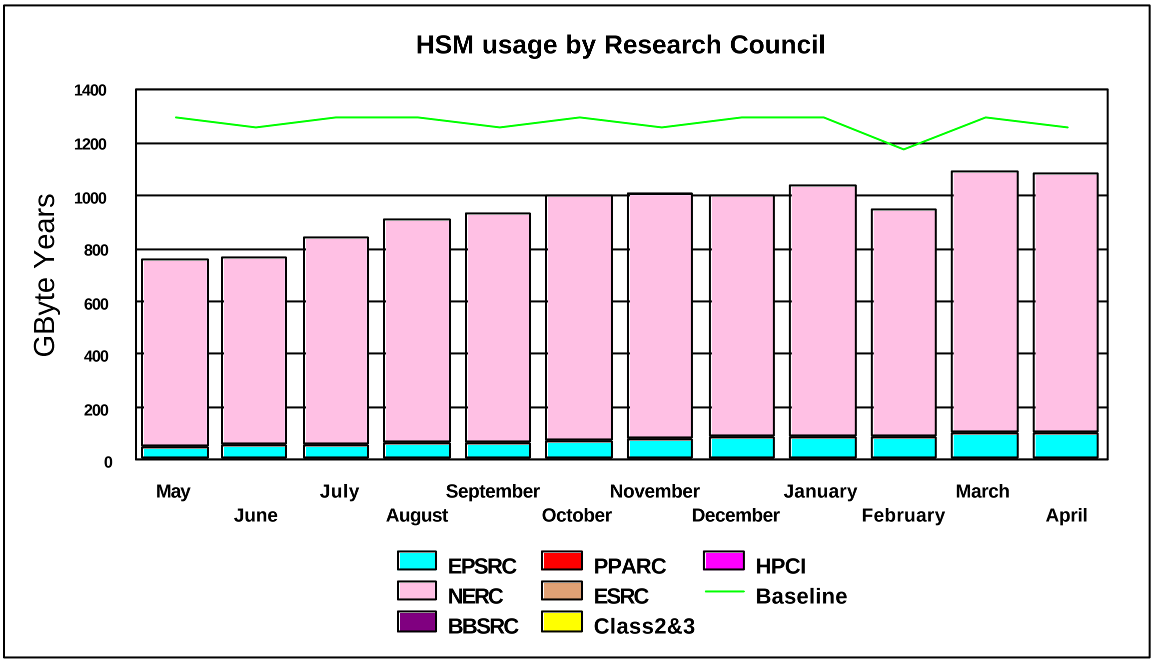


The preceding graph illustrates the historic allocation of the High Performance Disk on Turing.

