1.4.2 Circuit Switched Data Services (CSDS) [C.2.2.2]

Agencies will experience service continuity of circuit switched data services (CSDS) over a global network. The reach and reliability of the CSDS network will facilitate videoconferencing, dial-up backup circuits, bulk data transfer, and other Agency applications that require DS0 to DS1 bandwidth that can be tailored to meet specific needs.

1.4.2.1 Technical Approach to Transport/IP/Optical Service Delivery [L.34.1.4.1]

1.4.2.1.a Approach to Service Delivery

(a) Analyze the service requirements specified in this solicitation and describe the approaches to service delivery for each service.

The Government requires CSDS for substantial numbers of users with data and multimedia applications, such as video conferencing. Such services require dedicated bandwidth on demand, high service quality, security, and backup capacity. As depicted in **Figure 1.4.2.1-1**, AT&T offers,

██████████████████████████

██████ full featured CSDS that supports multimedia and toll-free feature requirements and delivers data services to our customers on a global basis.

Telemark scored AT&T **Excellent** *in the three attributes most important to customers:*

- *Network Reliability*
- *Secure Data Transfer*
- *Network Availability*

Telemark
Managed Data Network
Services
Voice of the Customer
Benchmarking Study
February 2005

Figure 1.4.2.1-1: Functional Architecture. *Agencies with domestic and overseas mission requirements for data services can tailor access from DS0 to DS1 to switched access* ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ ▮▮▮▮▮ *and unsurpassed reach, resilience, and reliability.*

AT&T's circuit switched data network spans ▮▮ countries with more than ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ and dedicated data access from ▮▮▮▮ ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ Agencies with overseas staff that have access to the AT&T Global Network can set up videoconferences with the speed and simplicity of a telephone call.

▮▮▮▮▮ is our dial up, bandwidth-on-demand service that allows customers to transmit data at speeds of 56/64 kbps up to 1.5 Mbps and higher. This service offers the quality and reliability of a private line network in a dial-up scenario. Customers select as much bandwidth as needed for their application. Agencies can connect PCs, workstations, facsimile (fax) machines, video codecs or Agency-specified terminations, such as a digital

PBX or intelligent MUX. Connections that are not made through the AT&T Global Network are limited to the bandwidth available through the public switched telephone network (PSTN). AT&T offers synchronous, full duplex, and digital services supporting speeds ranging from DS0 to DS1.

Table 1.4.2.1-1 depicts key elements of our technical approach for delivering services to Agencies under Networx.

SERVICE DELIVERY APPROACH	DESCRIPTION
Standards Compliance	Support for ANSI X3.189, ITU E.72, and ITU-TSS and EIA standards for DTE interfaces
Redundancy and diversity ██████████████	████████████████████████████████ ██ ██
Continuity of operations and disaster recovery	████████████████████████████████ • ████████████████████████ is prepared to respond to events impacting Agency telecommunications.
████████████████████	████████████████████████████████████ ████████████████████████████████ ████████████████████████████████
Multiple access options: ██████	████████████████████████████████ ████████████████████████████████ ████████████████████████████████
Multiple speeds	████████████████████████
Smoothly transition FTS2001 services to Networx	• Support for legacy services on current and future networks • Dedicated project managers for Networx
Networx vision for future services	• Circuit-switched digital service for the life of Networx ████████████████████████████████████

Table 1.4.2.1-1: CSDS Delivery. *Agencies will receive quality CSDS delivered through experienced people, processes, tools, client servicing, and a reliable network backbone.*

Government Agencies require reliable, resilient telecommunications to fulfill mission objectives. The AT&T network averages ████████████████ ██████ each business day—a number that will continue rising as Agencies and businesses field applications that require bandwidth on a dynamic basis.

AT&T's proactive network management and full set of access interface options and feature capabilities for CSDS represent a significant advantage for Government Agencies. AT&T identifies and corrects most network problems before they impact service. ████████████████████████

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████████████ provide high levels of service quality and reliability.

