

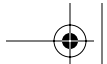
INDEX

A

A.L. Digital Ltd., 319
 Aarts, Emile, 241
 Abeyaratne, Rohan, 53
 accountability, 71–73
 Achilles' shield, 152
 active tags, 17, 261
 activism
 Asia, 453
 civil liberties, 432
 consumer education, 434
 RFID threats to privacy, 432
 technological assessment, 434–437
 technological-based solutions, 433
 addressing systems, 154–157
 ADS (Applied Digital Solutions), 31–32
 Afghanistan, military logistics, 194
 AIDC (automatic identification and data collection)
 benefits, 8–11
 future applications, 11–13
 global interconnection, 7
 history of, 4–6
 industry supporting, 6–7
 ALA Code of Ethics, 238
 Albano, Silvio, 52
 algorithms, authentication, 138
 Alien Technology, 45, 46, 446
 antennas, 20–21, 25
 See also networks
 anti-theft tags
 automotive, 363–364
 EAS (electronic article surveillance), 262
 inventory management, 384–385
 threats posed by, 262, 363–364

applications
 See also field trials; healthcare; inventory management; libraries; Procter & Gamble
 CVS Pharmacy, 201–210
 food ordering, 382–383
 highway toll payment, xxx–xxxi, 360–363
 pharmaceuticals, 11–12, 201–210
 Project Jump Start, 203–205
 Speedpass, 179–187
 typical, overview, 27–35
 Applied Digital Solutions (ADS), 31–32
 Aristotle, 153, 157–158
 Ashton, Kevin
 Auto-ID Center, 42–43
 growth of Auto-ID Center, 51
 Procter & Gamble field trial, 39, 52
 Asian RFID experience
 activism, 453
 China, 461–462
 concept of privacy, 452
 cultural predisposition, 455
 current technology, 455–456
 Hong Kong, 462
 India, 456–461
 Japan, 463
 Malaysia, 464
 national identities, 455–456
 paper databases, 455–456
 perspectives on privacy, 453–454
 Singapore, 464
 South Korea, 464
 versus Western experience, 451–452
 ATMs, 373, 425–426
 auction markets, 251–253
 Australia, tracking livestock, 253
 authenticatable tags, 137, 143





authentication

- algorithms, 138
- concepts, 138–140
- costs, 139–140
- federated systems, 147
- federation, 145–147
- integrity mechanisms, 138
- key distribution, 139
- pharmaceuticals, role of AIDC, 11–12
- products
 - AIDC, role of, 12
 - counterfeiting, 141–144
 - tags, role of, 140–141
- protocols, 138
- readers to tags, 144
- readers within an enterprise, 145
- revocation, 139
- secret data, 138
- stolen keys, 139
- supply chains, 145–147
- tags, 140–141
- users (federation), 145–147

Auto-ID Center

- See also* EPC (Electronic Product Code)
- “cheap chip manifesto”, 44
- Class 1 UHF protocol, 45
- creation of EPCglobal, 53–54
- CVS Pharmacy, 202–203
- founding sponsors, 42
- history of, 41–43
- industry evolution, 52–53
- labs, 51
- launch date, 42
- managing growth, 50–53
- manufacturing costs, 46–47
- network architecture, 47–48
- privacy, 48–50
- RFID protocol costs, 44–46
- software architecture, 47–48
- supply chain privacy, 401–406
- systems research, 50
- tag costs, 43–44

automatic identification

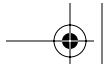
- See* AIDC (automatic identification and data collection)

B

- Baard, Mark, 26
- back room stock locations, 388

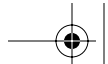
- backscatter, 23–24
- bar codes, 4, 41
 - See also* EPC
- barriers to reading range, 25–27
- Barrios, Jarrett, 447
- baseball bat dilemma, 423
- batteries, 17–18, 20
- BCMS (British Cattle Movement Service), 256
- BD_ADDR, searching for, 313–314
- Benetton, field trial, 84
- Blackmun, Harry, 417
- blocker tags, 332–335, 492–493
- Bluejacking, 321–322
- Bluesnarfing, 319–321
- BlueSpace, 324
- Bluetapping, 322
- Bluetooth
 - BD_ADDR, searching for, 313–314
 - Bluejacking, 321–322
 - Bluesnarfing, 319–321
 - BlueSpace, 324
 - Bluetapping, 322
 - Bluetooth Person Tracker, 324
 - Bluetooth Sniper, 322
 - BodyTags, 323–324
 - cable-replacement technology, 306–307
 - connecting to Macintosh computers, 315–316
 - defense-in-depth, 319
 - definition, 303–304
 - discoverability, 312–314
 - eavesdropping, 322
 - encryption, 305
 - frequency hopping, 305, 307–309
 - guessing the PIN, 318
 - history of, 306–309
 - IBM/Steelcase project, 324
 - implementations, 315–316
 - in automobiles, 315–316
 - in portable electronics, 315–316
 - keyboards and mice, 315–316
 - locational surveillance, 323–324
 - needed improvement, 304–305
 - OBEX (Object Exchange) protocol
 - abuse, 321–322
 - overview, 316–317
 - pairing, 312–314
 - passkeys, 309
 - physical access, 322
 - PINs, 309





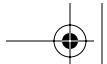
- power, 308
- profiles, 309–312
- range, 308
- RedFang, 314
- search tool, 314
- security
 - Bluejacking, 321–322
 - Bluesnarfing, 319–321
 - BlueSpace, 324
 - Bluetapping, 322
 - Bluetooth Person Tracker, 324
 - Bluetooth Sniper, 322
 - BodyTags, 323–324
 - defense-in-depth, 319
 - eavesdropping, 322
 - guessing the PIN, 318
 - IBM/Steelcase project, 324
 - locational surveillance, 323–324
 - needed improvement, 304–305
 - OBEX (Object Exchange) protocol
 - abuse, 321–322
 - overview, 316–317
 - physical access, 322
 - sharing sensitive data, 319–321
 - social engineering, 321–322
 - spoofing, 318
 - tapping conversations, 322
 - security levels, 312–314
 - sharing sensitive data, 319–321
 - social engineering, 321–322
 - spoofing, 318
 - standards, 304, 308–309
 - tapping conversations, 322
 - trusted pairing, 312–314
 - untrusted pairing, 312–314
 - usability, 304–305
 - video gaming, 315–316
 - wireless cables, 306–309
- Bluetooth Person Tracker, 324
- Bluetooth Sniper, 322
- Boath, Allan, 42, 52
- BodyTags, 323–324
- Bork Bill, xxxii
- Boss, Richard, 234, 235
- Bowen, Debra, 238
- brands and earmarks, livestock, 245
- Brazil, tracking livestock, 253
- British Cattle Movement Service (BCMS), 256
- Brock, David, 38–39, 42, 48
- Brown, Steve, 53
- business
 - claim of impossibility, 117
 - disclaimer of intent, 117
 - enforceable promises, 117
 - industry leadership, 119–120
 - privacy issues, 106–107
 - response to consumer concerns, 116–119
 - self-regulation, 116–117
 - users, 103
 - versus individuals, 114–119
- C**
- CALEA (Communications Assistance for Law Enforcement Act), 423–425
- Canada
 - privacy rights, 58–59, 70, 71–73
 - standards and guidelines, 58–59, 70–71
 - tracking livestock, 254
- Canadian Standard CAN/CSA Q-830, 70–71
- Cantwell, Dick, 42, 51, 52–53, 54
- Care, Carol, 42
- Carnivore technology, 112
- Carr, Carol, 53
- Carrender, Kurt, 45
- CASPIAN position statement on RFID
 - acceptable uses, 485–486
 - civil liberties, threats to, 483
 - cost of tags, 489
 - customer surveillance, 487–488
 - FIPS (fair information practices), 484–485
 - introduction, 482
 - myths, 487–489
 - privacy, threats to, 483
 - prohibited practices, 485
 - proposed solutions
 - blocker tags, 492–493
 - closed applications, 493
 - killing tags, 490–492
 - read range, 487–488
 - rights and responsibilities, 484–485
 - tag content, 488
 - tracking passive tags, 488
- CASPIAN, spying on consumers, 63
- Cavoukian, Ann, 240
- Central America, 469
- challenge-response system, 180, 298–300
- Charter of Fundamental Rights of the European Union, 68





