Endereçamento IP

(Parte 3 - *Classless*)

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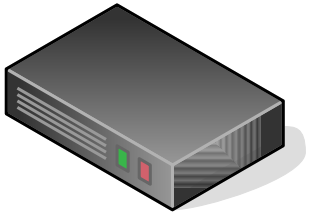
https://luizsantos.github.io/

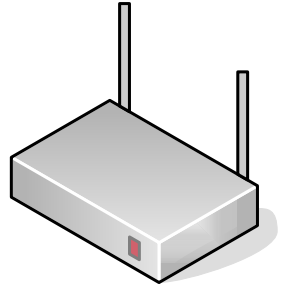
Endereçamento IP
(*classless*)

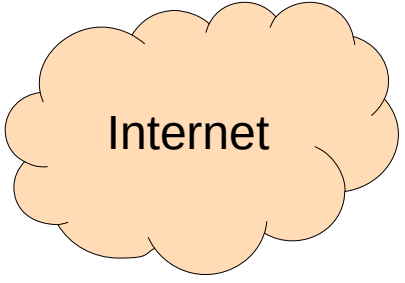
Modelo TCP/IP

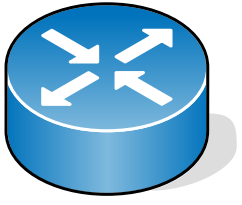
5	Aplicação
4	Transporte
3	Inter-rede
2	Enlace
1	Física

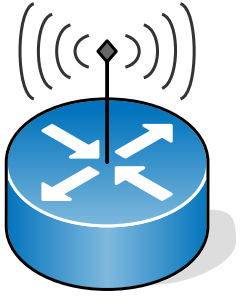
- Endereçamento e roteamento.





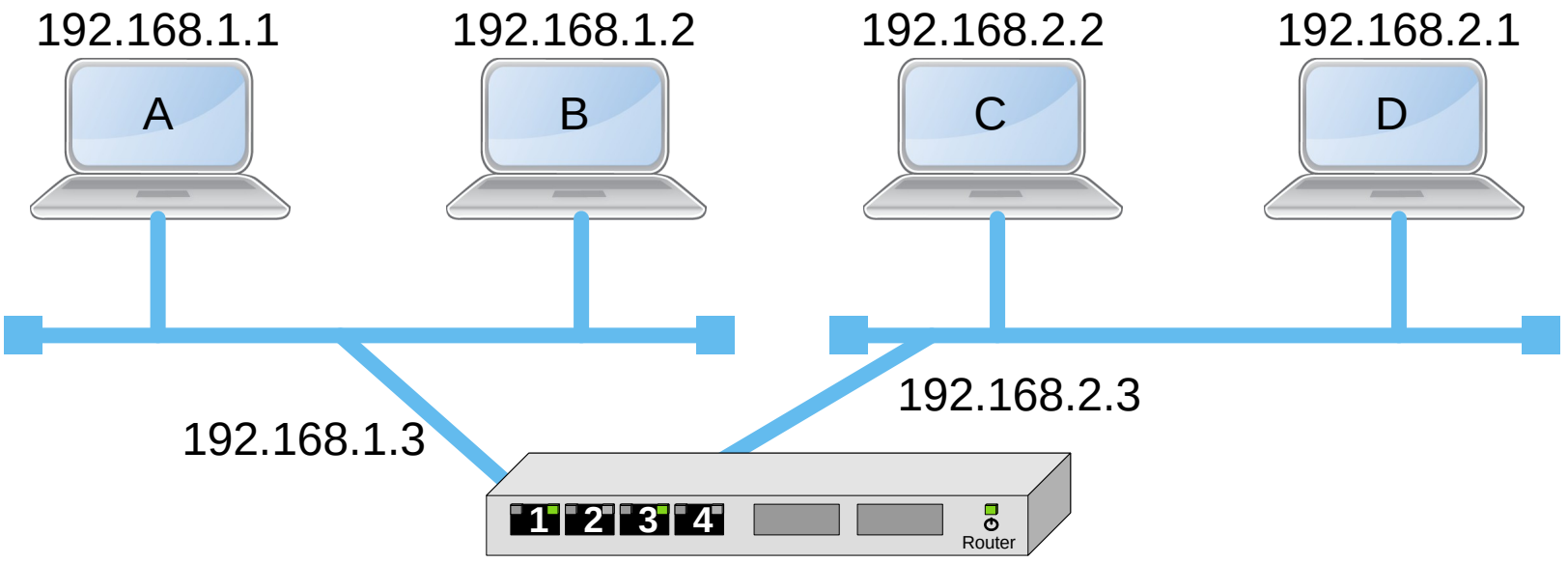






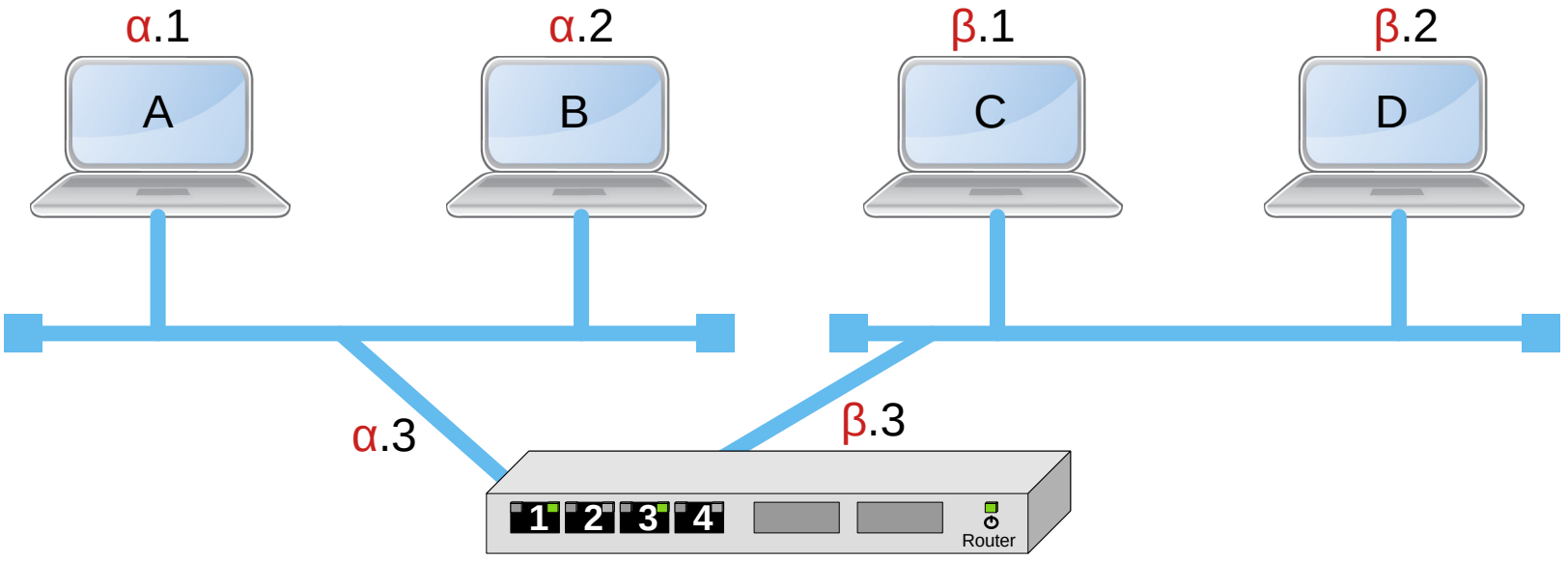
Camada de Inter-rede

Identificando rede e *host*:



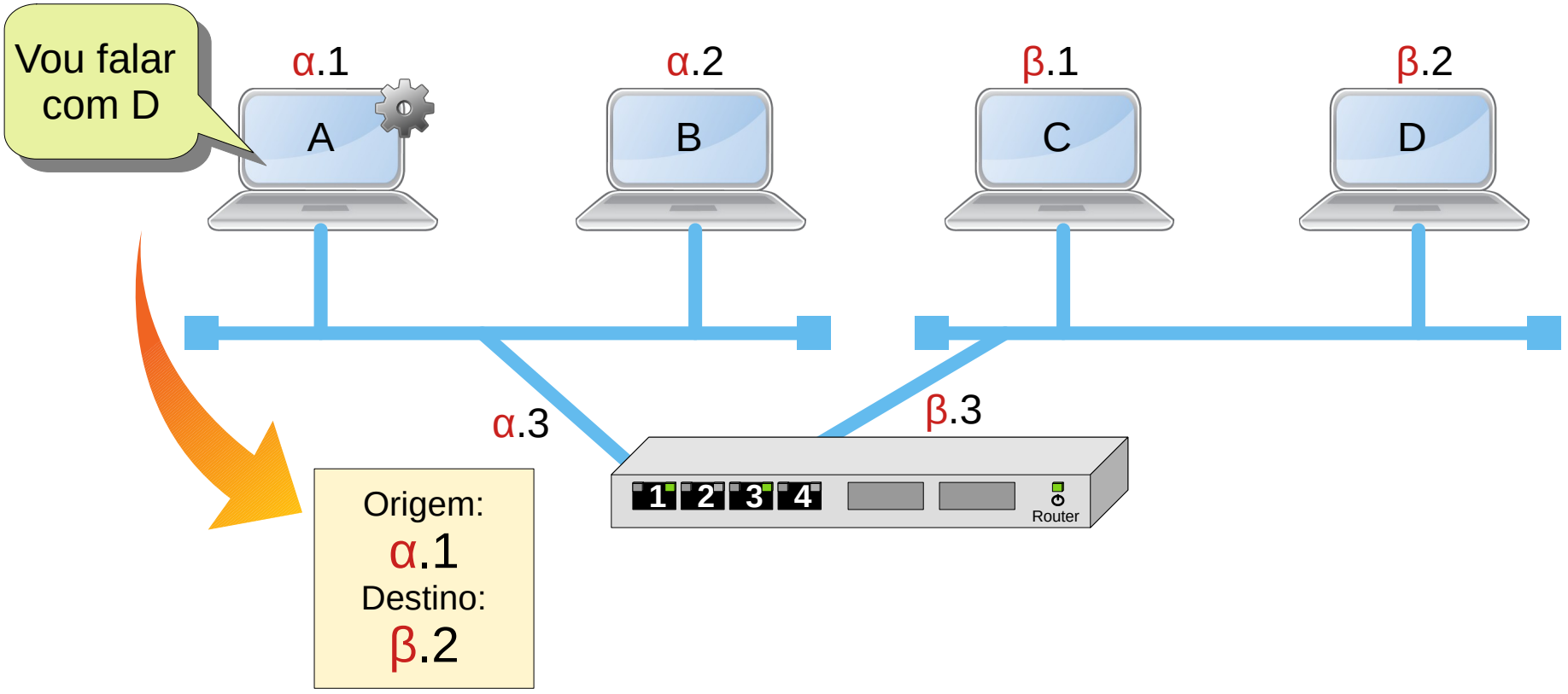
Camada de Inter-rede

Identificando rede e *host*:



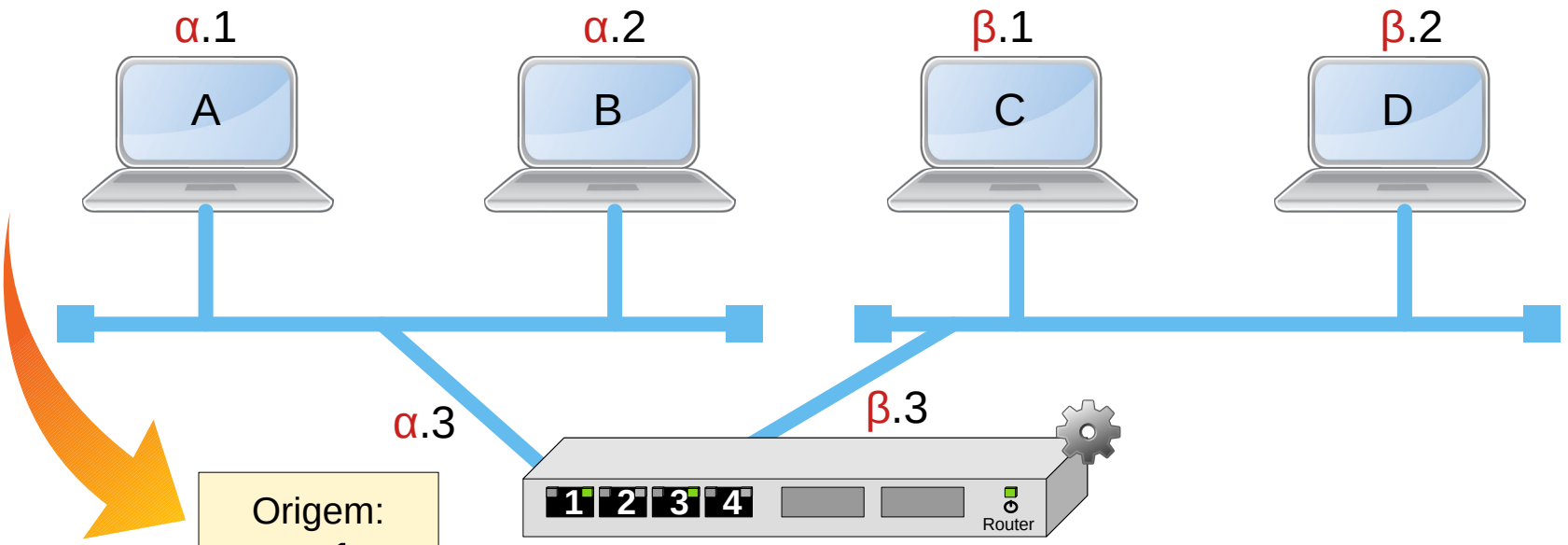
Camada de Inter-rede

Identificando rede e *host*:



Camada de Inter-rede

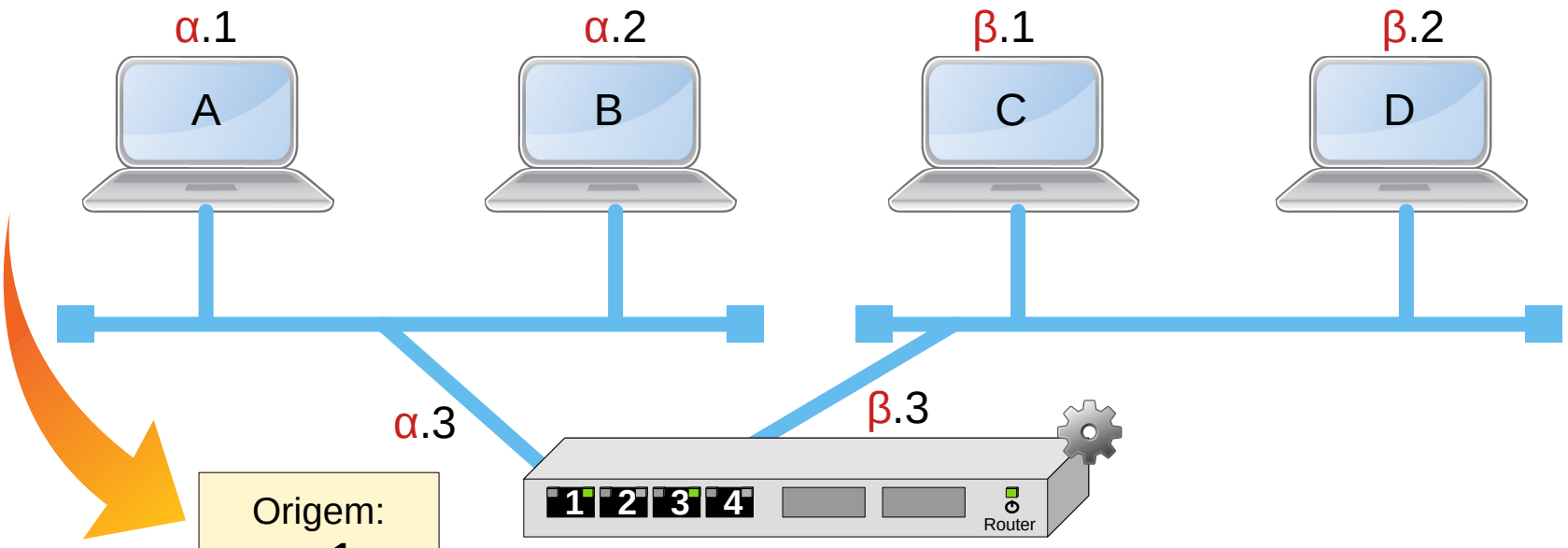
Identificando rede e *host*:



Placa	Rede
1	α
3	β

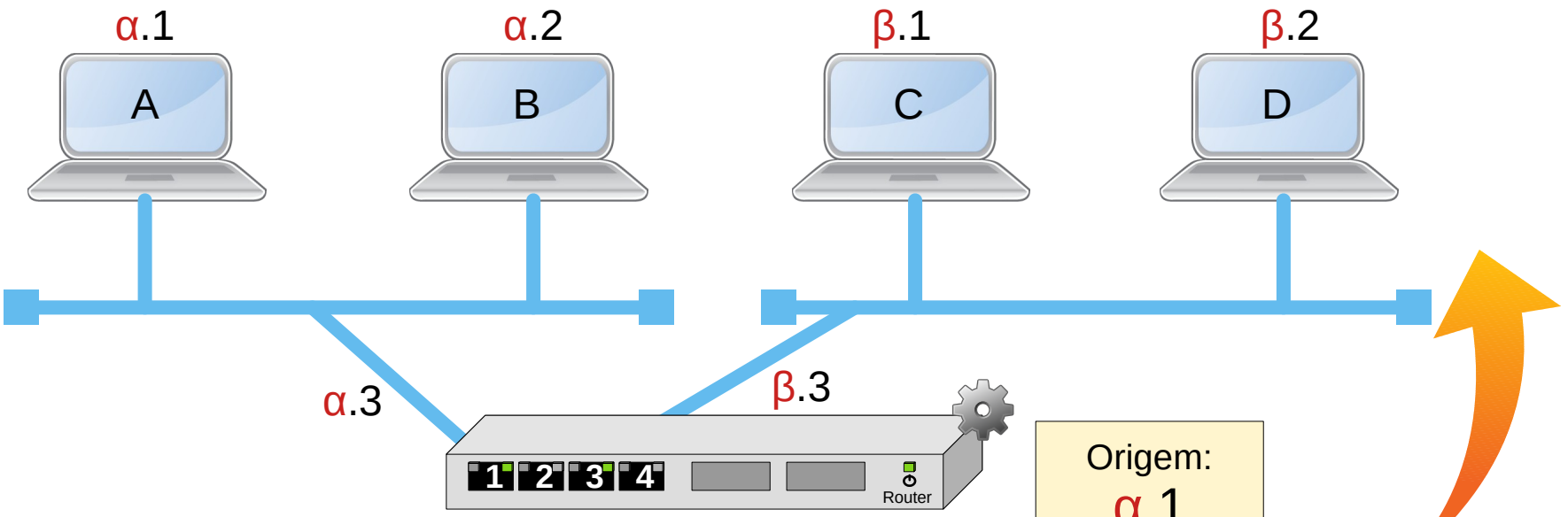
Camada de Inter-rede

Identificando rede e *host*:



Camada de Inter-rede

Identificando rede e *host*:

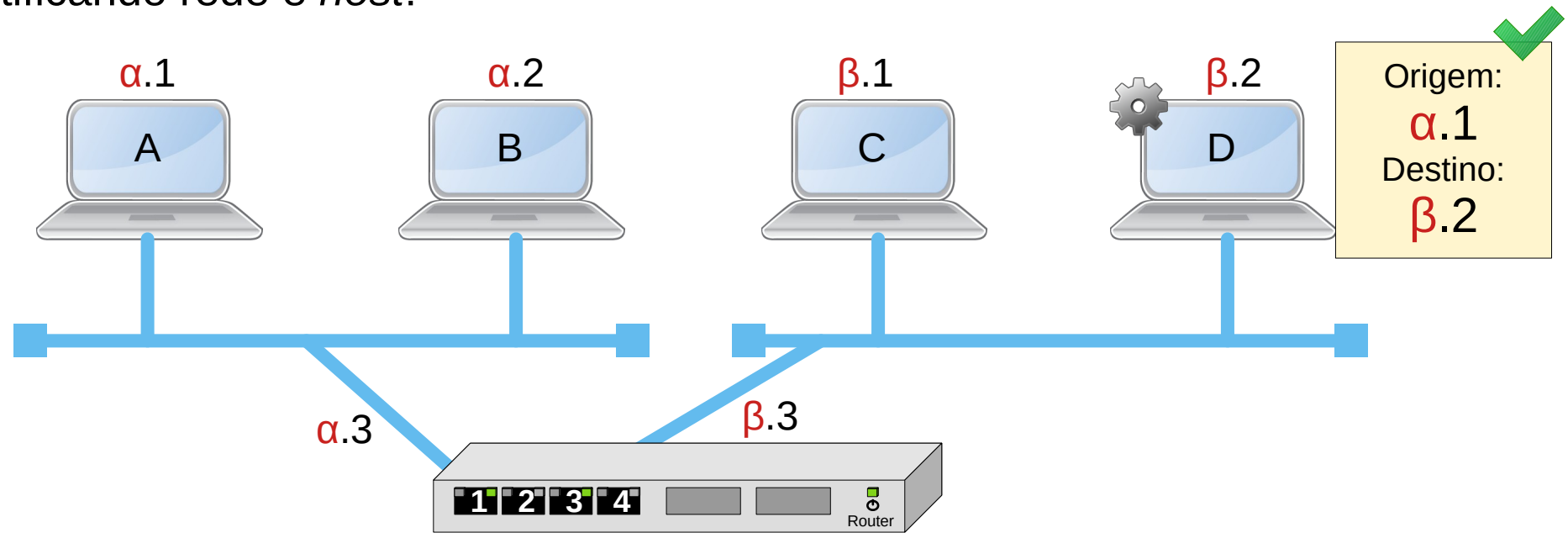


Placa	Rede
1	α
3	β

Origem:
α.1
Destino:
β.2

Camada de Inter-rede

Identificando rede e *host*:



Placa	Rede
1	α
3	β

Endereçamento IP (*classless*)

Classful

Classe	1's bits	Rede	Host	Faixa IPs
A	0	8	24	**0**.0.0.0 – **127**.255.255.255
B	10	16	16	**128**.0.0.0 – **191**.255.255.255
C	110	24	8	**192**.0.0.0 – **223**.255.255.255

Endereçamento IP
(*classless*)

Por que mudou?

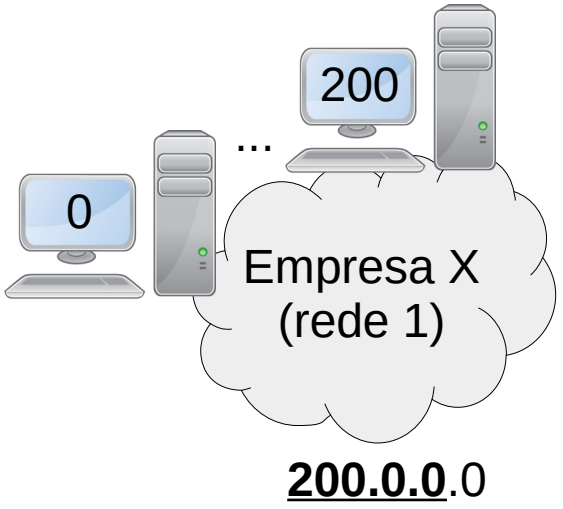
Endereçamento IP
(*classless*)

Por que mudou?

Mudou devido a falta de IPs válidos na Internet...

