

CSAR Service
Consolidated Management Report
3rd Quarter 2000

Management Summary

The system continues to be the flagship HPC facility for UK Academia and Industry, enabling World-Class research and development.

The number of users has grown to a total of 480 to date.

The Cray T3E (Turing) system has run almost to full capacity this quarter.

The first Intel IA64 prototype system has been installed and is being proved.

New Guest Systems are now available, the first of these being a Compaq cluster and an HP N class.

CfS remains active in the UK Grid Forum.

Introduction

This Management Report includes a section for each of the main service functions:

1. Service Quality
2. HPC Services
3. Science Applications Support Services
4. Training & Education Services
5. User Registration & New User Services
6. Value-Added Services

Each section includes a status report for the period, including notable achievements and problems, also noteworthy items for the next period.

1. 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.

1.1 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	< 1/4	< 1/2	< 1	< 2	< 4	4 or more
Non In-depth Queries - Max Time to resolve 95% of all queries	< 1/2	< 1	< 2	< 3	< 5	5 or more
Administrative Queries - Max Time to resolve 95% of all queries	< 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	< 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 sessions taken per system in the month	0	1	2	3	4	otherwise

Table 1

Table 2 gives actual performance information for the period. Overall, the CPARS Performance Achievement was good (see Table 3), i.e. Blue measured against the CPARS performance targets.

CSAR Service - Service Quality Report - Actual Performance Achievement

Service Quality Measure	2000											
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
HPC Services Availability												
Availability in Core Time (% of time)	100%	100%	100%	96.11%	95.00%	98.70%	100%	100%	98.70%	100%	100%	100%
Availability out of Core Time (% of time)	99.50%	100%	100%	98.52%	100%	99.50%	99.5%	99.40	99.40	100%	100%	100%
Number of Failures in month	1	0	0	4	1	2	1	1	2	0	0	0
Mean Time between failures in 52 week rolling period (hours)	437	486	534	230	515	486	437	515	461	461	626	626
Fujitsu Service Availability												
Availability in Core Time (% of time)	N/A	N/A	98.30%	100%	100%	100%	100%	100%	100%	100%	98.4%	100%
Availability out of Core Time (% of time)	N/A	N/A	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	<1	<3	<2	<1	<1	<2	<1	<2	<1	<2	<2	<2
Administrative Queries - Max Time to resolve 95% of all queries	<1	<2	<1	<0.5	<1	<2	<1	<2	<0.5	<0.5	<2	<2
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	0	0	0	0	0	0	<=0.5
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	10
System Maintenance - no. of sessions taken per system in the month	1	2	2	2	2	2	1	1	2	2	2	2

Table 2

Notes:

- HPC Services Availability has been calculated using the following formulae, based on the relative NPB performance of Turing and Fermat at installation: [Turing availability x 122 / (122 + 3.5)] + [Fermat availability x 3.5 / (122 + 3.5)]
- Mean Time Between Failures for Service Credits is formally calculated from Go-Live Date.

Table 3 gives Service Credit values for each month to date. These are 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

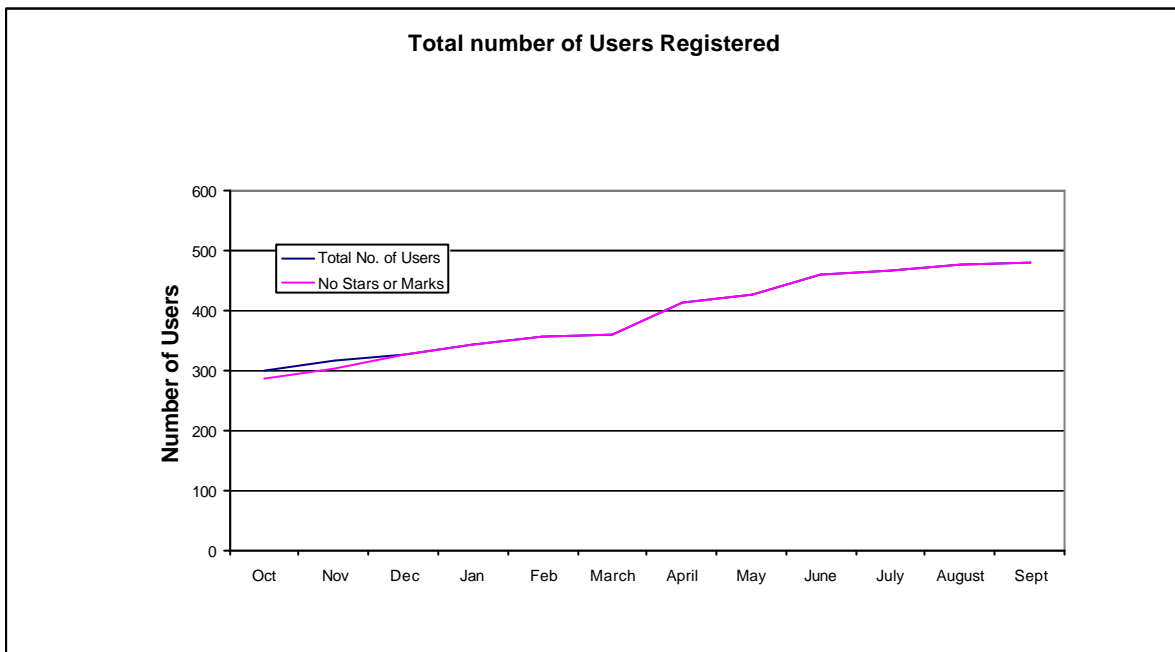
Service Quality Measure	2000											
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept
HPC Services Availability												
Availability in Core Time (% of time)	-0.058	-0.058	-0.058	0.195	0.195	-0.039	-0.058	-0.058	-0.039	-0.058	-0.058	-0.058
Availability out of Core Time (% of time)	-0.039	-0.047	-0.047	0	-0.047	-0.039	-0.039	0	0	-0.047	-0.047	-0.047
Number of Failures in month	-0.008	-0.009	-0.009	0.008	-0.008	0	-0.008	-0.008	0	-0.009	-0.009	-0.009
Mean Time between failures in 52 week rolling period (hours)	0	0	-0.008	0.008	-0.008	0	0	-0.008	0	0	-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	-0.016	0.016	0	-0.016	-0.016	0	-0.016	0	-0.016	0	0	0
Administrative Queries - Max Time to resolve 95% of all queries	-0.016	0	-0.016	-0.019	-0.016	0	-0.016	0	-0.019	-0.019	0	0
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	0.000	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0	-0.002
New User Registration Time (working days)	0	-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
System Maintenance - no. of sessions taken per system in the month	-0.003	0	0	0	0	0	-0.003	-0.003	0	0	0	0
Monthly Total & overall Service Quality Rating for each period:												
	-0.08	-0.07	-0.09	0.07	0.03	-0.06	-0.09	-0.06	-0.06	-0.09	-0.08	-0.08
Quarterly Service Credits:												
			-0.24			0.04			-0.21			-0.25

Table 3

1.2 No. Of Registered Users

The current position at the end of the quarter is that there are 480 registered users of the CSAR Service.

