Optimization Of Tcp Over Wireless Networks

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MALIK BRYNN

Analysis and Model Based Optimization of TCP Springer
Practical design and performance solutions for every ad hoc wireless network Ad Hoc Wireless Networks comprise mobile devices that use wireless transmission for communication. They can be set up anywhere and any time because they eliminate the complexities of infrastructure setup and central administration-and they have enormous commercial and military potential. Now, there's a book that addresses every major issue related to their design and performance. Ad Hoc Wireless Networks: Architectures and Protocols presents state-of-the-art techniques and solutions, and supports them with easy-to-understand examples. The book starts off with the fundamentals of wireless networking (wireless PANs, LANs, MANs, WANs, and wireless Internet) and goes on to address such current topics as Wi-Fi networks, optical wireless networks, and hybrid wireless architectures. Coverage includes: Medium access control, routing, multicasting, and transport protocols QoS provisioning, energy management, security, multihop pricing, and much more In-depth discussion of wireless sensor networks and ultra wideband technology More than 200 examples and end-of-chapter problems Ad Hoc Wireless Networks is an invaluable resource for every network engineer, technical manager, and researcher designing or building ad hoc wireless networks.
Network Optimization and Control CRC Press
This volume contains papers based on invited talks given at the 2005 IMA Summer Workshop on Wireless Communications, held at the Institute for Mathematics and Its Applications, University of Minnesota, June 22 - July 1, 2005. It presents some of the highlights of the workshop, and collects papers covering a broad spectrum of important and pressing issues in wireless communications.
9th European Conference, EWSN 2012, Trento, Italy, February 15-17, 2012, Proceedings IGI Global
The concept of content delivery (also known as content distribution) is be coming increasingly important due to rapidly growing demands for efficient distribution and fast access of information in the Internet. Content delivery is very broad and comprehensive in that the contents for distribution cover a wide range of types with significantly different characteristics and performance concerns, including HTML documents, images, multimedia streams, database tables, and dynamically generated contents. Moreover, to facilitate ubiqui tous information access, the network architectures and hardware devices also vary widely. They range from broadband wired/fixed networks to bandwid-constrained wireless/mobile networks, and from powerful workstations/PCs to personal digital assistants (PDAs) and cellular phones with limited processing and display capabilities. All these levels of diversity are introducing numerous challenges on content delivery technologies. It is desirable to deliver contents in their best quality based on the nature of the contents, network connections and client devices. This book aims at providing a snapshot of the state-of-the-art research and development activities on web content delivery and laying the foundations for future web applications. The book focuses on four main areas: (1) web con tent delivery; (2) dynamic web content; (3) streaming media delivery; and (4) ubiquitous web access. It consists of 17 chapters written by leading experts in the field. The book is designed for a professional audience including academic researchers and industrial practitioners who are interested in the most recent research and development activities on web content delivery.
Cognitive Radio Communications and Networks "O'Reilly Media, Inc."
This comprehensive resource contains a detailed methodology for assessing, analyzing and optimizing End-to-End Service Performance under different cellular technologies (GPRS, EDGE, WCDMA and CDMA2000). It includes guidelines for analyzing numerous different services, including FTP, WEB streaming and POC, including examples of analysis and troubleshooting from a user point-of-view. Focuses on the end-user perspective, with a detailed analysis of the main sources of service performance degradation and a comprehensive description of mobile data services Includes a detailed presentation of generic key performance indicators (KPIs) which can be re-defined to comply with each particular network Provides service performance benchmarking for different technologies from real networks Explores a new approach to service management known as customer experience management, including the reasons why it is overcoming traditional service management and its impact on revenues and customer satisfaction Illustrates all points throughout using real world examples gleaned from cutting-edge research This book draws together findings from authoritative sources that will appeal to cellular network operators and vendors. The theory-based, practical approach will be of interest to postgraduate students and telecommunication and consulting companies working in the field of cellular technologies.
What every web developer should know about networking and web performance Springer Science & Business Media
Cognitive Radio Communications and Networks gives comprehensive and balanced coverage of the principles of cognitive radio communications, cognitive networks, and details of their implementation, including the latest developments in the standards and spectrum policy. Case studies, end-of-chapter questions, and descriptions of various platforms and test beds, together with sample code, give hands-on knowledge of how cognitive radio systems can be implemented in practice. Extensive treatment is given to several standards, including IEEE 802.22 for TV White Spaces and IEEE SCC41 Written by leading people in the field, both at universities and major industrial research laboratories, this tutorial text gives communications engineers, R&D engineers, researchers, undergraduate and post graduate students a complete reference on the application of wireless communications and network theory for the design and implementation of cognitive radio systems and networks Each chapter is written by internationally renowned experts, giving complete and balanced treatment of the fundamentals of both cognitive radio communications and cognitive networks, together with implementation details Extensive treatment of the latest standards and spectrum policy developments enables the development of compliant cognitive systems Strong practical orientation – through case studies and descriptions of cognitive radio platforms and testbeds – shows how real world cognitive radio systems and network architectures have been built Alexander M. Wyglinski is an Assistant Professor of Electrical and Computer Engineering at Worcester Polytechnic Institute (WPI), Director of the WPI Limerick Project Center, and Director of the Wireless Innovation Laboratory (WI Lab) Each chapter is written by internationally renowned experts, giving complete and balanced treatment of the fundamentals of both cognitive radio communications and cognitive networks, together with implementation details Extensive treatment of the latest standards and spectrum policy developments enables the development of compliant cognitive systems Strong practical orientation – through case studies and descriptions of cognitive radio platforms and testbeds – shows how "real world" cognitive radio systems and network architectures have been built