- “cheap chip manifesto”, 44
- checkout
 - See point of sale
- Checkpoint Systems, 262
- China, 461–462
- chip security, 427–428
- chips
 - functions and responsibilities, 64
 - implants, 29–35
 - See also tracking, livestock; tracking, people
- chorographic places, 151
- civil liberties, 432, 483
 - See also privacy; security; threats
- Clark, Arthur C., 447
- Clarke, Roger, 159
- Class 1 UHF protocol, 45
- classes of tags, 19
- cloning, proximity cards, 292–295
- Code of Fair Information Practice, 520–522
- Code of Fair Information Practices, 69
- Cohen, William, 193
- Cold War, military logistics, 191
- Cole, Peter, 45, 49, 51
- Communications Assistance for Law Enforcement Act (CALEA), 423–425
- competitive intelligence
 - categories of consumer goods, 286
 - categories of tags, 286–288
 - in-store scenarios, 283
 - intelligence gathering, 284
 - inventory type and turnover, 286
 - killing tags, 289
 - ONS (Object Name System), 285
 - read distance, 284–285
 - recoding tags, 289–290
 - RFID benefits at the product level, 288–290
 - value of tags on shelves, 286–288
- Congress, role in regulation, 120–122
- connectors, 370
- consent, FIPS (fair information practices), 74–75
- constitutional implications of RFID, 113
- constitutional privacy rights, 68
- consumer choice, 527
- consumer education, 240–241, 434, 527
- consumer goods
 - See inventory; products; supply chain
- consumer notice, 527
 - See also labeling
- consumer rights
 - See also FIPS
 - Canada, 58–59, 70, 71–73
 - Charter of Fundamental Rights of the European Union, 68
 - constitutional, 68
 - ECHR (European Convention on Human Rights), 68
 - European Union, 58–59, 68
 - human, 65–67
 - laws and regulations, 447
 - United Kingdom, 68
 - United Nations’ Universal Declaration of Human Rights, 65, 65–67
 - United States, 69
- Consumers Against Supermarket Privacy Invasion and Numbering
 - See CASPIAN
- consumers, overcoming resistance, 441–442, 445–449
- contactless cards, 373
- “continued activation” as default, 420
- Conway, Ken, 250
- corporate abuse, 271–272
- corporate privacy, 337
- Costa Rica, 471
- costs
 - authentication, 139–140
 - “cheap chip manifesto”, 44
 - CVS deployment, 209
 - inventory management, 386
 - item-level tagging, 86–87
 - killing tags, 354–355
 - library implementation of RFID, 235–236
 - manufacturing, 46–47
 - of policy requirements, 115
 - of tags, 43–44, 489
 - recoding tags, 354–355
 - RFID protocols, 44–46
- couplers, 370
- coupling
 - dielectric, 26
 - electrostatic, 24
 - readers with tags, 23–24, 26
- cross-tag interference, 18–19





CVS Pharmacy, 201–210
See also healthcare; pharmaceuticals

D

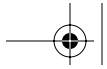
damaged goods, 208
 data
See also AIDC; databases; FIPS
 accuracy, 76
 collection, limiting, 75, 96
 disclosure, limiting, 75–76
 exchange, role of AIDC, 12–13
 harvesting, tracking livestock, 248–249
 retention, 75–76, 411, 527
 security
See privacy; security; threats
 use, limiting, 75–76
 databases
 fear of centralization, 61–62
 invasive
 EPC (Electronic Product Code), 267
 manufacturer's data, 266–267
 point of sale data, 268–270
 post-sale surveillance data, 270–271
 “What is this?”, 267
 “Where did this come from?”, 266
 “Where has it been seen?”, 270
 “Who bought it?”, 268
 David, Steve, 42, 52–53
 “deactivation” as default, 422
 DeAlmo, Jack, 206
 decisional privacy, 417
 Delagi, Bruce, 54
 denial of service, contactless cards, 379
 Department of Defense (DoD), 191, 194–197
 depot-level repairable (DLR) delivery, 191–192
 detuning antennas, 26
 dielectric coupling, 26
 Digital Angel, 32
 Dillman, Linda, 53
 disclaimer of intent, 117
 disclosure at read, 166–170
 disclosure of use, 170–171
 discoverability, Bluetooth, 312–314
 distribution, benefits of RFID, 8
 DiYeso, Mike, 53
 DLR (depot-level repairable) delivery, 191–192
 doctors
See healthcare

document tracking, benefits of RFID, 9
 DoD (Department of Defense), 191, 194–197
 Domesday Book, 259
 doorway readers, 263
 drivers, tracking, 264
 drug compliance, tracking, 209, 213–214
See also pharmaceuticals

E

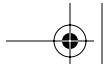
EAN International, 41
 EAS (electronic article surveillance), 262
 eavesdropping, Bluetooth, 322
 Eberhardt, Noel, 43
 ECHR (European Convention on Human Rights), 68
 ECPA (Electronic Communications Privacy Act), 322
 education
See consumer education
 El Salvador, 471, 474
 eldercare, 216–221
 electromagnetism, health impact, 109
 electronic article surveillance (EAS), 262
 electronic cash cards, 373
 Electronic Communications Privacy Act (ECPA), 322
 Electronic Frontier Foundation position
 statement on RFIDs
 introduction, 497–498
 privacy
 and rapid technological
 change, 504–505
 as social construct, 499–500
 developing norms, 504–505
 killing tags, 505–506
 protecting, 500–501
 threats, 498–499
 technology
 evaluating, 502–503
 neutrality, 503–504
 politics of, 503–504
 trajectories, 501–502
 electronic funds activity, 373, 425–426
 Electronic Product Code (EPC)
See EPC (Electronic Product Code)
 electrostatic coupling, 24
 employee ID cards
See proximity cards





