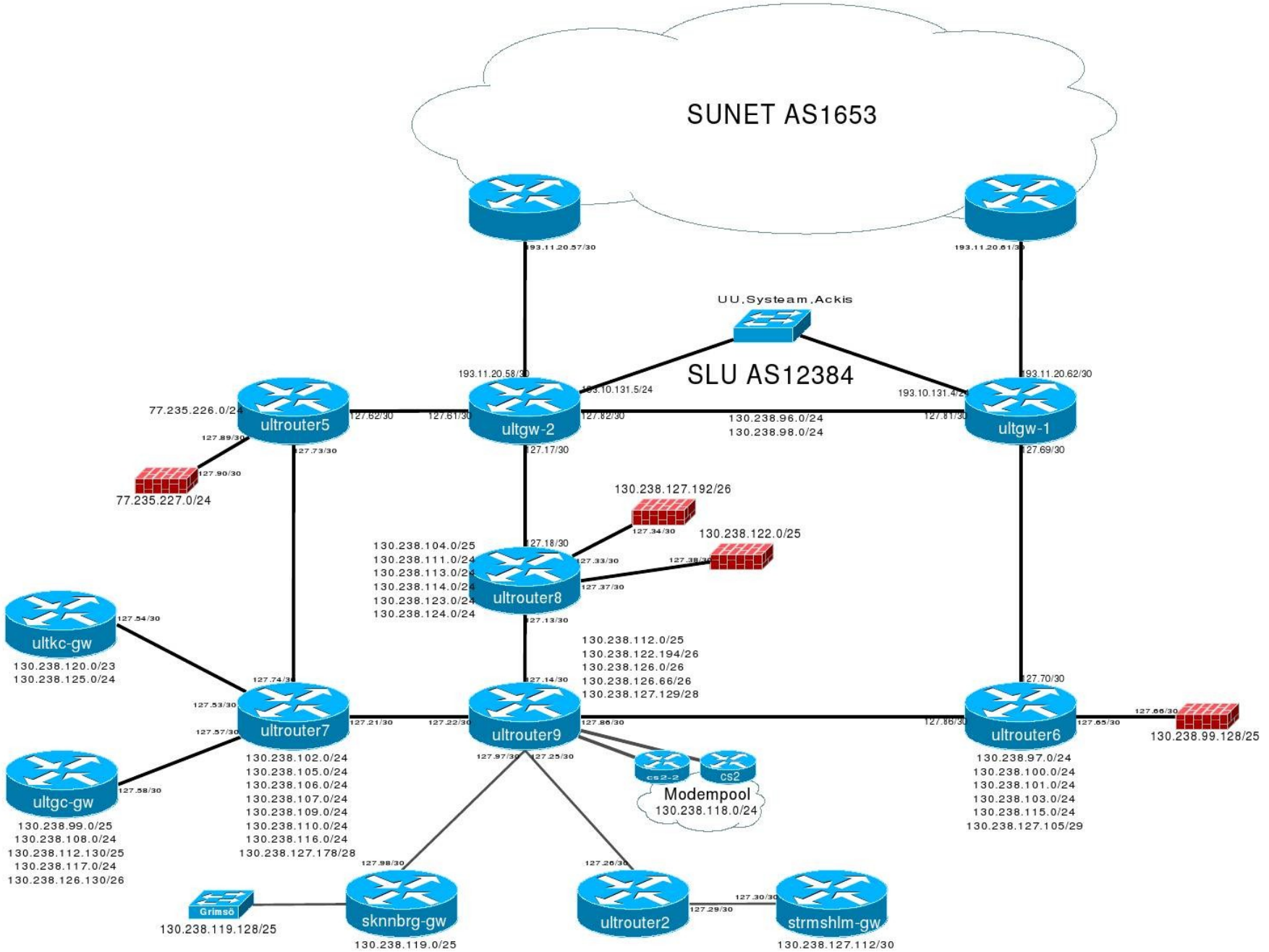
A Campus Design Example
Agricultural University
IP design - 2001

Supported protocols – IPV4, IPV6

Intranet – No

Internal is modeled after Internet which scales.


