CenturyLink Technology Solutions Service Guide

Data Center Network Services

This CenturyLink Service Guide ("SG") sets forth a description of CenturyLink Data Center Network Services ("Service") offerings including technical details and additional requirements, if any. This SG is subject to and incorporated into the Agreement and Service Schedule between the parties. The specific details of the Service ordered by Customer will be set forth on the relevant Service Order.

Products Included: HAN Internet, Managed Dedicated Load Balancing SSL Acceleration, Virtual Service Load Balancing and SSL Acceleration, Dedicated Switching and Services, Colocation Dedicated Connectivity Telco Access

Table of Contents

HAN Internet

Service Description

The Service is delivered in the United States and Europe on our Tier 1, AS3561 backbone at speeds ranging from Ethernet (10Mbps) to Gigabit Ethernet (1000Mbps). CenturyLink represents one of the largest IP networks in the world and can deliver worldwide connectivity to the Internet for, among others, carriers, Internet service providers (ISPs), application service providers (ASPs), content providers and multinational corporations. CenturyLink' global IP network reaches approximately 45 countries and has approximately 127 points of presence (POP) around the world. The Service itself is a non-managed service and all equipment and management will be provided by the customer.

Included in Service

- Direct connection between the CenturyLink network and Customer equipment via a single cross connect (SingleLine Service) or via dual cross connects (MultiLine Service) using the following connection types:

  - Fast Ethernet - 100Mbps
  - Gigabit Ethernet - 1000Mbps

- IP addresses consistent with CenturyLink IP policies and what the Customer can justify.

- Troubleshooting of CenturyLink-provided components.

Installation of cabling between the Customer patch panel and the CenturyLink patch panel in the Internet Data Center ("IDC") node room.

Cabling

- For copper connections, CenturyLink provides CAT5E patch cable, termination is the RJ45 connector.

- For fiber connections, CenturyLink provides 62.5 micron Multimode duplex 1000Base SX fiber patch cable, termination is the SC-SC connector.

- If different fiber optic termination is required for patch cable, Customer must provide its own cable (i.e., SC-MTRJ).

Not Included in Service

- Purchase of Customer Equipment
- Support of Customer Equipment

Service Options

- IP addresses consistent with CenturyLink IP policies and what the Customer can justify.
- If ordered by Customer, CenturyLink will use good faith efforts to assign Internet address space for the benefit of Customer during the Service Term. Any IP addresses and space provided to Customer by CenturyLink are solely for Customer's use with the Service, and are non-portable and non-transferable. Neither Customer nor any End Users will own or route any IP addresses or space provided by CenturyLink, and, upon any termination of Service, Customer's access to such IP addresses and space will cease.

Usage Based Billing

CenturyLink bills Customers monthly in advance for base bandwidth recurring charges associated with the Service.

For bandwidth usage above the base amount, there is an additional per megabit usage charge billed at the end of

each month. CenturyLink uses the 95th percentile measurement rule of the higher of the ingress or egress traffic to calculate the additional bandwidth usage charges above the base bandwidth recurring charges.

The bandwidth reporting system captures average data point's usage every five (5) minutes for each network line for ingress, egress, and total bandwidth data. The highest 5 percent of the data points out of a given set (ingress or egress or total) of data points over the billing period are discarded. The highest data point from the remaining data points is the 95th percentile value of the data set. Bandwidth reporting provides aggregate 95th percentile measurement billing for multiple lines within one IDC. If the Customer has lines in more than one IDC, each subgroup aggregate 95th percentile is summed together to get the total usage.

SingleLine Service

The Service provides an individual uplink to the CenturyLink IP Backbone. Customers have the option of purchasing Switched SingleLine Service, Statically Routed SingleLine Service, or BGP SingleLine Service.

SingleLine Delivery Options

SingleLine Routed - Static Route

The Service provides a single uplink to the CenturyLink IP Backbone. All Internet traffic is routed from the customer's router to CenturyLink via a static default route.

- Customer Required Equipment
  - Single Customer Provided Router.

SingleLine Routed - BGP

The Service provides a single uplink to the CenturyLink IP Backbone. All Internet traffic is routed from the customer's router to CenturyLink via BGP. This service is only available for Colo Bandwidth.

- Included
  - Setup of BGP between CenturyLink and Customer.
  - Setup of default route using BGP.
- Not Included
  - Public ASN for Multi-homing Customers. Customer must acquire their own Public ASN from ARIN.
- Optional
  - Full BGP Table Announce to Customer.
  - Private Autonomous System Number (ASN) can be provided by CenturyLink upon request.
  - Customer must acquire public ASN from ARIN to utilize BGP to multi-home between multiple ISPs.
- Customer Required Equipment
  - Single Customer provided router which support BGP. If full routes are required, router must have appropriate memory and/or processing power to support the BGP routing table.

SingleLine Switched - Static Route

The Service provides a single uplink to the CenturyLink IP Backbone. All Internet traffic is routed from the customer's LAN to CenturyLink via default route. Unlike SingleLine Routed - Static route, where the customer manages their own router, with SingleLine Switched, routing for the Customer network is done via the CenturyLink network router.

- Customer Required Equipment

- Single Customer provided switch

MultiLine Service

The Service provides increased network reliability and scalability through redundant uplinks and assures continued connectivity to the CenturyLink IP Backbone in the event of failure of one of the uplinks.

- In HAN 1.0 facilities, MultiLine Service supports two uplinks into the CenturyLink network running either in active/active mode, or in active/failover mode.

- In HAN 2.0 facilities, MultiLine Service supports two uplinks into the CenturyLink network running in an active/failover mode only.

Customers have the option of purchasing Switched MultiLine Service, Statically Routed MultiLine Service, or BGP MultiLine Service. Switched Multiline Service with HSRP is also available in select CenturyLink Data Centers.

Traffic Limitations for MultiLine

- Due to the behavior of Multiline, traffic is limited to half the aggregate uplink capacity. In the event of a failure of a single uplink, maximum aggregate bandwidth will be reduced by the bandwidth of the failed uplink.

- Customer must capacity-manage their network topology and utilization to not exceed the available active uplink capacity.

Failure Protection

- CenturyLink provides automatic transition to from the active uplink to the failover uplink if a network device fails. For all multiline except BGP, transition from the active uplink to the failover uplink should occur within 10 seconds of link failure and is fully automatic.

- For Multiline BGP, the failover timer is up to 180 seconds.

- This service protects against failures in the cable plant, CenturyLink switches, and Customer Equipment directly attached to CenturyLink equipment. It does not provide failover within Customer's backend network.