1.4.2.1.b   Benefits to Technical Approach

(b) Describe the expected benefits of the offeror's technical approach, to include how the services offered will facilitate Federal Enterprise Architecture objectives (see http://www.whitehouse.gov/omb/egov/a-1-fea.html).

From a Federal Enterprise Architecture (FEA) perspective, AT&T brings a market-based discipline to circuit-switched services that supports multiple lines of business and subfunctions defined by the ██████████████████ ████████ AT&T's CSDS components provide video, toll-free, and other communications services in support of Federal Agencies to accomplish citizen-centric service missions. An example is AT&T's ███████████ which will provide critical infrastructure resources to enable rebuild efforts for voice and data services when a communications central office or node is disabled or destroyed. As a service provider with worldwide reach, AT&T has a reliable and resilient network that provides substantial benefits for Networx customers. Some of these benefits are highlighted in **Table 1.4.2.1-2**.

SERVICE DELIVERY APPROACH	BENEFITS	FEA FACILITATION
Standards Compliance	Offers a service that will provide the interoperability and performance that are consistent.	• Support for multiple lines of business as defined by ██
Redundancy and diversity - ██████	• Automatically reroute circuits following failure on core network • Reroute circuits ████████████████████	
Redundancy and diversity - █████	████████████████████████ ██████████████████ ██████████████████	███████████████ ███████████████
Flexible routing	Flexible routing feature: • Enables alternate route during outages • Provides disaster recovery alternatives for Agencies.	• Utilization of industry standards
Shared Access for Switched Services (SASS)	T1.5 line with multiple nodal services: • Shares trunk subgroup on a call-by-call basis • Lets Agencies allocate channels based on a total toll-free and ████ call volume.	███████████████
Static Integrated Network Access (SINA)	T1.5 line with versatile access: • Enables Agency to carry toll-free, ████, and data calls on	• Support for network services.

SERVICE DELIVERY APPROACH	BENEFITS	FEA FACILITATION
	single T1.5 access • Lets Agency dedicate each channel for specific service.	
Switched access at multiple speeds/off-net overflow	ISDN calls: • 56, 64, and 384(H0) kbps • 384 kbps on single ISDN call; faster setup and less multiplexing than some competitors' methods. • Multirate NxDS0, N=1-24.	
Smooth transition FTS2001 services to Networx	AT&T's transition approach will minimize service disruption.	
Networx vision for future services	AT&T commitment to support leading edge and legacy services: • Provides continuity of operations • Facilitates transition to new services at each Agency.	

Table 1.4.2.1-2: Agency Benefits of CSDS and FEA Facilitation. *Agencies will receive CSDS services that are easily integrated, commonly manageable, and aligned to support FEA objectives and meet FEA guidelines.*

The high reliability and quality of AT&T's intelligent network will provide a sound foundation for CSDS under Networx.

1.4.2.1.c   Major Issue to Service Delivery

(c) Describe the problems that could be encountered in meeting individual service requirements, and propose solutions to any foreseen problems.

Drawing on extensive experience providing circuit-switched communications, AT&T has resources in place to provide the quality, continuity, and integrity of CSDS required under Networx. This section highlights issues of known importance to the Government: business continuity, implementation, and fraud detection. Potential problems for CSDS, such as service disruption due to natural or manmade disasters, will be similar to those for Voice Services (VS) because ███████████████████████████████████ (Refer to Section 1.4.1.1.c, Voice Service, for related discussion.)

"AT&T not only is the patriarch of today's disaster recovery programs, it also is the kingfish. AT&T has spent more than $300 million on the effort since 1991, and much of that money has been spent on 20-foot semi-tractor trailers that house network equipment, capable of replicating any domestic or international transport scenario."

--Telephony Online

Table 1.4.2.1-3 presents four risk areas with potential problems, and the steps AT&T is taking to eliminate or mitigate them.

