

Content Delivery Network Service (CDNS)

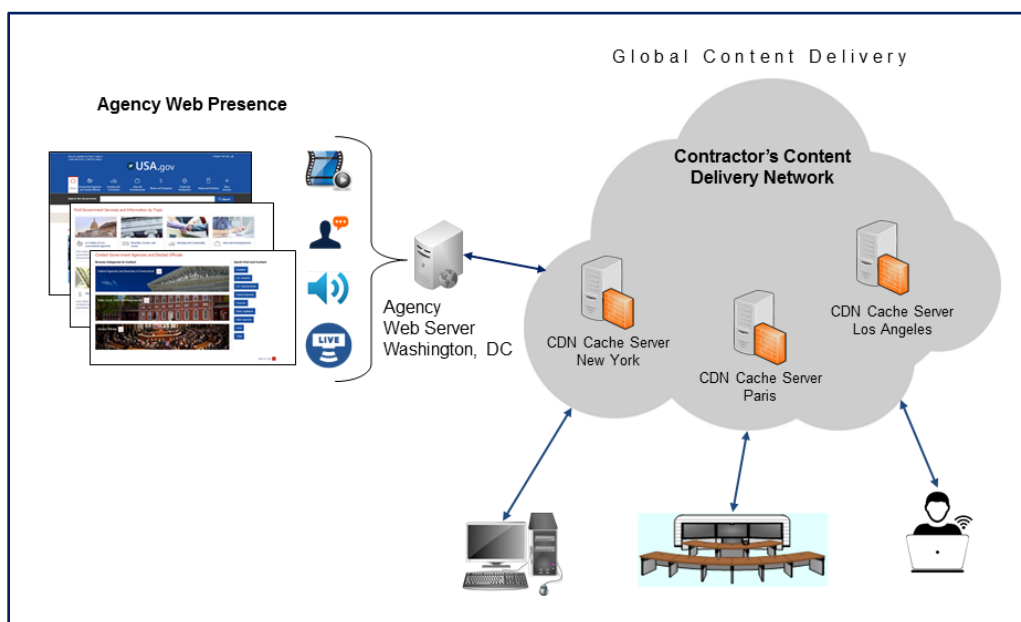
The Content Delivery Network Service speeds up and optimizes the delivery of agency content to Web browsers worldwide. The CDNS provider incorporates equipment and algorithms to cache content on geographically dispersed servers on the Internet. When a request is made from a particular location for specific content, the server that can most rapidly and efficiently provide the content is dynamically identified. CDNS ensures content availability and integrity, and automatically increases resources as end-user requests increase, and during periods of unexpected high usage.

Category: Cloud Services

Complementary Services Needed: In order to use CDNS, the agency would need: (1) Access Arrangements (AAs); and (2) the following EIS service or equivalent: Internet Protocol Service (IPS).

Definitions: Please see EIS contract [Section J.12 Glossary of Terms](#) for clarification of technical terms and acronyms.

Figure 1—Content Delivery Network Service



1. Why an Agency Might Select CDNS

- CDNS can enhance the performance of an agency’s public facing website by dynamically sharing end-user requests with additional CDN servers in the Content Delivery Network.
- CDNS can optimize the delivery of streaming audio and video content.
- CDNS allows for more flexible Continuity of Operations and Disaster Recovery solutions.
- CDNS helps ensure the continued operation of e-government applications due to the enhanced security and information assurance that CDNS provides.

NOTE: Agencies considering this service may also want to compare it with other offerings in the Cloud Service category such as Infrastructure as a Service (IaaS) or Platform as a Service (PaaS).

2. Examples of How CDNS Could be Used

- **Decreased Page Load Times:** An agency could use CDNS to decrease page load times for its website and web applications , thereby improving the end user experience.
- **Faster Data Set Transmission:** An agency could use CDNS to ensure the rapid and accurate transmission of its publicly available data sets.
- **Improved Tool Performance:** CDNS can be used to improve the performance of tools like SharePoint, SAP and Salesforce in transmitting complex, dynamic data to agency end-users across geographical locations, and on different devices and platforms.
- **U.S. Department of Education (ED):** ED launched its newly renovated Federal Student Aid website using a CDNS to improve the experience of the approximately 133,000 users who visit the site each day to research schools, submit college applications and apply for financial aid.

3. Key Technical Specifications

NOTE: This portion of the service guide has been abridged due to space considerations. For full technical details on CDNS, please refer to EIS contract [Section C.2.5.4 Content Delivery Network Service](#).

Table 1—CDNS Technical Capabilities

Capability	Description
Content Distribution	<ul style="list-style-type: none"> a) Static Content Download Service: <ul style="list-style-type: none"> i. Provides fast, secure, and reliable download of content including text, video and music. b) Real-time Streaming (Webcasting): <ul style="list-style-type: none"> i. Delivers streams in real time (the CDNS encodes the signal when sent in raw signal format by the content provider). ii. Real-time streaming content may include (but not be limited to) RealNetworks RealMedia, Microsoft Windows Media, and Apple QuickTime. c) On-demand Streaming: <ul style="list-style-type: none"> i. Host (i.e., provide storage) and deliver streams on demand or when requested by end-users (the CDNS encodes the signal when sent in raw signal format by the content provider). ii. On-demand streaming content may include (but not be limited to) RealNetworks RealMedia, Microsoft Windows Media, and Apple QuickTime.
Site Monitoring/ Origin Server Performance Measurements	<ul style="list-style-type: none"> a) Measurements include: <ul style="list-style-type: none"> i. Availability ii. Latency iii. FTP Load iv. CPU Load v. Memory Usage vi. TLS Service Load vii. HTTP Port Service Load viii. HTTP Connections Queue Statistics b) Performance Dashboard – a secure, Web-based portal accessible 24x7 by agency clients.

