



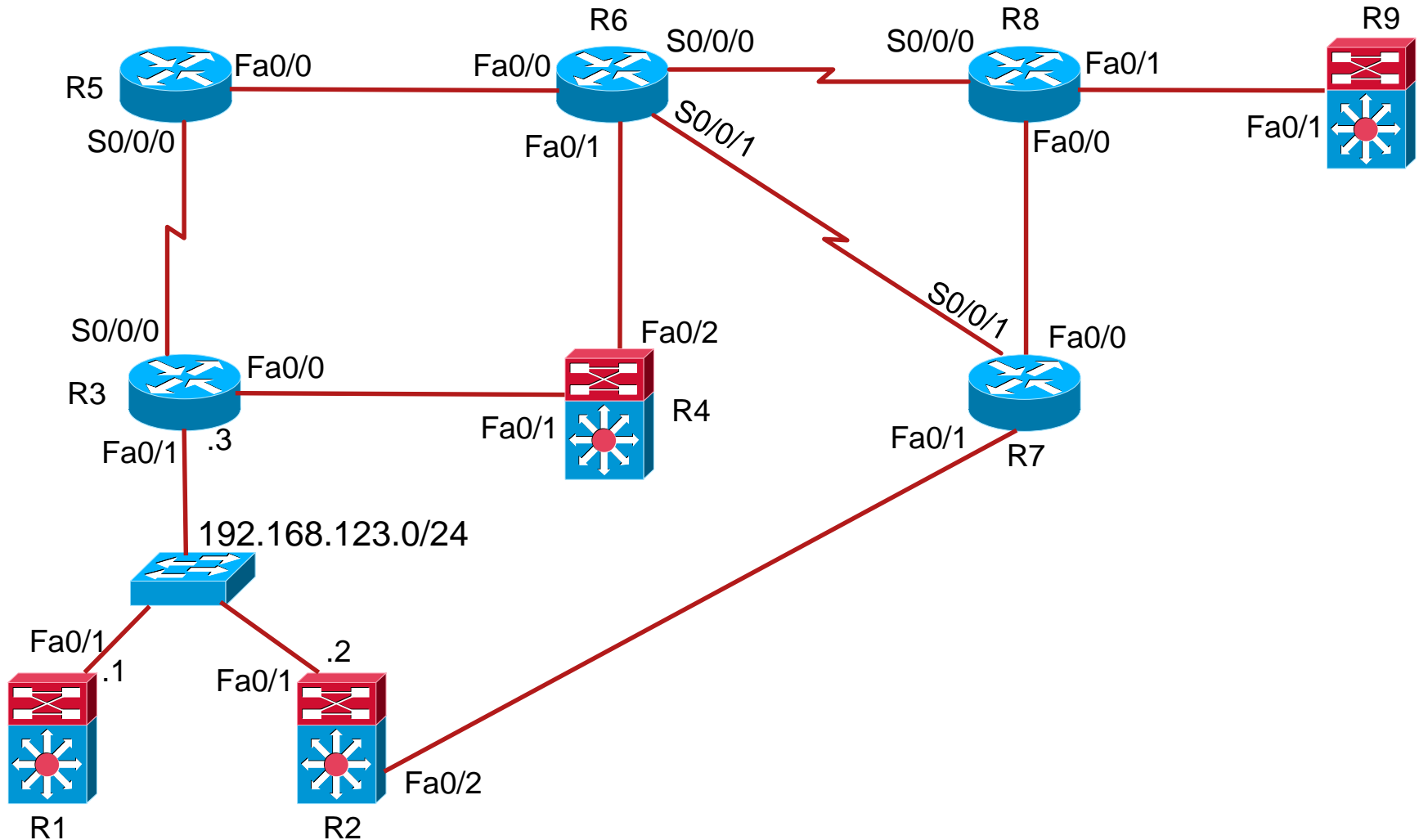
Laboratories IS-IS



ROUTE Module 9

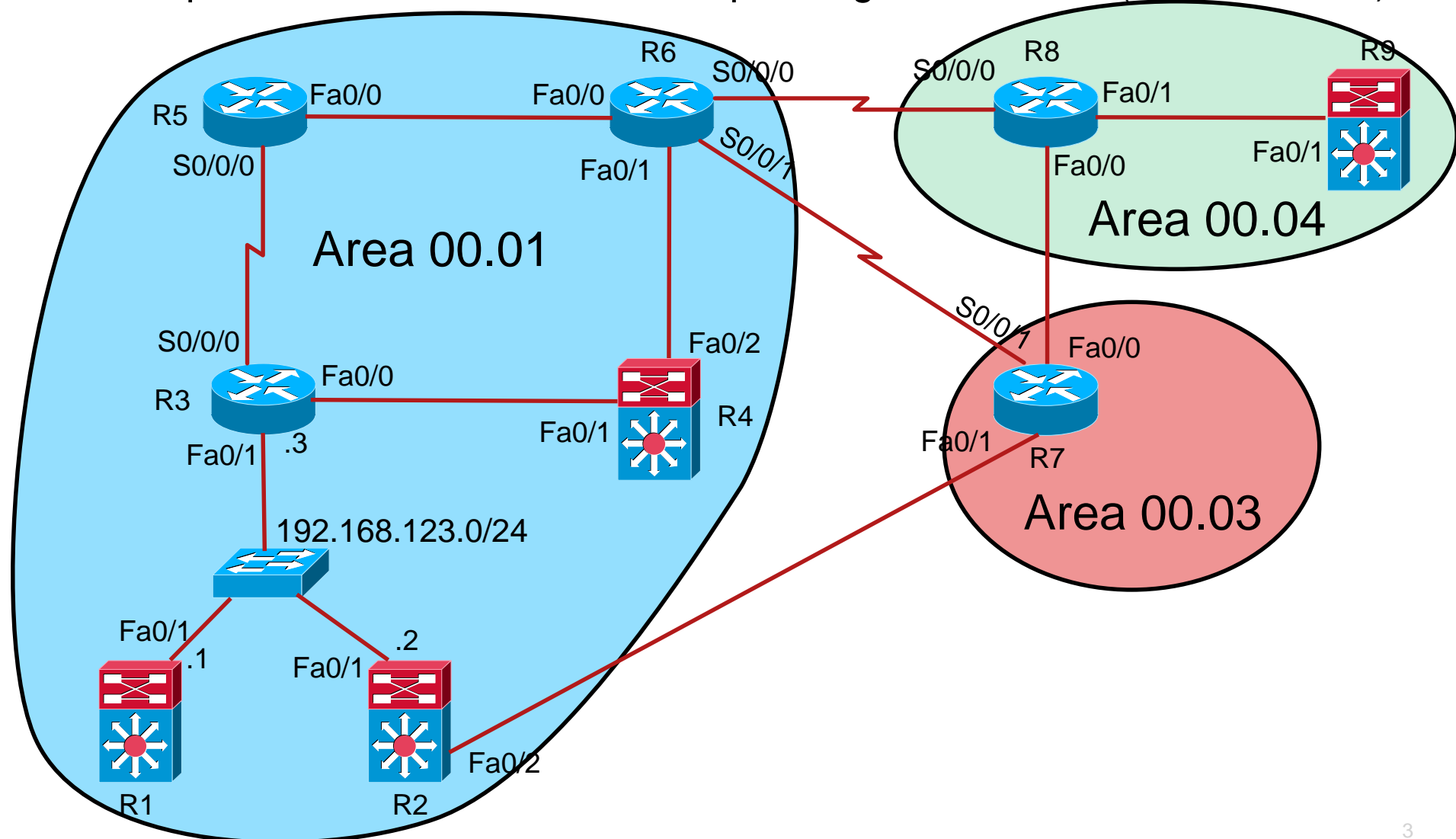
Basic Topology ①

- Pre-configured 172.16.XY.[1,2]/30 on point-to-point links where $X < Y$, and 192.168.123.0/24 between R1, R2, and R3

