



NetAbstraction

NetAbstraction is a cloud-based service that obscures and varies network pathways, while protecting customer identities and systems. NetAbstraction's patented design provides secure, varied, and non-apparent network connectivity, and a range options to alter or reduce the cyber attack profile. In addition, NetAbstraction can be used to protect networks, communications, applications and data between the Enterprise and the cloud.

CUSTOMER CHALLENGE:

Operating on the Internet creates a cyber threat to those who may want to conduct discrete market research, business intelligence collection, or establish private or privileged client communications channels. The simplest online activity leaves a "footprint". Anyone using the Internet "unprotected" exposes their IP (Internet Protocol) addresses and network identities making high interest users such as banks and national infrastructure providers, a potential target. A number of IP address blocking or IP address substitution techniques (all of which are proxy services) have been developed but they tend to be cumbersome to use and are often disruptive to normal business activities due to fraud profiling efforts that are trying to prevent non-identifiable people that are using a proxy service from accessing a company's goods and services. Along with fraud profiling techniques, major search engine optimization companies do a very good job at geo-locating a user based on their activity on the Internet. Many of the existing non-attribution systems don't address geo-location footprint, use patterns, or habits.

Enterprise-level cyber attacks continue to increase dramatically. Some statistics of interest:

- **Cyber Crime Annual Costs & Expenditures** -- Web-based crime incurs annual costs of \$114 billion to U.S. companies. The U.S. government is expected to spend \$10.5 billion a year on information security by 2015, and analysts have estimated the worldwide market to be as much as \$140 billion a year.
- **Corporate Cyber Attacks** -- 68% of all businesses reported that employees can not identify fraudulent attacks on the corporate network. Cybercrime is the fastest growing crime trend the United States.
- **Identity Theft & Digital Espionage** -- Over the last five years, the trend of intellectual property theft, government data, financial information, social media & SEO poisoning, infrastructure & digital espionage along with "hactivism" & mobile security has increased by an estimated 50%.

- **Cyber Security Protection** -- 97% of cyber attacks on business during 2012 were avoidable. 85% of those attacked took approximately two weeks to discover that they had been breached.

The threats are increasingly sophisticated and responses tend to be reactive rather than proactive. Typical commercial and government systems are fixed, static, easily located and thus more vulnerable to attack. We have to look at the problem differently.

Cutting Edge CA is pleased to propose a suite of solutions that not only helps secure and protect the network pathways between the enterprise and the cloud but which also obscures the existence of these pathways, reducing the possibility of attack. These solutions include:

- Disguising your network communications pathway – if they can't find you, they can't target/get you!
- Dynamically shifting your activity – it's hard to identify or hit a moving target.
- Use of a new tunneling protocol that is misidentified as normal TCP traffic enabling the tunnels to hide, (become lost), within the traffic of the commercial provider networks.
- Using multiple providers/technologies/geographic locations – to disperse and layer your points of possible attack.
- Protection of the subscriber information that is held in commercial provider's databases – this is a key issue that people often don't think about but it exposes who you are (and potential financial information) before adversaries even reach you.
- Increasing the layers of security in the network – to augment the security protections of the service providers.
- Taking advantage of the cloud technology's agility – the ability to quickly stand up and bring down resources.
- Using and varying surrogate, low profile, personas to procure cloud services so that your workloads, data transfers, and data storage are not attributable to you.

NETABSTRACTION OVERVIEW:

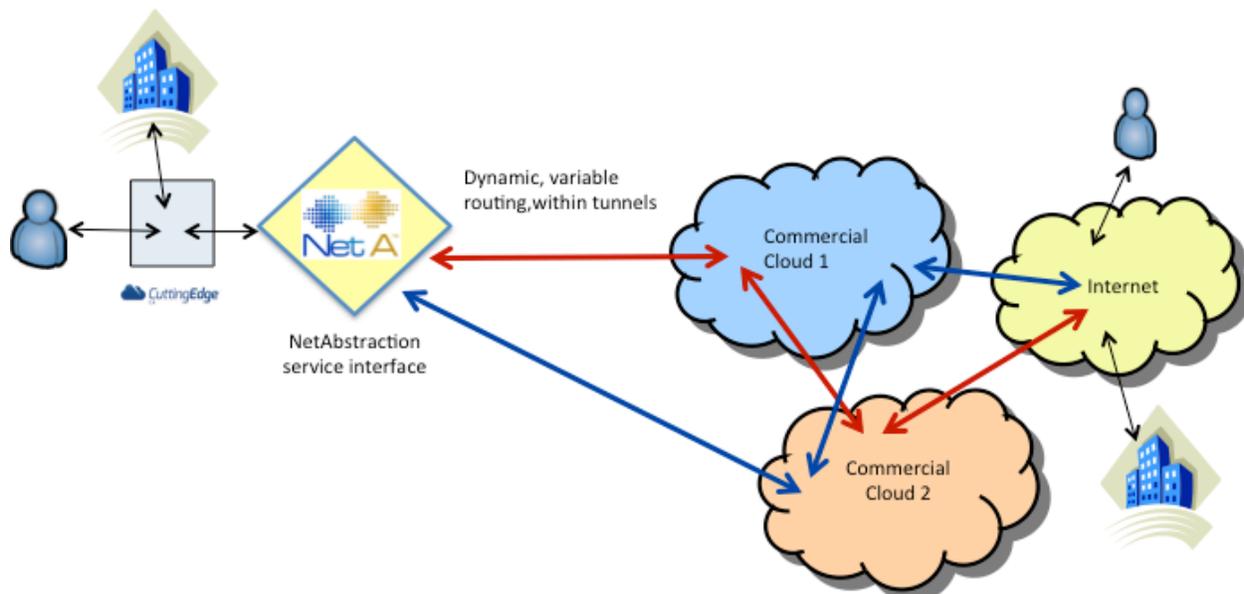
NetAbstraction is a cloud-based service that obscures and varies network pathways, while protecting customer identities and systems. NetAbstraction's patented design provides secure, varied, and non-apparent network connectivity, a range of identity management and persona attribution options to alter or reduce the cyber attack profile, and system designs to help control customer information held within commercial cloud provider databases. In addition, NetAbstraction will augment the multi-layered security capabilities provided by the commercial cloud providers, to include implementing dynamic security policies to help ensure that malicious traffic is not allowed to enter the network.

NetAbstraction transparently distributes the communications activity within and across multiple clouds and regularly churns the underlying network infrastructure. The dynamic shifting of communications across multiple commercial providers and use of multi-hop transport makes actual user information and origination location and identities a very difficult target for hackers, search engine optimization companies, or other privacy threats.

NetAbstraction allows users to create dedicated networks within the NetAbstraction service infrastructure. NetAbstraction's capabilities and solutions include:

- Internet identity protection – NetAbstraction provides a range of identity management and persona attribution options to alter or reduce your cyber profile.
- Secure virtual private networks – NetAbstraction establishes secure Virtual Private Networks (VPNs) and identity-protected access.
- Distributed communications – NetAbstraction distributes customers' communications activity and data storage across multiple networks.
- Dynamic routing across multiple clouds – NetAbstraction works dynamically within and across multiple clouds simultaneously.
- Enhanced security protections – NetAbstraction's design provides multiple layers of security protections to defend against a variety of threats including malicious software, users, and organization.

The NetAbstraction Overview:



NetAbstraction can be used to conduct privacy protected Internet browsing, implement secure virtual private networks between either individuals or facilities, or establish protected enclaves between customer data centers and commercial clouds. NetAbstraction provides a range of identity (persona) options, choice of globally distributed egress nodes (east coast US, west coast US, Europe, South America, Asia), and control over information held within commercial providers' databases. Users are able to select their preferred connection point whenever they log-in. They also have the option of requesting additional entry points.

While NetAbstraction provides anonymization of a user's Internet activities, it is not recognized by websites as a proxy. (Websites routinely filter for the use of proxies and prohibit anyone using a proxy from access to their sites.) NetAbstraction controls the network routing through its network to abstract user's location and identity via its patented design.

