

Reti di Calcolatori I

Esercizio di subnetting IP

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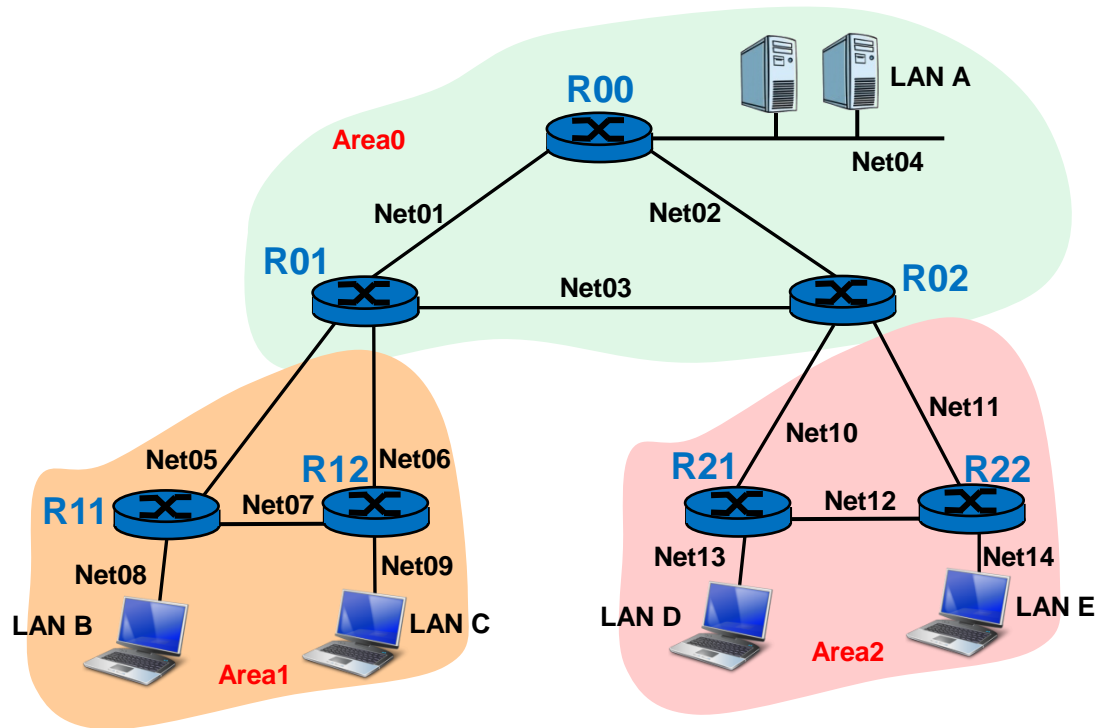
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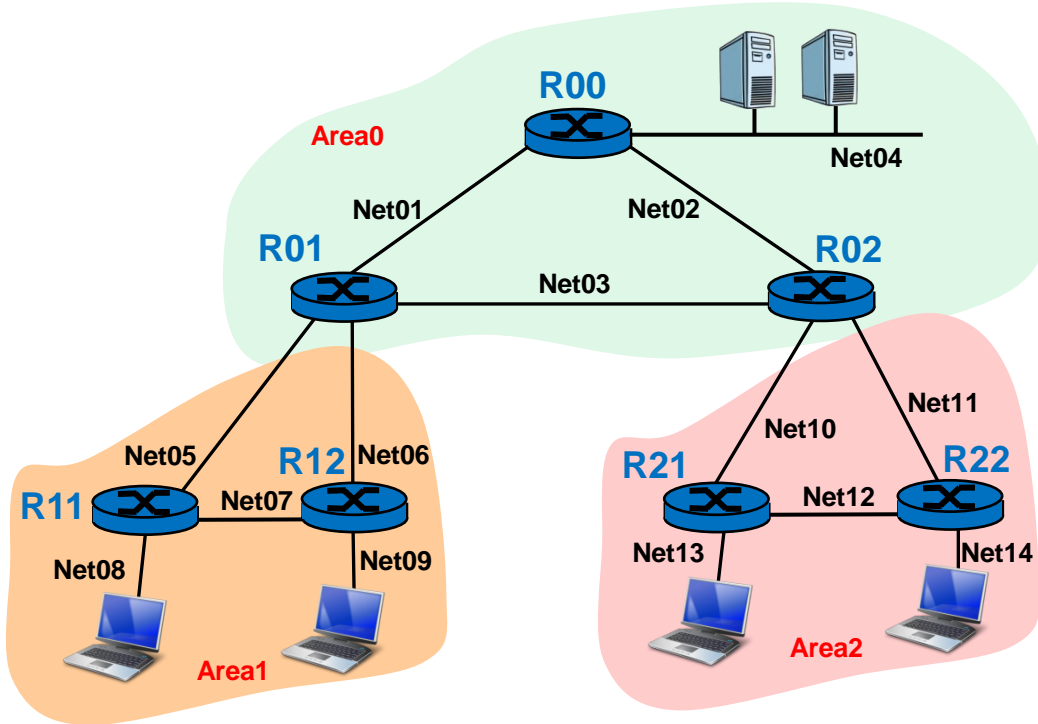
Esercizio di subnetting



