



Cogent Customer User Guide

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Useful Links:

Cogent Communications Home Page: <http://www.cogentco.com>

eCogent: <http://ecogent.cogentco.com>

Acceptable Use Policy (AUP): <http://www.cogentco.com/acceptable-use-policy>

IP Allocation Policy: http://www.cogentco.com/Guide/IP_Allocation_Policy.txt

DNS Questionnaire: <http://www.cogentco.com/Guide/DNSQ.txt>

<http://www.cogentco.com/Guide/DNSQ.Sample.txt>

SMTP: <http://www.cogentco.com/Guide/SMTPQ.txt>

<http://www.cogentco.com/Guide/SMTPQ%20Sample.txt>

Network Performance: <http://status.cogentco.com>

I. Overview

Thank you for choosing Cogent as your Internet service provider!

The Cogent User Guide has been designed to address any questions that may arise with your Cogent network services. Whether you have a question concerning installation, maintenance or customer support, you will find the Cogent User Guide a valuable “one stop” resource for the information you need. We urge you to read the User Guide in its entirety; however, each section is designed to stand-alone so that you can quickly find an answer to any given topic.

Mission

Cogent’s mission is to simplify the delivery and lower the cost of high-bandwidth Internet access and/or transport services by providing non-oversubscribed, dedicated broadband access to businesses.

The Cogent Network

At Cogent, we provide a service that combines optical technologies with Internet protocols to provide reliable 10 Mbps to 100 Gbps Internet services. By owning and managing our own network, you benefit from the complete control we maintain over service, quality and cost.

II. Acceptable Use Policy

The most current version of the Acceptable Use Policy can be found at:

<http://www.cogentco.com/acceptable-use-policy>

Please read the entire contents before your service is installed. The Acceptable Use Policy applies to all persons and entities using our products and services.

If you are unsure of whether any contemplated use or action is permitted, please contact Cogent at abuse@cogentco.com or contact the Customer Support Hotline for your region as specified in Section XVI.

Your Service Delivery Specialist will also be able to answer any questions you may have.

III. Installation Process

Your Service Delivery Specialist

Your Cogent Service Delivery Specialist will be your single point of contact during the provisioning process of your service. Our Specialists are trained and experienced in service implementation. Your Specialist will facilitate a smooth installation of your Cogent service and will remain in contact with you to ensure your service is delivered in a timely manner. You may monitor progress of your order's installation by logging into Cogent's customer portal (see Section XVIII). An overview of the installation process is provided here:

<http://cogentco.com/en/next-steps-for-your-order>

All concerns regarding service activation should be directed to your Service Delivery Specialist. In the event you are unable to contact your Service Delivery Specialist, or you need to escalate concerns you have regarding your order, please contact us via global_order_management@cogentco.com

The Installation Process

1. Upon signature of your Customer Service Agreement (CSA), your Cogent Sales Representative will place your order into our order-tracking database with the Order Number from your CSA.
2. Upon receipt of the signed CSA, the Cogent Sales Operations Department will validate your order and ensure it has been properly written.
3. If a credit application has been submitted, or a credit review is required, Cogent's Finance Department will process the application and/or review your account for credit approval.
4. After the order is validated and your credit approved (if necessary), a Service Delivery Specialist will be assigned to your order. This Specialist will send you a Welcome Letter via email describing your order. As a point of reference, this Welcome Letter email contains a link to this User Guide.
5. Your Service Delivery Specialist will strive to install your order within the normal provisioning interval, or on your requested service date as specified on the CSA. Billing will commence as soon as Cogent has successfully completed the installation. It is your responsibility to have your equipment ready to test on the scheduled installation date or to advise Cogent of any changes in the requested service date prior to the scheduled installation date.
6. If your order requires a local access circuit from a third-party local access provider, your Service Delivery Specialist will coordinate the third-party provider to obtain a firm circuit installation date (referred to as FOC) from the local access provider. Note that there are

different average installation intervals for the various types of local access circuits, as specified in the Service Level Agreement (SLA).

7. If your order requests Cogent provided IP space, BGP, DNS, or SMTP, questionnaires are required to complete your order. If you need a copy of any of these questionnaires, your Service Delivery Specialist will provide you the necessary links. The links to these questionnaires may also be found on page 3 of this User Guide. If you require Cogent provided IP space you will need an order for those IP resources, and your completed IP Questionnaire will need to be approved by Cogent prior to beginning your service implementation. It is strongly encouraged that you follow the detailed instructions of the IP Questionnaire (or any of the required questionnaires). This step can be extremely time-intensive and thus requires your prompt attention.
8. Depending on your order type, port(s) and/or other resources on the Cogent network will be requested and assigned.
9. The required cabling from the Cogent equipment within your building to your point of demarcation for the service will need to be determined.
 - In office buildings (i.e., non-colocation configurations), a Cogent Field Engineer will contact you to schedule a site-survey in order to design and deliver cable to the demarcation point.
 - In Carrier Neutral Data Centers, the cabling from the customer point of demarcation to the Cogent point of demarcation (either the Cogent cabinet or panel assignment in a meet-me-room) is the responsibility of the customer. Your Service Delivery Specialist will provide you with any required LOA/CFA so that you may place your cabling order with your colocation vendor.
 - In the case of an order requiring a third-party supplied local access circuit, the point of demarcation between Cogent and the customer is the point of demarcation of the local access provider in the customer's service location. It is strongly suggested that the customer equipment be located near this local access provider's point of demarcation in the customer's service location. Cable extensions beyond that point of demarcation are the sole responsibility of the customer. As such, Cogent will not be liable to pay for or install any cabling beyond the local access provider's point of demarcation, or any cable pulls, drilling, installation of conduit, or other alteration/addition to the customer's service location. Customer is solely responsible for the upkeep and maintenance of any cabling beyond the point of demarcation. If additional or replacement cabling is needed, you can request a quote for such cabling from your Cogent Sales Representative.
10. IP address allocation will be based on of your justification provided in the IP Questionnaire, and IP addresses will be allocated accordingly (applicable for IP Transit products only).
11. The Cogent port(s) will be configured as required.