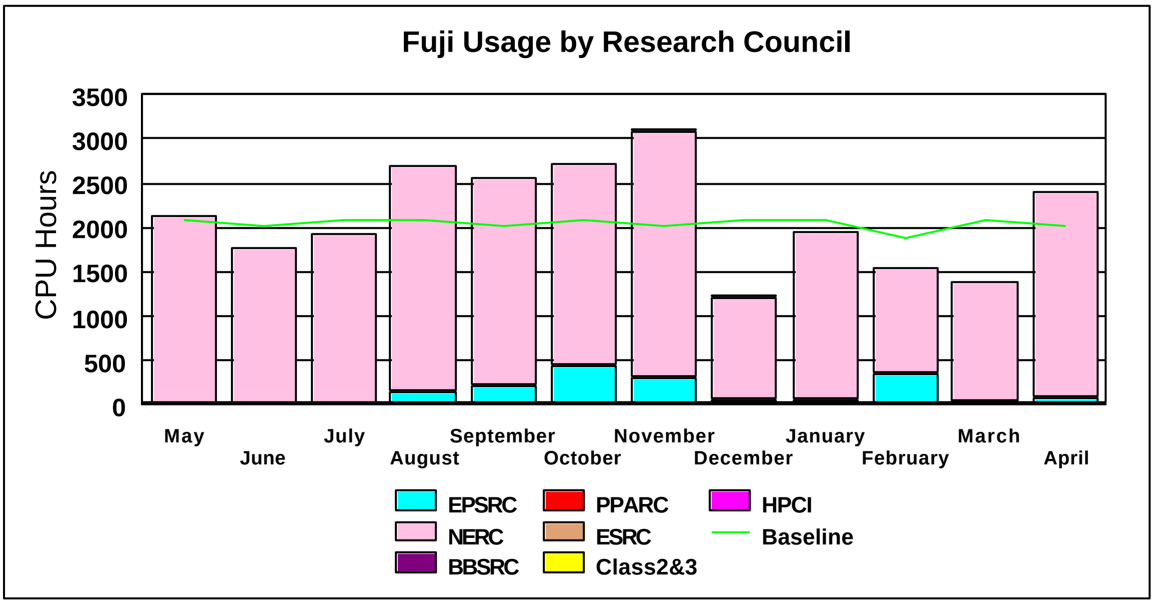


The graph above illustrates the historic allocation of the Medium Performance Disk on Fermat.

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



The next chart shows the historic usage of the Fuji system.



The Fujitsu system was above baseline this month.

4.5 Guest System Usage Charts

There is at present no guest system usage to report, however NERC continue to evaluate the Compaq.

5. Service Status, Issues and Plans

5.1 Status

The service continues to run almost at full capacity.

During the month, 68% of the jobs run on Turing were larger than 128 PEs in size.

The Origin 128 (Fermat) continues to be heavily used.

5.2 Issues

Wait times on the T3E continue to be long.

5.3 Plans

The first phase of the introduction of what is to become the largest shared memory machine available to UK academia is complete. The second phase is due to be complete at the end of May.

6. Conclusion

April 2001 saw the overall CPARS rating at Green with the baseline being exceeded by 63%.

The largest proportion of the workload continues to be of the larger job sizes.

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 April 2001

Appendix 2 contains the Percentage shares by Consortium for April 2001

Appendix 3 contains the Percentage shares by Research Council for April 2001

Appendix 4 contains the Training, Applications and Optimisation support figures to the end of April 2001

Appendix 5 contains a reference table of the Consortia name, the subject area and the PI name.

Appendix 1

The summary accounts for the month of April 2001 can be found at the URL below

http://www.csar.cfs.ac.uk/admin/accounts/summary.shtml

Appendix 2

Percentage PE time per consortia for Turing in April 2001

Consortia	% Machine Time
CSE002	11.61
CSE003	1.94
CSE007	2.47
CSE021	0.00
CSE023	0.00
CSE025	0.00
CSE030	0.07
CSE051	0.29
CSE006	13.96
CSE026	1.43
CSE004	16.03
CSE010	0.00
CSE011	0.00
CSE013	10.22
CSE014	0.00
CSE016	0.03
CSE022	1.59
CSE027	0.00
CSE029	0.00
CSE040	0.00
CSE041	0.00
CSE043	0.00
CSE008	0.00
CSE009	4.97
CSE024	0.34
CSE033	0.00
CSE035	1.33
CSE019	0.00
CSE020	0.00
CSE034	0.00
CSE036	0.00
HPCI Southampton	0.00
HPCI Daresbury	0.48
HPCI Edinburgh	0.00
CSN001	3.27
CSN003	16.82
CSN005	0.00
CSN006	8.23
CSN007	0.00
CSN010	0.00
CSN011	0.57
CSN012	0.03
CSN013	0.00
CSN015	1.20
CSN017	0.00
CSB001	0.92
CSB002	1.16
CSB003	0.00
CSP002	1.39
CSP003	0.00
CSS001	0.07
CS2018	0.00
CS2021	0.01
CS2022	0.00
CS2023	0.00
CS2026	0.00
CS2027	0.00
CS3001	0.00
CS3002	0.00
CS3004	0.00
CS3005	0.01
CS3007	0.00
CS3008	0.00
CS3010	0.00
CS3012	0.00
CS3013	0.00