- Si deve definire un piano di indirizzamento per la rete illustrata in figura costituita da:
 - 7 router IP (R00, R01, R02, R11, R12, R21, R22)
 - 5 LAN (A, B, C, D ed E) in ciascuna delle quali si trovano al più 5 host (più l'interfaccia del router che collega ciascuna LAN con il resto della rete)
- Per l'indirizzamento, si ha a disposizione il blocco di 128 indirizzi 192.168.24.0/25
- Si deve effettuare un subnetting con netmask a lunghezza variabile usando:
 - subnet con netmask /30 per i collegamenti punto-punto tra i router
 - subnet con netmask /28 per le LAN

Esercizio di subnetting: soluzione

Si ha a disposizione il blocco di 128 indirizzi 192.168.24.0/25

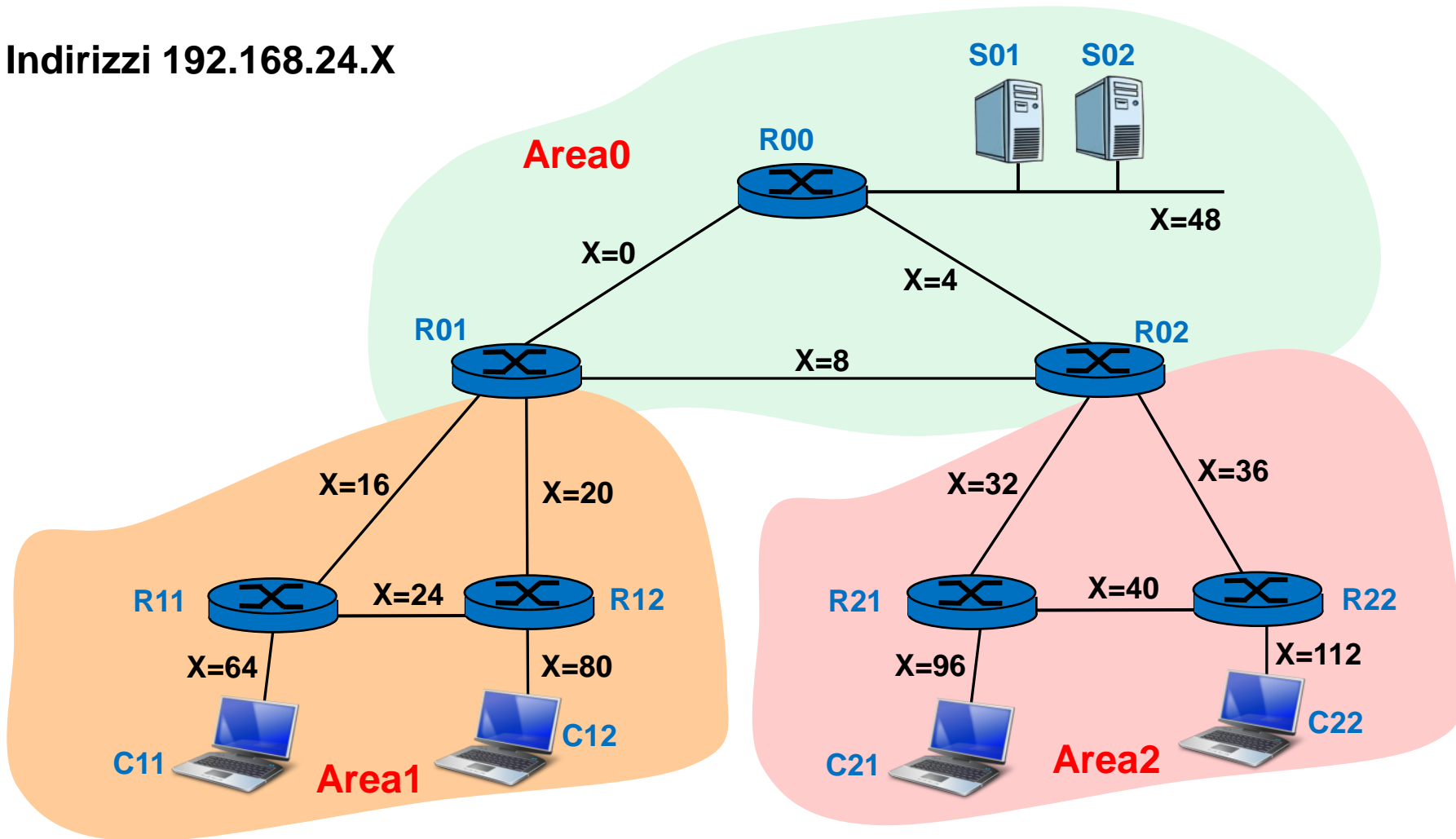