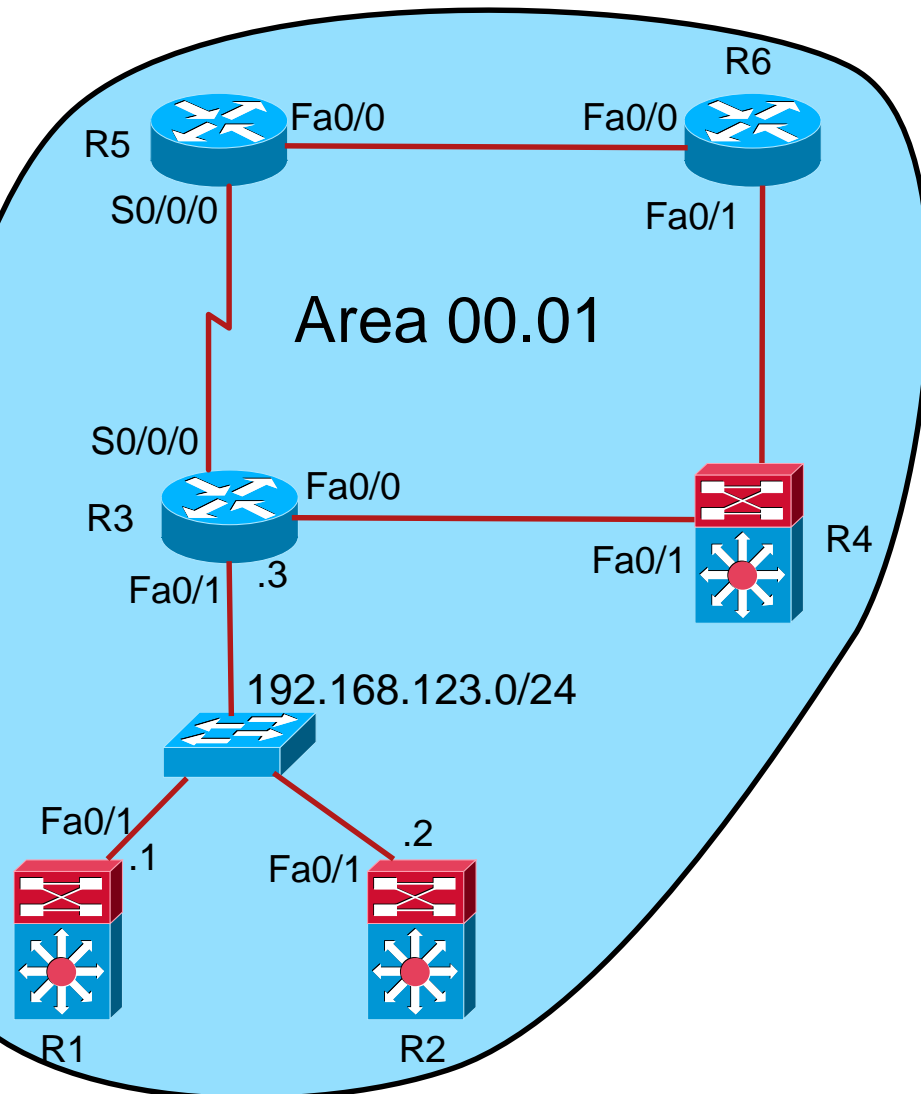


Task 1 - preparation

- Configure loopback interface on each router in format 10.X.0.0/24
- Compute NET address from corresponding lo0 interface (use private AFI)