- encryption
 - Bluetooth, 305
 - proximity cards, 299–300
 - tags, 331–332
- enforceability of RFID regulation, 128, 129
- enforceable promises, 117
- Engels, Dan
 - director of research, MIT, 54
 - Hardware Action Group, 54
 - low-cost RFID protocols, 45
 - mapping EPC to a database, 38–39
 - network architecture, 47
 - privacy issues, 49
 - Procter & Gamble field trial, 52
 - software architecture, 47
- environmental factors, reading range, 25–27
- EPC (Electronic Product Code)
 - See also* Auto-ID Center; bar codes
 - database, 267
 - fields, 38
 - for consumer products, 525–527
 - history of
 - beginnings, 37–38
 - distributed intelligent systems center, 38–39
 - Procter & Gamble, 39–40
 - mapping to a database, 38–39
 - ONS (Object Name System), 39
 - partitions, 261–262
 - PML (Physical Markup Language), 38–39
 - recoding tags, 350–352
 - record use, 411
 - retention, 411
 - security, 411
 - standards and guidelines, 406, 408–411
 - threats posed by, 260–262
- EPCglobal
 - creation of, 53–54
 - policy leadership
 - current policies, 132–133
 - industry alternatives, 131–132
 - public policy development process, 130
- Estevez, Alan, 194
- European, 254
- European Convention on Human Rights (ECHR), 68
- European Data Protection Directive 95/46/EC, 58–59
- European Union
 - privacy rights, 58–59, 68
 - privacy standards and guidelines, 58–59, 68
 - tracking livestock, 254
- evolution of RFID industry, Auto-ID Center, 52–53
- exercise, tracking, 217–220
- extended supply chain, 40
- ExxonMobil Speedpass
 - See* Speedpass
- F**
- fair information practices (FIPS)
 - See* FIPS (fair information practices)
- far field, 21
- Faraday cages, 330
- father of bar codes, 41
- Federal Trade Commission (FTC), 122–124
- federated systems, 147
- federation, 145–147
- Ferguson, Mark, 51
- field trials
 - See also* applications; Procter & Gamble
 - Aalborg Zoo, 324
 - Benetton, 84
 - highway toll payment, xxx–xxxi, 360–363
 - IHVS (Intelligent Highway Vehicle Systems), 360–363
 - JRS (Joplin Regional Stockyards), 251–253
 - Marks & Spencer, 84
 - Max Factor Lipfinity Lipstick, 404–406, 446
 - McDonald's, 181–182
 - Metro Future Store, 404
 - Michelin, 85
 - Operation Iraqi Freedom, 8–9
 - Soviba Group, 255
 - supply chain privacy, 404–406
 - tracking livestock, 251–253, 255
 - Wal-Mart, 84, 404–406, 446
- FIPS (fair information practices)
 - See also* consumer rights
 - accountability, 71
 - adapting to RFID systems, 515–522
 - best use of, 95
 - CASPIAN position statement, 484–485
 - challenging compliance, 80
 - consent, 74–75
 - data accuracy, 76
 - data collection, limiting, 75, 96
 - data disclosure, limiting, 75–76





data retention, limiting, 75–76
 data use, limiting, 75–76
 duty to notify, 78
 history of, 69–71
 identifying purposes, 73–74
 individual access, 78–80
 openness, 77–78
 optical scanning, 516–517
 privacy issues, 519–520
 product codes, 517
 required information, 78
 responsibility, scenarios, 71–73
 RFID Bill of Rights, 520–522
 right to corrections, 79
 safeguards, 77–80
 serial numbers, 517
 Fishkin, KP, 336
 Fleisch, Elgar, 51, 54
 Fletcher, Rich, 43
 FlexPass, 291–300
 FlexSecur, 299–300
 Foley, Joe, 39, 47, 48
 food supplies, benefits of RFID, 10
 France, tracking livestock, 255
 fraud detection, Speedpass, 185–187
 frequency hopping, Bluetooth,
 305, 307–309
 FTC (Federal Trade Commission), 122–124

G

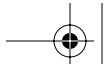
generations of tags, 19
 Gershenfeld, Neil, 43
 Gillette, Auto-ID Center sponsor, 42
 Giordano, Joe, 182
 goods
 See inventory; logistics; products; supply chain
 government
 abuses by, 272
 access to data, 108–109
 Congress, 120–122
 FTC (Federal Trade
 Commission), 122–124
 leadership options, 120–124
 privacy issues, 107
 required action, 276
 users, 104
 versus individuals, 111–114
 group privacy, 60
 Guatemala, 471

Guerre, Martin, 160
 guidelines
 See laws and regulations; policies and
 practices; standards and guidelines
 Guidelines on the Protection of Privacy and
 Transborder Flows of Personal Data, 70
 Gulf War (1991), military logistics, 192

H

Haberman, Alan, 41–42, 52
 Harmon, Mark, 252
 Harper, Jim, 118
 Harwig, Rick, 241
 Health Information Portability and
 Accountability Act of 1996 (HIPAA),
 healthcare privacy issues, 223–226
 health issues, 109, 250
 healthcare
 See also pharmaceuticals
 assisting medical personnel, 214–216
 benefits of RFID, 10–11
 exercise, tracking, 217–220
 HIPAA, 223–226
 home eldercare, 216–221
 hospital use, 212–216
 memory therapy, 221
 name and face rehearsal, 221
 nutrition, tracking, 220–221
 objects, tracking, 212–213
 “OKness”, tracking, 217–220
 patient activity, tracking, 217–219
 people, tracking, 212–213
 pill dispensing, 213–214
 privacy, 223–226
 radio frequency, health issues, 221
 RFID benefits, 10–11, 211
 RFID-detecting gloves, 215–216
 RFID-detecting pill basket, 214
 safeguarding equipment use, 213–214
 security, 223–226
 standards, 223
 tags on pill bottles, 213–214
 Henneberry, Tom, 53
 Heyman, Dirk, 52
 HF band radio, 21
 highway toll payment, threats, 360–363
 HIPAA (Health Information Portability and
 Accountability Act of 1996), healthcare
 privacy issues, 223–226





Hogan, Bernie, 53
home eldercare, 216–221
Homer, 152
Honduras, 472
hospital use of RFID, 212–216
hotlisting, 229
Hughes, Sandy, 270
human identification, 159
human privacy rights, 65–67
hybrid scanners, 389–391

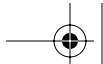
I
IBM, Margaret product, 263
IBM/Steelcase project, 324
identifiable readers, 172–173
identity, history of
 See location, and identity
IHVS (Intelligent Highway Vehicle Systems), 360–363
implantation, 106–107
implants, 29–35
 See also tracking, livestock;
 tracking, people
impossibility, claims of, 117
Indala, 291–300
India, 456–461
individual access, FIPS (fair information practices), 78–80
individual privacy, 105–107
individual risk management, 127
individual users, 103
industrial espionage
 See competitive intelligence
industry
 See business
Information Resources, Inc. (IRI), 268–270
Information Technology Association of America (ITAA), 119–120
information transparency, 127
inserting implants, 29
integrity mechanisms, authentication, 138
integrity of the system, 108
Intelligent Highway Vehicle Systems (IHVS), 360–363
intelligent items, role of AIDC, 12
interaction design, 164
international use of RFID
 See specific countries

inventory management
 See also logistics; products; supply chain
 accuracy, 41
 back room stock locations, 388
 benefits of RFID, 8
 cost, 386
 counting, 40–41
 electronic shelf labels, 385
 installation limitations, 386
 misplaced inventory, 386–387
 mobile systems, 388
 outdates, 208
 out-of-stocks, 384
 product locator, 387
 recalls, 208, 349–350
 returns, 208, 349–350
 RFID applications, 27–29
 technical limitations, 385–386
 theft prevention, 384–385
 tracking, 27–29
 type and turnover, 286
invisible tags, threats posed by, 262
IRI (Information Resources, Inc.), 268–270
ISM band radio, 21
ISO 15693, 233
ISO 18000, 233
ITAA (Information Technology Association of America), 119–120
item-level tagging, 86–88, 207