RISKS	RISK DESCRIPTION	RISK MITIGATION
Business disruption	• Network congestion and call blockage • Failure of urban telecommunications nodes	████████████████
Implementation	• Incomplete or inaccurate location information • Requirements changes	████████████████
Communications	Poor communications between prime contractor, suppliers, and customers.	████████████████
Network facilities	Network facilities not available when Agency requests service	████████████████

Table 1.4.2.1-3: Mitigating Risk. *Agencies will receive high quality service through AT&T's strategic investments in resources to maintain its network, recover from network disasters, and prevent losses arising from fraud and calling card misuse.*

"We got immediate recoverability. AT&T let us redirect all our lines to new offices, home phones, cell phones—anywhere we wanted to send the calls…The quality of customer service we've seen with AERS exceeds that of its competitors… AT&T offers predictable service and reliable technology… I'm pleased with the account team and the service overall."

--Ashley Feher,
Assistant Vice President
Technology Site Management

AT&T continues to invest in resources to provide continuity and integrity of circuit switched services required under Networx. Potential problems for CSDS, such as service disruption due to natural or

manmade disasters, will be mitigated by AT&T's extensive redundant network and proven disaster recovery capabilities.

1.4.2.1.d   Network Architecture Synchronization

(d) Describe the synchronization network architecture to support the offeror's access and transport networks.

More detailed discussion is provided in Section 1.3.6.1, Network Architecture Synchronization.

1.4.2.2   Satisfaction of Transport/IP/Optical Performance Requirements [L.34.1.4.2]

1.4.2.2.a   Service Quality and Performance

(a) Describe the quality of the services with respect to the performance metrics specified in Section C.2 Technical Requirements for each service.

AT&T is committed to offering the Government the highest quality in circuit switched digital services; this commitment extends beyond simple promises.

Table 1.4.2.2-3. **Table 1.4.2.2-1** lists our KPIs and AQLs for various service quality levels.

KEY PERFORMANCE INDICATOR (KPI)	SERVICE LEVEL	PERFORMANCE STANDARD (THRESHOLD)	PROPOSED SERVICE QUALITY LEVEL
Availability (POP-to-POP)	Routine	99.95%	
Availability (SDP-to-SDP)	Routine	99.5%	
	Critical	99.95%	

KEY PERFORMANCE INDICATOR (KPI)	SERVICE LEVEL	PERFORMANCE STANDARD (THRESHOLD)	PROPOSED SERVICE QUALITY LEVEL
Time to Restore (TTR)	With Dispatch	8 hr	▇
	Without Dispatch	4 hr	▇
Grade of Service (Call Blockage)	Routine	0.07 (SDP-to-SDP)	▇▇▇
		0.01 (POP-to-POP)	▇▇▇▇
	Critical	0.01 (SD- to-SDP & POP-to-POP)	▇▇▇▇▇

Table 1.4.2.2-1: CSDS Performance Metrics. *Agencies will benefit from AT&T's high-quality standards meeting service-level standards.*

███

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███

█████████████

1.4.2.2.b   Approach to Monitoring and Measuring Performance

(b) Describe the approach for monitoring and measuring the Key Performance Indicators (KPIs) and Acceptable Quality Levels (AQLs) that will ensure the services delivered are meeting the performance requirements.

Of equal importance to identifying the KPIs for a service is the method by which the KPIs are captured, measured, and monitored. Agencies will receive the most accurate assessment of the service when the KPI measurement and monitoring methodology replicates the Agency's experience. **Table 1.4.2.2-2** outlines our approach to monitoring and measuring CSDS KPIs.

KEY PERFORMANCE INDICATOR (KPI)	APPROACH TO MONITORING AND MEASURING
Availability (POP-to-POP)	██ ████████████████████████████████ ████████████████████████████████████
Availability (SDP-to-SDP)	████████████████████████████ ██████████████████████████████████ █████████████████████████████████████ ██████████████████████████████
Time to Restore (TTR)	█████████████████████████████ ██████████████████████████ ████████████████████████████████ ████████████████████████

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KEY PERFORMANCE INDICATOR (KPI)	APPROACH TO MONITORING AND MEASURING
Grade of Service (GoS) (Call Blockage)	██

Table 1.4.2.2-2: CSDS Measurement. *Agencies will have access through AT&T* **BusinessDirect**® *to KPI data presented in spreadsheet and graphic displays.*

The first time the service is provided through the Networx contract, the performance must be verified. The KPIs will be monitored to certify that service performance complies with the AQL. ██ The service verification process is presented in greater detail in Section 1.3.2.d, Approach to Perform Service Delivery Verification.