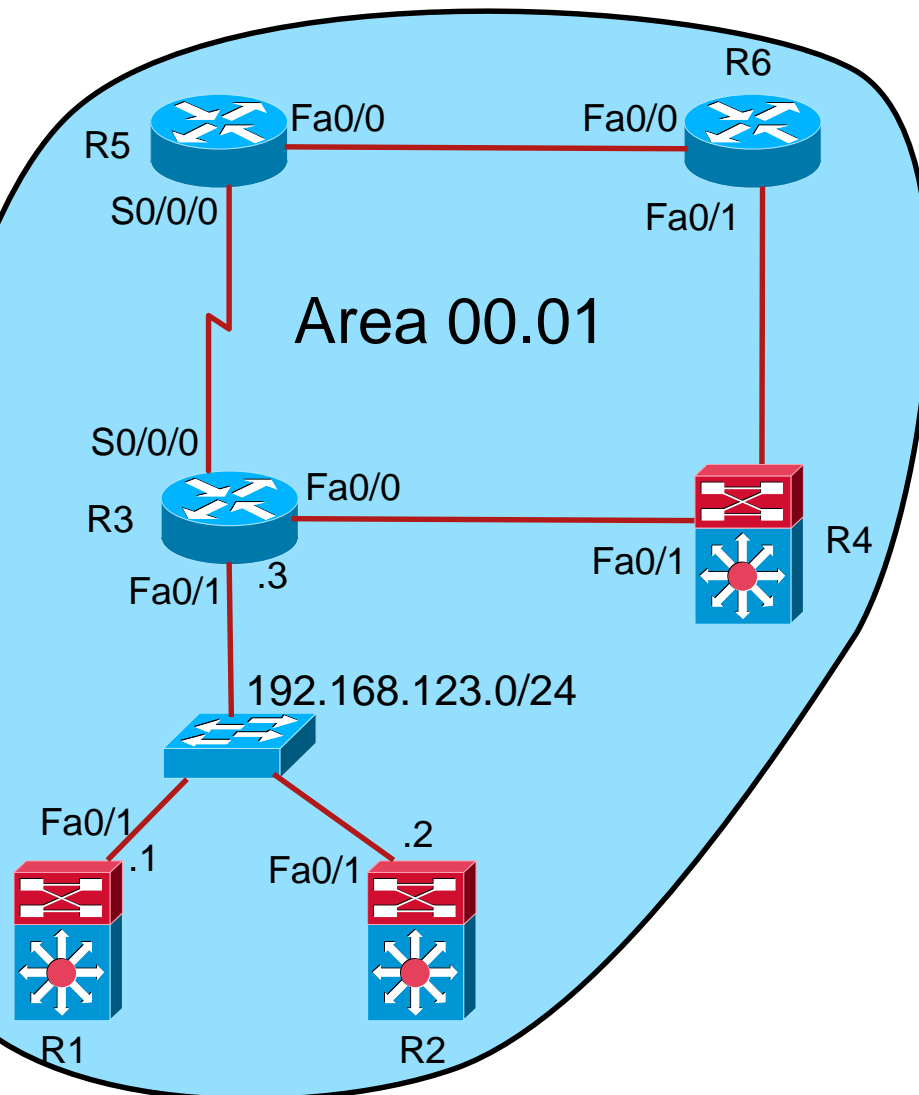


Task 2 – configure level-1 CLNS



- Consider only routers in Area 00.01
- Activate IS-IS routing process
- Set NET address
- Set all routers as **level-1**
- Activate IS-IS only for CLNS
- Verify configuration with:
 - **show clns neighbors**
 - **show isis neighbors**
 - **show isis topology**
 - **show isis database [detail]**
 - **show clns protocol**
 - **show clns route**
 - **ping clns**

