Proposal Figures
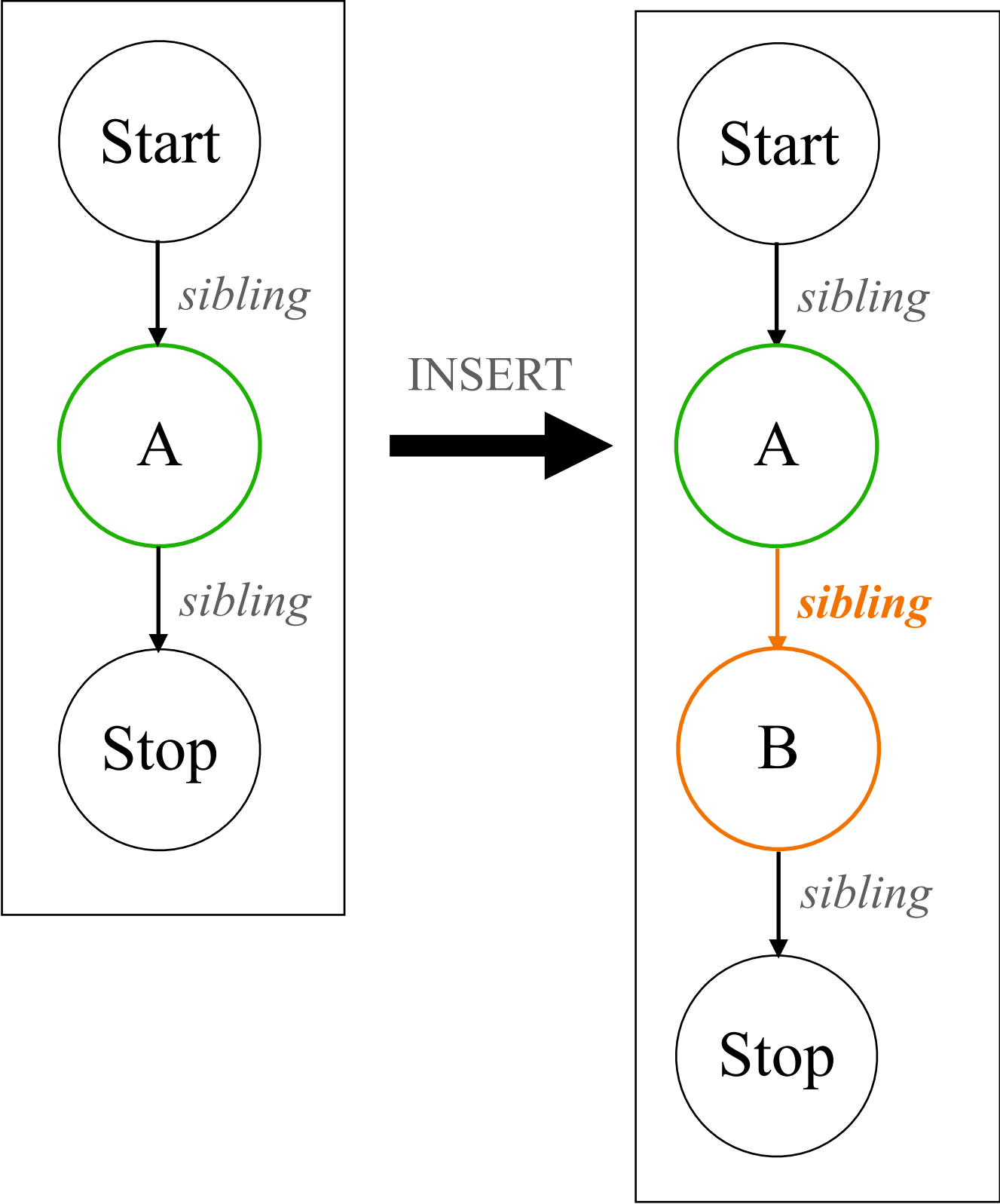
Insert API

Start
↓ *sibling*
A (green)
↓ *sibling*
Stop

INSERT →

Start
↓ *sibling*
A (green)
↓ **sibling** (orange)
B (orange)
↓ *sibling*
Stop

Insert CFS

Start
↓ *sibling*
A (green)
↓ *sibling*
Stop

INSERT →

Start
↓ *sibling*
A (green)
↓ **sibling** (orange)
