

TECHNICAL VOLUME

LIST OF FIGURES

Figure 1.0-1: Responsive Lead Vendor. 2

Figure 1.0-2: Quality Service Provider. 3

Figure 1.0-3: Flexibility to Transition. 6

Figure 1.0-4: Moving to Performance-Based Contracts. 6

Figure 1.3-1: Converged Backbone Services. 10

Figure 1.3-2: AT&T’s Global Network Architecture Sound
Technology and Operational Layers 13

Figure 1.3.1.b-1: Early Phases of the Sasser Worm [REDACTED]
..... 26

Figure 1.3.1.b-2: Tracking Activity of Major Network
Applications [REDACTED]. 28

Figure 1.3.1.b-3: AT&T Internet Protect [REDACTED]
[REDACTED] 31

Figure 1.3.1.b-4: AT&T’s Integrated Managed Security Services. 33

Figure 1.3.1.e-1: [REDACTED] Security Engineering Tool. 42

Figure 1.3.2.a-1: AT&T-Provided Local Access for
Government Agencies. 47

Figure 1.3.2.a-2: WiMax Sample Architecture. 53

Figure 1.3.2.b-1: Domestic Private Peering. 56

Figure 1.3.2.c-1: Service Assurance Architecture. 62

Figure 1.3.2.c-2: Service Verification Process. 65

Figure 1.3.2.c-3: Performance Management [REDACTED]
[REDACTED] 66

Figure 1.3.2.c-4: Global IP Network Performance Website. 67

Figure 1.3.2.c-5: Performance Dashboard. 68

Figure 1.3.2.d-1: Approach for Providing Quality for Time-Sensitive Traffic..... 69

Figure 1.3.2.d-2: High-level View of CoS and QoS Management across Network. 71

Figure 1.3.2.d-3: Differentiated Services [REDACTED] 73

Figure 1.3.2.d-4: MPLS Header Encapsulation [REDACTED] [REDACTED] 73

Figure 1.3.2.d-5: MPLS Packet Priority Routing. 74

Figure 1.3.3.a-1: The MSE/MSA architecture provides resilient access to AT&T networks and services..... 78

Figure 1.3.3.a-2: The MSE Physical and Virtual Elements. 80

Figure 1.3.3.a-3: Traditional Topology for Separate Service Types..... 81

Figure 1.3.3.a-4: The MSA/MSE Combination Used to Take Advantage of Access Network Bandwidth Reduction and Resiliency..... 81

Figure 1.3.3.a-5: Services are consolidated onto an IP Infrastructure. 82

Figure 1.3.3.b-1: The AT&T Global Network Architecture..... 83

Figure 1.3.3.b-2: WDM Provides More Bandwidth..... 86

Figure 1.3.3.b-3 The Optical-Electrical Optical Switch..... 86

Figure 1.3.3.b-4. [REDACTED] Protection for Data Circuits. 87

Figure 1.3.3.b-5: Intelligent Optical Network with Mesh Network..... 88

Figure 1.3.3.b-6: Redundant Links Provide Reliability. 92

Figure 1.3.3.b-7: Built-in Management and Security..... 95

Figure 1.3.3.c-1: Next Generation Networks..... 102

Figure 1.3.3.c-2: Continued Evolution from the Inside Out. 103

Figure 1.3.3.c-3: MSE Configuration with IP Transport Services..... 104

Figure 1.3.3.c-4: [REDACTED] Telephone Systems..... 104

Figure 1.3.3.c-5: Addition and Convergence [REDACTED] 106

Figure 1.3.3.d-1: Approach for Infrastructure and Service Enhancements..... 108

Figure 1.3.3.d-2: Approach for Operations System Enhancements..... 110

Figure 1.3.3.d-3: Approach for Security System Enhancements. 112

Figure 1.3.3.d-4: AT&T One Process [REDACTED] 114

Figure 1.3.3.e-1: AT&T's VoIP to PSTN interconnect. 117

Figure 1.3.3.e-2: [REDACTED] interconnect carriers at the IP to IP level. 120

Figure 1.3.3.f-1: AT&T Lead in Transition to IPv6..... 123

Figure 1.3.3.f-2: The AT&T MPLS core network [REDACTED] 124

Figure 1.3.3.f-3: Initial IPv6 tunnel access is analogous to the dialup IPv4 access of the early 1990s..... 125

