

VOLUME 1, SECTION 3.10

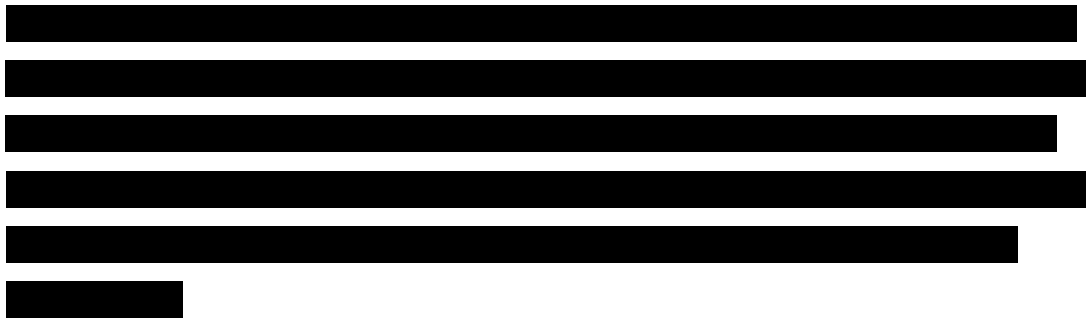












Content Delivery Network Services



3.10 CONTENT DELIVERY NETWORK SERVICES (CDNS) [C.2.4.6, M.6]

This section of our proposal addresses the Level 3 Team's offering to provide Content Delivery Network Services (CDNS) to Government agency customers through the Networx program. Our service meets or exceeds the requirements for CDNS as defined in Section C.2.4.6 of the Networx RFP.

Level 3's CDNS offering will be supported by Level 3 

[REDACTED] brings its Network [REDACTED] approach to media delivery, a unique real-time open framework that routes rich media content through the [REDACTED] CDNS and seamlessly across other top-tier worldwide CDNS providers. [REDACTED] also brings an exemplary reputation for quality resulting in zero downtime, and the [REDACTED]