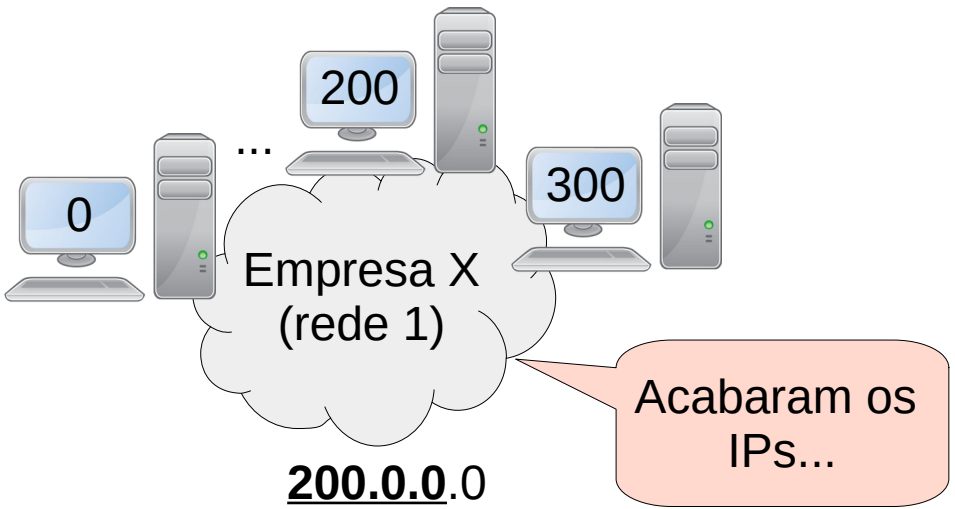
Endereçamento IP
(*classless*)

Desperdício de endereços IPv4 com *classful*:



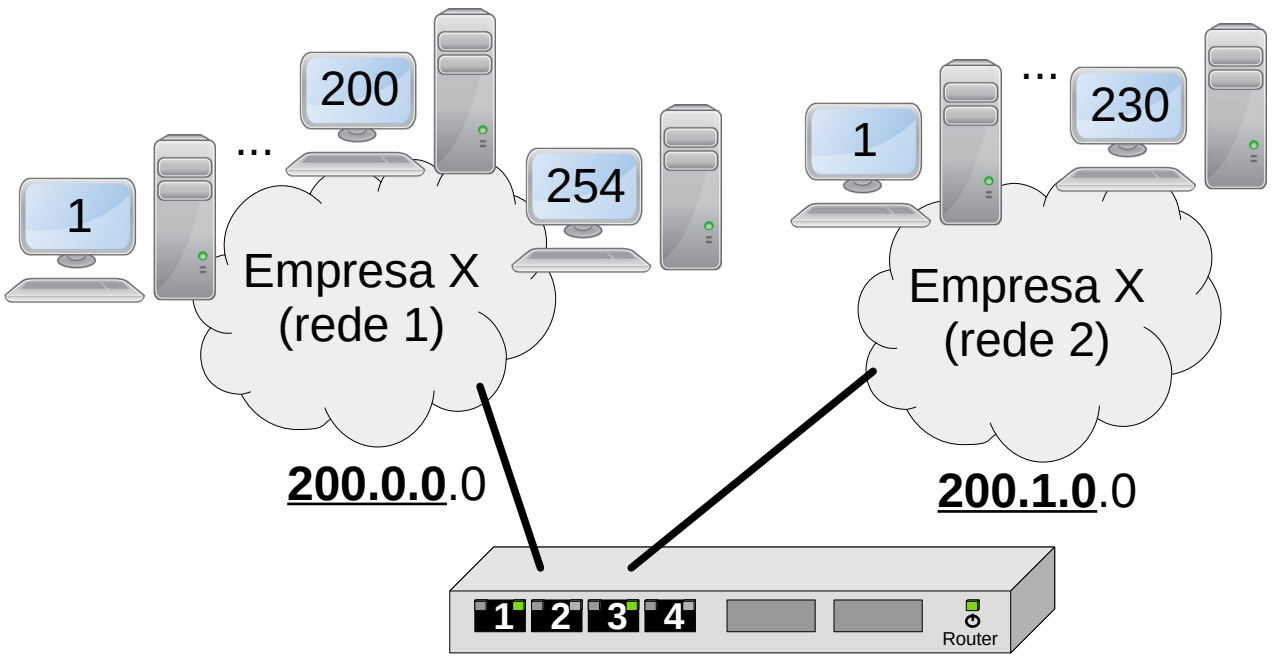
Endereçamento IP (*classless*)

Desperdício de endereços IPv4 com *classful*:



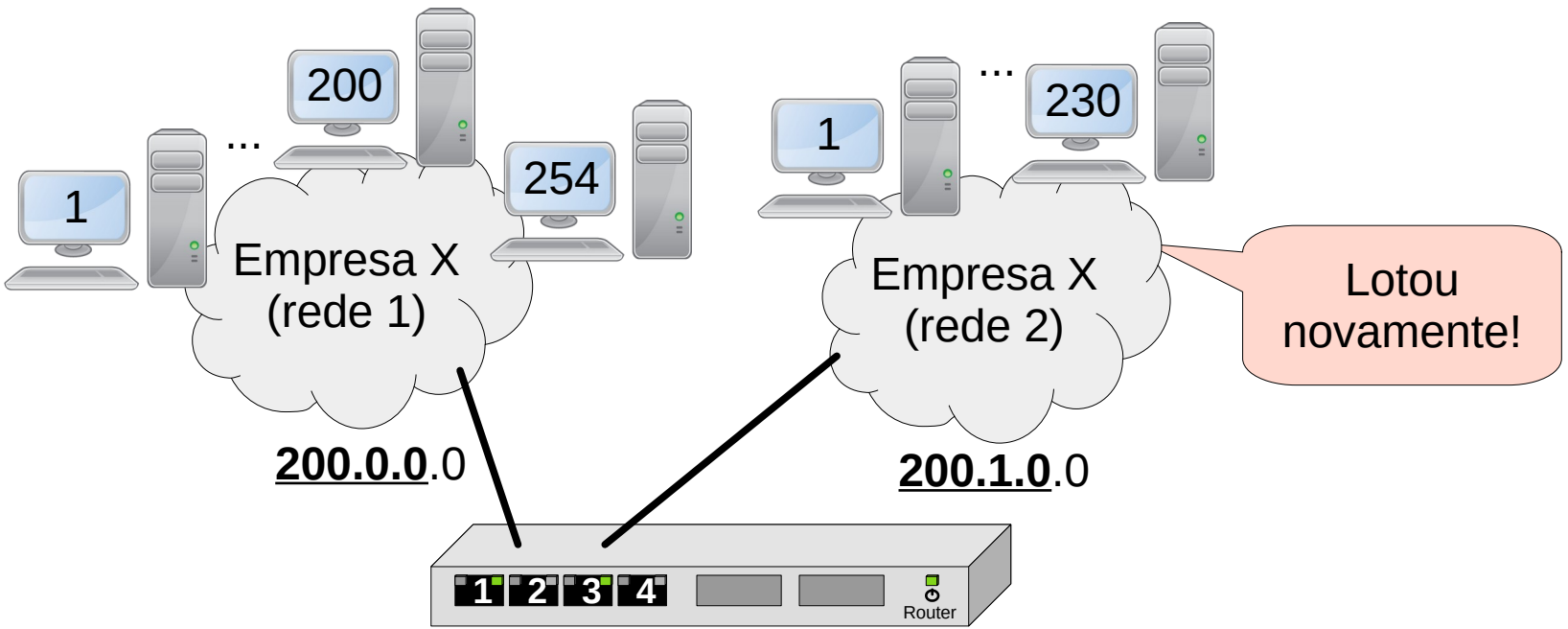
Endereçamento IP
(*classless*)

Desperdício de endereços IPv4 com *classful*:



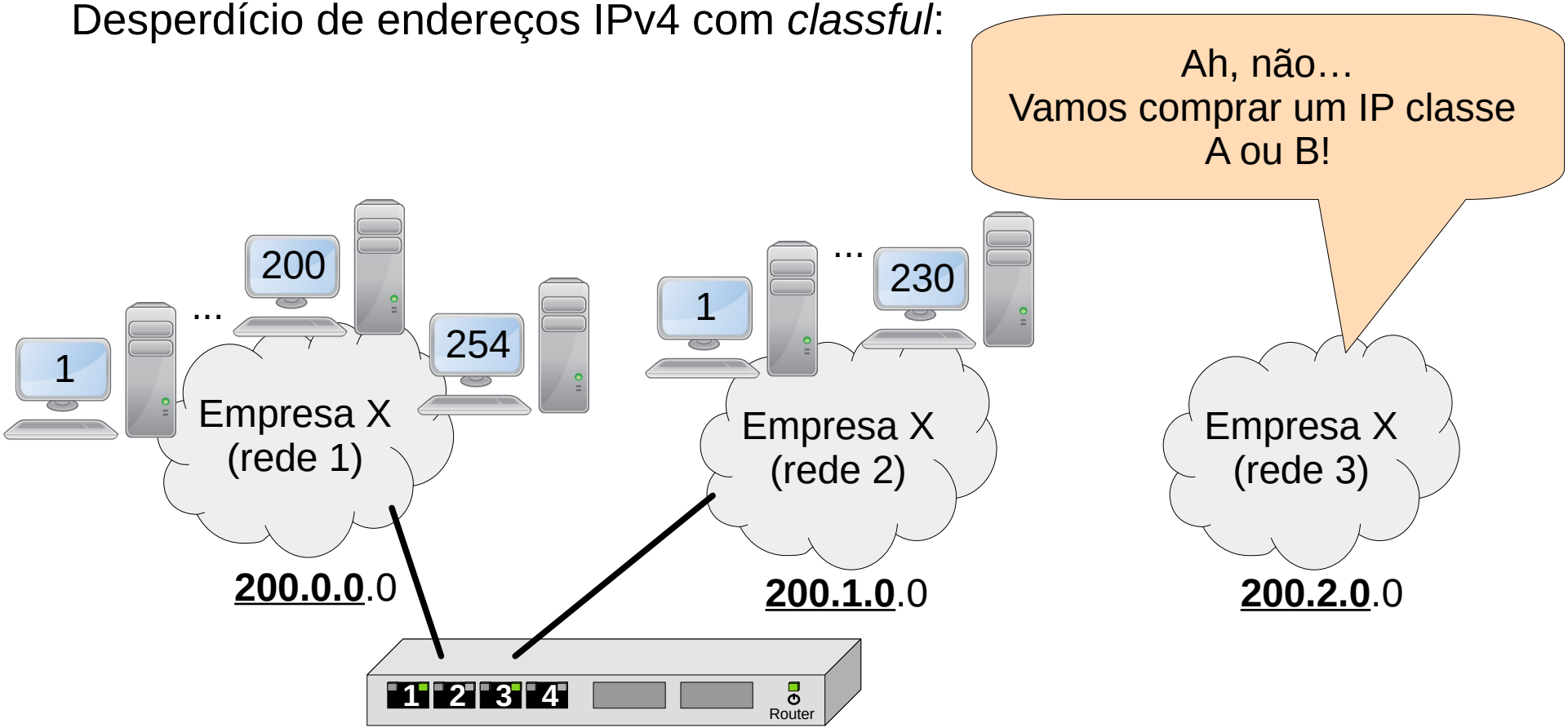
Endereçamento IP (*classless*)

Desperdício de endereços IPv4 com *classful*:



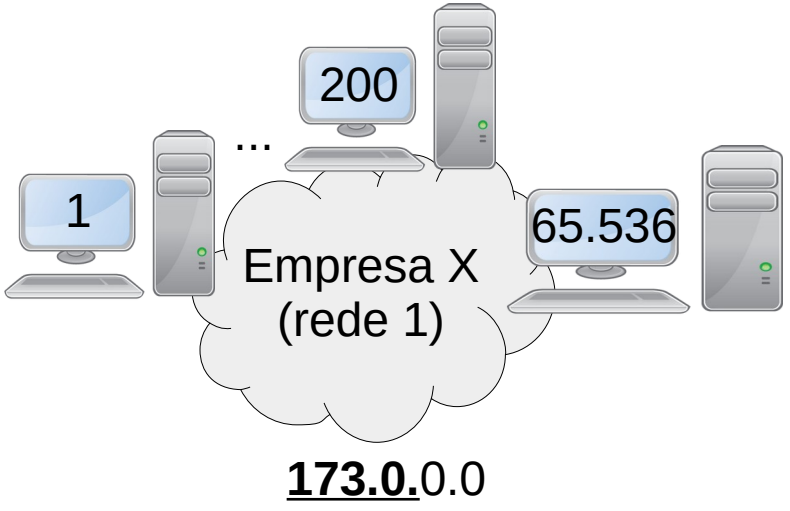
Endereçamento IP (*classless*)

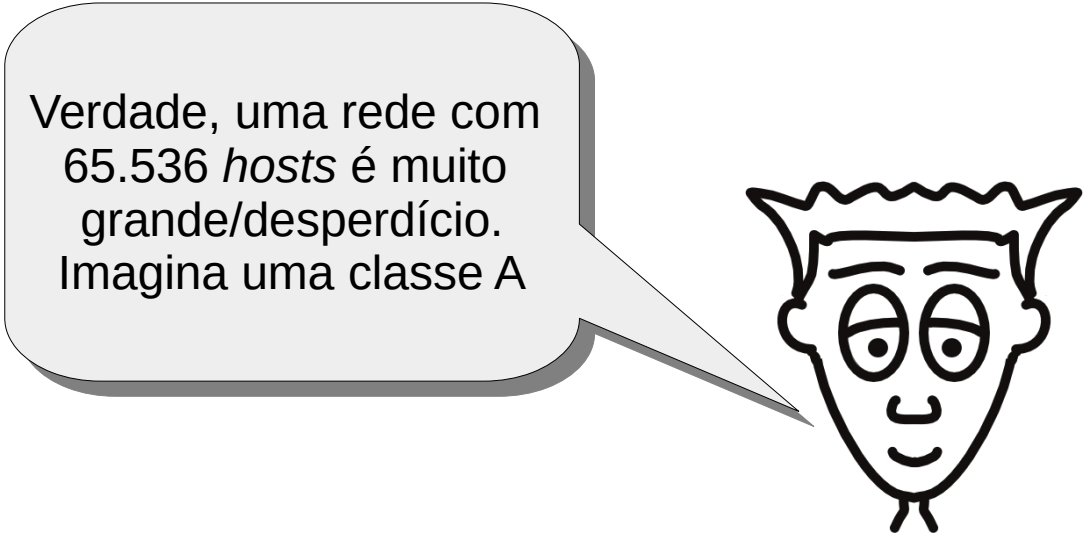
Desperdício de endereços IPv4 com *classful*:



Endereçamento IP
(*classless*)

Desperdício de endereços IPv4 com *classful*:





Endereçamento IP
(*classless*)

Então sai o *classful* e entra o *classless*, com máscara de rede!

Classe	1's bits	Rede	Host	Faixa IPs
A	0	8	24	**0**.0.0.0 – **127**.255.255.255
B	10	1		**128**.0.0.0 – **191**.255.255.255
C	110	24	8	**192**.0.0.0 – **223**.255.255.255

Endereçamento IP
(*classless*)

Máscara aqui também?

Endereçamento IP
(*classless*)

Máscara aqui também?

Calma...

Endereçamento IP (*classless*)

No *classless* os IPs não têm mais classe, ou seja, não é mais os primeiros bits do IP que dizem qual parte do IP representa rede e *host*.

Agora o que dita qual parte do IP é rede ou *host* é a máscara de rede.

Então, hoje em dia é de extrema importância para o profissional de rede, saber como funciona a máscara de rede!

Endereçamento IP
(*classless*)

Tá mas o que é a máscara?

Endereçamento IP
(*classless*)

A máscara possui 32 bits tal como o IP, que também são divididos em quatro octetos. Exemplo:

255.255.0.0

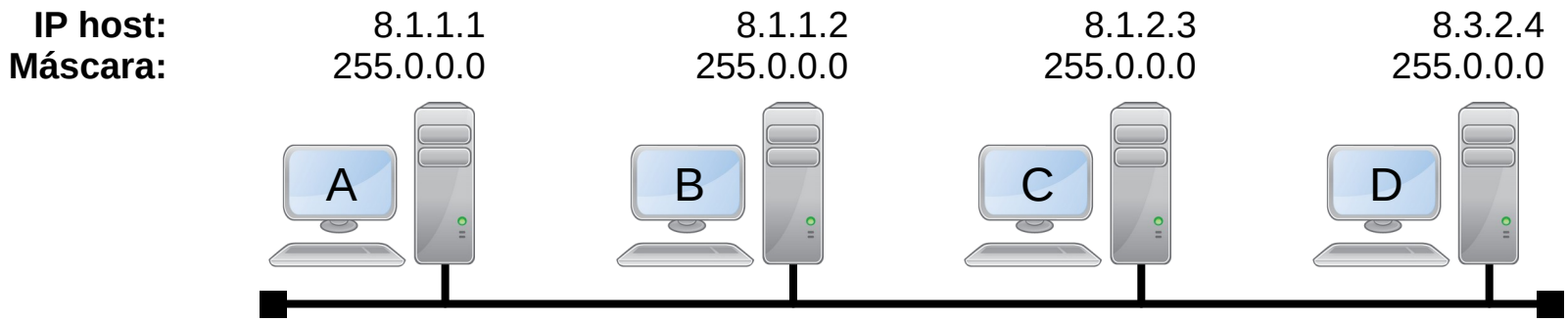
Cada bit da máscara faz referencia direta ao bit do IP, que esta máscara é aplicada.

Agora com a máscara, para identificar rede/*host* no IP, a regra é:

- Bit 1 (um) na máscara, indica que o bit equivalente no IP é rede.
- Bit 0 (zero) indicam que o bit equivalente no IP é *host*.
- Atenção, não pode intercalar zeros e uns na máscara!

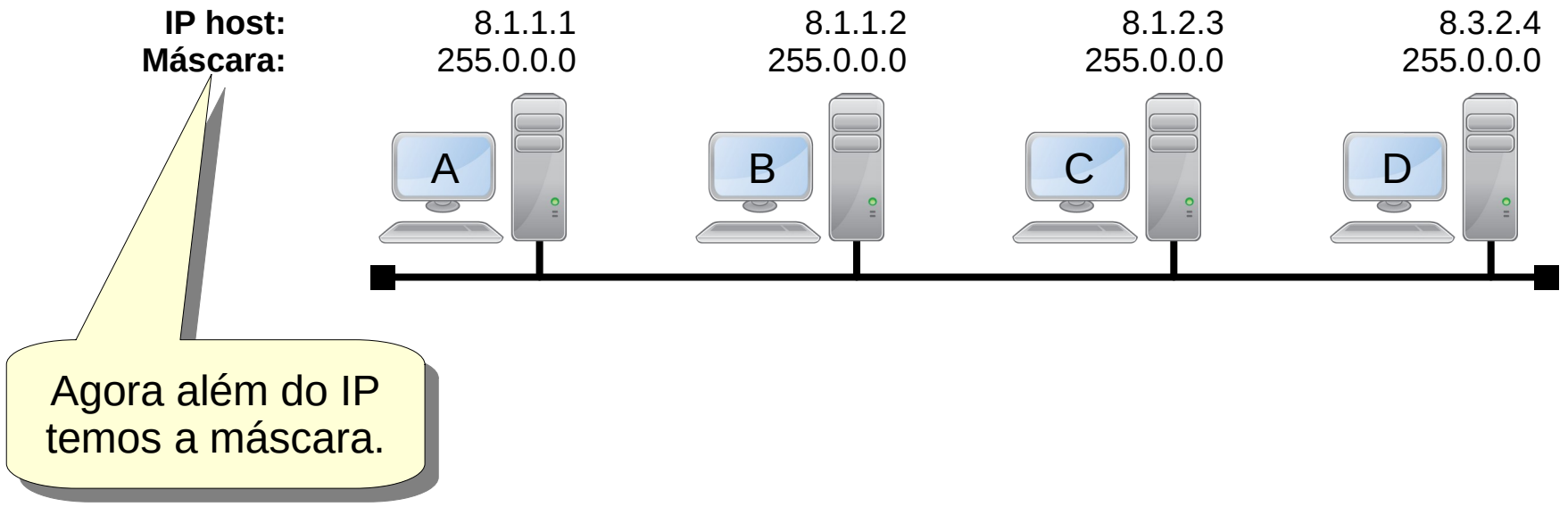
Endereçamento IP
(*classless*)

Exemplo 1:



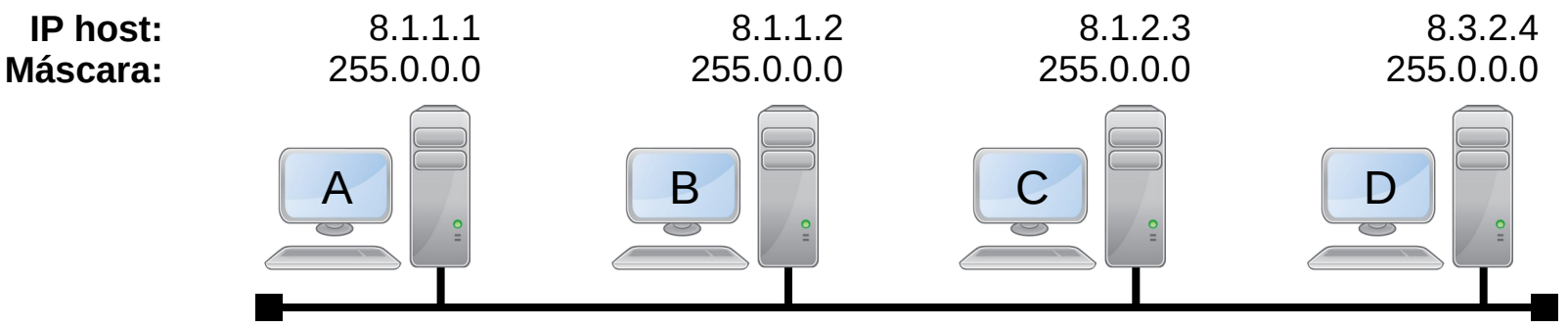
Endereçamento IP
(*classless*)

Exemplo 1:



Endereçamento IP
(*classless*)

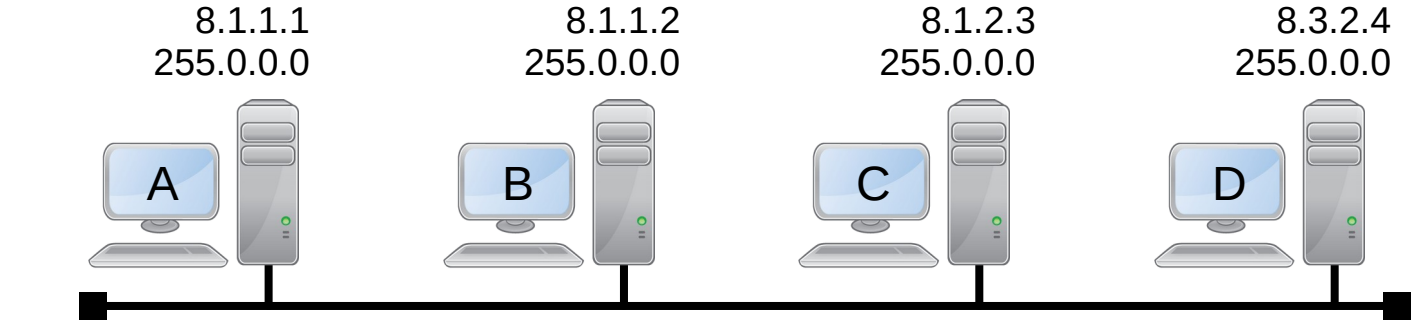
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0



Endereçamento IP
(*classless*)

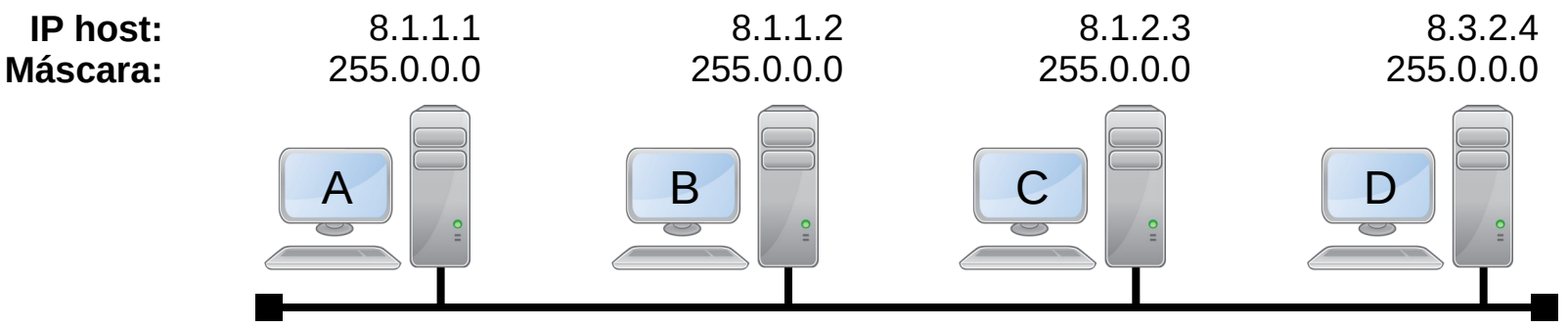
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0

1 na máscara significa que o bit equivalente no IP do *host* representa rede...