J
Jacobsen, Jeff, 45
Japan
 RFID use, 463
 tags, standards and guidelines, 507–514
Johnson, Howard, 41
Jules, A, 332
Jump Start, 203–205
just-in-case delivery, 191
just-in-time delivery, 193–194

K
Kaplan, LM, 16
Kennedy, Arthur, 416
keyboards, Bluetooth, 315–316
keys, 139
killing tags
 applications prevented by, 349–350





- at point of sale, 490–492
- competitive intelligence, 289
- cost, 354–355
- issues, 348
- shortcomings, 448
- subthreshold retailers, 354
- unauthorized use, 352–353
- Kokesh, Fritz, 42
- Kriofsky, TA, 16
- L**
- labeling systems, 167–170
- labeling tags, 329–330
- labor issues, 109
- Latin America
 - Costa Rica, 471
 - El Salvador, 471, 474
 - Guatemala, 471
 - Honduras, 472
 - Nicaragua, 472
 - Panama, 470
 - privacy
 - and poverty, 476
 - future of, 477
 - issues, 473–474
 - overview, 475–476
 - RFID, 469
 - Spread Spectrum, 468
 - U.S.-Mexican border, 476
 - WiFi, 469
 - wireless penetration, 468–469
- Laurie, Adam and Ben, 319
- law enforcement access, 108–109
- Law, Ching, 45
- laws and regulations
 - See also* policies and practices; standards and guidelines
 - business
 - claim of impossibility, 117
 - disclaimer of intent, 117
 - enforceable promises, 117
 - privacy issues, 106–107
 - response to consumer concerns, 116–119
 - self-regulation, 116–117
 - users, 103
 - versus individuals, 114–119
 - CALEA, 423–425
 - Carnivore technology, 112
 - Code of Fair Information Practice (HEW73), 520–522
 - constitutional implications, 113
 - current policy, 101–105, 124–126
 - ECPA (Electronic Communications Privacy Act), 322
 - electromagnetism, health impact, 109
 - electronic surveillance, 423–426
 - enforceability, 128, 129
 - EPCglobal leadership, 130–133
 - fulfilling consumer expectations, 127
 - government
 - access to data, 108–109
 - Congress, 120–122
 - FTC (Federal Trade Commission), 122–124
 - leadership options, 120–124
 - privacy issues, 107
 - users, 104
 - versus individuals, 111–114
 - health issues, 109
 - HIPAA (Health Insurance Portability and Accountability Act of 1996), 77
 - implantation, 106–107
 - individual privacy, 105–107
 - individual risk management, 127
 - individual users, 103
 - industry leadership, 119–120
 - information transparency, 127
 - integrity of the system, 108
 - international applications, 129
 - introduction, 99–101
 - labor issues, 109
 - law enforcement access, 108–109
 - limiting product function, 110
 - location data, 106
 - mass-marketing of RFID, 129
 - Patriot Act, 236
 - PI (personally identifiable data), 105, 107
 - policy dialogue, 116–119
 - policy prescriptions, 126–129
 - policy-related performance standards, 127
 - Privacy Act of 1974, 237
 - private-sector leverage, 129
 - radio frequency spectrum issues, 110
 - regulatory access, 109
 - RFID use, 447
 - SB1834, 447
 - security of the system, 108





laws and regulations (*Continued*)
 self-regulation, 128
 Senate Bill No. 1834, 238
 sensitive data, 105
 stakeholders, 103–105
 statutory implications, 113–114
 tag defaults, 423
 tracking e-mail, 112
 U.S. Supreme Court opinion, 416–419
 VPPA (Video Privacy Protection Act of 1988), xxxii

lean logistics, 193–194

legislation
See laws and regulations; policies and practices; standards and guidelines

LF band radio, 21

liability issues, tracking livestock, 248

Liberty readers, 264

librarians, role of, 236

libraries
 ALA Code of Ethics, 238
 best-practices guidelines, 239–241
 cost of implementation, 235–236
 educating the public, 240–241
 ethical dilemmas, 236
 hotlisting, 229
 passing data to applications, 232–233
 Patriot Act, 236
 Privacy Act of 1974, 237
 privacy protection, 237–239
 problems addressed by RFID, 234–235
 readers, 231–232
 RFID penetration, 234
 role of librarians, 236
 Senate Bill No. 1834, 238
 standards, 233–234
 system components, 230–233
 tags, 230–231
 tracking books and patrons, 229–230

Lipfinity Lipstick, 404–406, 446

livestock, tracking
See tracking, livestock

load modulation, 23

locality of reference, 47

location data, 106

location, and identity
 Aristotelian systems, 157–158
 basic concepts, 150–152
 chorographic places, 151
 human identification, 159

locational technologies
 addressing systems, 154–157
 maps, history of, 152–154
 Ptolemy, 152–154
 YAWL (you are where you live), 156–157
 ZIP Code, 156

prototypical classification, 157–160

RFID, role of, 160

role of vision, 150–152

topographic places, 151

locational surveillance, 323–324

logistics, merchandise handling, 40

logistics, military
 Afghanistan, 194
 Cold War, 191
 definition, 190
 DLR (depot-level repairable)
 delivery, 191–192
 DoD (Department of Defense),
 191, 194–197
 emerging technologies, 193–194
 Gulf War (1991), 192
 history of RFID, 192
 just-in-case delivery, 191
 just-in-time delivery, 193–194
 lean logistics, 193–194
 reforming business practices, 193
 supply chain management, 193–194
 TAV (Total Asset Visibility), 191, 191–192
 time-definite delivery, 193–194
 velocity management, 193–194

M

Magnanti, Tom, 53

magnetic stripes, history of, 5

Malaysia, 464

manufacturer's data, database, 266–267

manufacturing
See also inventory; logistics; products; supply chain
 benefits of RFID, 8
 costs, 46–47
 maps, history of, 152–154

Margaret, 263

Mark of the Beast, 35, 67, 446

Marks & Spencer, field trial, 84

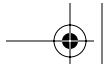
Max Factor Lipfinity Lipstick, 404–406, 446

Maxwell, Elliot, 49

McFarlane, Duncan, 51

McNealy, Scott, 48, 61





medical personnel, assisting, 214–216
See also healthcare
 medications
See pharmaceuticals
 memory therapy, 221
 merchandise
See inventory; logistics; products;
 supply chain
 metal, effects on reading range, 26
 Metro Future Store, 404
 mice, Bluetooth, 315–316
 Michelin, field trial, 85
 MICR, history of, 5
 Min, Hao, 51
 mitigating threats
See threats, mitigation
 mobile communication, 372
 mobile systems, inventory management, 388
 Molnar, David, 234, 239
 monitoring
See surveillance
 Moore, Jackie, 252
 mu-chip, 17
 Mulliner, Collin, 324
 multimode readers, 20
 Murai, Jun, 51, 54
 mutual tag interference, 18–19, 26, 87
 myths of RFID, 487–489

