5.2.5 Content Delivery Network Services (CDNS) (L.34.1.4.6; C.2.4.6)

The offeror shall describe each of the optional services offered. Table L.34.1-4 shows the Transport/IP/Optical Services that shall be optional to offer. Tables J.9.1.1.2 (b) Technical Stipulated Requirements for Optional IP-Based Services and J.9.1.1.3 (b) Technical Narrative Requirements for Optional IP-Based Services identify the stipulated and narrative requirements, respectively, that shall apply exclusively to optional services.

The offeror shall describe all optional Transport/IP/Optical Services offered to include:

5.2.5.1 Satisfying the Service Requirements (L.34.1.4.6 (c))

A technical description of how the service requirements (e.g., capabilities, features, interfaces) are satisfied for all proposed optional services.

Today’s Government Agencies realize how mission critical their web sites are, so they have looked to find ways to maintain availability and increase performance. In the past, options such as traditional Centralized Hosting and Site Mirroring often would create performance problems, take several hours to recover from outages and represented a substantial infrastructure cost. Figure 5.2.5-1 shows the traditional web site infrastructure.

Figure 5.2.5-1. Typical Web Site Infrastructure

Internet bottlenecks and the performance problems they create are a result of the two traditional models of web applications architecture: centralized hosting and site mirroring.
To realize the full promise and advantages of e-government, Agencies require a platform with services designed specifically to avoid Internet limitations and to provide the online environment the Government requires.

Content delivery network services (CDNS) are designed to improve website performance and availability by routing content on a specialized overlay network of servers or datacenters that tap a variety of content-speeding technologies, including caching, load balancing, and replication. This method of outsourcing content delivery has become an attractive option for many Government Agencies who are trying to sustain performance and reliability of their online presence while controlling the cost of infrastructure build-out.

The Sprint CDNS solution provides a proven platform that will satisfy Agency e-government objectives for increased web performance and availability. The Sprint CDNS solution supports large downloads, video files, and streams over the Internet, and thus realizes the potential of digital media and streaming distribution. With a network presence of more than 15,000 servers throughout the world, the Sprint solution provides the global reach, the redundancy, and the resulting proven performance the Government requires. Our distributed model, where content and computing applications are exchanged in a system of distributed servers and processed at the most efficient places within the network, provides the Government many advantages over a centralized architecture including improved performance, increased availability and infrastructure savings. The Sprint proven, global CDNS solution is a robust, functionally rich, effectively supported solution.
The Sprint solution meets and exceeds the stated CDNS requirements and offers a number of unique additional capabilities that provides the industry’s broadest spectrum of solutions. As the market leader, the Sprint solution supports the most Agencies, delivers the most traffic, offers the most diverse functional capabilities, and is committed to continuing to expanding its market leadership. GSA can be assured that Sprint can provide the best possible CDNS solutions, both today and in the future.

The Sprint CDNS Solution

This intelligent “edge-based” CDNS solution delivers content and applications though a network of more than 15,000 servers in more than 1,100 ISP networks, in 2500 physical locations, in 70 countries, and on 6 continents. Figure 5.2.5-2 depicts the Sprint Globally Distributed Network Platform.
Sprint has taken the Internet – never designed for the critical e-government mission it now serves – and made it predictable, scalable and secure - a robust e-government platform. Essentially an overlay of the Internet, Sprint places information — web and portal content, streaming services, and applications – at the “edge” of the Sprint network, where it is delivered quickly and reliably. With the Sprint CDNS solution, the Government will continue to maintain their web Server for publishing content, leveraging their previous IT investment. The Sprint global network edge servers pull and cache content at the edge of the Internet for superior whole site delivery to end users. Figure 5.2.5-3 shows the Sprint edge computing technology.
The Sprint solution enables the Government to extend their online architecture to the Internet, and meet the growing needs of Agencies in a cost-effective manner. Specifically, the solution offloads centralized web infrastructure and ensures that all digital media is served without fail from a network of 15,000 servers. This solution, developed based on experience, supports the ability to respond rapidly to shifts in market conditions and Government demands. By extending their web site to the Sprint network, Agencies can deliver all content types—HTML, images, dynamic content, software and document downloads, secure content, personalized content, and streaming media—directly to requesting end users, while preserving the network’s ability to absorb peak traffic. Online applications are distributed over this global network to help ensure that critical processes are never
interrupted. And the network inherently masks Agency web sites from external attacks that can lead to frustrated users, a damaged brand image, and loss of critical assets and revenue. The result for each web site is higher availability, superior performance and protection, and greatly enhanced scalability. Figure 5.2.5-4 illustrates the Sprint CDNS offering.