12. DNS, SMTP, and any other services you might require in conjunction with an IP transit connection will be completed based upon the appropriate information provided.
13. BGP customers must be prepared to support BGP during the Cogent turn-up phase. If you are not ready to run BGP during the turn-up phase, Cogent will test and complete the circuit with a static route configuration. When you are ready to run BGP, please send an email to Cogent's Support team referencing your Order Number.
14. With new port installations, once the required cabling has been delivered and terminated, the service(s) will be tested and handed off to you via email upon Cogent's determination that the service is operational. For non-port installations, Cogent will complete the order upon successful installation and/or testing of the service(s).

At the end of the provisioning cycle, you must ensure that all your equipment is prepared to receive Cogent service as service and billing will commence upon Cogent's successful installation. If you are not prepared, Cogent will maintain your port and IP addresses and our Network Operations Center (NOC) will be advised that your equipment is not on the circuit. Please notify Cogent Customer Support when you connect your equipment to the circuit. To reiterate, it is important that you understand that the billing cycle commences at the time Cogent's provisioning cycle is completed (i.e., when the port or service has been successfully installed and/or tested at the end of the provisioning cycle).

Cogent Standard Configurations

Your device should be configured as follows:

10 Gigabit Ethernet (10000Mbps) Configuration:

- LAN PHY / WAN PHY.

Fast Ethernet (100Mbps) Configuration:

- Full Duplex
- 100 Mbps
- Auto negotiation capabilities or Auto Detect feature: Disabled or Off
- If Layer 2, IEEE 802.1q VLAN tags if required will be provided for you.

Gigabit Ethernet (1000Mbps) Configuration:

- Full Duplex
- 1000 Mbps
- Auto negotiation capabilities or Auto Detect feature: Disabled or Off
- If Layer 2, IEEE 802.1q VLAN tags will be provided for you.

Ethernet (2 and 10Mbps) Configuration:

- Full Duplex
- 10 Mbps

- Auto negotiation capabilities or Auto Detect feature: Disabled or Off.

Installation Intervals for orders with third-party supplied local access Circuits*:

- T1/E1 Service: 40 business days
- T3/E3/DS3 Service: 60 business days
- OCn/STM-n Service: 90 business days
- Ethernet: 90 business days

Our standardized configuration is designed to guarantee the quality and stability of service to our customers; customers not using Cogent's standard configuration will not be eligible to receive service credit for Network Availability and Notification Guarantees under Cogent's SLA.

* Note that all installation intervals assume the third-party suppliers have available facilities at your service location to provide the service.

IV. Interoperable Hardware

Gigabit Ethernet, 10 Gigabit Ethernet and 100 Gigabit Ethernet

The Cogent Network is comprised of Cisco routers and equipment. Consequently, Cisco switches or routers with a GigE, 10GigE or 100GigE port can be expected to operate with our network. Other vendor equipment that is compatible with Cisco equipment is also expected to work with the Cogent Network. Cogent has tested various pieces of equipment for compatibility.

Fast Ethernet

The Cogent Network is predominantly comprised of Cisco routers and equipment. Consequently, Cisco switches or routers with a 10/100 or Fast Ethernet port can be expected to operate with our network. Other vendor equipment that is compatible with Cisco equipment is also expected to work with the Cogent Network. Cogent has tested various pieces of equipment for compatibility.

Customers connecting with hubs should be aware that hubs, by definition, cannot run full duplex, which means the bandwidth of the connection will be artificially limited at the customer's site. Cogent will not be able to reliably connect to a half duplex piece of equipment.

V. Router Policy

Cogent requires all customers in a CNDC or any customer with a /24 or larger, to have a router. This enables Cogent to improve monitoring capabilities and offer better customer support.

Monitoring Capabilities

If a customer uses a switch, Cogent needs to ping (ICMP) a host machine. This is less reliable than a router, which gives a definitive point (IP) for Cogent to monitor. For example, if a customer uses a switch and a host machine goes down, whether planned or unplanned, the line will appear down even if the other servers are up. With a router, Cogent immediately knows that the customer is unreachable. Therefore, routers allow for better accuracy in troubleshooting and thus better customer support.

In order for Cogent to honor the Guarantees and Service Credits provided in any Service Level Agreement, you must allow our monitoring systems to reach the monitored host, whether it be your router interface or host IP. The Cogent monitoring systems are in the IP range as referenced in the table below.

Region	IPv4 Monitoring Range	IPv6 Monitoring Range
North America and Asia Pacific	66.28.3.0/24 and 66.250.250.0/23	2001:550:1:300::/56
Europe	130.117.254.0/24 and 130.117.228.0/24	2001:978:1:300::/56

VI. Customer DNS Information

Introduction

The Domain Name System (DNS) is a distributed database throughout the Internet used for translating names of network nodes into IP addresses and vice versa, and also provides other name-based information such as where to send mail and whom to contact with issues concerning nodes or domain names. In order for Cogent to provide accurate DNS service, please fill out the DNS Questionnaire online via eCogent at <http://ecogent.cogentco.com> or at this link (<http://www.cogentco.com/Guide/DNSQ.txt>). The DNS Questionnaire is text formatted so you can directly fill in the information and either email the attachment or directly paste into email.

DNS Servers

Resolving/caching name servers are used to look up DNS information, such as the location (IP address) of a host on the Internet. The IP addresses of the caching servers will need to be configured into each computer on your network or into a DHCP server that will give this information to the clients that connect to it.

Determine your business location in the table below to set up the primary and secondary name servers that you should use. When configuring your machines to point to the following name servers, they should be listed in the order given below with primary first and secondary next.

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Name servers for configuring customer machines (for resolving):

Location	Primary IPv4 Address	Secondary IPv4 Address
East of Mississippi	66.28.0.45	66.28.0.61
West of Mississippi	66.28.0.61	66.28.0.45
Asia Pacific / Mexico	66.28.0.45	66.28.0.61
Europe	66.28.0.45	66.28.0.61

Location	Primary IPv6 Address	Secondary IPv6 Address
East of Mississippi	2001:550:1:1::d	2001:550:1:2::d
West of Mississippi	2001:550:1:2::d	2001:550:1:1::d
Asia Pacific / Mexico	2001:550:1:1::d	2001:550:1:2::d
Europe	2001:978:1:1::d	2001:978:1:2::d

Your Domain Name

Cogent can provide Primary or Secondary name service for domain names that you own and use. There is no fee for Cogent to host the first ten of your domain names. Thereafter, there is a one-time fee for each set of up to ten domain names. This one-time fee is used to maintain the hardware for the domain name servers and to cover their administration costs. Cogent is not responsible for any fees payable to the registrars that are associated with your domain name (e.g., registration fees, annual fees, etc.). You are responsible for providing your own billing information to the registrar, and the registrar will bill you directly. Cogent and the registrar are completely exclusive of one another.