Figure 1.3.4.5-1: Global Customer Care Help Desks..... 139

Figure 1.3.4.a-1: Basic GSM Components. 147

Figure 1.3.4.b-1: Global Infrastructure Security Requirements for International Carriers. 152

Figure 1.3.4.c-1: AT&T Global IP Network Peering Summary. 158

Figure 1.3.4.c-2: Private and Public Peering:..... 160

Figure 1.3.4.c-3: AT&T Global IP Network-Autonomous System Structure Today. 162

Figure 1.3.5.a-1: Voice over IP Advantages. 175

Figure 1.3.5.d-1: AT&T's 508 Specialty Team Members. 184

Figure 1.3.5.d-2: AT&T's All-Inclusive Section 508 Compliance Support. . 185

Figure 1.3.6.1-1: Generic AT&T Synchronization Architecture. 195

Figure 1.3.6.1-2: AT&T Core Synchronization Network. 196

Figure 1.3.6.1-3: AT&T Office Synchronization Architecture 197

Figure 1.3.6.2-1: Traditional Networking Places Complexity in
Access and at Agency. 201

Figure 1.3.6.2-2: The re-engineered the networking model. 202

Figure 1.3.6.2-3: Optical Electrical Optical Switch Provides
Redundancy at Core Optical Network Level. 203

Figure 1.3.6.2-4: ██████████ Networks Co-Exist. 204

Figure 1.3.6.2-5: Virtual Concatenation (VC) provides better
use of bandwidth on Ethernet over SONET Applications. 205

Figure 1.3.6.2-6: Virtual Concatenation (VC) Provides Better Use of
Bandwidth for Transport SONET Applications. 205

Figure 1.3.6.2-7: MSE/MSA Architecture Provides Resilient
Access to AT&T Networks and Services. 206

Figure 1.3.6.2-8: MSE Contains Both Physical and Virtual Elements. 208

Figure 1.3.6.2-9: SoIP Service Integration in SDP. 209

Figure 1.3.6.2-10: SoIP Service Network Components, Gateways and
Routing Components Create New Services 210

Figure 1.3.6.2-11: Common Control Plane Optimizes Routing. 213

Figure 1.3.6.3-1: SoIP Service Integration in SDP. 214

Figure 1.3.6.3-2: AAN Packet-based Routing. 216

Figure 1.3.6.3-3: Network Representation of the SoIP Architecture. 217

Figure 1.3.6.3-4: CoS is maintained end-to-end. 218

Figure 1.3.6.3-5: Differentiated Services ██████████ 219

Figure 1.3.6.3-6: MPLS Header Encapsulation ██████████
██████████ 220

Figure 1.3.6.3-7: MPLS Packet Priority Routing. 220

Figure 1.3.6.4-1: Network Based VPN Service: In the NB-IPVPN,
two or more SDP are tied together. 221a

Figure 1.3.6.4-2: Service Assurance Architecture..... 221f

Figure 1.4.1-1: Voice Services..... 227

Figure 1.4.1.c-1: Network Assets and Performance Characteristics..... 231

Figure 1.4.1.f-1: Network Disaster Recovery site in Jersey City, NJ,
September 2001..... 238