SUNET AS1653
193.11.20.57/30
193.11.20.61/30
UU,Systeam,Ackis
SLU AS12384
193.11.20.58/30
193.10.131.5/24
193.10.131.4/24
193.11.20.62/30
77.235.226.0/24
ultrouter5
127.62/30
127.61/30
ultgw-2
127.82/30
130.238.96.0/24
130.238.98.0/24
127.81/30
ultgw-1
127.89/30
127.73/30
127.17/30
127.69/30
127.90/30
77.235.227.0/24
130.238.127.192/26
127.34/30
130.238.122.0/25
127.38/30
130.238.104.0/25
130.238.111.0/24
130.238.113.0/24
130.238.114.0/24
130.238.123.0/24
130.238.124.0/24
127.18/30
ultrouter8
127.33/30
127.37/30
127.13/30
130.238.112.0/25
130.238.122.194/26
130.238.126.0/26
130.238.126.66/26
130.238.127.129/28
127.54/30
ultkc-gw
130.238.120.0/23
130.238.125.0/24
127.74/30
127.14/30
127.70/30
127.53/30
127.57/30
ultrouter7
127.21/30
127.22/30
ultrouter9
127.86/30
127.85/30
ultrouter6
127.65/30
127.66/30
130.238.99.128/25
130.238.102.0/24
130.238.105.0/24
130.238.106.0/24
130.238.107.0/24
130.238.109.0/24
130.238.110.0/24
130.238.116.0/24
130.238.127.178/28
130.238.97.0/24
130.238.100.0/24
130.238.101.0/24
130.238.103.0/24
130.238.115.0/24
130.238.127.105/29
127.58/30
ultgc-gw
130.238.99.0/25
130.238.108.0/24
130.238.112.130/25
130.238.117.0/24
130.238.126.130/26
127.97/30
127.25/30
cs2-2
cs2
Modempool
130.238.118.0/24
127.98/30
127.26/30
Grimsö
130.238.119.128/25
sknnbrg-gw
130.238.119.0/25
ultrouter2
127.29/30
127.30/30
strmshlm-gw
130.238.127.112/30

Clean API

Who owns what and who is responsible

Topology

Simple, easy to maintain even in daytime, redundant if possible

Economy

Expand when there is need or a good opportunity

Standard

Design based on standards. Benefit from market competion. Avoid propitary solutions. Make this more than words

Routing.

- BGP4 peering with ISP's
- OSPFV2 internal
- Router discovery with servers, hosts
- OSPFV3 (IPv6)

Strategi

- IP-numbers, AS-numbers
- Address map
- LIR?

Net security

- Distributed. Only few central filters

Local peering

With other University and companies.

