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SCIENCE AND ENGINEERING RESEARCH COUNCIL

RUTHERFORD APPLETON LABORATORY
COMPUTING DIVISION

D I S T R I B U T E D C O M P U T I N G N O T E 5 7 8

VISITS

Notes on a meeting with Mr Shepherd and Mr Holloway
at British Telecom at Martlesham on 1.2.82.

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PRESENT:

Bernie Holloway
David Milham
David Duce
Doug Shepherd
Alistair Grant

1. INTRODUCTION

The purpose of the meeting was to discuss the possible conversion of Doug Shepherd's grant application to the DCS Panel into a co-operative award with British Telecom. The meeting arose following the discussion of the DCS Panel on 20 January, and the action placed on Bernie Holloway and David Duce to propose a way forward.

2. DISCUSSION

Doug Shepherd provided the background to the grant application. He had received funding from the Joint Network Team for investigations into sub-setting X25. The pilot project lasted for one year and terminates in August 1982. The project has been undertaken by Alistair Grant who is now being paid from the University research funds. Following on from that feasibility study the present project aims to investigate low cost gateways from Cambridge Ring to X25 Network.

On the hardware side the Gateway is to be based on an M68000 board from Motorola, Munich, using a new bus known as the VME bus. On the ring side Strathclyde are in close contact with John Gibbons at Cambridge, who is developing an M68000 to ring interface. This interface is for the Acorn M68000 board and Doug is modifying John's design to interface to the VME bus. David Hutchison is also looking at Ethernet (Strathnet) to M68000 interfaces.

Motorola are now bringing out chips with on-board RAM (68120). These chips are dual ported but currently only have 128 bytes of RAM. In a collaborative grant with Motorola, Strathclyde are looking at how these chips could be improved. Strathclyde have recently received funding from SERC for the construction of a Strathnet to Cambridge Ring gateway. Strathclyde are proposing using the Motorola 6854 HDLC chip. Doug mentioned the Western Digital chip which is said to support the whole of level 2. David Milham pointed out that British Telecom have some of these chips and they do not work.

Motorola are interested in promoting chip sales and Strathclyde have good relationships with Motorola (they have a factory near by) and also good links with Cambridge who use Motorola systems.

Bernie Holloway said that British Telecom use solely Intel products and knowledge of the Motorola product range will be a useful second string. David Milham said the Intel range was chosen because, although benchmarks for the 8086 family looked weaker than those of the competition, the 8086 was particularly strong in the byte manipulation orders, which is a critical requirement for efficient implementation of X25 level 2. BT consciously reviewed the whole field with a blank sheet of paper.

Doug Shepherd said that Strathclyde had chosen Motorola products because they have built up an existing stock of tools for the M6800 and also because of the choice made by Cambridge in this respect.

David Milham enquired about data rates. British Telecom are looking for 64 kbytes which leads to a large number of problems concerned with tight timing. Strathclyde do not seem to have clear ideas yet on the rates they could hope to support.

Bernie Holloway then gave an overview of the work of the packet switching studies section. The chief work of the section is concerned with the design of second generation packet switch exchanges (BSE) and integrated surfaces digital network (ISDN) to PSS internetworking. This work is sponsored by the network executive, British Telecom. ISDNS is concerned with data services and internetworking problems associated with data services (non-voice).

The section are currently looking at the design of network terminating equipment (NTE). They hope to have a demonstration system of digital working down to the customers' premises operating by the end of 1983. This will offer 64K primary channel, and 8K secondary channel, and 8K common channel signaling which allows a user to set up an 8 or 64K channel. The model considered will use dedicated subscriber lines between the NTE and PSS Telenet PSE. The project is currently on target.

This service system would actually be based on 2 Mbyte standard lines between the gateway to PSS and an ISDN local exchange. They are looking at how to develop the gateway coupled with the development of second generation PSEs. The project is known as project Portal. Currently a private pad is under development based on the Intel 8085. The Prestel development group have put Intel processors on a double eurocard board, this is being used for prototyping. It is intended to have a prototype demonstration by the end of 1982 to be followed by development in the co-operation of a manufacturer in 1983. David Milham pointed out that they are using Intel 8273 HDLC controllers. Intel have corrected most of the problems with this chip except for slowness. 64K operation is possible - just. Intel are bringing out a new product the 8274 which is a two channel device. Ideally BT would like 8 to 16 ports per card. BT are also looking at the new Zilog chip. It is a requirement that all devices used should be second sourced, NEC second source the 8274 but it is not clear if there is a second source for the Zilog chip. The Western Digital chip poses similar problems together with the question of whether it will be available before 1990 and at what cost.

Steve Pretty from Bernie's groups then gave a presentation on the implementation of X25 link level for a microprocessor pad using the 8085, 8273, and 8257 (DMA controller) chips. The project used the Monarch operating system developed by the PABX group. The system was programmed in PLM80 and will support a line rate of 4.8K baud, which is roughly equivalent to 10 packets per second. The next phase of the project is to implement full X25 to the latest CCITC standards, both DTE and DCE, lack the framing, 64K for duplex high throughput. The environment for this will be 8088, 8273, and 8237 (DMA controller). The system will be built on the RMX88 operating system. A paper describing preliminary design studies for this system was made available. The project is expected to be completed in July 1982. It involves a large amount of software development but the software required is well understood by the group.

3. PRIVATE DISCUSSION

Bernie Holloway said he was keen to enter into a co-operative project with Strathclyde. He felt that Strathclyde had probably grossly underestimated the software effort required for the proposed project, but they were an attractive group to co-operate with as they were using Motorola hardware, and seemed to be the only group in the field with a project sufficiently close to BT's interest at the present time. BT hoped to collaborate with Strathclyde at the worker rather than the manager level so should be a good directing influence on the project. BT's chief interest is to gain experience of the Motorola product range as a second string to their choice of Intel products.

Bernie is prepared to put 10K cash into the project. After a telephone call to John Monniot, it was agreed that Bernie Holloway would draft a letter indicating BT's desire to co-operate with Strathclyde, and spelling out what BT would provide in the way of cash and staff contribution to the project. It would seem appropriate that BT should purchase the equipment and pay for the travel (this constitutes half the present cost of the Strathclyde application). Bernie will, in the first instance, talk to the secretary of the Co-operative Awards Committee if this is acceptable, and will then formally write to the secretary of Co-operative awards with copies to Roger Needham, John Monniot and David Duce.

Bernie asked for a copy of the grant regulations which David Duce will send.