Index

3D Black Scholes 132-133
3D visualization 139

A
adaptive provisioning 200
Adaptivity 256
Advanced Configuration and Power Interface (ACPI) 193
Agathon Group 256
Akamai 256
Alternate Data Streams (ADM) 181
Amazon 256
Amazon CloudWatch 222
Amazon Elastic Block Store (EBS) 223
Amazon Elastic Compute Cloud (Amazon EC2) 38, 82, 97, 99, 109, 222, 238, 252
Amazon Flexible Payments ServiceTM (Amazon FPS) 222
Amazon Fulfillment Web Service (Amazon FWS) 222
Amazon Relational Database Service (Amazon RDS) 222
Amazon Simple Notification Service (Amazon SNS) 222
Amazon Simple Queue Service (Amazon SQS) 222
Amazon Virtual Private Cloud (VPC) 223
Amazon Web Services (AWS) 149, 225, 238
anti-forensics 181
Application Programming Interfaces (API) 207, 249
Application Protocol Interfaces (API) 207
architectural evaluation 3
Architectural Level Modifiability Analysis (ALMA) 11
Architectural Trade-off Analysis Method (ATAM)
  quality attribute characterization 11
  risks and non-risks 13
  sensitivity and trade-off points 14
  utility trees 12
Architectural Trade-off Analysis Model (ATAM) 1, 15
Aspectual Software Architectural Analysis Method (ASAAM) 11
AT&T 257
attacking CF tools 180
attacking data 180
attacking the investigator 180
automatic approach 5

B
backend data analysis 50
Best Fit Decreasing (BFD) 26
Black Scholes Model (BSM) 125, 127, 130, 132-133
Blue Pill Rootkit 163
botnets 182
broad network access 86, 116
business process change 248
Business Process Modeling (BPM) 39
Business Process Utility (BPU) 210

C
careless computing 98, 147
CF detection 185
checkpointing protocols 282
checkpoint technique 282
Chip Aware VM Scheduler 190, 200-201, 203
Cloud Business Model Framework (CBMF) 129
cloud classroom 93
cloud computing 1, 19, 23, 30, 37, 67, 84, 86, 97, 112, 115, 154-155, 171, 206-207, 219, 243-244, 252, 267, 280
countermeasure 158
exposure 158
in higher education 92
in India 90, 236
risk 158
threat 158
vulnerability 158
Cloud Computing Business Framework (CCBF) 125, 129
cloud controller 234
cloud databases 229
cloud enterprise architecture 209
Cloudkick 228
cloud library 93
cloud middleware 104
Cloud Security Alliance (CSA) 89, 159, 162
CloudSim 286
cloud threats 149
cluster controller 234
Common Vulnerabilities and Exposures (CVE) 183, 189
Common Vulnerabilities Exposure (CVE) library 160
communication network 264, 268
community cloud 88, 130, 208
Community Enterprise Operating System (CentOS) 104
comprehensive severity evaluation 4
compute clouds 2
Computer Anti-Forensics (CAF) 176, 179, 181, 187
Computer Forensics (CF) 176, 178-179, 187
Constrained Markov Decision Process (CMDP) 28
Continuous Data Protection (CDP) 282
Control Volume Method (CVM) 166-167
Copy-on-Write (CoW) mechanism 282
cost savings 247
counter forensics 180
curl-loader tool 107
Current Job Performance (CJP) 27
cybercrimes 177