N

name and face rehearsal, 221
 Napoleon, 189
 Nass, Clifford, 163
 Nasser, Gabriel, 48
 National Circulation Interchange Protocol
 (NCIP), 234
 national ID system, 246
 National Livestock Identification Scheme
 (NLIS), 253
 NCIP (National Circulation Interchange
 Protocol), 234
 near field, 21
 Negraponte, Nick, 38
 Nelson, Lita, 53
 networks, 22–23, 47–48
 New Zealand, tracking livestock, 256
 Nicaragua, 472
 NLIS (National Livestock Identification
 Scheme), 253
 “No one wins” scenario, 277–278

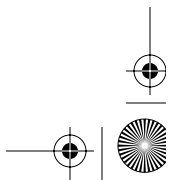
nonconsumer goods
See inventory; logistics; products;
 supply chain
 notification, duty of, 78
 nutrition, tracking, 220–221
 Nygren, Eric, 39

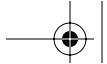
O

O’Connor, Sandra Day, 416
 OATSystems, 48
 OBEX (Object Exchange) protocol
 abuse, 321–322
 Object Name System (ONS)
See ONS (Object Name System)
 objects, tracking, 212–213
 OECD Guidelines, 58–59
 “OKness”, tracking, 217–220
 ONS (Object Name System)
 competitive intelligence, 285
 history of, 39
 privacy issues, 89
 openness, FIPS (fair information
 practices), 77–78
 Operation Iraqi Freedom, 8–9
 optical scanning, 516–517
 opt-out capability, 175
 outdates, 208
 out-of-stocks, 384
 Owens, Steve, 252
 owners, functions and responsibilities, 64

P

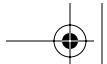
pairing Bluetooth devices, 312–314
 Panama, 470
 passive tags
 definition, 17
 history of, 16
 military use of, 194
 reading range, 24–25
 threats posed by, 260
 passkeys, Bluetooth, 309
 patient activity, tracking, 217–219
 Patriot Act, 236
 pay-TV, 372
 penetration
 item-level tagging, 86–88
 readers and tags, 25–27
 wireless, Latin America, 468–469
 people, tracking
See tracking, people





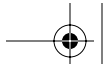
- performance standards, 127
- perishable products, 390
- permission-based tags, 174–175
- personal information, 58–59
 - See also* privacy; security; threats
- Personal Information Protection and Electronic Documents Act (PIPEDA), 58–59
- personally identifiable data (PI), 105, 107
- pharmaceuticals
 - See also* healthcare
 - authenticity, 11–12
 - CVS Pharmacy, 201–210
 - pill dispensing, 213–214
 - RFID applications, 201–210
 - RFID-detecting pill basket, 214
 - tags on pill bottles, 213–214
 - tracking, 201–210
- pharmacies, privacy issues, 206
- Phillips, David, 60
- Physical Markup Language (PML), 38–39
- PI (personally identifiable data), 105, 107
- pill dispensing, 213–214
 - See also* healthcare; pharmaceuticals
- PINs, Bluetooth, 309, 318
- PIPEDA (Personal Information Protection and Electronic Documents Act), 58–59
- PML (Physical Markup Language), 38–39
- point of sale
 - after
 - consumer goods, 415–416
 - nonconsumer goods, 414–415
 - privacy issues, 416–419
 - before, 414
 - database of data, 268–270
 - hybrid scanners, 389–391
 - perishable products, 390
 - privacy issues, 392–393
 - recalls, 390
 - receipts, 390
 - RFID portals, 393–394
 - technology analysis, 390
 - traceability, 389–390
- policies and practices
 - See also* FIPS; laws and regulations; standards and guidelines
 - dialogue, 116–119
 - prescriptions, 126–129
 - public policy, 338
- POS
 - See* point of sale
- post-sale surveillance data, database, 270–271
- Potter, Bruce, 319
- power supply, 17–18, 20
- practices
 - See* FIPS; laws and regulations; policies and practices; standards and guidelines
- prescriptions
 - See* pharmacies
- Price, John, 45
- privacy
 - See also* FIPS (fair information practices); security; surveillance; threats
 - and rapid technological change, 504–505
 - and RFID
 - action threats, 91–92
 - current and proposed applications, 84–86
 - discovery process, 62–64
 - killing tags, 94
 - legal restraints, 95
 - post-sale tag functionality, 96
 - profiling, 91–92
 - read ranges, 89
 - surveillance threats, 88–92
 - threat overview, 88–92
 - as social construct, 499–500
 - Asian concepts of, 452–454
 - attitudes on, 445
 - business users, 106–107
 - CASPIAN, 63
 - chips, functions and responsibilities, 64
 - contactless cards, 378
 - decisional, 417
 - definitions
 - European Data Protection Directive 95/46/EC, 58–59
 - OECD Guidelines, 58–59
 - personal information, 58–59
 - PIPEDA, 59
 - processing personal data, 59
 - Safe Harbor Arrangements, 58–59
 - developing norms, 504–505
 - early issues, 48–50
 - elements ensuring, 276–277
 - EPCglobal guidelines, 132–133
 - fear of central databases, 61–62
 - government users, 107





- group, 60
 - healthcare, 223–226
 - history of current paradigm, 59–62
 - individual users, 103, 105–107
 - international issues
 - See specific countries
 - language of change, 445–447
 - owners, functions and responsibilities, 64
 - pharmacies, 206
 - phone conversations
 - See Bluetooth
 - point of sale
 - See point of sale
 - protecting, 500–501
 - protection for libraries, 237–239
 - public's right to know, xxxiv–xxxv
 - readers, functions and responsibilities, 64
 - regulation
 - See laws and regulations; policies and practices; standards and guidelines
 - rights
 - Canada, 58–59, 70, 71–73
 - Charter of Fundamental Rights of the European Union, 68
 - constitutional, 68
 - ECHR (European Convention on Human Rights), 68
 - European Union, 58–59, 68
 - human, 65–67
 - United Kingdom, 68
 - United Nations' Universal Declaration of Human Rights, 65
 - United States, 69
 - spatial, 417
 - supply chain
 - Auto-ID Center, 401–406
 - dependencies, 407
 - external protocols, 406–407
 - field trials, 404–406
 - internal protocols, 406
 - Privacy Policy, 398–399
 - RFID technology, 399–408
 - spying on consumers, 405–406
 - technological solutions
 - See also threats, mitigation
 - blocker tags, 332
 - corporate privacy, 337
 - encryption, 331–332
 - Faraday cages, 330
 - killing tags, 330, 505–506
 - labeling, 329–330
 - measure of trust, 336
 - proposed, 433
 - public policy, 338
 - randomization, 341–343
 - reader-to-tag communication, 333
 - signal-to-noise measurement, 336
 - singulation, 333
 - soft blocking, 335
 - tag detection, 333
 - tags with pseudonyms, 336–337
 - tag-to-reader distance, 336
 - tree-walking, 333
 - types of, 60
 - U.S. Supreme Court opinion, 416–419
 - unintended violations, 418–419
 - United Nations' Universal Declaration of Human Rights, 65
 - wireless phone conversations
 - See Bluetooth
- Privacy Act of 1974, 237
- Privacy Fundamentalists, 445
- Privacy Pragmatists, 445
- Privacy Unconcerned, 445
- private data, tracking livestock, 249–253
- private-sector leverage, 129
- processing personal data, definitions, 59
- Procter & Gamble
 - Auto-ID Center sponsor, 42
 - field trial of RFID, 39, 52, 446
 - history of EPC, 39–40
 - supply chain privacy
 - Auto-ID Center, 401–406
 - dependencies, 407
 - external protocols, 406–407
 - field trials, 404–406
 - internal protocols, 406
 - Privacy Policy, 398–399
 - RFID technology, 399–408
 - spying on consumers, 405–406
- product codes, 517
- product locator, 387
- products
 - authenticating
 - See authentication
 - authenticity, role of AIDC, 12





products (*Continued*)