The NetAbstraction service is only available to organizational users, not private individuals. All organizational accounts will be registered, validated, and initiated through Cutting Edge. Users will be given a choice of:

- Using the standard NetAbstraction shared service, which includes:
 - Ability to support real-time collection of audio, video, social media content and large bandwidth file transfers without noticeable degradation;
 - Variable dynamic path between our cloud providers;
 - Selection from our end node access points.
- Establishment of dedicated network elements, which includes:
 - Dedicated end node identity/identities reached via the shared service;
 - Exclusive end-to-end networks for data communications that can be implemented with a variety of options.

While the NetAbstraction shared service maintains logs on the time of log in, egress node accessed, and the amount of bandwidth used, the system was designed to not be able to track a customer's Internet activities.

Security Features

The NetAbstraction service augments the security capabilities of commercial cloud providers by:

- Dynamically shifting the network;
- Rotating and replacing the commercial cloud infrastructure and identities on a frequent basis;
- Implementing independently controlled end-to-end logically separated tunnels for each of our customers;
- Adding an additional layer of virtualization within the commercial cloud providers' infrastructure to provide an independent layer of protection for our servers;
- Implementing software defined network (SDN) virtualization to decouple the logical network from the physical network. Advantages include:
 - SDN allows us to efficiently manage the complexity of establishing and maintaining the network supporting the NetAbstraction service. Our patented design establishes a logical Layer 2 network across the physical infrastructure and the ability to quickly (in real time) shift the network to mitigate any threats.
 - The logical decoupling of virtual servers from the physical network reduces the opportunity to attack resources connected to the network. It also protects the overall network from exploitation by a malicious actor. Because network virtualization decouples the logical network space from the physical, the actual network topology is also hidden from the end-points. Thus attack efforts cannot take advantage of weaknesses of the physical network to further attacks, such as overloading a choke point or evade network security devices.
 - Use of a new tunneling protocol that is misidentified as normal TCP traffic enabling the tunnels to hide, (become lost), within the traffic of the commercial provider networks.

NetAbstraction Interface Options

NetAbstraction works with multiple devices (computers, tablets, and smartphones) and provides a number of ways to connect including: software based Virtual Private Network, a Windows-based browser plugin that

provides protection from malware, and a virtual desktop solution. All of these interfaces provide a non-obtrusive user experience – NetAbstraction is simple to use, it does not require any specialized training or cumbersome steps to initiate Internet access. We also provide custom interfaces and connectivity in response to customer requirements and needs.

PRICING STRUCTURE:

Cloud “infrastructure as a service” is less expensive than traditional providers. NetAbstraction’s shared service offering is a subscription service cost with a basic data usage allowance priced on a per user basis. There is tiered pricing for multiple users, providing larger price breaks as the size of the user group expands.

The subscription cost for one user is \$220 per month for basic data usage, to include video capability. For customers with 20 or more users, we can base the subscription service on a negotiated number of concurrent users.

COMPANY BACKGROUND:

Cutting Edge CA is a network engineering and Internet security consulting firm that was founded in 2012 to provide leading edge, innovative, identity protected access to the Internet and Cyber threat mitigation capabilities. Our management team has over 50 years of combined experience working for the Federal Government, enabling capabilities to support a number of Intelligence Community missions. Our team has been designing, creating, and implementing non-traditional, non-attributable, telecommunications networks for many years. Building from a deep understanding of the current state of the art technologies, we are innovating and providing the next generation of privacy and identity protection capabilities while understanding, first hand, the challenges our customer face when meeting today’s cyber and privacy needs.

Cutting Edge’s flagship offering is NetAbstraction, a cloud-based service that obscures and varies your network pathways across multiple providers, while protecting your identity and your systems. NetAbstraction lowers your cyber attack profile and traceability.

Our differentiators:

- Extensive expertise in designing, creating, and implementing networks to protect the privacy and security of our customer’s communications using physical and software defined networks (SDN)
- Cyber domain expertise with extensive background in targeting and exploiting networks
- Cyber security team with extensive expertise and success in identifying, mitigating, and analyzing cyber threats in customer networks



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