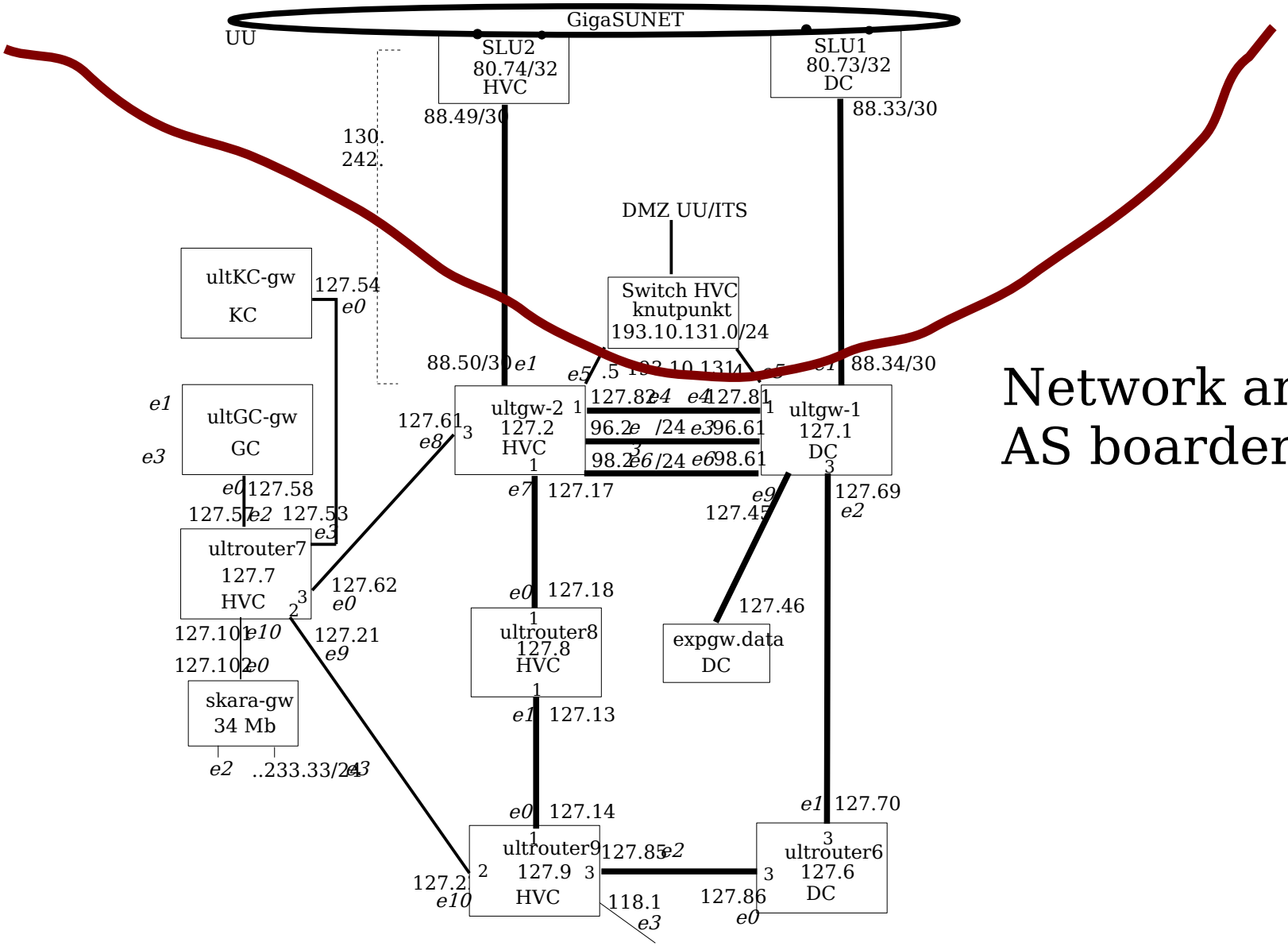
Local cooperation.