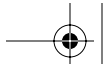
- categories of consumer goods, 286
- classifying, 423
- consumer
 - point of sale exposure, 415–416
 - tracking, 27–29
- counterfeiting, 141–144
- damaged goods, 208
- nonconsumer, point of sale exposure, 414–415
- outdates, 208
- recalls, 208
- returns, 208
- sensitive, 422
- tracking, 27–29
- profiles, Bluetooth, 309–312
- Project Jump Start, 203–205
- promiscuous tags, 18
- protocols, 138, 374–375
- prototypical classification, 157–160
- proximity cards
 - challenge/response system, 298–300
 - cloning, 292–295
 - encryption, 299–300
 - FlexPass, 291–300
 - FlexSecur, 299–300
 - Indala, 291–300
 - protection against attack, 297–300
 - read range, 291, 296
 - reading cards in wallets, 295
 - replay attacks, 297
 - reverse-engineering, 292–295
 - rolling codes, 297
 - sniffers, 296
- Ptolemy, 152–154
- public's right to know, xxxiv–xxxv
- Putta, Prasad, 48

R

- radio energy
 - classical uses, 21
 - far field, 21
 - frequency, 20–21
 - health issues, 221
 - near field, 21
 - power, 20
 - spectrum issues, 110
 - unlicensed spectrum, 21
- radio frequency identification (RFID)
 - See* RFID (radio frequency identification)

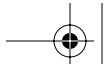
- radios, 20–21
 - See also* antennas; networks; readers; tags
- Ramachandran, Sridhar, 48
- randomization, 341–343
- range, Bluetooth, 308
- read fields, 165
- readers
 - See also* antennas; networks; radios; tags
 - authentication to tags, 144
 - authentication within an
 - enterprise, 145
 - backscatter, 23–24
 - batteries, 20
 - coupling with tags, 23–24, 25
 - dielectric coupling, 25
 - electrostatic coupling, 24
 - for multiple tag types, 20
 - functions and responsibilities, 64
 - history of, 45
 - library systems, 231–232
 - load modulation, 23
 - multimode, 20
 - penetration, 25–27
 - power supply, 20
 - reading proximity cards in
 - wallets, 295
 - screening, 25–27
 - shielding, 25–27
 - sizes, 20
 - Smart Cards, 370
 - threats posed by, 263–265
 - WID (wireless identification), 165
- reader-to-tag communication, 333
- reading devices, 165
- reading range
 - accuracy, 205–206
 - barriers to, 25–27
 - CASPIAN position statement, 487–488
 - competitive intelligence, 284–285
 - description, 17
 - environmental factors, 25–27
 - failure rates, 205–206
 - limitations, 171–172
 - metal, effects of, 25
 - proximity cards, 291, 296
 - water, effects of, 25
 - WID (wireless identification), 171–172
- recalls, 208, 349–350, 390
- receipts, 390





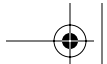
- recoding tags
 - and EPCs, 350–352
 - cost, 354–355
 - rewritable tags, 353
 - strategy for, 289–290
 - subthreshold retailers, 354
 - vandalism, 353
 - “write then lock” architecture, 353
 - recognition
 - See* WID (wireless identification)
 - record use, 411, 527
 - RedFang, 314
 - Reeves, Byron, 163
 - regulations
 - See* laws and regulations; policies and practices; standards and guidelines
 - regulatory access, 109
 - religious objections
 - See* Mark of the Beast
 - removing implants, 36
 - replay attacks, 297
 - responsibility
 - See* accountability
 - responsibility (accountability), 71–73
 - retail, benefits of RFID, 9
 - retention
 - See* data, retention
 - returns, 208, 349–350
 - Revelations
 - See* Mark of the Beast
 - reverse-engineering, proximity cards, 292–295
 - rewritable tags, 353
 - Reynolds, Matt, 25, 45
 - RFID (radio frequency identification)
 - acceptable uses, 485–486
 - adapting FIPS (fair information practices), 515–522
 - benefits at the product level, 288–290
 - Central America, 469
 - challenge-response system, 180
 - civil liberties, threats to, 483
 - CVS Pharmacy, 205–206
 - discovery process, 62–64
 - DoD road map, 197
 - elements of, 16–23
 - See also* antennas; networks; radios; readers; tags
 - fraud detection, Speedpass, 185–187
 - history of, 5–6, 15–16
 - laws and regulations
 - See* laws and regulations; policies and practices; standards and guidelines
 - military history, 192
 - myths, 487–489
 - passive systems
 - history of, 16
 - military use of, 194
 - reading range, 24–25
 - penetration in libraries, 234
 - portals, 393–394
 - privacy, threats to
 - See* privacy; security; threats
 - prohibited practices, 485
 - protocols, costs, 44–46
 - regulation
 - See* laws and regulations; policies and practices; standards and guidelines
 - rights and responsibilities, 484–485
 - role in location and identity, 160
 - sensor-enabled, 11
 - standardization, tracking livestock, 250–251
 - supply chain privacy, 399
 - typical applications, overview, 27–35
 - See also* specific applications
 - uses for
 - See* applications; field trials
 - RFID Bill of Rights, 520–522
 - RFIDAI (RFID Association of India), 461
 - RFID-detecting gloves, 215–216
 - RFID-detecting pill basket, 214
 - right to know, xxxiv–xxxv
 - rights of consumers
 - See* consumer rights
 - Rittenhouse, Tom, 42
 - Rivest, RL, 332
 - Rivest, Ronald, 49
 - rolling codes, proximity cards, 297
 - Rollins, John, 45
 - Roy, S, 336
 - rules
 - See* laws and regulations; policies and practices; standards and guidelines
- S**
- Safe Harbor Arrangements, 58–59
 - safeguards, FIPS (fair information practices), 77–80





