

# End Notes

## Preamble

[Preface] A riff on, “So long and thanks for all the fish!”, from Douglas Adams book, “The Hitchhiker’s Guide to the Galaxy”.

## Part I

[Thesis] All the techniques presented in this thesis (with the exception of the work done in Section 8.6) and Section 10.3 are open source, and are available for use to the networking community at large.

## Chapter 4

[Extended Constraint Set Technique] (page 93) The work on the extended constraint set technique for CIOQ routers was chronologically done before the application of the basic constraint set technique.

## Chapter 5

[Buffered Crossbars] (page 130) This work was done jointly with Da Chuang.

## Chapter 6

[Parallel Packet Switches] (page 143) The pigeonhole principle for routers was chronologically first applied to the Parallel Packet Switch (PPS). However the chapter on the PPS is presented after the analysis of the PSM, DSM and PDSM routers, since the latter routers are architecturally simpler monolithic routers.

## Part II

[Thesis] The approaches described in Part II, were originally conceived at Stanford University to demonstrate that specialized memories are not needed for Ethernet switches and routers. The ideas were further developed and made implementable [232, 207] by Nemo Systems, Inc. as one of a number of network memory technologies for Ethernet switches and Internet routers. Nemo Systems is now part of Cisco Systems.

## Chapter 8

[Packet Scheduling] (page 227) The techniques described in Section 8.6 were conceived when the author was at Nemo Systems and later refined with Da Chuang in the

Network Memory Group, Data Center Business Unit, Cisco Systems. We would like to thank Cisco Systems for permission to publish this technique.

## **Chapter 9**

[Statistics Counters] (page 265) This work was done independently, and later jointly with Devavrat Shah.

## **Chapter 10**

[State Maintenance] (page 287) The techniques described in Section 10.3 were conceived when the author was at Nemo Systems, which is currently part of Cisco Systems. We would like to thank Cisco Systems for permission to publish this technique.

## **Chapter C**

[Request Matrix] (page 331) The work done in Section C.1 was done by Rui Zhang in collaboration.