



Technical Description

Zayo’s Shielded Internet Access (SIA) is a dedicated, reliable, and fast Internet connection including automated DDoS Protection with always-on monitoring, attack identification, and unlimited auto-mitigation. Zayo also offers CloudLink, a secure, private connection to a customer’s Cloud Service Provider (CSP), as an optional add-on to SIA. Zayo will bundle Internet Access, DDoS Protection, and CloudLink (optional), and will provision all services on a single multi-service port or access facility.

TECHNICAL FEATURES

Shielded Internet Access is a Layer-3 service providing the following features:

SIA Technical Features	
Fiber Optic Backbone	SIA leverages Zayo’s owned fiber network at the foundation, extended to the edge. Zayo proactively augments core capacity to eliminate network congestion.
Security	Dedicated IP and DDoS Protection bandwidth means no shared uplinks with other customers. DDoS Protection is always monitoring IP traffic and redirects malicious traffic to Zayo’s global scrubbing centers, redirecting clean traffic to the customer edge without the use of GRE tunnels.
High Availability	Globally distributed peering and edge connections ensure Internet availability of 99.9% and minimal network hops.
Convenience	DDoS Protection is auto-initiated and protects the IP space configured on the Service. DDoS Protection features unlimited mitigation of inbound DDoS attacks towards the customer.
Support	Global Network Operations Center (NOC) support is available 24/7/365.
Scale	Bandwidth options from 100Mb to 10G with predictable, low latency routes. Note that higher bandwidth is available with Zayo’s standard DIA product.
Choice	Dual-stack architecture supports IPv4 and IPv6 simultaneously..
Routing	Connected IP routing by default; additional static-routed IPs can be configured upon request. Note that BGP is available with Zayo’s standard DIA product.
Optional Cloud Connection	Zayo’s CloudLink service, a direct, private and secure Ethernet connection to over 50 Cloud Service Providers (CSPs), can be added to the SIA access facility.



DDoS CONFIGURATION

Zayo requires configuration information from the customer, found on the DDoS Mitigation tab of the Zayo-provided [DDoS Configuration form](#).

DDoS Protection Features for SIA	
SIA Solution DDoS Protection Features	Functionality Included
Cloud Based	Yes
Monthly Subscription	Included in SIA Service
IP Addresses	Assigned in SIA Order and Fixed
IP Configuration Form	Required to define alert destinations
Monitoring	Proactive and continual
Incident Notification	Email and SMS options
Incident Reporting	Summary of mitigation actions based on alert triggers
Attack Thresholds	Predetermined and Fixed
Mitigation Type	System Automated
Scrubbing Cost	Unlimited/Included

NID SPACE AND POWER REQUIREMENTS

Zayo will install a network interface device (NID) at the customer premises. This NID will provide the multi-service port for SIA. The customer must provide ample space and power to accommodate the NID. The NID will require no more than 1 rack unit (RU) of space, with a typical power draw of 120V of AC power.



HANDOFF OPTIONS

Protocol channels will conform to the following standards for rate, format, and physical interface specifications. Customer equipment is required to generate the appropriate digital optical signal(s) for transmission to Zayo for transport over the access facilities in conjunction with the ordered protocol channel. The following SIA customer handoff types are available:

Standard SIA and CloudLink Interfaces				
Protocol Channel	Speed and Line Rate	Maximum Reach	Standard Handoff	Ports
100BASE-TX	100Mb	100m	Copper	GigE
100BASE-T	1G	100m	Copper	GigE
100BASE-LX	1G	5km-10km	SMF	GigE
100BASE-SX	1G	275-550m	MMF	GigE
100BASE-SR	10G	Varies (OM1-OM4)*	MMF	100GigE
100BASE-LR	10G	10km	SMF	100GigE

*OM = Optical Multimode Fiber

OM1 has a core size of 62.5 μm and can support up to 10G at lengths of 33 meters

OM2 has a core size of 50 μm and can support up to 10G at lengths of 82 meters

OM3 has a core size of 50 μm and can support up to 10G to 300 meters, or 100G to 100 meters

OM4 is backwards compatible with OM3 fiber and supports 10G to 550m, or 100G to 150 meters

PERFORMANCE STANDARDS

Zayo’s service performance is managed by our Global Network Operations Center (NOC). SIA services are supported by a front-end Service Orchestration Team. The team includes 6 tiers of possible escalations available to our customers.