Customer Requirements

- Compliance Review

  CenturyLink compliance review is required for all orders before the order is booked.

- Supported Environment

  Recommended equipment tested by CenturyLink for include the following:

Recommended Equipment		Ports	
Cisco	3560	Gigabit Ethernet	Fast Ethernet
	3750		
	6509-E		
Juniper	EX		

Recommended Equipment		Ports	
	M Series		

If Customer plans on utilizing equipment not tested and recommended by CenturyLink, the Customer is directed to consult with CenturyLink Solutions Consultants to verify suitability of proposed equipment.

MultiLine Delivery Options

MultiLine Routed - Static Route

The Service provides increased network reliability and scalability through redundant uplinks using static Routes and assures continued connectivity to the CenturyLink IP Backbone in the event of failure of one of the uplinks. The uplinks for the Service are available in active/failover or active/active modes.

Customer Required Equipment

- Dual Customer provided routers

MultiLine Routed - BGP

The Service provides increased network reliability and scalability through redundant uplinks using BGP and assures continued connectivity to the CenturyLink IP Backbone in the event of failure of one of the uplinks. The uplinks for the Service are available in active/active mode. This service is only available for Colo Bandwidth.

Included

- Setup of BGP between CenturyLink and Customer.
- Setup of default route using BGP.

Not Included

- Public ASN for Multi-homing Customers. Customer must acquire their own Public ASN from ARIN.

Optional

- Full BGP Table Announce to Customer.
- Private Autonomous System Number (ASN) can be provided by CenturyLink upon request.
- Customer must acquire public ASN from ARIN to utilize BGP to multi-home between multiple ISPs.

Customer Required Equipment

Dual Customer provided routers, which support BGP. If full routes are required, routers must have appropriate memory to support the BGP routing table.

MultiLine Switched - Static Route

The Service provides increased network reliability and scalability through redundant uplinks using static Routes and assures continued connectivity to the CenturyLink IP Backbone in the event of failure of one of the uplinks. The uplinks for the Service are available in active/failover mode only.

Customer Required Equipment

- Service requires dual Customer provided switches.

MultiLine Switched - HSRP (Select Data Centers)

The Service provides increased network reliability and scalability through redundant uplinks using HSRP and assures continued connectivity to the CenturyLink IP Backbone in the event of failure of one of the uplinks.

Customer Required Equipment

- Service requires dual Customer provided switches that support HSRP.

Managed Dedicated Load Balancing SSL Acceleration

Service Description

CenturyLink Managed Dedicated Load Balancing and SSL Acceleration Services provide a pair of devices, fully managed by CenturyLink, which reside in the CenturyLink Hosting Area

Network (HAN) within CenturyLink Managed Hosting facilities. The Services deliver server load balancing and SSL acceleration in conjunction with CenturyLink Managed Hosting or Colocation services. Server load balancing is the process of distributing service requests across a group of servers to address Customer requirements to optimize web applications performance. SSL acceleration is the process of offloading the processor-intensive public key encryption algorithms involved in SSL transactions to a hardware accelerator.

Managed Dedicated Load Balancing

CenturyLink Managed Load Balancing service is available in two versions (Small and Medium) and includes dedicated hardware, software, installation and 24/7 monitoring and support. Due to location and data center regulations, no Managed Dedicated Load Balancing equipment or software is physically accessible to the Customer.

Standard Device Options

Version	Service Element	Description
Small	Specification	1.8 GHz Intel Dual Core processor 160 GB hard drive 4 GB RAM Included is a 300W Power Supply that will operate on AC current at 100 or 240. Power consumption is 150W and the unit produces 512 BTUs of heat per hour
	Supports	1Gbps throughput 1Gbps of compression 5,000 SSL TPS (Transactions Per Second)
Medium	Specification	2.1 GHz Intel Dual Core processor with an 8 GB Flash 160 GB hard drive 4 GB RAM - The unit is powered by a 300W power supply that

Version	Service Element	Description
		operates at either 100 or 240 AC current. Power consumption is 165W and the unit produces 562 BTUs of heat per hour.
	Supports	▪ 2Gbps throughput ▪ 1Gbps of compression ▪ 10,000 SSL TPS (Transactions Per Second)

Standard Algorithmic Options

Managed Dedicated Load Balancers support the following algorithmic functions based on the Customer's specific requirements and configurations:

Load Balance Options

Methodology	Description
Round Robin	Distributes connections evenly among the servers
Ratio	Distributes connections in proportion to user-defined ratios
Fastest	Distributes connections based on response times of the servers
Least Connections	Distributes connections based on number of current connections.

Standard Persistence Options

As Internet traffic enters the CenturyLink Data Center through the CenturyLink Internet routers, it is passed through a pair of CenturyLink Managed Dedicated Load Balancers / Firewalls where the following algorithmic functions are supported based on the Customer's specific requirements and configurations:

Persistence Options

Source Address Persistence		Description
Source Address Persistence		Continues to route a connection to the same server based on Source IP Address
Cookie Persistence	Insert Mode	Load balancer inserts a cookie into all data going to a client and equates the cookie to a server. When the client sends another data stream, the data stream will have the cookie embedded in the data. The Load Balancer will see the cookie and route the data with the cookie in the data to the same server as before.
	Rewrite Mode	The Load Balancer inserts a cookie to all data going to a client and equates the cookie to a server. When the client sends another data stream, the data stream will have the cookie embedded in the data. The Load Balancer will see the cookie and route the data without the cookie in the data to the same server as before.

Source Address Persistence		Description
	Passive Mode	Similar to Rewrite Mode, except that the Server will initiate the cookie instead of the Big-IP and the Server will generate a new cookie each time it sends data to the client.
	Hash Mode	Similar to Passive Mode, except that the same cookie generated by the Server is used throughout the entire session.

Standard iRules Options

An iRule is a script that can examine traffic between clients and servers and use that information to change the flow of traffic. CenturyLink offers the following two types of iRules:

iRule Option

iRule	Description
HTTP Redirect	Used to redirect users to other content when a condition occurs (e.g., when a client requests a specific page and the page is unavailable, a '404' response is sent to the client. CenturyLink can look for a '404' and redirect the request to another web site.
URI Redirect	Used to redirect requests to servers that can better handle the content (e.g., some content at a specific web site contains very large graphics files, which the customer has placed on another server that can process the files faster).

Link Trunking

Link Trunking is utilized when bandwidth requirements exceed the speed of 1 link (1GB). Multiple links can be combined to appear as a single link (Etherchannel).

Note: Link Trunking is not available in all CenturyLink Data Centers.