It can be seen from the chart below that the number of users continues to grow steadily.



1.3 Service Quality Tokens

The graph below illustrates the monthly usage trend of Service Quality Tokens:



Over the course of the quarter the position is that as a management tool the Service Quality Tokens have been available to enable the users to provide qualitative feedback about all aspects of the service. This feedback is used as a mechanism to initiate change in the service where appropriate.

There are, at the end of the quarter, no stars or marks allocated to the service.

2. HPC Services Usage

Usage information is given in tabular form, and in graphical format. The system usage information covers:

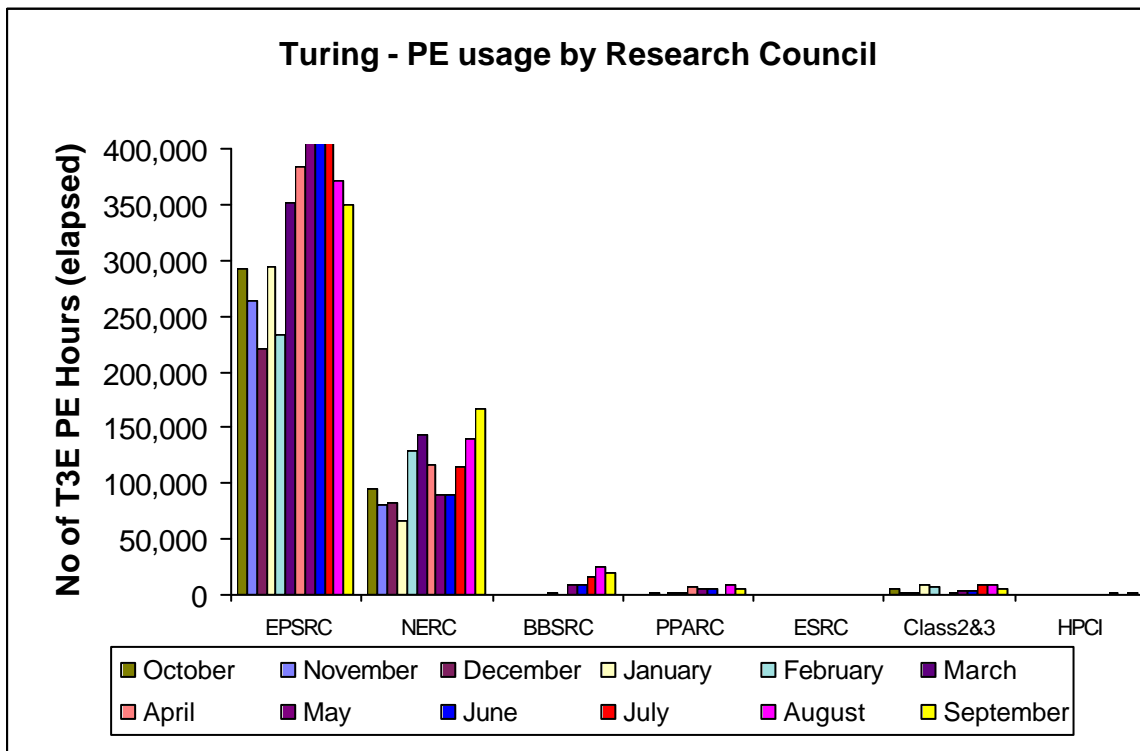
- ?? CPU usage
- ?? User Disk allocation
- ?? HSM/tape usage

This is illustrated in a number of graphs including;

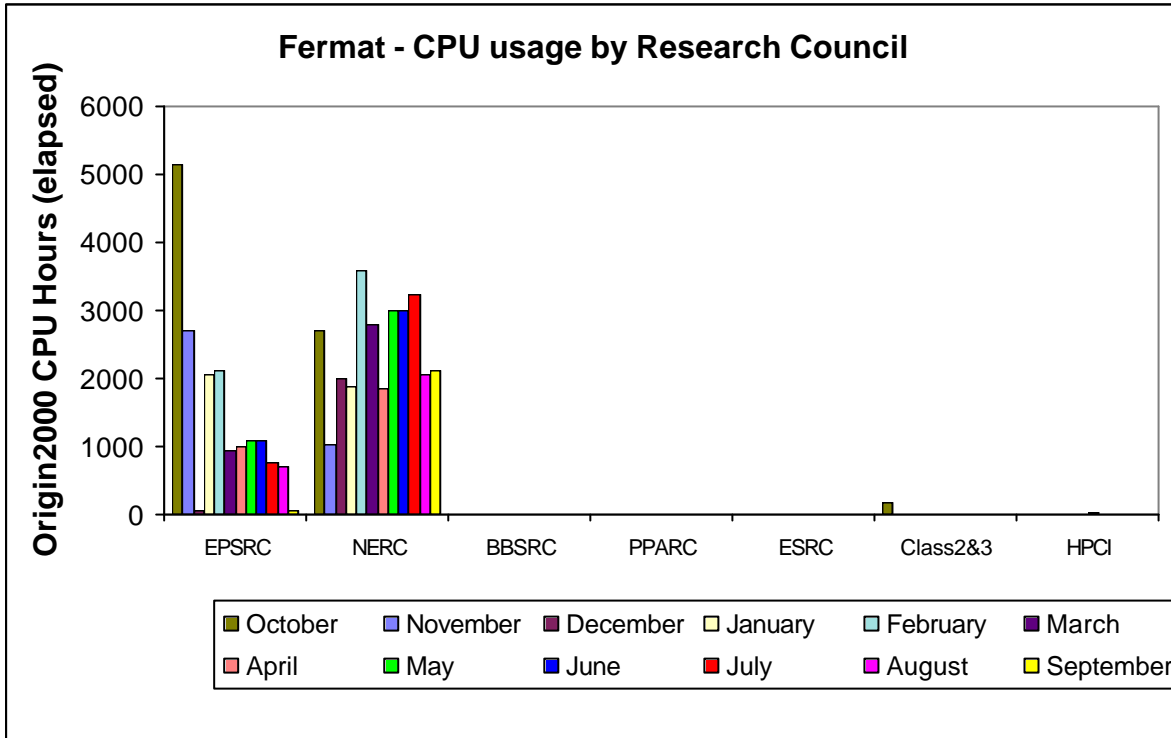
- a) MPP (T3E) Usage by month, showing usage each month of CPU (T3E PE Elapsed Hours), split by Research Council and giving the equivalent GFLOP-Years as per NPB. The Baseline Capacity is shown by an overlaid horizontal line.
- b) SMP (Origin) Usage by month, showing usage each month in CPU Hours, split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