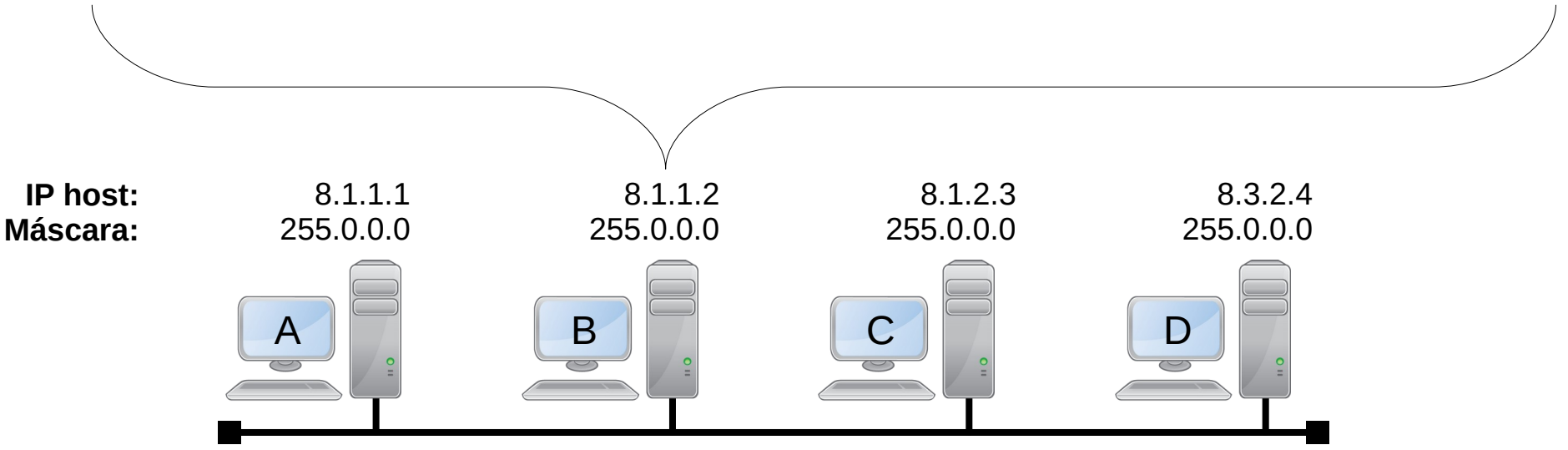
Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0



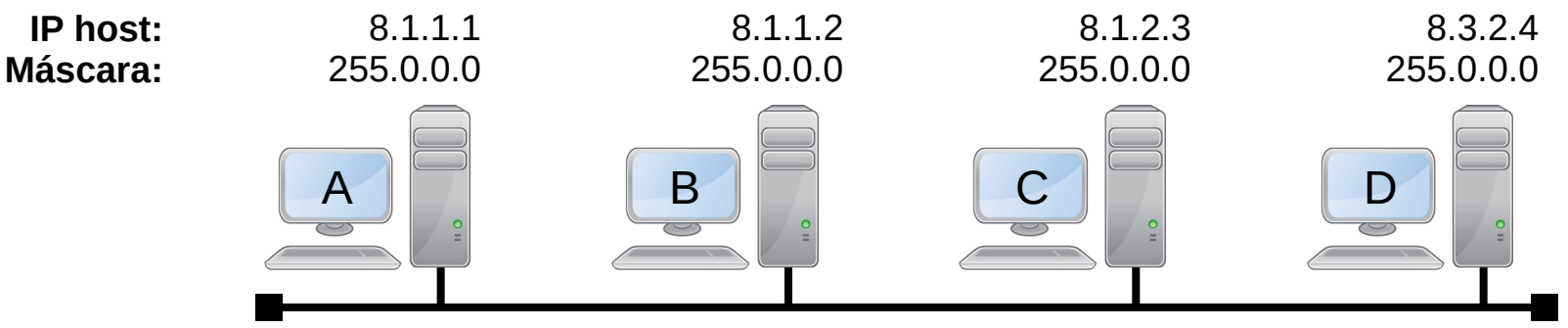
Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0



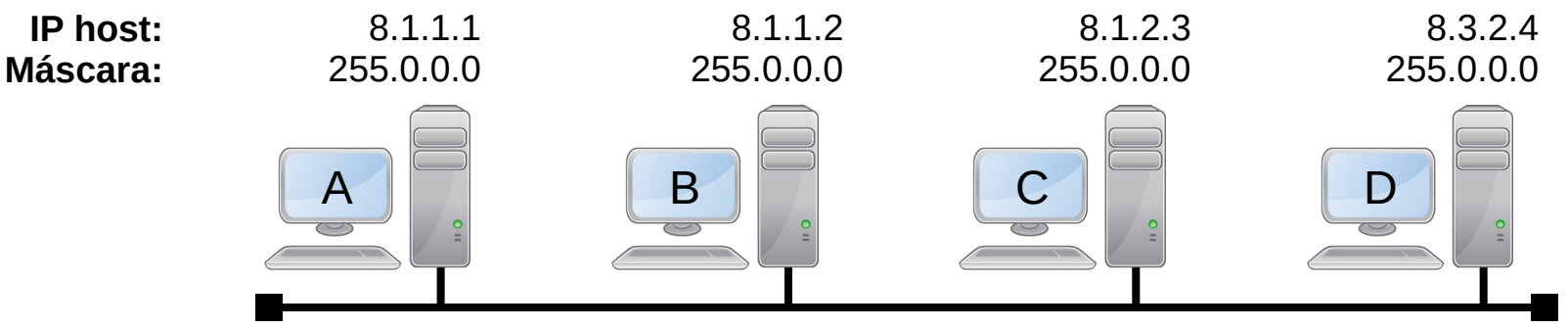
Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host C	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0	.	0	0	0	0	0	0	1	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0



Endereçamento IP
(*classless*)

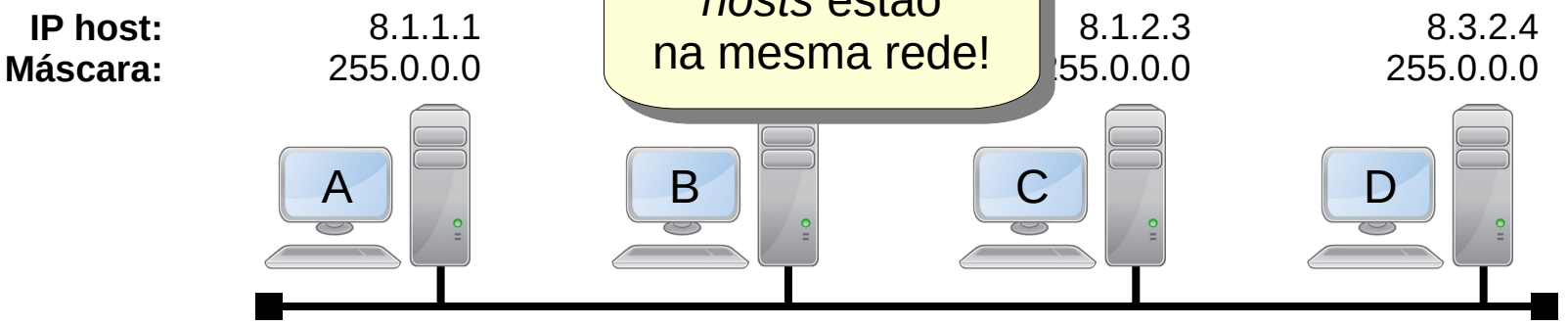
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host D	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	1	1	.	0	0	0	0	0	0	1	0	.	0	0	0	0	0	1	0	0
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0



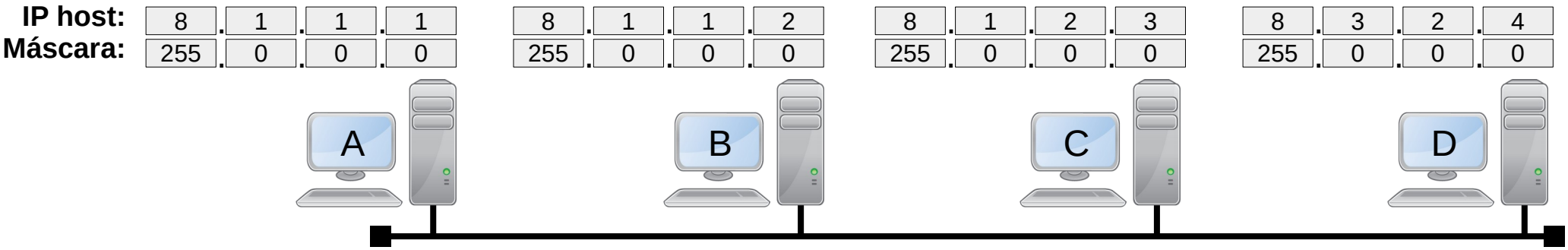
Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	14	25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
IP host B	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
IP host C	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
IP host D	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
Máscara	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

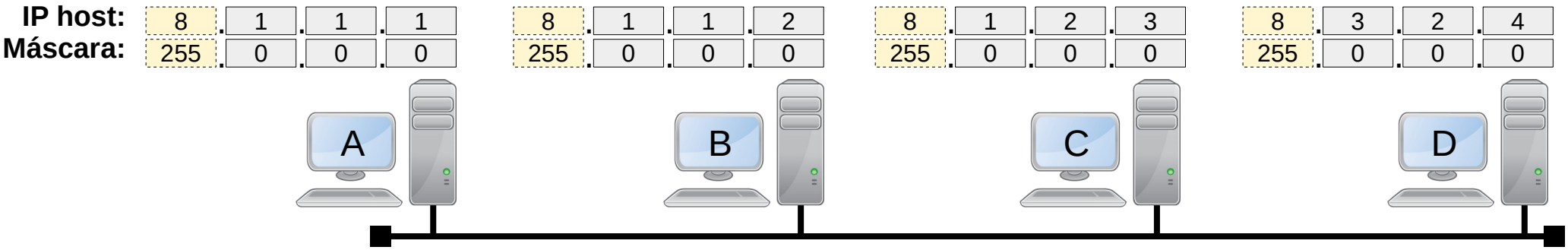
Todos esses *hosts* estão na mesma rede!



Endereçamento IP
(*classless*)



Endereçamento IP
(*classless*)



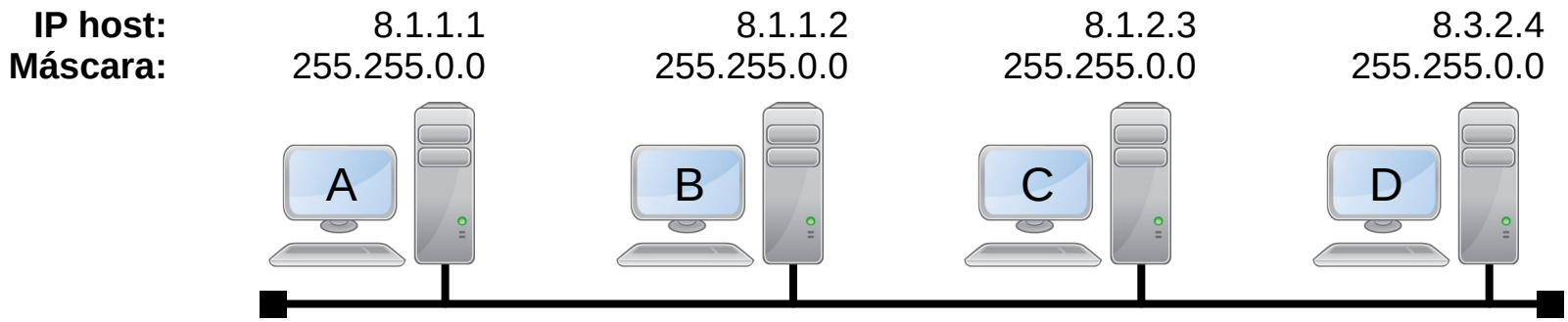
Neste caso, todos os *hosts* possuem o mesmo “endereço de rede”, que é 8. Ou seja, trocam informações diretamente entre eles (sem outras configurações).

Endereçamento IP
(*classless*)

Ah, a máscara é isso?
Mas qual é a diferença do *classful*? Não vi nada diferente...

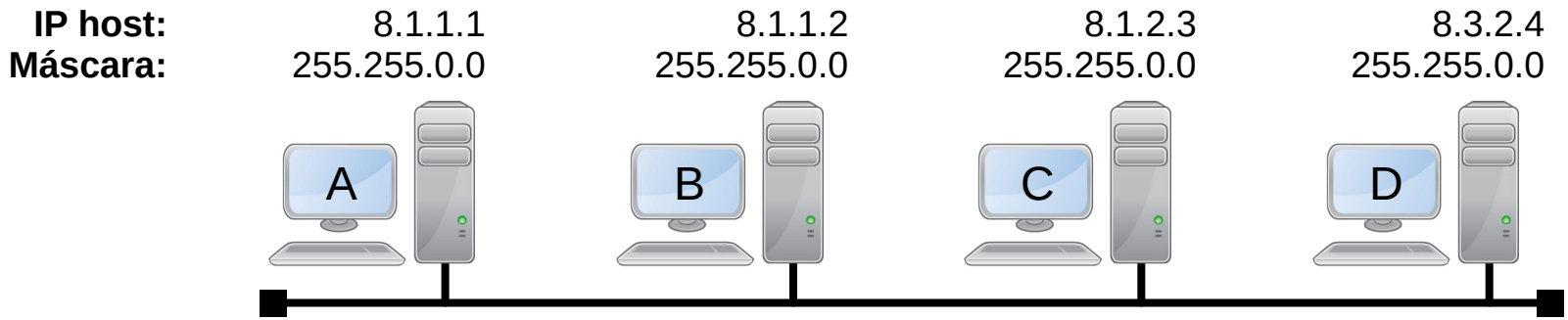
Endereçamento IP
(*classless*)

Exemplo 2:



Endereçamento IP
(*classless*)

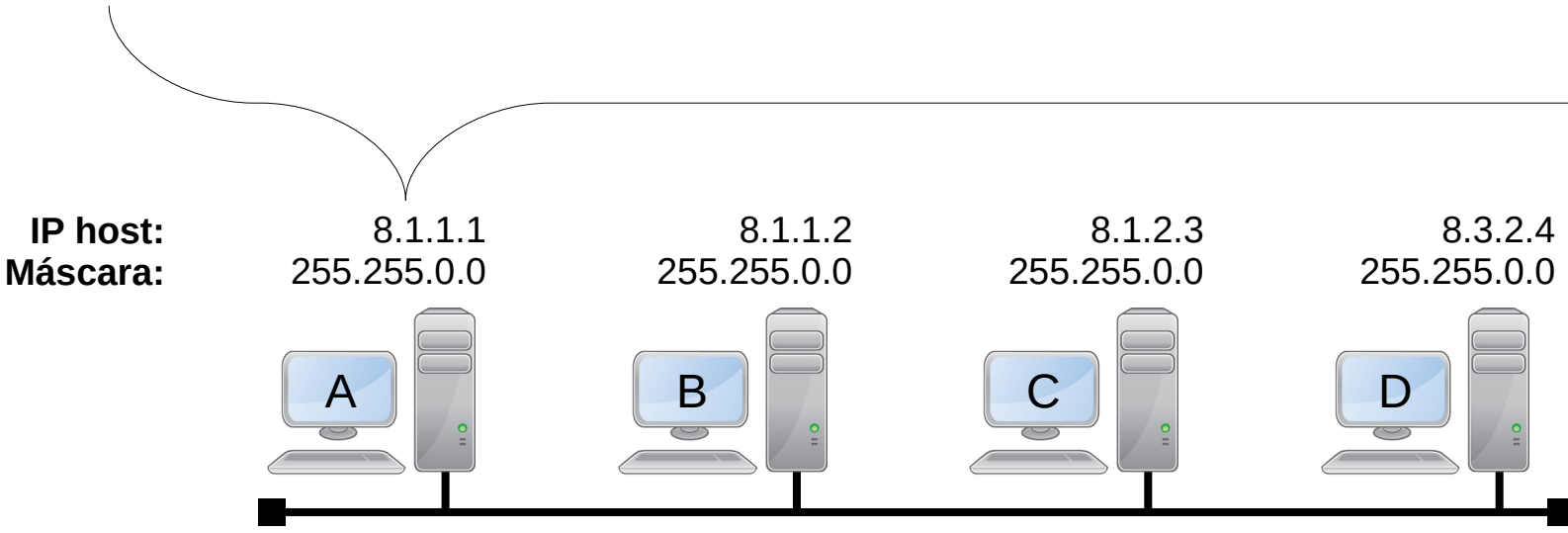
Exemplo 2:



Neste exemplo, os IPs dos *hosts* continuam o mesmo, mas as máscaras foram alteradas!

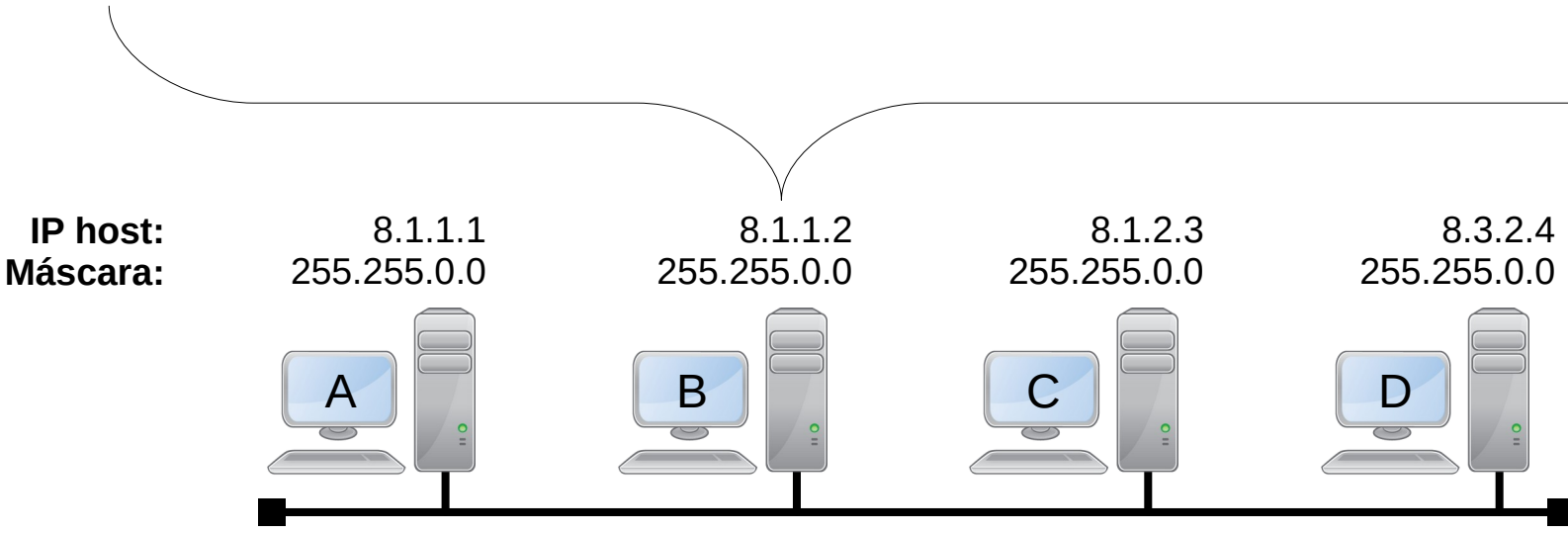
Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0



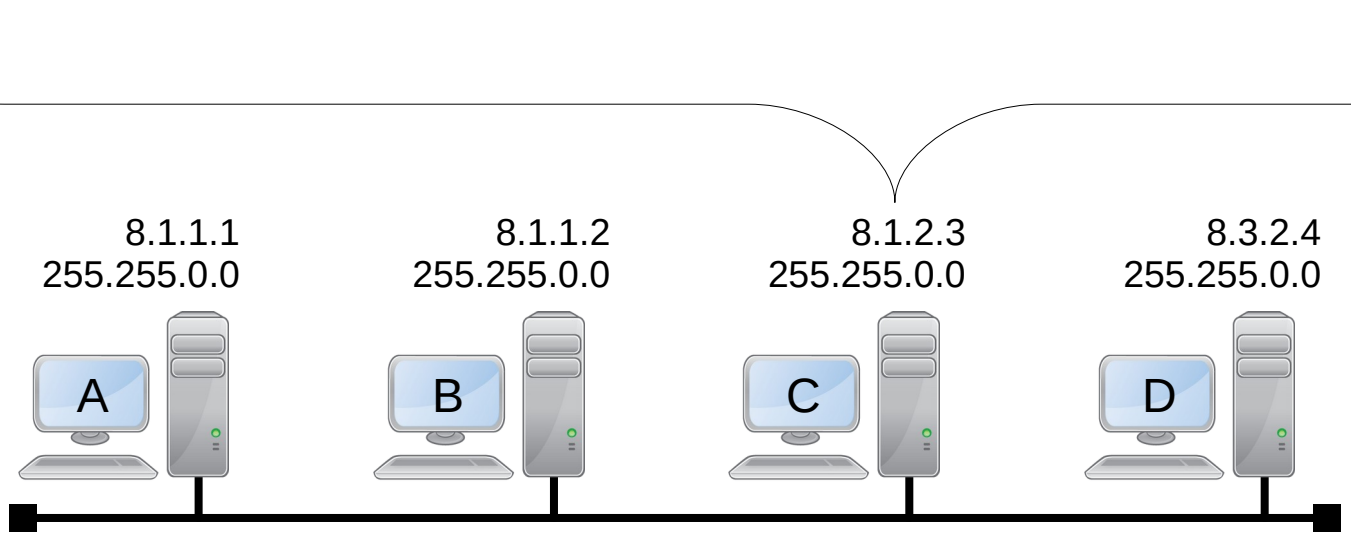
Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0



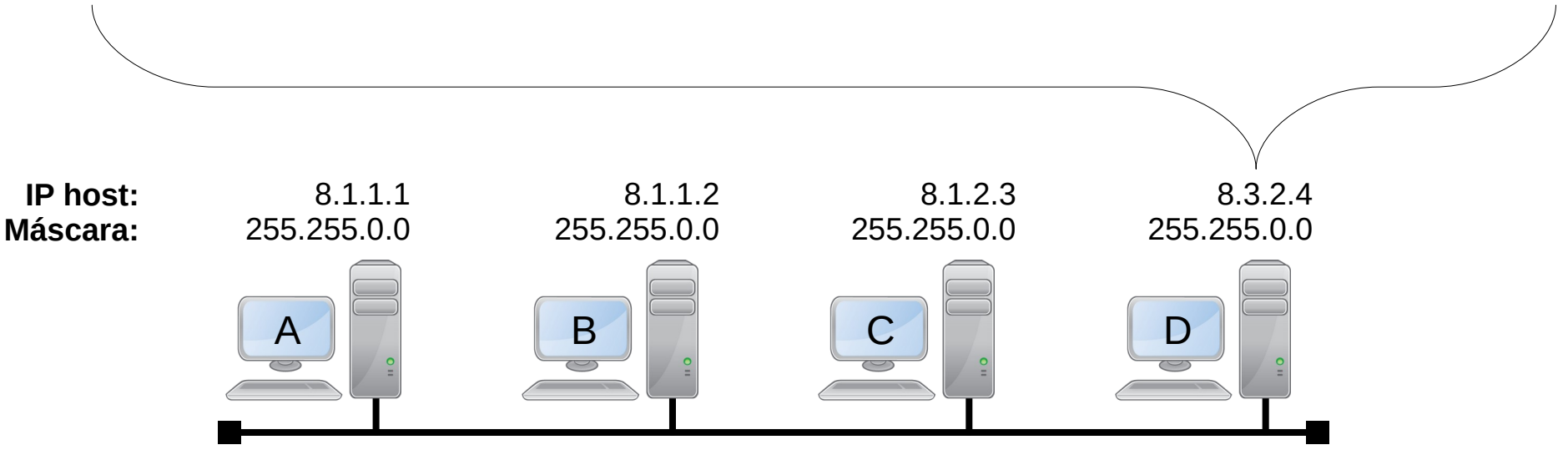
Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0	.	0	0	0	0	0	0	1	1
Máscara	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0



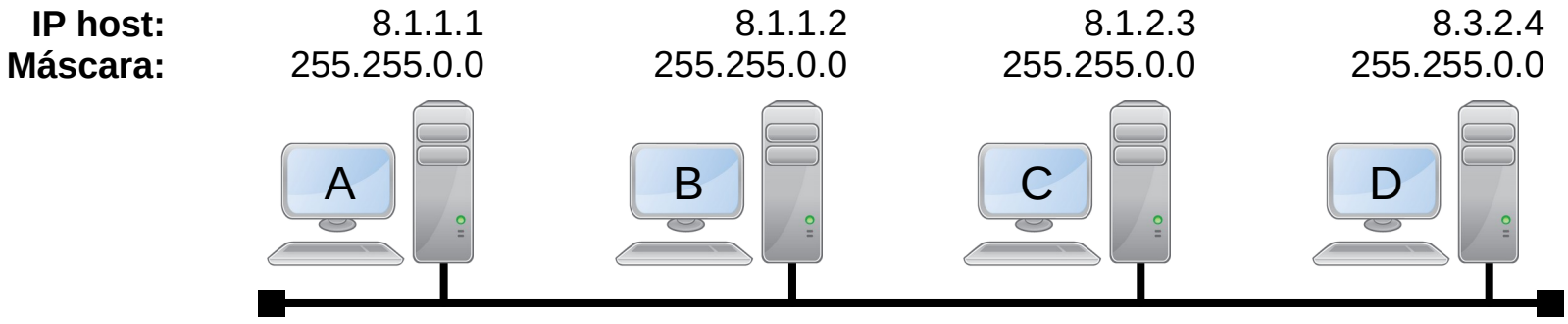
Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	**1**	1	.	0	0	0	0	0	0	1	0	.	0	0	0	0	0	1	0	0
Máscara	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0



Endereçamento IP
(*classless*)

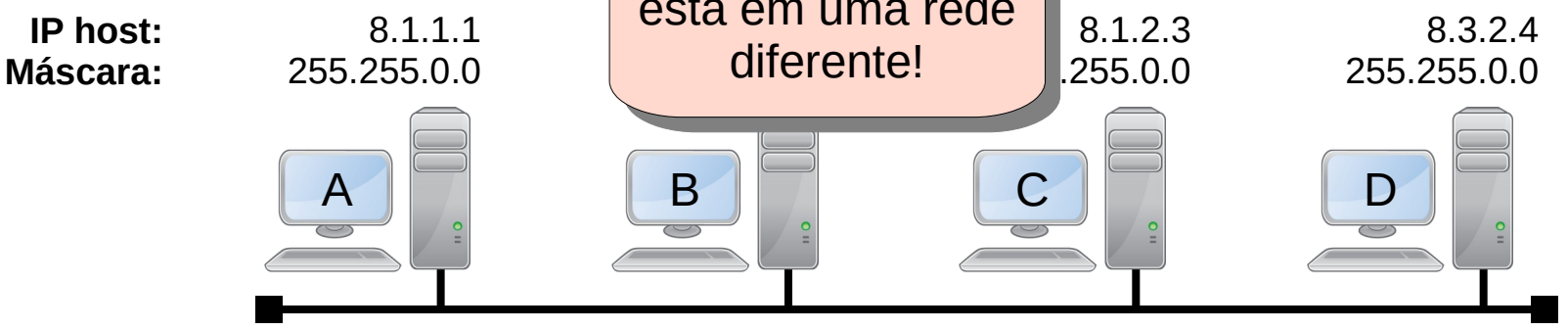
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	**0**	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	**0**	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
IP host C	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	**0**	1	.	0	0	0	0	0	0	1	0	.	0	0	0	0	0	0	1	1
IP host D	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	**1**	1	.	0	0	0	0	0	0	1	0	.	0	0	0	0	0	1	0	0
Máscara	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	.	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	.	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	.	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**



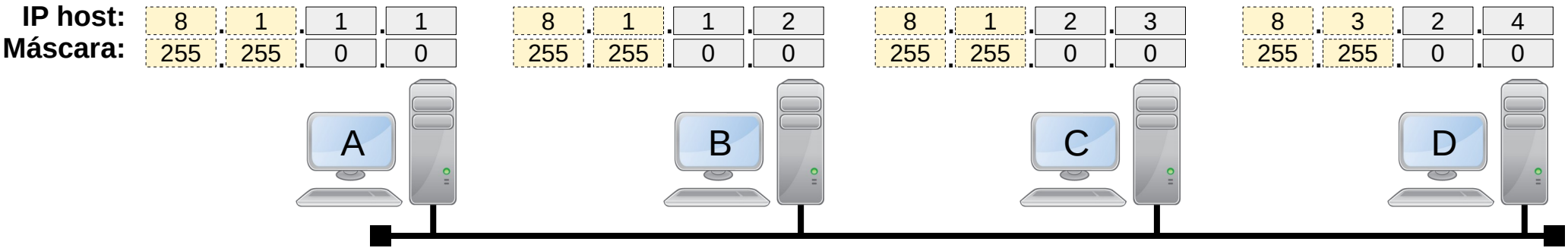
Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
IP host C	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0	.	0	0	0	0	0	0	1	1
IP host D	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	1	1	.	0	0	0	0	0	0	1	0	.	0	0	0	0	0	1	0	0
Máscara	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	.	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	.	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	.	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Agora o *host* D está em uma rede diferente!



