Index

Aaltola, M 25
Acharya, A 451
Ackerman, R 446, 447, 448
Afghanistan War 276, 324
African Union Cybersecurity Convention (AU Convention) 192, 196, 197, 200
Ago, R 58, 233, 244
Akande, D 274, 327
Akehurst, M 19, 31–2, 34
Albright, D 243, 330
Aldrich, R 123, 361
Alexander, K 418
Alston, P 337
Ambos, K 118–43, 156
Andress, J 229
Anonymous group 157, 213
Antolin-Jenkins, V 248, 249
Antonopoulos, C 28, 55–71
Aoki, K 76
Appelbaum, B 324
Arcaric, M 406
Areng, L 429, 445
Argomaniz, J 404–5
Arias, A 206
Arimatsu, L 121, 149, 228, 307, 326–42, 345, 368, 398
Armacost, M 390
armed force and conflict
army classification of armed see classification of cyber warfare, international armed conflict
cyber attacks as ‘armed attacks’ 263–70, 272–3, 275, 276, 279–80, 281–2
cyber attacks and crime of aggression 138–9
cyber operation as see cyber operations as a use of force, as armed force
determining whether armed force has been applied 122–3
existence of, cyber attacks as war crimes 121–6
international humanitarian law applied to cyber warfare 371–4
law of armed conflict (LOAC), and law of neutrality 396–9
Arquilla, J 212
ASEAN Convention on Counter Terrorism 162
Asia-Pacific cyber security 446–64
ASEAN CERT programs 454, 460, 462
ASEAN Cooperation Plan 455
ASEAN Defence Ministers Meetings (ADMMs) 454, 455
ASEAN Economic Community Blueprint 453
ASEAN Information Infrastructure and Hanoi Plan of Action 452
ASEAN Political-Security Community 454
ASEAN Regional Forum (ARF) 455–8
ASEAN Telecommunications and IT Ministers (TELMIN), ICT infrastructure and capacity development 452–4, 461
ASEAN Telecommunications and IT Ministers (TELMIN), Maclan Cebu Declaration 454
cyberspace ‘rules of engagement’ measures 463
e-ASEAN Framework Agreement 452
governmental landscape 447–51
international institution cooperation 462
private sector engagement 461–2
Security and Prosperity Steering Group (SPSG) 458, 460, 461–2
terrorist attacks, effects of 459
Asia-Pacific cyber security, Asia-Pacific Economic Cooperation (APEC) 458–62
Action Agenda for New Economy 458–9
Cybersecurity Strategy 460–61, 463
e-APEC Strategy 459, 460
international institution cooperation 462
private sector engagement 461–2
Security and Prosperity Steering Group (SPSG) 458, 460, 461–2
terrorist attacks, effects of 459
attribution
and anonymity problems, classification of cyber warfare 333
492 Research handbook on international law and cyberspace

of attack to one of the parties to the conflict 125–6, 129
identification problems 296, 362–4
methods and collateral damage 322
problems and due diligence, law of neutrality 394–5
State responsibility see State responsibility, attribution in cyberspace

Austin, G 83, 285, 286, 288, 289, 291
Australia 41, 43, 49, 158–9, 446, 448, 449
Azerbaijan 392
Baker, C 175–7
Baker, S 262
Balmond, L 406
Barlow, J 13, 96–7
Barnes, S 22
Barrett, E 307, 312
Barriga, S 138, 140, 141
Barron-Lopez, L 287
Bartelson, J 17, 18
Baruah, D 465, 466, 475, 478, 480
Barzashka, I 330
Beal, V 55
Beck, L 128, 129, 135, 136
Beitollahi, H 264
Belk, R 307
Bellamy, A 314
Benatar, M 138, 281
Bendiek, A 404, 408, 409, 419
Bently, L 96
Berne Convention, intellectual property rights 74, 78, 79, 84
Besson, S 16
Bethlehem, D 18, 278
Blair, D 223
Blake, D 346
Blakeney, M 74
Blockmans, S 423, 425
Blomme, M van 212, 223
Bocek, B 390
Boothby, W 120, 123, 124, 129, 133, 134, 135, 232, 242
Borgmann-Prebil, Y 417
Borne, W 381
Bosuyn, F 419
Bothe, M 351, 368
botnets and remote control 309, 313, 315, 319 see also hackers
Bouwmeester, H 370
Bowett, D 272
Brazil 113, 178, 179–80, 184, 473
Brenner, S 191, 196, 200
Briely, J 33
Brink, T 219
Brkan, M 420–21
Broad, W 243, 261
Bröllmann, C 21
Brown, G 247, 249, 264, 330
Brownlie, I 32, 187, 239, 266
Bruguière, J-M 84, 85
Bryant, R 15
Buck, S 27
Budapest Convention 149, 162–3, 192–7, 198–9, 200, 202–5, 412, 414, 418–19
Burnham, G 310
Burton, C 414, 417
Byassee, W 15
Caballero-Anthony, A 451
Cammack, C 137, 139
Carrapico, H 404
Cartwright, J 347
Cassese, A 121
Cathcart, B 375
Cavet, M 437
Cerf, V 109, 426
CERTS (Computer Emergency Response Teams) 221–2, 223, 411, 440–41, 454, 460, 462
Cesana, S 164
Chadwick, O 388
Chesney, R 337
Chesterman, S 185, 226
China 70, 111, 165, 319, 370, 457, 463, 478 and cyber espionage 114, 158, 168, 169, 172, 179, 184, 241, 245–6, 333, 448
Internet censoring and monitoring 45, 112–13, 115, 323
US–China cyber security working group 490
Chowdhury, N 404
Christakis, T 268
Christie, D 325
consumer protection, EU cybersecurity law 411
infrastructure damage and indirect killing 310
principle of distinction see under principle
of distinction, relevance of
principle of proportionality 372–3
see also collateral damage
Clark, R 140, 141
Clarke, R 188, 224–5, 253, 260, 317
classification of cyber warfare 326–42
actor identification problems 326
and international humanitarian law 326–7,
331–2, 335, 336, 339–40
classification of cyber warfare, international
armed conflict 328–35
anonymity and attribution problems 333
armed force use 328–32
by a State against another State 332–5
critical infrastructure and essential services,
harm to 330–32
Distributed Denial of Service (DDoS)
attacks 331
hacktivist involvement 334–5
intensity and duration of violence, relevance of
330, 332
private sector actors’ involvement 334–5
and State effective control 330, 334–5
classification of cyber warfare,
non-international armed conflict 336–41
definition 336, 339–40, 362
extension of weapons treaties to 327
geographical scope and territorial
boundaries 337
intensity of hostilities 340–41
and international humanitarian law 339–40
organized armed group, involvement of
337–40
‘virtual group’ involvement 338–40
Clinton, H 109, 184
Clough, J 190, 194, 195
corruption use 181–3, 249, 250–52, 253
Cohen, J 14–15, 22
Cohen, M 76
Colarik, A 229
Coleman, G 213, 217
collateral damage
and cyber weapons see ethical challenges of
cyber weapons, collateral damage
dual use function and collateral effects
377–8
international humanitarian law applied to
cyber warfare 373
principle of distinction see under principle
of distinction
principle of proportionality 134–6
see also civilian population
Computer Emergency Response Teams
(CERTs) 221–2, 223, 411, 440–41, 454,
460, 462
Computer Incident Response Capability
(NCIRC), NATO 429, 433, 444
computer systems
botnets and remote control 309, 313, 315,
319
and computer companies as targets, and
principle of distinction 360–61
copyright protection of software see
cyberspace, intellectual property rights,
copyright protection of computer
software
‘digital divide’ and right to development
107–8, 109–10
Distributed Denial of Service (DDoS) 242,
249–50, 259–60, 264, 265, 331, 392
evidence requirements and territorial
location 63–5
facilities, law of neutrality 397, 399
forgery and fraud 196
hackers see hackers
identification and attribution 62–3, 69–70
integrity crimes 191
interconnectivity between military and
civilian systems 131–3
malware 252–3, 257, 261, 308, 309, 312,
313, 444
network attacks 118–20, 186–8, 194
viruses see viruses
WIPO Model Provisions on the Protection
of Computer Programs 84
see also cyber attacks; Internet
Connolly, K 52
Constantinou, A 266
Conti, G 232
Cook, K 339
copyright issues 48, 193, 197
protection of computer software see
cyberspace, intellectual property rights,
copyright protection of computer
software
Corn, G 327
Cornish, P 227
Correa, C 74
Corten, O 237, 243
Costa, J-P 356
Crawford, J 19, 56
Cremona, M 405, 422

