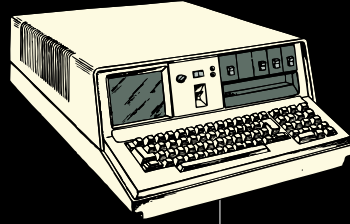
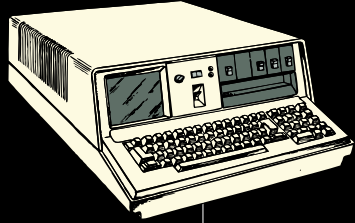


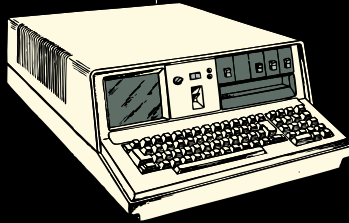
# A dirty trick to save a couple of IPv4 addresses on a LAN link

AusNOG 2018

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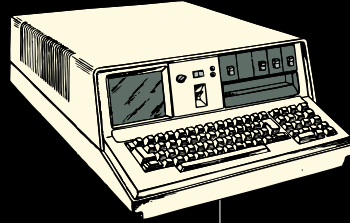
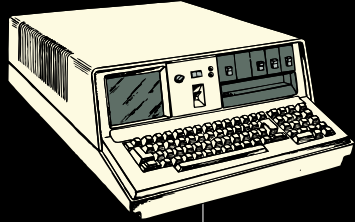


203.0.113.0/24

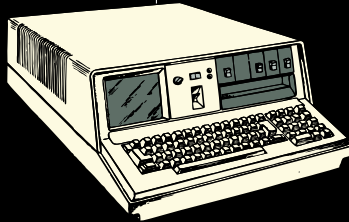


203.0.113.2  
SM - 255.255.255.0  
BCAST - 203.0.113.255

203.0.113.3  
SM - 255.255.255.0  
DG - 203.0.113.2  
BCAST - 203.0.113.255

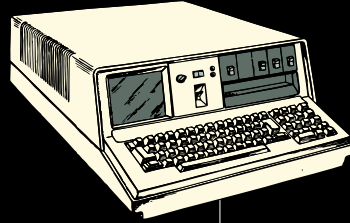
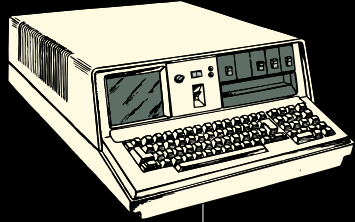


203.0.113.0/24

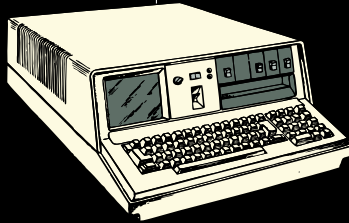


203.0.113.2  
SM - 255.255.255.0  
BCAST - 203.0.113.255

203.0.113.3  
**SM - 255.255.255.254** (i.e. /31)  
DG - 203.0.113.2  
**BCAST - ????**

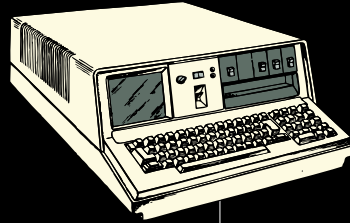
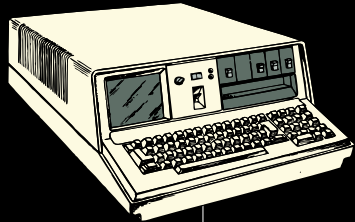


203.0.113.0/24

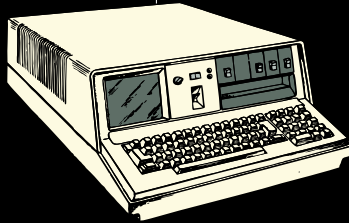


203.0.113.2  
SM - 255.255.255.0  
BCAST - 203.0.113.255

203.0.113.3  
**SM - 255.255.255.254** (i.e. /31)  
DG - 203.0.113.2  
BCAST - 255.255.255.255

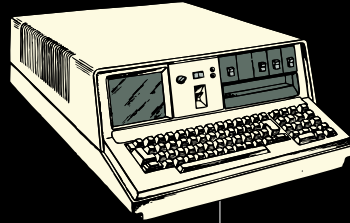
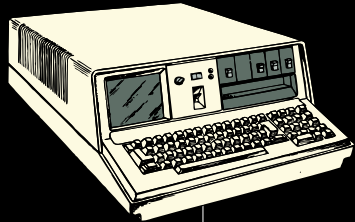


203.0.113.0/24

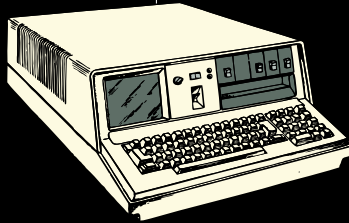


203.0.113.2  
SM - 255.255.255.0  
BCAST - 203.0.113.255

203.0.113.3  
**SM - 255.255.255.255** (i.e. /32)  
**DG - ????**  
BCAST - 255.255.255.255



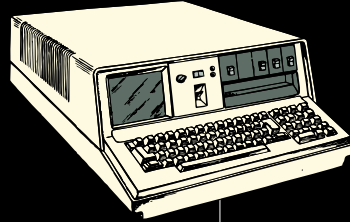
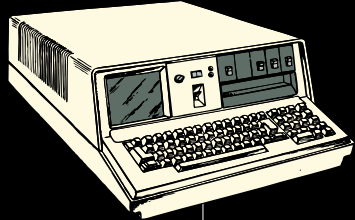
203.0.113.0/24