Nome	Indirizzo subnet	Range indirizzi 192.168.24.x	Numero indirizzi
Net01	192.168.24.0 /30	x in 0 ÷ 3	4
Net02	192.168.24.4 /30	x in 4 ÷ 7	4
Net03	192.168.24.8 /30	x in 8 ÷ 11	4
	192.168.24.12 /30	x in 12 ÷ 15	4
Net05	192.168.24.16 /30	x in 16 ÷ 19	4
Net06	192.168.24.20 /30	x in 20 ÷ 23	4
Net07	192.168.24.24 /30	x in 24 ÷ 27	4
	192.168.24.28 /30	x in 28 ÷ 31	4
Net10	192.168.24.32 /30	x in 32 ÷ 35	4
Net11	192.168.24.36 /30	x in 36 ÷ 39	4
Net12	192.168.24.40 /30	x in 40 ÷ 43	4
	192.168.24.44 /30	x in 44 ÷ 47	4
Net04	192.168.24.48 /28	x in 48 ÷ 63	16
Net08	192.168.24.64 /28	x in 64 ÷ 79	16
Net09	192.168.24.80 /28	x in 80 ÷ 95	16
Net13	192.168.24.96 /28	x in 96 ÷ 111	16
Net14	192.168.24.112 /28	x in 112 ÷ 127	16
		Totale:	128

