

GNET - A fully anonymous distributed networking infrastructure

by

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by

— not disclosed due to DMCA —

User Experience

- search for “mp3” AND “Metallica” AND “DMCA”
- *GNet* returns list of files with description
- user selects interesting file
- *GNet* returns the file

Applications

- anonymous sharing of medical histories
- distributed backups of important data
- ad-hoc communication between small devices

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- distributed backups of important data
- ad-hoc communication between small devices
- and others

Requirements

- Anonymity
- Confidentiality
- Deniability

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- Anonymity
- Confidentiality
- Deniability
- Accountability
- Efficiency

Related Work (1/2)

- Napster:
 - ★ centralized, outlawed
 - ★ no confidentiality or anonymity
 - ★ no authentication
- GNutella:
 - ★ distributed (breadth first), legally challenged
 - ★ no confidentiality or anonymity
 - ★ no authentication, no accounting

Related Work (2/2)

- Freenet:
 - ★ distributed (depth first)
 - ★ anonymity, confidentiality and deniability
 - ★ no accountability
 - ★ can not handle large files
- Mojo Nation:
 - ★ centralized
 - ★ no confidentiality or anonymity
 - ★ accounting (micro payments)

The GNet Framework

GNet is layered:

1. UDP

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The Networking Layer

GNet's networking layer provides:

- authentication \Rightarrow accountability
- confidentiality
- routing of queries and content
- host evaluation based on earlier behavior

The Application Layer

Currently, the only application implemented is *GProxy*.
GProxy provides:

- content encoding and decoding
- query encoding
- user interface

GProxy communicates with the networking layer via TCP (loopback).

How does it look like?



Java!?

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- *GNet*'s authors did realize that a JVM is too big for a server process.
- The networking layer is written in C.

Focus: Content encryption

- intermediaries can not find out the content transmitted or be plausibly be expected to
- intermediaries can not find out the content of queries
- hosts can deny being originator of a query as long as not all other hosts conspire
- retrieve content with simple keyword
- keep storage requirements minimal

Encoding Content

- split content into 1k blocks B (UDP packet size!)
- compute $H(B)$ and $H(H(B))$
- encrypt B with $H(B)$, with Blowfish
- store under $H(H(B))$
- build inner blocks containing $H(B)$
- root node R contains description

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this is intended to reduce storage costs!

System Requirements

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- Java JDK 1.3 for GProxy.
- OpenSSL for encryption
- gcc, autoconf, automake for compilation
- libz (CRC32), pthreads

What do I download?

First, you need the sources:

<http://gecko.cs.purdue.edu/gnet/download.php3>

In addition to this, you need an initial set of hosts. You can find their keys under:

<http://gecko.cs.purdue.edu/gnet/hosts/>

It is usually a good idea to download as many hostkeys as possible.

How to install?

```
# tar xvfz gnet-VERSION.tar.gz
# cd gnet-VERSION
# bin/build.sh /tmp
# cp gnet.conf ~/.gnet
# /tmp/bin/gnet &
# cd ../hosts
# cp * ~/.gnet_/data/hosts
# /tmp/bin/gproxy &
# sleep 60
```

Search for “Microsoft” to test.

How to insert content?

```
# /tmp/bin/insertfile FILENAME KEYWORD DESCR
```

Repeat for multiple keywords. If you want to share files that you are still using in plaintext on your drive, *GNet* will allow in the next version to share directly from the drive.

Is that safe?

Short answer: NO. Long answer:

- This is new software. There will be bugs and important features are missing.
- The TCP port 2086 (default) should be firewalled as the node “trusts” that connection.
- If nobody *guesses* your keywords, nobody will be able to know what you asked for or what you got.

GNet resources

- FAQ
- Mailinglist
- Mantis
- README
- Sources
- WWW page

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- *GNet* needs your help, participate!