2.1 Service Usage Charts

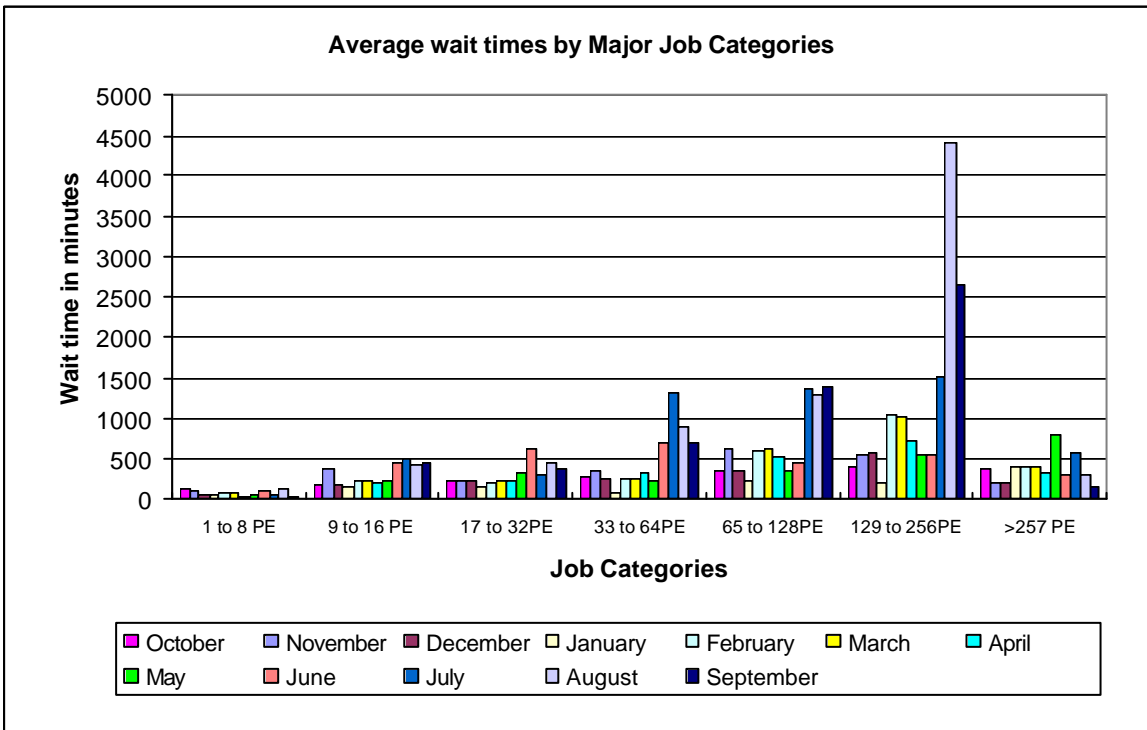
The graphs below show recent monthly CPU, PE, disk and HSM allocations and usage.



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

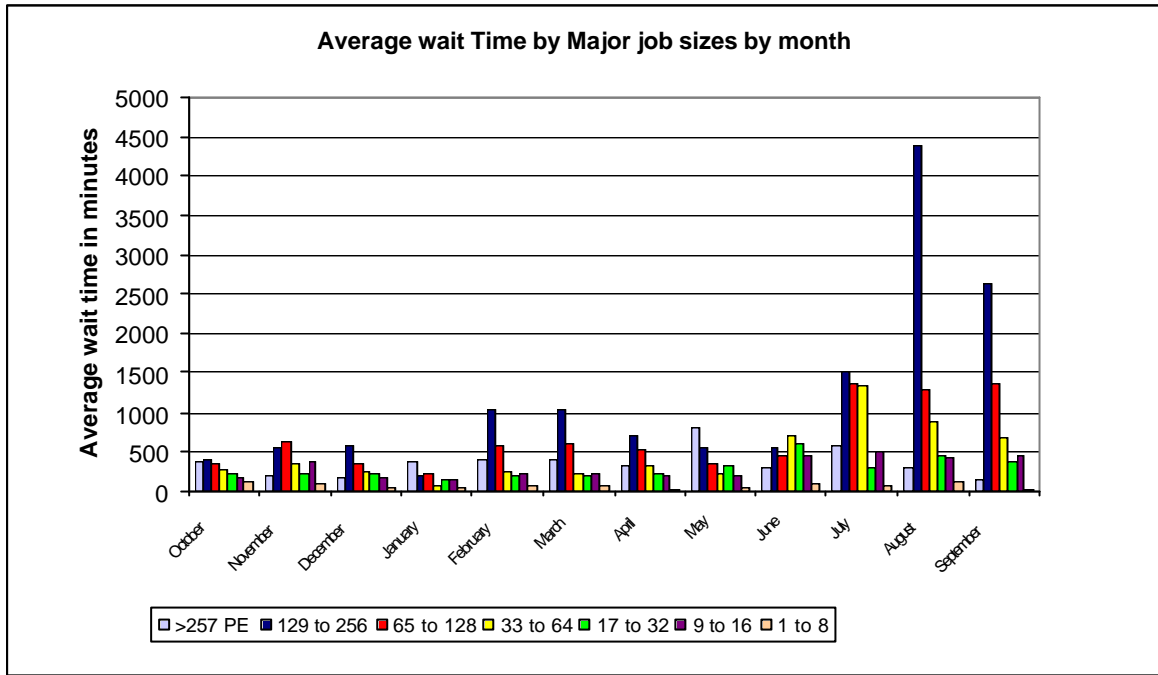


Origin2000 CPU usage is shown by Research Council during the last 12 months of service is shown in the above chart.