Percentage CPU time per consortia for Fermat in April 2001

Consortia	% Machine Time
CSE002	1.11
CSE003	0.07
CSE007	0.00
CSE021	0.00
CSE023	0.00
CSE025	0.00
CSE030	0.51
CSE051	0.00
CSE006	75.46
CSE026	0.00
CSE004	0.13
CSE010	0.00
CSE011	0.00
CSE013	0.00
CSE014	0.00
CSE016	0.00
CSE022	0.00
CSE027	0.16
CSE029	0.00
CSE040	0.00
CSE041	0.00
CSE043	0.00
CSE008	0.00
CSE009	0.00
CSE024	0.00
CSE033	0.00
CSE035	0.00
CSE019	0.00
CSE020	0.00
CSE034	0.00
CSE036	0.00
HPCI Southampton	0.00
HPCI Daresbury	0.02
HPCI Edinburgh	0.91
CSN001	1.06
CSN003	0.06
CSN005	0.00
CSN006	18.48
CSN007	0.00
CSN010	0.00
CSN011	0.50
CSN012	0.00
CSN013	0.00
CSN015	0.00
CSN017	0.00
CSB001	0.00
CSB002	0.00
CSB003	0.00
CSP002	0.00
CSP003	0.00
CSS001	0.00
CS2018	0.00
CS2021	0.00
CS2022	0.00
CS2023	0.46
CS2024	0.00
CS2027	0.00
CS3001	0.00
CS3002	0.00
CS3004	0.00
CS3005	0.00
CS3007	0.00
CS3008	0.00
CS3010	0.00
CS3012	0.00
CS3013	0.49

Appendix 2

Percentage disc allocation by Consortia for Turing in April 2001

Consortia	%Allocation
CSE002	25.14
CSE003	6.74
CSE007	1.06
CSE021	0.03
CSE023	0.00
CSE025	0.00
CSE030	22.66
CSE051	0.27
CSE006	0.98
CSE026	0.06
CSE004	9.18
CSE010	0.00
CSE011	0.79
CSE013	1.10
CSE014	0.00
CSE016	0.49
CSE022	0.49
CSE027	0.06
CSE029	0.00
CSE040	0.00
CSE041	0.06
CSE043	0.12
CSE008	0.00
CSE009	6.97
CSE024	0.43
CSE033	0.37
CSE035	0.86
CSE019	0.00
CSE020	0.00
CSE034	0.00
CSE036	0.03
HPCI Southampton	0.00
HPCI Daresbury	0.12
HPCI Edinburgh	0.12
CSN001	9.88
CSN003	2.58
CSN005	0.00
CSN006	4.90
CSN007	0.00
CSN010	0.00
CSN011	0.34
CSN012	0.00
CSN015	0.15
CSN017	0.01
CSB001	0.06
CSB002	1.59
CSB003	0.01
CSP002	0.73
CSP003	0.03
CSS001	0.18
CS2012	0.00
CS2018	0.10
CS2021	0.12
CS2022	0.00
CS2026	0.24
CS2027	0.03
CS3001	0.00
CS3002	0.60
CS3004	0.06
CS3007	0.18
CS3008	0.37
CS3005	0.03
CS3010	0.06
CS3012	0.00
CS3013	0.10