Loop (orange) —**child**→ B (orange) —**child**→ C (orange) —**sibling**→ Stop (orange)
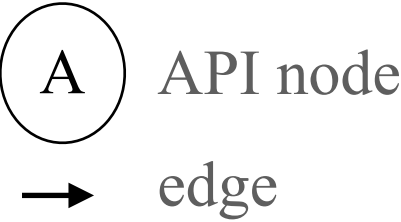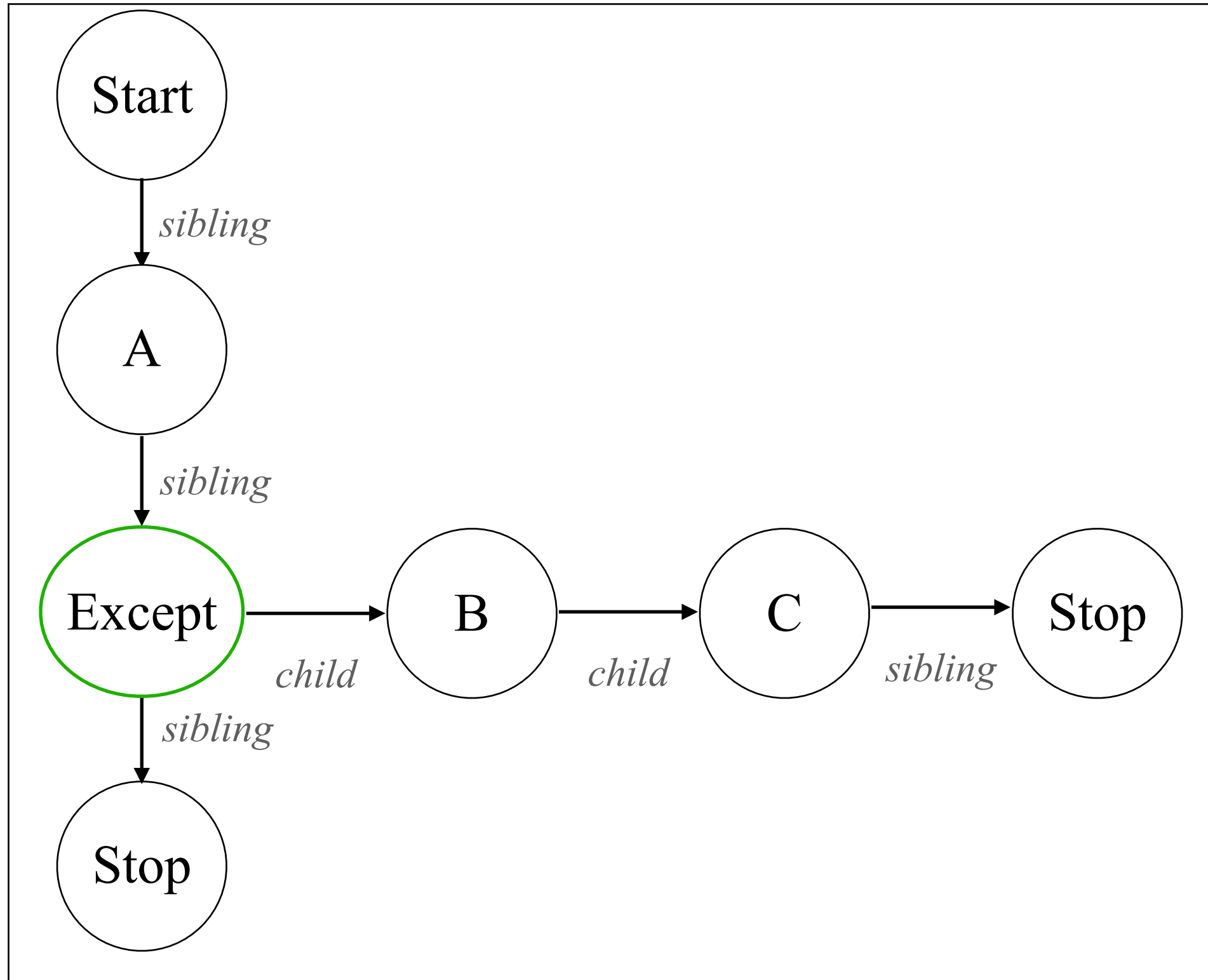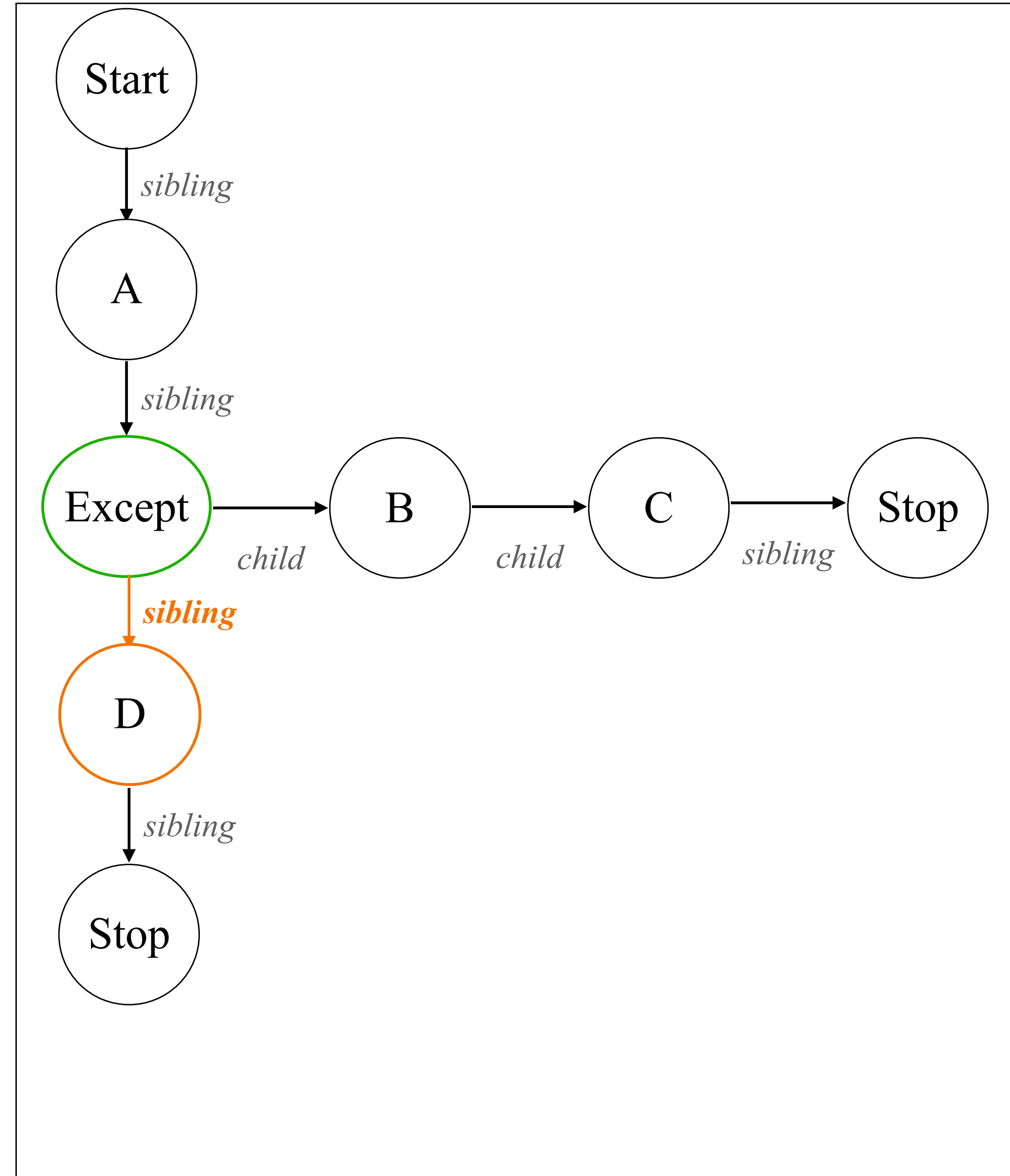↓ *sibling*
Stop
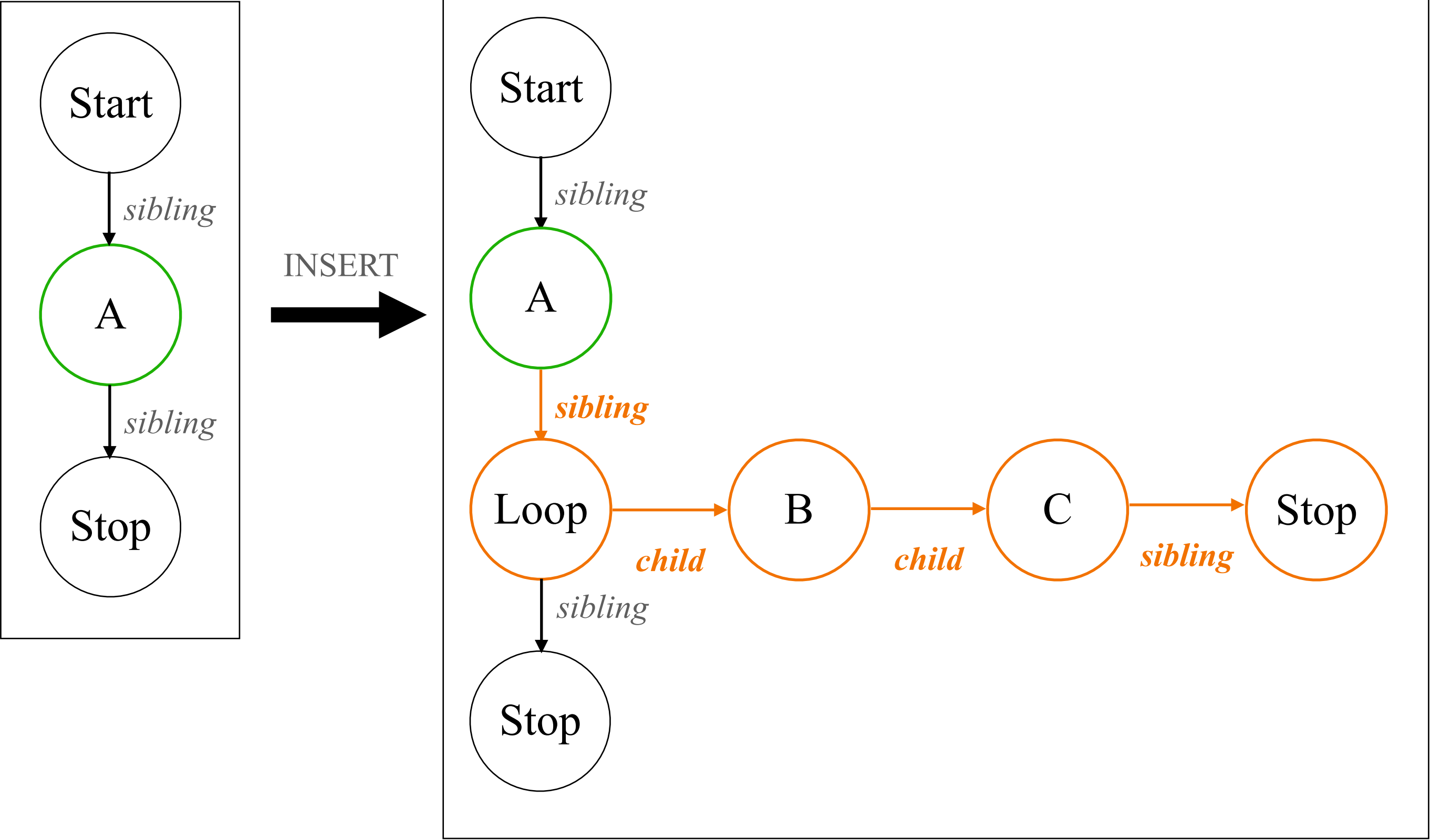
Key:
Green: node selected to perform the proposal move on
Orange: nodes added by the proposal

