n2n - Peer 2 Peer VPN

ntopConf'22

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Thanks

$company

What is it?

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- NAT Piercing

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- "Distributed Ethernet Switch"
- Userspace tuntap
- Low resource requirements

Basic Concepts

Supernodes

- Public IP Address
- Central Coordination Point
- Can implement some Access Control
- Last-resort packet forwarding

Communities

- Form a virtual Ethernet Segment
- Packets are protected by a shared key

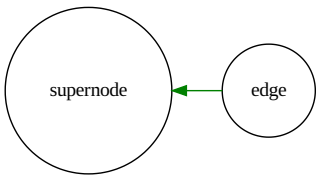
IP Addresses

- An address can be allocated by Supernode
- Static addresses are available
- Can even allocate via a DHCP server

Connection Lifecycles

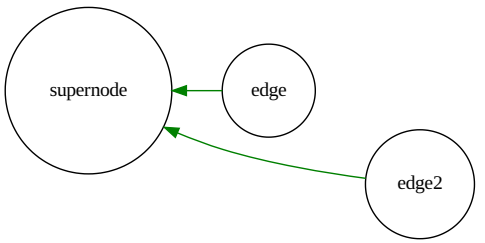
Connection Lifecycles

Each edge connects to a supernode



Connection Lifecycles

Extra edges join, and will try to find each other



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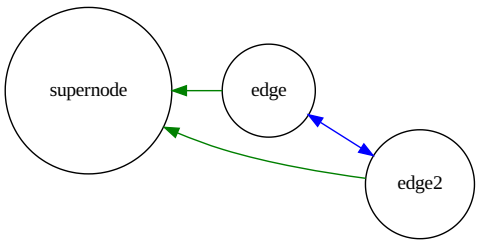

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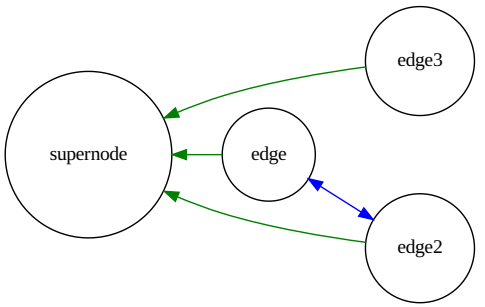

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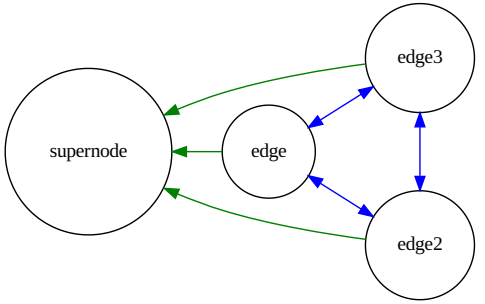
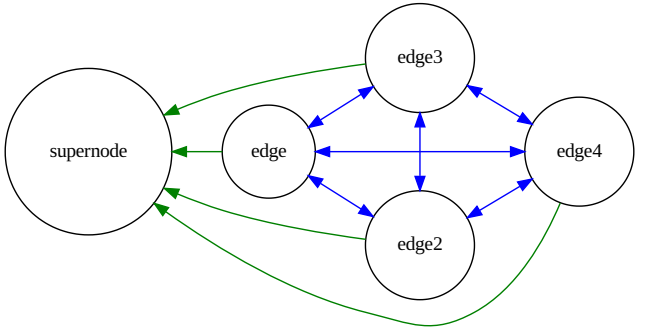