d
Database-as-a-Service (DBaaS) 255
data clouds 2
data computing 49
data governance 258
data hiding 182
data models
BigTable 57, 61
Cassandra 60-61
Dynamo 58, 61
HBase 58, 61
PNUTS 59, 61
Data Storage as a Service (DaaS) 87-88
Deltacloud 228
Denial of Service (DoS) 5, 181
detection module 9
digital evidence 183
Disk I/O Rate (DIOR) 53
Distributed Denial of Service (DDoS) 5
Distributed Denial of Service (DDoS) attacks 182
distributed Ordered Tables (DOT) 62
distributed framework 43
drained energy sources 23
dynamic backfilling 27
Dynamic Component Deactivation (DCD) 193
dynamic consolidation 194, 198
Dynamic Processor Scaling (DPS) 25
Dynamic Server’s Pool Resizing (DSPR) 25
Dynamic Voltage Frequency Scaling (DVFS) 192
E
education cloud 237
elastic web hosting 99
Elastra 226-227
Email Usage Policy (EUP) 120
encryption 183
end of IT life management perspective 22
energy-aware computing 19, 22
energy balance 169
energy consumption 20-21
energy-efficiency 19, 240
energy-efficiency optimizations
nodes disabling 55
energy-performance 19
Enterprise Cloud Server (ECS) 226
Enterprise Information Security Policy (EISP) 117
Eucalyptus 233
Eucalyptus components 234
event broker module 106
e-waste generation 20
Expected SLA Satisfaction (ESS) 27
F
fault tolerance 280-281
file signatures 185
financial benefits 254
financial clouds 130
Financial Service Authority (FSA) 125
Financial Software as a Service (FSaaS) 125, 130, 140
First Fit Decreasing (FFD) 196
FTCloud 283
G
Gigabit Interface Converter (GBIC) 276
global components 9
Globus Toolkit 100
Google 257
GreenCloud 29
green computing 22
green service allocator 26

H
Hadoop 49-50
hashing 184
higher education 85
Highest Potential Growth (HPG) 27
holistic service scalability 40
hybrid cloud 88, 208
HyperStratus 239
hypervisor technology 258

I
incremental First Fit Decreasing (iFFD) 196
Information and Communications Technologies (ICT) 18, 37, 240, 266
information assurance 248
Infrastructure as a Service (IaaS) 3, 37-38, 68, 87, 90, 116, 148, 156-157, 207, 247, 273
Infrastructure Development Life Cycle (IDLC) 147
Integrated Circuit (IC) 166-167
Integrated Development Environment (IDE) 73
internal risks 115
International Energy Agency (IEA) 20
Internet Usage Policy (IUP) 119
intrusion detection 3
Intrusion Detection Systems (IDS) 3, 141, 149
Intrusion Prevention System (IPS) 141
intrusion response system 10
intrusion severity analysis 3, 5
investigation constraints 182
I/O operation Per Second (IOPS) 275
IP Multimedia Subsystem (IMS) 264
Issue-Specific security policy (ISSP) 118

J
Java Enterprise Edition (Java EE) 67, 219
Jcloud 228
Joyent 226

L
Least Increase of Power Consumption (LEPC) 26
Least Square Methods (LSM) 128, 131
legal risks 161
Level of Severity (LoS) 4
Libcloud 227
load balancing 101
load creation software 107
load manager 106
Longest Approximate Time to End (LATE) 51
malware 182
Managed Service Provider (MSP) 206
management platform 234
Map Task Completed Time (MTCT) 53
MATLAB 137
measured service 86, 116, 156
Microsoft’s Azure 257
Minimization of Migrations (MM) 27
minimized response time 5
Monte Carlo Methods (MCM) 125, 127-128, 130, 136
Monte Carlo Simulation (MCS) 127
Multi-Chip Module (MCM) 166-167, 197
multi-tenancy 68
customization 71
isolation points 68, 71

N
Nagios API 106
Nagios Event Broker (NEB) API 106
National Institute of Standards and Technology (NIST) 23, 89, 116, 207, 260
Network Attachment Sub-System (NASS) 272
Network File System (NFS) 108, 111
network forensics 177
Next Generation Network (NGN) 265
node controller 234
non-traditional techniques 181
on-demand self-service 86, 116, 156

O
OpenNebula 100
operational benefits 253
operational risk 139
operation optimization
  adaptively parallelizing 62
  Complemental Clustering Index (CCIndex) 63
  planned bulk insertion 62
operation perspective 22
organizational risks 160
Index