Additional Service Options

Additional Managed Dedicated Load Balancing options are available only on the Medium device for an incremental fee:

Optional Load Balancing Services

Service	Description
Compression	Used to compress data through the load balancer to the Customer PC. Service supports up to 1Gbps.
Fast Cache	Caches the most frequently accessed URL pages/images to offload requests to the customer servers. Available on a per-server basis.
Rate Shaping	Bandwidth control that shapes the amount of bandwidth that can access a virtual

Service	Description
	server (load balancing pool).

Managed Dedicated SSL Acceleration

Managed Dedicated SSL Acceleration is an optional service that can be added to the Managed Dedicated Load Balancing devices. Managed Dedicated SSL Acceleration must be purchased in conjunction with the CenturyLink Managed Dedicated Load Balancing service.

CenturyLink Managed Dedicated SSL Acceleration service includes hardware, software, installation, and 24/7 monitoring and support. Due to location and Data Center regulations, no Managed Dedicated SSL Acceleration equipment or software is physically accessible to the Customer.

SSL Certificates

Certification Requirements

Certificate	Description
X.509	SSL server certificate must either be purchased separately from CenturyLink or provided by the Customer
Wild Card	Certifications can be managed by CenturyLink but must be supplied by the Customer.

Monitoring

CenturyLink provides the following two levels of monitoring of the load balanced and SSL acceleration devices to determine system availability (24/7). In the event that the servers fail to respond, CenturyLink will notify Customer and initiate corrective action.

Monitoring Options

Certificate	Description
Node Checking (ICMP-based)	Ping monitoring that verifies connectivity to the load balancer by pinging the IP and receiving a response from that device
Connection Checking (URL-based)	Ping monitoring that verifies connectivity to the load balancer by connecting to the device on a specific IP and specific port as determined during configuration.

Firewalls

A CenturyLink-provided Firewall solution is required when purchasing Virtual Services Load Balancing and SSL Acceleration in conjunction with CenturyLink Colocation or Managed Hosting solutions. CenturyLink Managed Firewall solutions are subject to separate rates and terms.

Installation

CenturyLink will provide installation of the Virtual Services Load Balancing and SSL Acceleration devices.

Configuration

▪ As part of the Installation, CenturyLink provides the following Components to connect the load balancers to the CenturyLink Hosting Area Network (HAN):

Connectivity	Description
3 FE/GE Ports per Load Balancer (total of 6)	▪ 1 Outbound ▪ 1 Inbound ▪ 1 Management
2 Data VLANS per Load Balancer (total of 4)	
Cabling of devices to CenturyLink' Network	

▪ CenturyLink will work with the Customer to perform a review of the Customer's network configuration, load balancing and SSL acceleration requirements to make recommendations.

▪ CenturyLink will work with the Customer to connect the load balancer and SSL accelerator to the pool of servers as agreed upon with the Customer.

▪ CenturyLink system administrators will perform ongoing, reasonable load balancer and SSL acceleration configuration changes as requested by the Customer (see change detail below).

▪ CenturyLink will provide ongoing administrative support for standard additions, deletions and changes to the existing configuration (e.g., adding or removing a server, a VLAN, or an IP).

Note: Any Ports and VLANs in addition to those included in the standard CenturyLink design shall be subject to incremental charges as set forth in the relevant Order Form. Any Port or VLAN requested by Customer after the initial installation of the Service shall also be subject to additional, incremental charges.

Virtual Services Load Balancing and SSL Acceleration Failover Solution

Redundancy is built into CenturyLink Virtual Services Load Balancing and SSL Acceleration. If the primary load balancer and SSL acceleration device fails, traffic will be redirected to a hot standby secondary device. This capability is delivered at no additional charge.

Maintenance and Support

▪ 24/7 support for load balancing and SSL acceleration problem resolution and Customer inquiries is included in the Services.

▪ To manage configuration consistency and accountability for changes, all system administration and device passwords will be managed by CenturyLink. Customer will not have access to load balancer passwords or be able to make changes to the load balancer configurations. Customer must request any changes by contacting the CenturyLink Response Center. Customer must provide complete authentication credentials to the CenturyLink Response Center when requesting changes. (Changes and updates to this process are available at http://CenturyLink.net/customer/techsuppt.html).

▪ System health checks are conducted to determine availability of load-balanced servers.

▪ A limited number of reports will be available for customer viewing on the CenturyLink portal, SavvisStation.

Level of Service

CenturyLink will supply hardware and software appropriate to the level of service purchased.

Customer Installation Requirements

- Where applicable, Customer must provide IP architecture for all network connections to real and managed servers (depending on the environment, Colocation or virtual).

- In order for CenturyLink to properly configure and install the Virtual Services Load Balancing and SSL Acceleration devices, when applicable, Customer must provide CenturyLink with a topology of their existing network, server architecture, port 80 and 443 (and other ports as deemed necessary by Customer) requirements, and throughput requirements.

- Because persistence methods vary with regard to configuration requirements, the Customer must provide all information necessary for CenturyLink to properly configure the persistence element of the load balancing service.

Customer Responsibilities

- CenturyLink' obligation to provide the Service is contingent upon Customer's compliance with all of its responsibilities under this SG. If Customer fails to comply with the terms of this SG, CenturyLink may suspend the Service.

- Customer will not, nor instruct or permit any other party to, make any physical changes or take actions that would reduce the effectiveness of the Virtual Services Load Balancing or SSL Acceleration devices.

- If the Customer declines to purchase Internet service through CenturyLink, the Customer must have a reliable and stable Internet connection. A connection is defined as unstable if it results in three false alarms per month. If there are three false alarms, the Customer will be charged a $300 false alarm fee. After the first alarm, the Customer may contact the CenturyLink Response Center to discontinue the monitoring after which such time, CenturyLink shall temporarily cease delivering the monitoring service as set forth in the "Monitoring" section of this SG.

- Customer must provide a 24/7 English-speaking technical contact in the event of questions or in case of emergencies.

- Customer must also purchase a CenturyLink Firewall in conjunction with CenturyLink Virtual Services Load Balancing and SSL Acceleration. CenturyLink Firewall services are provided pursuant to a separate Security Service Schedule and Firewall SG.

- If the Customer selects SSL Acceleration Service, the customer must provide a valid X.509 SSL server certificate from an established CA (Certificate Authority). Customer must provide SSL server certificate in either the PKCS12 or PFX12 format, including the private key and private key password.

- If the Customer provides an X.509 SSL server certificate, in lieu of purchasing an X.509 SSL server certificate through CenturyLink, then the Customer must notify CenturyLink two weeks in advance of the certificate's expiration date.