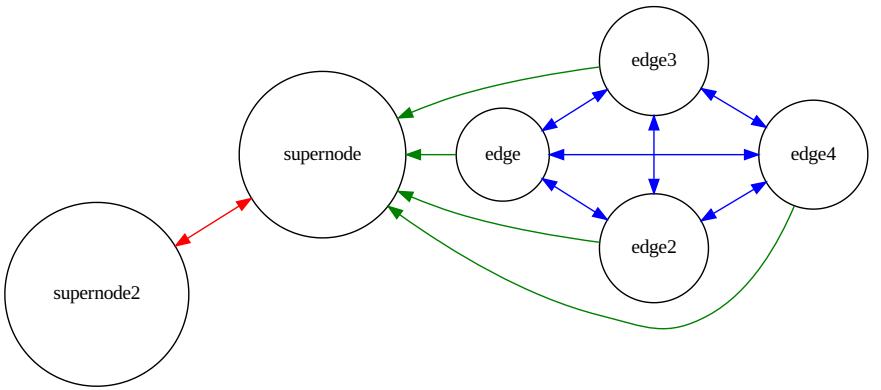
Connection Lifecycles

Ideally, all edges can form a full mesh



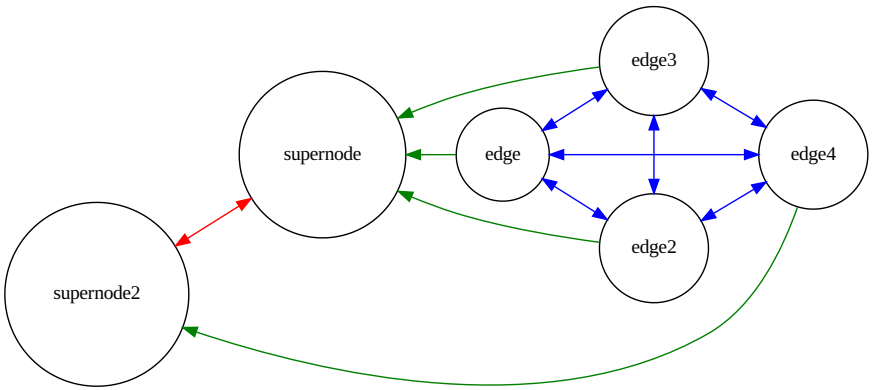
Connection Lifecycles

Extra supernodes can form a "Federation"



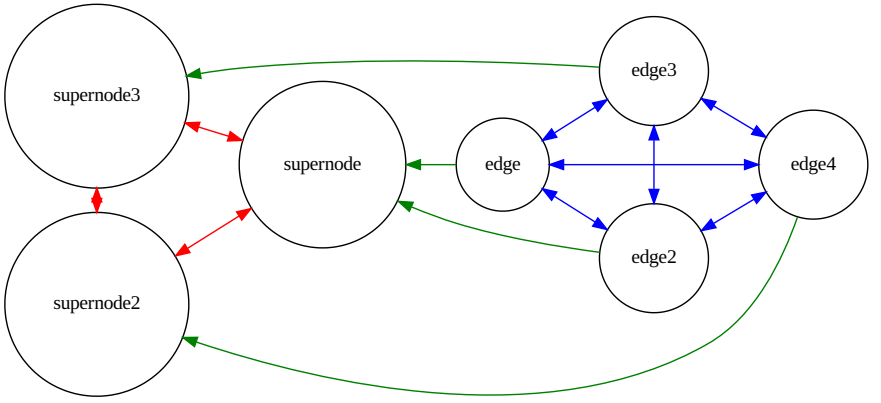
Connection Lifecycles

Edges will rebalance



Connection Lifecycles

Supernodes forward edge details



New in 3.0

Federation

- Allows extra Supernodes to be added
- Balance the Edge nodes
  - by Load
  - by Round Trip Time

JSON API

- an RPC interface to the running daemon
- Allows future extensions
- Monitoring / Statistics
- Debugging your setup

Automation / Releases

Github Action based CI

- Basic unit tests
- Linting
- Binaries and Packages

Multicast

- Send Multicast discovery packets
- Neighbour Edge nodes reply
- Send VPN data packets directly

(Supernode still needed for control plane)

Usernames, Communities and Authentication

- Supernodes default to allow all communities
- They can be restricted to a community list
- Restictions enables full header encryption
- user/password based auth also available

TCP and Filtering

- Default is to use UDP for all connections
- TCP-only as option for edge-supernode traffic
- The TAP interface default accepts all traffic
- TAP-traffic may have filter rules applied

Future plans

Near future plans

- Remove old human only management
- More JSON APIs and scripts/tools
- Move non-core functionality to helpers
- UPNP/PMP

On the Horizon

- Merge the Edge and Supernode
- Better NAT punching
- layered nat 'zone' discovery
- self-arranging tree of supernodes
- Better packaging
- More packages
- More automated test tools

Tell us your use case!

Questions?

- github project:
  - https://github.com/ntop/n2n

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