1.4.2.2.c   Performance Level Improvements

(c) If the offeror proposes to exceed the Acceptable Quality Levels (AQLs) in the Key Performance Indicators (KPIs) required by the RFP, describe the performance level improvements.

██ AT&T demonstrates its commitment to provide the Government with the improved reliability and performance as outlined in **Table 1.4.2.2-3**.

KEY PERFORMANCE INDICATOR (KPI)	SERVICE LEVEL	NETWORX AQL THRESHOLD	PROPOSED AQL	PERCENT IMPROVEMENT
Availability (POP to POP)	Routine	99.95%	████	██
Availability (SDP to SDP)	Routine	99.5%	███	██
	Critical	99.95%	████	██

Table 1.4.2.2-3: Performance Level Improvements. *AT&T will adhere to higher CSDS performance standards.*

1.4.2.2.d   Rationale and Benefits for Additional Performance Metrics

(d) Describe the benefits of, rationale for, and measurement of any additional performance metrics proposed.

The KPIs defined by the Government for CSDS will provide a comprehensive assessment for service verification and service performance monitoring. Therefore,

1.4.2.3   Satisfaction of Transport/IP/Optical Service Specifications [L.34.1.4.3]

1.4.2.3.a   Service Description

(a) Provide a technical description of how the service requirements (e.g., capabilities, features, interfaces) are satisfied.

AT&T has an extensive network for national and international circuit-switched services. We build resilience into our network to prevent service delay or loss.

*AT&T won the **Best Overall Performer Award** for data services in the Frost & Sullivan Asia Pacific Service Provider Awards 2004.*

"AT&T's Data Connectivity Services Portfolio, utilizing the AT&T Global Network, provides seamless features and capabilities around the world. AT&T's Global Connectivity services have the largest reach in the industry and help to keep customers competitive in today's global economy."

--Frost & Sullivan

AT&T provides synchronous, full-duplex, transparent, totally digital service from SDP to POP. Data rates of DS0 to DS1, including multiples of DS0 data rates, provide fast access, high speed, and bandwidth on demand. The service supports on-net and off-net locations. The following categories of information payload bandwidth are supported:

- DS-0 at 56-kbps and 64-kbps data rates (64 kbps requires ISDN access arrangement)
- Multirate NxDS0, N=1 to 24 for data rate up to 1.536 Mbps.

Multiple DS-0 usage will be critical to the Government end user, especially for video-teleconferencing capabilities.

1.4.2.3.a.1   Technical Capabilities

AT&T's CSDS will provide the technical capabilities specified in the RFP.

Table 1.4.2.3-1 details our CSDS capabilities.

CAPABILITY	DESCRIPTION
Uniform Numbering Plan	AT&T currently supports, and will continue to support and comply with, the ITU-TSS Integrated Services Digital Network (ISDN) E.164 uniform numbering and addressing plan.
Authorization codes	The network will support the same authorization codes as those offered in voice services.
User-to-user signaling via ISDN D-Channel	Non-call associated signaling (NCAS) allows users to communicate by means of user-to-user signaling without setting up a circuit-switched connection.
Multirate DS0	The network will offer appropriate dial sequences and transport of all bit sequences associated with signaling and transport.

Table 1.4.2.3-1: Key ▆▆▆ Capabilities. *Agencies will receive unparalleled service quality that provides Government voice services when and where needed.*

1.4.2.3.a.2   Features

Table 1.4.2.3-2 highlights key service components and their value to the Government. To deliver these features, AT&T will build on its AT&T **Business**Direct service portal and provide the Government with a web-based window into our support of required and optional services under Networx.

