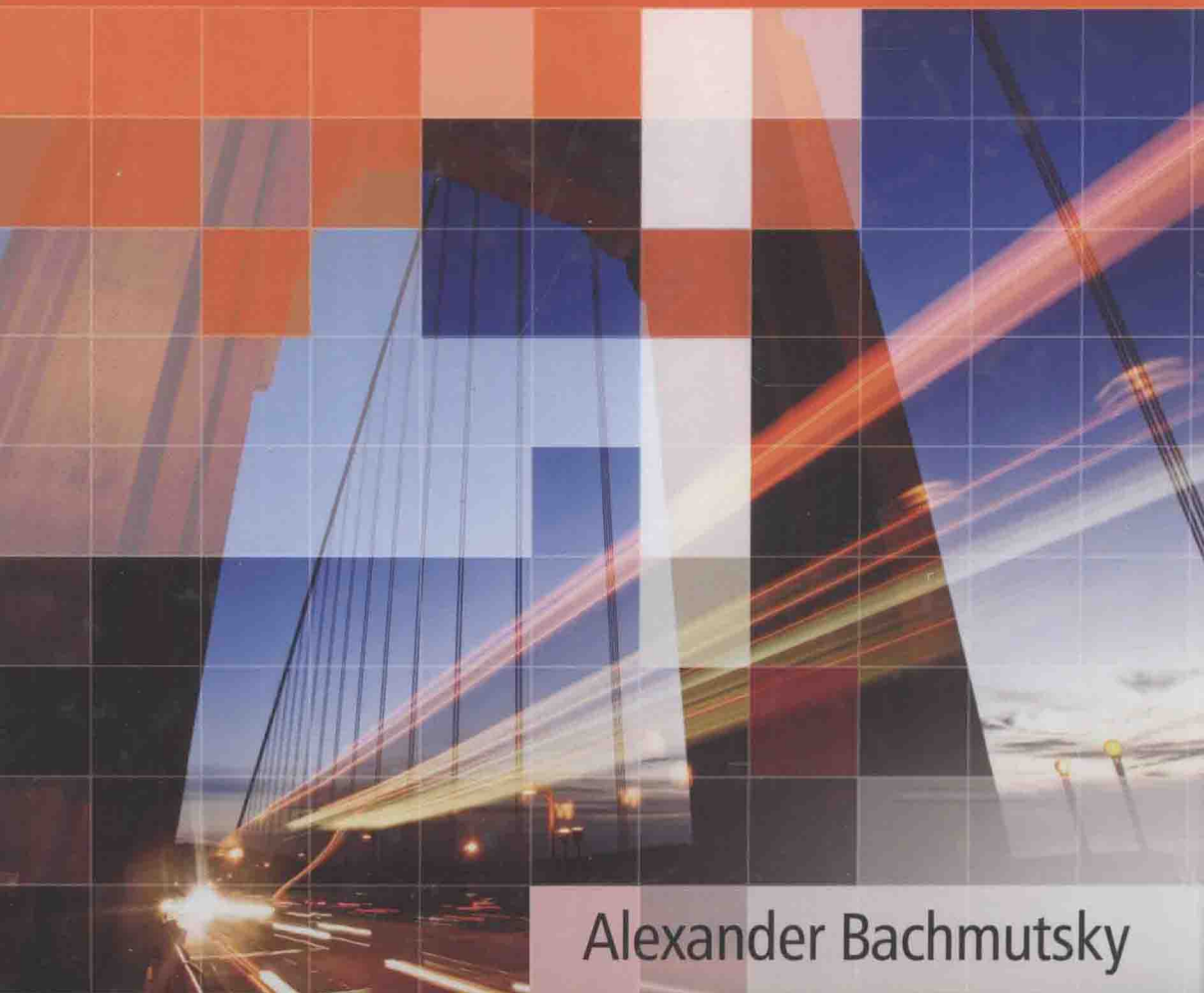


SYSTEM DESIGN FOR

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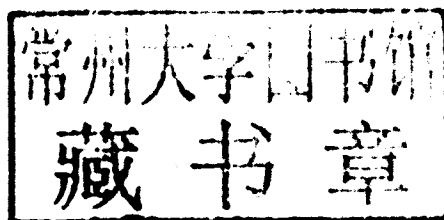


Alexander Bachmutsky

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SYSTEM DESIGN FOR TELECOMMUNICATION GATEWAYS

Alexander Bachmutsky
Nokia Siemens Networks, USA



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SYSTEM DESIGN FOR TELECOMMUNICATION GATEWAYS

This book is dedicated to my parents, Sophie and Victor,
for their unconditional and unlimited love and support.
I love you very much.