Cogent Providing Primary Name Service

If you would like Cogent to provide the primary name server for one or more of your domains, Cogent must be listed as the technical contact for the domain(s). When registering domains with Network Solutions, please enter the assigned NIC Handle, "DA23490-OR", in the technical contact information fields. When using a registry service that does not recognize that NIC Handle, the following details should be submitted for the technical contact (but not the billing contact and not the domain owner):

DNS Administration
Cogent Communications
2450 N St NW, Washington DC, 20037, USA

Email: dns@cogentco.com

Tel: 202-295-4200

Fax: 202-338-8798

In this situation, you will also need to provide to the registry the names and IP addresses of Cogent's primary and secondary name servers.

North America and Asia Pacific	IPv4	IPv6
Primary Server Hostname	AUTH1.DNS.COAGENTCO.COM	AUTH1.DNS.COAGENTCO.COM
Primary Server Netaddress	66.28.0.14	2001:550:1:a::d
Secondary Server Hostname	AUTH2.DNS.COAGENTCO.COM	AUTH2.DNS.COAGENTCO.COM
Secondary Server Netaddress	66.28.0.30	2001:550:1:b::d

Europe	IPv4	IPv6
Primary Server Hostname	AUTH4.DNS.COAGENTCO.COM	AUTH4.DNS.COAGENTCO.COM
Primary Server Netaddress	80.245.32.74	2001:978:1:a::d
Secondary Server Hostname	AUTH5.DNS.COAGENTCO.COM	AUTH5.DNS.COAGENTCO.COM
Secondary Server Netaddress	80.91.64.50	2001:978:1:b::d

Cogent Providing Secondary Name Service

Cogent can provide secondary name service if you would prefer to maintain your own primary name server for your domain and have Cogent pull the zone data from your server. It is not necessary to list Cogent as a contact with the registrar when Cogent is not running a Master server for the domain. However, Cogent will need all email sent from you to the registrar to be copied to support@coagentco.com or eu-support@coagentco.com. You will need to provide Cogent with the IP address of your Master name server and the name of the domain for which Cogent will be providing Slave name service. The name server information you need to provide to the registrar will usually be the following:

North America and Asia Pacific	IPv4	IPv6
Primary Server Hostname	Hostname of your name server	Hostname of your name server
Primary Server Netaddress	IP address of your name server	IP address of your name server
Secondary Server Hostname	AUTH1.DNS.COAGENTCO.COM	AUTH1.DNS.COAGENTCO.COM
Secondary Server Netaddress	66.28.0.14	2001:550:1:a::d
Secondary Server Hostname	AUTH2.DNS.COAGENTCO.COM	AUTH2.DNS.COAGENTCO.COM
Secondary Server Netaddress	66.28.0.30	2001:550:1:b::d

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Europe	IPv4	IPv6
Primary Server Hostname	Hostname of your name server	Hostname of your name server
Primary Server Netaddress	IP address of your name server	IP address of your name server
Secondary Server Hostname	AUTH4.DNS.COAGENTCO.COM	AUTH4.DNS.COAGENTCO.COM
Secondary Server Netaddress	80.245.32.74	2001:978:1:a::d
Secondary Server Hostname	AUTH5.DNS.COAGENTCO.COM	AUTH5.DNS.COAGENTCO.COM
Secondary Server Netaddress	80.91.64.50	2001:978:1:b::d

If you prefer not to list your primary server with the registrar, then you must put in the record for at least one of our servers auth1, auth2, auth4 or auth5.dns.cogentco.com. This is not optional, as at least two name servers must be listed with the registrar for any zone.

You will also need to make sure you have put the appropriate NS records in your zone data. Use the NS record for the correct server for your service area from the table above. You also need an NS record for any other DNS server you have listed with the registrar as a name server for your zone.

This is how the NS records in the zone file should appear if you are using auth1 and auth2 in North America and Asia Pacific:

```
@ IN NS auth1.dns.cogentco.com.  
@ IN NS auth2.dns.cogentco.com.
```

This is how the NS records in the zone file should appear if you are using auth4 and auth5 in Europe:

```
@ IN NS auth4.dns.cogentco.com.  
@ IN NS auth5.dns.cogentco.com.
```

IPv4: If Cogent is providing Slave service, you must also configure your name server to allow zone transfers originating from the following two IP addresses: 66.28.0.14, 66.28.0.30

IPv6: If Cogent is providing Slave service, you must also configure your name server to allow zone transfers originating from the following two IP addresses: 2001:550:1:a::d, 2001:550:1:b::d

DNS Changes or Additions

All request for DNS changes, additions, etc., should be completed via eCogent (<http://ecogent.cogentco.com>) or documented on the DNS Questionnaire (<http://www.cogentco.com/Guide/DNSQ.txt>) and sent to support@cogentco.com, or eu-support@cogentco.com

VII. Mail Exchanger Service Offering

Cogent offers backup Mail Exchanger service. If your site loses connectivity, your mail can be sent to a Cogent Backup Mail Exchanger. Once your site regains connectivity, your mail is downloaded to your mail server.

You should check to see that these backup mail exchanger records are in place for your site. If you have nslookup, you can check for your MX records with the following commands:

```
nslookup set q=mx
domain_name.com
```

In addition to your MX record, there should also be a record for a mail server that is not on your site's network, i.e., a backup mail exchanger.

If your site does not have backup mail exchangers listed, you may add our servers for your site at no extra charge.