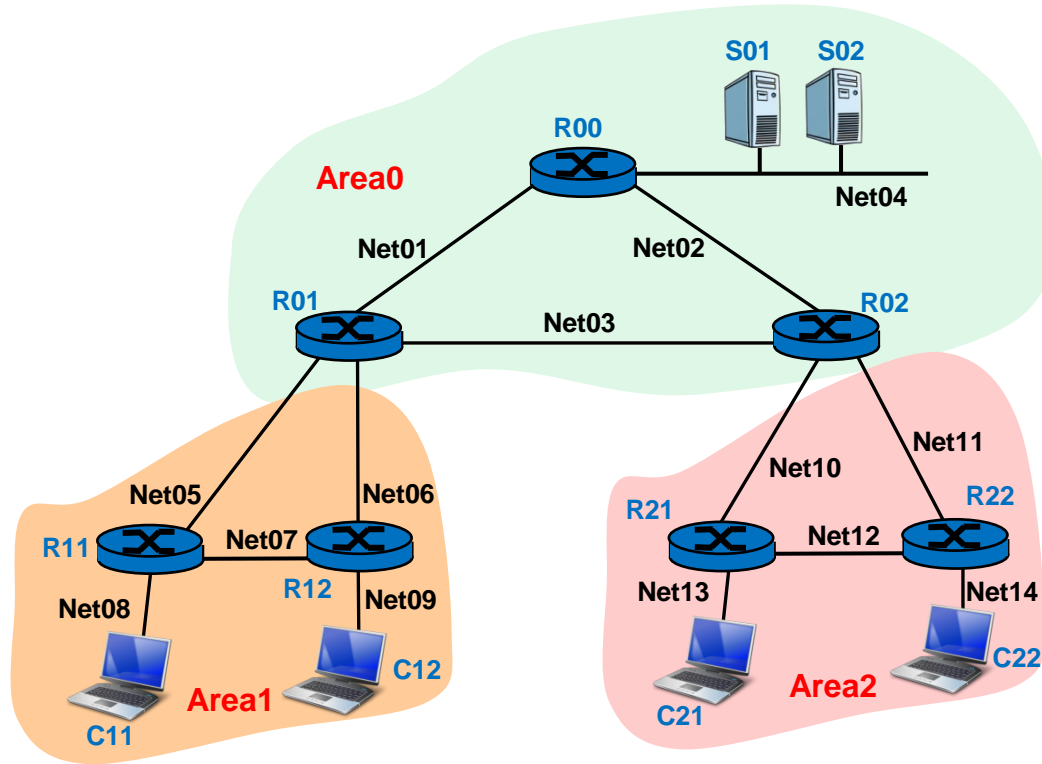
- La topologia della rete richiede 14 subnet
- Si effettua un subnetting con netmask a lunghezza variabile
- Si usano subnet con netmask /30 per i 9 collegamenti punto-punto tra i router
- Si usano subnet con netmask /28 per le 5 reti LAN che ospitano gli end-system

Indirizzi IP delle 14 subnet

Indirizzi 192.168.24.X



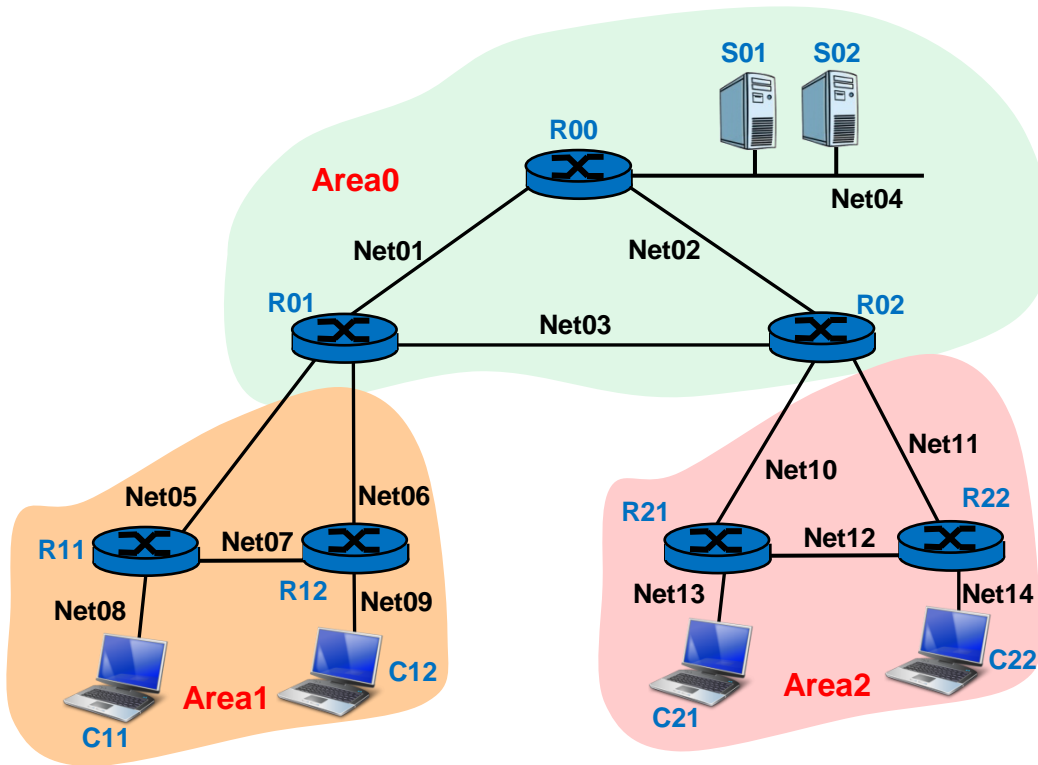
Assegnazione indirizzi IP alle interfacce dei router



