Netsukuku

Close the world, txen ent neqO

http://netsukuku.freaknet.org

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Abstract

Netsukuku is a P2P network system designed to handle a large number of nodes with minimal CPU and memory resources. It can be easily used to build a worldwide distributed, anonymous and not controlled network, separated from the Internet, without the support of any servers, ISPs or authority controls.

In this document, we give a generic and non technical description of the Netsukuku network, emphasizing its main ideas and features.

1 The old wired

The Internet is a hierarchic network managed by multinational companies and organisations supported by governments. Each bit of Internet traffic passes through proprietary backbones and routers.

The Internet Service Providers give the connectivity to all the users, who are in the lowest rank of this hierarchic pyramid. For this reason, the Internet is not a global network created by the users and shared between them. The people can join the Net only in accordance with the restrictive conditions and terms imposed by the Majors.

The Internet represents, today, the means to access information, knowledge and communication. About 1 billion of people can connect to this great proprietary network, but the remaining 5 billion of people, which don't have enough economic resource, are still waiting the multinationals to supply a service within their reach.

The Internet was born with the intent of warranting a secure and unattackable communication between the various nodes of the network, but now, paradoxically, an ISP has the power to cut out of the Internet entire nations by simply stopping to give its services.

Beside that, Internet is not anonymous: the ISP can trace back and analyse the traffic of data going through their servers, without any limits.

The centralised and hierarchical structure of the Internet creates, as a consequence, other identical systems, based on it, i.e. the DNS. The servers of the Domain Name System are managed by different ISPs, as well and the domains are literally sold through a similar centralised system. This kind of structures allows, in a very simple and efficient way, to physically localise any computers, which are connected to the Internet, in a very short time and without any particular efforts.

In China, the whole net is constantly watched by several computers filtering the Internet traffic: a Chinese will never be able to see or came to know about a site containing some keywords, such as "democracy", censored by the government. He'll never be able to express his own ideas on the net, e.g. about his government's policy, without risking till the death penalty.

Internet was born to satisfy the military needs of security for the administration of the American defence, not to ensure freedom of communication and information: in order to communicate between each other the Internet users are obliged to submit themselves to the control and to the support of big multinationals, whose only aim is to expand their own hegemony.

As long as all the efforts to bring more freedom, privacy and accessibility in the Internet face aversions, fears, contrary interests of governments and private companies, the very alternative solution to this problem is to let the users migrate toward a distributed, decentralised and fully efficient net, in which all the users interact at the same level, with no privilege and no conditioning means, as authentic citizens of a free world wide community.

2 The Netsukuku wired

Netsukuku is a mesh network or a p2p net system that generates and sustains itself autonomously. It is designed to handle an unlimited number of nodes with minimal CPU and memory resources. Thanks to this feature it can be easily used to build a worldwide distributed, anonymous and not controlled network, separated from the Internet, without the support of any servers, ISPs or control authorities.

This net is composed by computers linked physically each other, therefore it isn't build upon any existing network. Netsukuku builds only the routes which connects all the computers of the net.

In other words, Netsukuku replaces the level 3 of the model iso/osi with another routing protocol.

Being Netsukuku a distributed and decentralised net, it is possible to implement real distributed systems on it, e.g. the Abnormal Netsukuku Domain Name Anarchy (ANDNA)[4] which will replace the actual hierarchic and centralised system of DNS.

2.1 Gandhi

The main characteristic of Netsukuku is its self-management: the network dynamically configures itself without any external interventions. All the nodes share the same privileges and limitations, giving their contribution to sustain and expand Netsukuku. The more the nodes increase in number the more the net grows and becomes efficient.

The total decentralisation and distribution allows Netsukuku to be neither controlled nor destroyed: the only way to manipulate or demolish it, is to knock physically down each single node composing the network.

2.2   No name, no identity

Inside Netsukuku everyone, in any place, at any moment, can hook immediately to the net without coming trough any bureaucratic or legal compliance.

Every elements of the net is extremely dynamic and it's never the same. The IP address identifying a computer is chosen randomly, therefore it's extremely difficult to associate it to a particular physical place; furthermore since the routes are composed by a huge number of nodes, it becomes a titanic task to trace a specific node.
The traffic of the nodes is protected by a complete cryptographic layer[5], which ensures a strong anonymity and security.

2.3   So, what is it?

Netsukuku is a mesh network built on top of its own dynamic routing protocol.
Currently there are a wide number of dynamic routing protocols, but they are solely utilised to create small and medium nets. The routers of Internet are also managed by different protocols such as the OSPF, the RIP, or the BGP. They are based on different classical graph algorithms, which are able to find out the best path to reach a node in a given graph. However, all these protocols require a very high waste of CPU and memory. Indeed, the Internet routers are computers specifically dedicated to the executions of these algorithms. It would be impossible to implement one of these protocols to create a maintain a mesh network large as the whole Internet.
The Netsukuku protocol structures the entire net as a fractal[3] and, in order to calculate all the needed routes it makes use of a particular algorithm called Quantum Shortest Path Netsukuku (QSPN)[2].
A fractal is a structure which can be compressed infinitely, because every part of itself is composed by the same fractal. Thus its high compression level gives the ability to store the whole Netsukuku map in just few Kilobytes.
On the other hand, the QSPN is an algorithm that has to be executed by the network itself. The nodes, in order to execute it, have just to send and receive the Tracer Packets, without using heavy computational resources.

2.4   Netsukuku the wireless

The best medium to establish physical connections between nodes is the wifi. When Netsukuku will be widely adopted, its users will have just to set up their own wifi antennas on a well exposed place (i.e. windows or roofs), linking themselves to the other Netsukuku users, placed within their radio ranges. Nowadays, there is a great variety of wifi technologies which allow to link two nodes distant kilometres each other. A whole city can be easily covered by placing just one node in each neighbourhood.
Moreover, it is possible to use virtual tunnels over the Internet to temporarily replace missing physical links. This subject is described in [6].

References

[1] Netsukuku website: http://netsukuku.freaknet.org/

[2] QSPN document: qspn.pdf

[3] Netsukuku topology document: topology.pdf

[4] ANDNA document: andna.pdf

[5] Carciofo NTK_RFC: Carciofo

[6] Internet and Netsukuku: inetntk.pdf

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