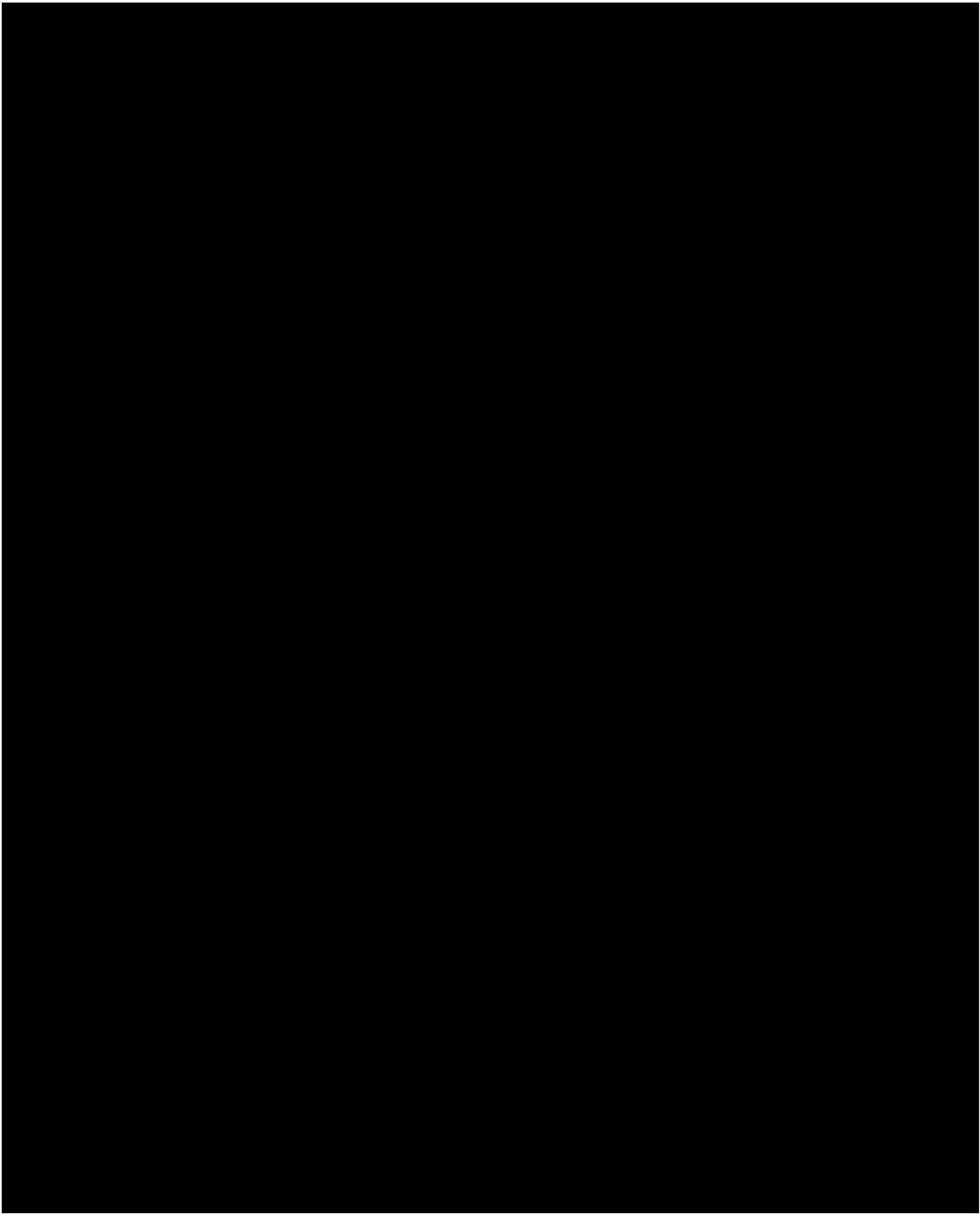
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED] enables the Level 3 Team to offer a solid, competitive streaming product. Based on the Networx RFP and our understanding of the Government's current and future requirements, we believe that our highly flexible, state-of-the-art CDNS offers the scalability and cost-effectiveness that will be needed to fulfill Agency requirements over the coming years.

3.10.1 Technical Description of CDNS [C.2.4.6.1]

Level 3's CDNS offering fulfills the mandatory service requirements contained in Section C.2.4.6.1 of the Networx RFP. A technical description of the service is provided below, followed by a description of our capabilities in the following areas:

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]



3.10.1.1 STANDARDS [C.2.4.6.1.2]

Level 3 continually monitors the development and revision of technical standards to ensure that we integrate critical revisions in our network architecture. Members of our team actively participate in standards formulation as the best way to influence the proposed construct of standards that directly impact our industry segment. Compliance with approved standards further assures our customers of our commitment to investing in the quality of our service offerings and network security infrastructure. [REDACTED]

[REDACTED]

3.10.1.2 CONNECTIVITY [C.2.4.6.1.3]

The Level 3 Team's CDNS solution is connected to a robust infrastructure in which all content is available immediately after upload. [REDACTED]

[REDACTED] In addition, our team offers the Government a proprietary application [REDACTED]

[REDACTED]

3.10.1.3 SINGLE USER INTERFACE

The Level 3 Team has established global partnerships with top-tier Content Network Service (CNS) providers whose networks can be aggregated over a single user interface for the Government's media delivery needs. [REDACTED]

[REDACTED]

[REDACTED]