Net01=192.168.24.0/30 **Net02**=192.168.24.4/30 **Net03**=192.168.24.8/30
Net04=192.168.24.48/28 **Net05**=192.168.24.16/30 **Net06**=192.168.24.20/30
Net07=192.168.24.24/30 **Net08**=192.168.24.64/28 **Net09**=192.168.24.80/28
Net10=192.168.24.32/30 **Net11**=192.168.24.36/30 **Net12**=192.168.24.40/30
Net13=192.168.24.96/28 **Net14**=192.168.24.112/28

	Dev	Indirizzo IP	Netmask	Subnet
R00	eth1	192.168.24.1	/30	Net01
R00	eth2	192.168.24.5	/30	Net02
R00	eth3	192.168.24.49	/28	Net04
R01	eth0	192.168.24.2	/30	Net01
R01	eth1	192.168.24.9	/30	Net03
R01	eth2	192.168.24.17	/30	Net05
R01	eth3	192.168.24.21	/30	Net06
R02	eth0	192.168.24.6	/30	Net02
R02	eth1	192.168.24.10	/30	Net03
R02	eth2	192.168.24.33	/30	Net10
R02	eth3	192.168.24.37	/30	Net11
R11	eth0	192.168.24.18	/30	Net05
R11	eth1	192.168.24.25	/30	Net07
R11	eth2	192.168.24.65	/28	Net08
R12	eth0	192.168.24.22	/30	Net06
R12	eth1	192.168.24.26	/30	Net07
R12	eth2	192.168.24.81	/28	Net09
R21	eth0	192.168.24.34	/30	Net10
R21	eth1	192.168.24.41	/30	Net12
R21	eth2	192.168.24.97	/28	Net13
R22	eth0	192.168.24.38	/30	Net11
R22	eth1	192.168.24.42	/30	Net12
R22	eth2	192.168.24.113	/28	Net14

Assegnazione indirizzi IP agli end-system



Indirizzi IP assegnati agli end-system

	Dev	Indirizzo /netmask	Subnet
S01	eth0	192.168.24.50/28	Net04
S02	eth0	192.168.24.51/28	Net04
C11	eth0	192.168.24.66/28	Net08
C12	eth0	192.168.24.82/28	Net09
C21	eth0	192.168.24.98/28	Net13
C22	eth0	192.168.24.114/28	Net14

Default router per gli end-system

	Indirizzo default router
S01	192.168.24.49
S02	192.168.24.49
C11	192.168.24.65
C12	192.168.24.81
C21	192.168.24.97
C22	192.168.24.113

Net01=192.168.24.0/30 **Net02**=192.168.24.4/30 **Net03**=192.168.24.8/30
Net04=192.168.24.48/28 **Net05**=192.168.24.16/30 **Net06**=192.168.24.20/30
Net07=192.168.24.24/30 **Net08**=192.168.24.64/28 **Net09**=192.168.24.80/28
Net10=192.168.24.32/30 **Net11**=192.168.24.36/30 **Net12**=192.168.24.40/30
Net13=192.168.24.96/28 **Net14**=192.168.24.112/28