

Blossom: A Perspective Access Network



[Geoffrey Goodell](#). [Perspective Access Networks](#). PhD thesis, Harvard University, July 2006.

[Geoffrey Goodell](#), [Mema Roussopoulos](#), and [Scott Bradner](#). [A Directory Service for Perspective Access Networks](#). Harvard Computer Science Technical Report TR-06-06, February 2006.

[Geoffrey Goodell](#), [Scott Bradner](#), and [Mema Roussopoulos](#). [Building a Coreless Internet Without Ripping Out the Core](#). Proceedings of the Fourth Workshop on Hot Topics in Networks, College Park, MD, November 2005.

[Geoffrey Goodell](#), [Scott Bradner](#), and [Mema Roussopoulos](#). [Blossom: A Decentralized Approach to Overcoming Systemic Internet Fragmentation](#). Harvard Computer Science Technical Report TR-10-05, May 2005.

[Running Blossom](#)

[Screenshots](#)

[Web Interface](#)

[Network Status](#)

[Bibliography](#)

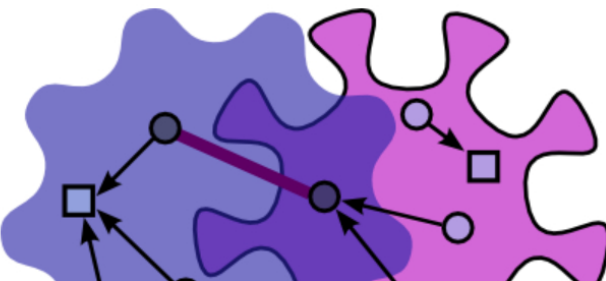
Philosophy

Network fragmentation occurs when the availability of a resource to an observer is a function of how the observer is connected to the network. While fragmentation may be desirable in certain circumstances and for various reasons, it can also be problematic, violating central Internet design principles and rendering routine tasks difficult. In the context of the Internet, network fragmentation is well-known and occurs in many situations, including an increasing preponderance of network address translation, firewalls, and virtual private networks. Recently, however, new threats to Internet consistency have received media attention. Alternative namespaces have emerged as the result of formal objections to the process by which Internet names and addresses are provisioned. In addition, various governments and service providers around the world have deployed network technology that (accidentally or intentionally) restricts access to certain Internet content. Combined with the aforementioned sources of fragmentation, these new concerns provide compelling motivation for a network that allows users the ability to specify not only the network location of Internet resources they want to view but also the perspectives from which they want to view them.

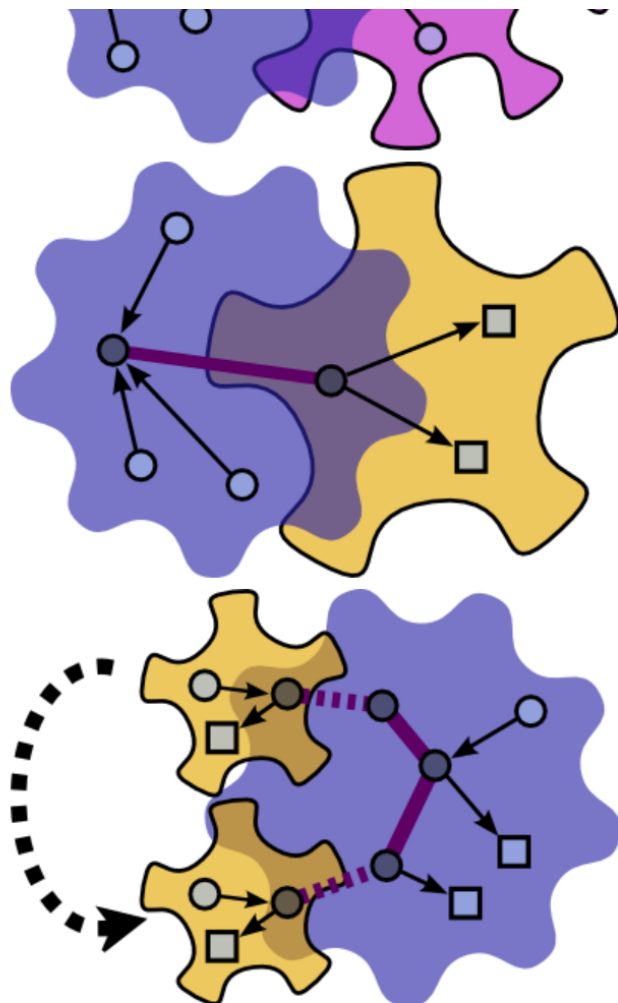
The philosophy underlying the Blossom architecture is that access to Internet resources should be a function of **WHO USERS ARE** rather than **HOW USERS ARE CONNECTED**. Ultimately, systems that seek to provide end-to-end connectivity will have to accept that unwelcome, perfunctory network filtering is here to stay. Rather than provide an architecture for implementing new Internet services, Blossom allows access to existing resources. In addition, Blossom does not require changes to client or server applications.

The Blossom software uses [Tor](#) for constructing circuits and transporting data. Blossom uses an alternate network discovery algorithm and its own directory servers. Unlike Tor directory servers, Blossom directory servers perform routing, using a policy-enhanced path-vector protocol. Both Blossom networks and Tor networks consist of interconnected proxies, but where Tor chooses to optimize for anonymity, Blossom chooses to optimize for reachability instead. So, Blossom affords users the ability to specify the perspective from which they want to view the Internet by sacrificing many of the stronger anonymity benefits of Tor. For example, unlike the Tor network, the Blossom network allows overlay topologies that are not fully-connected.

Design Objectives



Locality: Multiple services with the same name may coexist within different local namespaces. (Meaningful names within a local space.)



Access Through Obstructions: If two hosts can both access forwarders within the same forwarding infrastructure, then those two hosts can use the infrastructure to communicate. (Circumvent technical barriers.)

Distributed Management: Adding a network and its abundance of resources to the system need not require specific allocation of names, addresses, or routing from centralized authorities.

Implementation

Our implementation of Blossom uses the onion routing network [Tor](#) as a substrate and consists of the following components:

- [Blossom itself](#), written in Python.
- A comprehensive web page providing the [status of nodes in the Blossom Network](#), including the address, capacity, operating system, and exit policy of each Blossom forwarder. [We also have a web page providing the [status of nodes in the Tor Network](#).]
- [edgeproxy](#), an HTTP proxy that provides a very basic Blossom functionality to web browsers; this daemon relays traffic between a web browser and another proxy such as [Privoxy](#).
- The [Blossom User Interface](#), which provides an intuitive way to view web pages from the perspective of specified nodes in the Tor network.

We also have some [experimental results](#).

\$Id: index.html,v 1.58 2006-08-17 03:51:24 goodell Exp \$