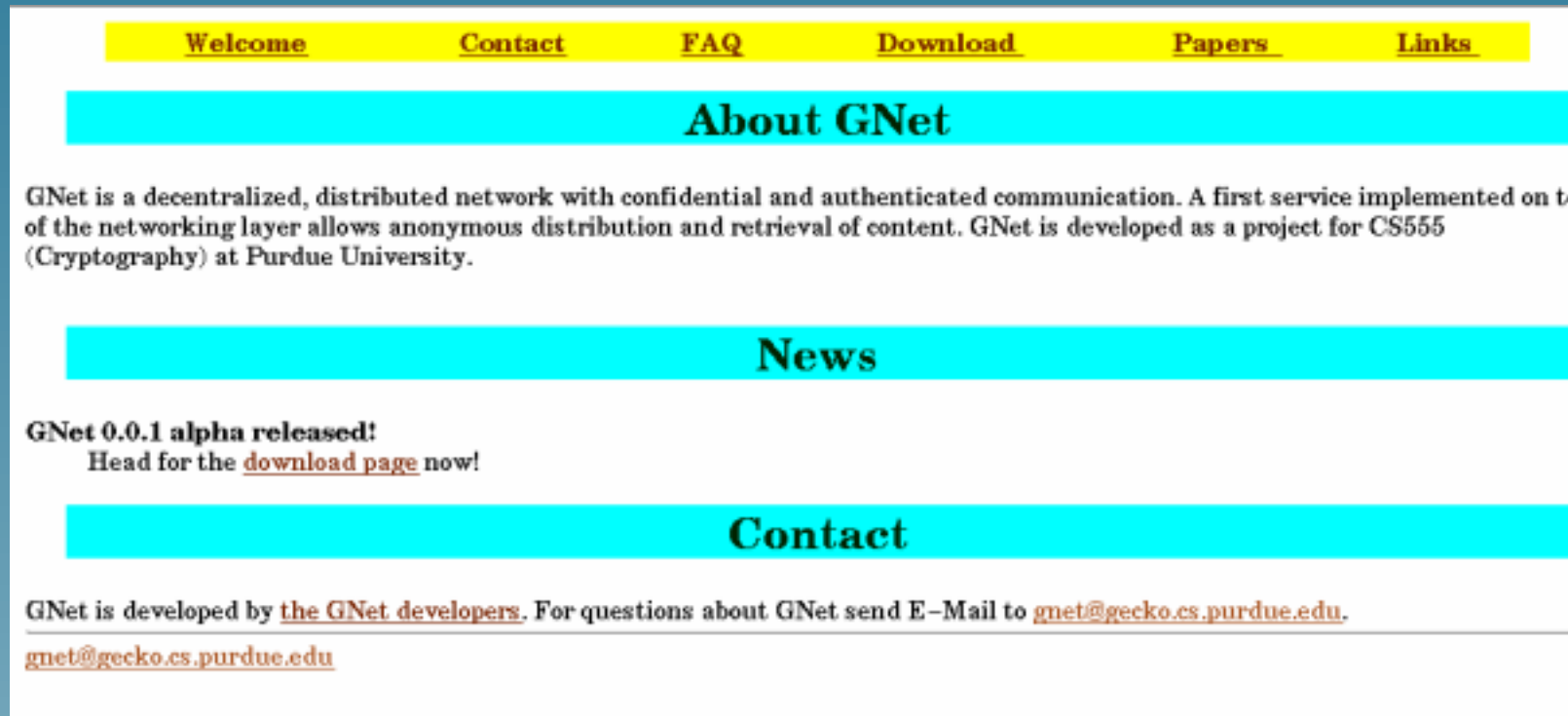
Conclusion

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- *GNet* can already be used.
- *GNet* can get alot better.
- *GNet* needs your help, participate!
- *Linux* rules.

GNET Online

GNET can be obtained from our web-page:

<http://gecko.cs.purdue.edu/gnet/>



The screenshot shows the GNET Online website with a yellow navigation bar at the top containing links: [Welcome](#), [Contact](#), [FAQ](#), [Download](#), [Papers](#), and [Links](#). Below this is a cyan header for the 'About GNet' section. The main text describes GNet as a decentralized, distributed network with confidential and authenticated communication, implemented on top of the networking layer for anonymous distribution and retrieval of content. It is developed as a project for CS555 (Cryptography) at Purdue University. A second cyan header introduces the 'News' section, which features the announcement 'GNet 0.0.1 alpha released!' and directs users to the [download page](#). A third cyan header introduces the 'Contact' section, which states that GNet is developed by [the GNet developers](#) and provides the email gnet@gecko.cs.purdue.edu for questions.

[Welcome](#) [Contact](#) [FAQ](#) [Download](#) [Papers](#) [Links](#)

About GNet

GNet is a decentralized, distributed network with confidential and authenticated communication. A first service implemented on top of the networking layer allows anonymous distribution and retrieval of content. GNet is developed as a project for CS555 (Cryptography) at Purdue University.

News

GNet 0.0.1 alpha released!
Head for the [download page](#) now!

Contact

GNet is developed by [the GNet developers](#). For questions about GNet send E-Mail to gnet@gecko.cs.purdue.edu.

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Famous last words...

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RTFM