Abbreviations

AC	Alternating Current
ACL	Access Control List
Advanced TCA, ATCA	Advanced TeleCommunication Architecture
AIS	Application Interface Specification
AMC	Advanced Mezzanine Card
AMP	Asymmetric Multi-Processing
ANSI	American National Standards Institute
API	Application Programming Interface
AS	Advanced Switching
ASIC	Application-specific integrated circuit
ASN.1	Abstract Syntax Notation One
ASN-GW	Access Service Network Gateway (WiMAX)
ASSP	Application specific standard product
ATM	Asynchronous Transfer Mode
BCN	Backwards Congestion Notification
BECN	Backward Explicit Congestion Notification
BGP	Border Gateway Protocol (routing)
BIOS	Basic Input/Output System
BMP	Bound Multi-Processing
CAM	Content Addressable Memory
CAPEX	Capital expenditure
CG	Carrier Grade
CISC	Complex Instruction Set Computer
CLI	Command Line Interface
CMOS	Complementary metal–oxide–semiconductor
CMT	Chip MultiThreaded
CoS	Class of Service
COM	Computer-on-Module
COTS	Commercial off-the-shelf
CPCI	CompactPCI
CPLD	Complex Programmable Logic Device
CP-TA	Communications Platforms Trade Association
CPU	Central Processing Unit
CRC	Cyclic redundancy check

DiffServ	Differentiated Services
DC	Direct Current
DFA	Deterministic Finite Automaton
DIMM	Dual in-line memory module
DMA	Direct Memory Access
DoS	Denial of Service
DPI	Deep Packet Inspection
DSCP	Differentiated Services Code Point
DSP	Digital Signal Processor
ECC	Error-Correcting Code
EEMBC	Embedded Microprocessor Benchmarking Consortium
EMI	Electro-Magnetic Interference
ETSI	European Telecommunications Standards Institute
FB.DIMM	Fully Buffered DIMM
FECN	Forward Explicit Congestion Notification
FIFO	First-In-First-Out
FPGA	Field-programmable gate array
FPU	Floating Point Unit
FRU	Field Replaceable Unit
FTP	File Transfer Protocol
GARP	Generic Attribute Registration Protocol
GBps	Gigabyte per second
Gbps	Gigabit per second
GE	Gigabit Ethernet
GMRP	GARP Multicast Registration Protocol
GPGPU	General Purpose GPU
GPL	GNU General Public License
GPU	Graphics Processing Unit
GUI	Graphic User Interface
GVRP	GARP VLAN Registration protocol
HAL	Hardware Abstraction Layer
HDD	Hard Disk Drive
HPI	Hardware Platform Interface
HTTP	Hypertext Transfer Protocol
HW	Hardware
IBoE	InfiniBand over Ethernet
ICMP	Internet Control Message Protocol
IDE	Integrated development environment
IDS	Intrusion Detection System
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
IGMP	Internet Gateway Management Protocol
IKE	Internet Key Exchange (protocol)
IMDB	In-Memory DataBase
IMS	IP Multimedia Subsystem
IO, I/O	Input/Output