Figure 5.2.5-4. XXXXXXXXXXXXXXXXXXXXXXXX

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Proven Service Delivery Process

One of the reasons the Sprint solution is ideal is its use of a proven process-based deployment model. This flexible approach to service delivery consists of:

- Thorough assessment and documentation of client requirements by experienced Sprint pre-sales technical consultants
- The skilled development – in partnership with Sprint clients - of the optimum CDNS solution
- The development of and execution of a documented deployment plan by the Sprint Professional Services team
- On-going support of Sprint local Account Management and award-winning global Customer Care support team to ensure ongoing performance.
This process, proven and refined in the implementation of thousands of deployments world-wide, is managed by the dedicated and experienced Sprint Federal Team, ensuring each Government Agency receives the optimal content delivery solution to address their unique requirements.

*The Sprint CDNS Standards*

Sprint complies with all Government CDNS Standards, as follows:

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Sprint CDNS Connectivity

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5.2.5.1.1 Capabilities (L.34.1.4.6 (c))

As part of its CDNS solution, Sprint provides the Government Static Content Download Service, Real-time Streaming (webcasting) and On-Demand Streaming. Each of these technical capabilities is identified below.

**Static Content Download Service.** Sprint meets and exceeds this requirement, providing not only static content – in all forms – but also dynamic content. We store and distribute content on the world’s largest delivery platform, consisting of over 15,000 servers, deployed in over 70 countries. The global leader in content and business process delivery, the Sprint solution has the depth and breadth in its distributed platform to support any content download, anywhere, regardless of size and complexity.
Figure 5.2.5-5. The Sprint Real-Time Streaming

*Sprint provides industry leading real-time streaming capability.*
Sprint CDNS Site Monitoring

Sprint provides a management portal that is a powerful yet easy to use web-based system for continuous monitoring to ensure performance and quality of service.

The Sprint CDNS solution provides comprehensive and continuous monitoring and This web-based “dashboard” tool is highly secure and available 24 x 7. It gives enterprises the visibility and control that comes with knowing exactly how their extended web infrastructure is functioning at all times. Based on industry best practices, it is comprehensive, yet intuitive and easy to use.
5.2.5.1.2 Features (L.34.1.4.6 (c))

The Sprint solution will provide the Failover and Redirection/Distribution Services as specified in the Networx RFP.
• **Failover Service** – The Sprint solution meets and exceeds the Government requirement for Failover Service. Sprint will provide a failover feature to insure that a failed site does not take an Agency web presence “off the air”. Sprint provides a flexible failover service that ensures multiple options for the Government web sites that rely on centralized infrastructure often find that ensuring uptime is a continuous challenge.
Figure 5.2.5-6. XXXXXXXXXXXXXXXXXXXXXXXXXXX

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• **Redirection and Distribution Service** – The Sprint solution provides

Redirection and Distribution Service

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5.2.5.1.3 Interfaces (L.34.1.4.6 (c))

Sprint can provide the required Internet connectivity to the Government’s origin server(s). Sprint methodology to meet Internet service requirements is to utilize the Sprint public IP network, SprintLink. As a Tier 1 Internet Service Provider (ISP), the Sprint public IP network is one of the major backbones of the Internet. SprintLink is built and operated using industry standards and supports the range of speeds and features required by the Networx RFP.