Figure 1.4.1.l-1: Current Services Networks..... 243

Figure 1.4.1.l-2: Converged Network Architecture..... 244

Figure 1.4.1.v-1: ██████████ Capacity..... 248

Figure 1.4.2-1: Functional Architecture..... 250

Figure 1.4.2.v-1: Spare Switch Capacity..... 263

Figure 1.4.3-1: AT&T TFS..... 265

Figure 1.4.3.3-1: ██████████ Platform..... 288

Figure 1.4.3.3-2: Automated Call Flow ██████████..... 289

Figure 1.4.3.x-1: Next Available Agent Routing and Network Queuing..... 298d

Figure 1.4.3.x-2: Reserved

Figure 1.4.3.x-3: Agency Call Allocation.....298i

Figure 1.4.3.x-4: North American Toll-Free Call Attempts..... 298n

Figure 1.4.4-1: AT&T’s Approach to Service Delivery..... 300

Figure 1.4.5-1: AT&T’s Global Approach to Service Delivery..... 321

Figure 1.4.5.x-1: Inverse Multiplexing over ATM..... 343a

Figure 1.4.6.1-1: MPLS as Convergence Platform..... 345

Figure 1.4.6.1-2: AT&T IPS..... 348

Figure 1.4.6.2-1: Network Reach Comparison..... 356

Figure 1.4.6.2-2: IP Network Latency Comparison..... 357

Figure 1.4.6.2-3: IP Network Health Web Page – Packet Loss (DDR)..... 360

Figure 1.4.6.2-4: IP Network Health Web Page – Delay..... 360

Figure 1.4.6.3-1: Peering..... 364

Figure 1.4.6.4-1: Class of Service..... 371

Figure 1.4.6.8-1: IPS with Managed Router..... 375
Figure 1.4.6.8-2: CPE Redundancy375c
Figure 1.4.6.8-3: Backbone Node Redundancy 375c(1)
Figure 1.4.6.8-4: Access Router Redundancy 375c(1)
Figure 1.4.6.8-5: Automatic Load Balancing 375c(2)

[REDACTED]

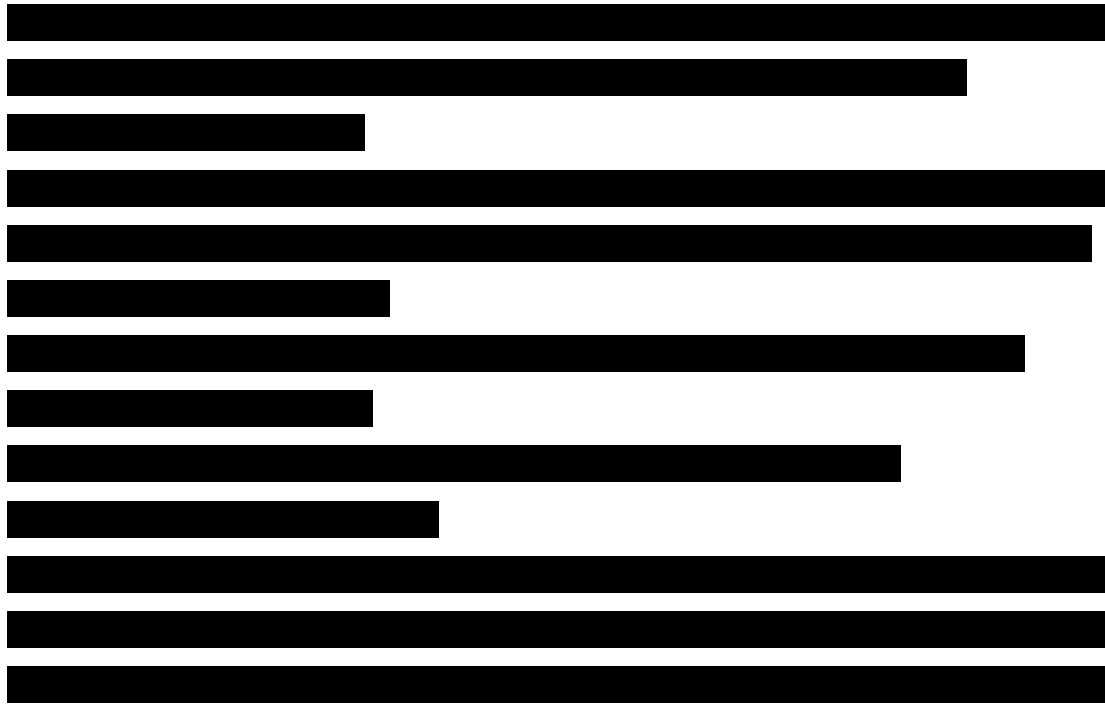


Figure 1.4.7-1: Global Network for CDNS..... 377

Figure 1.4.7.c-1 CDNS Infrastructure 380

Figure 1.4.7.c-2 Failover Feature..... 381

Figure 1.4.7.c-3 Intelligent Site Management – Capacity on
Demand/Redirection and Distribution Feature..... 382

Figure 1.4.7.c-4: AT&T BusinessDirect..... 385

Figure 1.4.7.c-5 IP Activity Reporting Tool 385

Figure 1.4.7.c-6 Bandwidth Usage Report..... 386

Figure 1.4.7.c-7 Response Code Count Report..... 386

Figure 1.4.8-1: AT&T Private Line Services Architecture..... 396

Figure 1.4.8-2: AT&T International Footprint..... 398

Figure 1.4.8.c-1: Private Line Service with Fully Managed End-to-End
Connectivity to Agency SDP..... 400