Fault Reporting and Service Restoration

- Suspected faults on the Service should be reported to CenturyLink at the telephone number provided to the Customer for this purpose.

- To diagnose and resolve suspected faults, CenturyLink requires certain information when the problem is first reported. This will normally include:
    - Site ID.
    - The CenturyLink references for the circuit(s) and/or any other part of a service thought to be affected.
    - Symptoms of the problem.
    - Details of any tests carried out in attempting to isolate the problem.
    - Whether affected services can be taken out of service for testing, if necessary.
    - The name and telephone number of the person reporting the fault.

Customer-Requested Changes

The following applies to Customer-requested changes after implementation and in support environment:

Requirements	
Server	▪ Must exist
IP	▪ Available ▪ Sub net already provisioned
SSL certificate	▪ Already available ▪ SSL license already available
SSL certificate meets checklist conditions	▪ .pfx ▪ Password ▪ (Intermediate certificate)
SSL exceptions	▪ Go through support
Reasonable Changes	
Definition	▪ Reasonable is defined as changes that can be completed, if resources are available, within 60 minutes.
Allowance	▪ Completed within 4 hours.
Excessive Changes	
Definition	▪ Excessive is defined as changes that take longer than 2 hours to complete.
Require	▪ A Change Order must be completed and signed by the Customer.
Cost	▪ Excessive changes may require an additional set-up fee of $150 per hour.

Change examples include:

- Route add or delete
- Monitoring Probes (health checks)
- Load Balancing Predictor (in existing environment)
- Load Balancing Persistence (in existing environment)
- Real Server (add/remove or activate/de-activate)
- Server Farm (add/remove or activate/de-activate)
- VIP additions (add/remove or activate/de-activate)

Unmanaged Devices or Server Instances

- Customer must advise CenturyLink of all unmanaged devices that will be added to a load balancer pool BEFORE that IP is added to the pool.

- Customer will be alerted of any trap received for an unmanaged device.

- Customer will be responsible for first-level (basic) troubleshooting for any unmanaged device.

- Customer will be responsible for contacting CenturyLink to assist after first-level unmanaged device troubleshooting has been completed.

- CenturyLink will not begin investigating any trap from an unmanaged pool member until the customer contacts the CenturyLink support team.

- CenturyLink operations team will not troubleshoot any unmanaged device from a Tier 1 support perspective.

Virtual Services Load Balancing and SSL Acceleration

Service Description

CenturyLink Virtual Services Load Balancing and SSL Acceleration provide a pair of devices, fully managed by CenturyLink, which reside in the CenturyLink Hosting Area Network (HAN) within CenturyLink Managed Hosting or Colocation facilities. The Services deliver server load balancing and SSL acceleration in conjunction with CenturyLink Managed Hosting or Colocation services. Server load balancing is the process of distributing service requests across a group of servers to address Customer requirements to optimize web applications performance. SSL acceleration is the process of offloading the processor-intensive public key encryption algorithms involved in SSL transactions to a hardware accelerator.

Common Service Description

Common service elements including the description of installation, configuration, Service inclusions and exclusions, monitoring, and other service details common across Managed Security Services are defined here. These service elements are in addition to specific Service details provided within the body of each SG offering.

For a full description of common SG Managed Security Service elements, please reference the Common Service Description section.

Virtual Services Load Balancing

CenturyLink Virtual Services Load Balancing includes hardware, software, installation and 24/7 monitoring and support. Due to location and data center regulations, no Virtual Services Load Balancing equipment or software is physically accessible to the Customer.

Virtual Services Load Balancing Standard Predictor Options

As Internet traffic enters the CenturyLink Data Center through the CenturyLink Internet routers, it is passed through a pair of CenturyLink-managed Virtual Services Load Balancers / Firewalls where the following algorithmic functions are supported based on the Customer's specific requirements and configurations.

Load Balance Options

Methodology	Description
Round Robin	Distributes connections evenly among the servers
Weighted Round Robin	Allows priorities to be assigned to certain servers.
Least Connections	Distributes connections based on number of current connections.

Virtual Services Load Balancing Standard Persistence Options

Methodology	Description
IP-netmask (source / destination hash)	A sticky type that uses the source and destination IP address to identify connection.
Passive Cookie	A sticky type in which the device learns the name and value of the cookie that the

Methodology	Description
	server sends back to the client using this value to maintain persistence.
Active Cookie	A cookie is generated and inserted in to the HTTP headers, which it then uses to maintain persistence.

Virtual Services SSL Acceleration

Virtual Services SSL Acceleration is an optional service that can be added to the Virtual Services Load Balancing devices. Virtual Services SSL Acceleration may be purchased separately from CenturyLink but must be purchased in conjunction with CenturyLink Virtual Services Load Balancing. The Service includes hardware, software, installation, and 24/7 monitoring and support. Due to location and Data Center regulations, Customer may not physically access the Virtual Services SSL Acceleration equipment or software.

SSL Certificates

X.509 SSL server certificate must either be purchased separately from CenturyLink or provided by the Customer.

Monitoring

CenturyLink provides the following four levels of monitoring for Virtual Services Load Balancing and SSL Acceleration:

Monitoring Options

Methodology	Description
ICMP	Verifies connectivity to the load balancer by pinging the IP to determine system availability.
TCP	A TCP connection to the server is made on a designated port to determine system availability. It performs the three-way handshake with the server, SYN, SYN-ACK, ACK, followed with a RST (reset) to close the connection on the server.
URL	A TCP connection is made to the server and performs an HTTP GET and expects a "200 OK" message in the response.
Scripted	A TCP connection is made to the server and performs an HTTP GET on a specific web page and expects some type of regular-expression (i.e., the word "healthy"); this is configurable by the Customer.

Dedicated Switching and Services

Service Description

CenturyLink Dedicated Switching and Services is a Managed Hosting product portfolio offering that provides (depending on the level of service) a highly available switch or pair of switches creating an exclusive Hosting Area

Network (HAN) strictly dedicated to one customer. In conjunction with Dedicated Switching and Services, CenturyLink offers separate Virtual Services which deliver server load balancing, SSL acceleration and Firewall.

Dedicated Switching and Services

The Dedicated Switching and Services offerings are available in three distinct variations. The standard offering is provided in the Colocation environment and is available in a Managed environment as a custom solution. Customer agrees to provide CenturyLink with access to its Space as necessary to install, monitor and maintain the provided devices.