Nicholas Tsagourias and Russell Buchan - 9781782547396
Downloaded from Elgar Online at 04/15/2019 12:09:46AM
via free access
crime see cybercrime; international criminal responsibility
Croom, C 230
Cubby, B 159
Curran, J 31
Currie, R 182
cyber attacks
as adjunct to traditional means 370–71
as ‘armed attacks’ 263–70, 272–3, 275, 276, 279–80, 281–2
definitions 346–7, 348
duration of attack 124–5, 129, 330, 332
hackers see hackers
viruses see viruses
see also computer systems; individual countries; Internet
Cyber Conflict Studies Association (CCSA) 289, 296
cyber defence and NATO see NATO and cyber defence
cyber deterrence, and international cooperation, need for strengthening 166
cyber deterrence and public international law 284–304
consequence based approach 300–301
and critical infrastructures 302–3
cyber attacks in support of military attack with conventional means 285
cyber weapons’ use 284
EastWest Institute, A Measure of Restraint in Cyberspace 288–9
imminence of attack 301–2
NATO’s collective defence 291
nuclear-deterrence see nuclear deterrence protection via deterrence 290–91
retaliation via offensive means 291
security against cyber treats 286–90
UN Charter on the threat and use of force 299–302
UN General Assembly (UNGA) and protection of critical information infrastructures 288
US Presidential Decision Directive on cyber capacity 284, 297–8
cyber deterrence and public international law, cyber deterrent feasibility and technical considerations 295–8
nuclear deterrence, differences from 296–7, 299
potential adversaries, identification problems 296
self-defence, both passive and active 297–8, 299, 300–302, 304
terminology problems 297–8
cyber deterrence and public international law, security of critical infrastructures 287–90
Critical Information Infrastructure (CII) 288–9
military security and nuclear power plants 288–9
peacetime protection of critical infrastructures 289
cyber espionage 212, 219–20, 222, 224–6, 230, 311, 316–17, 369, 398–9, 408
cyber espionage and international law 168–89, 180–88
accessing and copying of electronic information 171
coercion and violation of territorial integrity 181–3
definition 170–74
espionage as permissible exception to non-intervention principle 185
Google cyber attack 168, 184
international humanitarian law 172
Mandiant Report 168, 169, 333
non-State actors 172–4
in peacetime 172
principle of non-intervention 180–86
prohibition against use of force and argument for inclusion of computer systems 186–8
sovereignty over information in cyberspace 183–4, 186
sovereignty as protection of territorial and political integrity 182, 183
States’ refusal to accept responsibility for espionage when accused 195–6
Tallinn Manual see Tallinn Manual
transboundary espionage 171–2
UN Charter and prohibition against use of force 186–8
US spy plane incident (Gary Powers) 177
cyber espionage and international law, as threat to international peace and security 174–80
confidential information from private companies 179
espionage inhibits and deters functional cooperation claim 177–8
espionage as tool that enables functional cooperation argument 175–7
human rights violations 179–80
increased knowledge of other States’ capabilities argument 174–5
information storage and speed of access 178–9
international agreements, compliance and verification mechanisms 176–7
national infrastructure information 179
sovereign equality of States 175, 177–8, 179–80
cyber exploitation and cyber attacks, difference between 240–42
cyber network attack (CNA) definition 264
cyber operations 211–32
‘air gap’ protection 212
Budapest Convention (Council of Europe Convention on Cybercrime) 149, 162–3, 192, 193–4, 412, 414, 418
common operational means and methods 217–18
cyber sabotage (cybotage) 212
cyberspace virtual layers 221–2
diversity in strategic objectives 215–17
hackers 212
military cyber operations 212–13, 214, 226–32
military cyber operations, operationalizing 230–32
military cyber operations, ‘targeting’ process 232
national security strategy 215–16
non-profit organizations and pressure groups 217
operationalizing cyber operations 229–32
private enterprises digitally collecting and providing information 211–12, 222
private enterprises supplying tools to enable cyber activities 216, 222
software monitoring 218
State’s critical infrastructure, digital nature of 216
cyber operations, State-level cyber paradigms 218–29
CERTs (Computer Emergency Response Teams) 221–2, 223, 411, 440–41, 454, 460, 462
governance and public-private involvement 222, 223
intelligence and counter-intelligence 224–6, 230
Internet governance and diplomacy 220–21
law enforcement 222–4, 230
military operations 226–9
military operations, ‘adequate’ legal basis requirement 228–9
protection of (critical) infrastructure 221–2
securitization and digital surveillance 219–20, 222
see also ‘State’ headings
cyber operations as a use of force 233–54
Distributed Denial of Service (DDoS) 242, 249–50
HPCR Manual on International Law Applicable to Air and Missile Warfare 238, 240
UN General Assembly conditions 234–5
UN General Assembly’s Declaration on the Definition of Aggression 237
cyber operations as a use of force, as armed force 235–40
arming and training of armed groups as use of force 238
cyberspace as fifth domain of warfare 239–40
effects of the action and direct destructive effects on property 236–7
identified by reference to instruments used
instrument-based approach and use of weapons 236
and intention to coerce 236–8
malware as weapon 238–9, 243, 244–5
target-based approach, conducted against national critical infrastructure (NCI) 236
weapons definition 238
cyber operations as a use of force, UN General Assembly (UNGA) prohibition of use of force 235–6, 237, 238, 240–53
conduct related to cyber attacks and malware supply 252–3
cyber attacks causing physical damage to property, or injury of persons 242–5
cyber attacks severely disrupting the functioning of infrastructures and security 245–50
cyber exploitation and cyber attacks, difference between 240–42
cyber exploitation as violation of sovereignty 241
cyber infrastructure used to launch cyber attack 253
data deletion as use of force, but without physical damage 244–5
disruptive cyber operation as use of force, need to establish 248
economic targets as economic coercion 249
minimum threshold of gravity debate 243–4
serious disruption of essential services without destroying infrastructures 247
significant disruption of essential services 249–50
violation of the principle of non-intervention and use of coercion 250–52, 253
virus attacks 244–5
website defacement 252
cyber security
Asia-Pacific see Asia-Pacific cyber security
cyber attacks severely disrupting, UNGA 245–50
human rights 112–15
intelligence information 224–6, 230, 259
law, EU see EU cybersecurity law
UN regulation see UN and the regulation of cyber security
see also cyber deterrence; cyber terrorism
cyber terrorism 147–67
comprehensive instrument and regulation need 163–7
concept 147–51
data retention schemes 167
definition, lack of an agreed legal 147–8, 152
facilitative acts of terrorism 150–51
and general Internet use by terrorist groups 150
hacking techniques 157, 158
international humanitarian law applied to cyber warfare 369–70
International Telecommunication Union (ITU), model cyber crime legislation 165
international treaty, lack of 149
as new terrorist tactic 148
political motive element and organised crime overlap 149–50
prohibited harms to protected targets 153–4
as prohibited intervention 148–9
regional and national instruments 149, 162–3, 166–7
supervisory control and data acquisition (SCADA) systems 147
Tallinn Manual see Tallin Manual
technical measures, possible necessary 165–6
terrorist groups, lack of perceived threat from 164
UN Draft Comprehensive Anti-Terrorism Convention, terrorist offences definition 155–7, 158, 159, 160, 161–2
UN Global Counter-Terrorism Strategy 151
US excessive intelligence collection methods, criticism of 167
see also cyber security
cyber terrorism, cyber attacks and general terrorism 155–62
civilian population, spreading terror among 160–61
customary international law crime of transnational terrorism 155–6, 158
industrial protest as terrorism, problems with 159–60
international humanitarian law and principles of distinction and proportionality 160–61
private motivation for attacks 158–9
‘special intent’ element 158
State-sponsored cyber attacks 158, 161–2, 164
cyber terrorism, ‘sectoral’ international anti-terrorism conventions 151–5
attacks against protected persons 154
cyber ‘weapon’ concept 154
‘physical attack’ question 153–4
violence understood as physical force 154
cyber warfare 119–20, 408, 436–7, 438
classification see classification of cyber warfare
and humanitarian law see international humanitarian law applied to cyber warfare
war crimes see international criminal responsibility, cyber attacks as war crimes
cyber weapons
concept 154, 284
ethical challenges see ethical challenges of cyber weapons
international criminal responsibility 139
treaties, extension of 327
cybercrime
Cybercrime Convention of the Council of Europe 118
definition 118, 407–8
EU Cybercrime Centre (EC3), EU cybersecurity law 409, 413
EU Cybercrime Convention Committee (T-CY) 418–19
Eurojust cross-border prosecution 409, 412, 413
UN Office on Drugs and Crime (UNODC) 489
see also international criminal responsibility
cybercrime, international legal dimensions 190–207
adjudication and enforcement 201
awareness-raising campaigns 205
child pornography 196–7
comprehensive multilateral instrument, need for 206
computer integrity crimes 191
computer-related forgery and fraud 196
cooperation between States 198–9
copyright issues 193, 197
crimes’ committed in virtual worlds 191
cybercrime definition 190–92
data retention requirements 203
denial of service attacks 195
EU Council of Europe Convention on Cybercrime (Budapest Convention) 149, 162–3, 192–7, 198–9, 200, 202–5, 412, 414, 418–19
EU Framework Decision 162, 192–3, 202–3, 415
harm to property or persons 191
human rights and liberties protection 199, 203–4
illegal interception and protection of privacy of electronic communication 194–5
intellectual property issues 193
international regime to fight cybercrime 198–200
international substantive law 192–8
jurisdiction problems 200–203, 206–7
mutual assistance and extradition 199–200
national legislation and fragmentation 201
offences where a computer system is targeted intentionally 194
penalties for illegal access 194
personal data protection 204
privacy rights 203–4
production and distribution of devices used to commit offences 195–6
safe havens, need for elimination of 206
search and seize powers and territorial issues 199
self-regulation 204–5
service providers, liability and responsibility 203, 205
similar activities with different legalities in different countries 193
sovereignty issues 196–7
spamming 195
State of origin and State of destination conflict 202–3
system interference 195
technical means of protection and preventive measures 204–5
territoriality principle of regulation and enforcement 198–200
UN Convention against Transnational Organized Crime (Palermo Convention) 198, 199
cyberspace
data protection see data protection definition 14–24
as global commons see cyberspace, legal status, cyberspace as global commons
human rights see human rights
law of neutrality see law of neutrality
virtual layers 15, 221–2
cyberspace, infrastructure
ASEAN, ICT infrastructure and capacity development 452–4, 461
collateral damage and malfunction of civilian facilities 349–50, 354
critical infrastructure and essential services, serious disruption of 245–50, 268–70, 302–3, 310, 330–32
cyber infrastructure used to launch cyber attack 253
dual-use of cyber infrastructure and principle of distinction 131–3
property, harm to property or persons, cybercrime, international legal dimensions 191
protection of critical 221–2
secure ICT infrastructure, NATO and cyber defence 433–4
security of critical see cyber deterrence and public international law, security of critical infrastructures
State’s critical infrastructure, digital nature of 216
technological capabilities and cyber infrastructure disparities 449–50
UN General Assembly (UNGA), cyber attacks causing physical damage to property 242–5
cyberspace, intellectual property rights 72–93
Berne Convention 74, 78, 79, 84
cybercrime, international legal dimensions 193
EU intellectual property laws 80–83
EU Unitary Patent Regulation 81, 84
European Patent Convention (EPC) 78, 81, 83–4, 91
in international law 73–7
Paris Convention 74, 78, 80
property and sovereignty, distinction in law
75–7
trade marks and domain names 91–2
TRIPs Agreement 74, 79, 80, 84
Uniform Domain Name Dispute Resolution
Policy (UDRP) 74, 92
cyberspace, intellectual property rights,
copyright protection of computer
software 83–91
‘author’s own intellectual creation’ 85–7
EU Database Directive 84–5
EU Information Society Directive 90–91
EU Software Directive 84, 85–7, 88, 90
idea–expression dichotomy principle 88–9
ISPs and ‘notify-and-take down’ approach
87–8
non-literal copying of software 88
permitted acts with regard to computer
programs 90–91
possible cyber attacks and response of
international law 89–90
protection of computer-related inventions
by patent 191
software originality definition 85–6
WIPO Copyright Treaty 74, 84
cyberspace, intellectual property rights,
territorial nature 77–83
EU copyright law and territoriality principle
81–2
EU supranational laws and harmonisation
of intellectual property laws 80–82
international conventions 78–9
lex loci protectionis 79, 82–3
private international law 82–3
in public international law and intellectual
property law 77–82
relaxation of territoriality principle 79
cyberspace jurisdiction 30–54
competence under public international law
31–5
enforcement jurisdiction 51–3
international law scope 31–3
jurisdictional principles versus legal
harmonisation 34–5
piracy sites, blocking 52–3
self-censorship 53
States claiming regulatory competence in
parallel 33–4
territorial fragmentation of the internet 52–3
territoriality principle and sovereignty 33
transnational corporations, power and
interests of 31
transnational online publishing 30–31
see also cyberspace, legal status; legal
dimensions
cyberspace jurisdiction,
adjudicative/legislative jurisdiction 35–51
advertising and selling drugs 39, 50
copyright claims 48
defamation and data protection 43–5, 47
democratic legitimacy problems 38
destination approach and accessibility
38–44
destination approach and targeting 44–7,
48–9
destination approach under customary
international law 47–9
effects doctrine 48
‘everything that is not prohibited is
permitted’ approach 36–7
free trade commitments 42–3
online gambling 40–42, 47
origin approach 49–51
publishing pornography 39
State’s legal standards 35–6
surfers purchasing artefacts from third
parties 38–9
territoriality principle within non-territorial
cyberspace 37–51
trademark owners 45–6
US due process requirement 47
voluntary compliance or enforcement via
local intermediaries 49
cyberspace, legal status 13–29
cyberspace definition 14–24
cyberspace global domain within the
information environment 15
cyberspace layers 15, 221–2
future challenges 28–9
see also cyberspace jurisdiction; legal
dimensions
cyberspace, legal status, cyberspace as global
commons 24–8
Antarctica, legal status as example 26–7
cyberspace differences from other global
commons 28
high seas designation 25–6
and Outer Space Treaty 26
and sovereignty principle 27–8
cyberspace, legal status, sovereignty and
international law 16–24
activities endangering important national
interests 20
cyberspace as sovereign entity, and
self-determination by community 22–4
deterritorialisation as detachment of regulatory authority from a specific territory 21–2