Host. Moving all towards DHCP

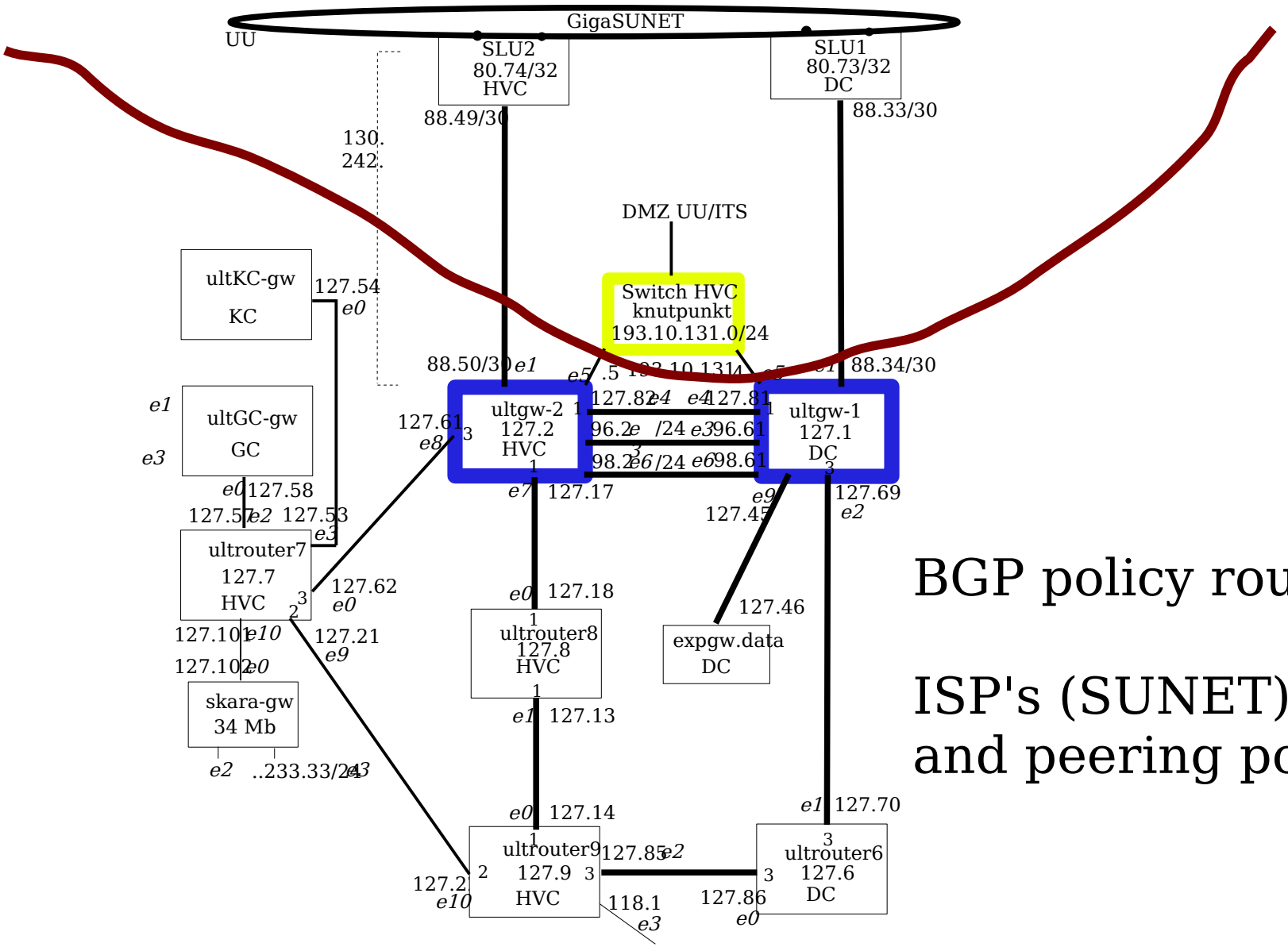
Collaboration,

Own planning, own staff is running the network