5.2.5.2 Quality of Services (L.34.1.4.6 (d))

A description of the quality of the services with respect to the performance metrics specified in Section C.2 Technical Requirements for each proposed optional service, and other performance metrics used by the offeror.
Sprint understands the Government’s web presence evolves into a key component of its business strategy and external communications. The capability and flexibility of its Internet infrastructure becomes mission critical. The infrastructure must provide good performance for all users – regardless of their location. It must scale to handle high traffic load during events. It must remain up and available 24 x 7, no matter what the network conditions on the Internet.

The Sprint Content Delivery services meet and exceed all of the performance standards of the key performance indicators as set forth in the RFP. The Sprint solution enables the Government to extend its web site to the Sprint Platform, thus bringing content close to requesting end users and leveraging the platform’s ability to absorb peak traffic. The result for each Agency web site is higher availability, superior performance, and virtually infinite scalability, without adding more bandwidth or buying a large number of additional servers. Sprint is committed to providing the Government with responsive, reliable, and quality support. We back up this commitment with strong SLAs as listed in Table 5.2.5-1.

### Table 5.2.5-1. Sprint KPIs and SLAs

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<th>Key Performance Indicator (KPI)</th>
<th>Description</th>
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| Availability of CDNS Network    | 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Page 420 March 5, 2007
5.2.5.3 Exceeding the Specified Service Requirements (L.34.1.4.6 (e))

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

The Sprint CDNS solution has many unique advantages have been described in the previous section, and will be summarized in this section.

- **Exceeding the Static Content Delivery Requirement** – The Sprint solution provides the world leader in content delivery, offering the Government a number of unique advantages that allow us to exceed this requirement.
Figure 5.2.5-7. The Sprint Access Control Service

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Figure 5.2.5-8. The Sprint Advance Cache Control Service
Figure 5.2.5-9. The Sprint Enhanced DNS Service

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Figure 5.2.5-10. The Sprint Secure Content Delivery
5.2.5.4 Experience Delivering Services (L.34.1.4.6 (f))

A description of the offeror’s experience (including major subcontractors) with delivering each proposed optional service.

A proven Federal service provider, the Sprint solution currently delivers content and applications for over XXXXXXXXXXXXXXXXXXXXXXXXXXXXX

The Sprint solution offers advantages as the leading innovator in the CDNS market, enhancing and expanding the quality and quantity of offerings. XXXXXXXXXXXXXXXXXXXXXXXXXXXXX the Sprint solution continues to “push the envelope”, offering the broadest and richest set of capabilities in the CDNS market. Sprint recognizes the importance of investing in research and development, is affiliated with key technology standards groups, and is represented on key Federal advisory organizations. This commitment ensures continued Sprint leadership in the CDNS market, and its understanding and implementation of leading technical and Federal standards.

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5.2.5.5 Ensuring Service Quality and Reliability (L.34.1.4.6 (g))

A description of the characteristics and performance of the access arrangements that will connect to the offeror’s backbone network(s) to ensure service quality and reliability. A description of how the performance is consistent with industry best practices.

Please see Section 4.2.1 for a description on ensuring service quality and reliability.

5.2.5.6 Testing and Verifying Services (L.34.1.4.6 (h))

A description of the offeror’s approach to perform verification of individual services delivered under the contract, in particular the testing procedures to verify acceptable performance and Key Performance Indicator (KPI)/Acceptable Quality Level (AQL) compliance.

The Sprint CDNS platform provides comprehensive and continuous monitoring and reporting. With browser-based access to this tool, the Government will be able to monitor and control their extended web infrastructure.
Sprint will use the methodology described in Table 5.2.5-2 for monitoring and measuring the Key Performance Indicators (KPIs) and Acceptable Quality Levels (AQLs).