Endereçamento IP
(*classless*)



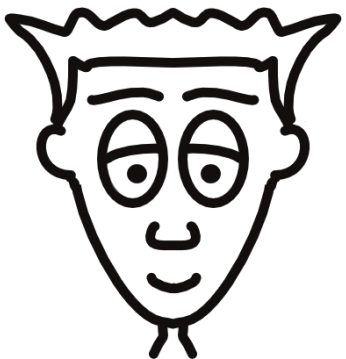
Agora temos duas redes: 8.1 e 8.3

Endereçamento IP
(*classless*)

Ah, agora eu vi a diferença do endereçamento com a máscara!

Sem mudar o IP conseguimos dividir a rede em duas…

Redes 8.1 e 8.3



Endereçamento IP
(*classless*)

Ah, agora eu vi a diferença do endereçamento com a máscara!

Sem mudar o IP conseguimos dividir a rede em duas…

Redes 8.1 e 8.3

Sim, mas o profissional de redes não iria chamar de rede 8.1 e 8.3… (IP da rede)

Endereçamento IP
(*classless*)

Endereço IP de rede e IP de *broadcast*:

Antes de prosseguir, estamos nos referindo as redes como 8, 8.1 e 8.3, mas temos o **endereço IP da rede**, que é utilizado para identificar a rede. Tal endereço é o primeiro/menor IP de cada rede.

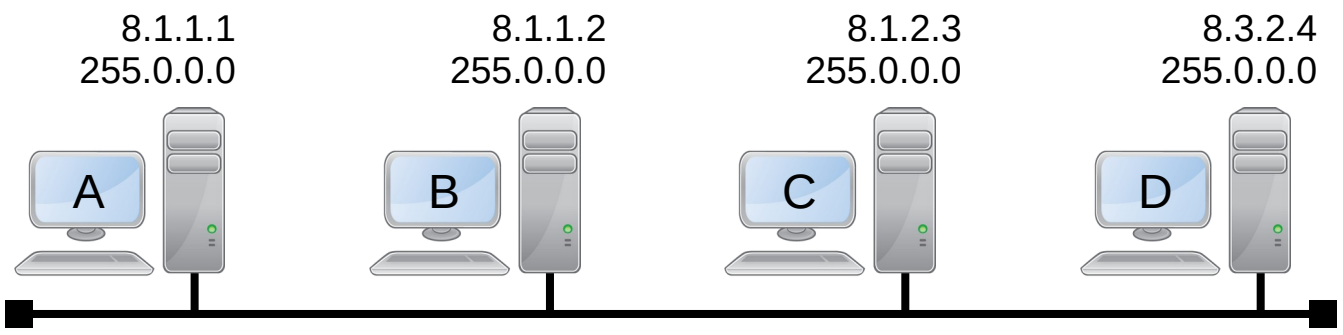
Já o **endereço IP de *broadcast***, é o último/maior IP de cada rede. O IP de *broadcast* é utilizado para enviar uma mesma mensagem para todos *hosts* daquela rede.

Tanto o IP de *broadcast* quanto o IP da rede **são IPs reservados** em toda rede, ou seja, *hosts* não podem utilizar tais endereços.

Endereçamento IP
(*classless*)

Calculando IP de rede:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede									.									.									.								



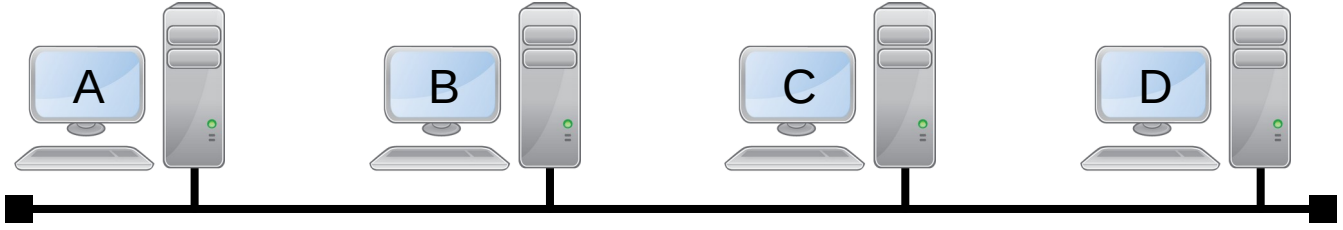
Endereçamento IP
(*classless*)

Calculando IP de rede:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede									.									.									.								

Atenção, neste exemplo a máscara voltou para **255.0.0.0**

IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.0.0.0	255.0.0.0	255.0.0.0	255.0.0.0

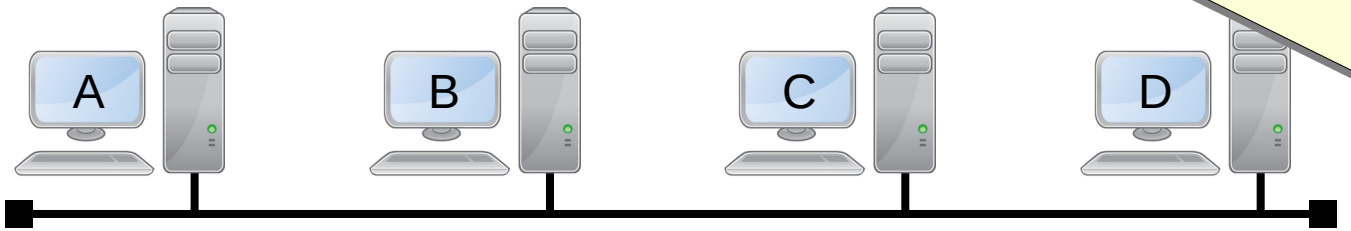


Endereçamento IP
(*classless*)

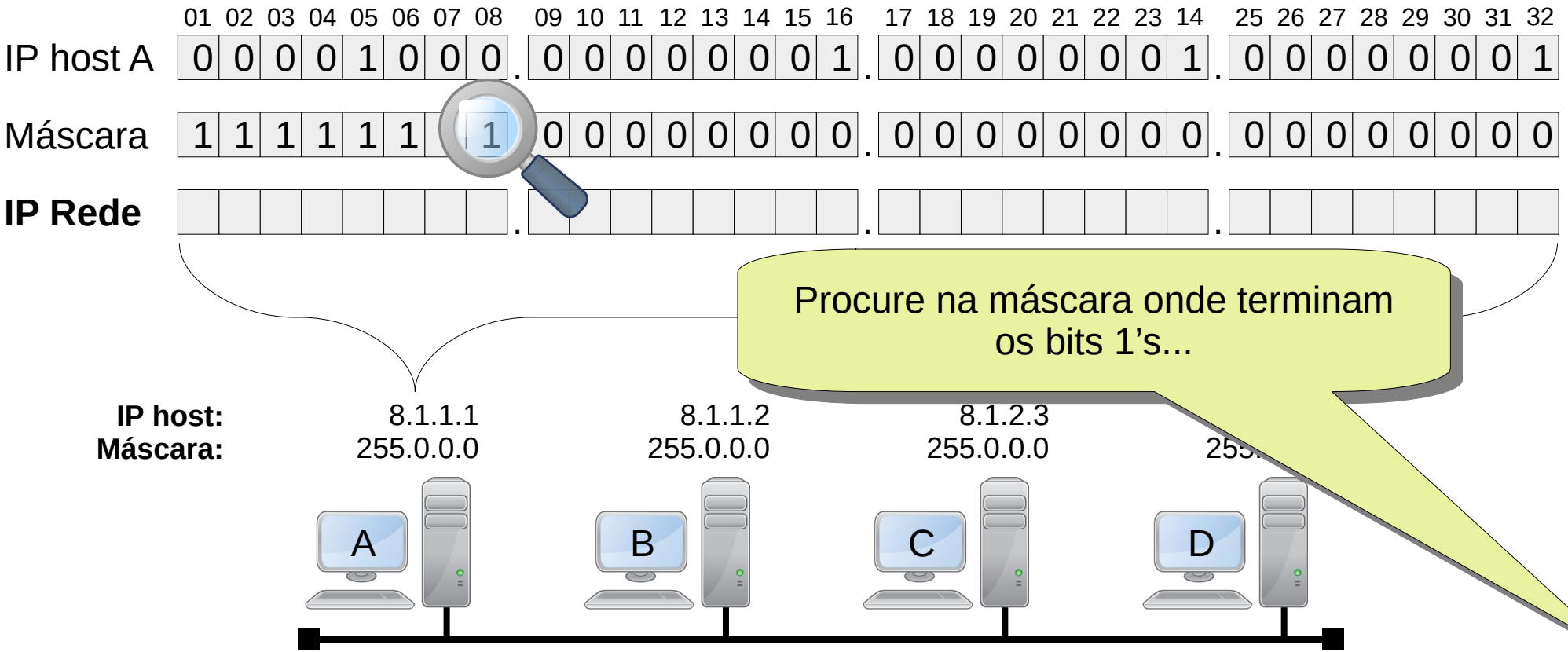
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede									.									.									.								

O calculo do IP da rede é um "*and*" entre máscara e IP do *host*…
Mas vamos fazer de outra forma que é mais prático!

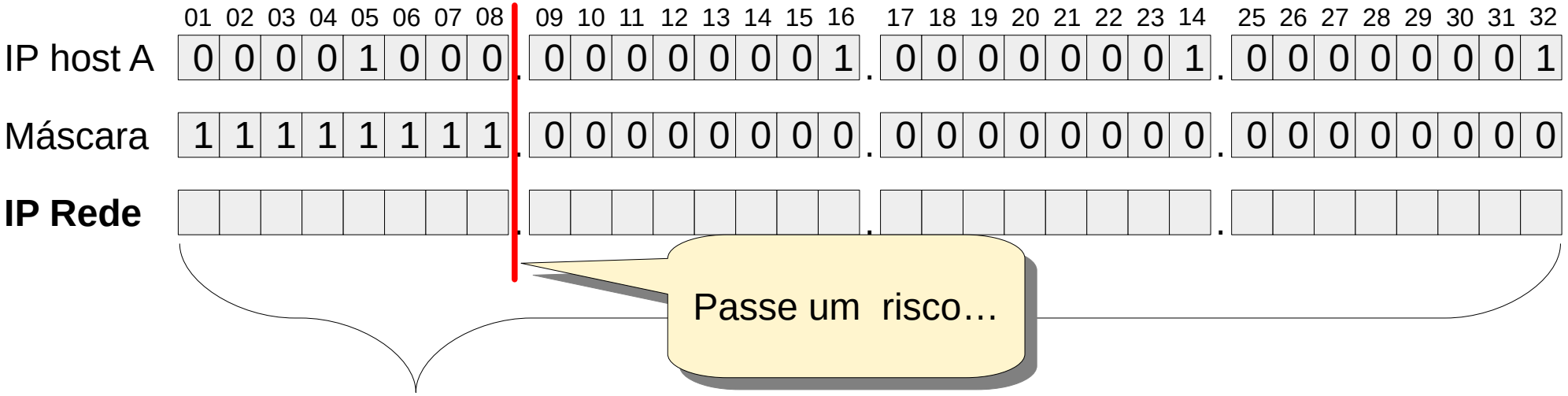
IP host:	8.1.1.1	8.1.1.2	8.1.2.3
Máscara:	255.0.0.0	255.0.0.0	255.0.0.0

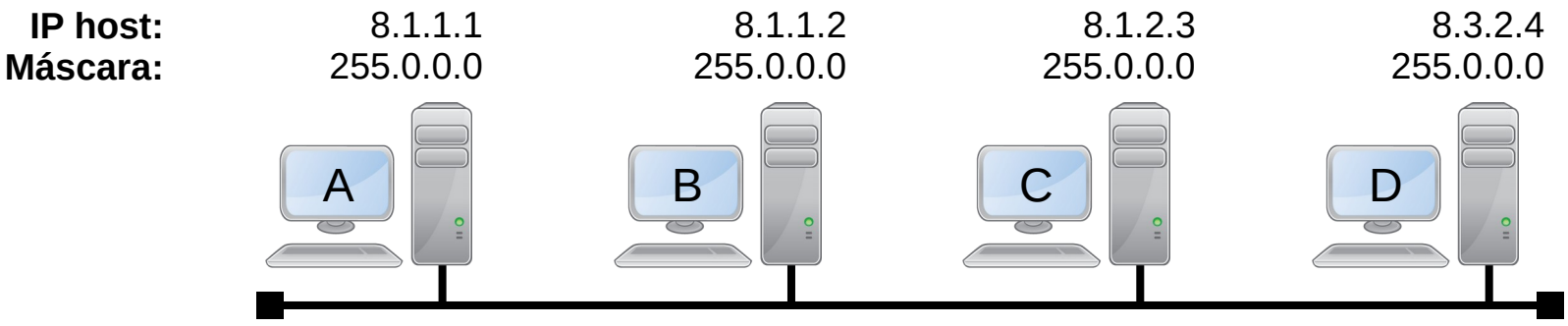


Endereçamento IP
(*classless*)



Endereçamento IP
(*classless*)



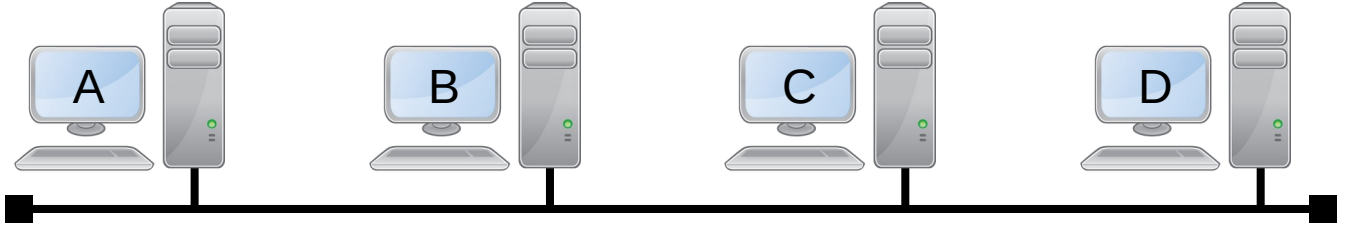


Endereçamento IP
(*classless*)

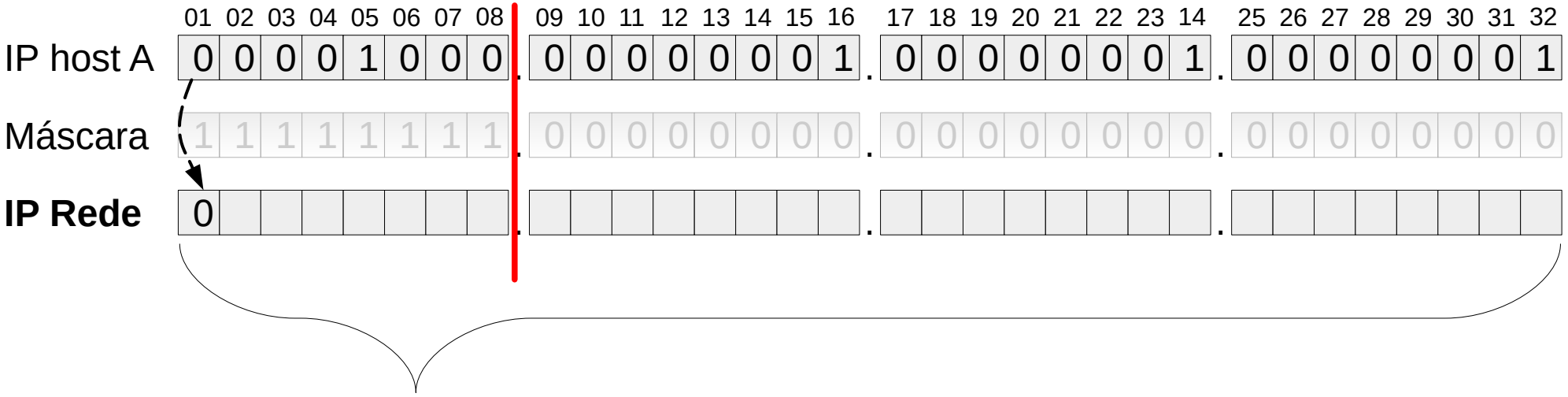
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede									.									.									.								

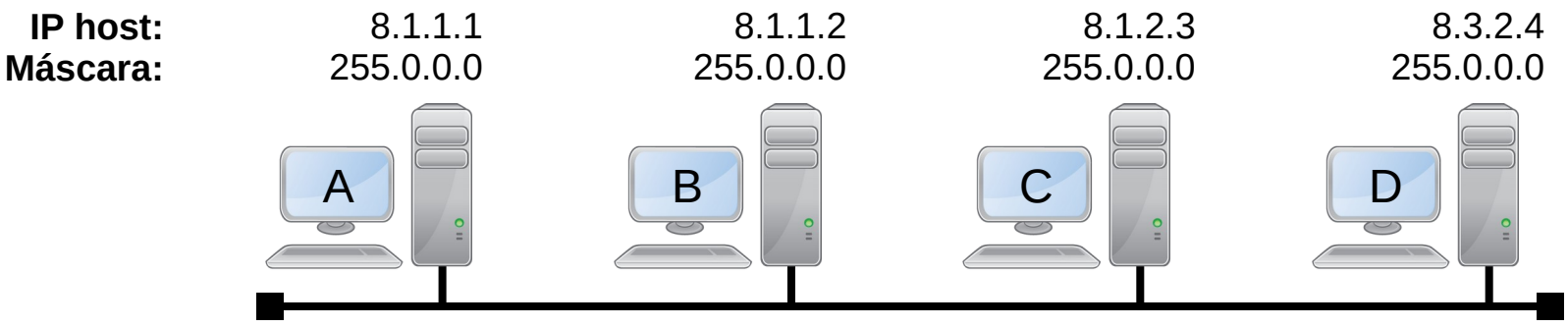
Copie do IP do *host* para o IP da rede...
o que estiver a esquerda do risco...

IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.0.0.0	255.0.0.0	255.0.0.0	255.0.0.0

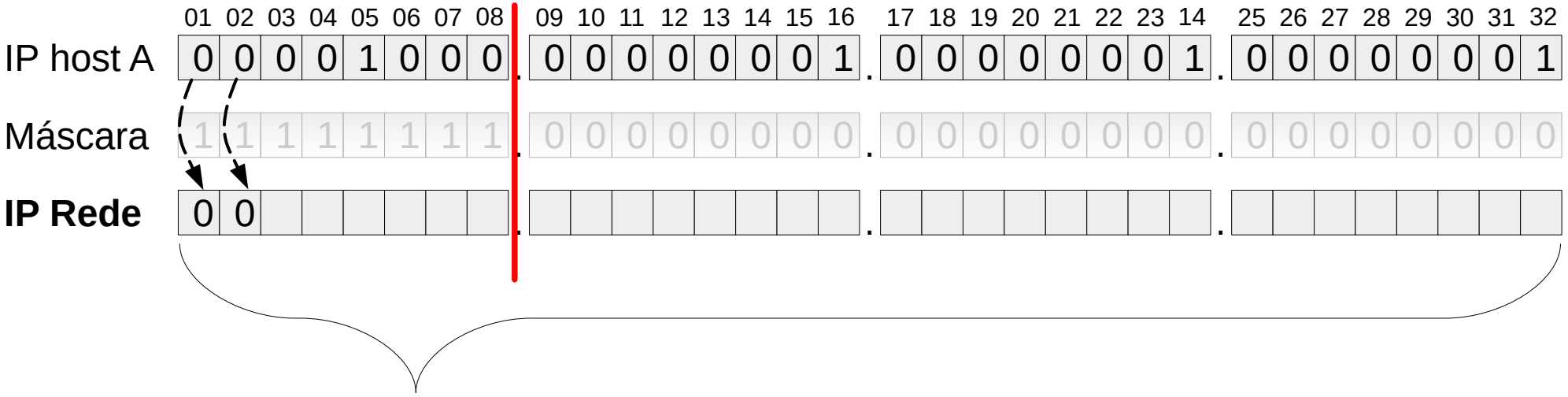


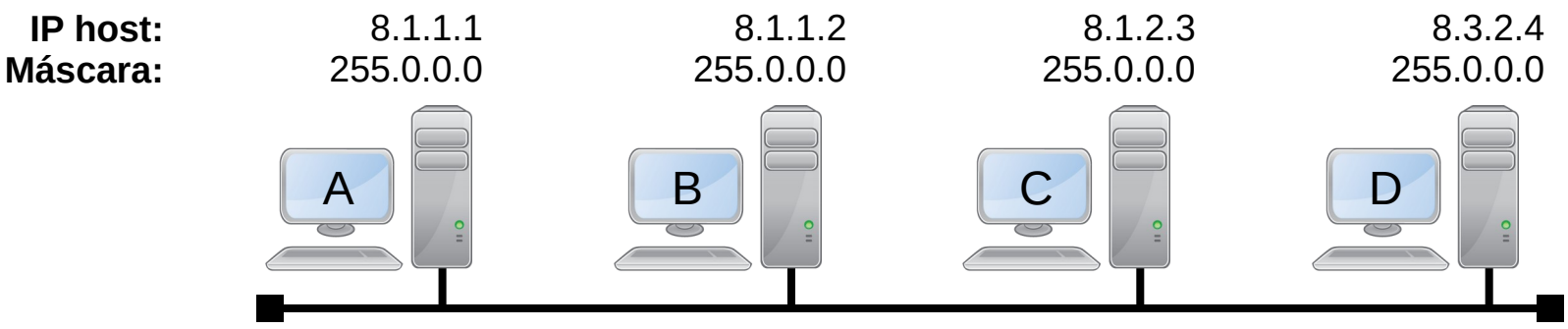
Endereçamento IP
(*classless*)



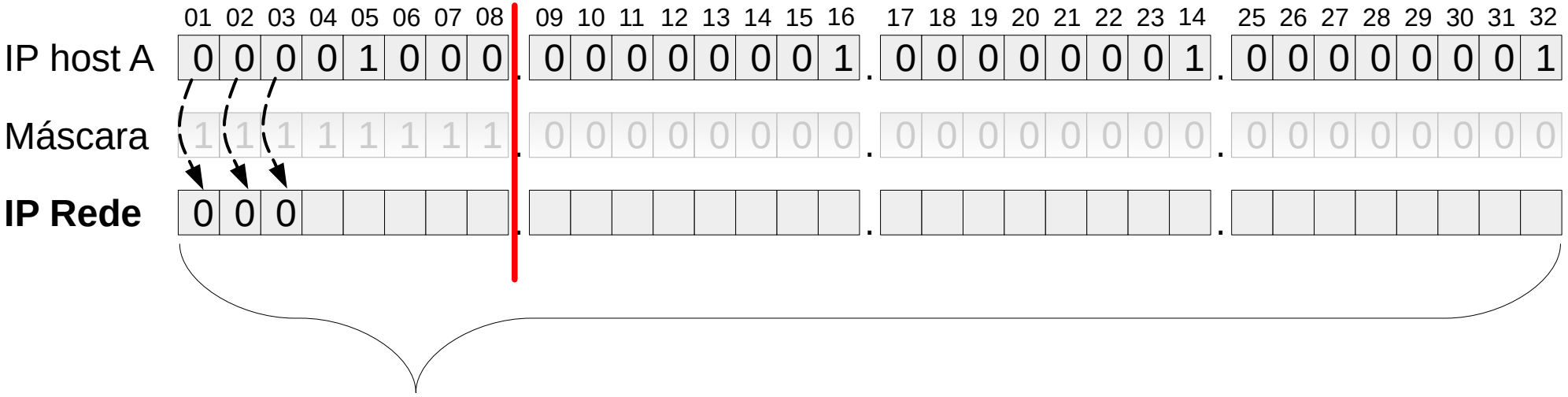


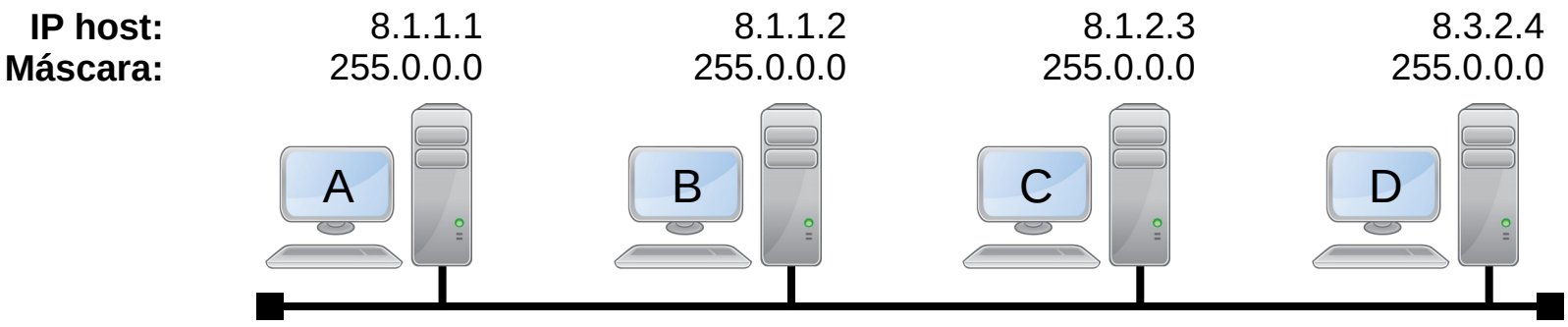
Endereçamento IP
(*classless*)