If we are providing your site with backup mail exchanger, the machines used should be the following:

```
North America and Asia
  Pref.  Name
  5000 backupmx1.mail.cogentco.com
  5000 backupmx2.mail.cogentco.com
```

```
Europe
  Pref.  Name
  MX 5000 eu-backupmx1.mail.cogentco.com
  MX 5000 eu-backupmx2.mail.cogentco.com
```

The backup mail exchanger will hold your mail for up to one week (7 days). The mail queue on these machines will periodically process your back-up mail and attempt delivery. Once a connection is made, the mail will be delivered. This process may vary in time based on the size of your mail backup and the duration of time required to connect to your server.

Requesting Mail Exchanger Service

To request this service, please complete the SMTP Questionnaire using the link below:

- SMTP Questionnaire - <http://www.cogentco.com/Guide/SMTPQ.txt>

VIII. IP Allocation Policy

Overview

Cogent efficiently allocates IPv4 and IPv6 addresses to customers based on RFC2050 (<http://www.ietf.org/rfc/rfc2050.txt>) and RFC6177 (<http://www.ietf.org/rfc/rfc6177.txt>). In cooperation with its customers, Cogent will make the most efficient use of allocated network space.

Cogent will examine all requests for address space with care to validate the use of the IP numbers that are allocated. In certain limited situations, Cogent may request a customer to re-design its network before routing new address space to the customer, if the existing range of addresses is sufficient for customer requirements. Cogent reserves the right to deny new address space in the event a customer unreasonably refuses a valid network re-design request.

Customers prove efficient usage of IP addresses by filling out an IP Questionnaire and documenting their needs. This document shows, in detail, the plan for using IP addresses over the next twelve months.

Allocations are based on need, not solely on a predicted customer base.

Allocations are based on utilization history, projected three-month requirement, and other information deemed necessary. Justification for subsequent address blocks will be based on utilization verification supplied in the form of reassignment information.

When evaluating requests for additional address space all previous and existing allocations are examined. At least 80% of the most recent allocations must be in use to obtain approval for additional IP's. This will also include any space reassigned to the customer's end users (downstream customers). Therefore, it is important the direct Customer require their end users (downstream customers) to practice efficient utilization as described in this and other guidelines.

Please refer to the following websites for further information:

<http://www.ietf.org/rfc/rfc2050.txt>

<http://www.ietf.org/rfc/rfc6177.txt>

Customer Equipment Guidelines

MTOB (Multi Tenant Office Building)

- Customers using Cogent service in an office building are considered Corporate end users. A typical example would be a law firm with offices in a Cogent lit building.
- Corporate customers may use a Switch (or other Layer-2 Device) to connect to Cogent if they require a /24 (256 IPs) or less.
- If more than a /24 is required, a Router (or other Layer-3 Device) is required.

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- Corporate connections are to be used for internet access for company employees and for company business. Web hosting your own corporate sites is OK, web hosting those of someone else is not.*

CNDC (Carrier Neutral Datacenter)

- All customers terminating in a carrier neutral datacenter are required to use a Router (or other Layer-3 Device) to connect to Cogent.

CDC (Cogent-owned Datacenter)

- At Cogent owned datacenter facilities, a Layer-2 Device [switch] is permitted to be used on the line, and the block of IP addresses will be directly connected to the interface. No routing is required.

T1/E1, T3/E3, OC3, OC12, OC48 and STMs Customers

- Customers with traditional 'telco-type' services must use a Router, as the line is a point-to-point link and no other connection type is possible. Only a /30 is possible for the router-router interface on a traditional telco-type line, and any justified block size will be routed to you across it.

*Only Customers whose service location (as set forth on the Order Form) is a COGENT-owned or carrier neutral data center may resell COGENT's Dedicated Internet Access Service (but not any other Service offered in such location). Customers located in any other service location may not resell their Service, in whole or in part.

General Conditions for Allocations (IPv4)

- Each customer port/LAG bundle will be allocated a /29 for the IPv4 interconnect with Cogent.
- If you need more IPv4 space than above listed amounts, place an order with your Cogent sales representative. They will provide you with the necessary IP Questionnaire form.
- Customers must use at least 50% of their initial allocation immediately (defined as same-day, with a one-week window for unexpected equipment issues or unusual circumstances). A utilization rate of less than 50% indicates the customer's immediate needs are for a smaller block. For example, if a /26 is assigned, Cogent should be able to ping (or otherwise verify usage) 31 of them one week after assigning them.
- Customers must use 80% of the block within three months. If the 80% mark is not reached, Cogent reserves the right to withdraw the block and reassign a more appropriate size.
- Customers must use 80% of the last-assigned block and 100% of all previous blocks before Cogent will issue additional IPs. The existing blocks of IPs must respond to ping (or be otherwise documented), and existing hosts must have forward and reverse DNS. Optimally, customers will receive a block adequate for their documented needs for the next 90 days, use it completely, and come back for more, once a quarter.

- Customer blocks are sub-delegated to customers via RWHOIS. Cogent's RWHOIS server is rwhois.cogentco.com, port 4321.

General Conditions for Allocations (IPv6)

- All Cogent customer ports will automatically be assigned an IPv6 /112 for the interconnect IP block. If your equipment does not support this please let your Service Delivery Specialist know.
- The maximum IPv6 allocation Cogent will allocate is a /48 block. If you do not already have an IPv6 allocation from an RIR and need only a /48 IPv6 block, contact your Cogent sales representative for an IPv6 order. They will provide you with the necessary IP Questionnaire form.
- If you need more IPv6 space than that, contact your local RIR for your initial IPv6 allocation. Most RIR's begin with a /32 IPv6 allocation.
- Full List of RIR Geographic coverage areas:
<https://www.arin.net/knowledge/rirs/countries.html>

Network Needs

For IPs to be used for your network, Cogent requires customers to list subnets and the numbers of servers/hosts in them for immediate, 3-month, 6-month and 12-month requirements. You should also include aggregate blocks that you will be using for customers, but do not detail individual customers or hosts here - we do not expect you to know at any given time what every single customer has going on, provided you gave them an appropriately sized block.