effects doctrine 20

external sovereignty power 17–18

extraterritorial extension 16–17, 19

indirect exercise 20–21

jurisdiction 18–22

no-sovereignty thesis and self-regulation 16

power concept 18

spill over effects 21

technology regulation 21

territory as element of sovereignty 18, 21

cyberspace, self-defence in 255–83

ad hoc international institutions and rules for the Internet, need for 282–3

against non-State actors 276–80

against non-State actors, and private trans-border harm, difference between 279–80

anticipatory self-defence 270–73

collective self-defence 260, 270, 275–6, 434–7

conditions concomitant to exercise of 273–5
cyber attacks preceded/accompanied a conventional attack 260, 261–2
cyber attacks and unlawful use of force 263
cyber network attack (CNA) definition 264

cyber sanctions 281

cyber security intelligence information sharing with private sector companies, call for 259
cyberspace as interconnection of electronic pathways 256

Distributed Denial of Service (DDoS) 259–60, 264, 265

EU Directive on attacks against information systems 269

immediacy, understanding of 275

industrial control systems, programmable logic controllers 261

information requests and use of private-sector ISPs 264

Institut de Droit International, Santiago Resolution on self-defence 266, 270–71, 277

jus ad bellum legal approach 262–3

legal doctrine, prevailing approaches 262–3

malware 257, 261

National Strategies and Policies on cybersecurity 258–9

NATO, 2010 Strategic Concept 257–8

NATO, 2020 Report on cyber defence 274, 275

NATO Cooperative Cyber Defence Centre of Excellence (CCDCOE) 258

NATO and security challenges to critical infrastructure 270

Non-Aligned Movement (NAM) and anticipatory self-defence 271, 272

proportionality test 274–5

in response to armed attack 369

scepticism over 281–3

and Tallinn Manual see Tallinn Manual

topicality of cyber security 257–9

UN General Assembly Resolution on misuse of information technologies 280

UN Security Council and inherent right to self-defence 277–8

US Patriot Act 269–70

and violation of the principle of non-intervention 261–2

cyberspace, self-defence in, UN Charter Article 51 255, 261

and anticipatory self-defence 271–3

‘critical infrastructure’ targeted by cyber attacks 268–70

customary law applying ‘separately from international treaty law’ 267–8
cyber attacks as ‘armed attacks’ 263–70, 272–3, 275, 276, 279–80, 281–2

and ‘use of force’ 265, 267

cyberspace sovereignty considerations, Asia-Pacific cyber security 447–8, 463

and cyber espionage 175, 177–8, 179–80, 182, 183–4, 186

cyber exploitation as violation of 241

and cybercrime, international legal dimensions 196–7

and cyberspace as global commons 27–8

and human rights 100–101

and intellectual property, distinction in law 75–7

and international law see cyberspace, legal status, sovereignty and international law

Internet freedom and Internet sovereignty contrasts 111

and non-intervention policies 97

and territoriality principle 33

violations, and law of neutrality 380–81, 389, 394–5, 397–8

see also State practice; State responsibility; territoriality

Nicholas Tsagourias and Russell Buchan - 9781782547396
Downloaded from Elgar Online at 04/15/2019 12:09:46AM
via free access
data protection 131, 204, 318, 416–17
backup data use 316
data destruction, and principle of proportionality 375–6
deletion as use of force, but without physical damage 244–5
European Data Protection Supervisor (EDPS) 407–8
Internet and data transmission 398, 399
jurisdiction and defamation 43–5, 47
privacy rights 203–4
retention schemes, and cyber terrorism 167
supervisory control and data acquisition (SCADA) systems 147

De Hert, P 193, 195, 202
Deconinck, G 264
Deeks, A 337
Dehghan, S 261
Dekker, I 295
Delupis, I 185
Demarest, G 170
DeNardis, L 220
Denmark, A 24
Denning, D 157, 164, 312, 314
Derclaye, E 86
Derejko, N 337
Dervan, L 132, 134
deterrence see cyber deterrence
‘digital divide’ and right to development 107–8, 109–10
Dinniss, H 119, 122–3 passim, 143, 236, 263, 345, 346, 347, 351, 356, 361
Dinwoodie, G 73, 75, 78, 79, 80, 82
Dipert, R 309
Distefano, G 355
Doerr, O 139
Döge, J 263
domain names 21–2, 74, 76, 79, 92, 116
Dörmann, K 120, 124, 128, 129, 131, 133, 263, 329, 343, 348, 352
Dörr, O 236, 237
Doswald-Beck, L 238, 327, 348, 385, 387
Drahos, P 72, 74
Dreier, T 74, 78
Drummond, D 168
dual-use function 115, 131–3, 358–62, 377–8
Dulles, J 292
Dunlap, C 262, 359
Dupert, R 261
duration of attack 124–5, 129, 330, 332
Easton, C 72
EastWest Institute, A Measure of Restraint in Cyberspace 188–9, 288–9
Eaton, J 62
economic cooperation see Asia-Pacific cyber security, Asia-Pacific Economic Cooperation (APEC)
economic, social and cultural rights 104–8
economic targets as economic coercion 249
Edwards, L 88
Edwards, S 109
Elisan, C 309
Emerson, R 23
Erdbrink, T 361
Erlank, W 76
espionage see cyber espionage
essential services, serious disruption of 245–50, 268–70, 302–3, 310, 330–32
see also cyberspace, infrastructure
Estonia, cyber attacks 56, 64, 221, 259–60, 262, 276, 335, 349–50, 429, 437–8, 475–6
Estrin, D 341
ethical challenges of cyber weapons 307–25
autonomous propagation methods, avoidance of 317
backup data use 316
botnets and remote control 309, 313, 315, 319
cyber attack damage repair 316–17
cyber espionage to cyber attack escalation 311, 316–17
cyber weapons definition 309–10
infrastructure damage and indirect killing 310
justification for cyber attack 312
malware 308, 309, 312, 313
overkill tendencies 315
peculiarities of cyber weapons and differences from traditional weapons 310–11
Index 501

