

# Sync vs Async Communication

Request and wait for a response  
Fire and forget with messages/events

@lorenz/23

## Synchronous



Request-response model

Send a request and wait for some response  
Example: API requests

## Asynchronous



Fire and Forget model

Send message/event and forget  
Example: Event Driven Architecture

# Async Communication Tutorial

**Udo Bartlang**



## Async Communication Tutorial:

**Tutorial** Sol M. Shatz, Jia-Ping Wang, IEEE Computer Society, 1989      Microservices with Go Alexander Shuiskov, 2022-11-25 Build scale and maintain microservices in Golang with ease Key Features Create and organize well structured Go microservices Learn industry best practices and gain insights into Go microservice development tools patterns and solutions Cover hands on Golang examples in each chapter Book Description This book covers the key benefits and common issues of microservices helping you understand the problems microservice architecture helps to solve the issues it usually introduces and the ways to tackle them You'll start by learning about the importance of using the right principles and standards in order to achieve the key benefits of microservice architecture The following chapters will explain why the Go programming language is one of the most popular languages for microservice development and lay down the foundations for the next chapters of the book You'll explore the foundational aspects of Go microservice development including service scaffolding service discovery data serialization synchronous and asynchronous communication deployment and testing After covering the development aspects you'll progress to maintenance and reliability topics The last part focuses on more advanced topics of Go microservice development including system reliability observability maintainability and scalability In this part you'll dive into the best practices and examples which illustrate how to apply the key ideas to existing applications using the services scaffolded in the previous part as examples By the end of this book you'll have gained hands on experience with everything you need to develop scalable reliable and performant microservices using Go What you will learn Get familiar with the industry's best practices and solutions in microservice development Understand service discovery in the microservices environment Explore reliability and observability principles Discover best practices for asynchronous communication Focus on how to write high quality unit and integration tests in Go applications Understand how to profile Go microservices Who this book is for This book is for all types of developers from people interested in learning how to write microservices in Go to seasoned professionals who want to take the next step in mastering the art of writing scalable and reliable microservice based systems A basic understanding of Go will come in handy      *Embedded Systems Dictionary* Jack Ganssle, 2003-01-04 This technical dictionary defines the 2 500 most used words in the embedded systems field with over 4 500 entries and cross references Designed to serve both the technical and non technical audience this book defines advanced terms in two steps The fi      *Architecture and Methods for Flexible Content Management in Peer-to-Peer Systems* Udo Bartlang, 2010-04-11 At times when the IT manager's best friend is systems consolidation which is a euphemism for centralisation it may come somewhat as a surprise for you that this book investigates decentralisation in the context of content management systems It may seem quite obvious that content will and should be managed by the party who creates and owns the content and hence should be held in a somewhat centralised and managed location However over the past few years we have been witnesses of some important trends and developments which call for novel ways of thinking about

content management and maybe even broader about computer systems in general First ongoing business globalization creates natural distribution of information at a corporate level as well as decentralization of control over business resources and business processes Changing alliances with partners require flexible architectures for content management that can adapt to changing constellations roles and access rights Second the need for outsourcing and resource efficiency has brought about concepts of virtualization recently culminating in the cloud computing buzzword Virtualization of content management services requires extremely scalable and flexible underlying information and communication architectures These kinds of solutions are theoretically and practically impossible to implement based on centralized client server architectures Third we are currently experiencing a dramatic shift in the roles of consumers in the Internet The times have gone when quality content was only delivered by publishers and news agencies Wikis and other Web 2.0 tools empower consumers to produce and publish their personal content

MSP430 Microcontroller Basics John H. Davies, 2008-08-21 The MSP430 microcontroller family offers ultra low power mixed signal 16 bit architecture that is perfect for wireless low power industrial and portable medical applications This book begins with an overview of embedded systems and microcontrollers followed by a comprehensive in depth look at the MSP430 The coverage included a tour of the microcontroller's architecture and functionality along with a review of the development environment Start using the MSP430 armed with a complete understanding of the microcontroller and what you need to get the microcontroller up and running Details C and assembly language for the MSP430 Companion Web site contains a development kit Full coverage is given to the MSP430 instruction set and sigma delta analog digital converters and timers

**Handbook of Distance Learning for Real-Time and Asynchronous Information Technology Education** Negash, Solomon, Whitman, Michael, Woszczyński, Amy, Hoganson, Ken, Mattord, Herbert, 2008-05-31 This book looks at solutions that provide the best fits of distance learning technologies for the teacher and learner presented by sharing teacher experiences in information technology education Provided by publisher