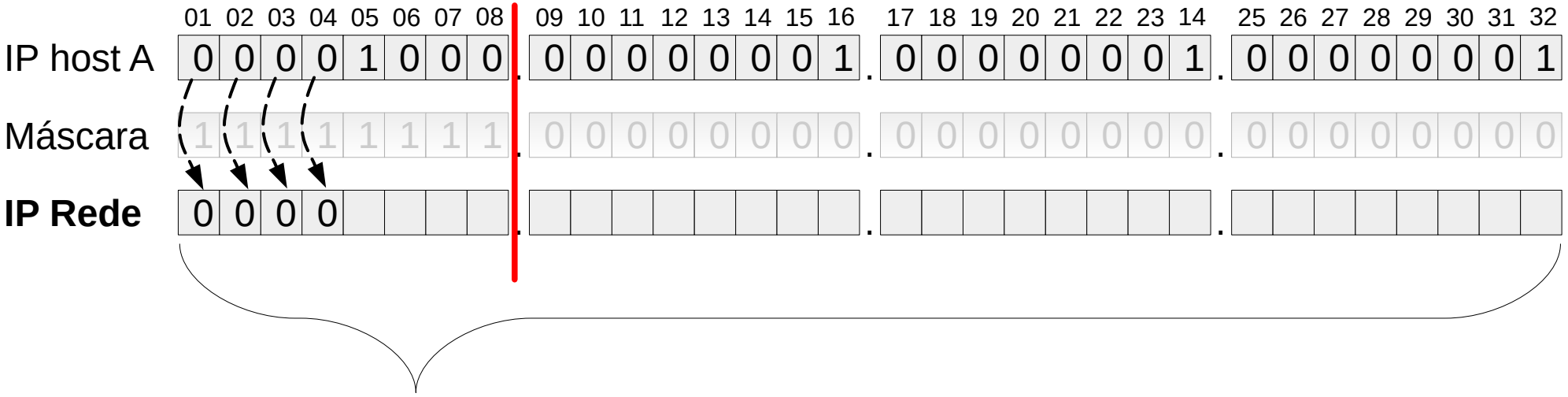


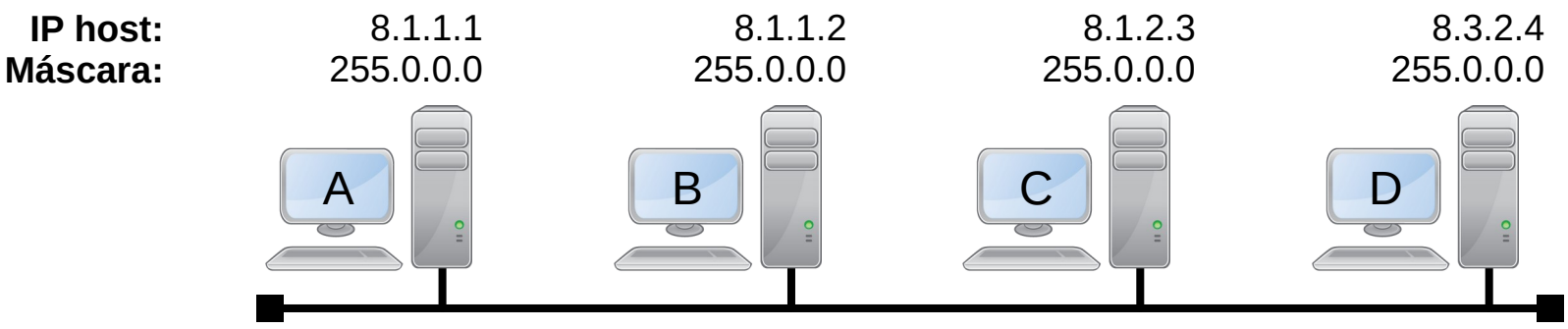
Endereçamento IP
(*classless*)



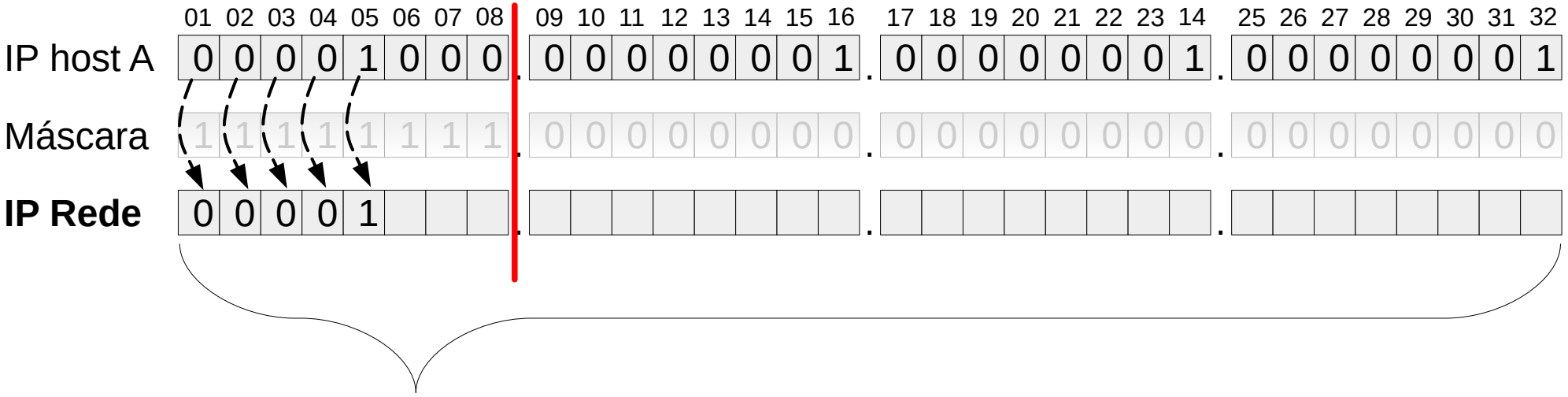


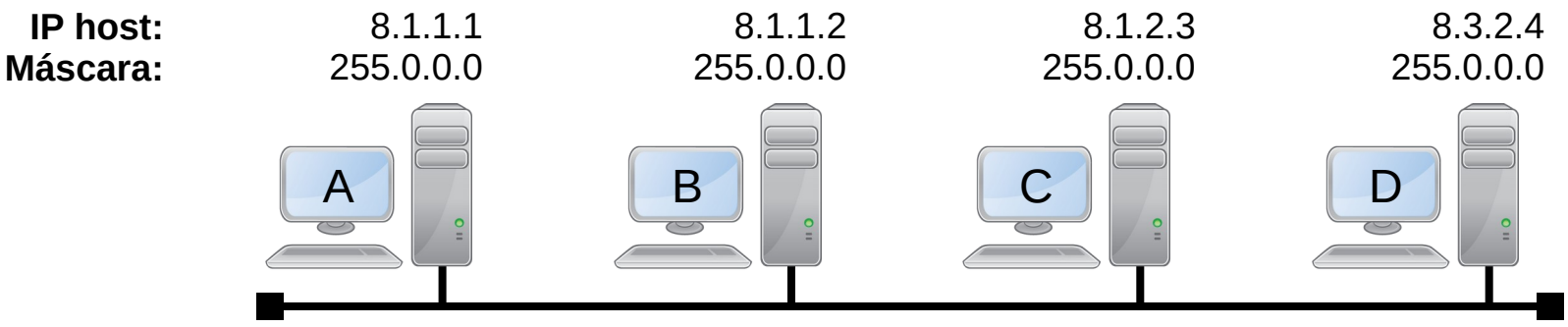
Endereçamento IP
(*classless*)



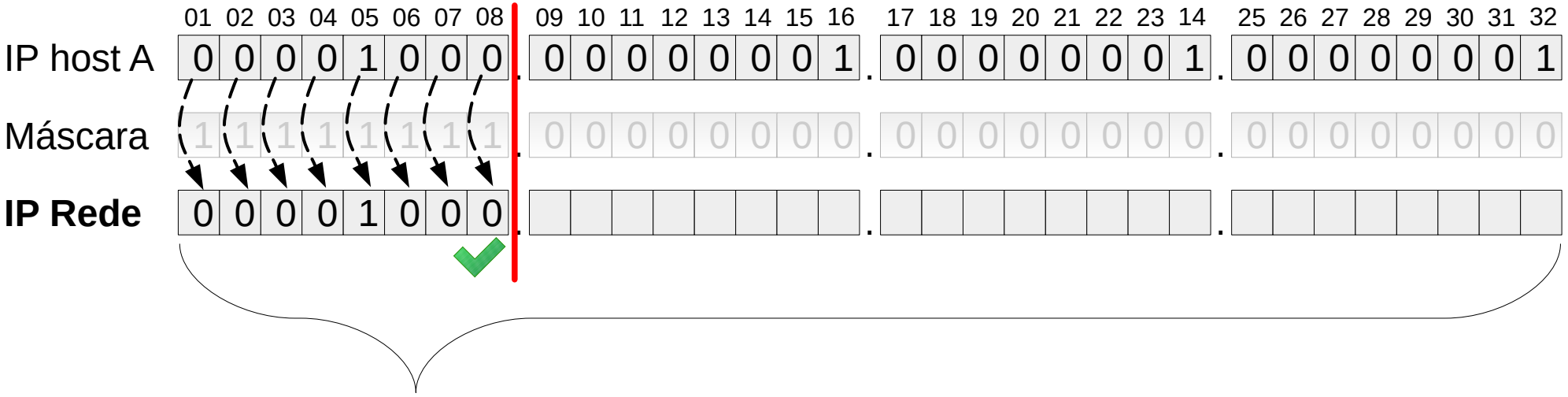


Endereçamento IP
(*classless*)

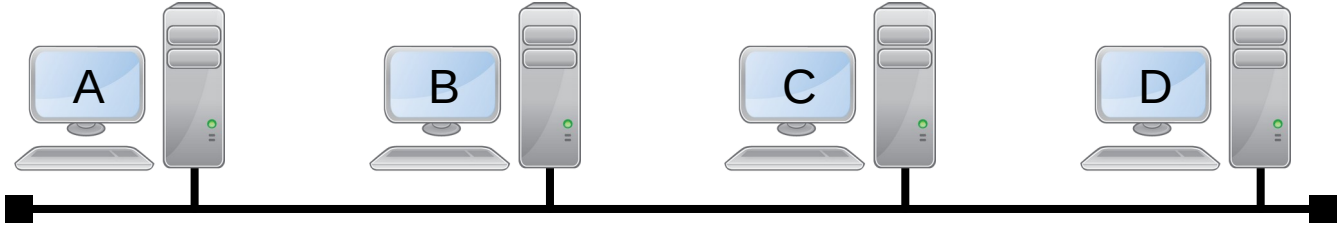




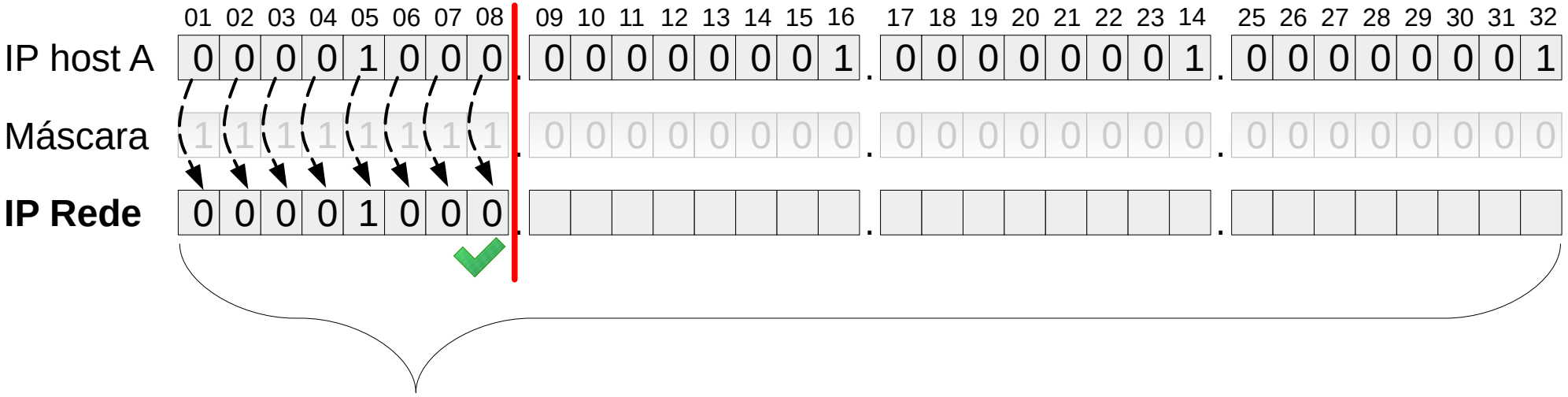
Endereçamento IP
(*classless*)

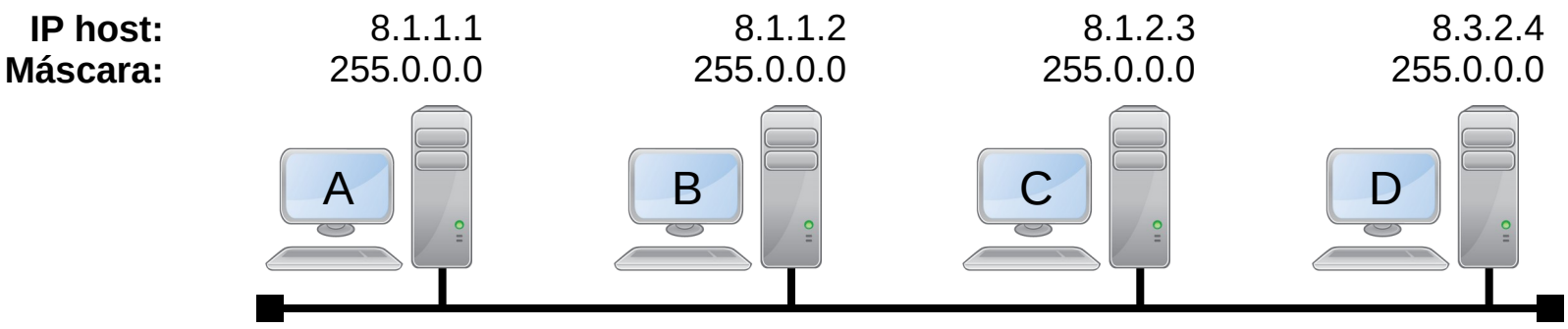


IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0



Endereçamento IP
(*classless*)



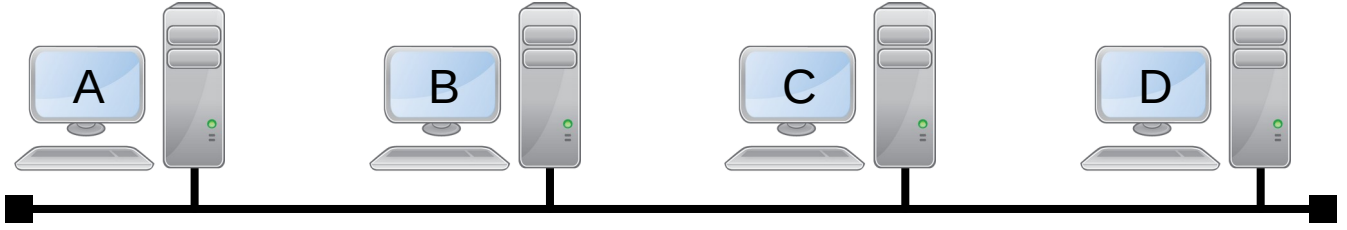


Endereçamento IP
(*classless*)

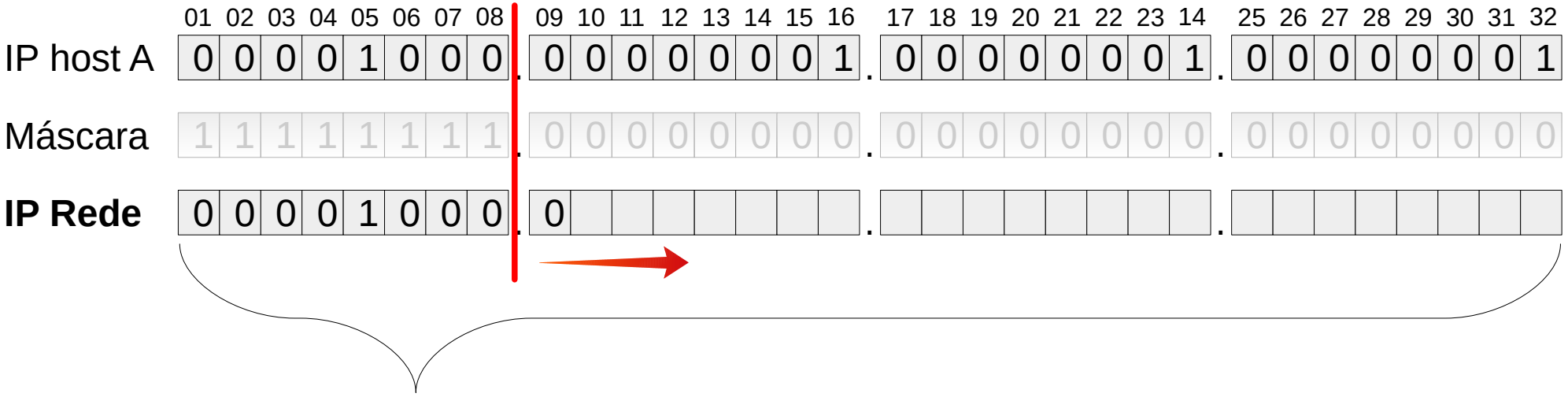
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.									.									.								

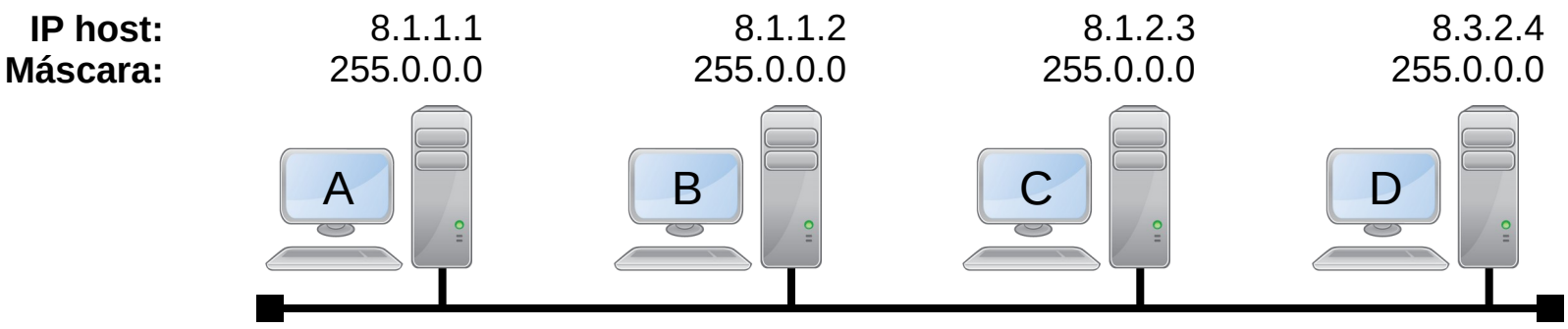
Na parte do IP de rede a direita do risco, preencha os bits restantes com 0 (zeros).

IP host:	8.1.1.1	8.1.1.2		
Máscara:	255.0.0.0	255.0.0.0	255.0.0.0	255.0.0.0



Endereçamento IP
(*classless*)



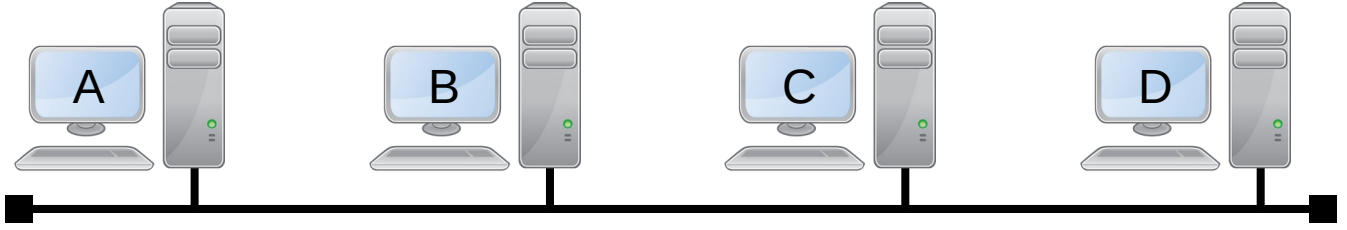


Endereçamento IP
(*classless*)

Calculando IP de rede:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0							.									.								

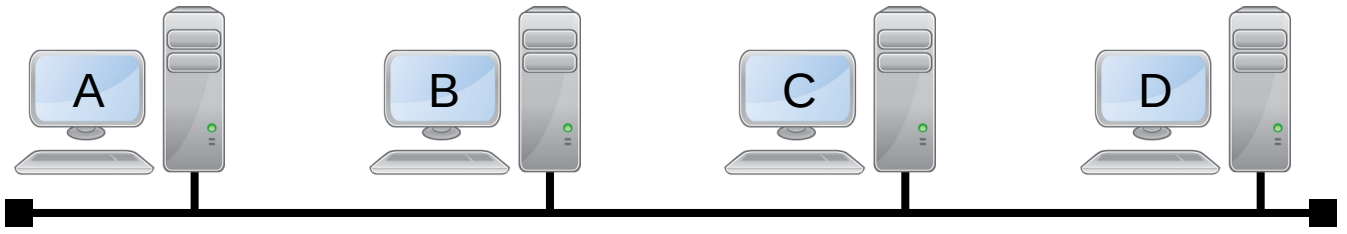
IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0



Endereçamento IP
(*classless*)

Calculando IP de rede:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0								.								

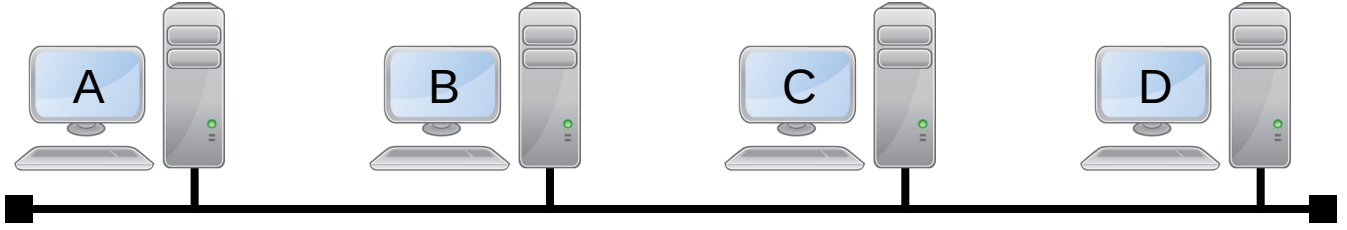


Endereçamento IP
(*classless*)

Calculando IP de rede:

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	14	25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							

IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.0.0.0	255.0.0.0	255.0.0.0	255.0.0.0



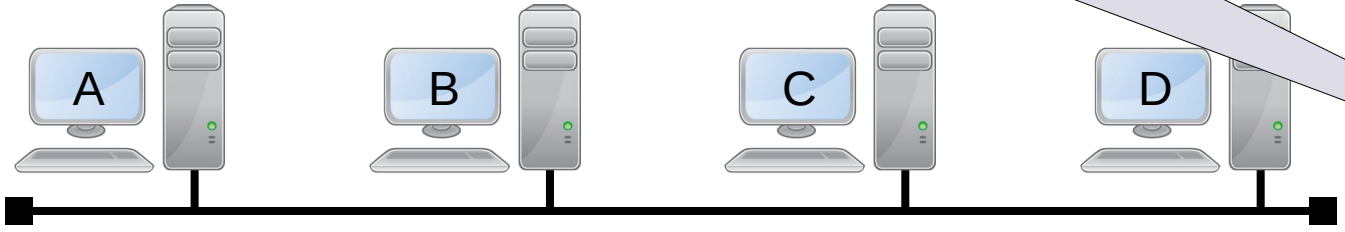
Endereçamento IP
(*classless*)

Calculando IP de rede:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0

Pronto o IP da rede, para o *host* A é: **8.0.0.0**

IP host: 8.1.1.1 8.1.1.2
Máscara: 255.0.0.0 255.0.0.0

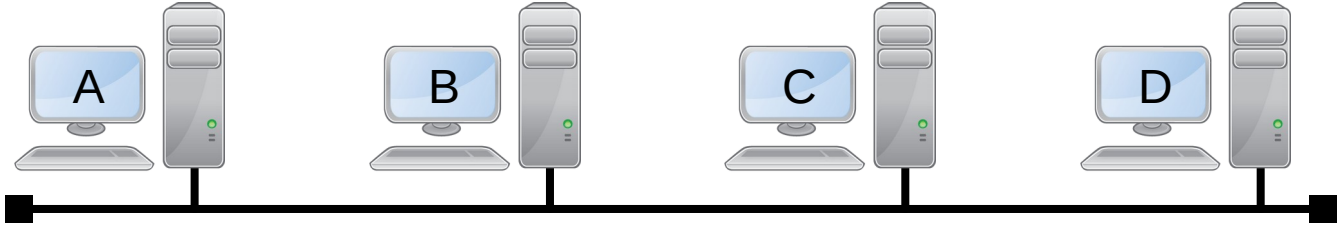


Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast									.									.									.								