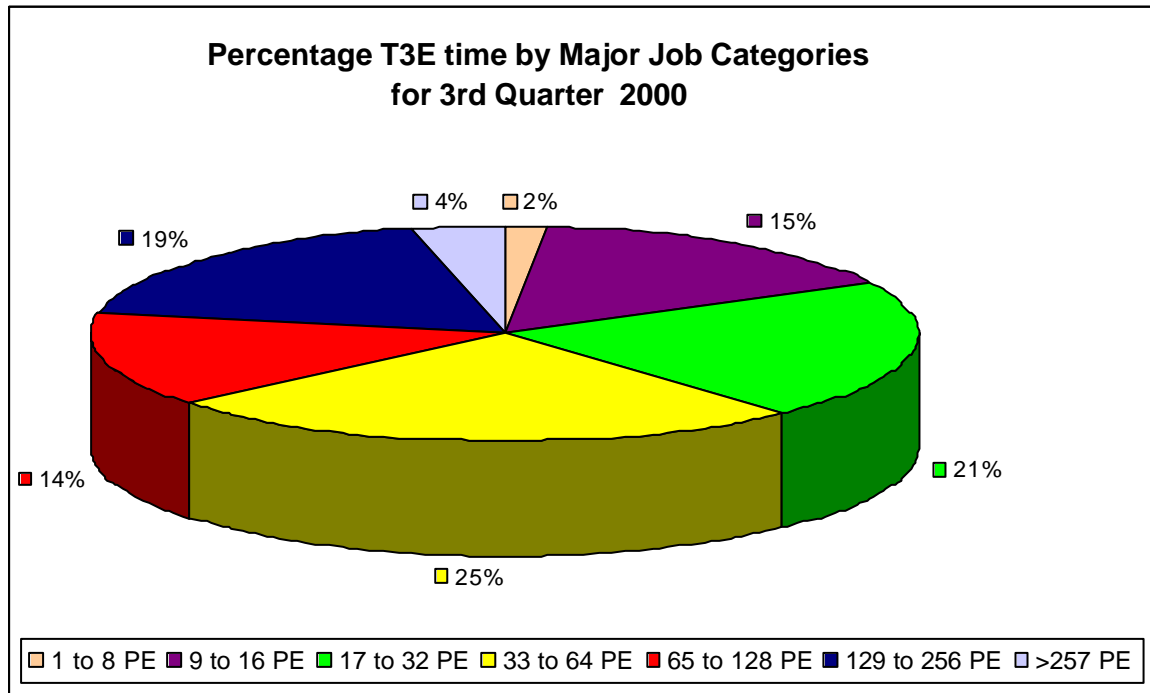
The above chart shows the wait time trend on the Turing system. The trend is towards rising wait times this is an unfortunate side effect of an overfull machine, this situation should however be alleviated as the new machines come on stream.

The first of these, being the upgrade to Fermat.



It can be seen from the above graph that enhancements to the scheduling on Turing did reduce the average wait times for a short period but increased demand in July through to September has increased queuing times again. CfS needs to ensure sufficient head room exists in the system to reduce wait times to more satisfactory levels. It is intended that the provision of the planned SGI IA-64 systems will assist in better meeting the growth in user demands, in addition to this the upgrade to Fermat should relieve the load on Turing while the migration of codes to the IA 64 platform is carried out.

The next chart shows the percentage PE time utilisation by the major job categories on the Turing system for the 3rd quarter in 2000.



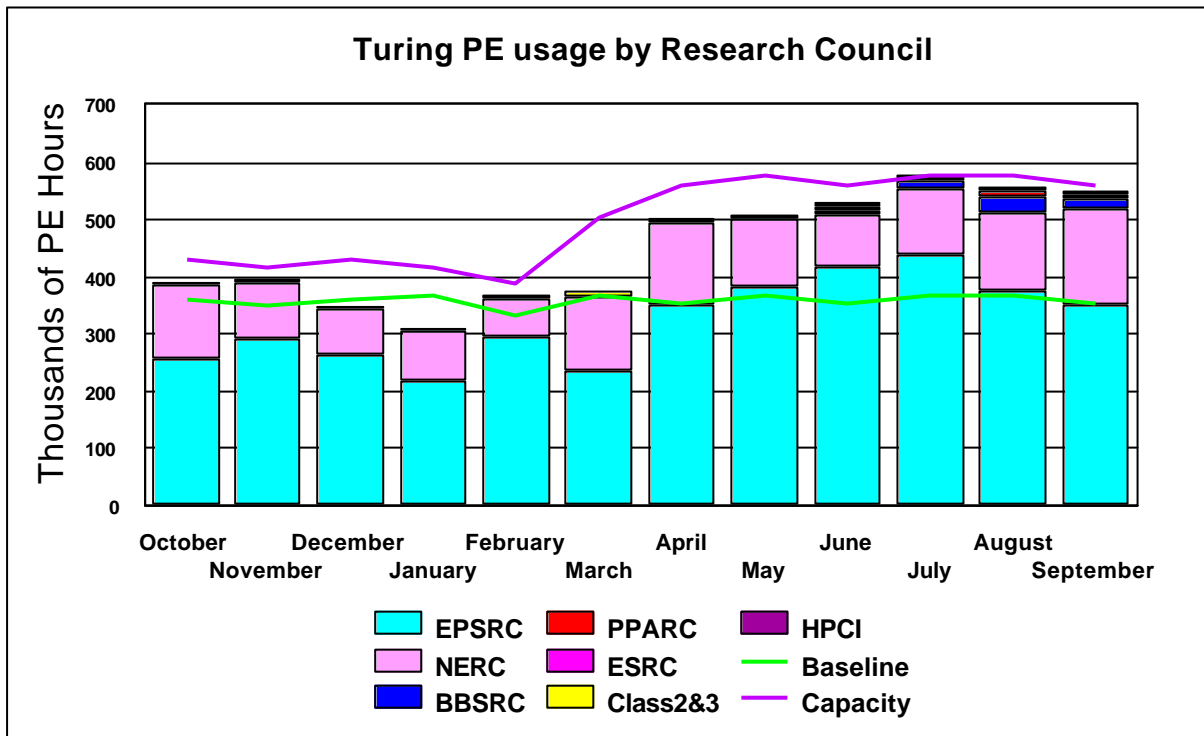
The trend on job size remains fairly stable.