Percentage disc allocation by Consortia for Fermat in April 2001

Consortia	%Allocation
CSE002	18.59
CSE003	0.85
CSE007	0.00
CSE021	0.00
CSE023	0.00
CSE025	0.00
CSE030	43.30
CSE051	0.00
CSE006	1.18
CSE026	0.00
CSE004	8.80
CSE010	0.00
CSE011	0.00
CSE013	0.39
CSE014	0.00
CSE016	0.00
CSE022	0.00
CSE027	0.14
CSE029	0.00
CSE040	0.00
CSE041	0.00
CSE043	0.28
CSE008	0.00
CSE009	0.28
CSE024	0.11
CSE033	0.04
CSE035	0.00
CSE019	0.00
CSE020	0.00
CSE034	0.00
CSE036	0.04
HPCI Southampton	0.00
HPCI Daresbury	0.14
HPCI Edinburgh	0.28
CSN001	17.56
CSN003	4.38
CSN005	0.00
CSN006	2.35
CSN007	0.00
CSN010	0.00
CSN011	0.00
CSN012	0.00
CSN015	0.00
CSN017	0.28
CSB001	0.00
CSB002	0.28
CSB003	0.00
CSP002	0.00
CSP003	0.07
CSS001	0.00
CS2012	0.00
CS2018	0.00
CS2021	0.00
CS2022	0.00
CS2026	0.00
CS2027	0.00
CS3001	0.00
CS3002	0.00
CS3004	0.00
CS3007	0.00
CS3008	0.28
CS3005	0.00
CS3010	0.00
CS3012	0.00
CS3013	0.25

Percentage usage of HSM by Consortium for April 2001

Consortium	% Usage
CSE002	0.77
CSE003	0.10
CSE030	1.19
CSE004	5.10
CSE013	0.09
CSE027	0.09
CSE041	0.09
CSE024	2.21
CSE035	0.06
CSN001	20.32
CSN003	64.94
CSN015	4.88

Appendix 3

Percentage PE usage on Turing by Reserch Council for April 2001	
~~Research Council~~	~~% Usage~~
EPSRC	65.88
HPCI	0.48
NERC	30.09
BBSRC	2.08
ESRC	0.07
PPARC	1.39

Percentage CPU usage on Fermat by Reserch Council for April 2001	
~~Research Council~~	~~% Usage~~
EPSRC	77.91
HPCI	0.93
NERC	19.60
BBSRC	0.00
ESRC	0.00
PPARC	0.00

Percentage Disc allocated on Turing by Research Council for April 2001		Percentage Disc allocated on Fermat by Research Council for April 2001	
~~Research Council~~	~~% Allocated~~	~~Research Council~~	~~% Allocated~~
EPSRC	78.48	EPSRC	74.07
HPCI	0.24	HPCI	0.43
NERC	17.88	NERC	24.57
BBSRC	1.67	BBSRC	0.28
ESRC	0.21	ESRC	0.00
PPARC	1.00	PPARC	0.07

~~Percentage HSM usage by Research Council for April 2001~~	
~~Research Council~~	~~% usage~~
EPSRC	9.70
HPCI	0
NERC	90.14
BBSRC	0
ESRC	0
PPARC	0

Appendix 4

The following tables show the training and support resource usage by the consortias in person days to the current month. Optimisation support for April totalled 10.5 man days.

Code	PI	Subject	Application Support for April 2001	Total Application Support from July 2000	Optimisation Support for April 2001	Total Optimisation Support from July 2000	Total Support Used	Training Used
Cse002	Dr Phil Lindan	Support for the UKCP		10.75			142.75	-
Cse003	Prof. Ken Taylor	HPC Consortiums 98- 2000	5	6		10.5	19.5	6
Cse004	Dr Neil Sandham	UK Turbulence						2
Cse006	Dr Patrick Briddon	Covalently Bonded Materials						
Cse007	Dr Matthew Foulkes	Quantum Many Body Theory					1	2
Cse008	Dr Mark Vincent (Hillier)	Model Chemical Reactivity						
Cse009	Dr Ben Slater (Catlow)	HPC in Materials Chemistry	0.5	6		3	9	
Cse010	Dr John Williams	Free Surface Flows					15.95	
Cse011	Dr John Williams	Open Channel Flood Plains					2.18	
Cse013	Prof Michael Leschziner	Complex Engineering Flows						3
Cse014	Dr Cassiano de Oliverira (Goddard)	Probs in Nuclear Safety						