In most circumstances, Cogent will allocate IPs based on 6-month requirements. Cogent may also, at its sole discretion, use the 12-month projections to set aside the next contiguous block for the customer, if it believes there is a high probability of accuracy in the customer projections. Such reservation is not a guarantee that the customer will receive that specific block. If the customer utilizes IPs at the indicated rate, it should not be a problem, but a slower than predicted utilization will likely result in the block being allocated to another customer who can use it immediately.

NAT, Firewalls, and Private IPs

If a proxy firewall or other means that prevents Internet traffic from bi-directionally connecting to internal LAN hosts will be used, the machines behind the "filter" are considered hosts that do not require globally routable IP addresses and do not need to be included in the map. A good example of this would be customer internal PCs and printers - these do not require and for security reasons should not have globally routed IP addresses. In this instance, the customer should use an RFC-specified Private Network (see RFC-1918) for internal networking. Cogent will assign an appropriately sized net block according to the customer's needs for publicly visible servers in the firewall DMZ (email, www, FTP, etc.).

Downstream Customer IP Needs

For IPs to be used for your downstream customer networks, Cogent requires its customers to list subnets and the associated downstream customer names.

No specific details are required as to customer host counts in the IPQ itself; it is assumed that you have enacted similar verification processes and have policies in place to ensure correct block selection for your downstream customers. If not, future allocations will be affected. Before issuing space, Cogent reserves the right to ask for documentation provided by your customers to justify assignment of a particular block to them. This is done to spot-check your own internal allocation policies and provide guidance when needed.

Web-hosting Services

If you will be doing IP-based web-hosting, Cogent requires you provide your "technical justification" for doing so, as well as a list of domains and URLs. Name-based web-hosting is the preferred way (whenever possible) as it utilizes significantly fewer addresses, but for a variety of reasons it is not always possible. If you can't use it, please simply explain why. URLs provided as documentation must resolve with both forward and reverse DNS.

BlackHole server

The Blackhole server allows customers under a DDOS attack to send all traffic to the IP address under attack to null route.

To request configuration on the blackhole server: Log into eCogent and click on BGP request. You will need the following information:

1. Order Number.
2. An IP address from your network with which we will peer.
3. A password (all blackhole server sessions are password protected).

All North American and Asia Pacific Customers will peer with:

IPv4: 66.28.8.2 and IPv6: 2001:550:0:1000::421c:802

All European Customers will peer with:

IPv4: 130.117.20.2 and IPv6: 2001:550:0:1000::8275:1402

Once your session to the blackhole server has been established, any network you announce to it will be stopped at our borders. Please note that Cogent does not warrant or guarantee that use of the blackhole server will mitigate, or minimize any effects of a DDOS attack nor does Cogent guarantee that a session to the blackhole server can be established on a timely basis.

You are limited to announcing 50 prefixes to our blackhole server. If you anticipate needing to announce more, relay that request to our Customer Support department along with the technical justification for an increase in the number of prefixes to be announced.

IX. Customer BGP Peering Information

Customer Requirements

All BGP peering requests must be accompanied by an order. If you need to run BGP routing with Cogent, please contact your Cogent sales representative. They will provide you with the necessary BGP Questionnaire form.

In order to have a BGP peer with Cogent, a customer must be multi-homed, either within Cogent's network or with another Internet provider's network. If the customer is multi-homed with another provider, the customer must also have a registered AS (Autonomous System) number. Cogent does not facilitate acquisition of a public AS number. If the customer is multi-homed only within Cogent's network, Cogent will assign a private AS number to the customer. Customers are responsible for configuring their own equipment, including the BGP peer. Cogent does not provide assistance in configuring customer routers for BGP. Cogent filters all announcements from Cogent customers to protect the quality and stability of the network.

For more information and definitions of abuse, see the Acceptable Use Policy at:

<http://www.cogentco.com/acceptable-use-policy>

What to Expect

- Cogent has an easy to use BGP Questionnaire to assist in the set-up of BGP. The form can be accessed online through eCogent <http://ecogent.cogentco.com> and be submitted to Cogent.
- Cogent's AS number is 174.
- Cogent recommends that all customers use MD5 authentication on their BGP sessions. If the customer wants to use MD5 authentication, they should supply a password string in the provided location in the BGP Questionnaire.
- Cogent filters BGP announcements from the customer based on network address space. Announcements are allowed on the following basis:
 1. Cogent assigns the IP block to the customer.
 2. ARIN, RIPE or other RIR assigns the IP block to the customer.
 3. When another provider assigns the IP block, Cogent will verify the announcements by one of the following:
 - The reassignment information is readily available in one of the RIR databases via a swip, route object or in the assigning provider's RWHOIS server.
 - The IP block already being announced globally from the AS on the BGP Questionnaire.
 - If you need to announce an IP block that is not registered to your company, you will need to provide an LOA from the registered holder of the IP resources if the above criteria have not been met.
- Cogent institutes a maximum number of prefixes that a customer is able to announce via the Cogent BGP session. The default max-prefix limit is currently set to 100 prefixes. Cogent does this to limit the growth of the global routing table by encouraging route aggregation. Cogent understands that for various reasons the customer may need to de-

aggregate its route announcements to Cogent. Cogent currently adds "le 24" to the customer prefix lists to allow for the de-aggregation of route announcements.

AS number

- The IP block has been cleared by Cogent abuse team.
- Cogent reserves the right to disable a BGP peer that is adversely affecting other Cogent customers or Cogent's network stability and/or performance until the problem is remedied. A reasonable effort will be made to contact the customer prior to turning down the peer; however, the integrity of the Cogent network remains the top priority.
- Cogent does not accept announcements that are smaller than a /24 to external peers.
- Cogent does not accept announcements with community strings that are not on the list of approved community strings.
- Cogent makes no guarantees, explicit or implicit, about the routing policies of other providers and the routes that they accept into their routing tables.

AS Padding

Customers with public AS numbers may pad their AS path to control the desirability of their connections. Customers with an assigned private AS number from Cogent may not pad their AS path. Cogent will ignore any padding of private AS numbers from customers.

Types of Peers

Cogent offers five types of peers:

Full

Cogent will send the customer a complete BGP table with the internal Cogent routes aggregated as much as possible. This is recommended for customers seeking a complete routing table.

Full (detailed)

Cogent will send the customer a complete BGP table without aggregating the internal Cogent routes. This is useful for customers who are multi-homed within the Cogent Network.