Own competence – No consultants

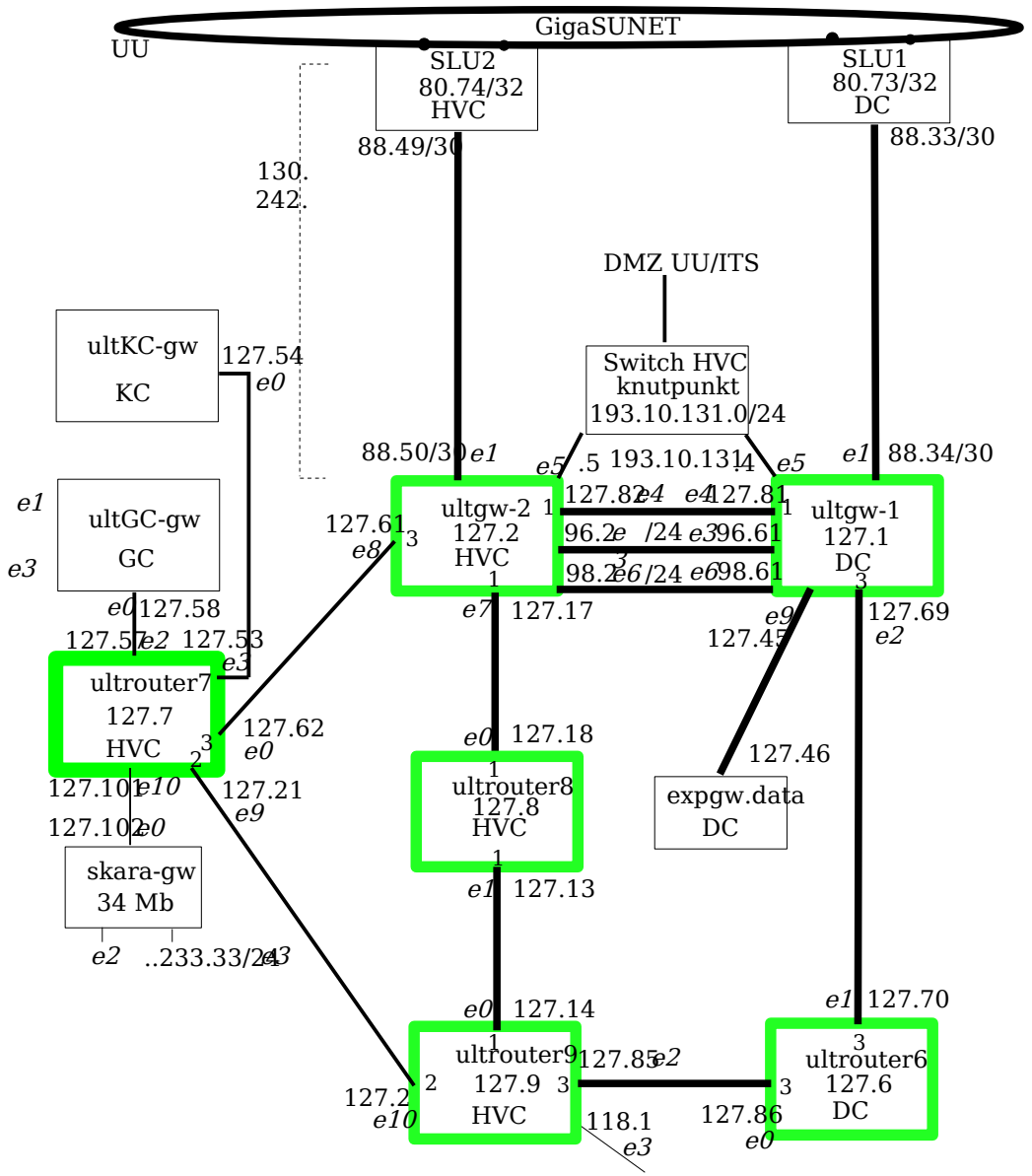


Network and AS boarder

