

**THIS BOOK  
CONTAINS  
NUMEROUS PAGES  
WITH DIAGRAMS  
THAT ARE CROOKED  
COMPARED TO THE  
REST OF THE  
INFORMATION ON  
THE PAGE.**

**THIS IS AS  
RECEIVED FROM  
CUSTOMER.**

STERLING: A PEDAGOGICAL IMPLEMENTATION  
OF THE  
ISO MODEL FOR OPEN SYSTEM INTERCONNECTION

by

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## PREFACE

In the spring of 1982 I completed course CS-725, Computer Networks, with the assigned text 'COMPUTER NETWORKS' by Andrew Tanenbaum. I found the text to be clear and easily understood, but suffering from several problems.

The Tanenbaum text is built around a discussion of the ISO ( International Standards Organization ) Reference Model for computer networks. While I agree with the idea of using a central reference when discussing the design of the various networks currently in use, a problem arises because there are no networks that truly follow the ISO model. The author does give segments of Pascal code to illustrate portions of the model, but no comprehensive overview is given.

Another problem is the order in which the layers of the ISO model are presented. It is now generally considered good style to approach problem analysis and program design in a 'top down' manner. Tanenbaum chose, however, to start with the bottom layers of the model and work his way to the top. This results in students having to cope with such problems as error correcting protocols before they even have an understanding of the essential aspects of a computer network and the functions it is to provide.

I believe that Per Brinch Hansen has shown us an excellent way to teach a complex computer system with his SCL0 operating system [solo]. He wrote a simplified but operational version of a single user operating system in a concurrent superset of Pascal.

He used a highly structured design to separate the various functions of the operating system and provided sufficient documentation to allow the students to modify the various components of the program.

I intend to correct those problems mentioned above by following Brinch Hansen's example and implementing a simple pedagogical network (STERLING) based on the ISO model. I will discuss the functions of the top four layers, design processes that perform simple subsets of those functions, and implement the designs in a language available at KSU. The report will not be an in-depth study of the ISO model, networking in general, or the language chosen for the implementation. Rather it should simply be viewed as a general workbook and source of assignments for a course in computer networks.

The goals of this project are as follows, to:

1. Provide a reference for teaching the ISO network reference model by implementing a simple version in a language available at KSU;
2. Provide a minimal subset of functions for the top four layers of the ISO model;
3. Design the layers for easy expansion and modification by students;
4. Allow for the function of each layer to be examined separately from other layers; and
5. Design for simplicity and clarity rather than efficiency and robustness.