(A) API node

→ edge

Start

sibling

A

sibling

Except

child

B

child

C

sibling

Stop

sibling

Stop

INSERT

Start

sibling

A

sibling

Except

child

B

child

C

sibling

Stop

sibling

D

sibling

Stop

Insert when CFS is chosen

Delete API

Start
sibling
A
sibling
B
sibling
Stop

DELETE

Start
sibling
A
sibling
Stop

Delete CFS

Start
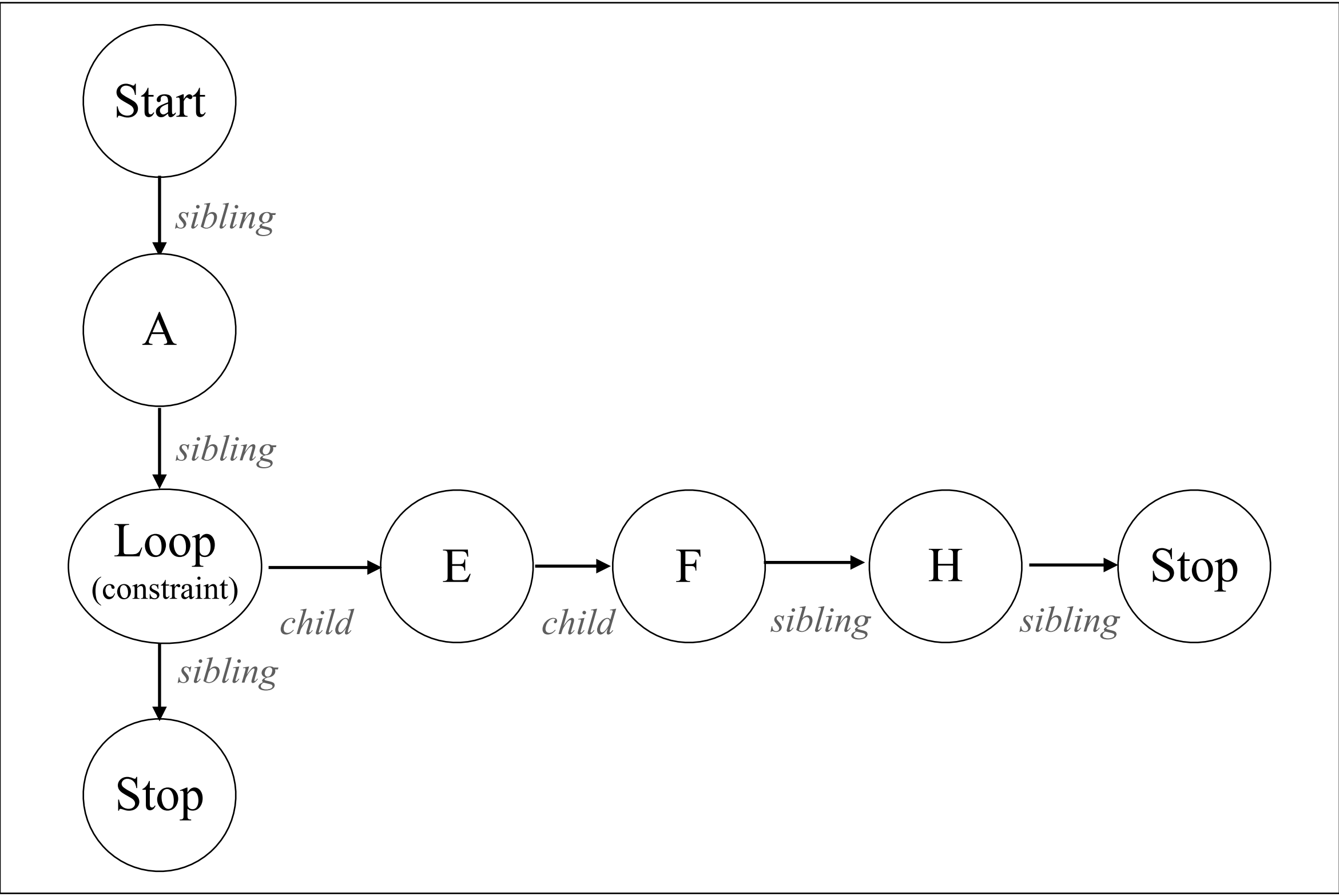sibling
A
sibling
Except
child
B
child
C
sibling
Stop
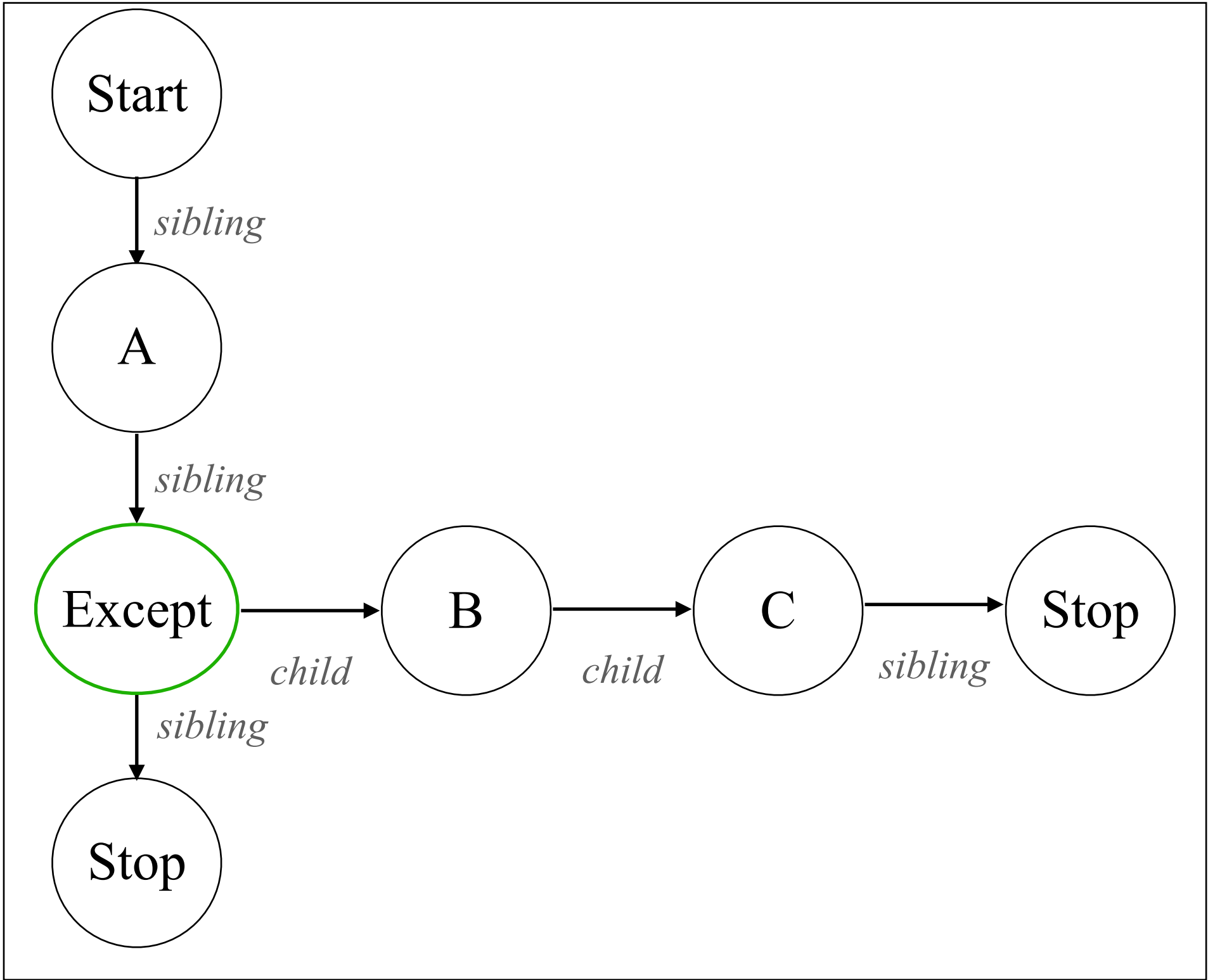sibling
Stop