Dedicated Switch

The Dedicated Switch offering is unique to one customer and is provided in CenturyLink Data Centers where space and power is available. Two platforms are available as options.

Included in Service

Switch (dedicated)	Included
Juniper EX-4200	▪ Quantities available ranging from one [1] to four [4] device(s) are available. ▪ Maintenance and support. ▪ Layer 2 switching handoff only.
Blade G8124	▪ Quantities of one (1) or two (2) device(s) are available. 1Gbps or 10Gbps connectivity options are supported. ▪ Maintenance and support.

Dedicated Aggregation Switch

The Dedicated Aggregation Switch offering provides an aggregation (DAS) level pair of Cisco 6509 switches.

Included in Service

Service Element	Included
(2) Cisco 6509	▪ (2) Supervisors ▪ (2) power supplies ▪ (2) 48-port copper cards ▪ Maintenance and support
Services Options (Add-ons)	▪ 48-port copper card 10/100/1000 ▪ 48-port fiber card ▪ GigE SFPs ▪ ACE Load Balancing, SSL Acceleration and Firewall ▪ Firewall Services Module

Dedicated Core Switch

The Dedicated Core Switch offering consists of a pair of Cisco 6509 Switches at the Core level linked to the switches at the DAS layer.

Included in Service

Service Element	Included
(2) Cisco 6509	▪ (2) Supervisors ▪ (2) power supplies ▪ (2) 8-port 10G cards ▪ (1) 48-port fiber card ▪ Maintenance and support
Services Options (Add-ons)	▪ 48-port copper card 10/100/1000 ▪ 48-port fiber card ▪ GigE SFPs ▪ ACE Load Balancing, SSL Acceleration and Firewall ▪ Firewall Services Module

Included in Service

The Dedicated Switching and Services offerings include hardware, software, installation and 24/7 monitoring and support.

Note: Due to location and data center regulations, customers may not physically access the equipment or software.

Installation

CenturyLink will provide installation and configuration for each Dedicated Switching and Services offering.

Customer Installation Requirements

▪ Customer must provide IP addresses for all network connections to real and managed servers.

▪ The Customer will, using CenturyLink' standard procedures, notify CenturyLink of the initial and later changes to be configured by CenturyLink within the appliance(s).

▪ In order for CenturyLink to properly configure and install the service, Customer must provide CenturyLink with a topology of their existing network, server architecture, port requirements, and throughput requirements.

▪ Because persistence methods vary with regard to configuration requirements, the Customer must provide all information deemed necessary for CenturyLink to properly configure the persistence element of the load-balancing service (if selected).

▪ Installation into the Colocation environment shall take place during normal business hours. If off-hour installation is required, an additional installation fee will apply.

CenturyLink Support, Management and Monitoring

▪ 24/7 support for Dedicated Switching and Services resolution and Customer inquiries.

▪ To manage configuration consistency and accountability for changes, all system administration and device passwords will be managed by CenturyLink. Customer will not have access to device passwords or be able to make direct changes to the device configurations. Customer must request changes by first contacting the CenturyLink Response Center. Customer must provide complete authentication credentials to the CenturyLink Response Center when requesting changes. Changes and updates to this process are available at http://CenturyLink.net/customer/techsuppt.html.

- ICMP (e.g., ping) and URL monitoring of the Dedicated Switch and load-balanced and SSL acceleration devices to determine system availability (24/7). In the event that the servers fail to respond, CenturyLink will notify Customer and initiate corrective action.

- System health checks are conducted to determine availability of load-balanced servers.

- A limited number of reports will be available for customer viewing on the CenturyLink portal: SavvisStation.

Customer Change Requests

Possible changes include: HAN Port Connectivity, changes to Application Control Engine (ACE) Load Balancing, SSL Acceleration, Firewall, and Firewall Services Module.

Change Request Allowance

Change Allowance	Description
Common	- Up to 2 hrs per calendar day - Up to 20 hrs per calendar month
Advanced	- Up to 5 hrs per calendar week - Up to 20 hrs per calendar month
Service Notes	
Changes that exceed these levels are subject to a charge of $250 hour Emergency or expedite changes not related to correcting a failure of service due to CenturyLink managed infrastructure are subject to a charge of $250 / hour.	

Change Request Categories

Category	Component	Description
Common Changes	FW	- X rules
	ACE	- VIP adds/remove/change - Farm adds/remove/change - Real Server adds/remove/change - Traffic engineering modifications (Persistence changes types, SSL, etc.)
	Switch	- Port config/change - Route add/delete
Advanced Changes	Switch	- VRF add\delete\change - Dynamic route change\add\delete - Connectivity add\delete\change - Failover
	Monitoring	- Cchanges
Complex changes	n/a	- An advanced change that has multiple change components or technologies
Infrastructure Changes	n/a	- Capacity expansion - Software upgrades - Non-impacting service repairs - Design change execution

Change turnaround

Turnaround	Description
Common	▪ Changes will be executed within 24 hours.
Advanced	▪ Changes will be executed within 48 hours.
Complex	▪ Changes may require several days to complete. ▪ Changes may be subject to CenturyLink change management process and change window.

Infrastructure Management

Infrastructure Change
▪ Require 4-6 weeks for planning and execution ▪ Subject to change with notice (standard CenturyLink notification) ▪ Infrastructure architecture must not deviate from CenturyLink HAN approved design ▪ Subject to CenturyLink change management process and maintenance windows

Integration with SavvisStation Web Portal

The Dedicated Switching and Services offering are viewable via SavvisStation, which is the web portal for CenturyLink Managed Services available at www.SavvisStation.com. Customers may use the web site to view statistics and manage reports related to the service.

Hosting Area Network

The CenturyLink Hosting Area Network ("HAN") offers a comprehensive set of network services for hosting customers. The HAN provides access to the Internet as well as between customer servers and Colocation space if purchased separately.

There are multiple types of HAN-related networking services including:

Load Balancing and SSL Acceleration

Provides load balancing and SSL acceleration services to the Hosting Area Network via managed dedicated or Virtual Services solutions. Server load balancing is the process of distributing service requests across a group of servers to address customer requirements to optimize web applications performance. SSL acceleration is the process of offloading the processor-intensive public key encryption algorithms involved in SSL transactions to a hardware accelerator.

HAN Ports

Provides physical Ethernet connectivity to the Hosting Area Network. Each Virtual Intelligent Hosting Node includes two Gigabit HAN ports for Customer-related network traffic and a third Gigabit HAN port for CenturyLink management of the solution.

VLANs (Virtual Local Area Networks)

VLANs provide tagged or untagged networks that provide common or separate local area networks. Each Customer is provided a single VLAN per Data Center, in addition to the IP transit VLAN at the routing gateway of the HAN.