precision, lack of 308
principle of responsibility for conduct in warfare 316–17
product tampering and perfidy 312–14
prolonged effect of damage 316
system interdependence challenges 311
targeting errors 314–15
traditional counterattacks, combining with 312
unreliability of cyber weapons 314–15
ethical challenges of cyber weapons, collateral damage 317–25
analysis costs and development of mitigation procedures 321–3
attack propagation costs 320–21
attribution methods 322
blocking network services 323
bulletin boards and blogs, use of 322
denial-of-service attacks 319
direct damage, costs of recovering from and costs of repair 320
economic value of attacks 324–5
and information extraction problems 318–19, 321
psychological damage 323–4
types 317–18
vulnerability analysis 323
EU
Copyright Directive 45, 86
copyright law and territoriality principle 81–2
Council of Europe Convention on Cybercrime (Budapest Convention) 149, 162–3, 192–7, 198–9, 200, 202–5, 412, 414, 418–19
Data Protection Directive 44
Database Directive 84–5
Directive on attacks against information systems 269
Electronic Commerce Directive 39, 41, 50–51
Europe-only communication network suggestion 53
exclusive origin rule 50–51
and facilitative acts of terrorism 150–51
Framework Decision on Attacks against Information Systems 162, 192–3, 202–3, 415
Information Society Directive 90–91
intellectual property laws 80–83
Online Music Recommendation 81
privacy and personal data protection 103
Software Directive 84, 85–7, 88, 90
Television Without Frontiers Directive 50
Trade Mark Directive 80
Unitary Patent Regulation 81, 84
website blocking 52
EU cyber security law 403–25
anti-terrorism measures 424
Area of Freedom, Security and Justice (AFSJ) 405, 410–11, 413, 415, 420, 421, 424
CERT (Computer Emergency Response Team) 411
Common Foreign and Security Policy (CFSP) 413, 414, 419, 421–4
Common Security and Defence Policy (CSDP) 403, 413, 420–24
counterterrorism 411
core EU values, inclusion of 411
Council of Europe Convention on Cybercrime (Budapest Convention) 149, 162–3, 192–7, 198–9, 200, 202–5, 412, 414, 418–19
cyber espionage 408
cyber resilience 408, 412
cyber security and cybercrime definitions 407–8
cyber war 408
Cybercrime Convention Committee (T-CY) 418–19
cybercrime reduction strategies 412–13
differing policy fields, need for combination of 405
Digital Agenda for Europe (DAE) 411
EU Commission Communication, ‘Network and Information Security’ 410, 411
EU Cybercrime Centre (EC3) 409, 413
EU Cybersecurity Strategy 411–14
Eurojust cross-border prosecution of cybercrime 409, 412, 413
European Data Protection Supervisor (EDPS) 407–8
European Information Sharing and Alert System (EISAS) 409
European Network and Information Security Agency (ENISA) 409, 411, 412
European Police College (CEPOL) 413
European Public-Private Partnership for Resilience (EP3R) 410
European Security Strategy 411
Europol support 408–9, 412, 413

Nicholas Tsagourias and Russell Buchan - 9781782547396
Downloaded from Elgar Online at 04/15/2019 12:09:46AM
via free access
information sharing and mutual assistance
institutional framework
international cyberspace policy, establishment of coherent
Internet regulation
Lisbon Treaty
policies on cybercrime and cybersecurity
principle of conferral
private actor involvement
States’ operational capability, strengthening
Stockholm Programme
technological resources, development of
TEU mutual defence clause
TEU ‘non-contamination clause’
TEU, ‘Union’s External Action’
TFEU data protection rules
TFEU on establishment and functioning of the internal market
TFEU on judicial cooperation in criminal matters
TFEU solidarity clause
see also European Court of Human Rights (ECtHR); European Court of Justice (CJEU)
EU cyber security law, legal basis choice and role of Court of Justice
‘centre of gravity’ approach
comprehensive approach, need for
cyber defence issues
principle of consistency
EU cyber security law, legal instruments, fragmentation in
Directive proposal for measures to ensure a high common level of network and information security
EU Framework Decision on attacks against information systems
European Parliament and solidarity clause
General Data Protection Regulation proposal
judicial cooperation
mainstream cyberspace issues into EU external relations proposal
Regulation proposal on electronic identification and trust services for electronic transactions
European Convention on Human Rights (ECHR)
Balan v Moldova
Infopaq
intellectual property rights
national differences on freedom of expression
originality for computer programs and databases
Yıldırım v Turkey
see also EU cybersecurity law
European Court of Justice (CJEU)
Donner (Free Movement of Goods)
ECOWAS (Small Arms and Light Weapons)
European Parliament v Council of the European Union
Gambelli
Google Spain v Agencia Española de Protección de Datos
Mauritius
Panmer and Hotel Alpenhof
Pinckney v KDG Mediatech
type of see EU cybersecurity law, legal basis choice and role of Court of Justice
Wintersteiger v Products
see also EU cybersecurity law
European Network and Information Security Agency (ENISA)
European Parliament and solidarity clause
European Patent Convention (EPC)
etradition
see also Snowden (Edward) revelations
Fanelli, R
Fassbender, B
Fawcett, J
Feakin, T
Fedosov, S
Feinstein, L
Fenrick, W
Ficsor, M
Fidler, D
Fleming, P
Flory, P
Index 503

Focarelli, C 75, 148, 188, 226, 228, 241, 255–83, 300, 312
Føllesdal, A 404
Foltz, A 330
force
  armed force and conflict see armed force and conflict
cyber operations as use of see cyber operations as use of force
Forcese, C 185
Ford, C 468
Forowicz, M 134
Forseberg, T 18
France 38, 78, 110
Franck, T 277
Franzese, P 182
Freedman, A 330
France, cyber operations as use of see cyber operations as use of force
Gable, K 165
Garcia-Mora, M 185
Gardam, J 301
Garside, J 52
Gasser, H-P 161
Gattegno, I 164
Gazmin, V 450
Geers, K 342
Geiss, R 125, 132, 133, 134, 135, 137, 341
Gellman, B 115
Geneva Conventions
  armed conflict and attack 122, 123–4, 142, 241–2, 282, 327, 328, 329, 352, 367–8, 371–2, 376, 398
civilians taking ‘direct part in hostilities’ 128
collateral damage to civilian objects 373, 374
  and international humanitarian law 120, 129, 130, 131, 134, 135, 136, 137, 172, 343, 371–2
  non-international armed conflict 126, 161, 336, 339–40, 362
  principle of distinction 130, 133, 344, 345, 362
  principle of precaution 136, 137
  principle of proportionality 134, 135
Germany 38, 39–40, 41, 43
  and US NSA cyber espionage 62–3, 113, 178, 179–80, 184, 473
Gervais, M 138–9
Gharibi, H 234
Gibson, W 22
Gill, T 134, 149, 161, 183, 214, 224, 226, 228, 307, 308, 311, 314, 316, 361, 366–79
Gillett, M 138
Gioia, A 390
Gjelten, T 97, 307, 309, 436
Glennon, M 278, 346
global commons see cyberspace, legal status, cyberspace as global commons
Global Network Initiative (GNI) 115
Goel, S 307
Goetz, M 212
Goldsmith, J 13, 16, 21, 119, 125, 126, 131, 139, 187, 241
Gombeer, K 281
Goodman, S 448
Google cyber attack 168, 184
Gorman, S 324, 332
Gosnell Handler, S 236
Govaere, I 404
Grabber, C 21
Graham, M 256
Gray, C 271, 274
Green, L 385
Greenberg, L 358, 361
Greenwald, G 284, 297
Greenwood, C 120, 277, 329, 368
Griller, S 420
Grimm, D 23
Gross, D 256
Gross, M 308
Grotius, H 25, 76
Guelff, R 385
Guitton, C 330

Haaster, J van 23, 211, 227, 230, 231
hackers 56, 157, 158, 213, 334–5, 348–9, 398
  see also botnets and remote control; malware; virus attacks
Hagopian, A 310
Hague Convention 134, 327, 385–7, 391, 393, 394, 396–7, 398, 399
Hannifah, A 448
Hankel, G 134
Hanspach, M 212
Hardin, G 28
Hardin, R 339
Hardt, S 228
Haslam, E 123, 124
Hathaway, O 118, 122, 125, 126, 127, 131, 135, 139, 347, 466, 476, 478
Healey, J 219, 223, 428
Heath, K 75, 147–67, 191
504  *Research handbook on international law and cyberspace*

Heckathorn, D 339
Heinl, C 447, 449, 450, 453, 455
Heinsch, R 140
Heintschel von Heinegg, W 241
Heliskoski, J 422
Henckaerts, J-M 130, 238, 327, 348
Henderson, C 257, 432, 460, 465–90
Herdegen, M 246
Herman, M 174
Her, A 331
Herrera, G 21
Hervik, P 35
Hessbruegge, J 66
Hestermeyer, H 355
Hider, J 261
Hildebrandt, M 26
Hillion, C 405, 420, 421, 423
Hinkle, K 123, 125, 126
Hmoud, M 280
Hong, X 79
Hörnle, J 50, 82
Horsley, T 420

*HPCR Manual on International Law Applicable to Air and Missile Warfare* 238, 240