Figure 1.4.8.c-2: Private Line Service with Agency-managed Dedicated
Access to SDP..... 401

Figure 1.4.8.h-1: GNOC Consoles, Workstation, and Wall Displays..... 409

Figure 1.4.9-1: AT&T SONET Services Layer. 415

Figure 1.4.9-2: CONUS SONET and OCONUS SDH Network Coverage. . 419

Figure 1.4.9.h-1: GNOC consoles, workstation, and wall displays used to monitor and maintain the global SONET/SDH network 24x7..... 432

Figure 1.4.10-1: AT&T WDM Services Layer..... 439

Figure 1.4.10-2: AT&T Baseline Hubbed Ring [REDACTED] 442

Figure 1.4.10.c-1: AT&T CONUS Network Example..... 447

Figure 1.4.10.c-2: AT&T Ultra-Longhaul Network Segment..... 447

Figure 1.4.10.c-3: AT&T Metro Protected WDM Ring..... 453

Figure 1.4.10.e-1: Architecture of [REDACTED]..... 456

Figure 1.4.10.h-1: [REDACTED] [REDACTED] monitor and maintain the global optical wavelength network 24x7. 458

Figure 1.4.11-1: Combined Services. 464

Figure 1.4.11-2: Local Service on a National Scale. 466

Figure 1.4.11.f-1: Customer Satisfaction Index for Local Telephone Service..... 472

Figure 1.4.11.v-1: [REDACTED] Capacity. 480

Figure. 1.4.12-1: Integrated VPN: Enabling IP VPN Convergence. 482

Figure 1.4.12-2: Approach to Service Delivery. 484

Figure 1.4.12.d-1: Network Reach Comparison..... 491

Figure 1.4.12.d-2: IP Network Latency Comparison. 492

Figure 1.4.12.h-1: Management Network [REDACTED]..... 497

Figure 1.4.13.1-1: Integrated VPN: Enabling IP VPN Convergence. 505

Figure 1.4.13.1-2: MPLS as Convergence Platform. 506

Figure 1.4.13.1-3: NBIP-VPNS Architecture. 509

Figure 1.4.13.2-1: Network Reach Comparison..... 516

Figure 1.4.13.2-2: IP Network Latency Comparison. 517

Figure 1.4.13.2-3: Management Network [REDACTED]..... 519

Figure 1.4.13.4-1: [REDACTED] Congestion Avoidance. 531

Figure 1.4.14.1-1: AT&T's VoIP Network Approach Interconnects PBX
Systems and PSTN. 538

Figure 1.4.14.2-1: AT&T Network Outperforms Typical
Networks for VoIP..... 545

Figure 1.4.14.2-2: Management Network [REDACTED] 547

Figure 1.4.14.2-3: Call Quality. 550

Figure 1.4.14.3-1: VoIP Network for PBX Interconnect..... 554

Figure 1.4.14.6-1: Differentiated Services [REDACTED] 560

Figure 1.4.14.6-2: VoIP Packets [REDACTED]
[REDACTED] 561

Figure 1.4.14.6-3: Network Core Follows SIP Network Security Model. 567

Figure 1.4.14.6-4: DoS Attacks are Thwarted by MPLS
Separation of Networks. 569

Figure 1.4.14.6-5: VoIP Offers Like-for-Like Wiretap Resistance. 571

Figure 1.4.15-1: AT&T VoIP Product Access..... 573

Figure 1.4.15.c-1: Systems Supporting AT&T's VoIP Network. 589

Figure 1.4.15.d-1: AT&T Network Performance over
Typical VoIP Networks..... 594

Figure 1.4.15.h-1: Management Network and EMS Data Collectors. 599

Figure 1.4.15.h-2: Network Based VPN Service 599a

Figure 1.4.15.h-3: Different Talk Paths 599d

Figure 1.4.15.x-1: Reserved

Figure 1.4.15.x-2: Reserved

Figure 1.4.15.x-3: Network Core [REDACTED]604c

Figure 1.4.15.x-4 Network Separation Security Defense. 604e

Figure 1.4.15.x-5: LAN Switch Configuration Protects VoIP Privacy. 604g

Figure 1.4.15.x-6: Differentiated Services [REDACTED]604i

Figure 1.4.15.x-7: VoIP Packets [REDACTED]
[REDACTED]604j

Figure 1.4.16-1: CIPS Network Consists of VPN Services and
Specialized Gateways. 606