Additional VLANs are available for an incremental fee. All networking infrastructure is redundant and multiple methods of failover protection are used including VVRP, RIP and OSPF. Customer solutions can be designed with the following standard options:

VLAN Type	Description
Public VLAN	Basic service used when traffic from multiple servers is not required to be segmented for performance or security. In most cases, the VLAN is configured to access the public Internet through the CenturyLink IP backbone
Private VLAN	Typically a private VLAN carries traffic that is not destined for the Internet. This can be intra-site communications, between application and database server, or for integrated connectivity with other CenturyLink Intelligent IP VPN services included in the Intelligent Hosting solution
Tiered VLAN	Premier service in which public and private VLANs are designed specifically to isolate traffic in "tiers" within the server architecture. Firewalls are usually also used in this model to add another layer of security

HAN Connect

The HAN Connect service provides a Fast or Gigabit-based Ethernet cross-connect from the HAN to a Customer's Colocation-based network. This service allows Colocation customers to integrate their exiting networks with the Virtual Intelligent Hosting service.

Internet Bandwidth

Packets moving to or from the Public Internet are charged separately as a HAN service. CenturyLink uses the CenturyLink Internet Backbone for Internet transit services. CenturyLink manages and monitors all connectivity points within the Data Center and on the CenturyLink Internet backbone. CenturyLink Data Centers are pre-provisioned with Ethernet cabling from the aggregation switch to each rack to minimize implementation timeframes and accidental disruption of service from build-outs in the Data Center. Every HAN Port is inventoried in SavvisStation for tracking, management and trouble resolution. Managed hosting customers that use the Internet to provide access to their hosted applications must have a burstable Internet component included with their solution.

Network Dedicated Connectivity Telco Access

Service Description

The Service provides and maintains dedicated network connectivity from the Customer's colocation or hosting space in the CenturyLink Internet Data Center ("IDC") to the selected customer's remote premise or telecom provider's central switching office ("CO"). This network connectivity consists of one of three types: Fully CenturyLink Provisioned, Customer Provisioned over CenturyLink Facilities, or Customer Provisioned.

- In Fully CenturyLink Provisioned, the Service includes dedicated capacity on the CenturyLink private entrance facility between the IDC and the telco carrier's CO, and the loop between that CO and the Customer's premises. The service also includes a separate cross connect from the Telco node room to the Customer's colocation or hosting space.

- In Customer Provisioned Over CenturyLink Facilities, the Service includes the cross connect between the Customer's colocation or hosting space and the Telco Node Room, and assigned capacity on the CenturyLink private entrance facility between the IDC and the telco carrier's CO to carry the circuit ordered by the Customer from such carrier.

- In Customer Provisioned Over Public Facilities, the Service includes the cross connect between the Customer's colocation or hosting space and the Telco Node Room, which connects to the Customer's telco carrier circuit brought into the IDC over public entrance facilities.

Applicability

To set up this service, the Customer must be provisioning a local loop through a telecom provider that serves the CenturyLink IDC.

Additional Service Notification

Service Responsibilities

The following tables describe the set of Customer and CenturyLink responsibilities in support of the Service.

Fully CenturyLink Provisioned

Responsible Party	Description
CenturyLink	- Provide ordering and tracking of required circuit. - Provide CFA to the Telco vendor. - Provide FOC date and due date to the Customer when made available by Telco vendor. - Provide tracking of the order to completion and alert Customer if the due date is going to be missed. - Contact all Telcos involved regarding any installation issues. - Maintain the cross connect to Customer's cage. - Contact the Telco vendor to perform maintenance on the circuit. - Termination of circuit should Customer cancel with CenturyLink.
Customer	None.

Customer Provisioned Over CenturyLink Facilities

Responsible Party	Description
CenturyLink	- Provide LOA/CFA to Customer within 8 business hours after the CenturyLink Project Manager makes the LOA/CFA request. - Will install the cross connect to Customer's cage once the circuit has been tested and dropped off. - Will maintain the cross connect to the Customer's cage.
Customer	Is responsible for giving the circuit ID to the CenturyLink Project Manager and notifying the project manager that the circuit has been tested and dropped off.

Customer Provisioned

Responsible Party	Description

Responsible Party	Description
CenturyLink	▪ Will install the cross connect to Customer's cage once the circuit has been tested and dropped off. ▪ Maintain the cross connect to the Customer's cage.
Customer	▪ Is responsible for giving the circuit ID to the CenturyLink Project Manager and notifying the project manager that the circuit has been tested and dropped off.

Customer Requirements/Obligations

The following tables describe the set of additional Customer requirements / obligations in support of the Service.

Fully CenturyLink Provisioned

Customer Responsibilities
▪ Provide correct and accurate information for order placement. ▪ Be obtainable for Telco installation. ▪ Have an informed and knowledgeable person available for the Telco installer. ▪ Provide any necessary information need to design circuit(s) to the Customer's Premises, e.g. LOA/CFA needed at Customer's premises.

Customer Provisioned & Customer Provisioned Over CenturyLink Facilities

Customer Responsibilities.
▪ Responsible for ordering and tracking of required circuit(s). ▪ Responsible for obtaining LOA/CFA via CenturyLink Project Manager and supply said LOA/CFA to Customer's chosen Telco vendor to ensure that Telco vendor follows LOA/CFA for installation. ▪ Provide CenturyLink Project Manager with the correct fax number to fax LOA/CFA. ▪ Responsible for all costs for the telco circuits. ▪ Provide CenturyLink project manager & Provisioning with a Telco circuit ID and due date on order. ▪ Track order to completion and notify CenturyLink if the due date is going to be missed by the Telco vendor.
▪ Ensure that the Customers Telco vendor follows the LOA/CFA given. If the Circuit comes in on an undesignated channel not following the CFA CenturyLink will not accept the circuit and will ask that it be re-provisioned to the designated channel stated on the LOA/CFA. ▪ Work with local and IXC Telcos at Customer location when needed for trouble shooting purposes. ▪ Have an informed and knowledgeable person available for the Telco installer. ▪ Be obtainable for Telco installation. ▪ Bear any costs associated with adding additional fiber/copper at Customer site. ▪ Bear any costs associated with any improvements needed by the local Telco at the Customer site. ▪ Schedule circuit cross connect at CenturyLink IDC with CenturyLink Project Manager. ▪ Be responsible for contacting the Telco vendor to perform maintenance on the circuit. ▪ Be responsible for termination of circuit should Customer cancel with CenturyLink.