Hugenholtz, B 78, 81
human rights 94–117
cybercrime and liberties protection 199, 203–4
cyberspace and general principles of international law 98–9
‘digital divide’ and right to development 107–8, 109–10
economic, social and cultural rights 104–8
International Covenant on Economic, Social and Cultural Rights (ICESCR) 104–7
Internet access as new human right 109–10
right to freedom of expression and national differences 100–102, 110
and sovereignty 100–101
UN ‘Right to Privacy in the Digital Age’ draft resolution 113
violations, and cyber espionage 179–80
see also international humanitarian law
human rights, civil and political rights 99–104
authoritarian government restriction 102
Freedom House report 102, 114
Internet censorship 100–102
right to privacy and national differences 103–4
human rights, international relations and cyberspace 110–16
authoritarian government threats 112–13
cyber security 112–15
extraterritorial application of right to privacy 114
Global Network Initiative (GNI) 115
Internet freedom and Internet sovereignty contrasts 111
Internet governance 111–12
private enterprise and cyber technologies 115–16
Wassenaar Arrangement on Export Controls and ‘dual use’ ICT technologies 115
human rights, Internet technology and international politics
communication technologies, evolution of 95–6
cyberspace connection with human rights 96–7
military potential of the Internet 97
packet switching 95–6
sovereignty and non-intervention policies 97
US political dominance 96, 97, 113–14
Hunter, D 24
Huntley, T 187
Huntsman, J 223
Hurt, C 40
Hutchins, E 229–30

ICANN (Internet Corporation for Assigned Names and Numbers) 21–2, 74, 76, 79, 116
ICRC see International Committee of the Red Cross (ICRC)
identification problems see attribution
Imburgia, J 346
indiscriminate attacks see principle of distinction, relevance of, prohibition of indiscriminate attacks in cyberspace
industrial protest as terrorism, problems with 159–60
information
access, cyber espionage and international law 171, 178–9
Critical Information Infrastructure (CII) 288–9
EU Commission Communication, ‘Network and Information Security’ 410, 411
EU Directive proposal on information security 415–16
European Information Sharing and Alert System (EISAS) 409
European Network and Information Security Agency (ENISA) 409, 411, 412
extraction problems, and ethical challenges 318–19, 321
illegal interception and protection of privacy 194–5
industry cooperation and information sharing 444
NATO Communications and Information (NCI) Agency 431–2
private sector involvement in information sharing 179, 211–12, 222, 259, 264
sovereignty over 183–4, 186
see also cyber security
infrastructure see cyberspace, infrastructure
Inkster, N 112
Institut de Droit International, Santiago Resolution on self-defence 266, 270–71, 277
intellectual property rights see cyberspace, intellectual property rights
intelligence see cyber espionage
intensity of attack 124–5, 330, 332, 340–41
Inter-American Court of Human Rights idea–expression dichotomy 89
Velasquez-Rodriguez 66–7
international armed conflict, classification see classification of cyber warfare, international armed conflict
International Committee of the Red Cross (ICRC)
armed conflict definition 329
customary law status 136
‘effective contribution’ requirement 130–31, 134, 335
intensity threshold 340–41
Interpretive Guidance on the Notion of Direct Participation in Hostilities 362–3, 372
non-international armed conflict 336–7, 340
weapons definition 238
International Court of Justice (ICJ)
Armed Activities in Congo 270
Arrest Warrant Case (Democratic Republic of Congo v Belgium) 19, 20
‘author’s own intellectual creation’ 86–7
Bosnian Genocide 57, 59, 60, 68, 70, 278, 334, 352
Congo v Uganda 67–8
Corfu Channel Case (UK v Albania) 17, 63–4, 66, 67, 182, 250, 254, 279, 333, 394–5
Declaration of Independence of Kosovo 37, 65
due diligence disputes 67–9, 394–5
Fisheries Jurisdiction (Spain v Canada) 244
Gabčíkovo-Nagymaros Project (Hungary/Slovakia) 279, 355
Legality of the Threat or Use of Nuclear Weapons 123, 235, 238, 265, 267, 271–2, 279, 293–5, 299, 301, 303, 343–4
Martens Clause and protection and authority of the principles of international law 344
Navigational and Related Rights (Costa Rica v Nicaragua) 246–7, 355
Nicaragua 60, 64, 65, 126, 175, 180–81, 182, 186, 233, 236–8, 242–3, 250, 252, 253–5, 266, 267, 273–5, 278, 301, 334, 376–7
Nottenbohm Case (Lichtenstein v Guatemala) 19
Oil Platforms (Islamic Republic of Iran v United States) 265, 267, 273, 275
on principle of non-intervention 251, 253
Pulp Mills (Argentina v Uruguay) 69, 279
SAS Institute v World Programming Ltd 90
on self-defence against non-State actors 276, 277
US Diplomatic and Consular Staff in Tehran 57, 67, 333, 335
International Covenant on Civil and Political Rights (ICCPR) 100, 101, 103–4, 114, 199
International Covenant on Economic, Social and Cultural Rights (ICESCR) 104–7
international crime of terrorism see cyber terrorism, cyber attacks and general international crime of terrorism
International Criminal Court (ICC) ‘act of aggression’ 137, 138–41
crimes against humanity 141–2
jurisdiction 120, 126
war crimes definition 121
international criminal responsibility 118–43
attribution of attack to one of the parties to the conflict 125–6, 129
computer network attacks (CNAs), overview 118–20
cyber attacks and crimes against humanity 141–2
cyber warfare definition 119–20
cybercrime definition 118

Nicholas Tsagourias and Russell Buchan - 9781782547396
Downloaded from Elgar Online at 04/15/2019 12:09:46AM
via free access
International Criminal Court see
International Criminal Court (ICC)
international criminal responsibility concept 120
jurisdiction for cyber attacks 120
Tallinn Manual see Tallin Manual
see also cybercrime
international criminal responsibility, cyber
attacks and crime of aggression 120, 137–41
‘act of aggression’ 137, 138–41
leadership clause 137–8
use of any weapons 139
use of armed force 138–9
international criminal responsibility, cyber
attacks as war crimes 121–37
armed conflict, existence of 121–6
civilians lose immunity from attack if they
take ‘direct part in hostilities’ 128
cyber attacks causing excessive collateral
damage and principle of
proportionality 134–6
data as a protected object 131
delimitation problems and principle of
distinction 130–31
determining whether armed force has been
applied 122–3
dual-use of cyber infrastructure and
principle of distinction 131–3
duration of participation 124–5, 129
and Geneva Convention see Geneva
Convention
geographical scope of armed conflict 126–7
intensity of attack 124–5
interconnectivity between military and
civilian computer systems 131–3
international humanitarian law (IHL)
principles 129–37
minor disruptions 124
principle of distinction 130–33, 135
principle of precaution 136–7
principle of proportionality 134–6
prohibition of indiscriminate attacks and
principle of distinction 133
quality of attacks 124–5
responsible agent 127–9
violent effects of CNA producing lasting
harmful result 123–4
International Criminal Tribunal for the Former
Yugoslavia (ICTY)
armed conflict definition 121–2
Prosecutor v Tadić 60, 121, 125, 126, 127,
278, 327, 328, 334, 335, 336–7, 345,
348, 368, 384
international humanitarian law
and classification of cyber warfare 326–7,
331–2, 335, 336, 339–40
international criminal responsibility, cyber
attacks as war crimes 129–37
principal of distinction see principle of
distinction
see also human rights
international humanitarian law applied to
cyber warfare 366–79
attacks of a perfidious nature, banning of
374
collateral effects and feasible precautions
373
conducting of attacks, law of armed
conduct relating to 371–4
cyber attacks as adjunct to traditional means
370–71
cyber surveillance and espionage 369
cyber terrorism 369–70
Geneva Convention see Geneva Convention
geographical scope of armed conflict 368–9
International Humanitarian Law or Law of
Armed Conflict (IHL/LOAC) 366–71
non-international armed conflicts 368
principle of distinction 372
principle of proportionality in attacks
against civilians or civilian objects
372–3
prohibition of means of attack not directed
at specific military objectives 373–4
rules relating to the targeting of persons and
objects 372
self-defence in response to armed attack
369
stand-alone cyber attacks 369–70
targeting of objects directly converted into a
military function 374
weapons or methods of combat which
would cause superfluous injury to
enemy combatants, restrictions on 374
international humanitarian law applied to
cyber warfare, principle of
proportionality in attacks employing
cyber weapons 374–8, 379
any attack not reasonably likely to cause
physical effects upon civilians or
civilian objects 376–7
data destruction 375–6
dual use function and collateral effects 377–8
military ‘information operations’ not considered as attack 375
operations considered as mere inconvenience 375
International Law Commission (ILC) 57–9, 66, 125–6
international law and cyber espionage see cyber espionage and international law
International Multilateral Partnership Against Cyber Threats (IMPACT) 257
international obligation breach, and State responsibility see State responsibility, international obligation breach
international peace and security threat, cyber espionage see cyber espionage and international law, as threat to international peace and security
international relations, and cyberspace see human rights, international relations and cyberspace
international substantive law, and cybercrime 192–8
International Telecommunication Regulations (ITRs) 111–12
International Telecommunication Union (ITU) 165, 257
International Tribunal of the Law of the Sea (ITLOS), due diligence concept 66
Internet
access as new human right 109–10
blocking network services 20, 319, 323
censorship 100–102
and cyberspace, differences in meaning 55–6
and data transmission, law of neutrality 398, 399
domain names 21–2, 74, 76, 79, 92, 116
freedom and Internet sovereignty contrasts 111
general use by terrorist groups 150
'Internet sovereignty' perspective 98
neutrality 476
online gambling 40–42, 47
regulation 111–12, 220–21, 406
service providers, liability and responsibility 203, 205
social networks as targets 361
technology, and human rights see human rights, Internet technology and international politics
territorial fragmentation 52–3

see also computer systems; cyber attacks
Iran 169, 182, 390
Iran–US Claims Tribunal, Yeager v Islamic Republic of Iran 60–61
Stuxnet attack 56, 133, 153, 212, 243, 261, 288, 308, 310, 315, 316, 318, 322, 324, 330, 361, 370, 376–7, 466
Iraq 141, 350, 390–91
Israel 276–7, 285, 341
Jacobs, D 61
James, A 16
Jamnejad, M 183, 250, 252
Janczewski, L 229
Japan 448
Jaycox, M 223
Jennings, P 446
Jennings, R 182, 186
Jensen, E 268, 291, 327, 361, 397
Jewkes, Y 157
Johnson, D 2, 13, 16, 37–8
Johnson, R 245
Jordan, D 227
Jouhert, V 429, 435
Joyner, C 236, 265
jurisdiction see cyberspace jurisdiction
Kaesling, K 81
Kahn, J 296
Kamal, A 29
Kammerhofer, J 277
Kanuck, S 19
Kaplan, D 308
Kastenberg, J 392
Kastner, P 148, 149, 190–207, 223, 265, 407, 460, 466
Katz, J 283
Kaurin, P 317
Kegel, O 78
Keller, H 134
Kelsey, J 343, 346, 353, 360, 361, 396
Kemp, G 139
Ker, P 159
Kerr, O 201
Kessler, O 119, 123, 125, 139
Keyser, M 418
Kimmel, P 324
kinetic effects equivalency (KEE) test see principle of distinction, relevance of, kinetic effects equivalency (KEE) test
Kingbury, K 324
Kirkpatrick, D 219
Kirsch, S 156
508 Research handbook on international law and cyberspace