Cogent backbone and Cogent customers routes

Cogent will only announce its aggregated internal routes, as well as the routes of other Cogent BGP customers. This is recommended for customers who want to use a single Cogent connection solely for access to the Cogent Network.

Cogent backbone and Cogent customers routes (detailed)

Cogent will send its internal routes without aggregating them, as well as the routes of other Cogent BGP customers. This is recommended for customers who are multi-homed within the Cogent Network and who want to use their connection to only access the Cogent Network.

Default (can be added to all other peer types)

Cogent will only announce default. This is recommended for customers who have a low-powered router and are only multi-homed for redundancy, with one line being the primary line and the other only used as a backup.

Services/Features

Local Preference

All customer routes announced to Cogent will have a local pref of 130.

The customer can control the local preference for their announcements by using a community string that is passed to Cogent in the BGP session. The following table lists the community strings and the corresponding local preference that will be set when they are used.

Community String	Local Pref	Effect
174:10	10	Set customer route local preference to 10 (below everything-least preferred)
174:70	70	Set customer route local preference to 70 (below peers)
174:120	120	Set customer route local preference to 120 (below customer default)
174:125	125	Set customer route local preference to 125 (below customer default)
174:135	135	Set customer route local preference to 135 (above customer default)
174:140	140	Set customer route local preference to 140 (above customer default)

No-Export

Customers can control the "no-export" settings of their routes with the following community strings:

Community String	Effect
174:990	Do not send route to BGP customers, or peers.
174:991	Do not send route to peers.

These communities affect what actions Cogent will take on the routes before sending them on to Cogent's peering partners:

Community String	Effect
174:3000	Do not announce to peers (equivalent to 174:991)
174:3001	Prepend 174 1 time to peers.
174:3002	Prepend 174 2 times to peers.
174:3003	Prepend 174 3 times to peers.

Communities Received from Cogent

Routes announced to customers by Cogent will have one of the following communities associated with them:

Community String	Description
174:21000	Route is learned from NA (North America) non-customer.
174:21001	Route is NA internal or customer route.
174:21100	Route is learned from EU (Europe) non-customer.
174:21101	Route is an EU internal or customer route.
174:21200	Route is learned from AP (Asia Pacific) non-customer.
174:21201	Route is an AP internal or customer route.
174:22001	Austria
174:22002	Belgium
174:22003	Canada
174:22004	Switzerland
174:22005	Germany
174:22006	Denmark
174:22007	Spain
174:22008	France
174:22009	Italy
174:22010	Netherlands
174:22011	Portugal
174:22012	United Kingdom
174:22013	United States
174:22014	Sweden
174:22015	Norway
174:22016	Czech Republic
174:22017	Slovakia
174:22018	Hungary
174:22019	Ireland
174:22020	Romania
174:22021	Croatia (locally Hrvatska)
174:22022	Slovenia
174:22023	Bulgaria
174:22024	Finland
174:22025	Estonia
174:22026	Ukraine
174:22027	Mexico
174:22028	Poland
174:22029	Luxembourg
174:22030	Serbia
174:22031	Greece

174:22032	Japan
174:22033	Macedonia
174:22034	Lithuania
174:22035	Turkey
174:22036	Moldova
174:22037	Latvia
174:22038	Singapore
174:22039	Hong Kong
174:22040	Montenegro
174:22041	Albania

BGP Bidirectional Forwarding Detection (BFD)

For customers who have a BGP session setup on a Layer 3 circuit with Cogent, Cogent offers the ability to run BGP Bidirectional Forwarding Detection (BFD).

BGP BFD tests the reachability of a peer and allows either side to take down a BGP session faster than the standard BGP default timers.

BGP BFD is setup by default when your BGP session is configured by Cogent.

To enable BGP BFD you will need to configure it on your device.

Cogent uses the following multiplier and millisecond interval for its default values:

- 3 x multiplier
- 333ms interval

Please Note, Cogent offers BGP BFD in a basic configuration only, which does not support customers who are using Link Aggregation (LAG).

To verify if your device supports BGP BFD, please consult with your hardware vendor.

If you need further assistance please contact Cogent Customer Support.

Sample Configuration for Customers using a Cisco device:

```
neighbor XXX.XXX.XXX.XX
remote-as XXXX
bfd fast-detect
bfd multiplier 3
bfd minimum-interval 200
```

X. Link Aggregation

Link aggregation (LAG) is a computer networking term used to describe various methods of combining (aggregating/bundling) multiple network connections in parallel to increase throughput beyond what a single connection could sustain, while providing redundancy in case one or most of the links should fail. This process is known as Link Aggregation Control Protocol (LACP), other terms used to describe this include Ether Channel, and Link Bundling, and others.

The form of LAG supported by the Cogent network is the standard Link Aggregation Control Protocol (LACP). There are 2 basic configurations of LACP:

- **Type A** (Cogent default). Specifies that if any of the links are up, the bundle is up; this allows the customer to continue to send traffic even if there is an issue with one or more port in that bundle. This could lead to congested links, but will keep traffic flowing if there is a problem with any of the circuits in the bundle.
- **Type B** (May be configured by Customer on his network as an option): Specifies that if any of the links are down, the bundle is down; this allows the customer to force traffic to their backup provider if there is an issue with one or more ports in that bundle. This configuration will stop all traffic over the bundle.

Cogent will always configure LAG as Type A, i.e. the Cogent network will continue to send traffic over the bundle even if one or more of the circuits in the bundle goes down. If the customer wants to force the whole bundle down if one or more links experiences a failure (thus forcing their traffic over a backup connection), this is an option the customer would configure on their equipment.

LAG is only offered for customers with 10GE interfaces in select markets / sites.

XI. Virtual Private Lan Service (VPLS)

Virtual Private LAN Services (VPLS) is a class of VPN that supports the connection of multiple sites in a single bridged domain over a managed IP/MPLS network. VPLS presents an Ethernet interface to customers, simplifying the LAN/WAN boundary for Service Providers and customers, and enabling rapid and flexible service provisioning, because the service bandwidth is not tied to the physical interface. All services in a VPLS appear to be on the same LAN, regardless of location.