2.2 System Usage Graphs

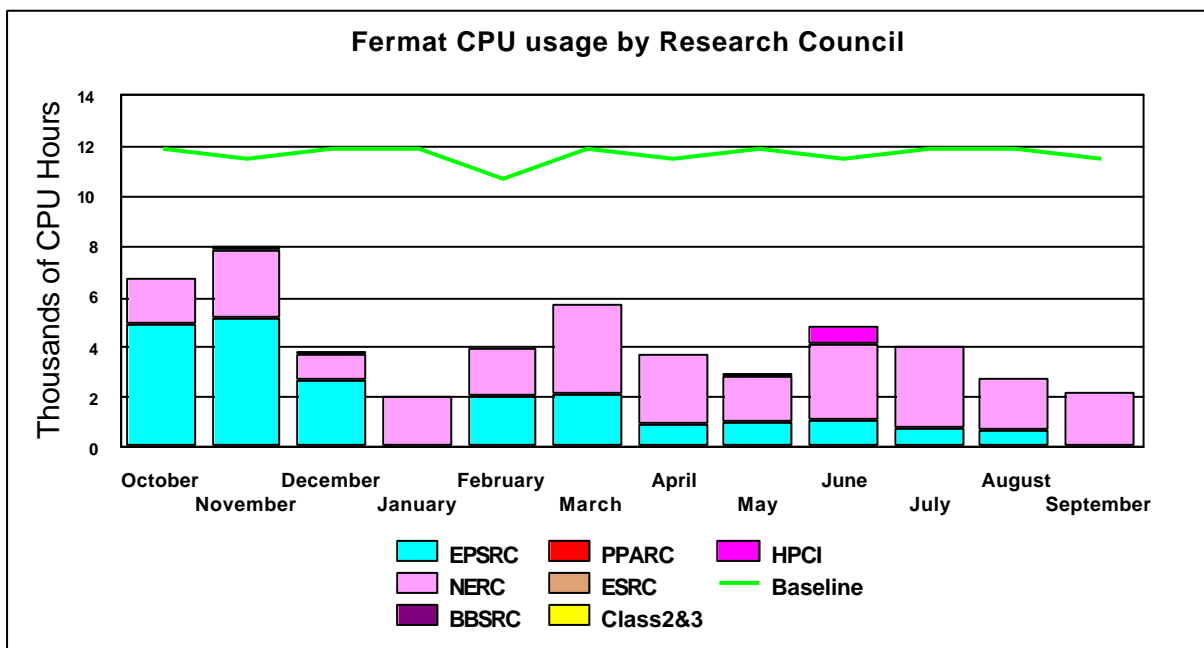
In all the Usage Charts, the baseline varies dependant on the number of days in each month, within a 365-day year.

2.2.1 Baseline System

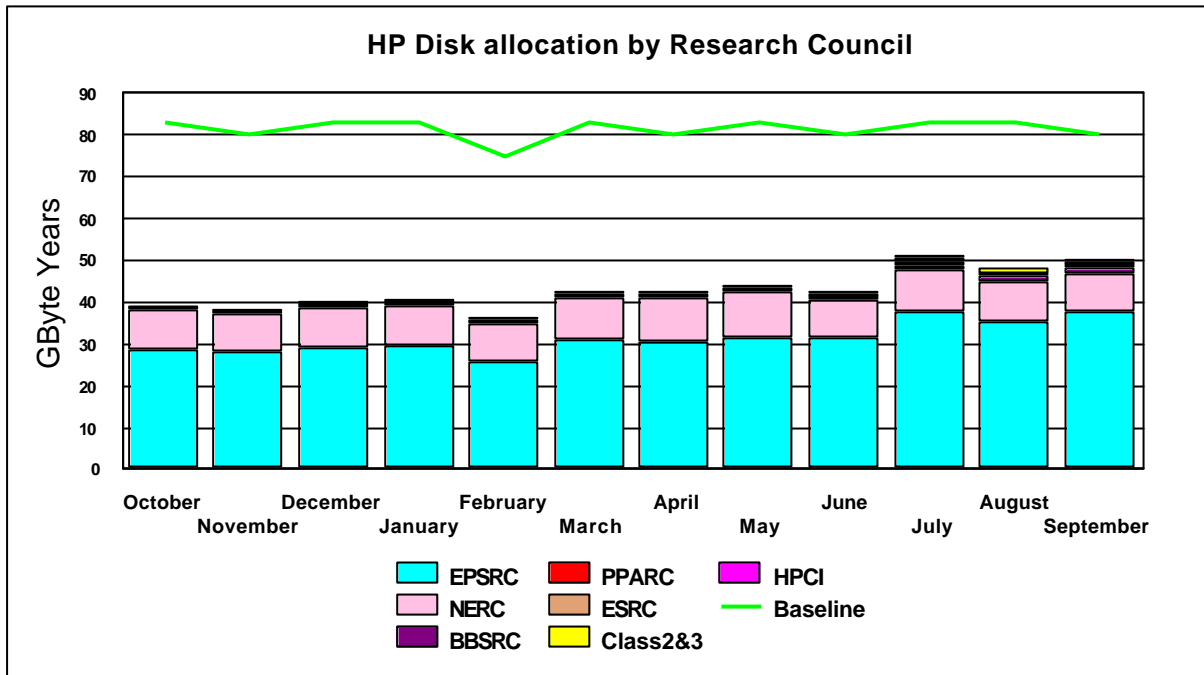
The graph below shows the PE hour's utilisation on Turing by Research Council from October 1999.



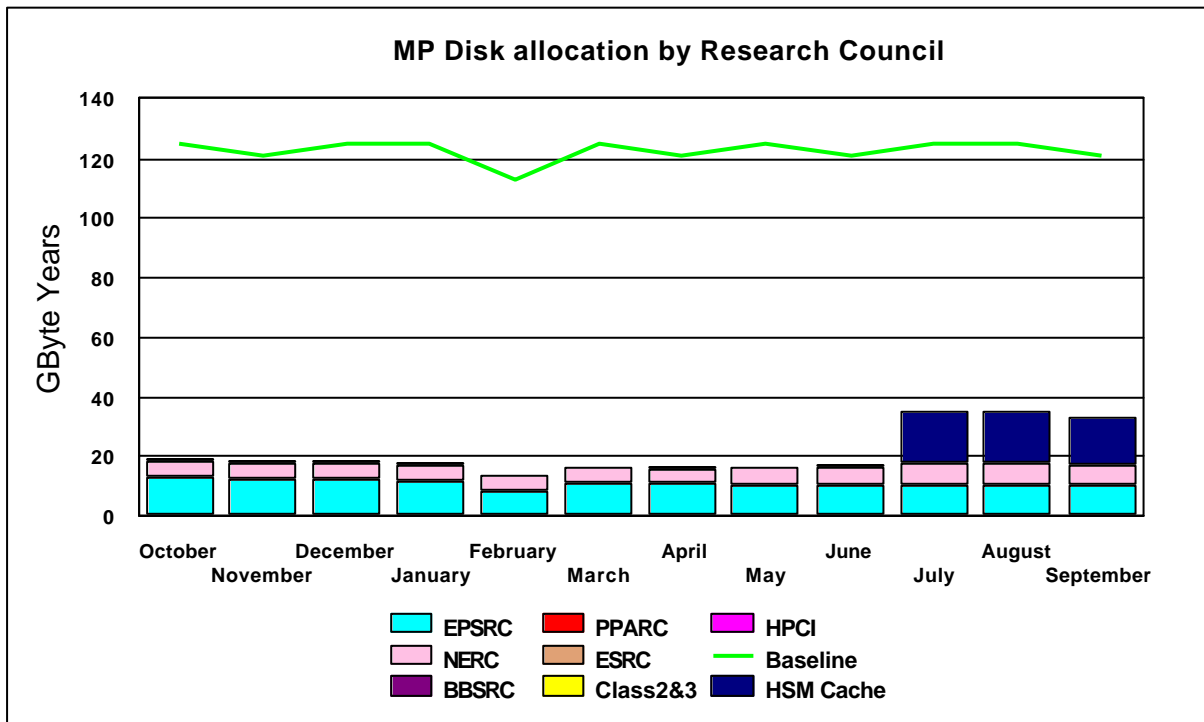
The graph below shows the historic CPU usage on Fermat by Research Council from October 1999.