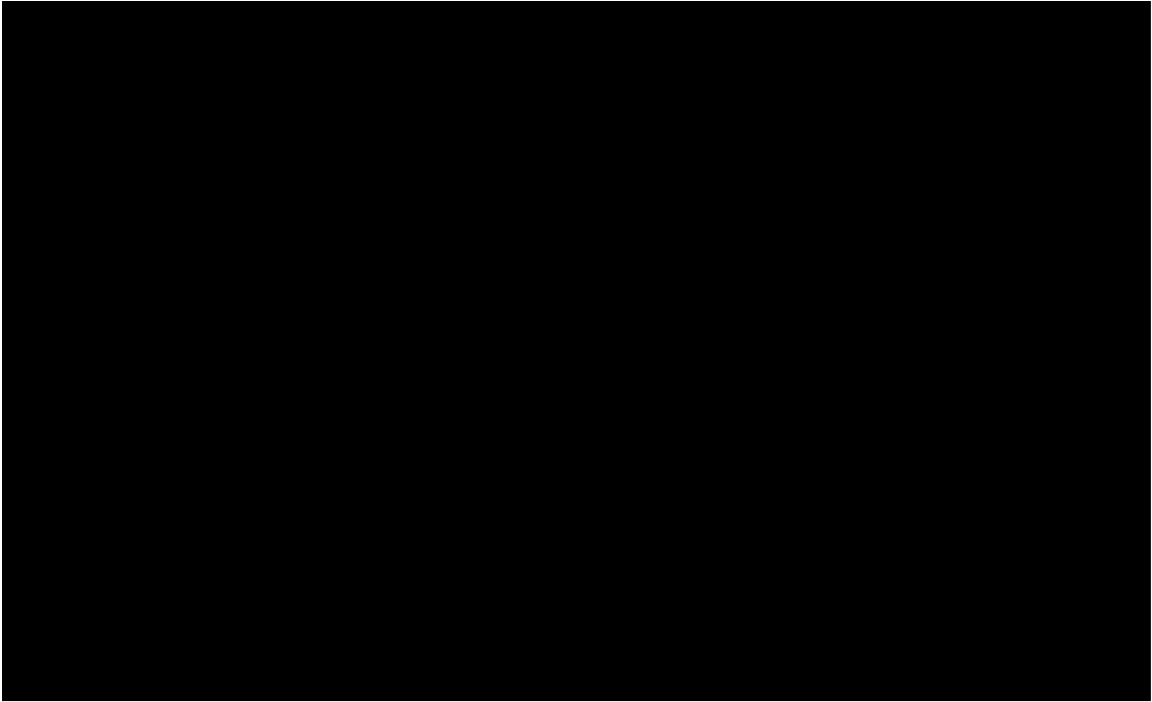
[REDACTED]

[REDACTED]

We support delivery of live, on-demand, and downloadable streaming content in Windows Media, Real, Flash, Quicktime, MP3, and various other formats. [REDACTED] one of the largest satellite downlink and encoding facilities in the industry to help create and encode customer content.

3.10.1.4 CONTENT MANAGER INTERFACE

Content Manager™ is an easy-to-use [REDACTED] interface allowing multiple users to manage rich media content. Content can be managed from both the [REDACTED] or via [REDACTED] that use [REDACTED] [REDACTED] to add content into our distributed file system. Meta data feeds are available via both [REDACTED] and [REDACTED]. Content is distributed by the [REDACTED] [REDACTED] over both the Level 3 Team's CDNS, and those of their top-tier CDNS partners worldwide. Through [REDACTED], we deliver the greatest aggregate capacity and broadest global reach of any CDNS firm in the industry.

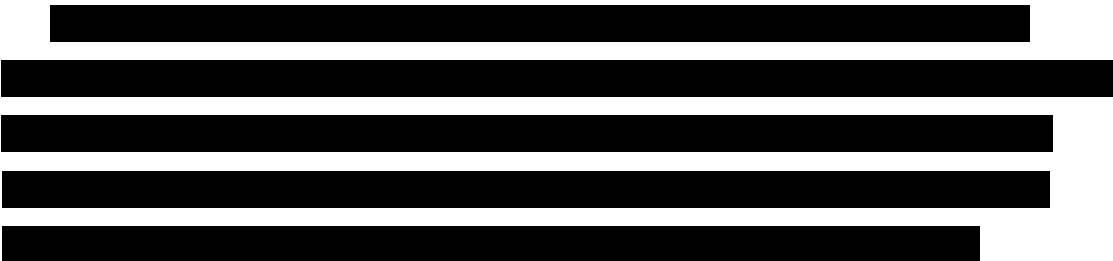


3.10.1.5 TECHNICAL CAPABILITIES [C.2.5.1.1.4]

3.10.1.6 STATIC CONTENT DOWNLOAD SERVICE [C.2.4.6.1.4 (1)]



3.10.1.7 REAL-TIME STREAMING (WEBCASTING) [C.2.4.6.1.4 (2)]





[Redacted text block]