DELETE

Start
sibling
A
sibling
Stop
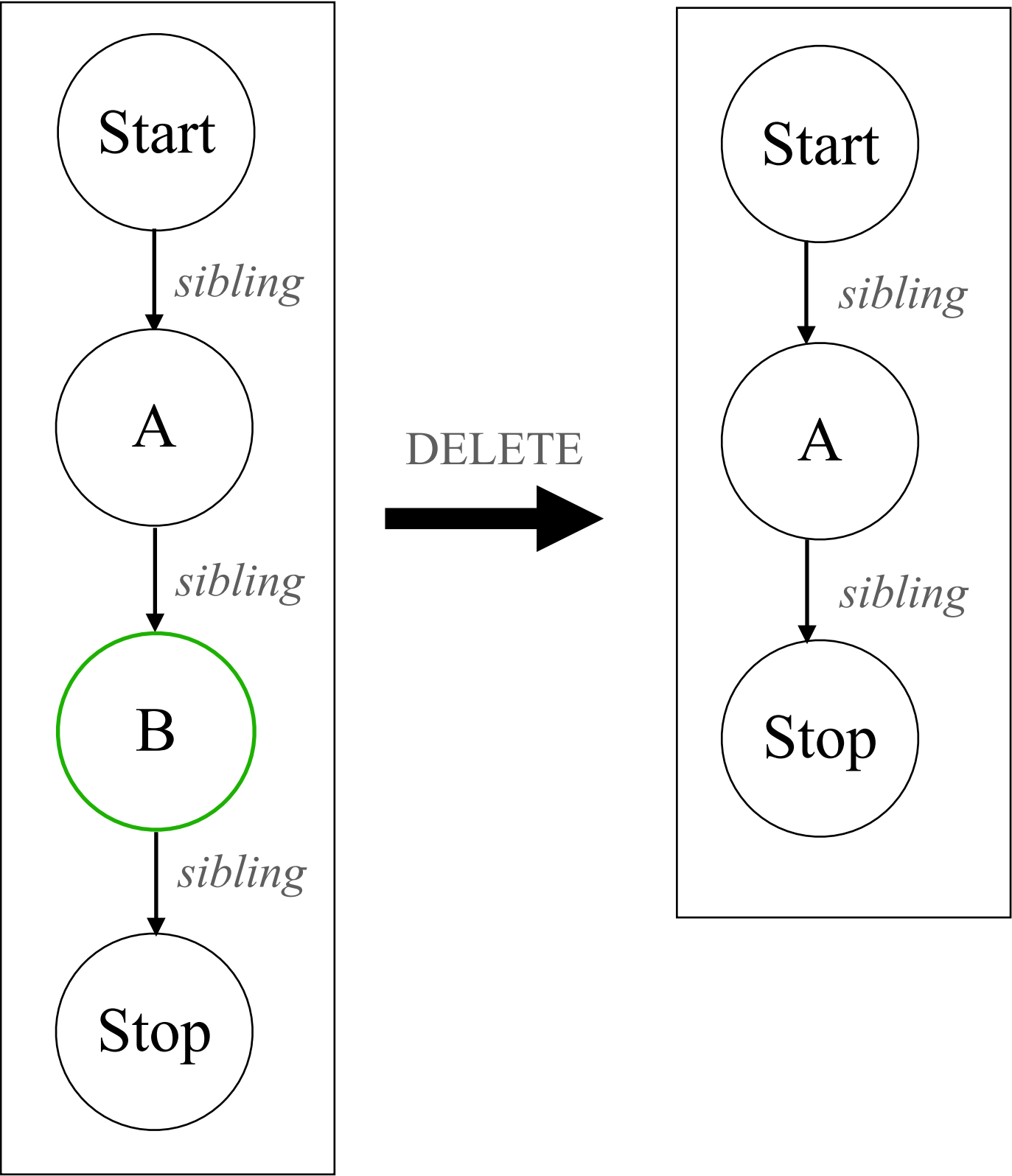