P
parallel computing 143
Partial Differential Equation (PDE) 168
Password Policies (PassP) 121
PCI Special Interest Group (PCI-SIG) 276
Performance-Based Probabilistic–Shortest Queue (PBP–SQ) 29
Peripheral Component Interconnect Express (PCI-E) 276
Physical Policy (PhyP) 121
Platform as a Service (PaaS) 3, 37-38, 43, 87, 90, 116, 148, 156-157, 207, 247
Platform Development Life Cycle (PDLC) 147
Power Aware Meta Scheduler (PAMS) 191
Private Branch Exchange (PBX) 265
private cloud 88, 100, 208
profile engine 9
Proprietary Information Use (PIU) 121
public cloud 88, 208
Public Computing Communication Network (PCCN) 268-269, 272-274

Q
Quality of Service (QoS) 4, 37, 39, 102

R
rapid elasticity 86, 116, 156
real-time operations 4
Red Hat Enterprise Linux (RHEL) distribution 104
Reduced Redundancy Storage (RRS) 222
Relational Database Management Systems (RDBMS) 230
relational databases 229
Resource and Admission Control Sub-System (RACS) 272
resource pooling 86, 116, 156
RightScale 225, 227, 237
risk reduction 130
Round Trip Time (RTT) 29
RUBiS application 80
secure-deletion 184
Secure Sockets Layer (SSL) 247
security policy 116
separate schemas 78
service broadcast 266
Service Development Life Cycle (SDLC) 147
service differentiation 266
service integrating totalization 266
Service Level Agreements (SLA) 2, 5, 185, 194, 207, 234, 238, 247
Service Management Facility (SMF) 223-224
Service Open Operational Oriented Intelligent Architecture (SO3IA) 272
Service-Oriented Application (SOA) 39
Service Oriented Architecture (SOA) 213
service perspective 22
severity analysis module 9
shared tables 78
Shortest Queue with Energy-Efficient (SQEE) priority 29
Shortest Queue with High Performance (SQHP) priority 29
Silicon Valley Education Foundation (SVEF) 239
simple cloud 227
Simple Storage Service (S3) 38
Small and Medium Businesses (SMB) 68, 236
Small Form-factor Pluggable (SFP) 276
Small, Medium, and Micro Enterprises (SMME) 205
Software Architectural Analysis Method for Complex Scenarios (SAAMCS) 11
Software Architectural Analysis Method (SAAM) 11
Software as a Service (SaaS) 3, 38, 67, 87, 90, 116, 126, 148, 156-157, 166-167, 207, 244, 247, 281
Solid-State Drive (SSD) 275
sourcing perspective 22
steganography 184
storage controller 234
storage optimizations
  DiskReduce 54, 56
  SplitCache 53, 56
  SuperDataNodes 54, 56
Stored Program Control switch (SPC switch) 264
system call handler 9
System In Package (SIP) 166
System Occupation (SO) 27
System Specific policy (SysSp) 118
System Usage policy (SUP) 120

S
scalability 247
scheduling optimizations
  delay scheduling 52
  Hadoop Fair Scheduler (HFS) 52, 56
  LATE scheduler 51, 56
  triple-queue scheduler 52, 56

315
Index

T
TCP/IP offload Engine (ToE) 277
technical risks 160
thermal analysis 167
thermal management 167
thin computing 23
timestamps 184
Total Cost of Ownership (TCO) 23
traditional techniques 181

V
Value-Added Service (VAS) 264
Variance-Gamma Processes (VGP) 131
virtual cloud computing 210
virtual enterprise architecture 209

Virtual Enterprises (VE) 205
Virtual Infrastructure Managers (VIM) 104
virtualization technology 213
Virtual Machine Device queues (VMDq) 277
Virtual Machine IDentifier (VMID) 9
virtual machines 2
Virtual Private Cloud (VPC) 137, 208, 223
Virtual Private Network (VPN) 208

W
Wake-On-LAN (WOL) 25
walrus 20, 41, 58-61, 108, 127-128, 130, 134-136,
158, 180, 206, 231, 234, 237, 248, 263
WebBeans 220
Wireless Security Policy (WSP) 121