IP	Internet Protocol
IPC	Inter-Process Communication
IPMI	Intelligent Platform Management Interface
IPS	Intrusion Protection System
IPsec	IP Security protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IPC	Inter-Process Communication
IPTV	Internet Protocol television
ISA	Industry Standard Architecture
ISP	Internet Service Provider
iWARP	Internet Wide Area RDMA Protocol
LAG	Link Aggregation
LAN	Local Area Network
LECN	Local Explicit Congestion Notification
LTE	Long Term Evolution
LUT	Look-up Table
LVDS	Low-voltage differential signaling
MAC	Media Access Control
Mbps	Megabit per second
MCA	MultiCore Association
MCD	MultiCore Design
MIB	Management Information Base
MID	Multi-Instance Design
MIMD	Multiple Instruction Multiple Data
MPD	Multi-Process Design
MPLS	Multiprotocol Label Switching
MPPA	Massively Parallel Processor Arrays
MS	Mobile Subscriber
MSID	Mobile Subscriber Identifier
MSTP	Multiple Spanning Tree Protocol
MTBF	Mean Time Between Failures
MTD	Multi-Threaded Design
MTU	Maximum Transmission Unit
MicroTCA	Micro TeleCommunication Architecture
MUX	Multiplexer
NAT	Network Address Translation
NEBS	Network Equipment-Building System
NETCONF	Network Configuration Protocol
NFA	Nondeterministic Finite Automaton
NP	Network Processor
NPU	Network Processor Unit
NUMA	Non-Uniform Memory Access
NVRAM	Non-Volatile RAM
O&M	Operations and Management
OAM&P	Operation, Administration, Management, and Provisioning

OBSAI	Open Base Station Architecture Initiative
OPEX	Operational expenditure
OS	Operating System
OSPF	Open Shortest Path First (IP routing)
P2P	Peer to peer (communication)
PC	Personal Computer
PCI	Peripheral Component Interconnect
PCIe PCIEx	PCI Express
PICMG	PCI Industrial Computer Manufacturers Group
PMC	Processor Mezzanine Card
POSIX	Portable Operating System Interface [for Unix]
PrPMC	Processor PMC
POA	Platform Oriented Architecture
QoS	Quality Of Service
R&D	Research and Development
RADIUS	Remote Authentication Dial-In User Service
RAID	Redundant Array of Inexpensive Disks
RAM	Random Access Memory
RDMA	Remote Direct Memory Access
RegEx	Regular Expression
RFI	Request for Information
RFP	Request for Proposal
RIP	Routing Information Protocol (IP routing)
RISC	Reduced Instruction Set Computing
RLDRAM	Reduced Latency DRAM
RSTP	Rapid STP
RTL	Register Transfer Level
RTM	Rear Transition Module
RTOS	Real-Time Operating System
SA Forum	Service Availability Forum
SAN	Storage Area Network
SAR	Segmentation and Reassembly
SAS	Serial Attached SCSI
SATA	Serial Advanced Technology Attachment
SBC	Single Board Computer
SCSI	Small Computer System Interface
SCTP	Stream Control Transmission Protocol
SDK	Software Development Kit
SHB	System Host Board
SIG	Special Interest Group
SIMD	Single Instruction Multiple Data
SIP	Session Initiation Protocol
SMP	Symmetric Multi-Processing
SMT	Simultaneous Multithreading
SNMP	Simple Network Management Protocol
SoC	System on Chip

SO-DIMM	Small Outline DIMM
SOM	System-on-Module
SPEC	Standard Performance Evaluation Corporation
SPI	System Packet Interface
SSH	Secured Shell
SSL	Secure Sockets Layer
STD	Single-Threaded Design
STP	Spanning Tree Protocol
SW	Software
TCAM	Ternary CAM
TDM	Time-division multiplexing
TEM	Telecom Equipment Manufacturer
TLB	Translation Look-aside Buffer
TLS	Transport Layer Security
TLV	Type-Length-Value
TM	Traffic Management
ToS	Type of Service
U	Rack unit (1.75 inch (44.45 mm) high)
UDP	User Datagram Protocol
USB	Universal Serial Bus
VC	Virtual Circuit
VLAN	Virtual LAN
VLIW	Very long instruction word
VM	Virtual Machine
VoIP	Voice over Internet Protocol
VOQ	Virtual Output Queue
VPN	Virtual Private Network
VRRP	Virtual Router Redundancy Protocol
WiMAX	Worldwide Interoperability for Microwave Access
WRED	Weighted Random Early Detection
XAU1	10 Gigabit Attachment Unit Interface
XMC	Switched Mezzanine Card
XML	Extensible Markup Language