203.0.113.3  
SM - 255.255.255.255 (i.e. /32)  
**DG - 169.254.0.1**  
**Reach 169.254.0.1 - ???**  
BCAST - 255.255.255.255

169.254.0.1  
SM - ????  
BCAST - ????  
**Reach 203.0.113.0/24s - ????**

169.254.0.0/16  
- Link-Local Prefix (RFC3927)  
- No forwarding off-link  
- Use on many links (all) fine

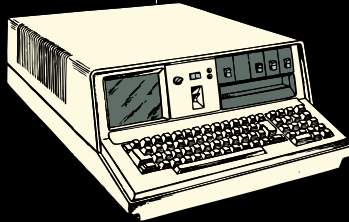


203.0.113.0/24

eth0



eth0



203.0.113.3

SM - 255.255.255.255 (i.e. /32)

DG - 169.254.0.1

Reach 169.254.0.1 - ip route 169.254.0.0/32

eth0 (host equiv)

BCAST - 255.255.255.255

169.254.0.1

SM - 255.255.255.255 (i.e. /32)

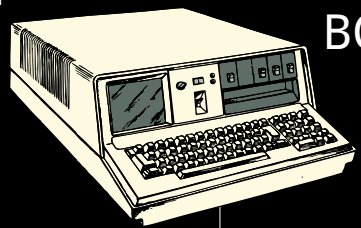
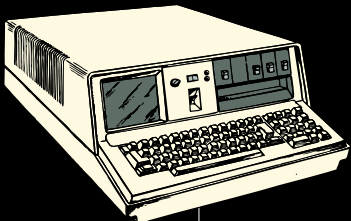
BCAST - 255.255.255.255

Reach 203.0.113.0/24s -

ip route 203.0.113.0/24 eth0

**203.0.113.0/32**

**BCAST 255.255.255.255, DG 169.254.0.1**



**203.0.113.255/32**

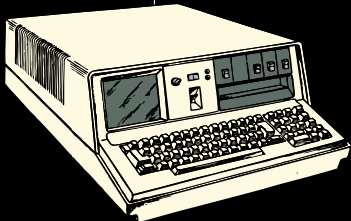
**BCAST 255.255.255.255, DG 169.254.0.1**

**Link address space**  
**203.0.113.0/24**

eth0



eth0



**203.0.113.3**

**SM - 255.255.255.255 (i.e. /32)**

**DG - 169.254.0.1**

**Reach 169.254.0.1 - ip route 169.254.0.0/32**

**eth0 (host equiv)**

**BCAST - 255.255.255.255**

**169.254.0.1**

**SM - 255.255.255.255 (i.e. /32)**

**BCAST - 255.255.255.255**

**Reach 203.0.113.0/24s -**

**ip route 203.0.113.0/24 eth0**



# Works - Linux Host

```
[root@opy mark]# ip addr add 192.168.0.0/32 brd 255.255.255.255 dev enp0s25
[root@opy mark]# ip addr show enp0s25 | grep 192.168
    inet 192.168.0.0/32 brd 255.255.255.255 scope global enp0s25
[root@opy mark]#
```

```
[root@opy mark]# ip route add 169.254.0.1/32 dev enp0s25
[root@opy mark]# ip route show 169.254.0.1
169.254.0.1 dev enp0s25 scope link
[root@opy mark]#
```

```
[root@opy mark]# ip route add default via 169.254.0.1
[root@opy mark]# ip route show default
default via 169.254.0.1 dev enp0s25
[root@opy mark]#
```

# Works - Linux Router

```
root@lede-wndr3800:~# ip addr add 169.254.0.1/32 brd 255.255.255.255 dev br-lan
root@lede-wndr3800:~# ip addr show dev br-lan | grep 169.254.0.1
    inet 169.254.0.1/32 brd 255.255.255.255 scope global br-lan
root@lede-wndr3800:~#
```

```
root@lede-wndr3800:~# ip route add 192.168.0.0/24 dev br-lan
root@lede-wndr3800:~# ip route show | grep 192
192.168.0.0/24 dev br-lan
root@lede-wndr3800:~#
```

# Works - Linux Host

<ping output here>

Yes it works, forgot to capture it

# Works (?) - Cisco router

A long time ago, pretty sure it worked.

```
int eth0
```

```
ip address 169.254.0.1 255.255.255.255
```

```
('ip broadcast-address 255.255.255.255' default)
```

```
ip route 203.0.113.0 255.255.255.0 eth0
```

# Advantages

**Got two more IPv4 addresses on the LAN link**

# Woohoo!

IPv4 FTW!

Meh

Use **IPv6** if you want/need more  
addresses.

# Advantages

Default Gateway address decoupled from hosts' "application" address prefix.

# Advantages

Renumber hosts without changing their Default Gateway address.



# Advantages

Removed one of hosts' external dependencies.

Good principle to remove external dependencies  
- simpler, therefore more reliable.

This is how IPv6 works

IPv6 hosts' default gateway is a link-local address

e.g., fe80::abcd/64



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