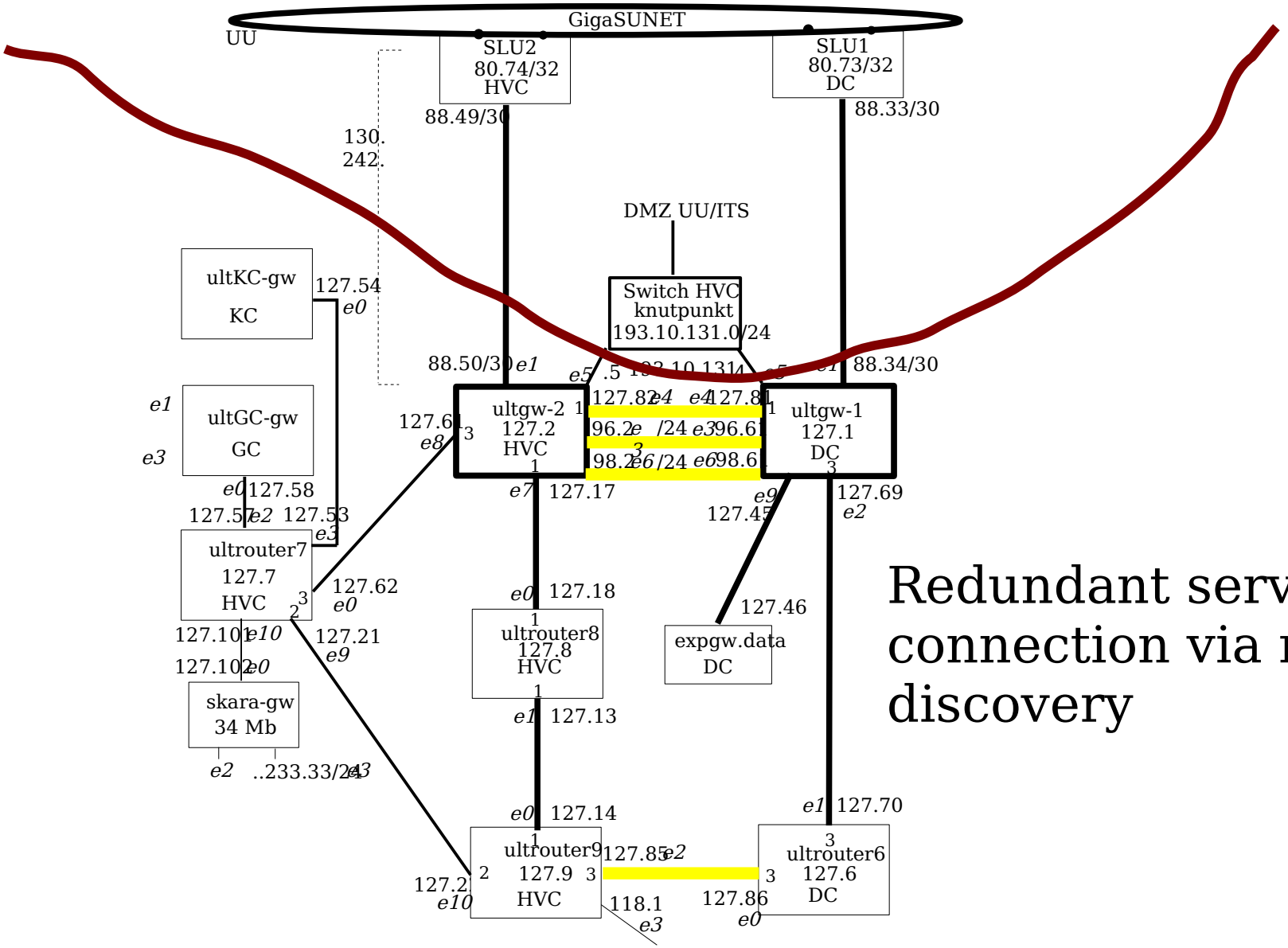


BGP policy routing

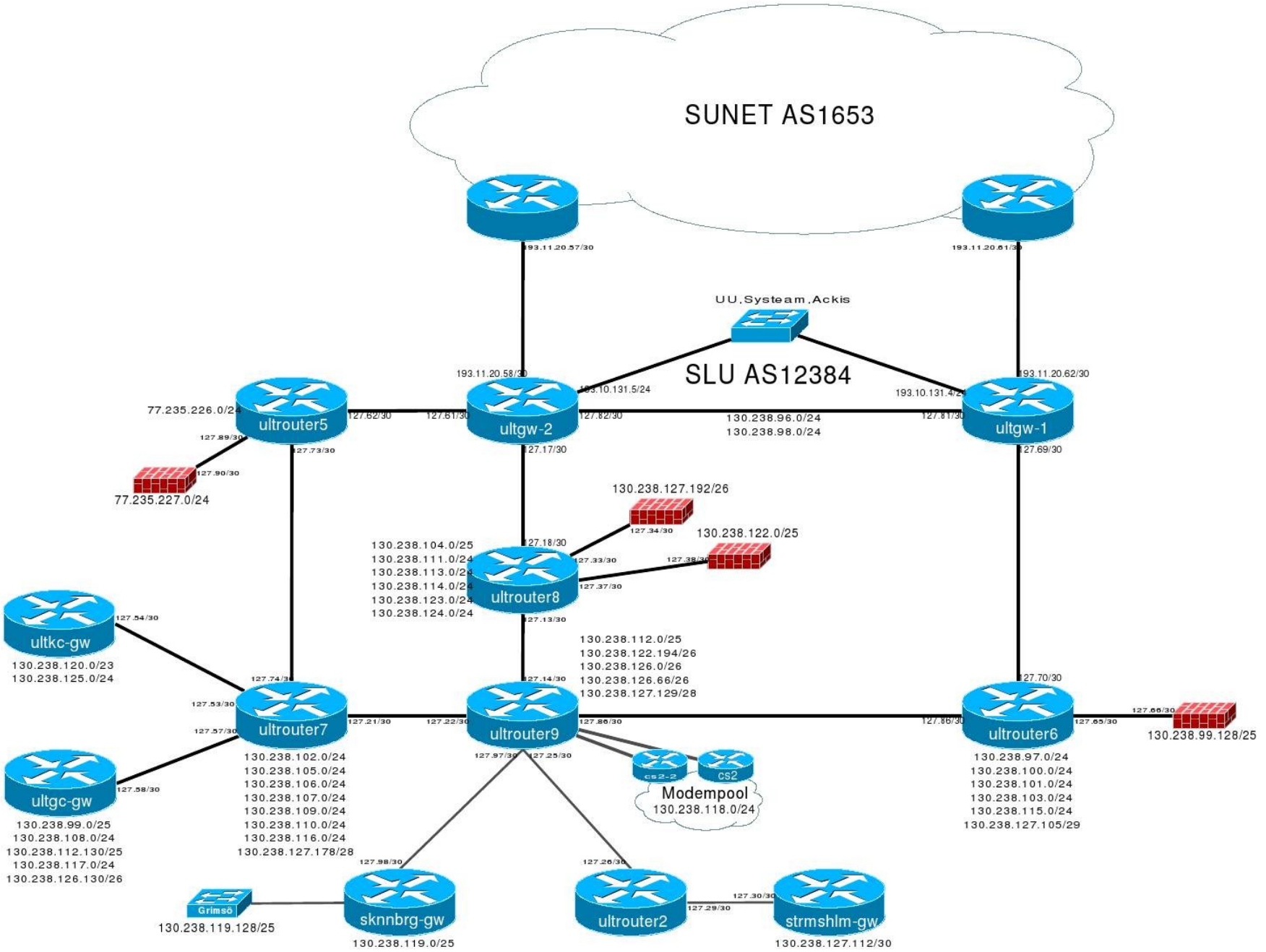
ISP's (SUNET) and peering point.