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

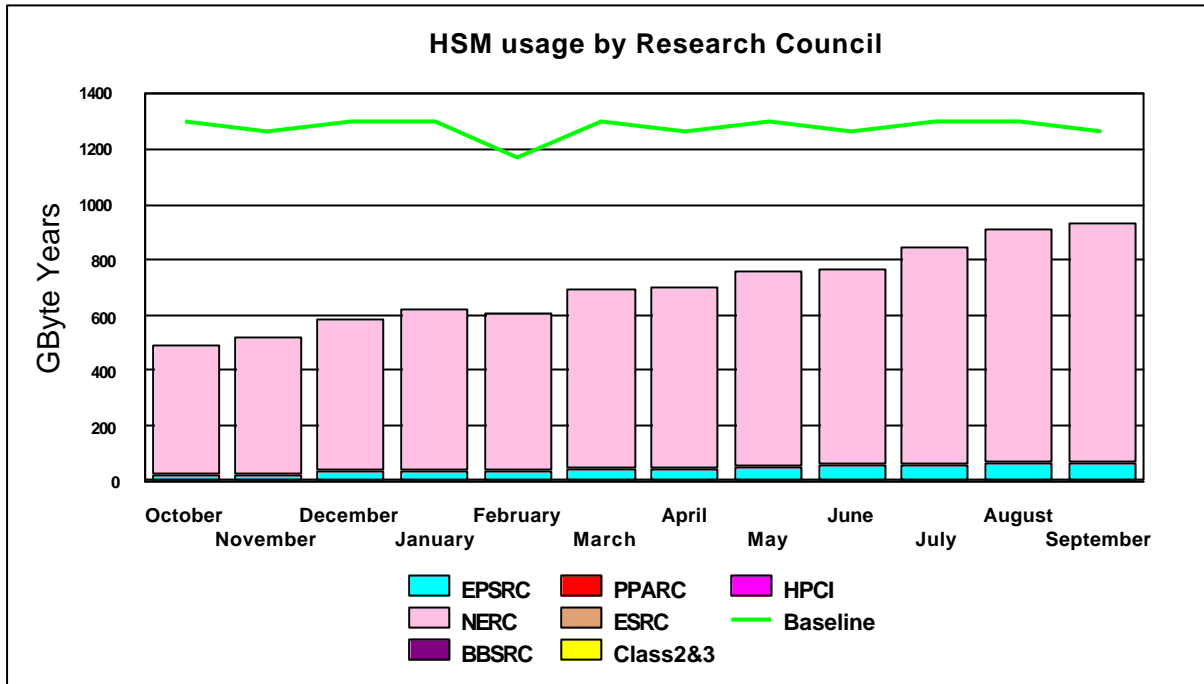


The preceding graph illustrates the historic allocation of the High Performance Disk on Turing.

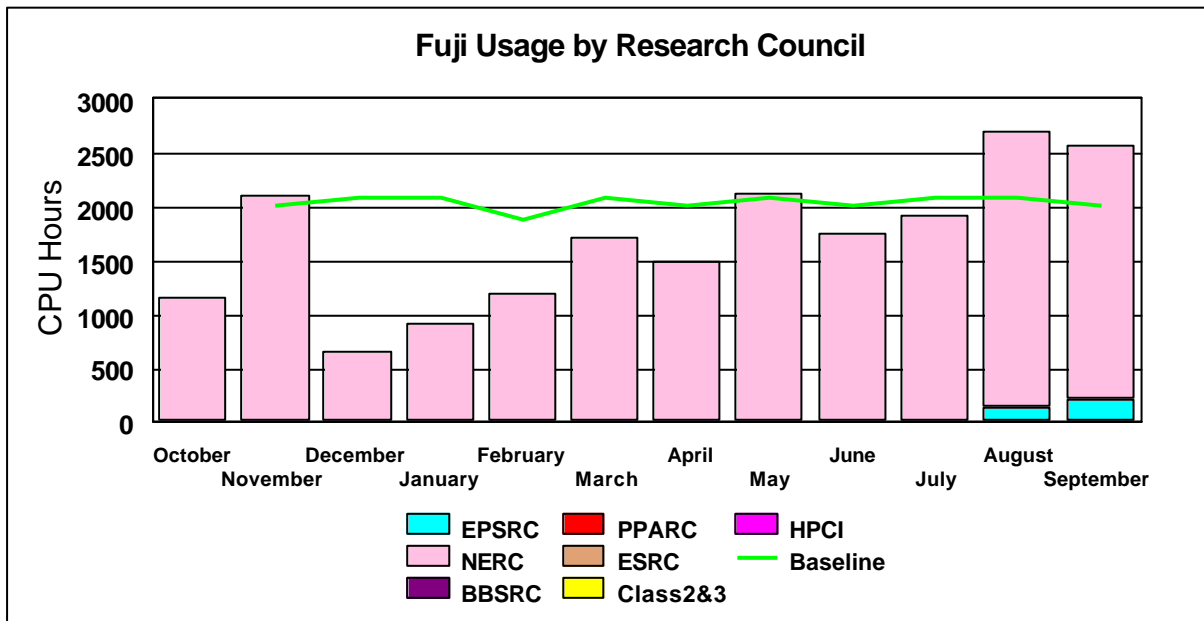


The graph above illustrates the historic allocation of the Medium Performance Disk on Fermat. From July 2000, 200 Gbytes will be used as a data cache for the enhanced HSM system.

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



2.2.2 Fujitsu System Usage Graph



The above graph shows the current CPU usage on the Fujitsu VPP 300 NERC system based at the University of Manchester. The Fujitsu usage exceeded the baseline usage in the last two months of the quarter.

2.2.3 Guest System Usage Graphs

There are currently available an HP 9000 guest system which is located in Maidstone, also a Compaq cluster is now situated at Manchester. An NEC vector system is also planned for installation at Maidstone very shortly.