Contents

List of Figures	ix
List of Tables	xvii
Abbreviations	xix
1 Introduction	1
2 System View	3
2.1 System Architecting	3
2.2 Platform-Based Approach	6
2.3 System Verification	14
3 Hardware Technologies and Platforms	17
3.1 Different Form Factors	17
3.1.1 <i>Proprietary 1U/2U/4U Chassis</i>	18
3.1.2 <i>Standard-Based Systems</i>	35
3.1.3 <i>IBM Blade Center</i>	80
3.1.4 <i>Comparison of Form Factors</i>	83
3.2 Stacking Chassis	84
3.3 Cluster Computing	86
3.4 Inter-Blade Interconnect	88
3.4.1 <i>Switch Fabric Technologies</i>	89
3.4.2 <i>Bandwidth Estimation and QoS in the Switch Fabric</i>	94
3.4.3 <i>Commercial Switch Fabric</i>	97
3.5 Hardware Solutions for Data, Control and Management Planes Processing	105
3.5.1 <i>General Purpose CPUs</i>	108
3.5.2 <i>FPGAs and ASICs</i>	110
3.5.3 <i>Network Processors</i>	134
3.5.4 <i>Classification Processors and Co-Processors</i>	158
3.5.5 <i>Content Processors</i>	160
3.5.6 <i>Multicore Processors</i>	189
3.5.7 <i>Graphic Processors</i>	275
3.5.8 <i>Massively Parallel Processor Array Chips</i>	286
3.5.9 <i>Traffic Management</i>	287

3.5.10	<i>Data Plane and Control Plane Scalability</i>	297
3.5.11	<i>Redundancy for Carrier Grade Solutions</i>	298
4	Software Technologies and Platforms	303
4.1	Basic Software Platform	303
4.1.1	<i>Operating Systems</i>	303
4.1.2	<i>Networking Stacks</i>	309
4.2	Expanded Software Platform	317
4.2.1	<i>Middleware</i>	318
4.2.2	<i>Management Plane</i>	402
4.2.3	<i>Deep Packet Inspection and Other Software</i>	412
4.3	Single-Threaded and Multi-X Software Designs	417
4.3.1	<i>Industry Opinions about Different Design Types</i>	418
4.3.2	<i>Single-Threaded Design</i>	419
4.3.3	<i>Multi-Threaded Design</i>	423
4.3.4	<i>Multi-Process Design</i>	425
4.3.5	<i>Multi-Instance Design</i>	428
4.3.6	<i>Co-Location and Separation of Platform and Application</i>	432
4.3.7	<i>Multicore Design</i>	434
4.3.8	<i>Fine-Grained Task-Oriented Programming Model</i>	436
4.3.9	<i>Multicore Performance Tuning</i>	443
4.4	Partitioning OS and Virtualization	449
4.4.1	<i>Commercial and Open Source Embedded Hypervisor Offerings</i>	459
4.4.2	<i>Hypervisor Benchmarking</i>	463
	References	465
	Trademarks	467
	Index	469