VPLS uses edge routers that can learn, bridge and replicate on a VPN basis. These routers are connected by a full mesh of tunnels, enabling any-to-any connectivity.

Cogent's VPLS service is offered in virtually all of our markets around the world. Please consult your sales representative.

XII. Colocation Customer Access Procedure

Colocation customers are required to provide 24 hours' notice when requesting access to their equipment. Access will be granted with less than 24 hours' notice only in emergency situations and should be verified.

To request access with a minimum of 24 hours advance notice, the customer must email the request to support@cogentco.com or eu-support@cogentco.com. The person making the request must be on the Customer Company Contact List. For emergencies, customers can call the appropriate Customer Support Hotline, but must also follow up with an email request. The person making the emergency request must also be on the Customer Company Contact List.

Customers will not be allowed access to a Hosting Center if they have an outstanding account balance.

These procedures apply only to Cogent owned colocation facilities. If you are purchasing colocation services from a party other than Cogent, you must contact that provider to determine its access procedure.

XIII. Utility Computing

Cogent's Utility Computing product is a bundled product offering consisting of Cogent bandwidth plus a managed server. The product is offered in select Cogent-owned datacenters in the US and Europe. The product is currently offered in Herndon, Chicago, Oakland, London, Paris, and Frankfurt. The total package includes bandwidth, server, pre-installed Linux OS, server management and monitoring, power, colocation space, and cross connects. As an option, the customer can choose to pay for access to the server's KVM/iDRAC console port. Customers are never permitted physical access to the Utility Computing servers.

The servers are connected to Cogent network equipment via cat-6 copper for 1G connections (CDR from 100M to 1G) or single mode 10G fiber (for CDR up to 10G). In most cases, the server network ports (1G copper and 10G fiber) are provisioned on Cisco 4900s assigned exclusively to Utility Computing. The 4900s are connected to the Cogent core by two or more 10G fiber ports. In some cases, Utility Computing servers with 10G fiber connections are provisioned on the Cogent core devices directly. The KVM/iDRAC console port on the server is connected to a Cisco 2900 series switch via cat-5 copper at 100Mbps. The 2900 switch ports are protected by a Cisco 5505 ASA firewall. The firewall is configured to allow connection to the console ports only from Cogent offices and customer defined network IP blocks. The ASA is connected to the Cogent network via a single 100M FE port.

The standard server offering consists of a 2U server with two CPUs, 32G of memory, and 8 hard drives. Based on customer specification, we can modify this configuration to include external storage arrays or servers capable of supporting up to 36 internal hard drives. Customers can also

choose to modify the amount of memory and number and type of CPUs deployed. The server hardware is generally either Dell or Silicon Mechanics.

Typically, customer Utility Computing contracts are for a minimum term of one year, especially for non-standard hardware configurations. Other terms are available.

XIV. Network Maintenance Policy

Cogent will perform regularly scheduled maintenance on the Cogent Network during a standard maintenance window from 00:00 AM to 06:00 AM (local time of the Cogent Hub to which Customer's circuit is connected). Cogent will normally notify customers of scheduled maintenance at least two (2) business days in advance, via email. In most cases, maintenance performed will not take the full configuration window, however, Cogent will provide more detail regarding the anticipated duration of the maintenance in the email notification.

In the event of unscheduled or emergency maintenance, Cogent will attempt to notify the customer via email and/or via telephone as soon as it is aware of the immediate need for maintenance. Unscheduled or emergency maintenance is generally defined as maintenance necessary to avoid imminent network outages.

XV. Troubleshooting

Cogent strives to provide you with the best service possible. In the event that you feel our level of service does not meet your expectations, please contact the Customer Support Hotline for your region as specified in Section XVI to escalate.

Cogent monitors the physical hardware on the network 24 x 7 x 365, and will attempt to proactively notify you if your service goes down. However, please be aware that some outages may not generate alarms on our monitoring system.

In the event that you have lost service, please have the following information available when calling Technical Support:

- For incidents in which you have lost connectivity to the Internet or external sites:

- Can you ping the gateway on your network to which the Cogent line is provisioned?
- If there is no response from your gateway, please ensure that your equipment is receiving power and that all cables are properly attached. If possible, power-cycle your equipment.
- If there is a response from your gateway, please specify whether or not you are able to ping sites on the Cogent Network such as your default gateway or 66.28.0.45 (res1.dns.cogentco.com).

- For incidents in which you have lost connectivity to some external sites, or general connectivity is slow and unresponsive:

- Ping your Cogent default gateway, reporting the latency and packet loss experienced.
- Identify which external sites are either not reachable or exhibit high latency and packet loss. Provide trace routes to Customer Support for these sites via eCogent or via email to the appropriated support team as specified in Section XVI, Customer Support Contact Information.
- Try to identify any sites that do not exhibit “slowness” or packet loss.

When contacting Customer Support, please be prepared to identify the following:

- Your order number.
- Your company name.
- Your domain name.
- The physical location of the line on which you are reporting a problem.
- A detailed description of the problem.
- How long you have been experiencing the problem.
- Time constraints that may affect when a technician or vendor can be dispatched to your location.

Cogent reserves the right to charge a customer in the event a Cogent representative is dispatched to the customer site to resolve a trouble report and that trouble report is discovered to be produced by customer's equipment.

XVI. Customer Support Contact Information

Contacting Cogent Customer Support

Cogent prides itself on superior customer support. We are available to you 24 hours a day, 365 days a year. Our support desk in Washington, DC primarily serves our North American and Asia-Pacific customers, and our support desks in Europe (Frankfurt, Germany; Madrid, Spain; and Paris, France) primarily serve our European and Mexican customers.

Please select the appropriate support desk's contact details from the list below, based upon your service location. Make sure to have your Customer Account Number or Order Number ready for your call, and include it in the subject line of any email you send. We appreciate your business!