Measurement	Performance Level Target
Service Availability*	99.9%

*Availability means the percentage of time that a customer location can access the Internet. The Availability measurement period begins when a Zayo trouble ticket is opened and is calculated on a calendar month basis.



Optional CloudLink Add-On to Shielded Internet Access

Technical Description

CloudLink provides direct private connectivity using Zayo’s carrier grade Layer-2 (Ethernet) transport service between an enterprise or data center location and major cloud service providers (CSPs) such as AWS, Azure, Google, and many others, bypassing the public Internet.

Ethernet provides a high-level of data networking security through the protocol’s Layer-2 attributes. Customers will access their CSP with a Zayo-assigned Ethernet Virtual Circuit (EVC). The EVC defines and provides data paths while keeping traffic distinct and secure across Zayo’s network.

Hosted vs. Dedicated Connection

A CSP dedicated connection is where the customer procures a dedicated, non-shared port from the CSP. The customer provides an LOA/CFA for the CSP port, and Zayo orders a cross-connect between the Zayo network demarc and the customer’s dedicated CSP port.

A CSP hosted connection is where multiple end-customers share a single CSP port through use of a Zayo deployed port with the CSP. Customer will provide Zayo with an activation key from the CSP to complete a “logical” cross-connect (i.e. complete the establishment of the Layer-2 VLAN).

CONFIGURATION

Ethernet CloudLink Standards

Supported Client Handoffs	10/100/1000 Copper RJ45, 1GE/10GE Optical Fiber
Diversity	CSP On-Ramp Diversity (optional)
Protection	<ul style="list-style-type: none"> ▪ MPLS core infrastructure protection ▪ Link Aggregation Group (LAG) protection (optional) - multiple fiber pairs, homed to a core-network switch, and configured as a LAG. If any LAG member fails, the remaining LAG members are able to continue transmitting traffic
Security Features	<ul style="list-style-type: none"> ▪ Avoids public Internet ▪ EVC separation using unique VLANs ▪ Protected physical access to Zayo sites ▪ No Layer-2 protocol exchange with customer network elements ▪ No access to customer data ▪ Secure authentication to Zayo network ▪ No ARP redirection or spoofing ▪ No VLAN jumping or trunking attacks



Zayo Cloudlink - Private Direct Connections

Attribute	Hosted Connection	Dedicated Connection
Port Tenancy	Shared Zayo's connection to the CSP port is shared among multiple customers	Dedicated Zayo's connection to the CSP port is dedicated to a single customer.
# Virtual Interfaces	Limited to 1 With a hosted connection, the customer is limited to 1 virtual interface per connection.	Multiple With a dedicated connection, the customer can have multiple virtual interfaces per connection.
Turn-Up Time	Faster Customers will experience shorter turn-up times, with automated installation (within minutes) to certain CSPs and locations.	Slower Dedicated connections involve longer turn-up times in order to deploy a dedicated Zayo port and to provision a cross-connect to the customer's dedicated CSP port.
Bandwidth	Subrate Port Speeds Available Customers have access to varying sub-rate port speeds if data needs don't warrant full port speeds, depending upon the CSP.	Up to 10G Customers have access to up to Up to 10G per dedicated connection, depending upon CSP.
Bandwidth Changes	Sometimes Logically Modified Sometimes this function can be automated, or logically changed by Zayo. Redesign may be needed depending upon the customer's capacity needs.	Sometimes Logically Modified Sometimes this function can be automated, or logically changed by Zayo. New physical ports may be required for increased bandwidth.
Costs / Pricing	Lower Monthly Rates Lower bandwidth customers pay only for the bandwidth they need.	Higher Monthly Rates Customers pay the CSP for the full port speed.
Availability	Limited – depends on the CSP Not all CSPs offer hosted connectivity. Work with Zayo to determine your CSP's availability of hosted service.	Widely Available Dedicated connections are widely available from nearly every CSP.