Product-Focused Software Process Improvement Danilo Caivano, Markku Oivo, Maria Teresa Baldassarre, Giuseppe Visaggio, 2011-06-29 This book constitutes the refereed proceedings of the 12 International Conference on Product Focused Software Process Improvement PROFES 2011 held in Torre Canne Italy in June 2011 The 24 revised full papers presented together with the abstracts of 2 keynote addresses were carefully reviewed and selected from 54 submissions The papers are organized in topical sections on agile and lean practices cross model quality improvement global and competitive software development managing diversity product and process measurements product focused software process improvement requirement process improvement and software process improvement

*Tutorial, Interconnection Networks for Parallel and Distributed Processing* Chuan-lin Wu, Tse-yun Feng, 1984

Tutorial, Distributed Processor Communication Architecture Kenneth J. Thurber, 1979

**Tutorial Hard Real-time Systems** John A. Stankovic, Krithi Ramamritham, 1988

Tutorial, Microcomputer System Design and Techniques Carol Anne Ogdin, 1980

Tutorial Office Automation Systems Harvey A.

Freeman, Kenneth J. Thurber, 1986      **TCP/IP Tutorial and Technical Overview** Adolfo Rodriguez, 2002 The comprehensive authoritative introduction to the protocols that drive the Internet Covers internetworking routing transport protocols multicast and much more Includes detailed coverage of application protocols DNS TELNET FTP HTTP SMTP RTP RTCP SNMP and WAP Presents techniques for maximizing security availability and scalability Extensive new coverage includes QoS MPLS IP telephony and WAP An in depth introduction to the entire TCP IP suite including the latest protocols and concepts Systematic coverage of internetworking routing transport multicast and application protocols New and updated coverage of QoS MPLS IP telephony security WAP and more TCP IP Tutorial and Technical Overview is an exceptionally complete easy to understand and up to date guide to the protocols that drive the Internet Ideal for beginners and for networking professionals who want to deepen their understanding this book covers the entire TCP IP suite including emerging protocols that address the Internet s key challenges The authors an expert team of IBM TCP IP instructors and consultants begin by introducing TCP IP s fundamental goals roles components and underlying concepts They survey today s core TCP IP application protocols from DNS to HTTP SMTP to RTP as well as protocols designed for advanced wireless and multimedia applications The book includes detailed coverage of the latest trends in networking and infrastructure including Quality of Service MPLS security IP mobility IP telephony and IPv6 The authors also introduce leading tools for maximizing availability and scalability in IBM and Cisco environments including IBM Sysplex Distributor Cisco MultiNode Load Balancing and OS 390 DNS WLM INTERNATIONAL TECHNICAL SUPPORT ORGANIZATION Sharing Technical Expertise From Around the World Prentice Hall PTR has selected this IBM Redbook for its worldwide publishing program IBM Redbooks are produced by the International Technical Support Organization where experts from around the world work together to build effective technical information based on their practical work experience For more information [ibm.com/redbooks](http://ibm.com/redbooks)

**Tutorial, Microcomputer Networks** Harvey A. Freeman, Kenneth J. Thurber, 1981      *Tutorial, Computer-aided Design Tools for Digital Systems* William Magda VanCleemput, 1979      Tutorial John Hargadine Carson, 1979      Tutorial, a Pragmatic View of Distributed Processing Systems Kenneth J. Thurber, 1980 The concepts described here were originally developed during a series of seminars given at the University of Minnesota portions of which dealt with the meaning of distributed processing and introduced overall concepts in distributed systems This volume presents those ideas beginning with the overall concept and works toward implemented hardware structures The intent of this volume is to illustrate the problems and promises of distributed systems while informing readers of the pitfalls and progress of distributed systems      *Proceedings of ASP-DAC/VLSI Design 2002*, 2002 Papers from a January 2002 conference are organized into four sessions each on low power design synthesis testing layout and interconnects and technology as well as two sessions each on embedded systems verification and VLSI architecture one session on analog design and one session on hot c

*Training Research Journal*, 1996      *Computer Architecture, Tutorial* Daniel D. Gajski, 1987 This tutorial is intended

for computer system architects designers and managers who need a broad range of knowledge on advanced topics in computer architecture The book can be used as a textbook or as a research and design reference The goal of this tutorial is to present the state of the art in advanced computer architecture Part I deals with the concepts underlying current architectures Part II covers a variety of approaches and techniques being used in the design of advanced computer systems

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