2.3 Service Status, Issues and Plans

Status

The service continues to be heavily used.

The IA 64 prototype system is being proved, and users are being approached for the code porting and single CPU performance exercise.

During the Quarter, 62% of the jobs run on Turing were larger than 33 PEs in size.

Issues

Wait times can still be excessive at times due to the time demands on the machine, however these are being carefully managed where at all possible.

Plans

The upgrade of Fermat is due to occur early in the next quarter to alleviate the load on Turing, in conjunction with this upgrade work continues on the Intel IA 64 cluster. It also remains the plan that 1st quarter 2001 to introduce a MIPS based Origin 3000 into the service. An NEC SX guest system is planned to be available in November based at CSC's Maidstone Data Centre.

3 User Registration and Project Management Services

This section covers aspects relating to the registration of projects and users, and the management of projects and resources.

3.1 Quarterly usage reports by email

The third of the quarterly emails providing a summary of actual and planned usage will be sent to PIs during October. The planned usage will be based on the six monthly capacity plan period from July to December 2000.

3.2 Conditions of use

With respect to the 'conditions of use of the CSAR systems', to which all CSAR users have been asked to agree, there are still some people who have not responded. A further reminder will be sent in the near future.

4 Science Application Support Services

4.1 Consortia Support

The parallelisation/optimisation of CASTEP on behalf of the UKCP consortium has continued, with the emphasis on stabilising version 4.2 of the software, which is now undergoing beta-testing by UKCP users.

Additional work with the UKCP consortium in the development of the CONQUEST code has resulted in a significant step forward in the size of problems that can now be studied. With further code improvements now on the way, it is hoped that calculations on systems with up to 50000 atoms will be possible in the near future – an increase of nearly two orders of magnitude over what was possible before.

New work has now started in connection with the development of the MPP version of another computational chemistry package, CRYSTAL. As with CASTEP, this is a major undertaking that should result in significant benefits for all users of this package.

The parallelisation of a serial lattice code for Professor Coveney at QMW (CSE030) has now been completed. However further support in the development of visualisation tools is now underway for the same research group.

4.2 Training and Education

The course schedule for the first semester of 2000/2001 is now available on the web pages and courses are now underway. Development of new IA64 based courses will start once access to such systems and staff training has taken place. It is expected that the first such courses to be scheduled will be in the second semester of 2000/2001.

4.3 Service Developments

There are a number of developments in the service that have either just started or are about to start. Information about these developments has been distributed to all CSAR users in an open letter. The key points are given below.

- ?? An IA 64 cluster (fourier.cfs.ac.uk) has been installed. This will be upgraded to 32 processors and used predominantly for code porting, with the IA 64 based Technology Refresh system in mind.
- ?? Fermat will shortly be upgraded to 128 processors. This will be using 400 MHz processors, instead of the current 250MHz ones. This additional facility will provide further capacity for smaller jobs currently running on Turing, allowing Turing to be used more extensively for large jobs.
- ?? A 128-processor Origin 3000 SN MIPS system will be installed in March 2001. This will evolve into the SN-IA refresh system over time.
- ?? A 16 processor Compaq ES40 Alphaserver Cluster with a Quadrics interconnect, has been installed as a Guest system. Account creation etc will be handled via the CSAR registration system.
- ?? An HP 9000 N-Class Enterprise server has been installed as a Guest system.
- ?? A NEC SX-4 system will be installed as a CSAR Guest machine during November/December.

5 Collaboration and Conferences

5.1 Visualisation Case Studies

A paper has been completed on the first visualisation case study, using the collaboration with the Tera group. This paper is being presented at the SGI User's Workshop in Krakow from October 11-14. Work has started on the second visualisation case study based on sunspot records from 1853 to the present day. This latter work has aroused considerable interest in the astrophysical community owing to the presentation of theoretical work on the subject by John Brooke at the International Astronomical Union meeting at Manchester in August and at the Nato Advanced Study workshop at Cargese also in August.

The first visualisation case study will form part of a joint AVS/SGI presentation of the multi-pipe edition of AVS at Super Computing 2000.

Jo Leng has organised a UKHEC visualisation seminar at Manchester on December 4th. The keynote speaker will be from New Zealand. John Brooke is organising the UKHEC Annual seminar that takes place the day after on December 5th and will give a joint presentation with Jo Leng entitled

"The role of Visualisation and Virtual Reality in e-Science"

5.2 UKHEC GRID Work

The UKHEC experiments have not gone forward since the summer, mainly because of Martyn Foster's increasing involvement in the IA-64 technology refresh and impending move to SGI. Other staff have been identified to continue with this work. Daresbury Laboratory is still interested in collaborative work and there have been discussions between staff at Manchester and Daresbury as to how this work can go forward.

John Brooke was a co-author of Dr Martyn Guest's presentation to the HPC Users meeting in September. He has also attended a recent meeting of the High-Energy Physics DataGrid group. From this a number of suggestions for joint work have evolved. Since DataGrid is to be one of the two major EU GRID projects it will have an important role in shaping the UK GRID. Since MRCCS are one of the European partners in the other project, EuroGrid, it can play a vital role in exploiting synergy between these two approaches to GRID computing.

John Brooke also represented MRCCS and UKHEC at the second EuroGrid meeting in Munich at the end of August. MRCCS have offered to show the major EuroGrid experiment at the University of Manchester booth at SC2000.

MRCCS is continuing to play an important role in developing the technology and ideas shaping the GRID worldwide. An important paper has been accepted for the GRID2000 workshop in Bangalore this December. This introduces the concept of a "Mini-GRID", that is to say a complex system which is a subcomponent of the global GRID but which can nonetheless stand as a entity in its own right. The thesis advanced in the paper is that many such Mini-GRIDs will evolve to suit the needs of particular communities and that the global GRID will arise out of a federation of such GRIDSs. The CSAR service is used as a primary example of such a Mini-GRID and the paper was entirely authored by MRCCS staff (Brooke, Foster, Pickles and Taylor).

5.3 UKHEC Report on the Cray/Tera Multithreaded Architecture

For the past year, Dr Keith Taylor of CSAR/MRCCS has been investigating the Cray/Tera MTA machine using codes developed at Manchester and used in local benchmarking and procurement exercises. This has been an exercise requiring great patience as it has involved working via intercontinental networks to San Diego Supercomputing, and on a machine which is still very experimental. It has resulted in the production of a UKHEC technical report on these experiences and a paper at the Cray/SGI MPP workshop in September.

Dr Taylor has also liaised with Tera staff to provide training for CSAR/MRCCS staff and has given a course/seminar to staff at CLRC at their request.