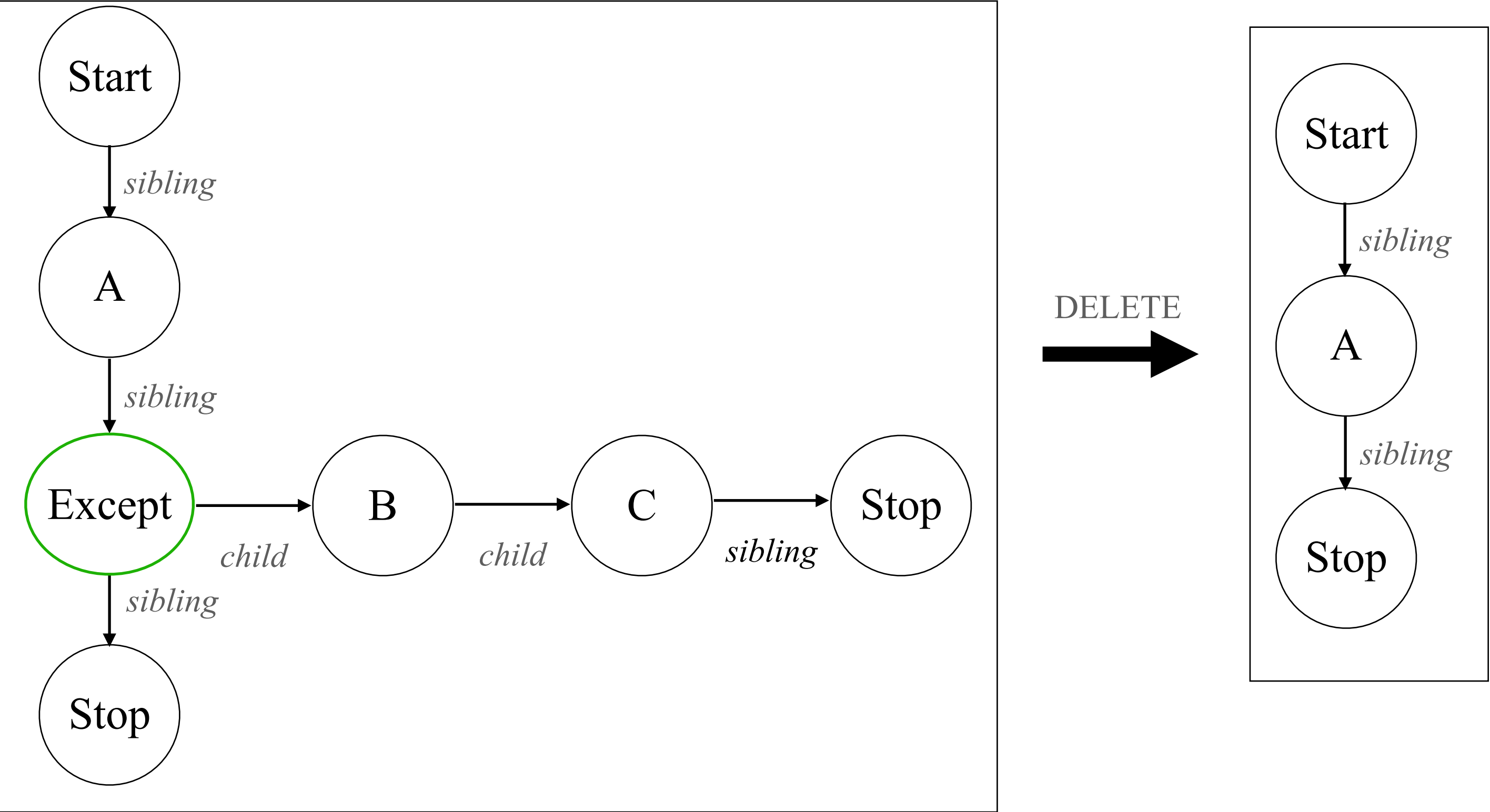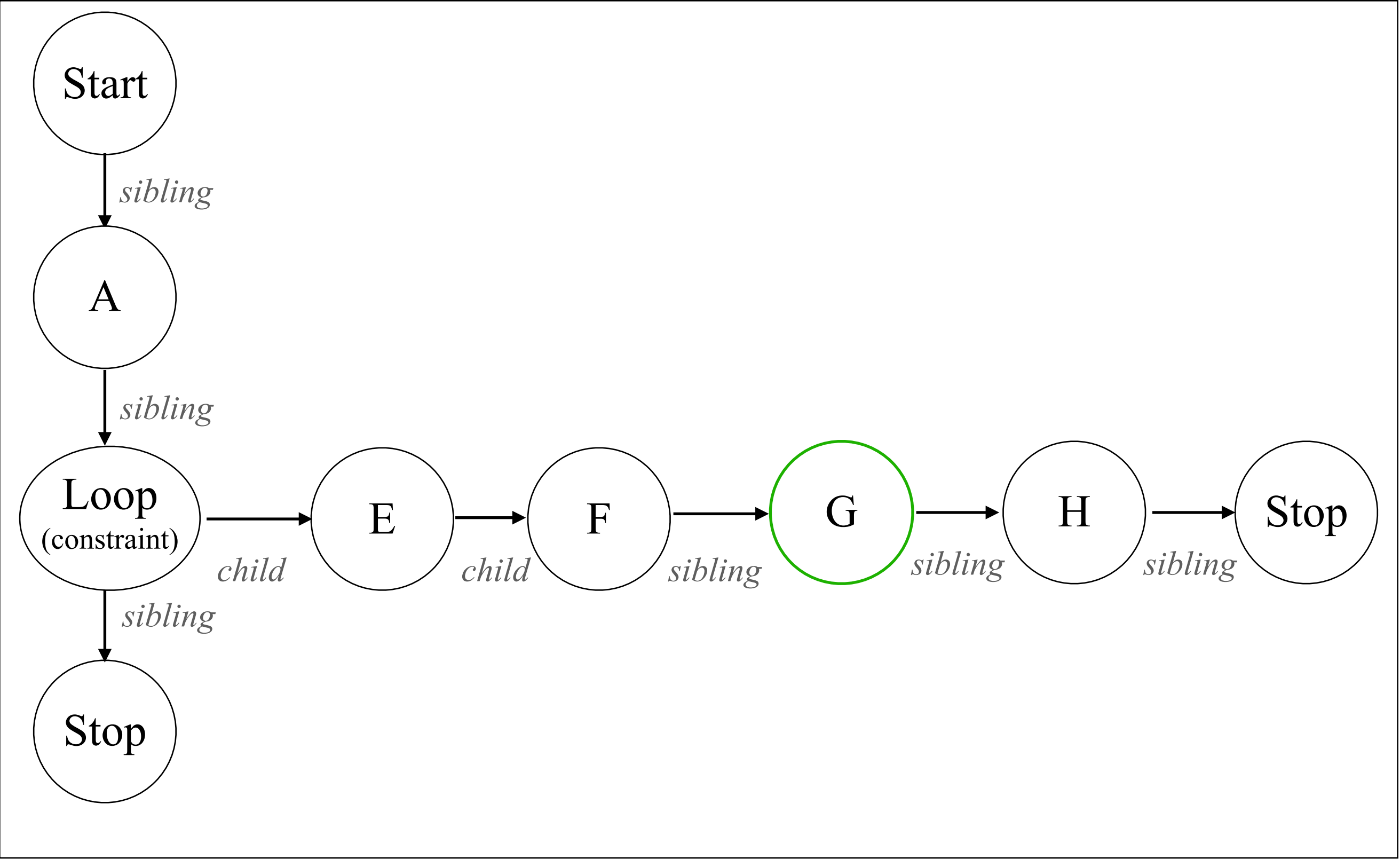
Delete API in CFS

