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 9 9

VISITS

Notes on a visit to Professor G Cain, PCL
16 March 1982.

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                Investigators/Cain and Morling

PRESENT: Professor R Needham   PCL
                F Chambers   Professor Gerry Cain
                D A Duce   Dik Morling
                                             Marco Loughi
                Bologna University   Piero Natali
                Dr Gianni Neri   Dr Graham Gifford
                Mario Pasquini

1   INTRODUCTION

The purpose of the meeting was to discuss progress on the Mininet project
and advise Professor Cain on a forthcoming grant application.

2   PRESENTATIONS

The interests of Gerry Cain's group include:

    Digital signal processing

        hardware and theory
        speech intelligibility
        VLSI structure

    Local area networking
        interface (DIM)
        Mininet

DIM is an instrumentation interface which is independent of Mininet. It is an intermediate interface standard for the interconnection of computers and peripherals.

The Mininet project itself is a joint project between Bologna University and PCL. The project started in 1975 when Dr Neri was visiting senior lecturer at PCL. The project team at PCL consists of:

    2 senior researchers
    2 junior researchers
    4 students (MSc level)
    2 technicians.

At PCL 3 RA's are SERC funded.

The first generation Mininet has been operational since 1980 at Bologna - it is used by all the machines in the department. Current configuration includes paper tape punch, teletypes, VDU's, VAX, HP 64000 and Intel MDS. Reliability and availability have been quite adequate.

The second generation Mininet is now under construction. This has much higher throughput (100K packets per second). Two stations with 20-25 ports each are under construction and the group are looking at ways to connect CSMA and Ring networks to Mininet and also at operating system features required to support Mininet.

Mininet has received major grants from CNR (Italian equivalent of SERC) in 1975, 1977 and 1979 totalling about £75K. CNR have recently launched a special program in informaties in which Mininet figures highly. The project has also attracted NATO (now expired) and EEC funds; these grants are largely travel money to enable the project teams to have regular progress meetings and exchanges.

PCL and Bologna also collaborate with French, German and Dutch groups under Cost 11/B15.

The distinctive features of Mininet are that it is designed to to support high speed instrumentation, being a product switched network (16 data bits per packet) offering guaranteed delivery of packets in sequence and making real-time applications possible. Novel features include fast algorithms for 2 dimensional polling (by destination and source) an the implementation of a connectivity driver algorithm for adaptive routing.

Further details are contained in the papers and copies of lecture slides in the file.

A demonstration of the first generation Mininet was given. Construction work on the second generation was also seen. The group are using PCB's for prototying and have run into problems with bad workmanship from their sub-contractor. The heart of the station is the master polling circuitry for which the sub-contractor has not yet got the artwork right.

3   FUTURE

The general feeling was that the group are good and doing good work.

The present SERC grant expires in July this year and Gerry intends to submit an application on 1 April 1982.

The group see Mininet as an instrumentation oriented LAN. It is definitely a level 3 object (in the ISO reference model). They are definitely interested in exploitation. There are several directions the project could take, including custom chips, interconnection to other LAN's, Cambridge Ring, Ethernet etc. Research interests include fast, efficient algorithms and hardware to make routing and polling decisions. These are seen as problems which the LAN community in general will have to face as LANs are interconnected. It was agreed that equipment has to be built to reach the point where one can explore these serious issues. Routing and polling problems cannot be investigated with a trivial amount of network. Roger Needham supported this work and also the idea of using a Cambridge Ring as a piece of wire.

There was much discussion about possible industrial contacts. It was agreed that PCL would look for "interest in the purposes of Mininet rather than in the article" prior to submission.

Suggested contacts were:

        Industrialists on Control and Instrumentation Committee
        Unilever
        BNOC (Nick Shelness)
        Loughborough Robotics (Richard Weston)
        Instrumentation people at RAL

D A Duce to supply addresses.

It was suggested that PCL should ask the DCS Panel to support a Mininet Workshop to advertise the project. It was also suggested that they include a page on why Mininet is so good compared to Cambridge Ring/Ethernet.