Kleinwächter, W 95, 97
Klimburg, A 218, 418, 428, 442
Knake, R 188, 253, 260, 317
Koepsell, D 14
Koh, H 14, 56, 63, 187–8, 234, 242, 243, 263, 351
Kohl, U 18, 20, 30–54, 72, 79, 183, 190, 200, 201, 226
Kolasky, R 331
Kolb, A 88
Koops, B-J 223
Korns, S 392
Korzak, E 330
Kostic, D 140
Koufa, K 151, 157
Koutrakos, P 413, 420
Kramer, E 255
Krska, J 119–20
Krasner, S 17
Kreß, C 140, 141
Kuehl, D 15
Kuhrs, C 380
Kunig, P 181, 182, 252
Kur, A 74, 78
Kurbalija, J 220
Kurlantzick, J 456
Kwon, H 449, 457
Lahmann, H 132, 133, 134, 135, 137
Lancaster, J 212
Landler, M 259
Lanz, C 389
Larik, J 405
Lauterpacht, H 57, 236
law of neutrality 380–400
belligerent’s right to use force to counter violations of State’s neutrality 394
computer facilities 397, 399
cyber activity attribution problems and due diligence 394–5
cyber context 391–9
cyber context, expressly applicable rules 392–4
cyber espionage and communication with belligerents 398–9
Georgia, South Ossetia War and website hacking 381–2
Hague Convention 134, 327, 385–7, 391, 393, 394, 396–7, 398, 399
Internet and data transmission 398, 399
Iraqi invasion of Kuwait and modified nature of neutrality 390–91
law of armed conflict (LOAC) 396–9
neutrality definition 382–4
non-belligerency practice 384
non-discrimination principle 387, 388–9
non-participation principle 387–8
permanent neutrality position 382–3
sources in customary international law 381, 385–7
Tallinn Manual see Tallinn Manual
temporary neutrality 383–4
territorial sovereignty violations 380–81, 389, 394–5, 397–8
UN Charter regime and Security Council Resolution effects 389–91, 393, 394, 395
Lawson, S 222, 370
League of Arab States Convention 196, 197, 200, 202–3
Lee, D 250
Lee, Y 448
legal dimensions of cybercrime see cybercrime, international legal dimensions
law of neutrality see law of neutrality
military operations, ‘adequate’ legal basis requirement 228–9
self-defence in cyberspace 262–3
see also cyberspace jurisdiction; cyberspace, legal status
Leiner, R 95
Lemley, M 75
Lessig, L 15, 16
Levie, H 329–30
Lewis, J 446, 449, 463
Libicki, M 290, 297, 323
Lieber, F 344
Lieber, K 293
Liefländer, T 274
Lin, H 118, 119, 122, 123, 132, 241, 249, 269, 308
Liptak, A 36
Lisbon Treaty, EU cybersecurity law 403–4, 413, 416, 420–21
Loewenheim, U 84
Lombois, C 34
Lotriente, C 236, 265
Lowe, A 48
Lowe, V 37, 397
Lubell, N 119, 120, 123, 124, 129, 131, 276, 337
Lucarelli, E 256
Lucas, G 261
Luijff, E 219, 223
Lülf, C 120, 123, 127
Lynch, C 113
Lynn, W 258
MacAskill, E 284, 297
McBurney, P 240
McClure, R 119
McConnell, B 285, 286, 288, 289, 291
McConnell, M 262
Malin, C 309
malware 252–3, 257, 261, 308, 309, 312, 313, 444
see also hackers
Mandiant Report 168, 169, 333
Mann, F 19, 32
Marauhn, T 427
Markoff, J 255, 259, 392
Marsden, C 406
Martin, C 190
Masli, U 449
Mason, S 358
Matera, C 406
Maurer, T 468, 470, 471, 474, 475, 481, 487, 488
Maybaum, M 229
Mayer, F 406, 418
Mégret, F 148, 149, 190–207, 223, 265, 407, 460, 466
Melnitzky, A 179, 187
Melzer, N 119, 122, 123, 124, 125, 128, 129, 131, 138, 244, 247, 329, 348, 353, 354, 362, 363
Mendez, F 410
Meyer, D 256
Meyer, J 359
Meyer, P 466, 473, 481
military operations
  cyber attack in support of conventional 260, 261–2, 285
  cyber operations directed against civilians see principle of distinction, relevance of, prohibition of military cyber operations directed against civilians cyber operations, notion of 212–13, 214, 226–32
  ‘information operations’ not considered as attack 375
  and Internet technology 97
  principle of distinction 358–9
  security against cyber treats 286, 288–9
  targeting of objects directly converted into military function 374
Miquelson-Weismann, M 197, 199, 204
Mirtl, P 218
Miryousefi, A 234
Monar, J 405
Moore, J 271, 388
Morgan, P 290, 303
Morley, D 30
Morozov, E 102
Morris, N 63
Moseley, A 311
Mueller, B 189
Müllerson, R 233
Mulvenon, J 24, 287, 289, 296
Murphy, J 180, 189, 244
Murphy, T 25
Mutz, G 32
Myers, S 277
Myjer, E 256, 284–304
Nakashima, E 115, 249, 333, 361
Nasu, H 446–64
national involvement see State practice; State responsibility
NATO
  2010 Strategic Concept 257–8
  2020 Report on cyber defence 274, 275
  collective defence 291
  collective self-defence 260, 270
  Cooperative Cyber Defence Centre of Excellence (CCDCOE) 258
  information security initiatives 70
NATO and cyber defence 426–45
  Allied Command Operations (ACO) 432
  CERTs (Computer Emergency Response Teams) 440–41
  Communications and Information (NCI) Agency 431–2
  Computer Incident Response Capability (NCIRC) 429, 433, 444
  Consultation, Control and Command (NC3) Board 431
  Cooperative Cyber Defence Centre of Excellence (NATO CCD COE) 441, 442
  Cyber Defence Management Board (CDMB) 431, 432, 439
  Cyber Defence Programme (Prague Capabilities Commitment) 429
  Euro-Atlantic Disaster Response Coordination Centre (EADRCC) 438
  exercises 432, 440–41, 443
  governance 430–32
  industry cooperation and information sharing 443, 444
international organizations, liaison with 429–30, 430, 437
Malware Information Sharing Platform (MISP) 444
NATO decision and NATO operation, meanings of 428
North Atlantic Council (NAC) 430–31, 435, 437
Policy on Cyber Defence 429, 430, 437–8, 439–40, 442
Rapid Reaction Teams (RRTs) 439–40
Science for Peace and Security Programme 442
Strategic Concept for the Defence and Security of the Members of NATO 429–30, 432, 434–6
see also Estonia; Georgia
NATO and cyber defence, key aspects 432–43
assistance to Member States and Memoranda of Understanding (MoUs) 439–40
civil crisis management 438–9
consultation 437–8
cyber crisis management 434–40
cyber defence cooperation 442–3, 444
cyber warfare perceptions 436–7, 438
defence of NATO’s own networks 432–4
exercises to ensure preparedness 440–41
secure ICT infrastructure 433–4
strategic ambiguity on concept of ‘armed attack’ 435
training, education, and research 441–2
Nemerofsky, J 186
Netherlands 41, 216, 225, 227, 331
Neumann, P 215
neutrality law see law of neutrality
New Zealand 41, 448
Newton-Small, J 253
Nollkaemper, A 61
Non-Aligned Movement (NAM) and anticipatory self-defence 271, 272
non-international armed conflict
classification of cyber warfare see classification of cyber warfare, non-international armed conflict
international humanitarian law applied to cyber warfare 368
non-intervention principle see principle of non-intervention
non-State actors involvement 172–4, 276–80, 449–50
Noyes, M 307
nuclear deterrence
 differences from cyber deterrence 296–7, 299
strategy see cyber deterrence and public international law, nuclear-deterrence strategy (strategy of massive retaliation)
nuclear security 272, 288–9
Nunziato, D 100
Nye, J 28, 286
Obama, B 164
O’Connell, M 56, 70, 255, 261, 263, 278, 281, 282, 289, 437
O’Donnell, B 119–20
O’Driscoll, M 384, 388
Oehmichen, A 156
Oeter, S 131
Olásolo, H 134
Olzak, T 229
Omanovic, E 115
Onuf, N 17
operations, cyber see ‘cyber operations’ headings
Ophardt, J 137, 140, 346
Opsahl, K 223
Owens, W 242, 247, 286
Palojärvi, P 242
Panetta, L 333
Paris Convention, intellectual property rights 74, 78, 80
Parizo, E 259
Parks, W 175
Pastukhov, O 92
Pateraki, A 414, 417
Pauli, D 147
Paulus, A 139–40, 141
peace time
 cyber espionage and international law in 172
 protection of critical infrastructures 289
Pelican, L 176–7
perfidy 129, 312–14, 357
Permanent Court of International Justice (PCIJ)
Factory at Chorzów (Indemnities) 57
Lotus 18, 19, 20, 21, 36, 37, 48, 51, 65, 181, 344
Oder River Commission 279
S.S. ‘Wimbledon’ 28
Pernik, P 398
persons, attacks on see civilian population
Index 511