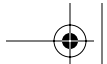
- the Savant, 47
- SB1834, 447
- scenarios of RFID use
 - “No one wins”, 277–278
 - “Shangri-La”, 278–279
 - “Trust but verify”, 280–281
 - “The Wild West”, 279–280
- Scharfeld, Tom, 54
- Schneider, Karen, 240–241
- Schuermans, Martin, 241
- Schwartz, Peter, 216
- screening, readers and tags, 25–27
- secure tags, 18
- security
 - See also* privacy; surveillance; threats
 - benefits of RFID, 9–10
 - Bluetooth
 - See* Bluetooth, security
 - contactless cards, 379
 - EPC, 411
 - healthcare, 223–226
 - of the system, 108
 - wireless phones
 - See* Bluetooth, security
- self-regulation, 116–117, 128, 276
- semi-passive tags, 17
- Senate Bill No. 1834, 238
- sensitive data, 105
- serial numbers, 18, 517
- “Shangri-La” scenario, 278–279
- shielding, readers and tags, 25–27
- shoppers, tracking, 263–265, 271–272
- signal-to-noise measurement, 336
- Singapore, 464
- singulation, 333
- SIP2 protocol, 233
- Siu, Sunny
 - distributed intelligent systems center, 38
 - lab research director, 42
 - low-cost RFID protocols, 45
 - privacy, 48
- Smart Cards
 - applications, 372–373
 - ATM cards, 373
 - command format, 370–371
 - communication format, 370–371
 - connectors, 370
 - couplers, 370
 - definition, 367
 - electronic cash cards, 373
 - functions, 371
 - life cycle, 371
 - manufacturing, 368–369
 - minimal hardware, 370
 - mobile communication, 372
 - pay-TV, 372
 - readers, 370
 - See also* contactless cards
- Smith, Stephen, 45
- sniffers, proximity cards, 296
- social engineering, Bluetooth, 321–322
- soft blocking, 335
- software architecture, developing, 47–48
- software-defined radio, 45
- solutions to privacy issues
 - See* privacy, technological solutions; threats, mitigation
- Souter, David, 416
- South Korea, 464
- Soviba Group, 255
- spatial privacy, 417
- Speedpass, 179–187, 361–363
 - See also* contactless cards; Smart Cards
- spoofing, Bluetooth, 318
- Spread Spectrum, 468
- spying
 - on competitors
 - See* competitive intelligence
 - on consumers, 63, 405–406
 - with contactless cards, 378
- stakeholders
 - business users, 103
 - government users, 104
 - individual users, 103
 - role in technology acceptance, 114–116
 - types of, 103–105
- standards and guidelines
 - See also* CASPIAN position statement; Electronic Frontier Foundation position statement; EPCglobal; laws and regulations; policies and practices
 - ALA Code of Ethics, 238
 - best-practices guidelines for libraries, 239–241
 - Bluetooth, 304, 308–309
 - Canada, 58–59, 70–71





- Canadian Standard CAN/CSA Q-830, 70–71
 - Charter of Fundamental Rights of the European Union, 68
 - Code of Fair Information Practices, 69
 - consumer choice, 527
 - consumer education, 527
 - consumer notice, 527
 - contactless cards, 374
 - ECHR (European Convention on Human Rights), 68
 - EPC for consumer products, 525–527
 - EPC usage, 406, 408–411
 - EPCglobal privacy guidelines, 132–133
 - European Data Protection Directive 95/46/EC, 58–59
 - European Union, 58–59, 68
 - Guidelines for EPC Usage on Consumer Products, 406, 408–411
 - Guidelines on the Protection of Privacy and Transborder Flows of Personal Data, 70
 - healthcare, 223
 - ISO 15693, 233
 - ISO 18000, 233
 - ISO/IEC 14443, 374
 - NCIP (National Circulation Interchange Protocol), 234
 - OECD Guidelines, 58–59
 - PIPEDA, 59
 - Privacy Rule, 224
 - record use, 527
 - retention, 527
 - RFID Bill of Rights, 520–522
 - RFID in libraries, 233–234
 - Safe Harbor Arrangements, 58–59
 - SIP2 protocol, 233
 - tags, in Japan, 507–514
 - United Kingdom, 68
 - United Nations' Universal Declaration of Human Rights, 65–67
 - United States, 69
 - statutory implications, 113–114
 - Stewart, Roger, 45
 - Stockman, Harry, 16
 - Suh, Nam, 39, 42
 - supply chain
 - See also* inventory; logistics; products
 - authentication, 145–147
 - common problems, 40–41
 - extended, 40
 - gray markets, 27
 - logistics, 40
 - military integration, 196
 - military management, 193–194
 - privacy
 - See* privacy, supply chain
 - product counterfeiting, 27
 - product diversion, 27
 - RFID applications, 27–29
 - shoplifting, 27
 - surveillance
 - See also* privacy; security; threats; tracking
 - CASPIAN position statement, 487–488
 - current state of, 440
 - electronic, laws and regulations, 423–426
 - e-mail, 112
 - government mandated, 265
 - locational, 323–324
 - perceived threat, 60
 - post-sale, 270–271
 - via ATM activity, 425–426
 - via electronic funds activity, 425–426
 - Sweeney, Latanya, 158
 - Szydlo, M, 332
- T**
- tagged objects, 165
 - tags
 - See also* antennas; networks; radios; readers
 - active, 17, 261
 - anti-theft
 - automotive, 363–364
 - EAS (electronic article surveillance), 262
 - inventory management, 384–385
 - threats posed by, 262, 363–364
 - authenticatable, 137, 143
 - See also* authentication
 - backscatter, 23–24
 - batteries, 17–18
 - blocker, 332–335, 492–493
 - categories of, 286–288
 - classes, 19
 - content, 488
 - costs, 43–44
 - coupling with readers, 23–24, 25
 - “continued activation” as default, 420
 - customer removable, 208, 410–411



tags (*Continued*)

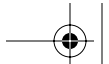
- “deactivation” as default, 422
 - defaults, laws and regulations, 423
 - description, 17–19
 - detecting, 333
 - dielectric coupling, 25
 - different frequencies, 426–427
 - electronic shelf labels, 385
 - electrostatic coupling, 24
 - encryption, 331–332
 - EPC (Electronic Product Code), 19
 - generations, 19
 - implants, 29–35
 - See also* tracking, livestock; tracking, people
 - killing
 - applications prevented by, 349–350
 - at point of sale, 490–492
 - competitive intelligence, 289
 - cost, 354–355
 - issues, 348
 - subthreshold retailers, 354
 - unauthorized use, 352–353
 - labeling, 329–330, 408–410
 - library systems, 230–231
 - load modulation, 23
 - minimum content, 18
 - mu-chip, 17
 - mutual interference, 18–19, 25, 87
 - on individual items
 - See* item-level tagging
 - on pill bottles, 208, 213–214
 - See also* CVS
 - passive
 - definition, 17
 - history of, 16
 - military use of, 194
 - reading range, 24–25
 - tracking, 488
 - penetration, 25–27
 - permission-based, 174–175
 - power supply, 17–18
 - premature removal, 410
 - product authentication, 140–141
 - promiscuous, 18
 - reader-to-tag communication, 333
 - reading range, 17
 - recoding
 - and EPCs, 350–352
 - cost, 354–355
 - rewritable tags, 353
 - strategy for, 289–290
 - subthreshold retailers, 354
 - vandalism, 353
 - “write then lock” architecture, 353
 - regulation
 - See* laws and regulations; policies and practices; standards and guidelines
 - rewritable, 353
 - screening, 25–27
 - secure, 18
 - semi-passive, 17
 - serial numbers, 18
 - shapes, 17
 - shielding, 25–27
 - sizes, 17–18
 - threats posed by, 260–262
 - unique identification, 137–138
 - value on product shelves, 286–288
 - visibility, 168–170
 - WID (wireless identification), 165
 - with pseudonyms, 336–337
- tag-to-reader distance, 336
- tapping phone conversations, 322
- TAV (Total Asset Visibility), 191, 191–192
- technological solutions
 - See* privacy, technological solutions
- technology
 - evaluating, 502–503
 - neutrality, 503–504
 - politics of, 503–504
 - trajectories, 501–502
- testing RFID
 - See* field trials
- Texas Instruments, 359–365
- theft prevention
 - See* anti-theft
- ThingMagic, 25, 45
- threats
 - See also* privacy; security; tracking
 - active tags, 261
 - anti-theft tags, 262, 363–364
 - at point of sale
 - See* point of sale
 - Bluetooth security
 - See* Bluetooth
 - cell phone
 - See* Bluetooth
 - Checkpoint Systems, 262