Cse016	Dr Stewart Cant	Turbulent Combustion						
Cse017	Dr Kai Luo	Large Eddy Simulation and Modelling of Buoyant Plumes and Smoke Spread in Enclosures						
Cse018	Dr Stewart Cant	Turbulent Flames						
Cse019	Dr Jason Lander (Berzins)	ROPA						
Cse020	Dr Marek Szularz	Symmetric Eigenproblem						
Cse021	Dr Julie Staunton	Magentisim						1
Cse022	Mr Niall Branley (Jones)	Turbulent Flames						
Cse023	Allen	Liquid Crystalline Materials						
Cse024	Dr Robert Allan (Tennyson)	ChemReact 98-2000						-
Cse025	Dr Niels Rene Walet(Bishop)	Nuclear Theory Progamme						1.5
Cse026	Dr Maureen Neal	Molecular Dynamics						
Cse027	Dr M Imregun	Excitation Mechanisims						
Cse028	Prof. P.W. Bearman	Bridge Design						
Cse029	Dr David Aspley	Validation of Turbulence Models						

	er)							
Cse030	Prof M Cates (VIPAR)	HPC for Complex Fluids	2	21		5	51	7
Cse033	Dr M Imregun	Tubomachinery core compressor						
Cse034	Dr Paul Durham	R&D of liner/non-linear systems						
Cse035	Dr Stephen Jenkins	Ab Initio Simulations						
Cse036	Prof Iain Duff	R&D of linear/non-linear systems						
Cse040	Dr Ken Badcock	-						
Cse041	Dr M Imregun	Flutter and Noise Generation						
Cse043	Dr J J R Williams	Numerical Simulation of flow over a rough bed						4
Cse051	Dr M Imregun	Flutter and Noise Generation						
Csn00 1	Mrs Beverly de Cuevas (Webb)	HPCI Global Ocean Consortium		1			3	1
Csn00 2	Dr Mark Vincent (Hillier)	Pollutant Sorption on Mineral Surf						
Csn00 3	Dr Lois Steenman-Clark (O'Neill)	UGAMP						4
Csn00 5	Dr Huw Davies	Constraining Earth Mantle					27	6
Csn00 6	Dr John Brodholt (Price)	Density Functional Methods						
Csn00 7	Dr John Brodholt	Density Functional						

	(Price)	Methods						
Csn008	Hulton	Sub-Glacial Process						
Csn009	Dr Roger Proctor							
Csn010	Dr Jason Lander (Mobbs)	Flow over Complex terrain					-	-
Csn011	Dr Ed Dicks (Thorpe)	Exchange of Polluted Air						
Csn012	Prof Tennyson	fuji user						
Csn013	Dr L Steenman-Clark (Voke)	Large-Eddy Simulation Extended by Extreme Value Theory for the Prediction of Dispersion, Concentration Threshold Boundaries and Field Connectivity						
Csn014	Prof Llewellyn-Jones	A new Data Assimilation Scheme to optimise the information on the surface-atmosphere interface from satellite observations of Top-of-the Atmosphere Brightness Temperature						
Csn015	Dr Roger Proctor	Atlantic Margin Metocean Project		2			2	3
Csn017	Dr Antony Payne	Stability of the Antarctic Ice Sheet						2
Csb001	Dr David Houldershaw (Goodfellow)	Macromolecular Interactions					2	2
Csb002	Dr Adrian Mulholland (Danson)	Stability of Enzymes at high temp						

Csb003	Dr John Carling (Williams)	Anguilliform Swimming						-
Csp002	Dr Sandra Chapman	Nonlinear process in solar system and astrophysical plasmas						4
Csp003	Prof Andrew Lyne	Computing Resources for Precision timing of Millisecond Pulsars		1			2	4
Csp004	Prof K L Bell	A Programme for Atomic Physics for Astrophysics at Queen's University, Belfast (2001 - 2005)						
Css001	Dr I J Turton	Human Systems Modelling						
Css002	Dr Robert Crouchley	Dropout in panel surveys						2
Hpcid	Dr Robert Allan							1
Hpcie	Dr David Henty							
Hpcis	Dr Denis Nicole							
Cs2001	Dr Sudhir Jain	3D Ising Spin Glass						-
Cs2002	Dr Ingrid Stairs (Lyne)	Millisecond Pulsars					0.25	-
Cs2004	Dr A. Paul Watkins	Internal Combustion Engine						
Cs2006	Prof. Walter Temmerman	Superconductivity & Magmetisim						
Cs2007	Choularton	Precipitation in the Mountains						1

