



# Microarchitecture of Network-on-Chip Routers: A Designer's Perspective

By Giorgos Dimitrakopoulos, Anastasios Psarras, Ioannis Seitanidis

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This book provides a unified overview of network-on-chip router micro-architecture, the corresponding design opportunities and challenges, and existing solutions to overcome these challenges. The discussion focuses on the heart of a NoC, the NoC router, and how it interacts with the rest of the system. Coverage includes both basic and advanced design techniques that cover the entire router design space including router organization, flow control, pipelined operation, buffering architectures, as well as allocators' structure and algorithms. Router micro-architectural options are presented in a step-by-step manner beginning from the basic design principles. Even highly sophisticated design alternatives are categorized and broken down to simpler pieces that can be understood easily and analyzed. This book is an invaluable reference for system, architecture, circuit, and EDA researchers and developers, who are interested in understanding the overall picture of NoC routers' architecture, the associated design challenges, and the available solutions.

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### **Editorial Review**

From the Back Cover

This book focuses on the microarchitecture of network-on-chip routers from a designer's perspective, providing ready-to-use solutions for simple and more sophisticated design cases. All aspects of the design of a network-on-chip router, including flow control, buffering architectures, arbitration and allocation, as well as pipelined organizations, are presented in detail. The authors provide numerous detailed examples and practical abstract models, when necessary. Router micro-architectural options are presented in a step-by-step manner, beginning from basic design principles. Even highly sophisticated design alternatives are categorized and broken down to simpler pieces that can be understood easily and analyzed. This book is an invaluable reference for system, architecture, circuit, and EDA researchers and developers, who are interested in understanding the overall picture of network-on-chip routers' microarchitecture, the associated design challenges, and the available solutions.

- Covers all aspects of the microarchitecture of Network-on-Chip routers;
- Justifies and explains every design choice that is presented in a ready-to-use manner following a designer's perspective;
- Describes performance-enhancing features in a step-by-step manner;
- Includes detailed examples presenting the flow of information inside the router on a cycle-by-cycle basis, highlighting the operation of each part under regular or worst-case traffic scenarios.

### **Users Review**

**From reader reviews:**

**John Armstead:**

This Microarchitecture of Network-on-Chip Routers: A Designer's Perspective book is not really ordinary book, you have it then the world is in your hands. The benefit you receive by reading this book is actually information inside this publication incredible fresh, you will get information which is getting deeper you read a lot of information you will get. This particular Microarchitecture of Network-on-Chip Routers: A Designer's Perspective without we recognize teach the one who examining it become critical in imagining and analyzing. Don't be worry Microarchitecture of Network-on-Chip Routers: A Designer's Perspective can bring any time you are and not make your tote space or bookshelves' turn out to be full because you can have it inside your lovely laptop even cellphone. This Microarchitecture of Network-on-Chip Routers: A Designer's Perspective having fine arrangement in word and also layout, so you will not experience uninterested in reading.

**Jeremy Bryant:**

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**Ethel Swafford:**

The particular book Microarchitecture of Network-on-Chip Routers: A Designer's Perspective has a lot info on it. So when you read this book you can get a lot of help. The book was written by the very famous author. Mcdougal makes some research prior to write this book. This specific book very easy to read you can find the point easily after looking over this book.

**Patricia Rivera:**

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