- corporate abuse, 271–272
- current safeguards, 361–363
- doorway readers, 263
- EAS (electronic article surveillance), 262
- employee ID cards
 - See proximity cards
- ensuring privacy, 276–277
- EPC (Electronic Product Code), 260–262
- government abuse, 272
- government-mandated surveillance, 265
- highway toll payment, xxx–xxxi, 360–363
- IBM, 263
- industrial espionage
 - See competitive intelligence
- invasive databases
 - EPC (Electronic Product Code), 267
 - manufacturer's data, 266–267
 - point of sale data, 268–270
 - post-sale surveillance data, 270–271
 - “What is this?”, 267
 - “Where did this come from?”, 266
 - “Where has it been seen?”, 270
 - “Who bought it?”, 268
- invisible tags, 262
- IRI (Information Resources), 268–270
- Liberty readers, 264
- Margaret, 263
- mitigation
 - See also privacy, technological solutions
 - CASPIAN position statement, 483
 - chip security, 427–428
 - constituents to change, 442–444
 - consumer education, 240, 409, 434
 - consumer goods, 421
 - “continued activation” as default, 420
 - “deactivation” as default, 422
 - different frequencies, 426–427
 - Electronic Frontier Foundation position statement, 498–499
 - hybrid products, 422–423
 - nonconsumer goods, 420–421
 - overcoming resistance, 441–442, 445–449
 - product classification, 423
 - sensitive products, 422
- passive tags, 260
- private-sector scenarios
 - “No one wins”, 277–278
 - “Shangri-La”, 278–279
 - “The Wild West”, 279–280
 - “Trust but verify”, 280–281
- required government action, 276
- self-regulation, 276
- source tagging, 262
- spying on competitors
 - See competitive intelligence
- tags, 260–262
- technology design requirements, 276
- ubiquitous readers, 263–265
- Tien, Lee, 238
- time-definite delivery, 193–194
- toll payment system, threats, xxx–xxxi, 360–363
- topographic places, 151
- Total Asset Visibility (TAV), 191
- traceability, point of sale, 389–390
- traceback, 250–251
- tracking
 - See also inventory; products; supply chain; surveillance
 - automobiles, 264
 - children, 323–324
 - consumer goods, 27–29, 415–416
 - documents, 9
 - e-mail, 112
 - inventory, 27–29
 - library books, 229–230
 - livestock
 - auction markets, 251–253
 - Australia, 253
 - BCMS (British Cattle Movement Service), 256
 - brands and earmarks, 245
 - Brazil, 253
 - Canada, 254
 - data harvesting, 248–249
 - European Union, 254
 - field trials, 251–253, 255
 - France, 255
 - health issues, 250
 - implants, 29–35
 - liability issues, 248
 - marketing, 249–253
 - national ID system, 246
 - New Zealand, 256
 - NLIS (National Livestock Identification Scheme), 253
 - privacy issues, 247–248



tracking (*Continued*)

- private data, 249–253
 - RFID standardization, 250–251
 - Soviba Group, 255
 - traceback, 250–251
 - United Kingdom, 256
 - medications
 - See* pharmaceuticals
 - nonconsumer goods, 414–415
 - “OKness”, 217–220
 - passive tags, 488
 - patient activity, 217–219
 - people
 - Bluetooth Person Tracker, 324
 - BodyTags, 323–324
 - children, xxv–xxvi, 323–324
 - corporate abuse, 271–272
 - drivers, 264
 - drug compliance, 209, 213–214
 - See also* pharmaceuticals
 - employees, 324
 - See also* proximity cards
 - exercise habits, 217–220
 - government abuse, 272
 - home eldercare, 216–221
 - implants, 29–35
 - in hospitals, 212–213
 - invasive databases, 266–271
 - library patrons, 229–230
 - nutrition, 220–221
 - shoppers, 263–265, 271–272
 - students, xxv–xxvi
 - video patrons, xxxii
 - pharmaceuticals, 201–210
 - traffic, 264
 - traffic, tracking, 264
 - transponders
 - See* tags
 - tree-walking, 333
 - trials of RFID
 - See* field trials
 - “Trust but verify” scenario, 280–281
 - trusted pairing, 312–314
 - Turner, Leigh, 45
- U**
- U.S. Supreme Court privacy opinion, 416–419
 - U.S.–Mexican border, 476

- UCC (Uniform Code Council), 41
- UHF band radio, 21
- Uniform Code Council (UCC), 41
- United Kingdom
 - privacy rights, 68
 - tracking livestock, 256
- United Nations’ Universal Declaration of Human Rights, 65, 65–67
- United States, privacy rights, 69
- universal product code (UPC), history of, 4
- unlicensed spectrum, 21
- untrusted pairing, 312–314
- UPC (universal product code), history of, 4
- UPS truck incident, 418–419
- usability, Bluetooth, 304–305
- users
 - authentication, 145–147
 - See also* federation
 - of RFID
 - See* stakeholders
 - WID (wireless identification), 165
- uses for RFID
 - See* applications; field trials

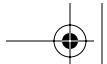
V

- Vainio, Juha, 318
- vandalism, 353
- velocity management, 193–194
- VeriChip implants, 32–35
- video gaming, Bluetooth, 315–316
- video patrons, tracking, xxxii
- Video Privacy Protection Act of 1988 (VPPA), xxxii
- Viet Nam, 190
- vision, role in location and identity, 150–152
- VPPA (Video Privacy Protection Act of 1988), xxxii

W

- Waldrop, Jim, 47
- Wal-Mart field trials
 - January, 2005, 84
 - language of change, 446
 - Max Factor Lipfinity Lipstick, 404–406
 - Metro Future Store, 404–406
 - Q & A, 529–534
- Wang, Dean and Karen, 248
- water, effects on reading range, 26





- Weis, Steve, 49
 - Westin, Alan, 60, 445
 - “What-is-this?” database, 267
 - “Where-did-this-come-from?” database, 266–267
 - “Where-has-it-been-seen?” database, 270–271
 - “Who-bought-it?” database, 268–270
 - WID (wireless identification)
 - benefits of, 164
 - designing and modifying
 - disclosure at read, 166–170
 - disclosure of use, 170–171
 - identifiable readers, 172–173
 - labeling systems, 167–170
 - opt-out capability, 175
 - permission-based tags, 174–175
 - read range, 171–172
 - recommendations, 166
 - tag visibility, 168–170
 - interaction design, 164
 - read fields, 165
 - reader, definition, 165
 - reading devices, 165
 - tagged objects, 165
 - tags, definition, 165
 - users, definition, 165
 - vocabulary, 164–165
 - WiFi, 469
 - “The Wild West” scenario, 279–280
 - wireless
 - cables, 306–309
 - cards
 - See contactless cards; Smart Cards; Speedpass
 - identification
 - See WID
 - penetration in Latin America, 468–469
 - tags
 - See RFID
 - telephones
 - See Bluetooth
 - wireless identification (WID)
 - See WID (wireless identification)
 - “write then lock” architecture, 353
- Y**
- YAWL (you are where you live), 156–157
- Z**
- ZIP Code, 156