SERVICE FEATURE OR COMPONENT	SERVICE DESCRIPTION	BENEFITS
Dial-in	The ▆▆▆▆▆▆▆▆▆▆▆▆▆▆▆▆▆ provides: • Access from customer locations to the AT&T switched network • Connection via all-digital electronic switching systems • Customized call handling • Network performance and control ▆▆▆▆▆▆▆▆	The flexibility and reliability of ▆▆▆▆▆▆▆ provides the Government with substantial benefits: • Agencies with wide variations in calling volume to geographically dispersed locations can economically include those sites in their CSDS network. • The Government gains additional security from a closed environment with private numbering plans, screening provisions, and use of authorization codes to meet Agency accounting and management requirements.
User-to-user signaling via ISDN D channel	The D channel's monitoring and control functions are totally separate from the transmission taking place on the B channels. The D channel is also responsible for much of the intelligence and flexibility of ISDN. D channel information is in fields of the call set-up message. The LEC information is limited to information about the caller, such as the caller's telephone number.	

Table 1.4.2.3-2: Key ▆▆▆ Components or Features. *Agencies will receive CSDS through a network designed to incorporate flexibility in multiple dimensions, including access, connectivity, compatibility, and programmability.*

▆▆▆ the

Government can tailor its CSDS choices to meet requirements as well as

preferences. ██

██

1.4.2.3.a.3   Interfaces

Table 1.4.2.3-3 presents the interfaces required for CSDS under Networx.

██

██████████████████████████████████████

UNI TYPE	INTERFACE TYPE AND STANDARD	PAYLOAD DATA RATE OR BANDWIDTH	SIGNALING TYPE
1	ITU-TSS V.35	Up to 1.536 Mbps	RS366A (dialing)
2	EIA RS-449	Up to 1.536 Mbps	RS366A (dialing)
3	EIA RS-530	Up to 1.536 Mbps	RS366A (dialing)
4	ISDN PRI (Multirate) (T Reference Point) (Standard: ANSI T1.607 and 610)	Up to 1.536 Mbps	ITU-TSS Q.931
5	T1 (with ESF) (Std: SR-TSV-002275, and ANSI T1.102/107/403)	Up to 1.536 Mbps	SS7

Table 1.4.2.3-3: Key CSDS Interfaces. *Agencies will receive a wide variety of network interfaces to meet the Government's CSDS service needs.*

1.4.2.3.b   Attributes and Value of Service Enhancements

(b) If the offeror proposes to exceed the specified service requirements (e.g., capabilities, features, interfaces), describe the attributes and value of the proposed service enhancements.

AT&T's ███████████████████████████████ provides the Government

with flexibility and reduces the administrative burden that accompanies

networks that are more hard wired. ███████████████████████████

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1.4.2.3.c   Service Delivery Network Modifications

(c) Describe any modifications required to the network for delivery of the services. Assess the risk implications of these modifications.

1.4.2.3.d   Transport/IP/Optical Service Experience

(d) Describe the offeror's experience with delivering the mandatory Transport/IP/ Optical Services described in Section C.2, Technical Requirements.

AT&T provides circuit-switched data and voice services for Government Agencies and commercial customers. During 2004, AT&T's network averaged about ▮▮ million voice calls and ▮▮▮▮▮▮▮▮▮▮▮ per business day. ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

Section 1.4.1.3.d, Voice Service, discusses AT&T's response to September 11, 2001, and its successful effort to restore network services to Lower

> *"AT&T really is the firm that you're going to want to have integrate voice and data for you over time."*
>
> --Richard Love
> Senior VP and CIO

Manhattan. It also provides information on Federal Agencies that use AT&T circuit-switched network services.

Table 1.4.2.3-4 highlights additional CSDS use in the public and private sectors.

Client Need	Solution	Created Value
███████████████████████	The hospital installed switched digital service along with video units to deliver specialized medical care to children in a remote South American location.	████████████████████████

Client Need	Solution	Created Value
██████████████████████	With SDDN and ISDN, the university can: • Broadcast using bandwidth on demand • Use high speeds to support high-quality videoconferencing • Receive access without having to dedicate part of its T1.5 line to high speed data	University can use the circuits when required, providing the best use of its facilities: • Bandwidth on demand provides automatic allocation of the speed need for high-quality broadcasts • Remote courses reach greater number of students. • Reducing student commuting enables the school to help the community meet its obligation to reduce regional, ground-level ozone pollution.