List of Figures

2.1	Simplified business processes	5
2.2	Cost and Time Estimates for Proprietary, COTS, and Application-Ready Platforms	7
2.3	Use platforms to control total lifetime cost of ownership	9
2.4	Experience with software reuse	10
2.5	Organizational change with common platform	12
3.1	Advantech NCP-5120 with dual Cavium Networks OCTEON Plus multicore	19
3.2	Advantech NCP-5120 block diagram	20
3.3	Bivio 7000 Network Appliance	21
3.4	Bivio stackability using classification-based load balancing	22
3.5	T5440 (open boxes are shown), and SPARC Enterprise T5120	24
3.6	Block diagram of the Sun SPARC Enterprise T5120/T5220	25
3.7	Sun SPARC Enterprise T5140 Server	26
3.8	Sun UltraSparc T2 Plus Netra T5440 block diagram	27
3.9	Sun SPARC Enterprise T5140 and T5240 block diagram	28
3.10	Sun utilities for Netra platforms	30
3.11	Sun SPARC Enterprise T5440 block diagram	31
3.12	Sun Netra Data Plane Suite	33
3.13	Sun virtualization with data plane processing	34
3.14	Sun/Aricent WiMAX ASN-GW reference application	35
3.15	Example of a PICMG 1.3 board	38
3.16	System Architecture with Serial Interconnect	38
3.17	System Architecture with Parallel Interconnect	39
3.18	System Architecture with Serial and Parallel Interconnects	40
3.19	ATCA Netra™ CT900 shelf from Sun	41
3.20	Mid Plane design	42
3.21	Caspian E1112 RTM	43
3.22	Sun Netra CP3200 ARTM-HDD with dual 2.5" HDD and additional interfaces	43
3.23	ATCA Ethernet Cost vs. Benefit Analysis	45
3.24	Fujitsu 26-port 10 Gbps switch with Serial 10 GBASE-KR Ethernet	46
3.25	Priority PAUSE vs. Traditional PAUSE	47
3.26	TCP/IP with and without RDMA	48

3.27	OS Bypass with iWARP	48
3.28	iWARP vs. InfiniBand – Performance and CPU efficiency	49
3.29	InfiniBand Roadmap for performance improvement	51
3.30	PCIe-to-PCI Bridge Performance problem example	53
3.31	Flexible topologies with Advanced Switching	54
3.32	Multiple protocols tunneling through Advanced Switching	54
3.33	Mobile Switching Center Architecture using Serial RapidIO interconnect	56
3.34	RapidIO Technology and Application Roadmap	57
3.35	Freescape QorIQ P4080 Communications Processor with integrated Serial RapidIO interconnect	57
3.36	AppliedMicro 460GT in a 3G Modem Card with RapidIO connectivity	58
3.37	Cavium Networks OCTEON Plus CN63XX Block Diagram with Serial RapidIO ports	59
3.38	32-Port Switch with Eight PRS Q-64G or PRS Q-80G	60
3.39	AppliedMicro PRS Evaluation System	61
3.40	XPedite5301 26 W PrPMC with low-power dual-core 1.5 GHz MPC8572E PowerQUICC™ III	63
3.41	XMC module with additional high speed connectors	63
3.42	AMC board sizes	65
3.43	AM4204 with Cavium Networks OCTEON Plus processor	67
3.44	Intel NetStructure® WiMAX Baseband Card AMC	68
3.45	MicroTCA Block Diagram	69
3.46	Sun Netra CP3250 with Intel Xeon ATCA Blade Server block diagram	72
3.47	Sun Netra CP3260 with UltraSPARC T2 ATCA Blade Server block diagram	73
3.48	Functional block diagram for Sun's 10 Gigabit Ethernet ASIC	74
3.49	Radisys' Promentum ATCA-7220 blade block diagram	76
3.50	Continuous Computing FlexPacket ATCA-PP50 with dual NetLogic XLR732 multicore	78
3.51	Internal traffic load balancing using Continuous Computing FlexPacket ATCA-PP50	79
3.52	Continuous Computing FlexTCA pre-integrated platform architecture	80
3.53	IBM Blade Center HT	81
3.54	Relationship between 3COM XRN technology components and key technologies	85
3.55	3COM XRN Distributed Resilient Routing component	86
3.56	3COM XRN Distributed Resilient Routing component	86
3.57	Dual-star and full-mesh interconnect diagrams	89
3.58	Shared bus architecture	90
3.59	Bufferless switch fabric crossbar architecture	91
3.60	Shared memory switch fabric architecture	91
3.61	Clos network architecture and its hierarchical scalability	92
3.62	Example of 16x16 Clos network switch	93
3.63	Example of a single-path multistage Banyan switch	93
3.64	AppliedMicro PRS Q-80G Switch with PRS C48X and PRS C192X Fabric Interfaces	97