Figure 1.4.16.c-1: MPLS VPN Network. 620

Figure 1.4.16.c-2: [REDACTED] Operating Areas. 624

Figure 1.4.16.d-1: AT&T Network Outperforms Typical
Networks for VoIP..... 626

Figure 1.4.16.x-1: Network [REDACTED]634c

Figure 1.4.16.x-2: MPLS Separation of Networks..... 634e

Figure 1.4.16.x-3: Base Functionality of LAN Switch to
Protect Privacy. 634g

Figure 1.4.16.x-4: Priority Routing. 634h

Figure 1.4.16.x-5: VoIP Packets [REDACTED]
[REDACTED]634i

Figure 1.4.16.x-6: Access to Other Networks.634j

Figure 1.4.16.x-7: Monitoring Service Usage with AT&T634l

Figure 1.4.16.y-1: [REDACTED]
[REDACTED] 634m

Figure 1.4.16.y-2: CPE Redundancy 634p

Figure 1.4.16.y-3: Backbone Node Redundancy 634q

Figure 1.4.16.y-4: Access Router Redundancy 634r

Figure 1.4.16.y-5: Automatic Load Balancing 634r

Figure 1.4.17-1: L2VPNS..... 636

Figure 1.4.17.c-1: Reserved

Figure 1.4.17.c-2: Virtual Private LAN Service..... 642

Figure 1.4.17.h-1: KPI Data Collection. 651

Figure 1.4.17.x-1: Encapsulation Schemes Supported..... 655a

Figure 1.4.18.c-1: Dark Fiber Service 668

Figure 1.4.18.x-1: Attenuation Test Setup679i

Figure 1.4.18.x-2: OTDR Test Setup -- [REDACTED]
[REDACTED]679k

Figure 1.4.18.x-3: PMD Test Setup679k

Figure 1.4.18.x-4: Chromatic Dispersion Test Setup.679l

Figure 1.4.19.c-1: AT&T WDM Services Layer..... 683

Figure 1.4.19.c-2: AT&T International Footprint..... 685

Figure 1.4.19.c-3: AT&T Baseline Hubbed Ring [REDACTED] 686

Figure 1.4.19.c-4: AT&T Optical Network Capabilities..... 694

Figure 1.4.19.c-5: AT&T Optical Network Provisioning..... 694

Figure 1.4.19.e-1: Architecture of Optical Control Plane..... 698

Figure 1.4.19.h-1: [REDACTED] 701

Figure 1.4.20.c-1: Representative E-Line and E-LAN Implementation
Architecture. 723

Figure 1.4.20.c-2: E-Line Implemented as a Virtual Private Wire
Service (VPWS)..... 724

Figure 1.4.20.c-3: E-LAN Implemented as Virtual Private LAN
Service (VPLS 725

Figure 1.4.20.x-1: Reserved

Figure 1.4.20.x-2: Reserved

Figure 1.4.20.x-3: Data Path Connectivity between Customer
Edge Routers..... 737g