critical date for assessment of existence of attack 350
interference with functionality as damage 351–2
limits of 349–53
problem of assessment of damage 349–51
principle of distinction, relevance of, prohibition of indiscriminate attacks in cyberspace 357–64
‘civilianization’ of war 358
computers and computer companies as targets 360–61
‘direct participation in hostilities’ interpretation 362–4
dual-use objects, distinction between civilian objects and military objectives 358–62
identification problems and protection of civilians 362–4
Internet and social networks as targets 361
military objectives definition 358–9
prohibition of perfidy 357
‘war-sustaining’ installations 359–60
principle of non-intervention

principle of precaution, cyber attacks as war crimes 136–7
principle of proportionality
cyber attacks as war crimes 134–6
international crime of terrorism 160–61
and international humanitarian law see international humanitarian law applied to cyber warfare, principle of proportionality in attacks employing cyber weapons
self-defence in cyberspace 274–5
Prislan, V 26
private motivation for attacks 158–9
private persons or entities, acts of, and State responsibility 60, 61
private sector
classification of cyber warfare 334–5
cyber espionage and confidential information sharing 179, 259, 264
and cyber technologies 115–16, 195–6, 211–12, 216, 222, 223

principle of distinction, relevance of, kinetic effects equivalency (KEE) test 348–9
acts of violence 348–9
collateral damage and malfunction of civilian facilities 349–50, 354
computer system hacking as attack 348–9

principle of conferral, EU cybersecurity law 405, 419–20
principle of distinction and dual-use of cyber infrastructure and armed conflict law 345
cyber attack definitions 346–7, 348
cyber-psychological operation (PSYOP) and denial of services 354
effectiveness in cyberspace 347–8
Geneva Conventions 130, 133, 344, 345, 362
Lieber Code 344
Martens Clause 344, 356
prohibition of cyber attacks against the civilian population and objects 346–53
prohibition of military cyber operations directed against civilians 353–7
principle of distinction, relevance of, kinetic effects equivalency (KEE) test 348–9
acts of violence 348–9
collateral damage and malfunction of civilian facilities 349–50, 354
critical date for assessment of existence of attack 350
interference with functionality as damage 351–2
limits of 349–53
problem of assessment of damage 349–51
principle of distinction, relevance of, prohibition of indiscriminate attacks in cyberspace 357–64
‘civilianization’ of war 358
computers and computer companies as targets 360–61
‘direct participation in hostilities’ interpretation 362–4
dual-use objects, distinction between civilian objects and military objectives 358–62
identification problems and protection of civilians 362–4
Internet and social networks as targets 361
military objectives definition 358–9
prohibition of perfidy 357
‘war-sustaining’ installations 359–60
principle of non-intervention
cyber espionage and international law, international law application 180–86
law of neutrality 387–8
sovereignty and non-intervention policies 97
violation 250–52, 253, 261–2
principle of precaution, cyber attacks as war crimes 136–7
principle of proportionality
cyber attacks as war crimes 134–6
international crime of terrorism 160–61
and international humanitarian law see international humanitarian law applied to cyber warfare, principle of proportionality in attacks employing cyber weapons
self-defence in cyberspace 274–5
Prislan, V 26
private motivation for attacks 158–9
private persons or entities, acts of, and State responsibility 60, 61
private sector
classification of cyber warfare 334–5
cyber espionage and confidential information sharing 179, 259, 264
and cyber technologies 115–16, 195–6, 211–12, 216, 222, 223

Nicholas Tsagourias and Russell Buchan - 9781782547396
Downloaded from Elgar Online at 04/15/2019 12:09:46AM
via free access
512 *Research handbook on international law and cyberspace*

engagement, Asia-Pacific Economic Cooperation (APEC) 461-2
involvement, EU cybersecurity law 410, 412
property
infrastructure *see* cyberspace, infrastructure
intellectual *see* cyberspace, intellectual property
rights
public international law
and cyber deterrence *see* cyber deterrence
and public international law
and intellectual property 77–82

Rahmatian, A 72–93, 226
Randelzhofer, A 139
Raymond, D 318
Reed, T 351
Rees, N 447, 450, 457
regulation
comprehensive multilateral instrument, need
for 206
cyber terrorism, comprehensive instrument
and regulation need 163–7
Internet 111–12, 220–21, 406
*see also* ‘legal’ headings
Reinold, T 276, 277
Reitman, R 112
Reydam, L 34
Rid, T 232, 240, 243, 285, 288, 289–90, 296,
298, 367, 369, 370, 377, 437
Roberts, A 385
Robins, K 30
Robinson, N 404
Rona, G 278
Ronzitti, N 233, 390
Rosati, E 86
Roscini, M 75, 148, 187, 224, 226, 228,
233–54, 262, 263, 264, 265, 268, 275,
282, 299, 312, 331, 466
Ross, M 417
Rotman, M 219
Rowe, N 307–25
Ruggie, J 18
Russia 70, 111, 114, 277–8, 457, 478
*see also* Estonia; Georgia
Russo, F 390
Ryngaert, C 20, 32, 33
Safferling, C 140
Sanger, D 212, 218, 360
Sassoli, M 360
Satzger, H 139
Saudi Arabia 244–5, 330
Saul, B 75, 147–67, 191
Scassa, T 182
Schabas, W 141
Schachtman, N 262, 426, 436
Schaller, C 175
Schell, B 190
Schiller, H 30, 31
Schjoldberg, S 206
Schmitt, E 334
Schmitt, M 1–9, 118, 123–31 *passim*, 138,
139, 149, 187, 214, 240, 246, 253, 255,
263, 264, 267, 268, 270, 273, 276, 280,
299–301, 302, 326, 329, 338, 339, 341,
347, 352, 353–4, 359, 361, 363–4
Tallinn Manual *see* Tallinn Manual
Schreier, F 240
Schriever, N 26
Schultz, T 20, 398
Schwartz, P 104
Scoville, H 175
security *see* cyber security
Segal, A 311
Segura-Serrano, A 246
Seidl-Hohenveldern, I 78
self-censorship, jurisdiction in cyberspace 53
self-defence in cyberspace *see* cyberspace,
self-defence in
Serbia and Montenegro 350
Shachtman, N 392
Shackelford, S 263
Shafer, G 332
Shakarian, P 392
Shamah, D 332
Shanahan, L 160
Shanker, T 334
Sharp, W 236
Shaw, M 32, 394
Shearer, I 34
Sheldon, J 436
Shelling, T 296
Sherman, B 86
Sikkink, K 489
Silver, D 139, 237
Simma, B 255
Simpson, B 381, 399
Singel, R 262, 437
Singer, D 426–7
Singer, P 213, 262, 426
Slaughter, A-M 277
Smith, G 48
Smith, J 185
Smith, M 215
State responsibility, international obligation breach 65–70
cooporation and concerted action, need for 70, 71
due diligence violation 66–9, 71
grounds for establishing responsibility 66
lack of consensus on 65
notification selection criteria 69–70
Steiger, D 131–2, 247
Stohl, M 148, 150
Stone, J 175
Stone Sweet, A 409, 420
Stout, C 324
Strate, L 22
Strawser, B 312, 314
Sulmasy, G 185
Swaine, J 260
Swanson, L 119, 123, 260
Syria 158, 260, 360, 361, 370, 371, 376
Tadjdeh, Y 427
Tallinn Manual
cyber attack definition 348, 374, 376
cyber operation as use of force 188, 242, 245, 250, 252–3, 299–301, 302, 328, 329, 330, 335
cyber operations against civilians 353–4, 363, 375
cyber terrorism 161
cyber warfare and the applicability of international law 366, 475
dual-use entities as military targets 361
interference with functionality as damage 351
international criminal responsibility 119–20, 123, 124, 127–39passim, 141
law of neutrality 386–7, 392–3, 394–5, 397, 398, 399
non-international armed conflicts 369
organization criterion 338
and self-defence 265, 273, 369
standard of the reasonable commander/combatant 373
State responsibility, attribution in cyberspace 63
Taubman, A 72, 74
Taylor, P 18
technology and cyber deterrence see cyber deterrence and public international law, cyber
deterrent feasibility and technical considerations

Index 513
cyber deterrent feasibility and technical considerations 297–8
and cyber infrastructure disparities 449–50
cyber terrorism and possible necessary technical measures 165–6
cybercrime and technical means of protection and preventive measures 204–5
Internet technology and human rights see human rights, Internet technology and international politics
private enterprise and cyber technologies 115–16
technological resources, development of, EU 413–14
Temple Lang, J 406
terminology problems, cyber deterrence and public international law 297–8
territoriality
coercion and violation of territorial integrity 181–3
objective, cybercrime and principle of nationality 202
principle 33, 48, 198–200
search and seize powers and cybercrime 199
sovereignty as protection of territorial integrity 182, 183
territorial nature of intellectual property see cyberspace, intellectual property rights, territorial nature
territorial sovereignty violations, law of neutrality 380–81, 389, 394–5, 397–8
see also cyberspace sovereignty
terrorism see cyber terrorism
Thomas, N 449, 452, 458, 461, 462
Thomson, J 16
Tiirmaa-Klaar, H 220, 223, 428
Tikk, E 250, 260, 281, 350, 438
Timberg, C 333
Timlin, K 449
Timofeeva, Y 38
Tirkka-Klaar, H 418
Tladi, D 278
Tobanksy, L 15
Toebes, B 106
Torremans, P 72, 73, 79, 82, 83
Touré, H 147
Townsend, M 157
Trachtman, J 17, 28
transnational corporations, power and interests of 31
Trauner, F 404