Customer Provided CPE in the Hosting Space

In the event a connection requires Customer provided CPE as part of their connection, for a fee, CenturyLink will provide space & power in addition to the cross connect for the CPE. The following responsibilities will apply to Customer access to the CPE:

Note: At no time, will the Customer, or the Customer's agent(s) have access to the CenturyLink managed spaces.

Responsible Party	Description
CenturyLink	▪ Will provide space/power for CPE ▪ Will rack and stack configured CPE on behalf of the customer ▪ In the event Customer requests to configure their own equipment on-site, CenturyLink will provide neutral space for configuration
Customer	▪ Is responsible for shipping equipment to CenturyLink facility per the standard equipment shipment terms and conditions set forth in the Colocation Service Guide ▪ Is responsible for pre-configuring CPE prior to shipment Or ▪ Can configure on-site in a neutral space outside of the managed cage

Common Service Description

The following service definitions apply to all CenturyLink service offerings describe in this SG. Any Service definition specific to individual Service offerings will be defined within the body of the Service offering.

Service Guide Release

This CenturyLink Service Guide updates and replaces the following legacy SGs,

- HOS-200914-External-SG-US-HAN Internet
- HOS-20090604-External-SG-US-Load Balancing SSL Acceleration
- HOS-20080822-External-SG-GL-Dedicated Switching and Services _JM1_
- NET-2001005-External-SG-US-Colo Dedicated Connectivity Telco Access

CenturyLink Professional Services

CenturyLink' Professional Services is a complementary service to each Dedicated Switching and Services offering for any ancillary services that are not provided as part of the standard Dedicated Switching and Services offering. The Dedicated Switching offering is primarily considered standard within the Customer's Colocation space. The Dedicated Switching offering in the Managed area of the Data Center could be considered custom and may require Professional Services.

For more details regarding the services outlined above, please contact your CenturyLink Account Executive, or please visit the following link on the CenturyLink Internet:

http://www.CenturyLink.net/corp/Products%20Services/Professional%20Services

Upgrades

CenturyLink may periodically upgrade the relevant hardware and/or software to make sure the latest versions are in operation. If CenturyLink determines an upgrade is necessary, CenturyLink will work with the Customer to schedule a time to make necessary changes, preferably during the normally scheduled Data Center (DC) maintenance window. Customer must allow CenturyLink to make these changes within five business days of receipt of the request from CenturyLink, or CenturyLink' obligation to provide this service in accordance with this CenturyLink Service Guide will be suspended until Customer grants CenturyLink the access CenturyLink requires to make such changes. If CenturyLink determines that an emergency security change is required, CenturyLink will make the change as quickly as possible. CenturyLink will make commercially reasonable attempts to contact the Customer's technical contact prior to said change.

Service Requirements

Customer agrees that Customer is not (1) located in, under the control of, or a national or resident of any country or territory to which export is prohibited under the laws of any country in which CenturyLink operates, or (2) on the U.S. Treasury Department List of Specially Designated Nationals or the U.S. Commerce Department's Table of Deny Orders.

If any third party software, including any corresponding documentation, is provided to Customer by CenturyLink in connection with the Service, Customer agrees to use such third party software strictly in accordance with all applicable licensing terms and conditions. CenturyLink makes no representations or warranties whatsoever with regard to such third party software.

If ordered by Customer, CenturyLink will use good faith efforts to assign Internet address space for the benefit of Customer during the Service Term. Any IP addresses and space provided to Customer by CenturyLink are solely for Customer's use with the Service, and are non-portable and non-transferable. Neither Customer nor any End Users will own or route any IP addresses or space provided by CenturyLink, and, upon any termination of Service, Customer's access to such IP addresses and space will cease.

Definitions

Term	Definition
American Registry for Internet Numbers (ARIN)	The Regional Internet Registry (RIR) that managed the distribution of Internet Numbers (IP Addresses), and AS Numbers.
Application Transport Service (ATS)	The CenturyLink product name for the physical connection (loop & port) delivered to a customer premise. There is a family of optional Service offerings available under Application Transport Service.
Backhaul Option	Wavelengths are available for backhaul connections at bandwidths of 10 Gbps. Customers can take a standard backhaul circuit, which provides a connection from a cable landing station to an access point - usually a CenturyLink node. Alternatively, customers can extend their backhaul connection to their required site, combining the backhaul and access options. Customers requiring protection for their service also have the option of diverse

Term	Definition
	routing. This option provides a very high level of protection for customer's traffic. In the event of a failure, traffic can be switched from one connection to the other quickly and easily.
BLSR	Should a fiber be cut or other network outage occur, traffic is rerouted back around the ring in milliseconds, so service continues uninterrupted. BLSR is available as two fiber or four fiber.
BLSR 2 Fiber	Both rings in the ring carry working traffic and half the capacity of each fiber is reserved for protection.
BLSR 4 Fiber	Each working fiber is assigned a protection fiber. If a working fiber is cut, it switches to the protection fiber on that span only.
Border Gateway Protocol (BGP)	A dynamic routing protocol used to establish routing between ISP's that, combined, make up the Internet.
BPDU	Enables switches that participate in a spanning tree protocol to gather information about each other.
Business Hours	Are Monday to Friday 0900 to 1700 local time, excluding public holidays.
Card Protection	CenturyLink offers 1+1 card protection, which means that one working optical port is protected by another optical port on a different card.
Colocation	The provision of space at a CenturyLink Location for the housing of Customer's equipment.
Committed Bandwidth	The level of usage that the customer commits to on a connection.
Core Network	The CenturyLink owned and operated network between CenturyLink Points of Presence (PoPs). Local access and customer premise equipment are specifically excluded.
Core Protection	The CenturyLink US network has a mesh design allowing traffic to be easily rerouted around a fault. For SONET circuits of OC-3 or above, CenturyLink uses a protection mechanism called Dedicated Transit Line (DTL) in the core to reroute the traffic. DTL is custom designed, diverse routed protection used for 155 Mbit/s and higher circuits. It uses simple static routes, meaning that the primary and protection paths are predetermined, which means that the switch over time is faster than OSRP. For circuits OC-3 and above we offer 1+1 protection. For SONET circuits of DS3 and below, CenturyLink uses Optical Signaling &