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0



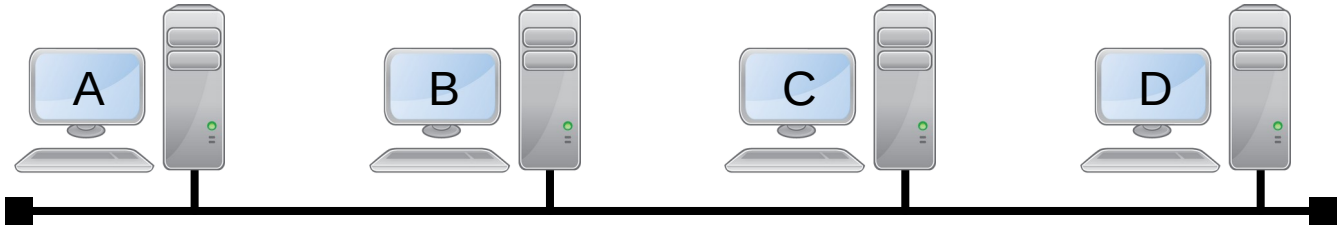
Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast																																			

O processo inicial é o mesmo:
Copie do IP do *host* para o IP de *broadcast*
o que estiver a esquerda do risco...

IP host: 8.1.1.1
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0

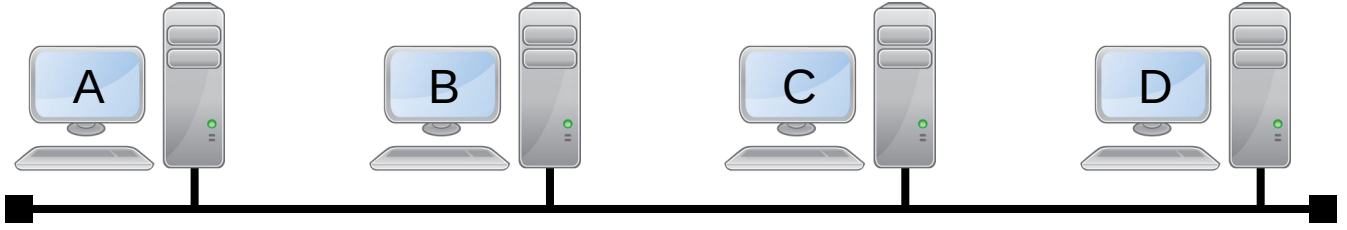


Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:

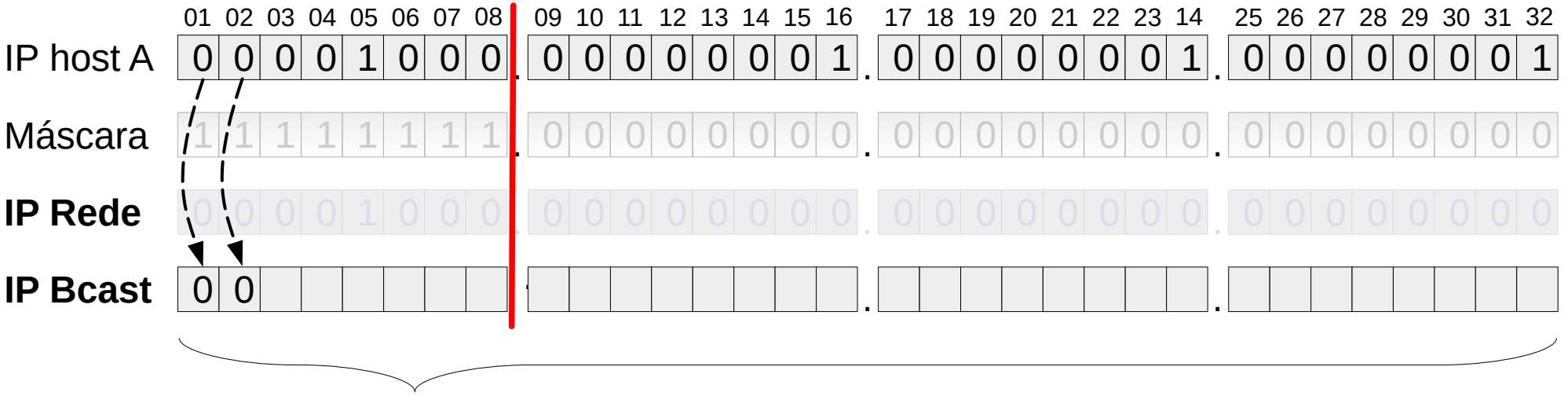
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0								.									.									.								

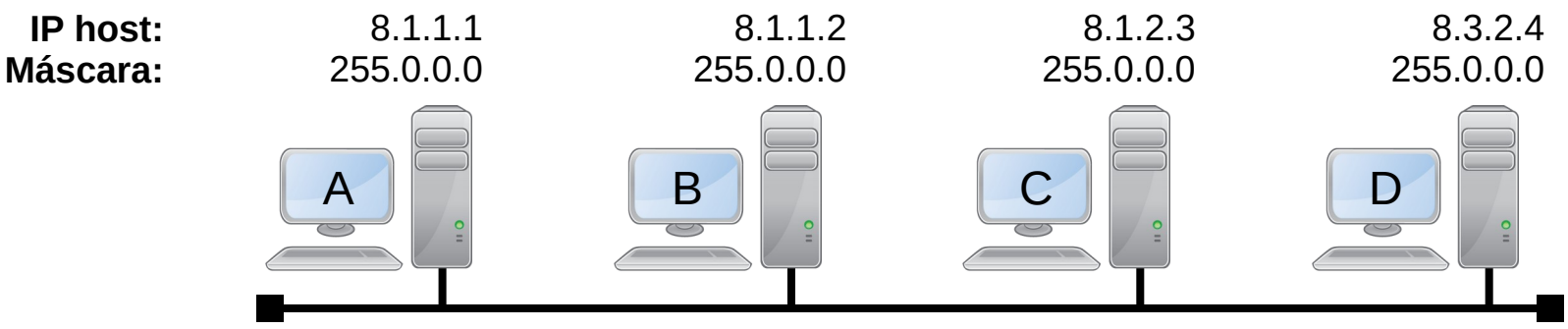
IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0



Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:



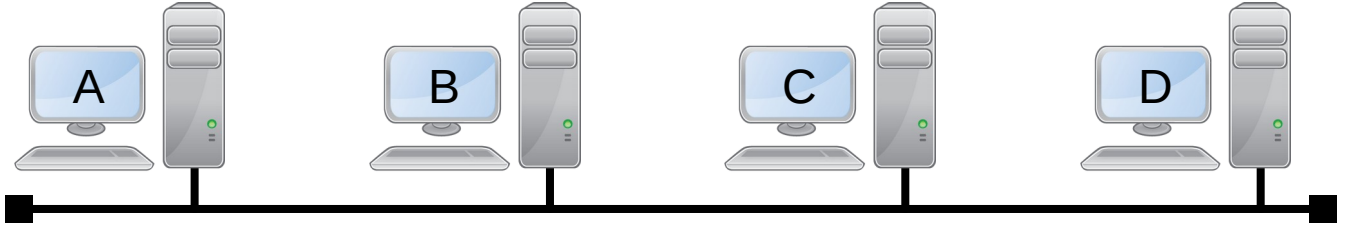


Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.									.									.								

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0



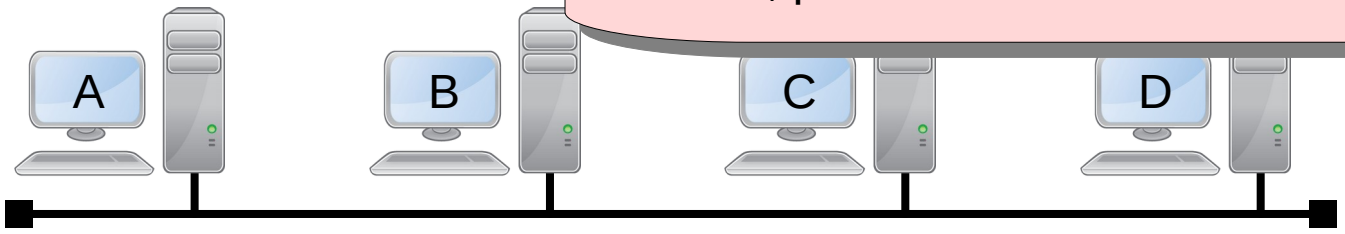
Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.									.									.								

Agora, na parte do IP de *broadcast,* a direita do risco, preencha os bits restantes com 1 (uns).

IP host: 8.1.1.1 8.1.1.
Máscara: 255.0.0.0 255.0.0.

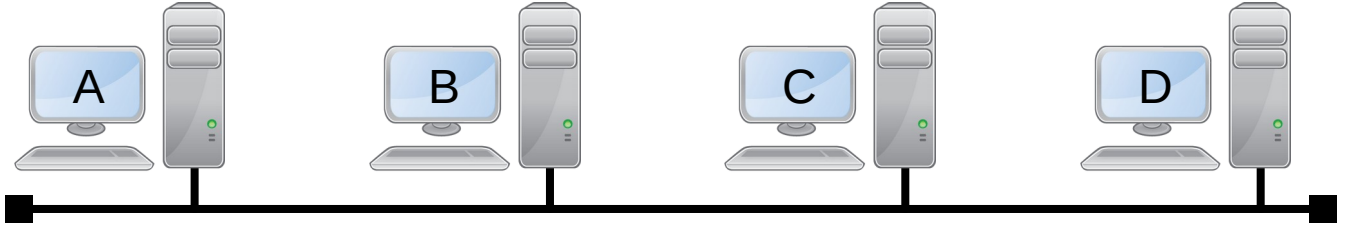


Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	1								.									.								

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0

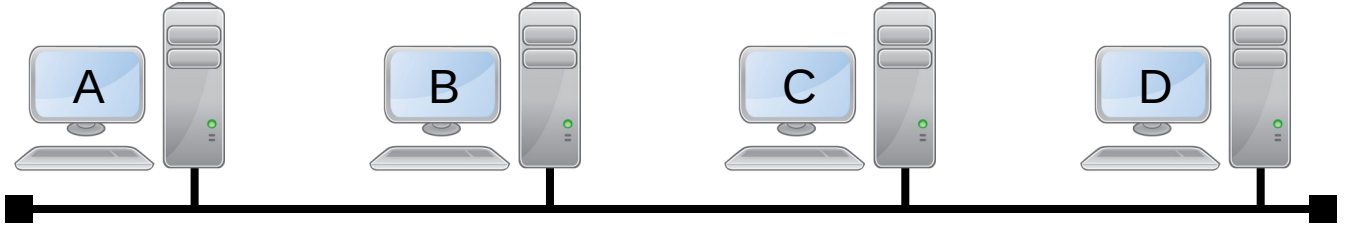


Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0

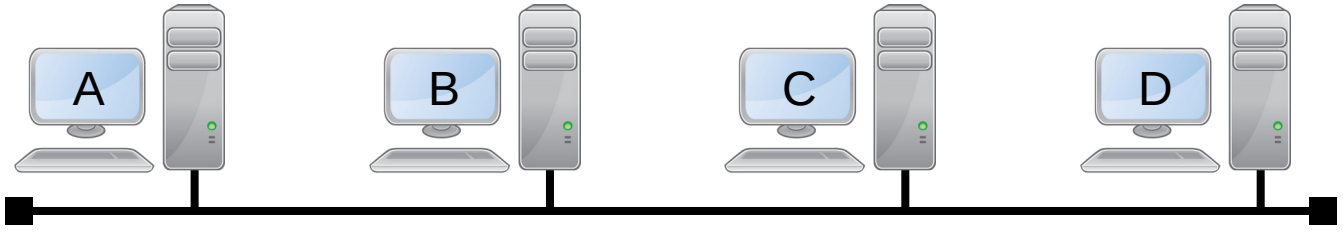


Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0



Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:

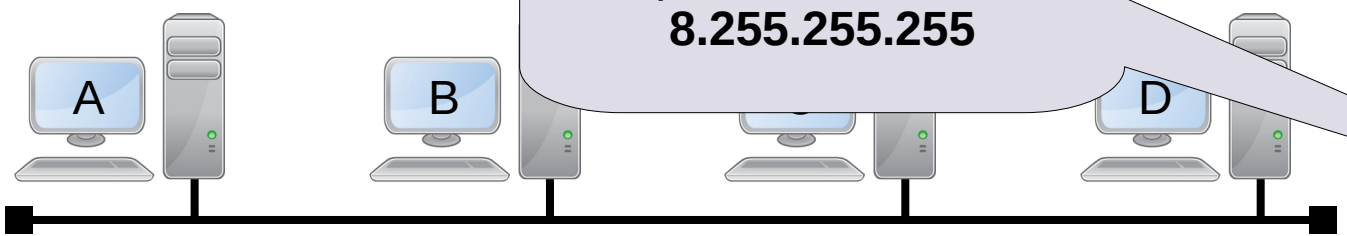
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1

IP host: 8.1.1.1
Máscara: 255.0.0.0

8.
255.

8.3.2.4
255.0.0.0

Pronto o IP de *broadcast*, para o *host* A é:
8.255.255.255



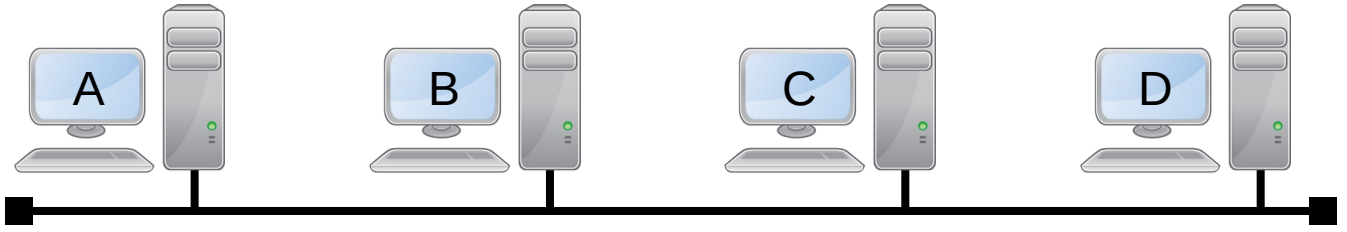
Endereçamento IP
(*classless*)

Calculando IP de *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0															0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0															0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	1	1	1	1	1	1				1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1

O mesmo calculo deve ser feito para todos os *hosts* da rede.

IP host:	8.1.1.1	8.1.1	8.1.2.3	8.3.2.4
Máscara:	255.0.0.0	255.0.0.0	255.0.0.0	255.0.0.0

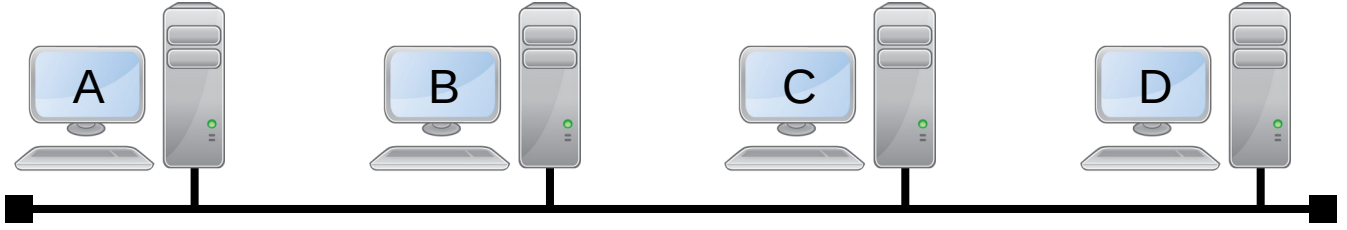


Endereçamento IP
(*classless*)

Calculando IP de rede e IP de *broadcast*

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0



Endereçamento IP
(*classless*)

Para todos os *hosts*? Isso vai levar muito tempo…

Endereçamento IP
(*classless*)

Para todos os *hosts*? Isso vai levar muito tempo…

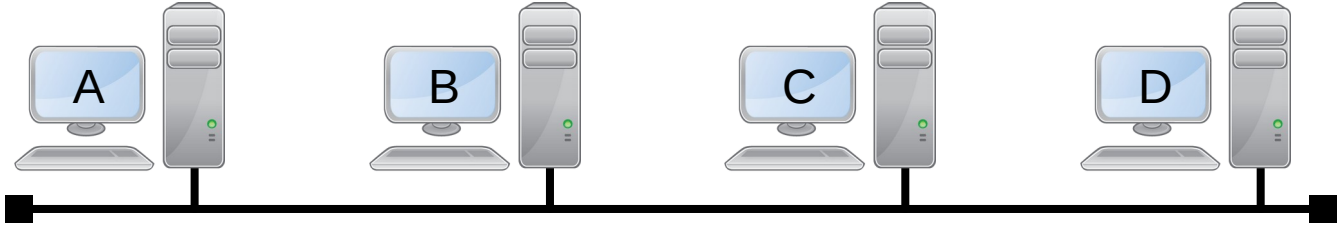
Calma, com a prática isso fica bem rápido!

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede									.									.									.								
IP Bcast									.									.									.								

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0

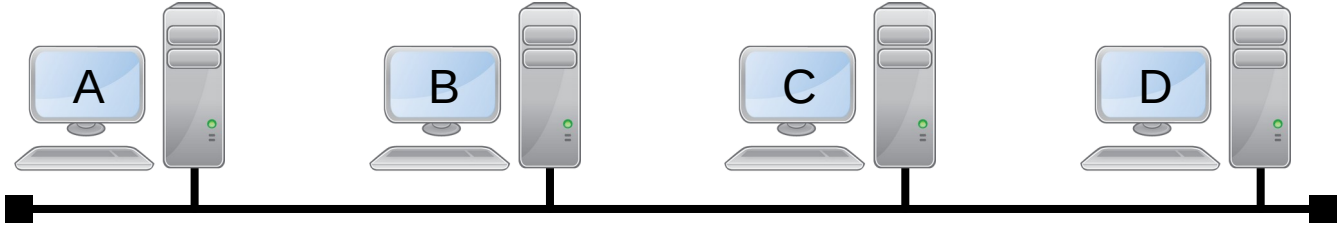


Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede									.									.									.								
IP Bcast									.									.									.								

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0

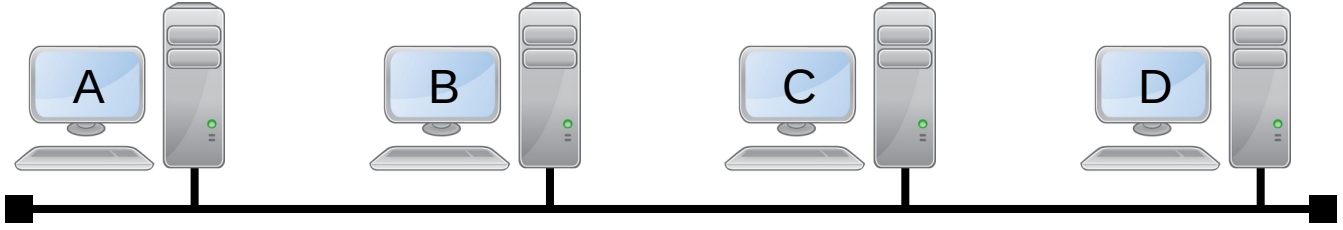


Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.									.									.								
IP Bcast									.									.									.								

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0

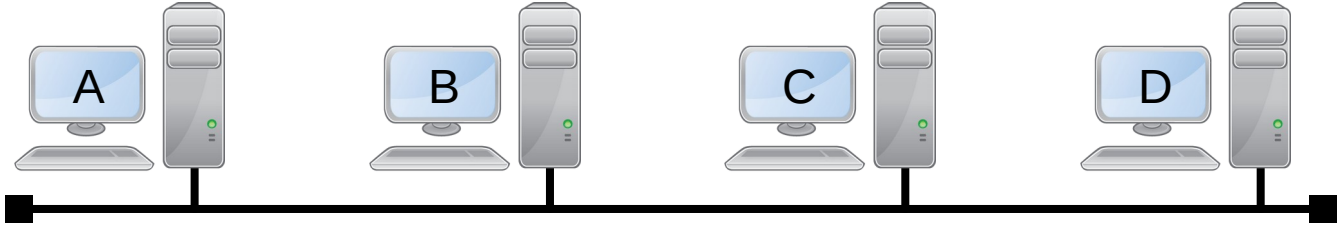


Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.									.									.								
IP Bcast	0	0	0	0	1	0	0	0	.									.									.								

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0

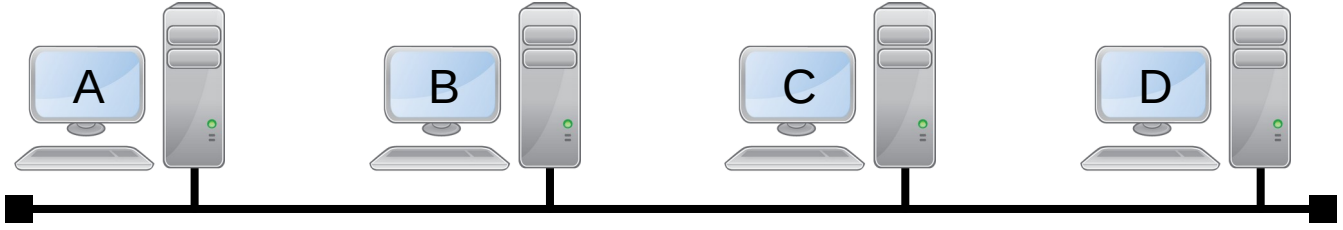


Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0							.									.								
IP Bcast	0	0	0	0	1	0	0	0	.									.									.								

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0

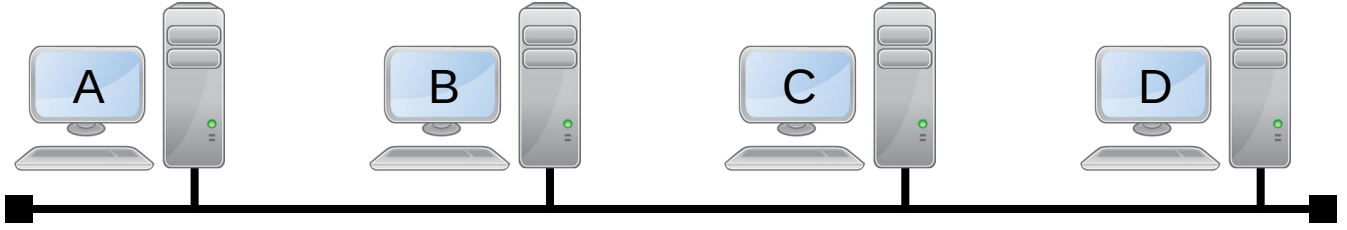


Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	1	1							.									.								