3.65	Broadcom BCM88020 24-port Gigabit Ethernet switch with uplink fabric	98
3.66	Broadcom BCM56820 24-port 10 Gigabit Ethernet switch block diagram	99
3.67	Fulcrum FM4000 series switch block diagram	100
3.68	Fulcrum FM3000 forwarding and traffic management	102
3.69	Dune PETRA 220/230 Fabric Access Processor block diagram	103
3.70	Dune FE 600 switch fabric block diagram	104
3.71	Vitesse VSC874 10 Gbps Queue Manager in direct (top) and fabric (bottom) modes	106
3.72	Comparison of different processor types	107
3.73	Code size for EEMBC reference implementation	109
3.74	FPGA advantages over ASSPs	112
3.75	FPGA solution value chart	112
3.76	Pre-Achronix asynchronous circuits implementations	114
3.77	Achronix FPGA architecture	115
3.78	Achronix building blocks and pipeline stages	115
3.79	Achronix data propagation vs. conventional FPGAs	116
3.80	Achronix vs. conventional FPGA routing	117
3.81	Achronix Speedster FPGA family	118
3.82	Achronix Speedster 100 Gbps Processing Platform Bridge100 Block Diagram	119
3.83	Altera Programmable Power Technology vs. conventional design	120
3.84	High-Level Block Diagram of the Altera Stratix IV ALM	121
3.85	Altera Stratix IV ALM in arithmetic (upper left), shared arithmetic (upper right) and LUT-register (lower) modes	122
3.86	Altera PicaRISC architecture	123
3.87	FPGA System Design Flow for Nios II using Altera SOPC Builder	124
3.88	Altera NIOS II multiprocessor system with shared (right) and dedicated memory	125
3.89	DRC Accellium Co-processor	129
3.90	DRC Accellium Integration with CPU	130
3.91	Convey FPGA co-processor board	130
3.92	Convey CPU-FPGA hybrid-core architecture	131
3.93	Convey FPGA co-processor block diagram	131
3.94	Stack of Intel QuickAssist compliant FPGA accelerators from Nallatech	132
3.95	Comparison of standard cell, embedded array and structured ASIC technology	134
3.96	NPU market shares in 2003 and 2004	135
3.97	NPU vendors in 2008	135
3.98	40 Gbps line card solution comparison	137
3.99	Generic Network Processor Architecture	139
3.100	Cisco Quantum Flow Processor block diagram	141
3.101	Cisco source-based Remote-Triggered Black Hole Filtering in QFP	142
3.102	AppliedMicro nP7310 Block Diagram	143
3.103	AppliedMicro nP73x0 10 Gbps Full Duplex System Diagram	145
3.104	EZChip NP-3 for 10 GE ring application	146
3.105	EZChip NPU architecture	147

3.106	LSI APP3300 Block Diagram with dual-core ARM11 and Security Engine	150
3.107	Xelerated Data flow processor with I/O processor integrated into the pipeline	151
3.108	Xelerated I/O processors offload I/O operations from packet processor blocks	151
3.109	Xelerated NPU programming model	152
3.110	Xelerated X11 Architecture	153
3.111	Xelerated HX family network processor block diagram	154
3.112	Comparison between Xeon multicore and IXP2800 network processor	155
3.113	Netronome Network Flow Processor Heterogeneous Architecture	156
3.114	Wintegra WinPath2 Block Diagram	157
3.115	cPacket Complete Packet Inspection transparent selective traffic duplication	159
3.116	cPacket compact mezzanine card for 20 Gbps packet classification	159
3.117	Traffic inspection: packet inspection and heuristic analysis	161
3.118	HTTP vs. P2P packet length distribution	162
3.119	Content Processing Complexity	167
3.120	WiMAX binary header structure (from WiMAX specification V1.2.2)	168
3.121	IBM BaRT-based finite state machine principle for XML acceleration	170
3.122	IBM XML accelerator using Cell-based blade	171
3.123	Regular Expression to identify SQL Slammer attack	174
3.124	DFA graph example for 'splice' and 'literal'	176
3.125	OCTEON DFA implementation block diagram	177
3.126	Fast Path and Slow Path processing	178
3.127	RegEx optimization example: NFA cut between Fast Path and Slow Path	179
3.128	LSI Tarari T2000 Regular Expression Processor	180
3.129	LSI Tarari T2000 dual-mode system	180
3.130	Cavium Networks standalone hybrid DFA/NFA RegEx engine	181
3.131	Cavium Networks CN1710 hybrid RegEx block diagram	182
3.132	NetLogic rules hierarchy example	184
3.133	Anagran Intelligent Flow Delivery	186
3.134	TIA 1039 in-band QoS signaling	187
3.135	Microprocessor clock rate count over time	189
3.136	Microprocessor transistor count over time	190
3.137	Doubling CPU clock only marginally improves the application performance	190
3.138	More efficient CPU time usage with parallel computing cores or threads	191
3.139	SMP interconnect technologies	195
3.140	Parallel SIMD Architecture	197
3.141	MPPA Architecture	198
3.142	MPPA buffered flow-controlled communication channel	198
3.143	LSI Axxia™ Communication Processor (ACP) Block Diagram	204
3.144	Example of x86 page tables	206
3.145	Example of AMD nested page tables	207
3.146	AppliedMicro Converged Processor	208