Replace API
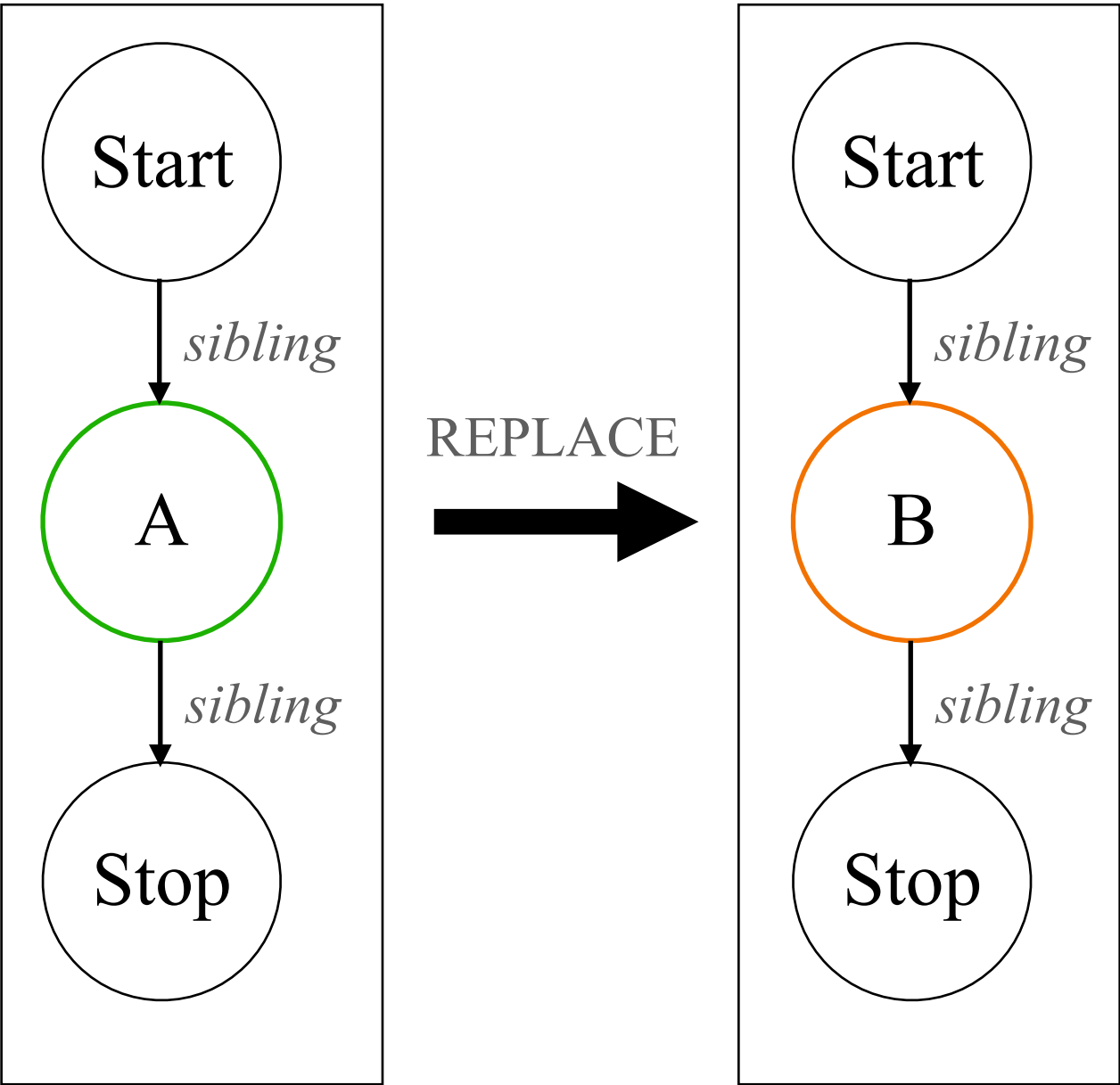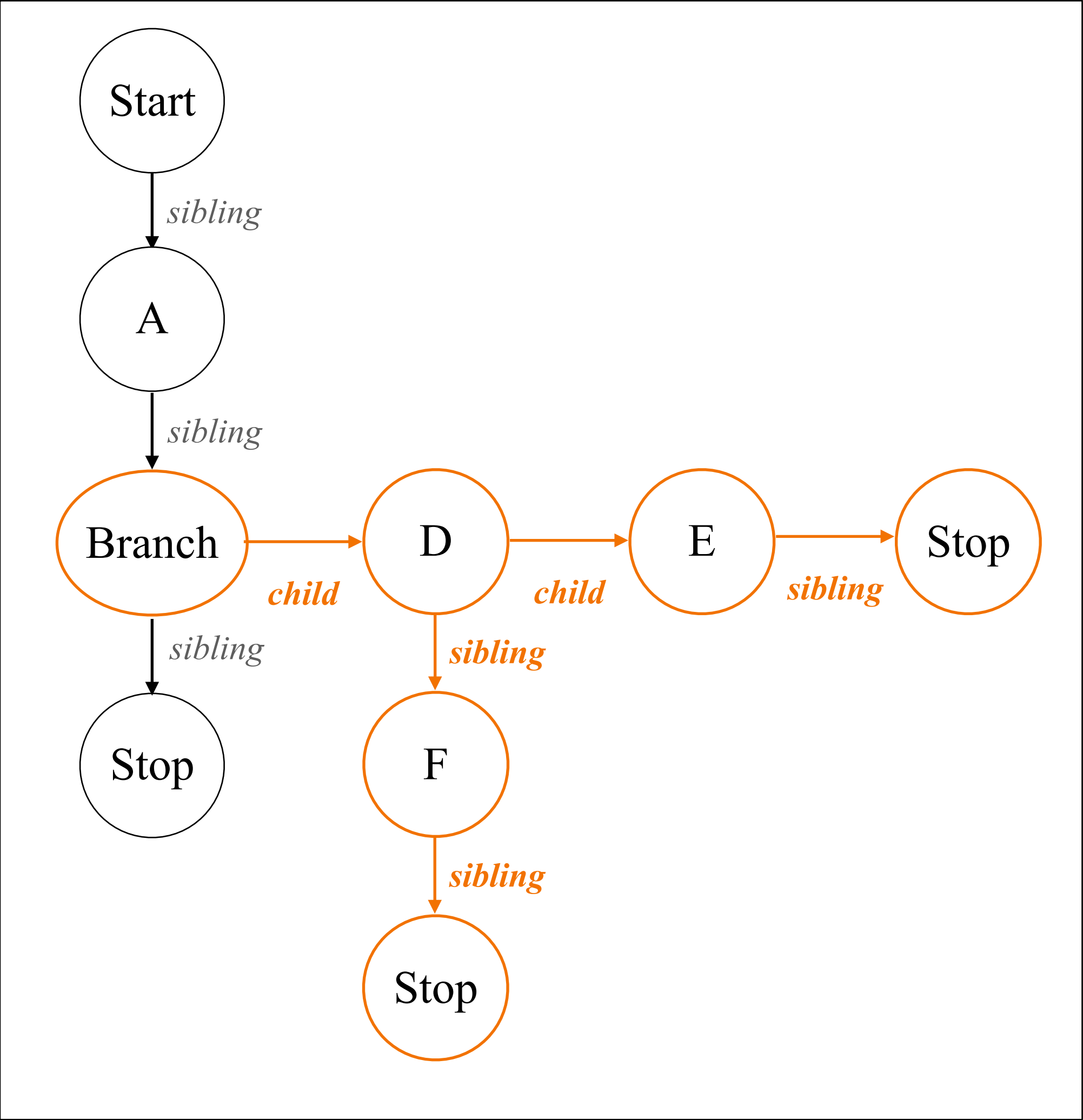