3.10.1.8 ON-DEMAND STREAMING [C.2.4.6.1.4 (3)]

[Redacted text block]

3.10.1.9 SITE MONITORING/SERVER PERFORMANCE REPORTING [C.2.4.6.1.4]

[Redacted text block]

3.10.1.10 FEATURES [C.2.4.6.2]

Level 3's CDNS is compliant with both the mandatory and optional features described in Section C.2.4.6.2.1 of the Network RFP, as described below.

3.10.1.11 FAILOVER SERVICE FEATURE [C.2.4.6.2.1]

[REDACTED]

3.10.1.12 REDIRECTION AND DISTRIBUTION SERVICE [C.2.4.6.2.2]

Redirection and distribution are assured through our [REDACTED] load-balanced CDN and through the [REDACTED], which load balances across [REDACTED] Tier 1 networks.

The [REDACTED] ensures all Web requests are directed to the closest, most available content server. The Level 3 Team [REDACTED] content to several different CDN networks and uses [REDACTED] to determine optimal utilization from each request. [REDACTED]

[REDACTED]



3.10.1.13 INTERFACES [C.2.4.6.3]

Because CDNS is connected to [redacted] networks, all [redacted] interfaces, including Government Agency origin servers, are supported. For a full list of these interfaces please see Section 3.1.3.1.5 of this Technical Volume.

3.10.2 Required Performance Metrics [C.2.4.6.4.1]

3.10.2.1 CDNS QUALITY OF SERVICE AND PERFORMANCE METRICS [C.2.4.6.4]

The Level 3 Team’s Service Level Agreement (SLA) assures [redacted] uptime for our CDNS. We offer [redacted] services subject to [redacted]

[redacted]

[REDACTED]

3.10.2.2 AVAILABILITY [C.2.4.6.4.1]

The Level 3 Team will provide access to [REDACTED] with [REDACTED] availability. [REDACTED] is one of the few [REDACTED] Tier 1 certified hosting providers. In the most recent assessment monitored by [REDACTED] Systems, the world leader in measuring, monitoring, and testing Web-based applications, [REDACTED]

Premier certified hosting providers must meet the following requirements:

[REDACTED]

3.10.2.3 LATENCY [C.2.4.6.4.1]

Our solution complies with the latency [REDACTED] Key Performance Indicator (KPI) established by the solicitation. We will provide a mean performance standard of [REDACTED] and [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

3.10.2.4 GRADE OF SERVICE (GOS) [C.2.4.6.4.1]

[REDACTED]
[REDACTED]
[REDACTED]

3.10.2.5 TIME TO RESTORE (TTR) [C.2.4.6.4.1]

[REDACTED]
[REDACTED]

3.10.3 Proposed Service Enhancements

The Level 3 Team offers the Government a robust CDNS solution compliant with the requirements for capabilities, features, and interfaces. As additional enhancements become commercially available, we will offer them to the Government.

3.10.4 Experience Delivering Content Delivery Network Services

Level 3 [REDACTED] provides today's best-known companies with broadcast audio and video over the Internet easily, affordably, and reliably. With more than [REDACTED] clients worldwide, [REDACTED] has experienced steady growth due to the quality and reach of [REDACTED] services.

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[REDACTED] serves over [REDACTED] streams monthly for clients including [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] With a customer base that includes more than [REDACTED] international firms, [REDACTED] demonstrates proven expertise in managing and delivering rich media for organizations in the [REDACTED]
[REDACTED]

The Level 3 Team offers Network User Agencies a dedicated, knowledgeable, and qualified team to fulfill the Government's needs in a timely manner, and ensure that Agency personnel and constituents experience optimum responsiveness.