Cs2008	Dr Matthew Genge	Extraterrestrial Mineral Surfaces						7.91	
Cs2009	Dr Roger Proctor	Atlantic Margin Metocean Project							
Cs2010	Dr Christopher Dempsey	Helical membrane-lytic peptides							
Cs2011	Dr D Drikakis	Transition & Turbulence in Physiological Flows							
Cs2012	Prof Ning Qin	Monotone Integrated Large Eddy Simulation							1.5
Cs2014	Dr Vladimir Karlin	Dynamics of intrinsically unstable premixed flames							2
Cs2015	Mr Pablo Tejera-Cuesta	Nonlinear Methods in Aerodynamics							1.5
Cs2016	Dr Jim Miles	Investigation of Scaline Properties of Hierarchical Micromagnetic Models							-
Cs2017	Mr Markus Eisenbach	Ab initio calculations of magnetic anisotropies in Fe inclusions in Cu							-
Cs2018	Mr Maxim Chichkine	Study of defect clusters in silicon for sub-micron technologies							-
Cs2019	Dr Guy H Grant	Theoretical studies of flavoproteins							-
Cs2020	Prof John Barker	Predicting the applicability of Aquifer Storage Recovery (ASR) in the UK							-
Cs2021	Dr A R Mount	A Computational Study of the Luminescence of Substituted Indoles							1

Cs2022	Dr Philippa Browning	Numerical simulation of forced magnetic reconnection						2
Cs2023	Prof W Ewen Smith	The use of DFT methods for the accurate prediction of the Ramen spectrum of large molecules						-
Cs2024	Prof J G Doyle	Modelling of late-type stellar chromospheres						-
Cs2026	Dr R J Greenall	Molecular dynamics simlulations of AT-tract DNA						-
Cs2027	Dr Anthony Kay	Mathematical Model of the Circulation of Lake Baikal						-
Cs2028	Dr James F Annett	Numerical Tests of Disorder Effects in D-Wave Superconductorsors						-
Cs3001	Mr John Andrew Staveley	Helical Coherent Structures					0	3
Cs3002	Dr Keir Novik	Simulations of DNA oligomers						2
Cs3003	Dr Eric Chambers	Band III peptide fragments						
Cs3004	Prof Nick Avis	Computational Steering and Interactive Virtual Environments						1
Cs3005	Mr Behrouz Zarei	Simulation of Queuing Networks						3
Cs3006	Mr F Li	Quantifying Room Acoustic Quality						1
Cs3007	Emma Finch	Development ofa 3D Crustal	2	7		5	12	-

		Model						
Cs3008	Dr B J Alsberg	Development of a 3D QSAR method based on quantum topological descriptors					-	-
Cs3009	Dr D Flower	Epitope Prediction Methods based on molecular dynamics simulation					-	-
Cs3010	Dr K Kemsley	Investigation of electromyographic recordings of muscle activity during chewing, and of relationships with perceived flavour and texture, in model and real food systems					-	1
Cs3012	Prof Jim Austin	Evaluation of binary neural networks on a vector parallel processor					-	2
Cs3013	Prof Rasmita Raval	Structure and function of Chiral Bioarrays: A fundamental approach to proteomic devices					-	-