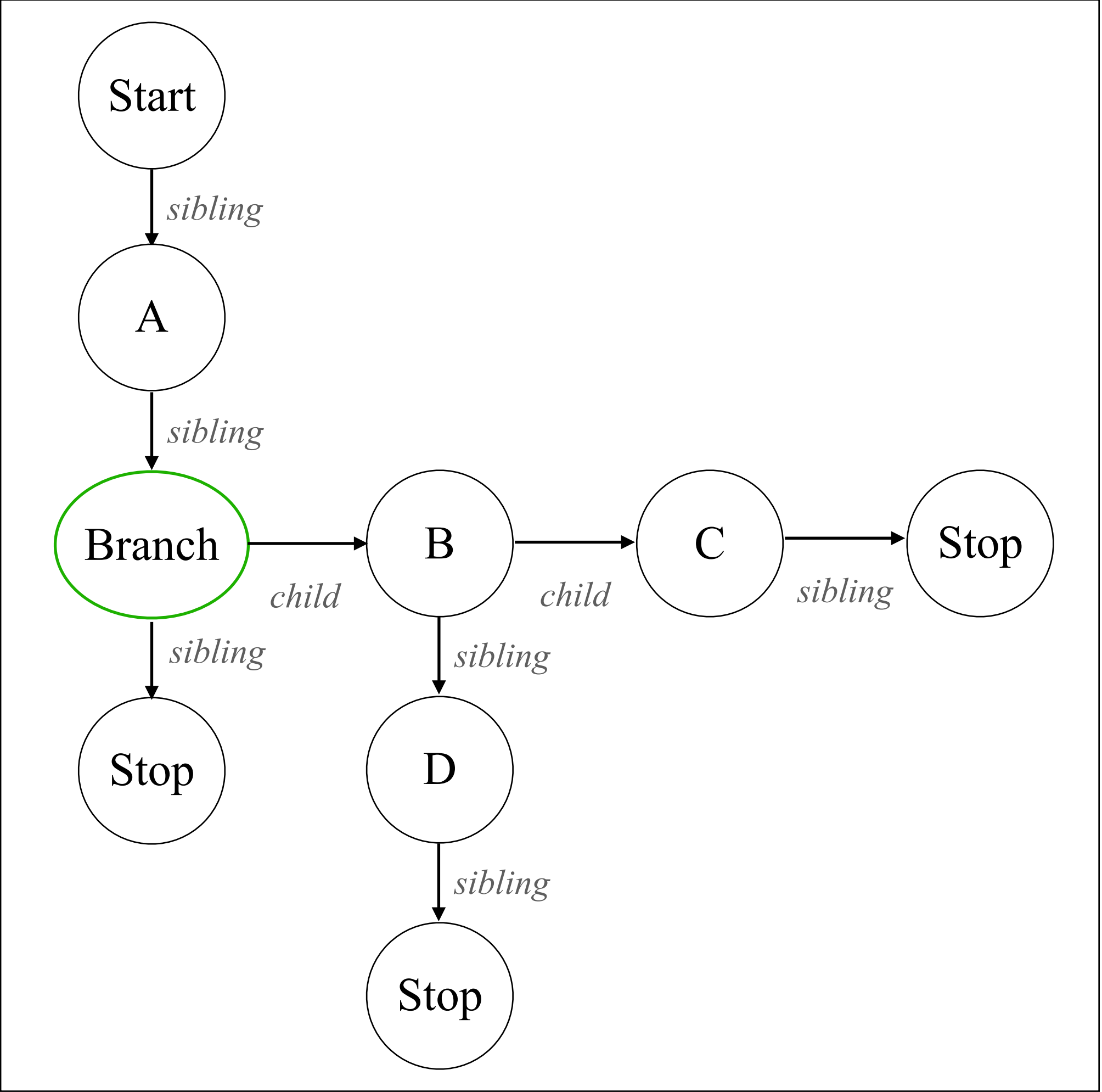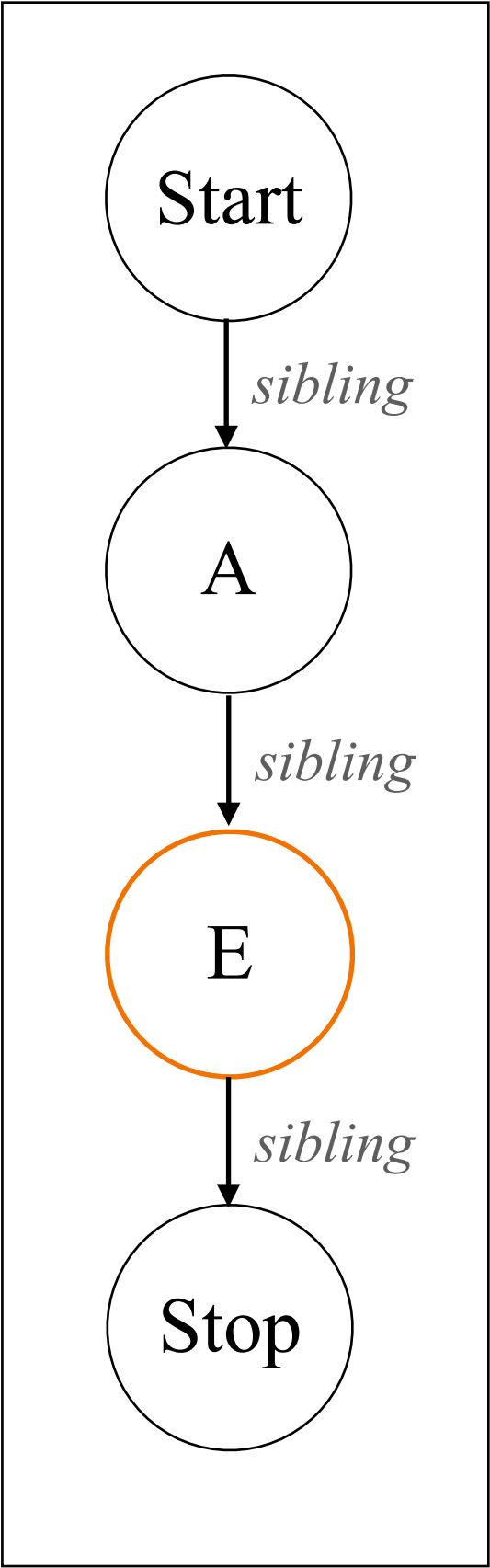
Replace CFS