**Table 5.2.5-2. Sprint Methodology Applied to KPIs and AQLs**

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### 5.2.5.7 Ensuring Quality of Time-Sensitive Traffic (L.34.1.4.6 (i))

A description of the approach to ensure the quality of time-sensitive traffic (e.g. voice quality, video quality, video lip-synch) under different traffic patterns and load conditions on the offeror’s network.

When utilizing our CDNS solution with Sprint provided access, we ensure the quality of time-sensitive voice and video traffic under different traffic patterns and load conditions:

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### 5.2.5.8 Providing Integrated Access to Customer Application Support Locations (L.34.1.4.6 (j))

A description of the approach for providing integrated access to locations that support customer applications with different performance requirements (e.g., voice, data, and video).

Integrated Access is not a requirement for the Sprint CDNS solution.

### 5.2.5.9 Incorporating Future Infrastructure Enhancements and Emerging Services (L.34.1.4.6 (k))

A description of the approach for incorporating into the offeror’s network, infrastructure enhancements and emerging services that the offeror believes are likely to become commercially available in the timeframe covered by this acquisition, including a discussion of potential problems and solutions.

Sprint has a proven history of introducing and managing new and enhanced services driven by Federal Agency needs with FTS2000 and FTS2001. Additionally, Sprint has a Technology Research and Development
(TR&D) team is responsible for researching, developing, and delivering new and emerging technologies. Section 5.2.4.9 provides further details on these subjects and how it will fulfill the Government’s requirements for future infrastructure enhancements and emerging services.

5.2.5.10 Approach to Network Convergence (L.34.1.4.6 (I))

A description of the approach for network convergence. In particular, describe how the approach ensures service quality over the converged network for data, voice, video, and multimedia.

Network Convergence is not a requirement for the Sprint CDNS solution.

5.2.5.11 Supporting and Ensuring Interoperability between IP and PSTN (L.34.1.4.6 (m))

A description of the approach to support and ensure interoperability between Internet Protocol (IP) networks and the Public Switched Telephone Network (PSTN), including the approach to map between IP and PSTN addresses.

Interoperability between IP and the PSTN is not a requirement for the Sprint CDNS solution.

5.2.5.12 Approach To IPv4-to-IPv6 Migration (L.34.1.4.6 (n))

A description of the approach for IPv4-to-IPv6 migration.

Sprint has been planning for the IPv4-to-IPv6 migration since the mid-1990’s and has been involved in the standardization, testing and deployment of IPv6.

5.2.5.13 Satisfying NS/EP Basic Functional Requirements (L.34.1.4.6 (o))

A description of the offeror’s approach to satisfy each NS/EP basic functional requirement.

Today, Sprint satisfies the critical user community’s National Security/Emergency Preparedness (NS/EP) needs by being a provider of the Government Emergency Telephone Service (GETS) and on Wireless Priority Service (WPS). Sprint addressed both of these NS/EP services through
special development efforts paid for by the NCS. Between these two services, Sprint can accommodate the 14 basic functional requirements listed in Section C.5.2.2.1.1 for voice band use.

5.2.5.14 Protecting SS7 Signaling Systems and Satellite Command Links (L.34.1.4.6 (p))

A description of how the offeror’s approach will satisfy the requirements in Section C.5.2.5 for protection of SS7 signaling systems and satellite command links (if employed).

SS7 signaling does not apply to CDNS.

5.2.5.15 Assuring Service in the National Capital Region (L.34.1.4.6 (q))

A description of how the network architecture will satisfy the requirements in Section C.5.2.7 for assured service in the National Capital Region, if applicable.

Sprint has provided assured service features within our network since the original FTS2000 contract. Today, Sprint meets the following conditions:
Assured service involves an end-to-end management and design process. Components include customer premises equipment, access and egress arrangements, inter-exchange network, and network management and control. Details on these components, i.e., access, network and egress, which Sprint can control to achieve the stated requirements will be in Part B of our NS/EP Functional Requirements Plan (FRIP) and constitute the Sprint Assured Service Plan.

