

# Networking

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# 1 Netmask

Netmask is used to differentiate between the network prefix and the host prefix. It's a 32bit integer, and can be represented as dot quadded form (like an ip), binary form or in short prefix (/n) form. Some examples follow:

	Standard classes			
/8	$\underbrace{11111111}_{255}$	$\underbrace{00000000}_0$	$\underbrace{00000000}_0$	$\underbrace{00000000}_0$
/16	$\underbrace{11111111}_{255}$	$\underbrace{11111111}_{255}$	$\underbrace{00000000}_0$	$\underbrace{00000000}_0$
/24	$\underbrace{11111111}_{255}$	$\underbrace{11111111}_{255}$	$\underbrace{11111111}_{255}$	$\underbrace{00000000}_0$
	Non-standard classes			
/13	$\underbrace{11111111}_{255}$	$\underbrace{11111000}_{248}$	$\underbrace{00000000}_0$	$\underbrace{00000000}_0$
/26	$\underbrace{11111111}_{255}$	$\underbrace{11111111}_{255}$	$\underbrace{11111111}_{255}$	$\underbrace{11000000}_{192}$
/21	$\underbrace{11111111}_{255}$	$\underbrace{11111111}_{255}$	$\underbrace{11111000}_{248}$	$\underbrace{00000000}_0$

# 2 Network and broadcast from ip and netmask

You can easily obtain network and broadcast from ip and netmask, since:

$$\begin{aligned} \text{network} &= \text{ip} \ \& \ \text{netmask}; \\ \text{broadcast} &= \text{ip} \ | \ \sim \text{netmask}; \end{aligned}$$

Eg: given 192.168.131.4/18, you can guess the network and the broadcast:

$$\begin{array}{cccc} \underbrace{192} & \cdot & \underbrace{168} & \cdot & \underbrace{131} & \cdot & \underbrace{4} \\ 11000000 & & 10101000 & & 10000011 & & 00000100 \end{array}$$

Our netmask, /18 is:

$$\begin{array}{cccc} \underbrace{11111111}_{255} & \underbrace{11111111}_{255} & \underbrace{11000000}_{192} & \underbrace{00000000}_0 \end{array}$$

So the network is:

$$\begin{array}{cccccc} 11000000 & 10101000 & 10000011 & 00000100 & & \& \\ 11111111 & 11111111 & 11000000 & 00000000 & & = & \\ \hline \underbrace{11000000}_{192} & \underbrace{10101000}_{168} & \underbrace{10000000}_{128} & \underbrace{00000000}_0 & & & \end{array}$$

Similarly, we guess the broadcast:

$$\begin{array}{cccc|c} 11000000 & 10101000 & 10000011 & 00000100 & | \\ 00000000 & 00000000 & 00111111 & 11111111 & = \\ \hline \underbrace{11000000}_{192} & \underbrace{10101000}_{168} & \underbrace{10111111}_{191} & \underbrace{11111111}_{255} & \end{array}$$

### 3 IP Forwarding on HP-UX

To enable/disable<sup>1</sup> or check ip forwarding status you can:

```
# ndd -get /dev/ip ip_forwarding
# ndd -set /dev/ip ip_forwarding {0, 1, 2}
```

You can also use *net tune* if installed.

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<sup>1</sup>0 disable forwarding, 1 enables it always, 2 enables it if more than one interface is up