Any Time, Anywhere Computing World Scientific
The proliferation of wireless networks and small portable computing devices has led to the emergence of the mobile computing paradigm. Mobile and nomadic users carrying laptops or hand-held computers are able to connect to the Internet through publicly available wireline or wireless networks. In the near future, this trend can only grow as new services and infrastructures delivering wireless voice and multimedia data are deployed.; This text is intended for technical and non-technical readers. It includes substantial coverage of the technologies that are shaping mobile computing. Current and future portables technology is covered and explained. Similarly, current and future wireless telecommunication networks technology is covered and reviewed. By presenting commercial solutions and middleware, this book will also help IT professionals who are looking for mobile solutions to their enterprise computing needs.; Finally, this book surveys recent research in the area of mobile computing. The research coverage is likely to benefit researchers and students from academia as well as industry.
Services with Initiative John Wiley & Sons
Whether gaming, constant communications and connectivity, or streaming video and audio is the future killer app that keeps consumers reaching for mobile devices, you can turn to this book for the hands-on technology details you need to know to prepare yourself and your organizations for tomorrow's world of wireless multimedia. The books includes in-depth discussions on the hottest topics in this area, including AAA, multiple access protocols, IPv6 and adaptive technologies. Such resource management strategies as power control, user admission techniques, and congestion control are fully explained, helping you design wireless multimedia systems that provide the required degree of quality of service by effectively utilizing limited radio resources.
High Performance Browser Networking John Wiley & Sons
This book gathers selected papers presented at the Inventive Communication and Computational Technologies conference (ICICCT 2019), held on 29–30 April 2019 at Gnanamani College of Technology, Tamil Nadu, India. The respective contributions highlight recent research efforts and advances in a new paradigm called ISMAC (IoT in Social, Mobile, Analytics and Cloud contexts). Topics covered include the Internet of Things, Social Networks, Mobile Communications, Big Data Analytics, Bio-inspired Computing and Cloud Computing. The book is chiefly intended for academics and practitioners working to resolve practical issues in this area.
Technology Trends in Wireless Communications Springer Science & Business Media
Mobile ad-hoc networks have attracted considerable attention and interest from the commercial sector as well as the standards community. Many new ad-hoc networking applications have been conceived to help enable new commercial and personal communication beyond the domain of tactical networks, including personal area networking, home networking, law enforcement operations, search and rescue operations, commercial and educational applications, and sensor networks. Emerging Technologies in Wireless Ad-hoc Networks: Applications and Future Development provides the rationale, state-of-the-art studies and practical applications, proof-of-concepts, experimental studies, and future development on the use of emerging technologies in wireless ad-hoc networks. In addition, this work explores emerging wireless ad hoc technologies based on communication coverage areas: body sensor networks, personal area networks, local area networks, and metropolitan area networks and their applications in critical sectors, for example, agriculture, environment, public health and public transportation.
Wireless Sensor Networks Springer
The Internet is evolving from the perspective of both usage and connectivity. The meteoric rise of smartphones has not only facilitated connectivity for the masses, it has also increased their appetite for more responsive applications. The widespread availability of wireless networks has caused a paradigm shift in the way we access the Internet. This shift has resulted in a new trend where traditional applications are getting migrated to the cloud, e.g., Microsoft Office 365, Google Apps etc. As a result, modern web content has become extremely complex and requires efficient web delivery protocols to maintain users' experience regardless of the technology they use to connect to the Internet and despite variations in the quality of users' Internet connectivity.To achieve this goal, efforts have been put into optimizing existing web and transport protocols, designing new low latency transport protocols and introducing enhance- ments in the WiFi MAC layer. In recent years, several improvements have been introduced in the HTTP protocol resulting in the HTTP/2 standard which allows more efficient use of network resources and a reduced perception of latency. QUIC transport protocol is another example of these ambitious efforts. Initially developed by Google as an experiment, the protocol has already made phenomenal strides, thanks to its support in Google's servers and Chrome browser.However there is a lack of sufficient understanding and evaluation of these new protocols across a range of environments, which opens new opportunities for research in this direction. This thesis provides a comprehensive study on the behavior, usage and performance of HTTP/2 and QUIC, and advances them by implementing several optimizations. First, in order to understand the behavior of HTTP/1 and HTTP/2 traffic we analyze datasets of passive measurements collected in various operational networks and discover that they have very different characteristics. This calls for a reappraisal of traffic models, as well as HTTP traffic simulation and benchmarking approaches that were built on the understanding of HTTP/1 traffic only and may no longer be valid for modern web traffic. We develop a machine learning-based method compatible with existing flow monitoring systems for the classification of encrypted web traffic into appropriate HTTP versions. This will enable network administrators to identify HTTP/1 and HTTP/2 flows for network managements tasks such as traffic shaping or prioritization. We also investigate the behavior of HTTP/2 stream multiplexing in the wild. We devise a methodology for analysis of large datasets of network traffic comprising over 200 million flows to quantify the usage of H2 multiplexing in the wild and to understand its implications for network infrastructure.Next, we show with the help of emulations that HTTP/2 exhibits poor performance in adverse scenarios such as under high packet losses or network congestion. We confirm that the use of a single connection sometimes impairs application performance of HTTP/2