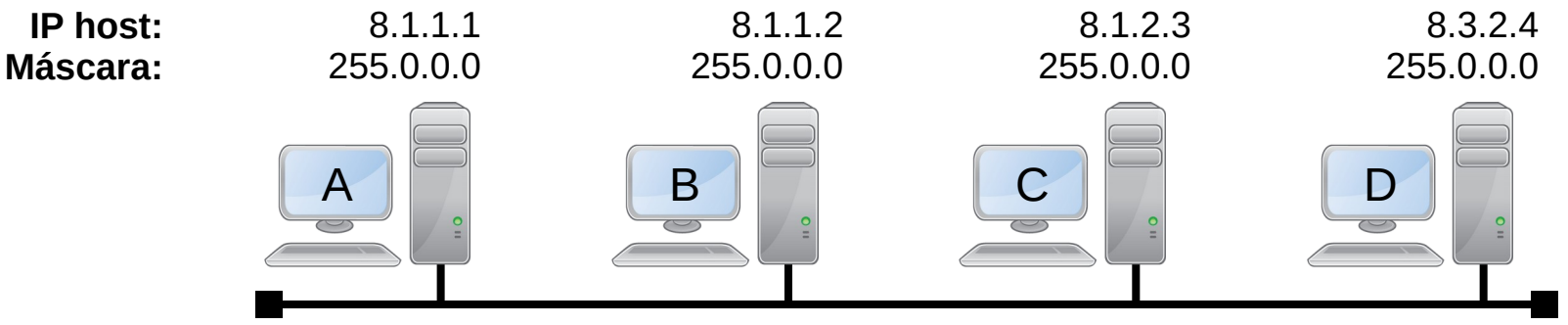
IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0



Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1



Endereçamento IP (*classless*)

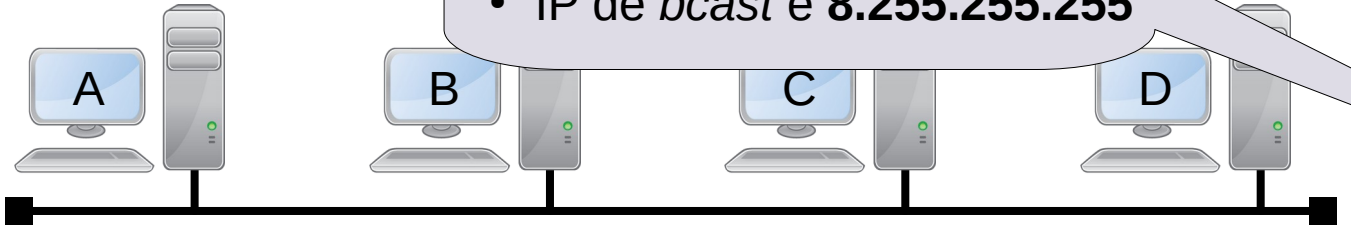
Calculando IP de rede e *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1

Para o *host* B:
- IP da rede é **8.0.0.0**
- IP de *bcast* é **8.255.255.255**

IP host: 8.1.1.1
Máscara: 255.0.0.0

8.3.2.4
255.0.0.0



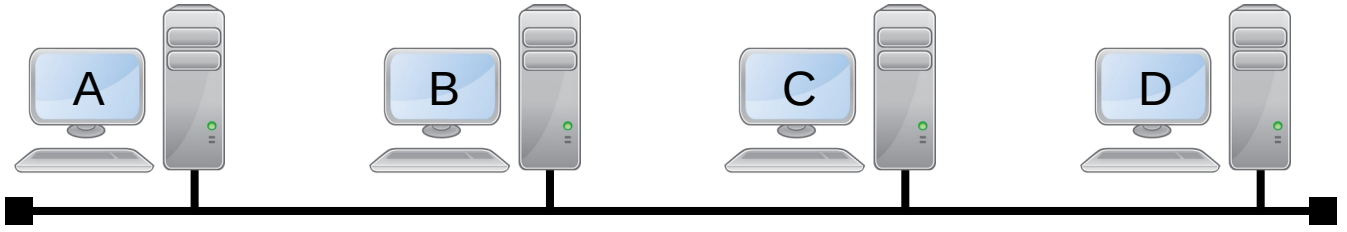
Endereçamento IP (*classless*)

Calculando IP de rede e *broadcast*:

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host B	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	1	0
Máscara	1	1	1	1	1	1	1	1	.	0	0							.								0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0							.								0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	1	1	1	1	1	1	1	1	.	1	1			1	1	1	1	.	1	1	1	1	1	1	1	1

Tente você fazer o calculo para *host* C e D!

IP host: 8.1.1.1 8.1.1.2 8.1.2.3 8.3.2.4
Máscara: 255.0.0.0 255.0.0.0 255.0.0.0 255.0.0.0



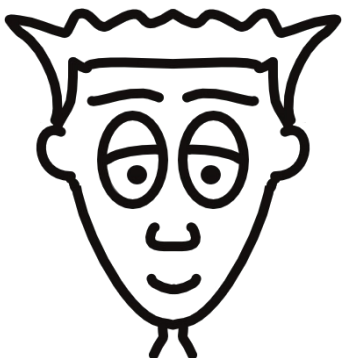
Endereçamento IP
(*classless*)

Fiz aqui e deu o mesmo para os dois *hosts*:

- IP de rede, **8.0.0.0**;

- IP de *broadcast,* **8.255.255.255**,

Está certo?



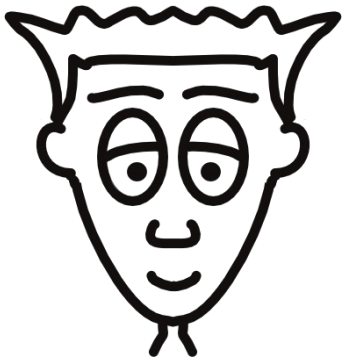
Endereçamento IP
(*classless*)

Fiz aqui e deu o mesmo para os dois *hosts*:

- IP de rede, **8.0.0.0**;

- IP de *broadcast,* **8.255.255.255**,

Está certo?



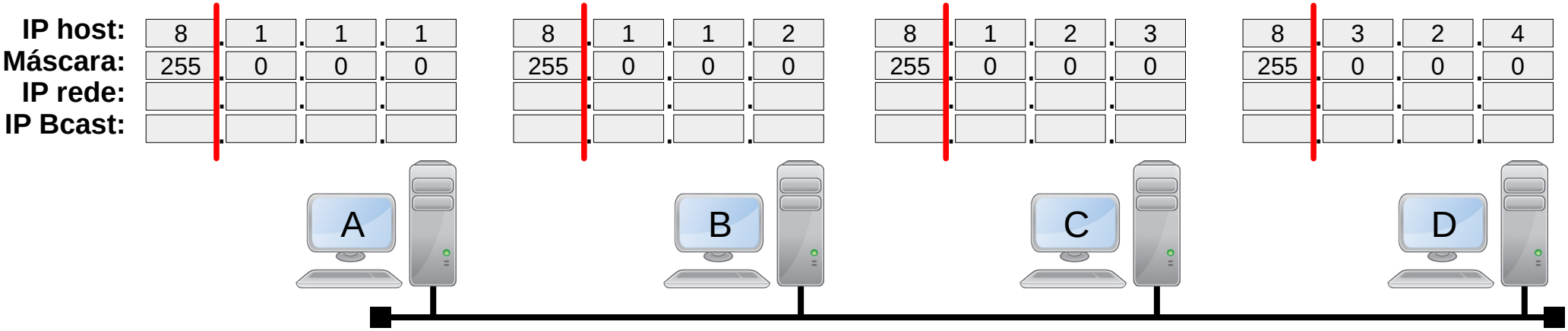
Está certo!
É necessário notar que todos possuem o mesmo IP de rede, logo estão na mesma rede…
Dá para fazer isso facilmente só usando o IP em decimal...

Endereçamento IP
(*classless*)

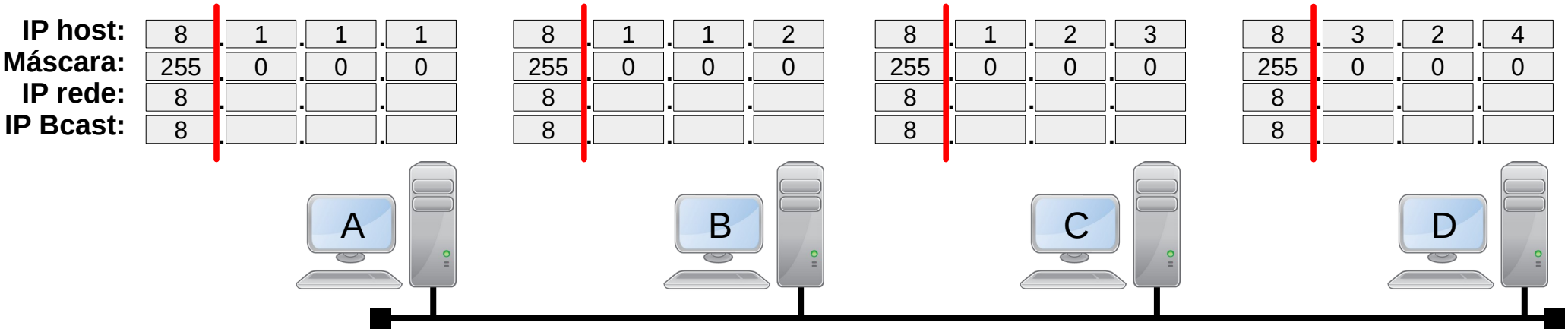
Calculando IP de rede e *broadcast* com IP decimal e máscara 255.0.0.0:

IP host:	8	1	1	1	8	1	1	2	8	1	2	3	8	3	2	4
Máscara:	255	0	0	0	255	0	0	0	255	0	0	0	255	0	0	0
IP rede:																
IP Bcast:																

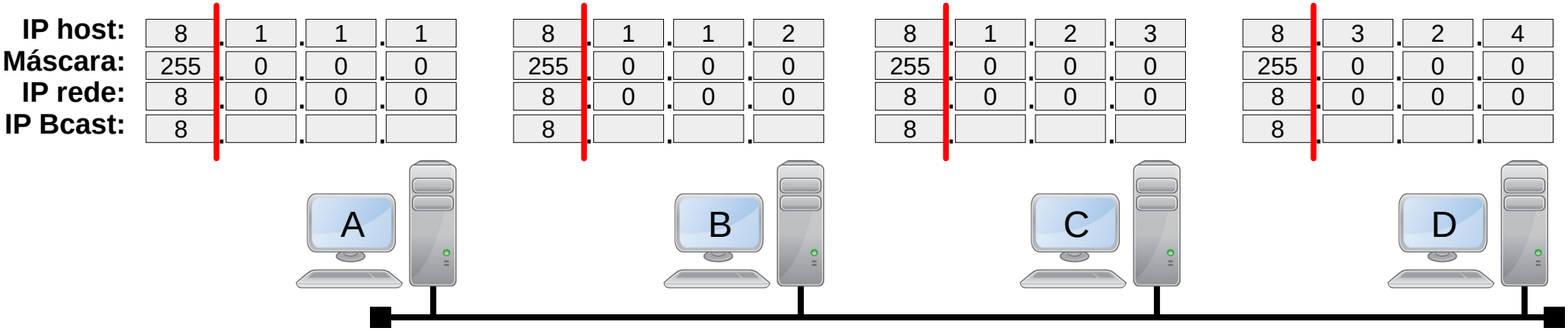
Endereçamento IP
(*classless*)



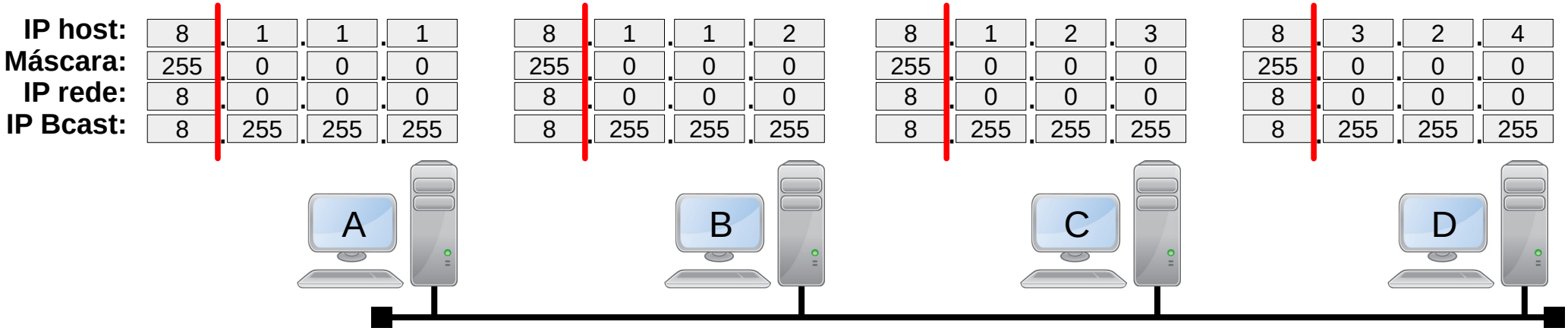
Endereçamento IP
(*classless*)



Endereçamento IP
(*classless*)

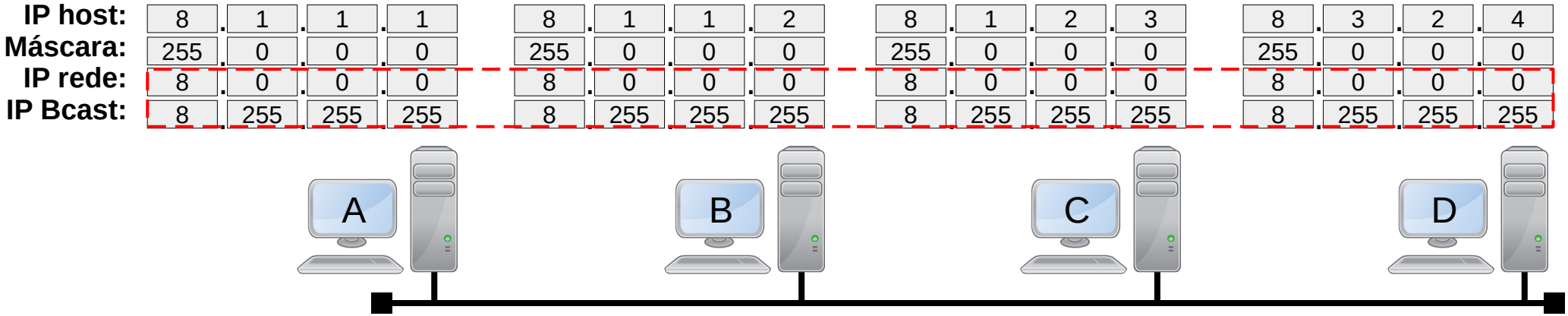


Endereçamento IP
(*classless*)



Todos estão na mesma rede 8.0.0.0, logo possuem o mesmo IP de broadcast 8.255.255.255

Endereçamento IP
(*classless*)



Todos estão na mesma rede 8.0.0.0, logo possuem o mesmo IP de *broadcast* 8.255.255.255

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara **255.255.0.0**:

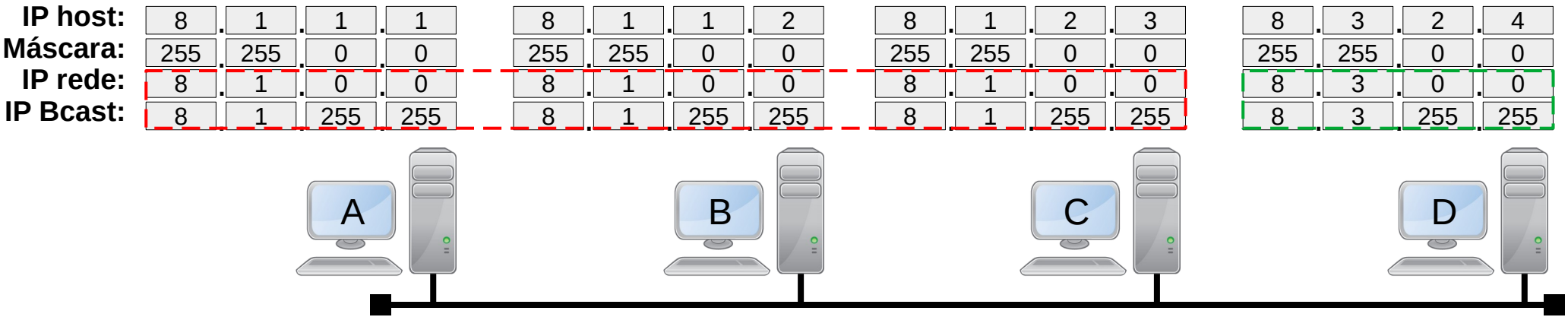
	A	B	C	D
IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.0.0	255.255.0.0	255.255.0.0	255.255.0.0
IP rede:				
IP Bcast:				

Atenção, mudando da máscara 255.0.0.0 para **255.255.0.0**

Endereçamento IP
(*classless*)

	A	B	C	D
IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.0.0	255.255.0.0	255.255.0.0	255.255.0.0
IP rede:	8.1.0.0	8.1.0.0	8.1.0.0	8.3.0.0
IP Bcast:	8.1.255.255	8.1.255.255	8.1.255.255	8.3.255.255

Endereçamento IP
(*classless*)

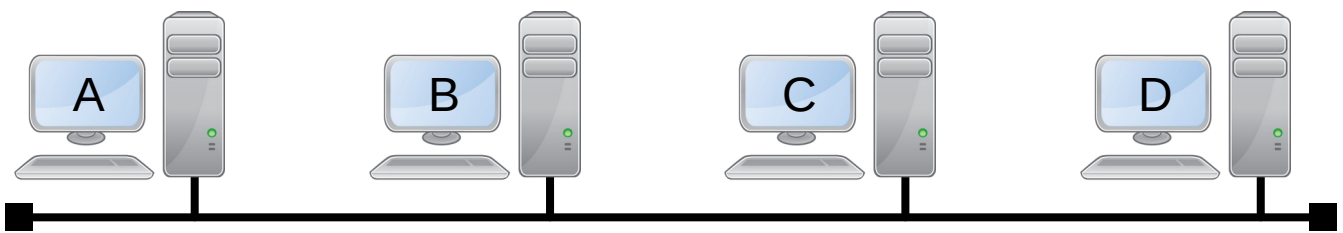


Temos duas redes:
8.1.0.0 e 8.3.0.0

Endereçamento IP
(*classless*)

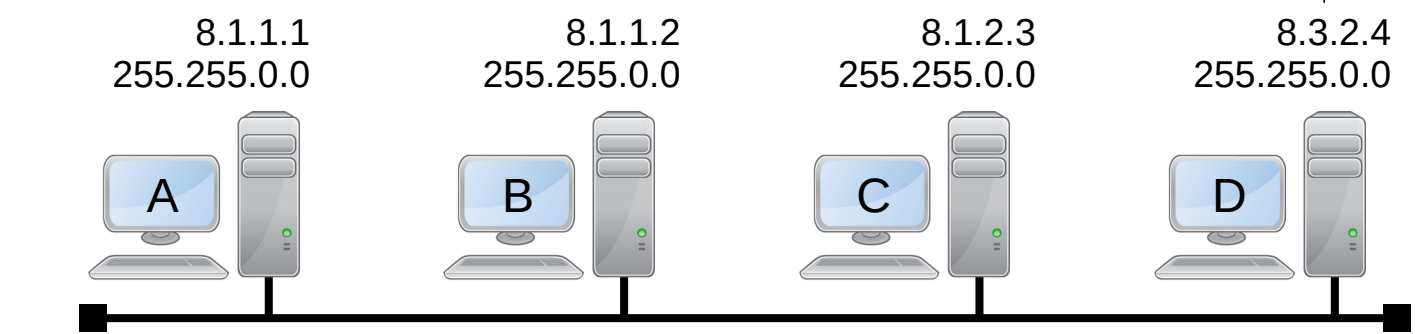
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1

IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.0.0	255.255.0.0	255.255.0.0	255.255.0.0



Endereçamento IP
(*classless*)

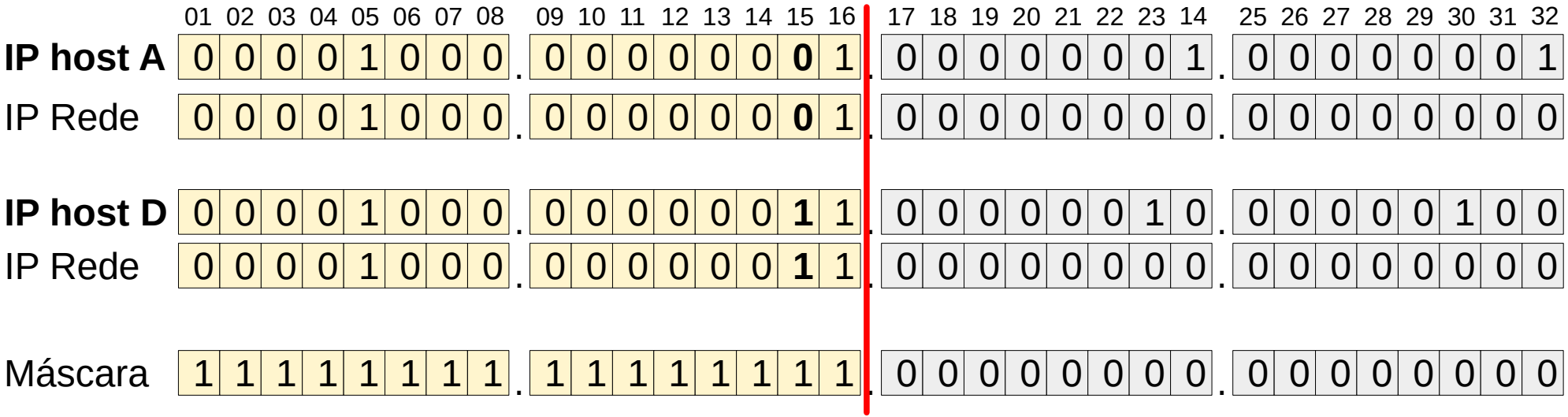
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host D	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	**1**	1	.	0	0	0	0	0	0	1	0	.	0	0	0	0	0	1	0	0
Máscara	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	**1**	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	**1**	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1



Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	**0**	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	0	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1
IP host D	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	1	1	.	0	0	0	0	0	0	1	0	.	0	0	0	0	0	1	0	0
Máscara	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Rede	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	**1**	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
IP Bcast	0	0	0	0	1	0	0	0	.	0	0	0	0	0	0	1	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1

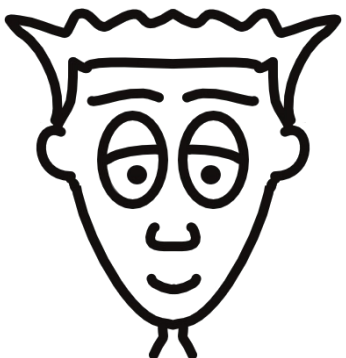
Endereçamento IP
(*classless*)



Endereçamento IP
(*classless*)

Antes a máscara **255.0.0.0**, deixava todo mundo na rede 8.0.0.0.

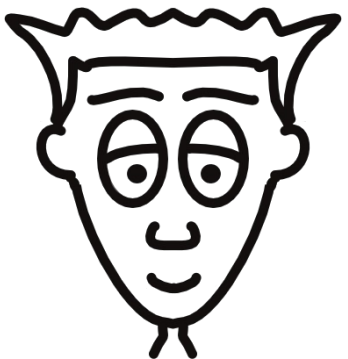
Já com a máscara **255.255.0.0**, os mesmos IPs criaram duas redes: 8.1.0.0 e 8.3.0.0.



Endereçamento IP
(*classless*)

Antes a máscara **255.0.0.0**, deixava todo mundo na rede 8.0.0.0.

Já com a máscara **255.255.0.0**, os mesmos IPs criaram duas redes: 8.1.0.0 e 8.3.0.0.



Agora tente fazer
com a máscara 255.255.255.0

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara **255.255.255.0**:

	A	B	C	D
IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.255.0	255.255.255.0	255.255.255.0	255.255.255.0
IP rede:				
IP Bcast:				

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara 255.255.255.0:

IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.255.0	255.255.255.0	255.255.255.0	255.255.255.0
IP rede:	8.1.1.			
IP Bcast:	8.1.1.			

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara 255.255.255.0:

IP host:	8	1	1	1	8	1	1	2	8	1	2	3	8	3	2	4
Máscara:	255	255	255	0	255	255	255	0	255	255	255	0	255	255	255	0
IP rede:	8	1	1	0												
IP Bcast:	8	1	1													

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara 255.255.255.0:

IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.255.0	255.255.255.0	255.255.255.0	255.255.255.0
IP rede:	8.1.1.0			
IP Bcast:	8.1.1.255			

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara 255.255.255.0:

IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.255.0	255.255.255.0	255.255.255.0	255.255.255.0
IP rede:	8.1.1.0	8.1.1.	. . .	. . .
IP Bcast:	8.1.1.255	8.1.1.	. . .	. . .

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara 255.255.255.0:

IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.255.0	255.255.255.0	255.255.255.0	255.255.255.0
IP rede:	8.1.1.0	8.1.1.0		
IP Bcast:	8.1.1.255	8.1.1.255		

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara 255.255.255.0:

IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.255.0	255.255.255.0	255.255.255.0	255.255.255.0
IP rede:	8.1.1.0	8.1.1.0	8.1.2	
IP Bcast:	8.1.1.255	8.1.1.255	8.1.2	

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara 255.255.255.0:

	A	B	C	D
IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.255.0	255.255.255.0	255.255.255.0	255.255.255.0
IP rede:	8.1.1.0	8.1.1.0	8.1.2.0	
IP Bcast:	8.1.1.255	8.1.1.255	8.1.2.255	

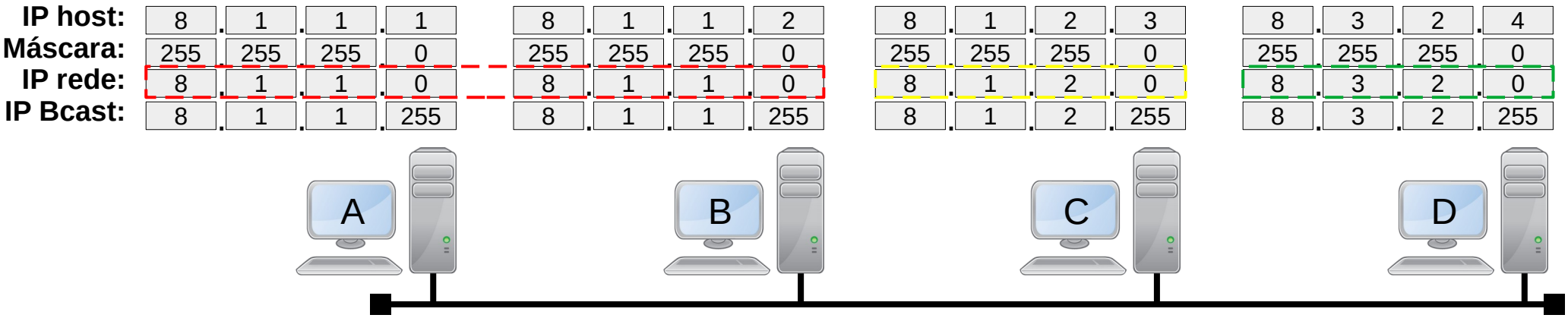
Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara 255.255.255.0:

IP host:	8.1.1.1	8.1.1.2	8.1.2.3	8.3.2.4
Máscara:	255.255.255.0	255.255.255.0	255.255.255.0	255.255.255.0
IP rede:	8.1.1.0	8.1.1.0	8.1.2.0	8.3.2.0
IP Bcast:	8.1.1.255	8.1.1.255	8.1.2.255	8.3.2.255

Endereçamento IP
(*classless*)

Calculando IP de rede e *broadcast* com IP decimal e máscara 255.255.255.0:



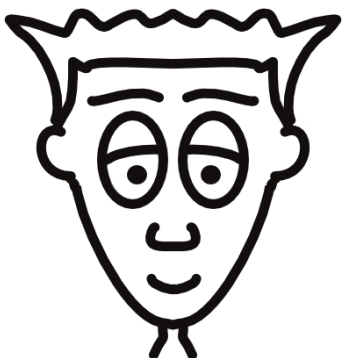
Endereçamento IP
(*classless*)

Agora com a máscara 255.255.255.0, temos três redes:

8.1.1.0

8.1.2.0

8.3.2.0



Endereçamento IP
(*classless*)

As máscaras utilizadas até agora lembram o antigo sistema de classes:

Máscara	Classe*	Rede	*Host*
255.0.0.0	A	8	24
255.255.0.0	B	16	16
255.255.255.0	C	24	8

* **Máscaras não têm classe** (*classless*). Então, é possível utilizar IPs classe A com máscaras que lembram o antigo padrão classe C. Também, é possível utilizar máscaras que fogem totalmente da ideia proposta pelas classes. Esse é o poder da máscara!

