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DSL and satellite links aggregation

The purpose of this document is to explain how to aggregate a DSL link (low latency, low bandwidth) with a satellite link (high latency, high bandwidth) to get the best parts of both solutions. Actually it's not a real "aggregation" method but it's rather a manual balancing depending on outgoing traffic.

Context

Living far away from the city and thus far away from a DSLAM, the DSL link I'm connected to doesn't allow decent bandwidth (**1.5 Mbits/768 Kbits**) but the latency is fine (~ **30ms**). Current satellite internet rate plans can reach **20 Mbits/6 Mbits** with a round latency of **700ms**.

Why more bandwidth ?

- Having several computers or devices is painful in case of software upgrades (occur pretty often)
- Overall bandwidth is crawled when a computer/device is downloading
- Sending files takes millions of years (remote backups, emails, etc)
- VOD with some TV related devices require a lot of bandwidth (> 5Mbits)

Why keeping a DSL link ?

- Online gaming (MMORPG, FPS) needs a low latency
- Vital network services (like DNS) run smoothly with a low latency. Performing DNS resolution with a DSL link should improve matters
- Interactive services such as SSH and VPN can turn you mad with a too high latency but work great with a DSL link

Having 2 links allow to use failover in case one link is failing.

Cons

- Price is high (one DSL and one satellite subscription)
- Setting a parabola up is painful

Used software

To achieve this we use [ZeroShell](#). It has tons of functionalities and especially handles multi WAN interfaces (with load balancing, failover and manual balancing). It's based on Linux and runs on many devices (PCs, Alix/Soekris boards, etc). Although it's live CD based profiles and parameters can be saved on hard drive, usb devices, CF/SD cards, etc. Specific hardware images are also available for download. A recent linux distro can do the job but you need to be familiar with advanced iptables configuration, routing, traffic classification, etc. ZeroShell makes life easier.

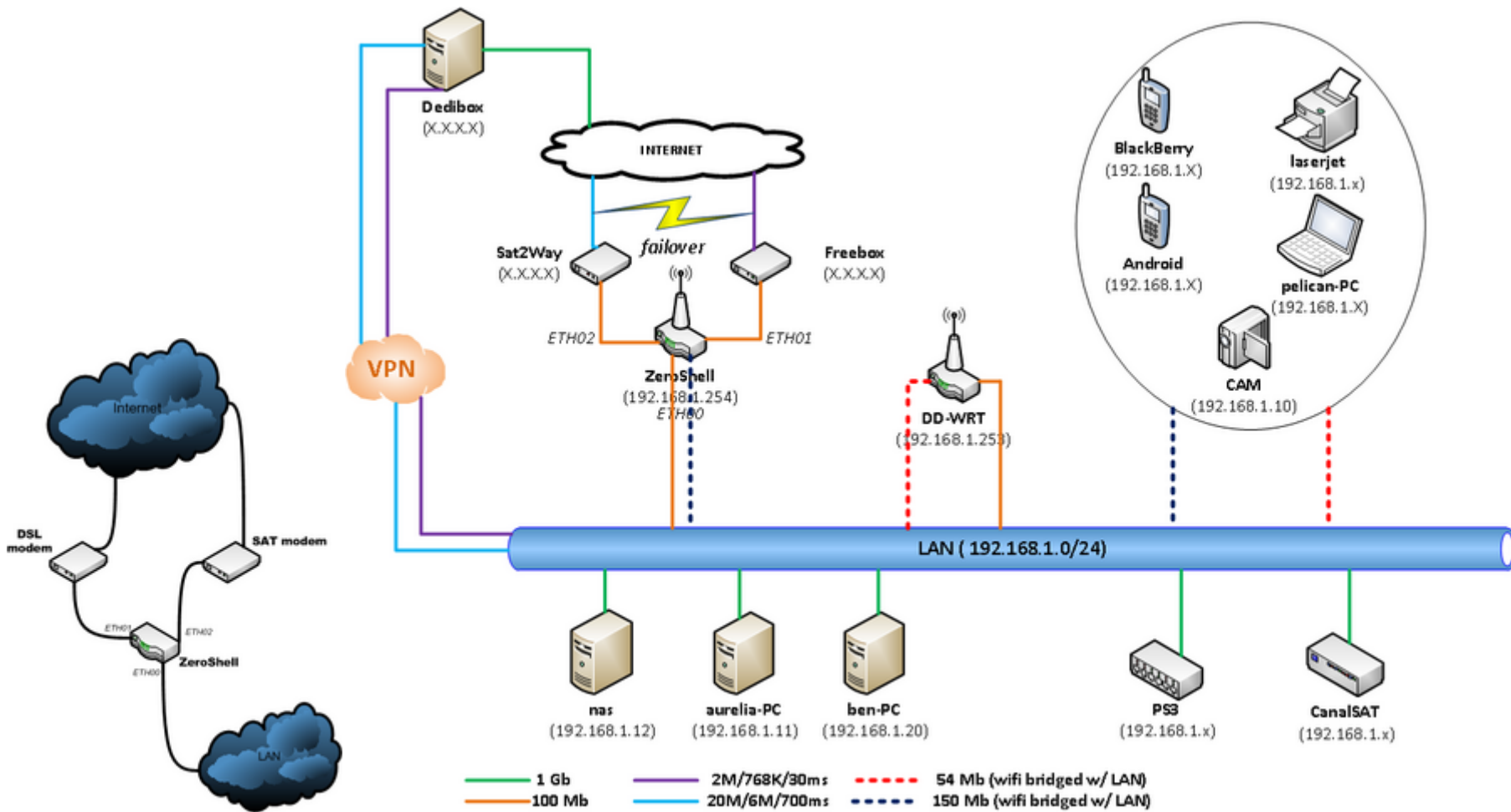
A Web GUI is available to perform all tasks (except Wireless). A console or SSH access is available anyway.

Used hardware

- [Alix boards 2D3](#) with 3 LAN interfaces and 1 mini PCI wireless adapter
- 1 dsl modem (acting as a bridge and providing a WAN ip, let's say WAN_IP1 for later use)
- 1 satellite modem (acting as a bridge and providing a WAN ip, let's say WAN_IP2 for later use)
- At least one switch to connect the router to the LAN

⇒ ZeroShell supports PPPoE, 3G modems, etc

Architecture design



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