and implement an optimization in Chromium browser to make it more robust in such scenarios.Finally, we collect and analyze QUIC and TCP traffic in a production wireless mesh network. Our results show that while QUIC outperforms TCP in fixed networks, it exhibits significantly lower performance than TCP when there are wireless links in the end-to-end path. To see why this is the case, we carefully examine how delay variations which are common in wireless networks impact the congestion control and loss detection algorithms of QUIC. We also explore the interaction of QUIC transport with the advanced link layer features of WiFi such as frame aggregation. We fine-tune QUIC based on our findings and show notable increase in performance.

Dynamic Spectrum Access and Management in Cognitive Radio Networks Academic Press

The debut of small, inexpensive, yet powerful portable computers has coincided with the exponential growth of the Internet, making it possible to access computing resources and information at nearly any location at almost any time. This new trend, mobile computing, is poised to become the main technology driver for a decade to come. There are many

GSM, GPRS and EDGE Performance Artech House

Cooperation in Wireless Networks: Principles and Applications covers the underlying principles of cooperative techniques as well as several applications demonstrating the use of such techniques in practical systems. The book is written in a collaborative manner by several authors from Asia, America, and Europe. This book puts into one volume a comprehensive and technically rich appraisal of the wireless communications scene from a cooperation point of view.

Data Services Performance Optimization in 2G/3G KHANNA PUBLISHING HOUSE

This practical hands-on new resource presents LTE technologies from end-to-end, including network planning and the optimization tradeoff process. This book examines the features of LTE-Advanced and LTE-Advanced Pro and how they integrate into existing LTE networks. Professionals find in-depth coverage of how the air interface is structured at the physical layer and how the related link level protocols are designed and work. This resource highlights potential 5G solutions as considered in releases 14 and beyond, the migration paths, and the challenges involved with the latest updates and standardization process. Moreover, the book covers performance analysis and results, as well as SON specifications and realization. Readers learn about OFDMA, and how DFT is used to implement it. Link budgeting, parameter estimations, and network planning and sizing is explained. Insight into core network architecture is provided, including the protocols and signaling used for both data and voice services. The book also presents a detailed chapter on the end-to-end data transfer optimization mechanisms based on the TCP protocol. This book provides the tools needed for network planning and optimization while addressing the challenges of LTE and LTE-advanced networks.