Appendix 5

Code	PI	Subject	Subject Area
Cse002	Dr Nicolas Harrison (Gillan)	Support for the UKCP	Physics
Cse003	Prof. Ken Taylor	HPC Consortiums 98- 2000	Physics
Cse004	Dr Neil Sandham	UK Turbulence	Engineering
Cse006	Dr Patrick Briddon	Covalently Bonded Materials	Materials
Cse007	Dr Matthew Foulkes	Quantum Many Body Theory	Physics
Cse008	Dr Mark Vincent (Hillier)	Model Chemical Reactivity	Chemistry
Cse009	Dr Ben Slater (Catlow)	HPC in Materials Chemistry	Chemistry
Cse010	Dr John Williams	Free Surface Flows	Engineering
Cse011	Dr John Williams	Open Channel Flood Plains	Engineering
Cse013	Dr David Aspley (Leschziner)	Complex Engineering Flows	Engineering
Cse014	Dr Cassiano de Oliverira (Goddard)	Probs in Nuclear Safety	Engineering
Cse016	Dr Stewart Cant	Turbulent Combustion	Engineering
Cse018	Dr Stewart Cant	Turbulent Flames	Engineering
Cse019	Dr Jason Lander (Berzins)	ROPA	Information Technology
Cse020	Dr Marek Szularz	Symmetric Eigenproblem	Information Technology
Cse021	Dr Julie Staunton	Magentisim	Physics
Cse022	Mr Niall Branley (Jones)	Turbulent Flames	Engineering
Cse023	Allen	Liquid Crystalline Materials	Robin Pinning
Cse024	Dr Robert Allan (Tennyson)	ChemReact 98-2000	Chemistry
Cse025	Dr Niels Rene Walet (Bishop)	Nuclear Theory Progamme	Physics
Cse026	Dr Maureen Neal	J90 move	
Cse027	Dr M Imregun	J90 move	
Cse028	Prof. P.W. Bearman	J90 move	
Cse029	Dr David Aspley (Leschziner)	J90 move	Engineering
Cse030	Prof M Cates	HPC for Complex Fluids	Physics
Cse031	Brebbia	J90 move	
Cse033	Dr M Imregun	Tubomachinery core compressor	Chemistry
Cse034	Dr Paul Durham	R&D of liner/non-linear systems	Mathematics
Csn001	Mrs Beverly de Cuevas (Webb)	HPCI Global Ocean Consortium	
Csn002	Dr Mark Vincent (Hillier)	Pollutant Sorption on Mineral Surf	
Csn003	Dr Lois Steenman-Clark (O'Neill)	UGAMP	
Csn005	Dr Huw Davies	Constraining Earth Mantle	
Csn006	Dr John Brodholt (Price)	Density Functional Methods	
Csn007	Dr John Brodholt (Price)	Density Functional Methods	
Csn008	Hulton	Sub-Glacial Process	
Csn009	Dr Roger Proctor		
Csn010	Dr Jason Lander (Mobbs)	Flow over Complex terrain	
Csn011	Dr Ed Dicks (Thorpe)	J90 move	
Csb001	Dr David Houldershaw (Goodfellow)	Macromolecular Interactions	
Csb002	Dr Adrian Mulholland (Danson)	Stability of Enzymes at high temp	
Csb003	Dr John Carling (Williams)	J90 move	
Css001	Dr Stan Openhaw	Human Systems Modelling	
Css002	Dr Robert Crouchley	Dropout in panel surveys	
Hpcid	Dr Robert Allan		
Hpcie	Dr David Henty		
Hpcis	Dr Denis Nicole		
Cs2001	Dr Sudhir Jain	3D Ising Spin Glass	
Cs2002	Dr Ingrid Stairs (Lyne)	Millisecond Pulsars	
Cs2003	Mr Tom Coulthard	Holocene Sediment Fluxes	
Cs2004	Dr A. Paul Watkins	Internal Combustion Engine	
Cs2005	Mr Sean Walsh	Arabidopsis Genome	
Cs2006	Prof. Walter Temmerman	Superconductivity & Magmetisim	
Cs2007	Choularton	Precipitation in the Mountains	
Cs2008	Dr Matthew Genge	Extraterrestrial Mineral Surfaces	
Cs3001	Mr John Andrew Staveley	Helical Coherent Structures	