Table 2—CDNS Features

Feature	Description
Failover Service	Monitors single-location web sites (maintained by agencies or third parties under contract to agencies) and redirects traffic to a CDNS in the event of failure. This service ensures that end-users do not experience delays, site inaccessibility, or error messages.
Redirection and Distribution Service (Global Load Balancing) (NOTE: May not be available from all contractors.)	When users type in a web site address or Universal Resource Locator (URL), they rely on Domain Name System (DNS) servers to direct them through the Internet and connect them to the specified Web server. Redirection and distribution services ensure that all Web requests are directed to the closest, most available cache server. Typically a set of surrogate servers is provisioned to cache content for the content provider's origin server, enabling requests to bypass congested areas. Redirection and Distribution Services may employ any proven technique(s) including, but not limited to: <ul style="list-style-type: none"> a) DNS Redirection b) URL Rewriting c) Layer-4 Switching d) Layer-7 Switching e) HTTP Redirection

4. Pricing Basics for CDNS

Please visit the [EIS Resources Listing](#) and locate the [Basic EIS Pricing Concepts Guide](#) to gain an understanding of EIS pricing fundamentals.

4.1 Access Arrangements

Appropriate access arrangements must be selected for each endpoint. Please visit the [EIS Resources Listing](#) and locate the [Access Arrangements Guide](#) for more detailed information.

4.2 Service Related Equipment (SRE)

- SRE must be chosen based on equipment required at each location. NOTE: SRE uses catalog-based pricing.
- Request that contractor provide pricing for any SRE that would be required, in addition to the agency’s existing infrastructure, to deliver the service.
- Please visit the [EIS Resources Listing](#) and locate the [Service Related Equipment Service Guide](#) for more detailed information.

4.3 CDNS Price Components

The price structure for CDNS consists of the components shown in *Table 3* below.

Table 3—CDNS Pricing Components

Component	Charging Unit
CDNS Outbound Data	GB
CDNS Task Order Unique (MRC)	ICB
CDNS Task Order Unique (NRC)	ICB
CDNS Task Order Unique (Usage)	ICB

Figure 2 below shows how the pricing components in Table 3 are combined to produce the total cost for the service.

Figure 2—This figure shows how the various pricing components in Table 3 would be combined to calculate the total CDNS charges. NOTE: One or more of these components may not be needed to price a particular service package.



The charges for the different components in Figure 2 are calculated using details provided in the pricing related tables found in EIS contract [Section B.2.5.3 Content Delivery Network Service](#). (Please see the [EIS Basic Pricing Concepts Guide](#) for instructions on using the pricing tables to compute the cost of a service.)

4.4 CDNS Pricing Example

The pricing example for CDNS will only deal with one pricing component—CDNS Outbound Data—as the other three components (see *Figure 2* above) are defined and priced by the contractor for particular task orders. That is, the other three components are priced on an Individual Case Basis (ICB).

CDNS Outbound Data charges are based on a banded structure as illustrated in the excerpted table below (EIS contract *Table B.2.5.3.1.1.1—CDNS Pricing Example*). Each band includes a fixed price and a variable price element. The specific bands and their costs are determined by the contractor, and hence are contractor-specific. CLIN CD00100 is used for all CDNS Outbound Data service items.

EIS contract Table B.2.5.3.1.1.1—CDNS Pricing Example

CLIN	Task Order Number	Band Low	Band High	Fixed Price Element	\$/GB Variable Price Element	Price Start Date	Price Stop Date
		$L_1=0$	H_1	$F_1=0$	V_1		
		L_2	H_2	$F_2=H_1 * V_1$	V_2		
		L_3	H_3	$F_3=F_2+(H_2-H_1)*V_2$	V_3		
		L_4	H_4	$F_4=F_3+(H_3-H_2)*V_3$	V_4		

As an example of CDNS pricing, assume that an agency consumes 3.427 TB (3,427 GB) of Outbound Data in a month, and the contractor usage bands are as shown in *Table 4* below. (NOTE: This table is for illustration purposes only and does not represent actual or approximate prices available under any EIS contract.)

Table 4—An Example EIS contractor's CDNS Outbound Data Pricing Table

CLIN	Task Order Number	Band Low	Band High	Fixed Price Element	\$/GB Variable Price Element	Price Start Date	Price Stop Date
CD00100		0	500 GB	0	10		
CD00100		500	1,500	5,000	8		
CD00100		1,500	3,000	13,000	6		
CD00100		3,000	6,000	22,000	4		

The agency’s use of 3,427 GB falls into the band ranging from 3,000 to 6,000 GB, the fourth row of the table. Thus the Fixed Price Element is \$22,000, and the Variable Price Element (used to price all usage above the “Band Low” value) is \$4/GB. As a result, the price for the month would be: $\$22,000 + (3,427 - 3,000) * \$4 = \$23,708$.

5. References and Other Sources of Information

- For more technical details and information on CDNS, please refer to EIS contract [Section C.2.5.4](#); for pricing details, [Section B.2.5.3](#).
- For more information on service-related items, please see:
 - [EIS contract Section B.2.10 Service Related Equipment](#)
 - [EIS contract Section B.2.11 Service Related Labor](#)
- Please refer to a contractor's individual EIS contract for specifics on the contractor's CDNS offerings.
- For additional EIS information and tools, visit the [EIS Resources Listing](#).
- For guidance on transitioning to EIS, please visit [EIS Transition Training](#) where you'll find several brief video training modules.