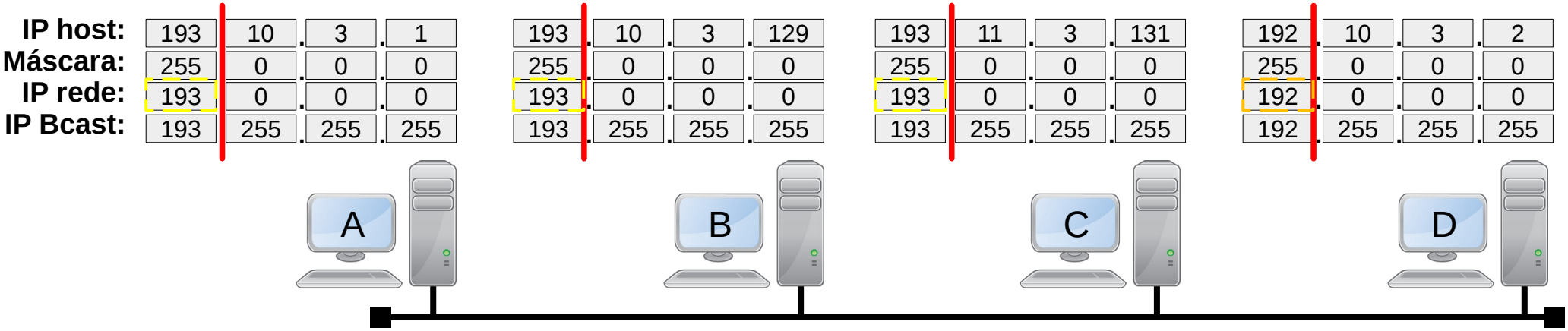
Endereçamento IP
(*classless*)

IP classe C com máscara classe A:

IP host:	193.10.3.1	193.10.4.129	193.11.3.131	192.10.3.2
Máscara:	255.0.0.0	255.0.0.0	255.0.0.0	255.0.0.0
IP rede:				
IP Bcast:				

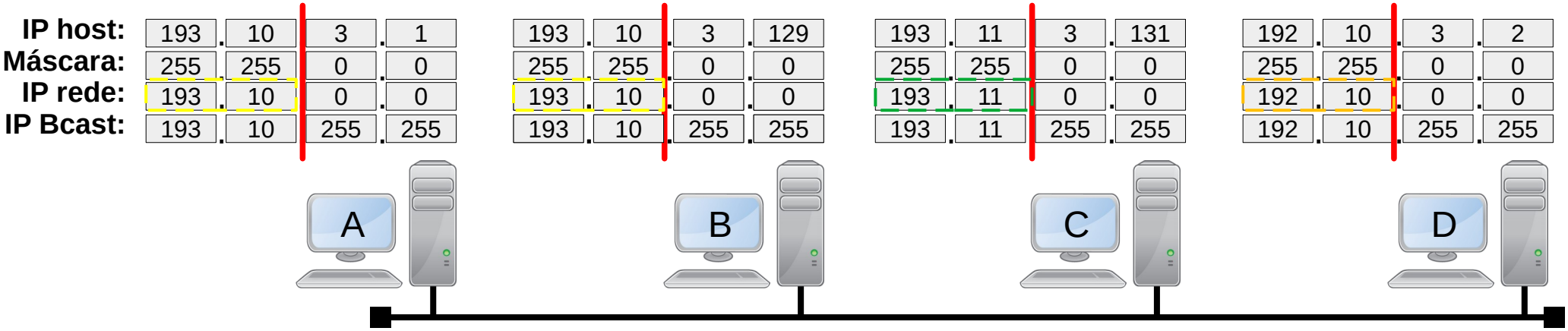
Endereçamento IP
(*classless*)

IP classe C com máscara classe A:



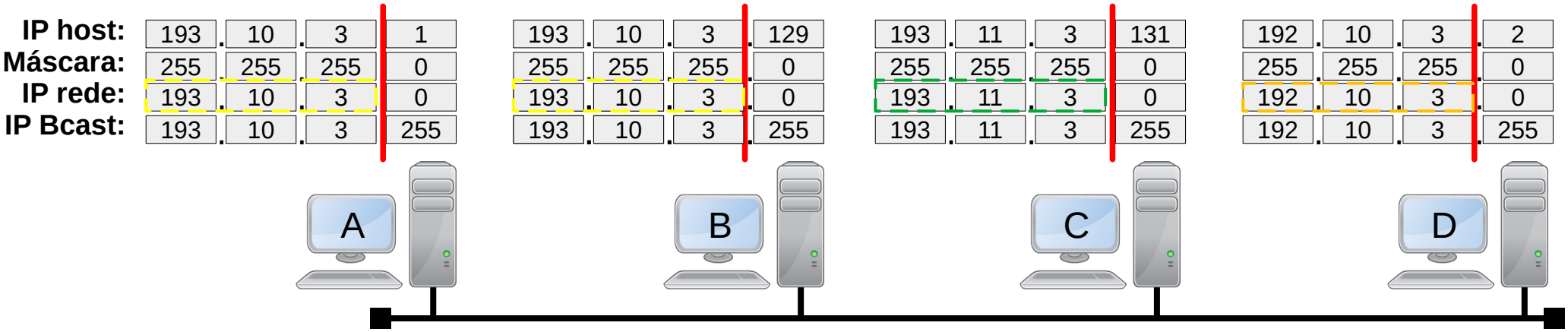
Endereçamento IP
(*classless*)

IP classe C com máscara classe B:



Endereçamento IP
(*classless*)

IP classe C com máscara classe C:



Endereçamento IP
(*classless*)

IP classe C com máscara que não lembra nenhuma classe:

IP host:	193.10.3.1	193.10.3.129	193.11.3.131	192.10.3.2
Máscara:	255.255.255.**128**	255.255.255.**128**	255.255.255.**128**	255.255.255.**128**
IP rede:	193.10.3.0	193.10.3.128	193.11.3.128	192.10.3.0
IP Bcast:	193.10.3.127	193.10.3.255	193.11.3.255	192.10.3.127

Endereçamento IP
(*classless*)

Mais heim?

Máscara 255.255.255.128?

Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	14	25	26	27	28	29	30	31	32
IP host A	1	1	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
IP Rede	1	1	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
IP Bcast	1	1	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1

IP host:	193.10.3.1	193.10.3.129	193.11.3.131	192.10.3.2
Máscara:	255.255.255.**128**	255.255.255.**128**	255.255.255.**128**	255.255.255.**128**
IP rede:	193.10.3.0	193.10.3.128	193.11.3.128	192.10.3.0
IP Bcast:	193.10.3.127	193.10.3.255	193.11.3.255	192.10.3.127

Endereçamento IP
(*classless*)

	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	1	1	0	0	0	0	0	1	.	0	0	0	0	1	0	1	0	.	0	0	0	0	0	0	1	1	.	0	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	0	0	0	0	0	0	0
IP Rede	1	1	0	0	0	0	0	1	.	0	0	0	0	1	0	1	0	.	0	0	0	0	0	0	1	1	.	0	0	0	0	0	0	0	0
IP Bcast	1	1	0	0	0	0	0	1	.	0	0	0	0	1	0	1	0	.	0	0	0	0	0	0	1	1	.	0	1	1	1	1	1	1	1

IP host:	193 . 10 . 3 . 1	193 . 10 . 3 . 129	193 . 11 . 3 . 131	192 . 10 . 3 . 2
Máscara:	255 . 255 . 255 . **128**	255 . 255 . 255 . **128**	255 . 255 . 255 . **128**	255 . 255 . 255 . **128**
IP rede:	193 . 10 . 3 . 0	193 . 10 . 3 . 128	193 . 11 . 3 . 128	192 . 10 . 3 . 0
IP Bcast:	193 . 10 . 3 . 127	193 . 10 . 3 . 255	193 . 11 . 3 . 255	192 . 10 . 3 . 127

Endereçamento IP
(*classless*)

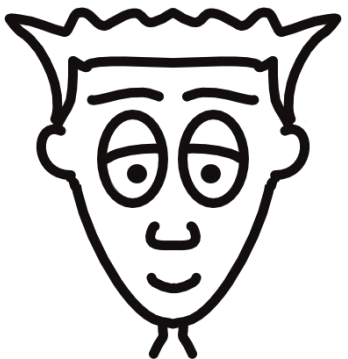
	01	02	03	04	05	06	07	08		09	10	11	12	13	14	15	16		17	18	19	20	21	22	23	14		25	26	27	28	29	30	31	32
IP host A	1	1	0	0	0	0	0	1	.	0	0	0	0	1	0	1	0	.	0	0	0	0	0	0	1	1	.	**1**	0	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	0	0	0	0	0	0	0
IP Rede	1	1	0	0	0	0	0	1	.	0	0	0	0	1	0	1	0	.	0	0	0	0	0	0	1	1	.	**1**	0	0	0	0	0	0	0
IP Bcast	1	1	0	0	0	0	0	1	.	0	0	0	0	1	0	1	0	.	0	0	0	0	0	0	1	1	.	**1**	1	1	1	1	1	1	1

IP host:	193 . 10 . 3 . 1	193 . 10 . 3 . 129	193 . 11 . 3 . 131	192 . 10 . 3 . 2
Máscara:	255 . 255 . 255 . **128**	255 . 255 . 255 . **128**	255 . 255 . 255 . **128**	255 . 255 . 255 . **128**
IP rede:	193 . 10 . 3 . 0	193 . 10 . 3 . 128	193 . 11 . 3 . 128	192 . 10 . 3 . 0
IP Bcast:	193 . 10 . 3 . 127	193 . 10 . 3 . 255	193 . 11 . 3 . 255	192 . 10 . 3 . 127

Endereçamento IP
(*classless*)

Quer dizer que eu posso usar outros

Números que não 255 e 0, nos octetos da máscara?



Endereçamento IP
(*classless*)

Quer dizer que eu posso usar outros

Números que não 255 e 0, nos octetos da máscara?

Sim mas lembre que não pode intercalar uns e zeros...

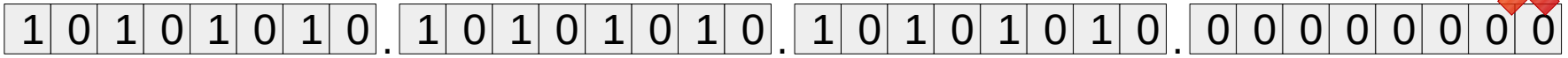
Endereçamento IP
(*classless*)

Máscara 1	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0
Máscara 2	1	0	1	0	1	0	1	0	.	1	0	1	0	1	0	1	0	.	1	0	1	0	1	0	1	0	.	0	0	0	0	0	0	0	0
Máscara 3	0	1	1	1	1	1	1	1	.	1	1	1	1	1	1	1	1	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0
Máscara 4	1	1	1	1	1	1	1	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0	.	0	0	0	0	0	0	0	0

Quais máscaras são válidas?

Endereçamento IP
(*classless*)

Máscara 1 

Máscara 2 

Máscara 3 

Máscara 4 

Endereçamento IP
(*classless*)

Máscara 1 ✓ 1 1 1 1 1 1 1 1 . 1 1 1 1 1 1 1 1 . 1 1 1 1 1 1 1 1 . 0 0 0 0 0 0 0 0

Máscara 2 ✗ 1 0 1 0 1 0 1 0 . 1 0 1 0 1 0 1 0 . 1 0 1 0 1 0 1 0 . 0 0 0 0 0 0 0 0

Máscara 3 ✗ 0 1 1 1 1 1 1 1 . 1 1 1 1 1 1 1 1 . 0 0 0 0 0 0 0 0 . 0 0 0 0 0 0 0 0

Máscara 4 ✓ 1 1 1 1 1 1 1 0 . 0 0 0 0 0 0 0 0 . 0 0 0 0 0 0 0 0 . 0 0 0 0 0 0 0 0

Como ficará a rede
anterior se aplicarmos a máscara 4?

Endereçamento IP
(*classless*)

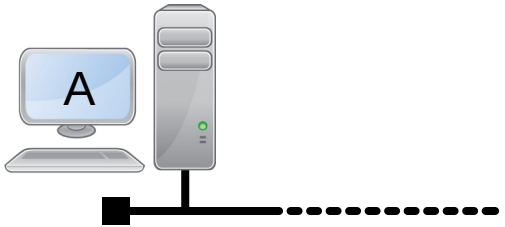
IP classe C com máscara 254.0.0.0:

IP host:	193.10.3.1	193.10.3.129	193.11.3.131	192.10.3.2
Máscara:	254.0.0.0	254.0.0.0	254.0.0.0	254.0.0.0
IP rede:	192.0.0.0	192.0.0.0	192.0.0.0	192.0.0.0
IP Bcast:	193.255.255.255	193.255.255.255	193.255.255.255	193.255.255.255

Endereçamento IP
(*classless*)

IP classe C com máscara 254.0.0.0:

IP host:	193	10	3	1
Máscara:	254	0	0	0
IP rede:				
IP Bcast:				

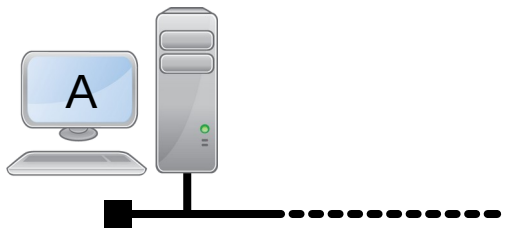


Uma forma mais rápida de calcular...

Endereçamento IP
(*classless*)

IP classe C com máscara 254.0.0.0:

IP host:	193	10	3	1
Máscara:	254	0	0	0
IP rede:				
IP Bcast:				

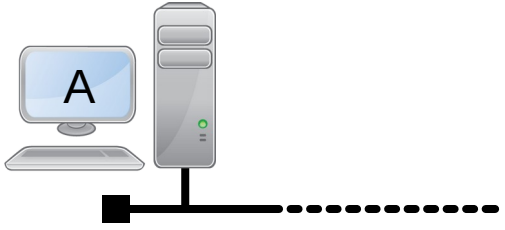


Sabemos que
os três últimos octetos
são *host*...

Endereçamento IP
(*classless*)

IP classe C com máscara 254.0.0.0:

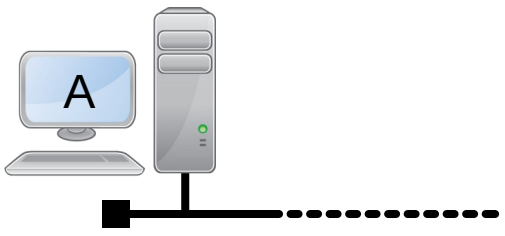
IP host:	193	10	3	1
Máscara:	254	0	0	0
IP rede:		**0**	**0**	**0**
IP Bcast:		**255**	**255**	**255**



Endereçamento IP
(*classless*)

IP classe C com máscara 254.0.0.0:

IP host:	193	10	3	1
Máscara:	254	0	0	0
IP rede:		**0**	**0**	**0**
IP Bcast:		**255**	**255**	**255**

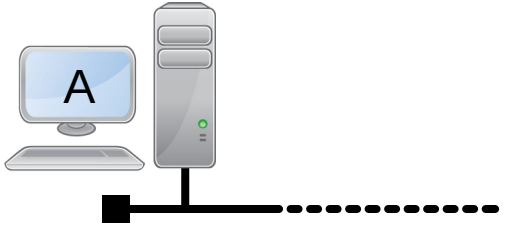


Neste caso, a dúvida fica apenas no primeiro octeto...

Endereçamento IP
(*classless*)

IP classe C com máscara 254.0.0.0:

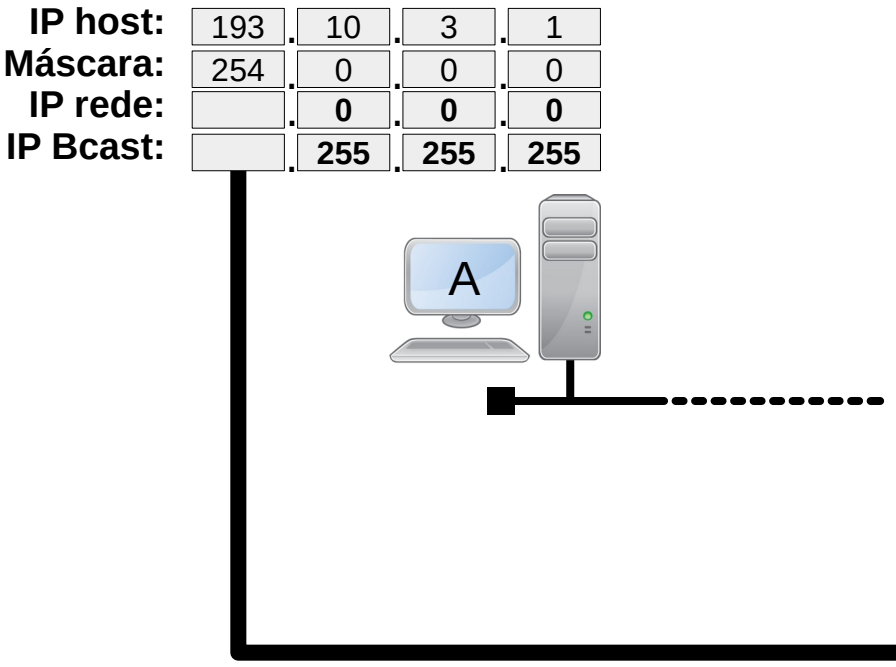
IP host:	193	10	3	1
Máscara:	254	0	0	0
IP rede:		**0**	**0**	**0**
IP Bcast:		**255**	**255**	**255**

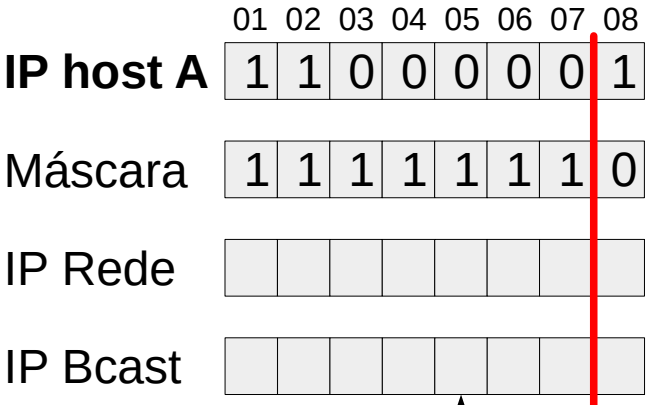


	01	02	03	04	05	06	07	08
IP host A	1	1	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	0
IP Rede								
IP Bcast								

Endereçamento IP
(*classless*)

IP classe C com máscara 254.0.0.0:

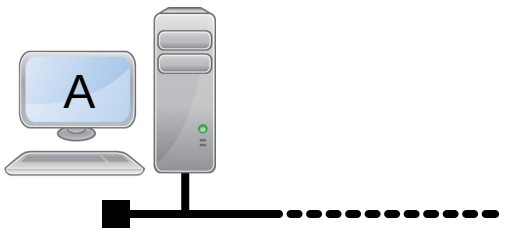




Endereçamento IP
(*classless*)

IP classe C com máscara 254.0.0.0:

IP host:	193	10	3	1
Máscara:	254	0	0	0
IP rede:		**0**	**0**	**0**
IP Bcast:		**255**	**255**	**255**

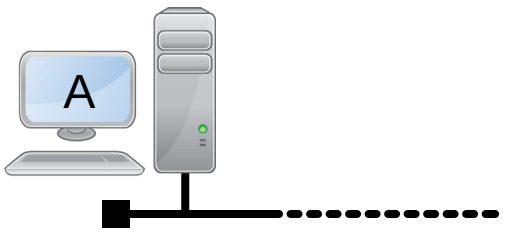


	01	02	03	04	05	06	07	08
IP host A	1	1	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	0
IP Rede	1	1	0	0	0	0	0	
IP Bcast	1	1	0	0	0	0	0	

Endereçamento IP
(*classless*)

IP classe C com máscara 254.0.0.0:

IP host:	193	10	3	1
Máscara:	254	0	0	0
IP rede:		**0**	**0**	**0**
IP Bcast:		**255**	**255**	**255**

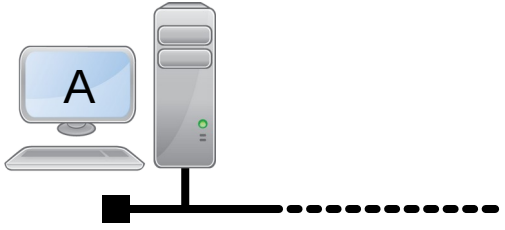


	01	02	03	04	05	06	07	08
IP host A	1	1	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	0
IP Rede	1	1	0	0	0	0	0	**0**
IP Bcast	1	1	0	0	0	0	0	**1**

Endereçamento IP
(*classless*)

IP classe C com máscara 254.0.0.0:

IP host:	193	10	3	1
Máscara:	254	0	0	0
IP rede:	192	**0**	**0**	**0**
IP Bcast:	193	**255**	**255**	**255**

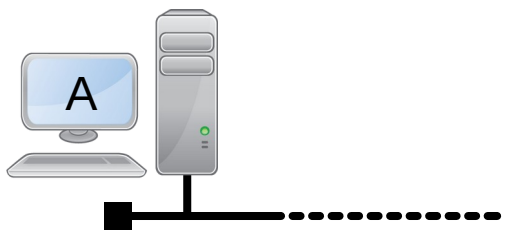


	01	02	03	04	05	06	07	08
IP host A	1	1	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	0
IP Rede	1	1	0	0	0	0	0	**0**
IP Bcast	1	1	0	0	0	0	0	**1**

Endereçamento IP
(*classless*)

IP classe C com máscara 254.0.0.0:

IP host:	193	10	3	1
Máscara:	254	0	0	0
IP rede:	192	**0**	**0**	**0**
IP Bcast:	193	**255**	**255**	**255**



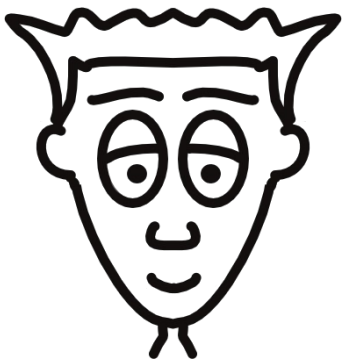
	01	02	03	04	05	06	07	08
IP host A	1	1	0	0	0	0	0	1
Máscara	1	1	1	1	1	1	1	0
IP Rede	1	1	0	0	0	0	0	**0**
IP Bcast	1	1	0	0	0	0	0	**1**

Faça para os outros *hosts*...

Endereçamento IP
(*classless*)

Entendi, como funciona a máscara (*classless*),

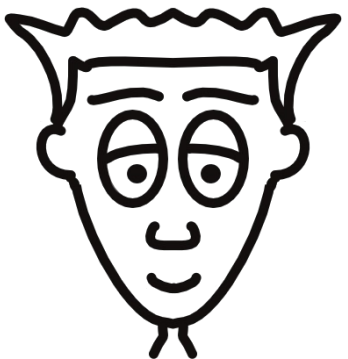
mas ainda não entendi muito bem como ela ajuda no problema de desperdício de IPs...



Endereçamento IP
(*classless*)

Entendi, como funciona a máscara (*classless*),

mas ainda não entendi muito bem como ela ajuda no problema de desperdício de IPs...



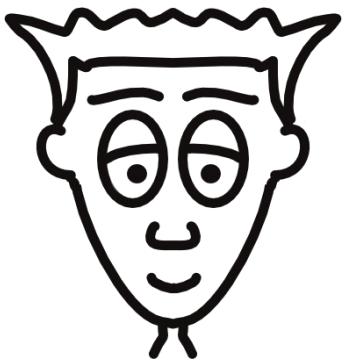
Vamos deixar para
a próxima aula…

Ainda tem muita coisa:
- Notação CIDR;
- Calcular quantidade de *hosts*;
- Endereços reservados...

Endereçamento IP
(*classless*)

Conclusão

Temos que treinar para saber como usar máscara de rede, principalmente para extrair/identificar o endereço IP de rede e *broadcast*...



Obrigado!!!

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https://luizsantos.github.io/

Links e referencias na descrição do vídeo