Figure 1.4.20.x-4: Proactive Measures Against Denial of Service.737k

Figure 1.4.20.x-5: EthS Management/Maintenance Architecture..... 737m

Figure 1.4.20.x-6: EthS Architecture..... 737o

Figure 1.5.1-1: Continuum of Hosting and Management Services..... 741

Figure 1.5.1-2: DHS Architecture..... 742

Figure 1.5.1.c-1: IDC Architecture. 754

Figure 1.5.1.c-2: Global IDC Locations..... 757

Figure 1.5.1.c-3: GIDC Power Architecture..... 758

Figure 1.5.1.c-4: Air Flow and Cooling..... 759

Figure 1.5.1.c-5: Smoke Detection and Fire Suppression. 760

Figure 1.5.1.n-1: AT&T Application Performance Management..... 772b

Figure 1.5.1.n-2: AT&T Application Performance Reporting.....772c

Figure 1.5.1.n-3: AT&T Enterprise Messaging Service..... 772g

Figure 1.5.1.n-4: ERP Cross-Functional Business Processes..... 772h

Figure 1.5.2-1: CHS Architecture..... 774

Figure 1.5.2.c-1: █████ Architecture. 778

Figure 1.5.2.c-2: AT&T Hosting Network Infrastructure. 781

Figure 1.5.2.c-3: GIDC Power Architecture..... 782

Figure 1.5.2.c-4: Air Flow and Cooling..... 783

Figure 1.5.2.c-5: Smoke Detection and Fire Suppression. 784

Figure 1.5.3-1: VTS Overview..... 795

Figure 1.5.3.c-1: Reservation-Based Conferences..... 807

Figure 1.5.3.c-2: Video On-Demand Conferences..... 808

Figure 1.5.3.c-3: Conference Viewing Options. 809

Figure 1.5.3.n-1: Agency Firewall Compatibility with VTS. 817b

Figure 1.5.3.n-2: On-line Access to Reports.....817c

Figure 1.5.3.n-3: VTS Bridging and Gateway Capabilities..... 817e

Figure 1.5.4-1: Audio Conference Bridge Architecture. 819

Figure 1.5.4-2: Audio Conferencing..... 820

Figure 1.5.4.e-1: Conference Monitor █████..... 826

Figure 1.5.4.e-2: Internet Reservation System. 827

Figure 1.5.5.c-1: Synchronized Streaming and Media Files. 843

Figure 1.5.5.n-1: Customized GSA Welcome Screen..... 851b

Figure 1.5.5.n-2: [REDACTED] Tab851c

Figure 1.5.6.1-1: AT&T Comprehensive Network Management Process. .. 853

Figure 1.5.6.2-1: AT&T Service Level Reporting. 860

Figure 1.5.6.3-1: Comprehensive Managed Network Solution..... 864

Figure 1.5.7-1: Contact Center Project Lifecycle. 875

Figure 1.5.7-2: Multimedia Customer Contact Centers..... 876

Figure 1.5.7.c-1: ARM Architecture and Key Components. 912

Figure 1.5.7.c-2: VoiceTone’s Service Creation Environment..... 913

Figure 1.5.7.c-3: Call Center Evolution Convergence..... 914

Figure 1.5.7.n-1: Network Call Queue. 921a

Figure 1.5.7.n-2: ARM’s Web Contact Service (WCS).....921z

Figure 1.5.8.1-1: Service Delivery CSDES Planning and Design. 923

Figure 1.5.8.4-1: [REDACTED] Network Environment..... 942

Figure 1.5.9-1: SS Architecture..... 962

Figure 1.5.9.c-1: Direct Area Storage Device. 966

Figure 1.5.9.c-2: Tape Backup and Restore Services. 967

Figure 1.5.9.c-3: Storage Plus Service. 968

Figure 1.5.9.c-4: StorageConnect Service..... 969

Figure 1.5.9.c-5: Ultravailable Storage. 970

Figure 1.5.9.c-6: AT&T’s Portfolio of Storage Solutions..... 971

Figure 1.5.10.n-1: Teleworker Call Logs..... 1003c

Figure 1.5.10.n-2: AT&T’s BusinessDirect portal..... 1003d

Figure 1.5.12.c-1: UMS Technical Architecture. 1009

Figure 1.5.12.c-2: [REDACTED] Supporting
VoIP and PSTN Telephony..... 1011

Figure 1.5.12.c-3: VoIP Access Call Flow for Voice
 Message Generation. 1013

Figure 1.5.12.c-4: Messaging Front-End/Back-End Architecture..... 1014

Figure 1.5.12.d-1: Service Tracking Hierarchy..... 1015

Figure 1.5.12.e-1: Sample UMS Web Messaging Screen. 1017

Figure 1.5.12.e-2: Speech Messaging Commands..... 1018

Figure 1.5.12.n-1: Unified Messaging Architecture..... 1022b

Figure 1.5.12.n-2: [REDACTED] Commands.
..... 1022c

Figure 1.5.13.c-1: Enterprise Instant Messaging Platform. 1022f

Figure 1.5.13.c.1-1: Enterprise Presence Integration. 1022h

Figure 1.5.13.c.2-1: [REDACTED]
Conference Room..... 1022i

Figure 1.5.13.c.3-1: [REDACTED]
[REDACTED] Alerts and Broadcasts. 1022j

Figure 1.5.13.c.4-1: Message Exchange with 2-Way Encryption..... 1022j

Figure 1.5.13.h-1: [REDACTED] Load Balanced Solution... 1022p

Figure 1.6-1: AT&T Integrated Security Solution. 1025

Figure 1.6.1.1-1: Multi-Layer Protection..... 1030

Figure 1.6.2.3-1: Graphical Representation of the Network-based
 Firewall Service. 1072