5.2.5.16 Meeting Section 508 Provisions (L.34.1.4.6 (r))

A description of the offeror’s approach for providing the capabilities needed to meet Section 508 provisions for each of the proposed optional services identified in Section C.6.4.

Sprint provides the capabilities for supporting Section 508 requirements related to Electronic Information Technology (EIT) from a technical operations perspective as noted in the ancillary Voluntary Product Accessibility Templates (VPAT) documentation. Sprint strives for compliance by meeting the standards criteria or equivalent facilitation. The VPATs cover all aspects of Sprint product and services capabilities ranging from software to hardware, web information, functional capability, and documentation. The completed supporting VPAT documentation is noted in Volume 1, Appendix A.
5.2.5.17 Impact of Delivery of Optional Services on the Network Architecture (L.34.1.4.6 (s))

A description of how the delivery of any optional services would impact the network architecture (e.g., security, quality and reliability, performance).

The Sprint network is a robust and reliable service delivery platform using leading edge IP technology in support of CDNS. Sprint delivers CDNS that satisfy Agency requirements without any impact to the network architecture.

5.2.5.18 Optimizing the Engineering of Services (L.34.1.4.6 (t))

A description of the offeror’s approach for optimizing the engineering of IP-Based and optical services.

Please refer to Section 5.2.3.5.1 IPS for the Sprint vision for implementing service internetworking over a common, IP-packet infrastructure.

5.2.5.19 Implementing Service Internetworking Over A Common Infrastructure (L.34.1.4.6 (u))

A description of 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.

5.2.5.19.1 Network Interoperability (L.34.1.4.6 (u))

Please refer to Section 5.2.3.5.4 IPS for the Sprint view of Network Interoperability.

5.2.5.19.2 Control Plane Integration (L.34.1.4.6 (u))

Please refer to Section 5.2.3.5.4 IPS for the Sprint view of Control Plane Integration.

5.2.5.19.3 Optical Infrastructure Support (L.34.1.4.6 (u))

Please refer to Section 5.2.3.5.4 IPS for the Sprint view of Optical Infrastructure Support.

5.2.5.19.4 Rationale and Benefits of Sprint’s Approach (L.34.1.4.6 (u))

Please refer to Section 5.2.3.5.4 IPS for a description of the rationale and benefits of the Sprint approach.
5.2.5.20 Supporting the Government’s Traffic Model (L.34.1.4.6 (v))

Given the offeror’s current network capacity and utilization, an explanation of 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 build out contemplated.

The Sprint approach to modeling the Networx traffic attempts to use real-world assumptions concerning the interaction of traffic that uses common network resources. Sprint grouped similar types of traffic in its model to show the maximum impact on these resources.

Sprint wants the network to pass the toughest stress test under any predictable GSA loading scenario of traffic.

Our conclusion is the Sprint network will function without impact on quality of performance when various percentages of loading increase are applied to projected Networx switched service loading.
Table 5.2.5-3. Sprint and Networx Traffic Impacts

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<thead>
<tr>
<th>Service</th>
<th>Traffic Model Quantity/Model Units</th>
<th>Converted Monthly Traffic/Monthly Units</th>
<th>Networx Traffic Percent</th>
<th>Monthly Quantity/Units</th>
<th>Total Capacity (Including Spare and Reserve)</th>
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For content delivery service, increased traffic has negligible effect on IP bandwidth utilization at the network resource level. XXXXXXXXXXXXX

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Figure 5.2.5-12. Content Delivery Traffic

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The Sprint CDNS Solution Summary

As the Government becomes increasingly reliant on the Internet for mission critical applications, web site and Internet application downtime is unacceptable. The Sprint CDNS solution is a cost-effective method for maintaining 100 percent uptime for web sites and online applications.