Mobile WiMAX Springer Science & Business Media

In June 2000, GTEL (Wireless Telecommunications Research Group) at the F- eral University of Ceara´ was founded by Professor Rodrigo Cavalcanti and his c- leagues with the mission of developing wireless communications technology and impact the development of the Brazilian telecommunications sector. From the start, this research effort has been supported by Ericsson Research providing a dynamic environment where academia and industry together can address timely and relevant research challenges. This book summarized much of the research output that has resulted from GTEL's efforts. It provides a comprehensive treatment of the physical and multiple access layers in mobile communication systems describing different generations of systems but with a focus on 3G systems. The team of Professor C- alcanti has contributed scienti cally to the development of this eld and built up an impressive expertise. In the chapters that follow, they share their views and kno- edge on the underlying principles and technical trade-offs when designing the air interface of 3G systems. The complexity of 3G systems and the interaction between the physical and m- tiple access layers present a tremendous challenge when modeling, designing, and analyzing the mobile communication system. Herein, the authors tackle this pr- lem in an impressive manner. Their work is very much in line with the developments in 3GPP providing a deeper understanding of the evolution of 3G and also future enhancements.

Scheduling and Congestion Control for Wireless Internet World Scientific

Optimization of Tcp Over Wireless NetworksLAP Lambert Academic Publishing

Resource Allocation and Performance Optimization in Communication Networks and the Internet CRC Press

Find out how the exciting new developments towards 4G mobile services and technologies will put the user at centre stage. Towards 4G Technologies provides a comprehensive explanation of future networking and service delivering technologies for next generation mobile systems. The authors explain how personalization, mobile middleware, peer-to-peer services, semantic computing, and content-awareness fit into this new concept and why they will become a necessity for future mobile services. The book presents the latest challenges and opportunities of Next Generation Mobile Systems, explaining new paradigms of service provisioning that include flexible and adaptable services. Towards 4G Technologies: Gives a comprehensive description of future networking and service delivering technologies. Covers hot topics such as intelligent user profiling, proactive service selection, context-aware service provisioning and ubiquitous computing. Introduces seemingly diverse technologies to show how they will play together to create a new user experience. Includes case studies to illustrate the theory. This invaluable guide will provide telecoms engineers in R&D departments, CTOs, and telecoms managers as well as academic researchers in electrical, electronic engineering and telecommunications with a comprehensive understanding of next generation mobile system technologies and services.

Advances in Grid and Pervasive Computing Springer Science & Business Media

How prepared are you to build fast and efficient web applications? This eloquent book provides what every web developer should know about the network, from fundamental limitations that affect performance to major innovations for building even more powerful browser applications—including HTTP 2.0 and XHR improvements, Server-Sent Events (SSE), WebSocket, and WebRTC. Author Ilya Grigorik, a web performance engineer at Google, demonstrates performance optimization best practices for TCP, UDP, and TLS protocols, and explains unique wireless and mobile network optimization requirements. You'll then dive into performance characteristics of technologies such as HTTP 2.0, client-side network scripting with XHR, real-time streaming with SSE and WebSocket, and P2P communication with WebRTC. Deliver superlative TCP, UDP, and TLS performance Speed up network performance over 3G/4G mobile networks Develop fast and energy-efficient mobile applications Address bottlenecks in HTTP 1.x and other browser protocols Plan for and deliver the best HTTP 2.0 performance Enable efficient real-time streaming in the browser Create efficient peer-to-peer videoconferencing and low-latency applications with real-time WebRTC transports

Architectures and Protocols Pearson Education

Network Optimization and Control is the ideal starting point for a mature reader with little background on the subject of congestion control to understand the basic concepts underlying network resource allocation.

Dissecting HTTP/2 and QUIC : Measurement, Evaluation and Optimization John Wiley & Sons

This book provides a comprehensive introduction to the underlying theory, design techniques and analytical results of wireless communication networks, focusing on the core principles of wireless network design. It elaborates the network utility maximization (NUM) theory with applications in resource allocation of wireless networks, with a central aim of design and the QoS guarantee. It presents and discusses state-of-the-art developments in resource allocation and performance optimization in wireless communication networks. It provides an overview of the general background including the basic wireless communication networks and the relevant protocols, architectures, methods and algorithms.

From LTE to LTE-Advanced Pro and 5G Springer Science & Business Media

While there are countless books on wireless networks, few actually quantify the key performance-limiting factors of wireless local area networks (WLANs) and describe various methods for improving WLAN performance. Fulfilling these needs, Improving the Performance of Wireless LANs: A Practical Guide provides both theoretical background and empirical