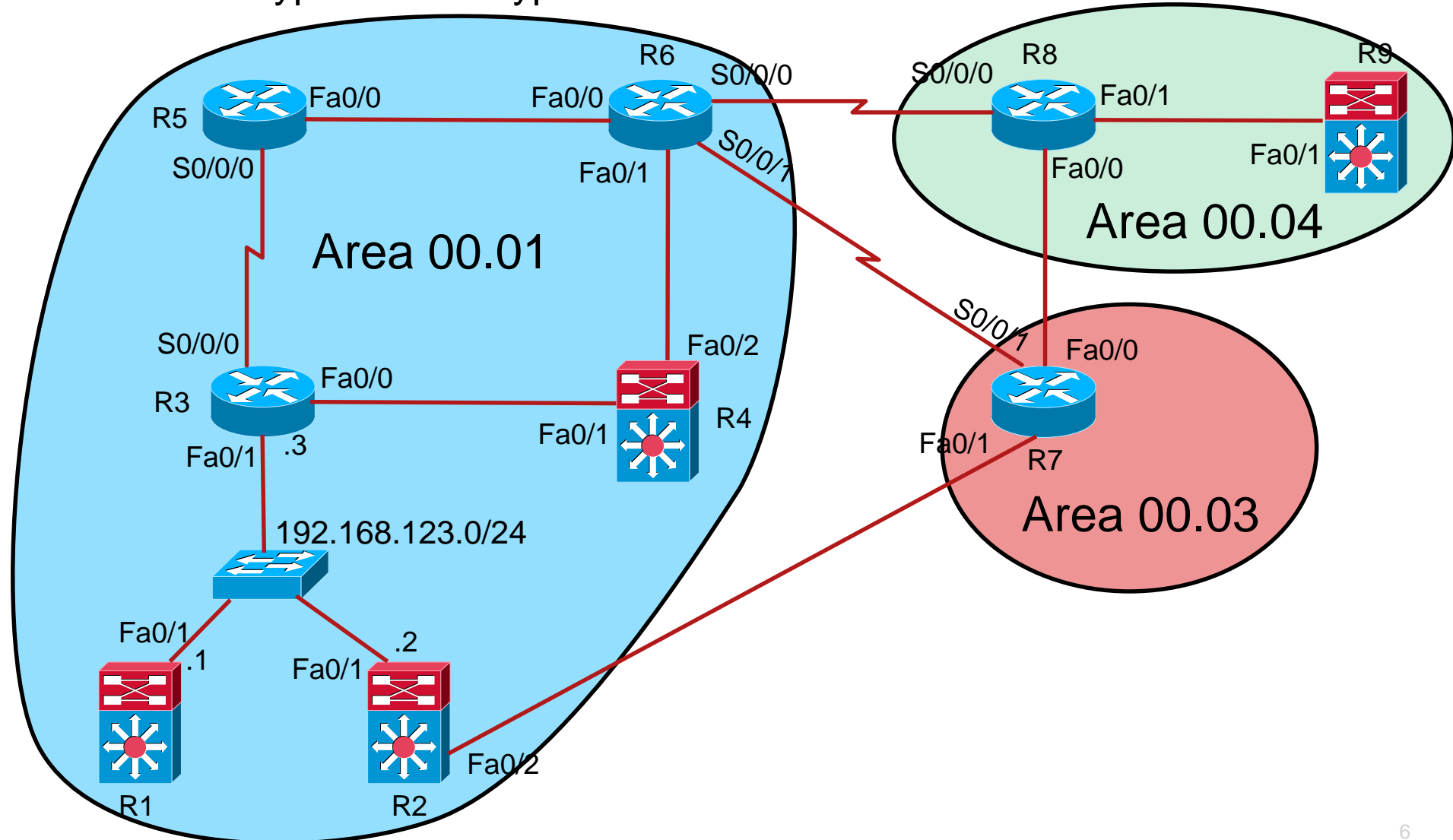
Task 3 – tuning IS-IS



- Change Serial links to proper type
 - Watch certain LSPs to die-out from LSP-DB
- Change metric between R5 and R6 to 5
- Adjust priority for R1, R2, and R3 so a new DIS is elected and watch LSP-DB
- Verify configuration with:
 - `show clns neighbors`
 - `show isis neighbors`
 - `show isis topology`
 - `show isis database [detail]`
 - `show clns protocol`
 - `show clns route`
 - `ping clns`