3.147	AppliedMicro Queue Manager QM-Pro	209
3.148	AppliedMicro QM-Pro as a QoS management mechanism	209
3.149	AppliedMicro dual-core Titan block diagram	210
3.150	Cavium Networks latest multicore processors	211
3.151	Cavium Networks CN31XX block diagram	212
3.152	Cavium Networks OCTEON CN58XX block diagram	213
3.153	Cavium Networks storage-oriented OCTEON CN57XX block diagram	214
3.154	Cavium Networks newest OCTEON CN68XX block diagram	215
3.155	Cavium Networks OCTEON hardware architecture	216
3.156	Cavium Networks OCTEON CN58XX coherent bus block diagram	220
3.157	Cavium Networks OCTEON timer hardware acceleration	222
3.158	Cavium Networks OCTEON chaining architecture based on HW CPU bypass	223
3.159	Problem of multicore processing without target scheduling	224
3.160	Packet Ordering and Synchronization Using Atomic Tag	225
3.161	Comparison of Cavium Networks OCTEON processor three generations	228
3.162	IPv4 packet forwarding performance scalability in Cavium Networks OCTEON processors	229
3.163	IBM Cell processor block diagram	229
3.164	IBM Cell processor system configurations	230
3.165	IBM Cell Synergistic Processor Element block diagram	230
3.166	IBM Cell automatic code partitioning	232
3.167	Intel's Tera-scale Computing Research Program vision	234
3.168	Intel's Tera-scale tiled design with core and HW accelerator tiles	235
3.169	Interconnect bisection bandwidth	235
3.170	Intel fine grain power management for tera-scale project	236
3.171	Intel 3D stacked memory technology	236
3.172	Hardware accelerated task scheduler	237
3.173	Dynamic fault discovery and repartitioning of arbitrary shaped domains	238
3.174	Intel Accelerator Hardware Module concept	239
3.175	Intel QuickAssist System Architecture block diagram	240
3.176	Packet Capture acceleration using Netronome NPU and Intel QuickAssist Technology	241
3.177	Freescale QorIQ Ingress Packet Processing	242
3.178	Freescale MPC8641D Block Diagram	243
3.179	NetLogic XLS616 Block Diagram	244
3.180	NetLogic XLR700 Series Block Diagram	245
3.181	NetLogic XLP832 Block Diagram	246
3.182	Plurality HAL with cache	249
3.183	Plurality HAL without cache	250
3.184	Plurality memory address space with and without cache	251
3.185	Sun's UltraSPARC T1 processor block diagram	252
3.186	UltraSPARC T1, T2, and T2 Plus processor features	253
3.187	UltraSPARC T2 or T2 Plus processor with up to sixty-four threads	254
3.188	UltraSPARC T2 (top) and T2 Plus (bottom) block diagrams	255
3.189	Tensilica's range of system-interconnect topologies	257