5.4 MRCCS Projects

MRCCS has been awarded funding for two major projects to develop scientific applications for a computational GRID and to develop tools for e-Science.

5.4.1 EuroGrid

This is one of two complementary European wide GRID projects funded under the IST programme. The EU regards EuroGrid, along with DataGrid, as the projects which will promote the European GRID within Europe and globally. The project is led by FZJ (Ge) with partners from major European HPC centres at MRCCS (UK), IDRIS (Fr), ICM (Po), Parallab (No), software developers, Pallas (Ge), Fecit (UK), service providers Debis (Ge), DWD (Ge) and industry, Aeromatra (Fr). The MRCCS tasks are to develop a resource broker and to investigate on-line processing of experimental data via distributed resources on the GRID. MRCCS is currently in the process of appointing a new member of staff for this work.

5.4.2 Establishing a Global Supercomputer

This is a one year project funded by JISC to develop links between Internet2 in the US and SuperJanet4 in the UK. The projects are encouraged to work with a US partner; MRCCS will twin with Pittsburgh Supercomputer Centre who is centrally involved in several important Internet2 projects. A WWW page announcing the project is now available on the MRCCS WWW page and article on the Global Metacomputer have been produced for CSAR focus. This will provide a unique resource for UK researchers to investigate e-Science on a global scale as described by John Taylor of OST and Sid Karin of NPACI at the HPC Users meeting.

5.5 MRCCS Research

MRCCS is conducting research into questions of interest to computational scientists. The following areas have been the focus of the last quarter's work.

5.5.1 Job scheduling on multiprocessor systems

Fumie Costen has been investigating the loading profile of jobs on the SGI Origin systems Fermat and Kilburn. The aim of the research is to derive a reliable statistical modelling of the job profile that can be used to provide multiple copies of job loads with similar statistical properties to the real data (these are called "quasi-workloads") that can be used to test simulations of different job scheduling schemas on real systems. This work will be of importance to the assessment of differing methods of managing the loading of work across complex multiple systems (such as the CSAR configuration) and builds on earlier work presented last year to a major IEEE conference. This work is now nearing publication stage and will be made available as an MRCCS technical paper and submitted to relevant conferences.

5.5.2 Solar-Terrestrial Physics

This is an area of great theoretical interest and considerable social and economic importance given the effects of the sun-earth magnetic connection on satellite communications and ground-based power grids. MRCCS has been developing links with the solar-terrestrial research community to utilise the Global Metacomputer and to exploit visualisation technology.

The papers given by John Brooke and mentioned in the Visualisation Case Studies section, have aroused interest in MRCCS techniques in these areas. The idea behind this work is that the needs of the solar-terrestrial physics community could be a very important driver of the technology necessary for e-Science since they combine observation (from satellites and ground-based telescopes) with simulation and there is a necessity to do this in real-time if the forecasting of warnings of potentially damaging magnetic storms (sometimes called "space weather") is to be made effective. These techniques ally well to those necessary for the meteorological and climate modelling community.

5.6 Conferences, Workshops, etc

CSAR staff has been involved with the following events:

- ?? Assistance was provided with the CCP5 summer school at UMIST, July.
- ?? A seminar about the Cray MTA was given at Daresbury Laboratory on 15th August.
- ?? A presentation on spatial information in sunspot records was given in JD16 of the IAU 24th General Assembly, Manchester, August 2000
- ?? A one-day tutorial was given at Eurographics, Interlaken, August.

- ?? A presentation was given at the NATO ASI Workshop "Dynamo and Dynamics", INES Corsica August 2000
- ?? A presentation was given at Euro-Par 2000, Munich, 29th August - 1st September.
- ?? A number of presentations were made at the Cray/SGI MPP Workshop at Manchester, 7th/8th September.
- ?? The second European workshop on OpenMP, Edinburgh, 14/15th September.
- ?? EPSRC Town Meeting, Westminster, 19th September.
- ?? The Maxwell Institute Grid Workshop, Edinburgh, 20th/21st September.
- ?? UGAMP annual conference, Royal Institution, 19th-21st September.

6 Added Value Services

6.1 Joint Projects

Phase II of the AVS Express multi-pipe edition is progressing. The first software update has been released and the 2nd one is due at the end of October. Current work includes the integration of pointing devices such as wands.

6.2 6th SGI/Cray MPP Workshop, September 7th-8th

This was the Sixth European SGI/Cray MPP Workshop - a two-day international conference on the use of SGI and Cray massively parallel computer systems in scientific applications. The conference, organised by MRCCS, was held at the Manchester Conference Centre, and attracted over 70 delegates from across Europe and the USA, and featured 30 presentations, including several from both SGI and Cray Inc. For further details of this event, including the conference proceedings, see <http://www.man.ac.uk/mrccs/mpp-workshop6/>.

6.3 Summer School 2000, September 4th-15th

This year's summer school was attended by 18 people. As well as some CSAR users, there were delegates from Italy (CINECA), Holland and Australia (CSIRO). The lectures were given by international speakers from the Ohio Supercomputing Center (USA), Pallas (Germany), Sgi (USA), and Scali (Norway) as well from the UK (UMIST, U. of Greenwich, Portland Group, Quadrics, IBM and others). The talks covered a wide range of topics from high-level vendor-built systems down to low-level details of networking and processor choices.

A major theme of the MRCCS Summer Schools is 'hands-on' experience. This year each group of three attendees were given the perhaps daunting task of assembling their own Linux Beowulf cluster out of some Pentium100 PCs taken from an undergraduate cluster that was being upgraded. After some initial problems such as removing boot-EPROM's and unknown Bios passwords, this proved to be a remarkably successful exercise with the first MPI job run across by the Friday of the first week. By popular demand, this 24-node cluster has been kept alive since the summer school finished so that the delegates can continue to try out software.

All the notes from the talks and the practical exercises will be made available to CSAR users (at a small cost to cover duplication and administration).

6.4 International Conferences

Organisation of the two European conferences to take place in Manchester in the summer of 2001 is progressing well. Europar will take place on 28th-31st August 2001, and Eurographics shortly afterwards on 3rd-7th September. The call for papers for Eurographics has already been advertised and that for Europar will take place early in November. Web pages are available for both: <http://www.man.ac.uk/europar/> and <http://www.eg.org/egorg2001>

6.5 Seminars

The seminars series for HPC and visualisation, organised by MRCCs, are now being finalised for the first semester of the 2000/2001 academic year.

6.6 Summer Students

The summer student program for 2000 has now finished. There were 11 students from the UK, Europe and South-East Asia. The projects covered a wide variety of topics involving the web, visualisation, meta-computing and mixed-memory parallel programming.