

SCIENCE AND ENGINEERING RESEARCH COUNCIL
RUTHERFORD APPLETON LABORATORY

COMPUTING DIVISION

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issued by
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IKBS INFRASTRUCTURE
Meeting at Edinburgh 18th January 1983

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IKBS Policy/Computing Infrastructure File
DIC Notes File

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1. INTRODUCTION

Two meetings were held. The first, with JH discussed his AI Computing Requirements paper. The second, without JH, discussed: the benchmarking programme RR is running; the SUSSG M68000 survey and the IKBS infrastructure paper to be written by BA for the Architecture study.

2. AI COMPUTING REQUIREMENTS

JH gave us his revised proposal. The main changes from the circulated draft are:

- a. The projected demand has been scaled up, leading to a proposal for up to 20 VAXs.
- b. In order to support InterLISP it is proposed to upgrade the DEC10 to a DEC20.
- c. Note is taken that SERCNet performance would be inadequate to support the proposed use, so use of Mercury or PSS is proposed for WAN. Ethernet is favoured as the LAN technology.

The choice of Ethernet appears to have been made without full assessment of the practical consequences. Those at the meeting had a totally unrealistic notion of the implications of allowing mixed networks of proprietary protocols to flourish. JH accepted an offer from WPS of a paper on these issues. This will be written in consultation with JNT.

There was agreement that Berkley 4.1 is the desirable version of Unix and it was accepted that there should be central systems support. It was hoped that support for Berkeley 4.1 would be a part of the CBP.

JH reported that he had reckoned on approx 18 users to a VAX/750 with 4-8 active at any time. WC said that for his applications 4 users on a VAX/750 is the practical maximum. In his case the other users are physicists running big FORTRAN jobs and he thought Unibus contention for the disks was the main bottleneck. It was agreed that there would be heavy reliance on the RAL support to determine the best VAX configurations for the IKBS systems.

3. BENCHMARKING

Under the SIGAI contract RR is benchmarking the following machine/system/language configurations:

LISP:	FranzLISP	PERQ under Microcode UNIX
	FranzLISP	VAX 750 under UNIX
	UCI LISP	DEC10 under TOPS-10
POP-2:	POP-11	VAX 780 under VMS
	WPOP	DEC10 under TOPS-10
	POP-11	VAX 750 under UNIX(if available)
Prolog:	C Prolog	PERQ under Microcode UNIX
	C Prolog	VAX 750 under UNIX
	Edinburgh	DEC10 under TOPS-10
	Prolog	
	POPLOG	VAX 780 under VMS
	York Portable	VAX 750 under UNIX
	Prolog	

The following areas were agreed as important

- resources required
- programming environment
- user interface
- compatibility with other and standard dialects
- documentation available
- built-in facilities
- library facilities
- limitations on system areas such as frame stack, heap, etc
- procedure call space and time overheads
- i/o efficiency
- error handling
- arithmetic and array handling capabilities
- virtual memory performance
- impact of physical memory size
- machine load.

Only 2-3 months effort are allocated to this work so there are unlikely to be any very detailed or conclusive results. RR will contact KR to find out what benchmarks are already available for the PERQ. C Prolog was reported to be up and running on the PERQ with only one or two bugs left to fix - most bugs have been due to the non-portability of 'portable' C.

It was suggested that it would be valuable if a second LISP could be compared on the DEC10, and that LISPKIT should be benchmarked on the PERQ. The latter is said to be very much oversold by its author.

4. 68000 SURVEY

The RAL 68000 survey was discussed with a view to making comments that would make the results as useful as possible to the IKBS community. Detailed comments are as follows:

- 2.1(i) Which version of Unix is implemented - Look-alike or Bell. Are 32 bit integers supported.
- 2.2(ii) Does not have to be standard bus 'based' as long as it has access to one (WF said Multibus is not fast enough for the system bus).
- 2.3(i) Issues in the comparison are: bus structure, memory management, i/o processing. It would be desirable to factor out floating point performance for comparison purposes.
- 2.3(iv) WCS will not be on these chips in the time scales of interest and this statement of requirement is misleading. Put WCS as a separate point(v).
- 2.4(i) Also need DMA access to all physical memory.
- 2.4(ii) It would be helpful to solicit full details of memory management, the requirement as stated is rather strong. 24 bit virtual addressing might be adequate.
- 2.4(iii) essential rather than desirable.
- 2.6(vii) Not thought to be possible as it requires a 4 MHz bandwidth.
- 2.8(i) Seek times are also important: stepping motors are too slow.
- 2.8(iii) printing at screen resolution desirable.
- 2.8(iv) not required.
- 2.11(i) Minimum configurations (for IKBS) could acceptably cost 10-15K pounds.

5. IKBS INFRASTRUCTURE/COMMON BASE

WC was supposed to have produced a summary of the comments he had received on these issues while writing his 'Virtual Machines for IKBS' study paper. He had not done so, largely it seems because the comments were generally anecdotal or statements of personal preferences. BA is to write a paper for the next IKBS workshop.