Redundant Internal core



Redundant server connection via router discovery


SUNET AS1653
193.11.20.57/30
193.11.20.61/30
UU,Systeam,Ackis
SLU AS12384
193.11.20.58/30
193.10.131.5/24
193.11.20.62/30
193.10.131.4/24
77.235.226.0/24
ultrouter5
127.62/30
127.61/30
ultgw-2
127.82/30
130.238.96.0/24
130.238.98.0/24
127.81/30
ultgw-1
127.89/30
127.73/30
127.17/30
127.69/30
127.90/30
77.235.227.0/24
130.238.127.192/26
127.34/30
130.238.122.0/25
127.38/30
130.238.104.0/25
130.238.111.0/24
130.238.113.0/24
130.238.114.0/24
130.238.123.0/24
130.238.124.0/24
127.18/30
127.33/30
ultrouter8
127.37/30
127.13/30
130.238.112.0/25
130.238.122.194/26
130.238.126.0/26
130.238.126.66/26
130.238.127.129/28
ultkc-gw
127.54/30
130.238.120.0/23
130.238.125.0/24
127.74/30
127.70/30
127.53/30
127.57/30
ultrouter7
127.21/30
127.22/30
ultrouter9
127.14/30
127.86/30
127.86/30
ultrouter6
127.65/30
127.66/30
130.238.99.128/25
ultgc-gw
127.58/30
130.238.99.0/25
130.238.108.0/24
130.238.112.130/25
130.238.117.0/24
130.238.126.130/26
130.238.102.0/24
130.238.105.0/24
130.238.106.0/24
130.238.107.0/24
130.238.109.0/24
130.238.110.0/24
130.238.116.0/24
130.238.127.178/28
127.97/30
127.25/30
cs2-2
cs2
Modempool
130.238.118.0/24
130.238.97.0/24
130.238.100.0/24
130.238.101.0/24
130.238.103.0/24
130.238.115.0/24
130.238.127.105/29
127.98/30
127.26/30
Grimsö
130.238.119.128/25
sknnbrg-gw
130.238.119.0/25
ultrouter2
127.29/30
127.30/30
strmshlm-gw
130.238.127.112/30

Most parts are Open Source

- Open-Source implementation
- bifrost
- quagga

Future work

- WLAN architecture
- User and/or distributed access-filters