United States / Canada

Hotline: 1-877-7-COAGENT (877-726-4368 (US Toll Free)) or 1-202-295-4368
Fax: 1-202-461-3245
Email: support@coagentco.com (support desk)
Email: billing@coagentco.com (billing, customer care)
Email: billingca@coagentco.com (billing, customer care)
Canada - Specific Complaints: canada.complaints@coagentco.com

Mexico

Hotline: 01-800-681-9553 (Toll Free) or +52 55 4169 7175
Fax: +34 91 102 2509
Email: eu-support@coagentco.com
Email: billing@coagentco.com (billing, customer care)

Asia-Pacific

Hong Kong: +852 5808 0736
Singapore: +65 3158 2050
Tokyo: +81 34 577 6393
Fax: +1-202-461-3245
Email: support@coagentco.com (support desk)
Email: billingeu@coagentco.com (billing, customer care)

Europe (all countries, except as listed below)

Hotline: +49 69 2998 9696
Fax: +49 69 2998 9666
Email: eu-support@coagentco.com (support desk)
Email: billingeu@coagentco.com (billing, customer care)

United Kingdom

Hotline: 0800 877 8005 (UK Toll Free)
Fax: +49 69 2998 9666

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Email: uk-support@cogentco.com (support desk)
Email: billingeu@cogentco.com (billing, customer care)

France / Benelux

Hotline: +33 1 49 03 1818
Fax: +33 1 49 03 1803
Email: fr-support@cogentco.com (support desk)
Email: bnl-support@cogentco.com (support desk)
Email: billingeu@cogentco.com (billing, customer care)

Spain / Portugal / Italy / Croatia / Slovenia / Bulgaria

Hotline: +34 91 102 2501
Fax: +34 91 102 2509
Email: es-support@cogentco.com (support desk)
Email: billingeu@cogentco.com (billing, customer care)

Hungary

Hotline: 06800 18854
Fax: +49 69 2998 9666
Email: de-support@cogentco.com (support desk)
Email: billingeu@cogentco.com (billing, customer care)

Montenegro

Hotline: +382 (0) 20 510 597
Fax: +49 69 2998 9666
Email: eu-support@cogentco.com (support desk)
Email: billingeu@cogentco.com (billing, customer care)

All Customers in Europe can also contact the European **Cogent Customer Support team** using the **generic email address for Europe: eu-support@cogentco.com** as an alternative to the support email addresses listed above for each European region. This alternative email address will have the same effect in the Cogent Trouble Ticketing System, opening a trouble ticket and issuing Cogent's ticket number to the customer by means of an auto-reply email.

XVII. Escalation Procedures

Cogent Escalation Procedures have been established for notifying upper management of customer service and operational system problems. This escalation procedure may also apply to installation of new customer services. Cogent customer, backbone and operational system problems are tracked in the Cogent Trouble Tracking System. If Cogent has determined that the problem is due to customer equipment, escalation procedures may be halted.

Please note that if Cogent has not been able to interface with the customer to eliminate customer initiated actions, Cogent Customer Support Staff may:

- Continue internal escalation if initial troubleshooting indicates that the outage is associated with the Cogent Network. See **Appendix A** for Customer Support Internal Escalation List.
- Halt escalation (until 7am local time the next business day) if the troubleshooting indicates that the customer's equipment may be the root cause of the outage.

XVIII. eCogent

Now that you are a Cogent customer, we would like to invite you to register to use eCogent. eCogent allows you to access information you need via the web. Features of eCogent include:

- A Global View of Your Orders & Billing Accounts.
- Account Balance & Transaction History for each of your Billing Accounts.
- The ability to open a Support Ticket for Technical Assistance, Billing Questions or Sales Inquiries.
- A complete view of helpdesk tickets with summary and status information, including trouble ticket number, order ID, issue summary, status, and issue type (category).
- The ability to view and update your administrative and/or technical contact information.
- The ability to update Domain Names Service (DNS) records.
- Access to our online IP address and BGP request forms.
- Information on how to contact each of the Cogent Country Entities.
- The ability to view "Track My Order", which displays the progress and next steps during the installation process. This screen also provides your single point of contact at Cogent responsible for ensuring delivery of service.
- Access to signed contract documents.
- All pertinent billing data is provided, including account balance & transaction history for each circuit.
- eCogent User Guide (located on the login screen) for information regarding eCogent registration, navigation of eCogent, and updating your contact information.

To register or log into eCogent, please visit <http://ecogent.cogentco.com>. You will need an email address and any active Cogent Order ID/Service ID related to your Cogent account. If you need assistance with the registration process, please contact the Cogent Customer Support team.

Appendix A: Customer Support - Internal Escalation List

Level 1	15 Min.	30 Min.	1 Hour	2 Hours	4 Hours	6 Hours	8 Hours	12 Hours	1 bus. Day	2 bus. Days	3 bus. Days
DNS add/change Response to Customer Email Billing or Informational Request										Manager, Customer Support	Director, Customer Support
Level 2	15 Min.	30 Min.	1 Hour	2 Hours	4 Hours	6 Hours	8 Hours	12 Hours	1 bus. Day	2 bus. Days	3 bus. Days
Non-service affecting problem report on single customer line				Senior Technician on Duty	Senior Technician, Customer Support	Manager, Customer Support		Director, Customer Support	VP, Operations		
Level 3	15 Min.	30 Min.	1 Hour	2 Hours	4 Hours	6 Hours	8 Hours	12 Hours	1 bus. Day	2 bus. Days	3 bus. Days
Non-service affecting problem on multiple customer lines.			Senior Technician	Manager, Customer Support	Director, Customer Support	VP, Operations					
Level 4	15 Min.	30 Min.	1 Hour	2 Hours	4 Hours	6 Hours	8 Hours	12 Hours	1 bus. Day	2 bus. Days	3 bus. Days
Service affecting problem on single customer line.		Senior Technician	Manager, Customer Support	Director, Customer Support	VP, Operations						
Level 5	15 Min.	30 Min.	1 Hour	2 Hours	4 Hours	6 Hours	8 Hours	12 Hours	1 bus. Day	2 bus. Days	3 bus. Days
Service affecting multiple customer problem	Manager, Customer Support	Director, Customer Support	VP, Operations								

NOTE: Cogent telephone system operates off an Automated Call Distributor (ACD). Therefore, the escalation process is regulated through the contact of the Customer Support Hotline for you region as specified in Section XVI. Please use the number to both contact Cogent Customer Support and request escalation if you believe that proper support is not being provided.