Client Need	Solution	Created Value
████████████████████	State and local Governments have installed switched digital service to use in conjunction with video equipment at the police station and at the judges' office or home for video arraignment of prisoners.	████████████████████████

Table 1.4.2.3-4: CSDS Experience. *Customers receive CSDS solutions that expand service options and reduce their costs to deliver service.*

1.4.2.4   Robust Delivery of Transport/IP/Optical Services [L.34.1.4.4]

1.4.2.4.a   Network Traffic Utilization

(a) Given the offeror's current network capacity and utilization, explain how the offeror will support the Government requirements specified in the traffic model. Describe the impact on capacity and utilization, as well as any infrastructure buildout contemplated.
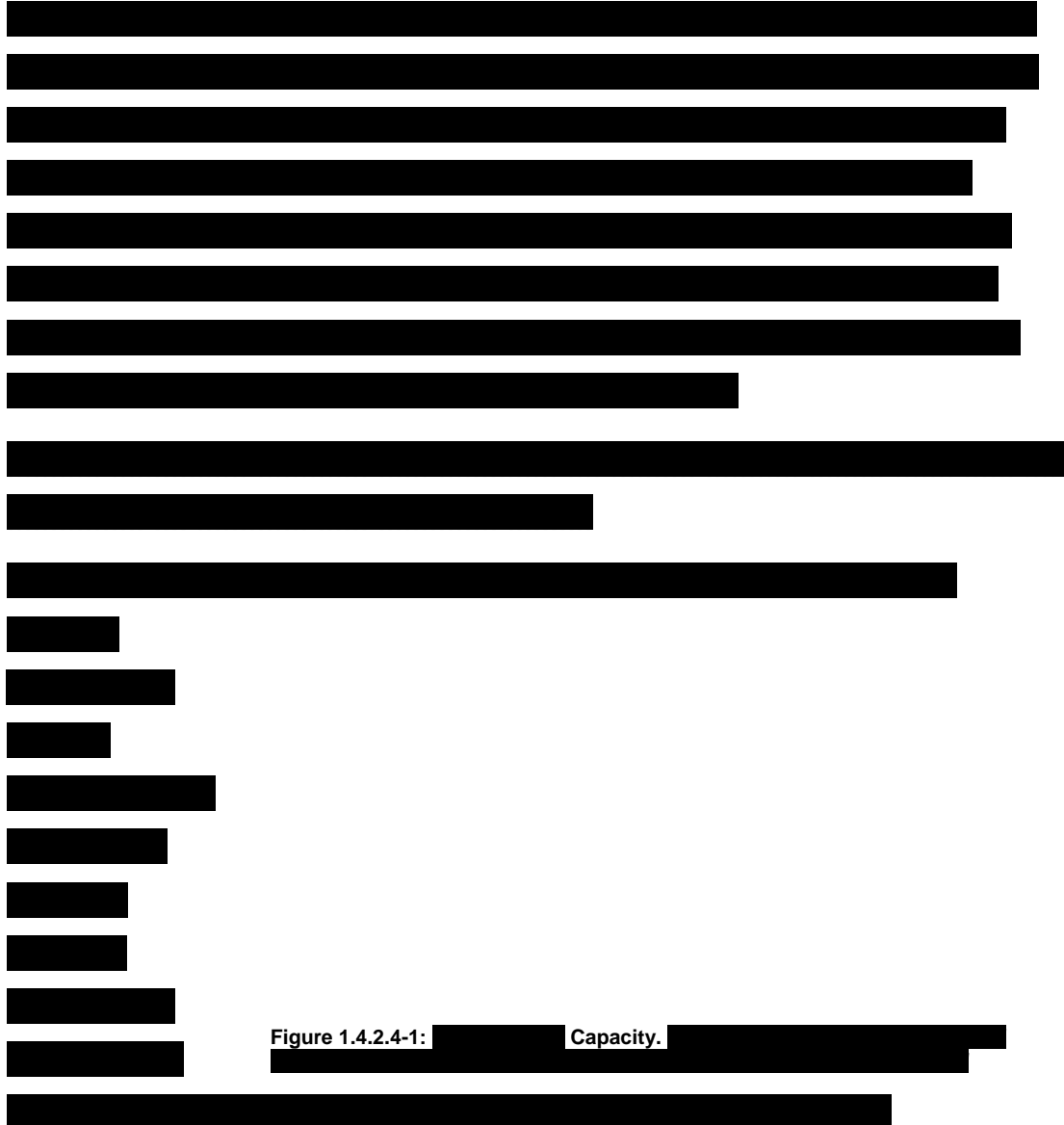
Figure 1.4.2.4-1: ████████ **Capacity.** ████████████