Task 4 - expanding

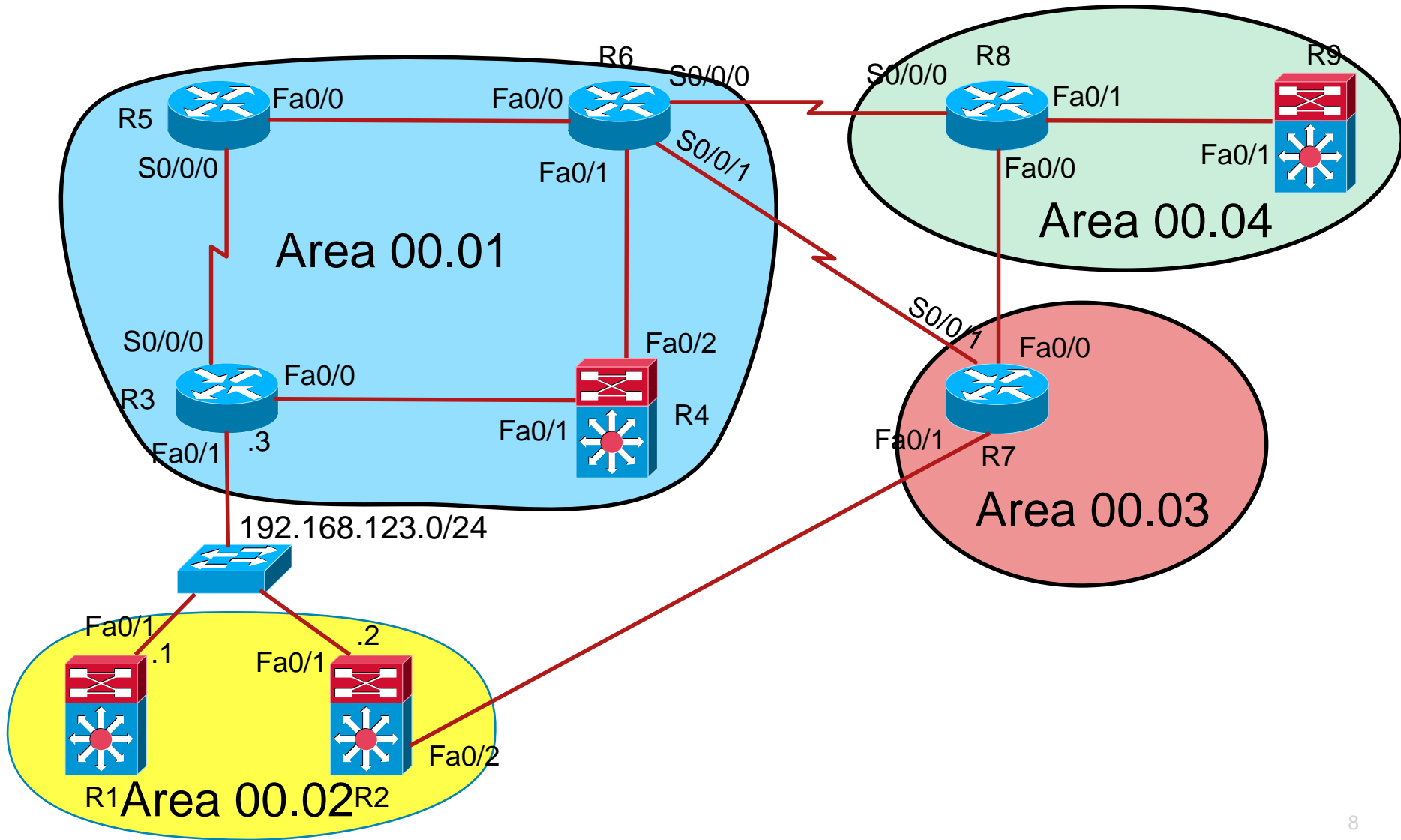
- Configure IS-IS (CLNS only) on ALL routers
- Limit IS-Type and link type other than **level-1** to minimum



Task 5 – start IS-IS for IPv4

- Include IPv4 addresses in IS-IS's LSPs
 - what happens? How to prevent it?
- Limit IS-Type and link type other than `level-1` to minimum

Task 6 - partitioning



Task 6 – partitioning

- Divide Area 00.01 into two areas
- R1 and R2 now constitutes new Area 00.02
- Maintain connectivity while moving
 - Start ping from R5 to R1 (or connect PC to both of them)
 - Add NET (R1, R2)
 - Change IS-type (R3)
 - Change link type (R1, R2, R3)
 - Remove arbitrary NET (R2, then R1)

Task 6 – suboptimal routing

- Try traceroute from R5 to R1
 - Which path?
 - What is the cost?
 - What is the cost of alternative path?
 - Why this path?
- Fix it!
 - How?
 - Redistribution?
 - On which router
 - From where to where?

Task 7 – more tuning

- Add more loopback interfaces to any router with format 10.X.X.Y/32 (increment Y) and add it to IS-IS routing process
- Force router to generate LSP fragments
 - Check it with `show isis database`
- Adjust LSP generation, lifetime and refresh timers to non-default

Task 8 – summarization

- You should now see several routes on all routers with format 10.X.X.Y/32
- Summarize them!
 - On L1L2 routers

Task 9 – WHAT ABOUT SECURITY O_O?

- Protect Hello messages on link between R5 and R3 with a password
 - Old way
- Protect L1 LSP, PSNP, and CSNP in Area 00.04 with a password
 - Old way
- Force router to generate LSP fragments
 - Check it with `show isis database`
- Adjust LSP generation, lifetime and refresh timers to non-default

Task 10 – IPv6

- Add IPv6 addresses to routers in Area 00.04
- Add them to IS-IS routing process
 - What happens?
 - How to prevent it?
- Display IS-IS database – one LSP rules them all!
- **show isis database detail**



Labs created by [Marcel Marek](#) for C1P practice.

Last updated: 2016-04-05