

# Internet and Netsukuku

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## Abstract

Netsukuku is completely independent from the Internet. However, a good level of integration between the two networks must be preserved. In this document, we present the techniques that allow Netsukuku to be compatible with the standard Internet. Moreover, we show how it is possible to use virtual Internet tunnels to temporarily replace missing physical links.

## 1 Internet compatibility

Even if Netsukuku has the potential to be a full substitute of the Internet, it must remain compatible with it for several reasons:

1. During the transition phase, the Internet will play a key role for the distribution of Netsukuku.
2. Internet virtual tunnels will be used to temporarily replace missing physical links between nodes or entire gnodes.
3. The Internet will continue to be active and many people will rely on it. One optimistic perspective is that Netsukuku will take its current place, and the Internet will become more and more a commercial network, f.e. a huge interactive network-TV.

There are two techniques which ensure the Internet compatibility. The first restricts the IP assigned to the Netsukuku network to a large private class. The second is a Linux hack which permits Netsukuku to utilise the complete set of IPs.

Currently only the first has been implemented, however, when the second will replace it.

### 1.1 IP restriction

Netsukuku, in the Internet compatibility mode, is restricted to a subclass of ip, so that it doesn't interfere with the public classes of the Internet. We use the private class A (10.0.0.0) for the ipv4 and the Site-Local class for the ipv6. The other private classes are not influenced, to let the user create a LAN with just one gw/node Netsukuku.

You can read more information about the Netsukuku restricted mode, in the NTK.RFC 008 [5].

## 1.2 Net split

Net Split is a method, which gives Netsukuku the ability to use all the IP addresses available for a specific Internet Protocol while being compatible with it.

In other words, Netsukuku can use all the ipv4 addresses while avoiding any IP conflict with the Internet.

For more information about this method, read Net Split [6].

## 2 Internet sharing

If the nodes are in restricted mode, they can share their Internet connection. Netsukuku will distribute efficiently the shared connections among the nodes, in this way every node will automatically know its nearest Internet gateway.

For more information read IGS[4].

### 2.1 Distributed Internet connections

Netsukuku supports a routing method called "multi inet gateway". A node  $n$  can connect to the Internet using, at the same time, multiple nodes which are sharing their connection.

For example, if there are 5 nodes which share their 640Kb/s connections, the node  $n$  will be able to use 5 parallel downloads at 640Kb/s.

Furthermore, even the nodes which share their connections are able to use the Internet connections shared by the other nodes. In this way, a node donates its bandwidth but, at the same time, it receives donations from other users.

For more information read IGS[4].

## 3 Virtual to Physical Layer Mapper

Viphilama stands for Virtual to Physical Layer Mapper.

The basic idea of Viphilama is to connect, with Internet tunnels, nodes which aren't physically linked. Then whenever, Viphilama finds that a virtual link can be replaced by a physical one, it removes the virtual link.

Viphilama will permit to Netsukuku to expand itself over the Internet and then switch automatically to the physical layer without interfering with the stability of the Net.

Viphilama transforms Netsukuku into a hybrid overlay network which expands the original structure of the Internet. Its main advantages are:

1. the faster diffusion of Netsukuku: every user with an Internet connection can join Netsukuku
2. the creation of a scalable network which is built upon the Internet but is completely separated from it.
3. the automatic switch from the Netsukuku overlay network to the physical one
4. the freely registration of domain names (see ANDNA[7]).

5. the usage of Carciofo [8] over the Internet.
6. the workaround of NAT restrictions: even with only one Internet connection it is possible to connect an entire LAN to Viphilama. Inside Viphilama, every node of the LAN will get an unique IP, therefore the NAT restriction imposed by the ISP (if you want more IPs you have to pay) is ignored.

## References

- [1] Netsukuku website: <http://netsukuku.freaknet.org/>
- [2] Netsukuku topology document: [topology.pdf](#)
- [3] Viphilama NTK\_RFC: [Viphilama](#)
- [4] IGS NTK\_RFC: [IGS](#)
- [5] NTK\_RFC 008: [Restricted ip classes](#)
- [6] Net Split NTK\_RFC: [Net split](#)
- [7] ANDNA document: [andna.pdf](#)
- [8] Carciofo NTK\_RFC: [Carciofo](#)