1.4.2.4.b   System Robustness and Resiliency

(b) Describe the measures and engineering practices designed to provide robustness of the access and backbone networks, ensure resiliency, and plan for growth.

AT&T manages circuit-switched calls through ███████████████

██

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███████████████████████ uses various tools (**Table 1.4.2.4-1**) and controls over

long distance, edge, and local end-office switches to route traffic around affected

areas and optimize performance.

VS TOOL	FUNCTION
████████	███████████████████████████████
████████	████████████████████████
████████	█████████████████████████████████
████████	████████████████████████████████
████████	█████████████████████████████████

Table 1.4.2.4-1: CSDS Tools. *AT&T's circuit-switched network detects congestion and overloads and instantaneously reroutes traffic to maintain availability and high service quality.*

Additional measures and engineering practices for TDM and IP networks are

described throughout Section 1.3, Network Architecture, notably in Section

1.3.2.c, Congestion and Flow Control Strategy. Network growth for CSDS is

addressed in Section 1.4.2.4.a, Network Traffic Utilization.

1.4.2.5   Transport/IP/Optical Service Optimization and Interoperability [L.34.1.4.5]

1.4.2.5.a   Approach to Optimizing IP-based and Optical Services

(a) Describe the offeror's approach for optimizing the engineering of IP-Based and Optical Services.

Engineering optimization of the optical and IP-based services is described in

Section 1.3.6.2.a.

1.4.2.5.b   Network Architecture Optimization

(b) Describe how the offeror will utilize methods such as remote concentration, switching/routing capabilities, and high bandwidth transmission facilities to optimize the network architecture.

Optimization of the network architecture through the use of remote concentration, switching/routing capabilities, and high bandwidth transmission facilities is described in Section 1.3.6.2.b.

1.4.2.5.c   Optimizing Engineering Techniques

(c) Describe the engineering techniques for optimizing access for improved performance or increased efficiency in areas where large concentrations of diverse customer applications exist (e.g., the use of multi-service edge platforms).

Optimization of the access for improved performance or increased efficiency through the use of multiservice edge (MSE) platforms is described in Section 1.3.6.2.c.

1.4.2.5.d   Vision to Implement Service Internetworking

(d) Describe the offeror's vision for implementing service internetworking over a common infrastructure (e.g., IP-centric architecture). Include a view on network interoperability, control plane integration, and optical infrastructure support for IP-Based Services. Describe the benefits and rationale of the offeror's approach.

Agencies will be able to use CSDS over the AT&T circuit switched backbone network. To meet Government requirements and anticipate future needs, the Networx contractor must have a sound plan to migrate to a converged IP platform. This plan will address the vision expressed in GSA's Networx Initiative of migrating from a federated aggregation of services to enterprise architecture over the IP infrastructure.

Additional issues related to the common network that carries CSDS, toll-free, and other voice traffic are discussed in Section 1.4.1.5.d, Voice Service. See

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also Architecture Section 1.3.6.2.d for information on network interoperability, control plane integration, and optical infrastructure support for IP-based services.

1.4.2.6 Stipulated Deviations

AT&T complies with all the Stipulated Requirements for CSDES.

1.4.2.6.1 Reserved