Term	Definition
	Routing Protocol (OSRP) to reroute traffic. OSRP does not determine the protection path until it is needed which makes the switch over slightly slower than DTL. CenturyLink tries to avoid delayed failover or dropped circuits wherever possible by not allowing the network to become over-utilized (50 percent is policy). For circuits DS3 and below we offer 1:n protection. For all SONET circuits, CenturyLink uses non-revertive switching, meaning that once the failed path is restored traffic is not moved back to the original path and the protect path becomes the primary path. CenturyLink can offer protection for 2.5 Gbps wavelength circuits; although wavelengths are normally unprotected. For our 2.5 Gbps offering, we can offer protection using Automatic Protection Switching (APS).
Customer Location	Premises designated by the Customer for the delivery of Capacity.
Customer Premise Equipment (CPE, or CE)	The terminating device that is located at a Customer Site and terminates the Service connection. This equipment can be defined as a router, and bridge or a switch depending on the Application Transport Service options selected by the customer.
Data Center	The facility in which the Systems are located.
Demarcation	The Ethernet port on CenturyLink' Provider Edge Equipment shall be the network connection demarcation point.
Dense Wave Division Multiplexing (DWDM)	Works by combining and transmitting multiple signals simultaneously at different wavelengths on the same fiber, allowing one fiber to be transformed into multiple virtual fibers.
Etherchannel	A port trunking technology which allows grouping several physical Ethernet links to create one logical Ethernet link for the purpose of providing fault-tolerance and high-speed links between switches, routers and servers.
Hosting Area Network (HAN)	The managed networking infrastructure that supports CenturyLink Managed Hosting services.
Intelligent Hosting	A managed server service that includes use of a dedicated standalone server, space and power for the server, operating system license, network connectivity, management and monitoring of the server hardware and operating system.
IP Address	A numerical identification (logical address) that is assigned to devices participating in a computer network utilizing the Internet Protocol for communication between its nodes.

Term	Definition
LACP	Allows for the bundling of several physical ports together to form a single logical channel.
Leased Capacity or Capacity	Any portion of the capacity specified as such in the applicable Service Order.
Local Access Facilities premise.	Are the domestic facilities and related equipment required to connect the CenturyLink network to the Customer's premises. Local Access Facility termination points are located at the Customer's premise.
Local Access (Local Loop)	A physical circuit, that connects from the demarcation point of the Customer premises to the edge of a service provider's network.
Managed Hosting	The set of CenturyLink managed server services that include Foundation Hosting, Intelligent Hosting, CenturyLink Dedicated Cloud Compute, and Open Cloud Compute.
Maximum Transmission Unit (MTU)	The largest size packet or frame that can be sent in a packet- or frame-based network.
Meet Me Room	A central location within a collocation center or carrier hotel where multiple carriers and/or customers can interconnect with each other via a cross connect.
METRO Ethernet Virtual Private Line (EVPL)	A Layer 2 point-to-point connection between two fixed points within a CenturyLink Metro Network.
MPLS Network	The CenturyLink owned and operated network between CenturyLink Points of Presence (PoPs). Local access and customer premise equipment are specifically excluded.
Network Node (Nodes)	A direct point of entry and departure on the CenturyLink network. Nodes provide the infrastructure to enable the Customer to connect to the CenturyLink network. The list of current CenturyLink Nodes and details of their locations are available from your CenturyLink Account Manager.
Network Termination Point	The telecommunication network interface at the Customer's premises, as provided by the local exchange carrier, if CenturyLink orders the local loop on behalf of the customer.
On-net	The Services or any part of them supplied over infrastructure owned by or controlled by CenturyLink or its Affiliates.
Off-net	The Services or any part of them supplied over a third party's local loop.
Protection in the Access	Most local loop providers offer a protection mechanism called Bi-Directional Line Switching Ring (BLSR) although Uni-Directional Path Switched Ring

Term	Definition
Circuit	(UPSR) is often used instead.
Provider Edge (PE) Provider Edge	A router or switch on the CenturyLink network on which a customer's connection terminates.
Public IP	Is an option of the Application Transport Service (ATS) that delivers Internet access service.
Real Server	A unique IP address.
CenturyLink IP Backbone	The CenturyLink IP network between its Primary Backbone Nodes (AS3561).
CenturyLink Network / Metro Network	The fiber optic telecommunication network operated by CenturyLink, including such telecommunication capacity as CenturyLink may obtain from other network providers and integrate into its own network and including any cable system.
SavvisStation	The name for the interface that ties together all the centralized systems that CenturyLink uses to provide services to customers. Included in SavvisStation are systems for order processing, provisioning, procurement, management and monitoring, change management, billing, customer support / ticketing and reporting.
Spanning Tree Protocol (STP)	A link management protocol that provides path redundancy while preventing undesirable loops in the network.
Specifications	Recommendation ITU G-826.
Static Route or Default Route	A defined fixed path for traffic to travel. A default route is a "gateway of last resort". All traffic destined for networks not know by the router will be forwarded via this "gateway".
Virtual Intelligent Hosting (VIH)	A managed server service which includes use of a dedicated server, space and power for the server, virtualization operating system license, instance operating system licenses, network connectivity, use of storage services on a managed storage area network, management and monitoring of the server hardware, virtualization operating system and instance operating systems.
VLAN or logical connection	Terms that refer to the Layer 2 separation utilized on the Application Transport Service to separate various traffic types (e.g., Public and Private traffic).

Term	Definition
WAN Ethernet Virtual Private Line (EVPL)	A Layer 2 point-to-point connection between two fixed points across the CenturyLink Core Network.
Wavelength Access Option	Wavelengths are available for access connections at bandwidths of 2.5 Gbps or 10 Gbps. CenturyLink can connect customers to a CenturyLink node from their own site or from a carrier hotel facility. The configurations and service details of wavelength-based access services will vary, depending on whether customers require a connection to their site or a carrier hotel, and according to the local infrastructure. CenturyLink can provide the access connection (with the terminating equipment provided by the customer).
	There are some distance limitations for access services where CenturyLink provides only the fiber-optic access connection and not the terminating equipment: ▪ 2.5 Gbps access connections - maximum distance of 10 kilometers between the customer site or carrier hotel and the CenturyLink node. ▪ 10 Gbps access connections - maximum distance of 3 kilometers between the customer site or carrier hotel and the CenturyLink node.
Wavelength Connectivity	Wavelength connectivity is enabled by the use of Dense Wave Division Multiplexing (DWDM), a technology that allows a single fiber to perform as multiple 'virtual fibers.' The customer is allocated a wavelength (Lambda on our DWDM links), allowing the customer to transparently pass their SONET overheads through the CenturyLink network. Wavelength circuits provide customers with scalable network capability, without the expensive creation of fiber and at a quicker time to market. CenturyLink supports a 2.5 Gbps framed service and a 10 Gbps transparent service (US).