Figure 1.6.2.3-2: Graphical Representation of the Premises-based
 Firewall Service. 1073

Figure 1.6.2.1-1: AT&T Network and Premises-based Managed
 Firewall Services. 1057

Figure 1.6.3.1-1: AT&T Managed Intrusion Detection Service
 Security Solution..... 1078

Figure 1.6.4-1: VSS Architecture Using [REDACTED] Solution..... 1097

Figure 1.6.4.c-1: VSS Security Solution Backend Architecture..... 1102

Figure 1.6.4.c-2: VSS Security Solution Architecture for
External Scans. 1104

Figure 1.6.5.3-1: AVMS Desktop and Server Security Solution..... 1124

Figure 1.6.6-1: INRS Service Components..... 1132

Figure 1.6.6.c-1: ██████████ Components. 1135

Figure 1.6.6.c-2: ██████████ Interface..... 1136

Figure 1.6.6.c-3: ██████████ Early Detection Capabilities..... 1137

Figure 1.6.6.c-4: Internet Protect. 1138

Figure 1.6.6.c-5: INRS Malicious ██████████ 1140

Figure 1.6.6.c-6: ██████████ Operations Center. 1141

Figure 1.6.7-1: AT&T Managed Subscription Token
Service Architecture. 1148

Figure 1.6.7-2: AT&T ACES Functional Flow..... 1151

Figure 1.6.7.c-1: Token Authentication Process. 1155

Figure 1.6.8-1: SMEMS Architecture. 1167

Figure 1.6.8.c-1: Secure Email Features. 1170

Figure 1.6.8.c-2: SMEMS Spam Filtering. 1172

Figure 1.6.8.c-3: SMEMS Virus Filtering..... 1173

Figure 1.6.8.c-4: SMEMS Content Filtering. 1174

Figure 1.7.1-3 & 4: Adequate Spectrum 1186

Figure 1.7.1-1: ██████████ Network..... 1187

Figure 1.7.1-2: Nationwide Coverage. 1188

Figure 1.7.1-5: Increasing Data Speeds. 1189

Figure 1.7.1.e-1: Push-to-Talk ██████████ 1194

Figure 1.7.1.e-2: Push-to-Talk ██████████ 1194

Figure 1.7.1.e-3: Enterprise Paging. 1196

Figure 1.7.1.e-4: Blackberry Enterprise Service Architecture. 1196a

Figure 1.7.1.e-5: AT&T's GPRS Service Area. 1196c

Figure 1.7.1.h-1: Overall Network Architecture. 1199

Figure 1.7.1.i-1: Cell Network [REDACTED] 1205

Figure 1.7.1.j-1: Wireless Network Status Report. 1207

Figure 1.7.1.q-1: Fraud Detection Report. 1214

Figure 1.7.1.q-2: Message Filtering. 1217

Figure 1.7.1.q-3: RF Optimization Process. 1223

Figure 1.7.1.q-4: RF Optimization Process 1223

Figure 1.7.1.q-5: Cell on Wheels. 1226

Figure 1.7.1.q-6: IMS [REDACTED]
[REDACTED] 1228

Figure 1.7.1.q-7: [REDACTED] of RF Network. 1231

Figure 1.7.2-1: MWLAN Network Architecture. 1233

Figure 1.7.2-2: Software Client Identity Management. 1234

Figure 1.7.2.i-1: Support for Convergence [REDACTED] 1241

Figure 1.7.2.j-1: Real-Time Monitoring and Reporting. 1245

Figure 1.7.5.c-1: LMRS Basic Network Components. 1249

Figure 1.7.5.c-2: LMRS Field Radios. 1254

Figure 1.7.5.i-1: Project 25 Systems Worldwide. 1261

Figure 1.7.5.r-1: Systems Planning and Requirements Engineering Work
Products 1265a

Figure 1.7.5.r-2: Systems Design Phase Work Products 1265c

Figures 1.7.6-1; 1.7.6-2; and 1.7.6-3: [REDACTED]
[REDACTED] 1265f

Figure 1.9.4-1: T3 PRI Capability 1292fff