3.10.5 Access Arrangements

Level 3 will provide Internet connectivity to Agency servers through our IPS. We [REDACTED] have the ability and flexibility to meet customer service requirements. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]



[REDACTED]

3.10.6 Verification and Testing for KPIs and AQLs

Working closely with our team throughout the life of the contract, Level 3 will verify that individual services delivered function at acceptable and contractually established performance levels. At a minimum, they will meet the Government's KPIs and AQLs. [REDACTED]

[REDACTED]

Independent of Level 3, [REDACTED] maintains a relationship with

[REDACTED] for testing of [REDACTED] CDNS [REDACTED] provides [REDACTED]

[REDACTED]

3.10.7 Handling Time-Sensitive Traffic

Level 3's Network is designed for fully integrated service delivery. All services provided are delivered over the same world-wide [REDACTED] network. Our system is designed with multiple levels of [REDACTED] to manage and deliver traffic consistently no matter what delivery requirements are or traffic load exists. Section 2.2.4 of this Technical Volume addresses this topic in detail.

3.10.8 Integrated Access for Different Performance Requirements

Level 3 services are all based on delivery over the same network. The Level 3 Network supports various [REDACTED] to ensure that all traffic is handled as required for high-bandwidth services. Section 2.3.1 of this volume discusses this topic in detail.

3.10.9 Infrastructure Enhancements and Emerging Services

This section describes the approach for incorporating infrastructure enhancements and emerging services that Level 3 believes are likely to become commercially available in the timeframe covered by this acquisition, including a discussion of potential problems and solutions.

Level 3 is committed to providing all customers with access to the latest technology development and enhancements for both hardware and software.



[Redacted text block]

[Redacted text block]

[Redacted text block]

Level 3's business practices incorporate broad involvement in the technology community and the standards-development community to both monitor and influence the development of emerging technology and standards.

[Redacted text block]

[REDACTED]

This is especially important for services such as CDNS. Level 3 will work closely with [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] We anticipate no problems working with [REDACTED] solution because their network infrastructure, like that of Level 3, is state-of-the-art, fully redundant, and continually monitored for performance issues. As enhancements related to CDNS become commercially available, and are added to Level 3's solution set, we will make them available to the Government.

[REDACTED]

3.10.10 Network Convergence

Level 3 maintains high traffic flow and quality over our network while handling multiple types of service including data, voice, and video. This is possible because of the underlying architecture of the Level 3 Network and the various [REDACTED] protocols used on the system. Section 2.3 of this Technical Volume discusses network convergence from a Level 3 perspective in detail.

3.10.11 IP and PSTN Interoperability

[REDACTED]

Level 3 is a large national CLEC. We have close to [REDACTED] ports of Local Interconnect trunks with Incumbent, Independent, and Competitive Local Exchange carriers. Level 3's voice network can accept both [REDACTED] and [REDACTED] traffic and supports an interoperability process to ensure successful establishment of [REDACTED] handoffs across a variety of industry platforms and with respect to a variety of call flows.

[REDACTED]

3.10.12 IPv4-to-IPv6 Migration

[REDACTED]

3.10.13 Compliance with NS/EP Functional Requirements

[REDACTED]

3.10.14 Protection of SS7 Signaling

[REDACTED]

3.10.15 Assured Service in the National Capital Region

Level 3 complies with the requirements in RFP Section C.5.2.7 to offer assured service in the National Capital Region. We maintain diverse facilities and network infrastructure in the National Capital Region (NCR). At least [REDACTED] geographically separated network facilities, with redundant [REDACTED] and [REDACTED] equipment, are available to provide service into and out of the Capital Region. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



[Redacted text block]

3.10.16 Meeting Section 508 Provisions

[Redacted text block]

3.10.17 Impact on Network Architecture

[Redacted text block]

3.10.18 Optimizing Engineering of CDNS

Level 3 is committed to keeping CDNS optimized. All requested features being offered are currently supported and in commercial use.

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] Our focus is to deliver optimized content.

3.10.19 Implementing Service Internetworking Vision (IP-Centric Architecture)

This requirement is not applicable to CDNS.

[REDACTED]
[REDACTED]

3.10.20 CDNS Support for Traffic Model Requirements

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]