Traynor, I 260
Trezise, H 446–64
Tsagourias, N 13–29, 33, 48, 63, 64, 72, 75, 98, 149, 224, 231, 235, 247, 261–2, 267, 278, 287, 296, 301, 394, 398, 448
Tullos, O 264
Turns, D 118, 127, 128, 131, 149, 349, 362, 363, 364, 380–400

UK
BT v One in A Million 92
copyright, Designs and Patents Act 72, 84, 85, 86–7, 89, 90–91
copyright law and territoriality principle 78–9
cybercrime cost 1
cybersquatting 92
Digital Economy Act 75
Gambling Act 51
Harrods v Dow Jones Co 43
John Richardson Computers Ltd v Flanders 89
Lewis & Ors v King 43
military cyber operations definition 227
Navitaire 89
Obscene Publications Act 39
R v Perrin 39, 50
R v Sheppard & Amor 19
SAS Institute v World Programming Ltd 89
Twentieth Century Fox Film Corp & Ors v British Telecommunications 52
Vidal-Hall & Ors v Google Inc 44

UN Charter
self-defence in cyberspace see cyberspace, self-defence in, UN Charter Article 51
and use of force 186–8, 265, 267, 299–302
UN Convention against Transnational Organized Crime 149, 198, 199
UN Counter-Terrorism Implementation Taskforce (CTITF) 147, 151
UN Draft Comprehensive Anti-Terrorism Convention, terrorist offences definition 155–7, 158, 159, 160, 161–2
UN General Assembly (UNGA)
Declaration on the Definition of Aggression 237
and prohibition of use of force see cyber operations as a use of force, UN General Assembly (UNGA) and prohibition of use of force protection of critical information infrastructures 288
regulation of cyber security see UN and the regulation of cyber security, General Assembly (UNGA)
Resolution on misuse of information technologies 280
UN Global Counter-Terrorism Strategy 151
UN Hostages Convention 154
UN Internationally Protected Persons Convention 154
UN Office of Drugs and Crime (UNODC), cyber terrorism definition 147, 150
UN and the regulation of cyber security 465–90
differences on fundamental issues between Eastern and Western States 466
Economic and Social Council (ECOSOC) 484–6
emerging regulatory framework for cyber security 477
information security 467–9, 474–81
International Code of Conduct for Information Security 478–81
International Telecommunications Unit, Global Cyber-Security Agenda 487–8
International Telecommunications Unit, online protection for children 488
Internet neutrality 476
norms, rules and principles of responsible behaviour by States, recommendations for 480
UN Charter affirmation and rules on the non-use of force and self-defence 480
UN Global Counter-Terrorism Strategy 482
UN Institute for Disarmament Research (UNIDR) 488–9
UN Office on Drugs and Crime (UNODC) 489
UN Security Council (UNSC) 481–4
UN and the regulation of cyber security, General Assembly (UNGA) 467–81
First Committee (Disarmament and International Security) 467–9, 474–6, 477–8, 488
Groups of Governmental Experts (GGEs) 469, 470, 473–81
Groups of Governmental Experts (GGEs), First Group 474–6
Groups of Governmental Experts (GGEs), Fourth Group 481
Groups of Governmental Experts (GGEs), Second Group 476–8
Groups of Governmental Experts (GGEs), Second Group, ICT disruptions and risk 477, 480–81
Groups of Governmental Experts (GGEs), Third Group 478–81
Second Committee (Economic and Financial Committee) and Global Culture of Cyber-security initiative 469–71
Second Committee, global culture of cyber security 470–71
Second Committee, voluntary self-assessment tool for national efforts 471
Third Committee (Social, Humanitarian and Cultural Committee) 471–3, 489
Third Committee (Social, Humanitarian and Cultural Committee), resolution combating the criminal misuse of information technologies 471–2
Third Committee (Social, Humanitarian and Cultural Committee) resolution on right to privacy in the digital age 473
Third Committee (Social, Humanitarian and Cultural Committee) and UN Crime Prevention and Criminal Justice Programme 472
Vienna Declaration on Crime and Justice 485–6
UN Reports of International Arbitral Awards (RIAA)
Island of Palmas Case (US v Netherlands) 17, 279
Trail Smelter 279
UN ‘Right to Privacy in the Digital Age’ draft resolution 113
UN Security Council Resolutions inherent right to self-defence 277–8
regulation of cyber security 481–4
and terrorism 150–51, 156, 158
UN Special Tribunal for Lebanon 155–6, 158
UN Terrorist Bombings Convention 154–5
US botnets 319
Cable News Network LP v cnnews.com 47, 52
Caroline 271, 273
Comprehensive National Cybersecurity Initiative (CNCI) 258–9
CompuServe v Patterson 19, 20
Computer Associates v Altai 89
Computer Software Act 84
copyright authorship and lex originis 79
Cyber Policy Review 55, 56
cyber security intelligence information
sharing with private sector companies,
call for 259
Digital Millenium Copyright Act (DCMA)
74–5, 90
drones’ hacking claims 245
due process requirement 47
east coast blackout 349
Espionage Act 171–2
EU–US Working Group on Cyber-Security
and Cyber-Crime (WGCC) 408, 411, 414
excessive intelligence collection methods,
criticism of 167
Federal Anti-Tampering Law 312–13
Hartford Fire Insurance Co v California
49
International Shoe Co v Washington 20, 47
International Strategy for Cyberspace
13–14, 343
Iran–US Claims Tribunal, Yeager v Islamic
Republic of Iran 60–61
National Security Strategy, and anticipatory
self-defence 271, 285
NSA cyber espionage 62–3, 113, 178,
179–80, 184, 473
NSA electronic surveillance practices 62,
64, 65
Patriot Act 165, 269–70
People v World Interactive Gaming
Corporation 47
political dominance 96, 97, 113–14
Presidential Decision Directive on cyber
capacity 284, 297–8
Presidential Policy Directive, cyber
espionage definition 170–71
privacy and personal data protection 103,
114
Reno v American Civil Liberties Union 256
Restatement (Third) of Foreign Relations
Law 49
Snowden (Edward) revelations 53, 62, 64,
94–5, 112, 113–15, 169, 172–3, 179,
180, 219, 224, 466, 473
spy plane incident (Gary Powers) 177
Strategic Command, nuclear deterrence 296
T-Mobile West Corp. v Crow 19
territoriality principle 80
The Exchange v McFadden 17
US v $734, 578.82 in US Currency 47
US v Yousef 20
US–China cyber security working group
490
website blocking 52
Yahoo! v La Ligue contre le racisme et
l’antisémitisme 193
Young v New Haven Advocate 47
Vagts, D 381, 389, 391
Valeriano, B 427
Van Bochoven, L 428
Van Elsuwege, P 413
Van Ginkel, B 222
Van Hoboken, J 224
Van Vooren, B 404, 421, 422
Vassilaki, I 38
Verdelho, P 200
Vermeulen, M 414
‘virtual group’ involvement, classification of
cyber warfare 338–40
virtual worlds, ‘crimes’ committed in 191
virus attacks 244–5
malware 252–3, 257, 261, 308, 309, 312,
313, 444
Stuxnet see under Iran
see also hackers
Viscusi, W 324
Vitė, S 326
Vivant, M 84, 85
Vogler, J 24–5
Von Heinegg, W 182, 186
Wachenfeld, M 390
Wala, R 278
Walden, I 220
Walker, G 397, 400
Wall, D 191, 194
Waltz, K 97, 174
Walzer, M 307
war crimes see international criminal
responsibility, cyber attacks as war
war-crimes see international criminal
responsible for cyber warfare 359–60
warfare see cyber warfare
Wassenaar Arrangement on Export Controls
and ‘dual use’ ICT technologies 115
Waters, S 399
Watkins, K 214
Watt, H 410
Watts, A 182, 186
Waxman, M 138, 187, 236, 242, 247, 262,
265, 427
weapons see cyber weapons
Wegener, H 488
Weisbord, N 137
Weissbrodt, D 118, 119, 123, 139
Wenger, A 358
Werle, G 120, 127
Werner, W 119, 123, 125, 139, 295
Wessel, R 258, 403–25, 432
Wikileaks see Snowden (Edward) revelations
Wills, A 224, 414
Willson, D 392
Wilmshurst, E 249, 278, 326
Wilson, C 92
Winterfeld, S 229
Woltag, J-C 149, 426
Wood, M 183, 250, 252
World Conference on International Telecommunications 111–12, 265–6
Wortham, A 187
Wray, R 110
Wright, J 134, 136
Wright, Q 181, 185

Wriston, W 181
WTO Appellate Body, United States – Measures Affecting the Cross-Border Supply of Gambling and Betting Services 42, 52
Wu, T 13, 22

Yadron, D 324, 332
Yar, M 157
Yoo, J 185
Younes, A 92
Young, B 55

Zekoll, J 405, 410
Zhang, L 233
Ziolkowski, K 170, 171, 178, 182, 183, 224, 226, 238, 241, 245, 258, 426–45
Zuckerberg, M 109