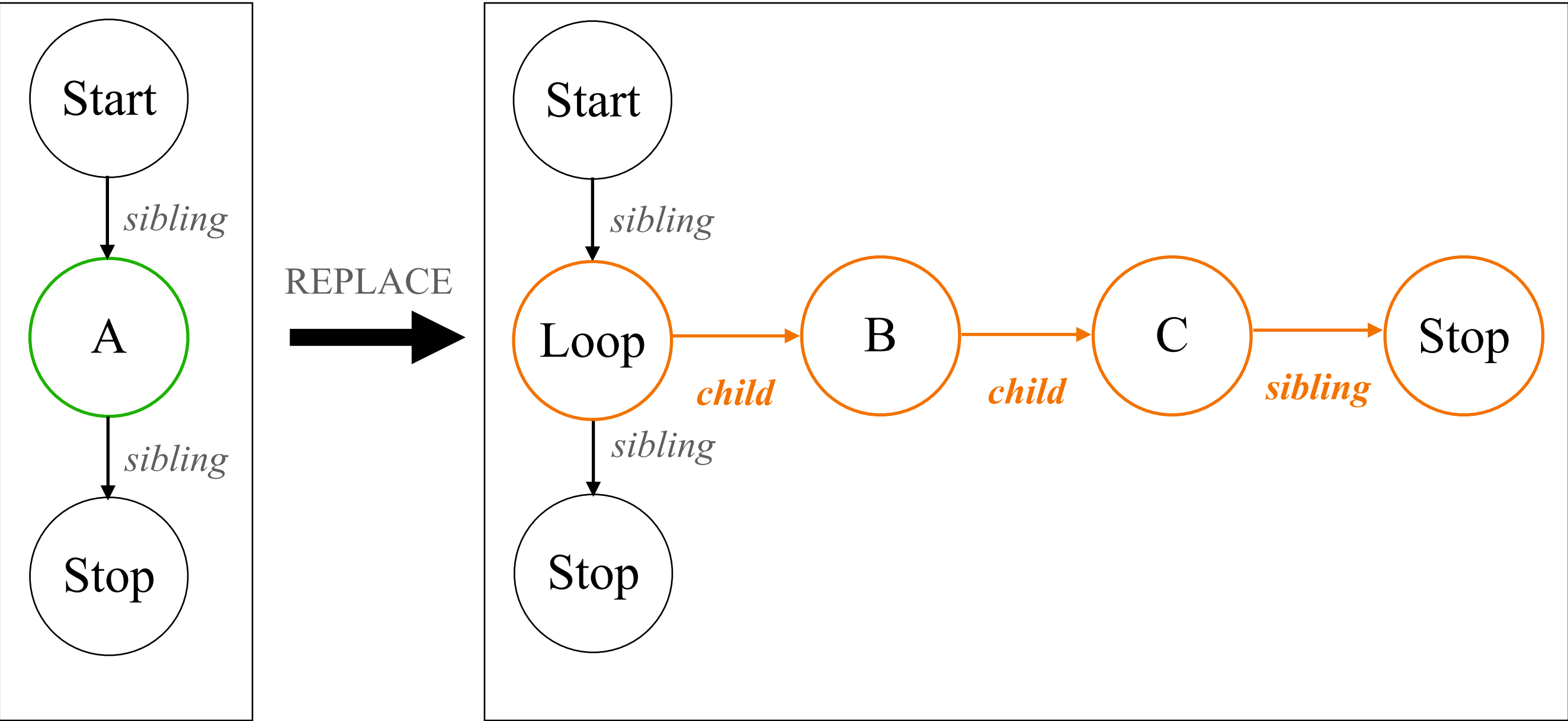
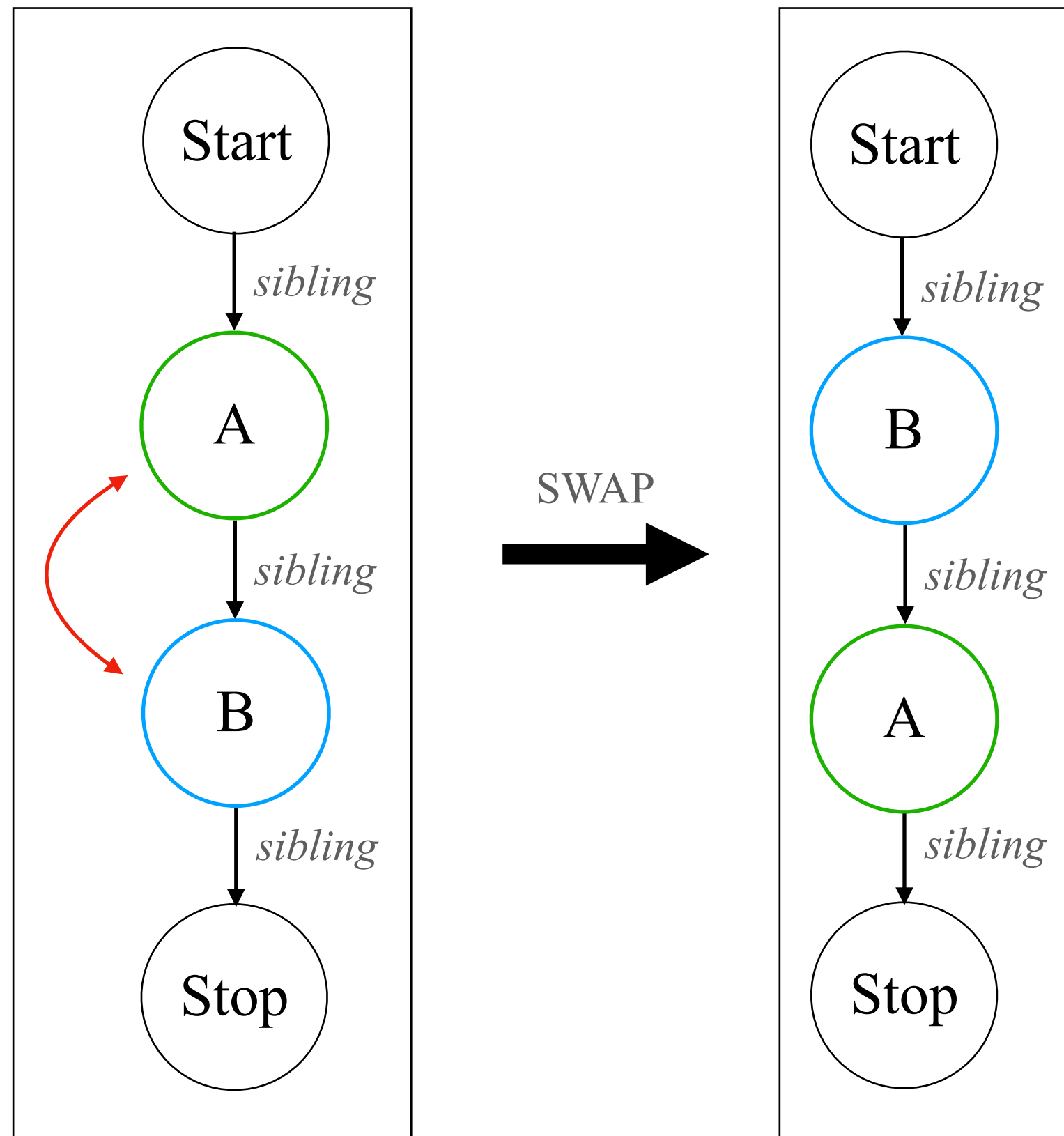Replace CFS with another CFS

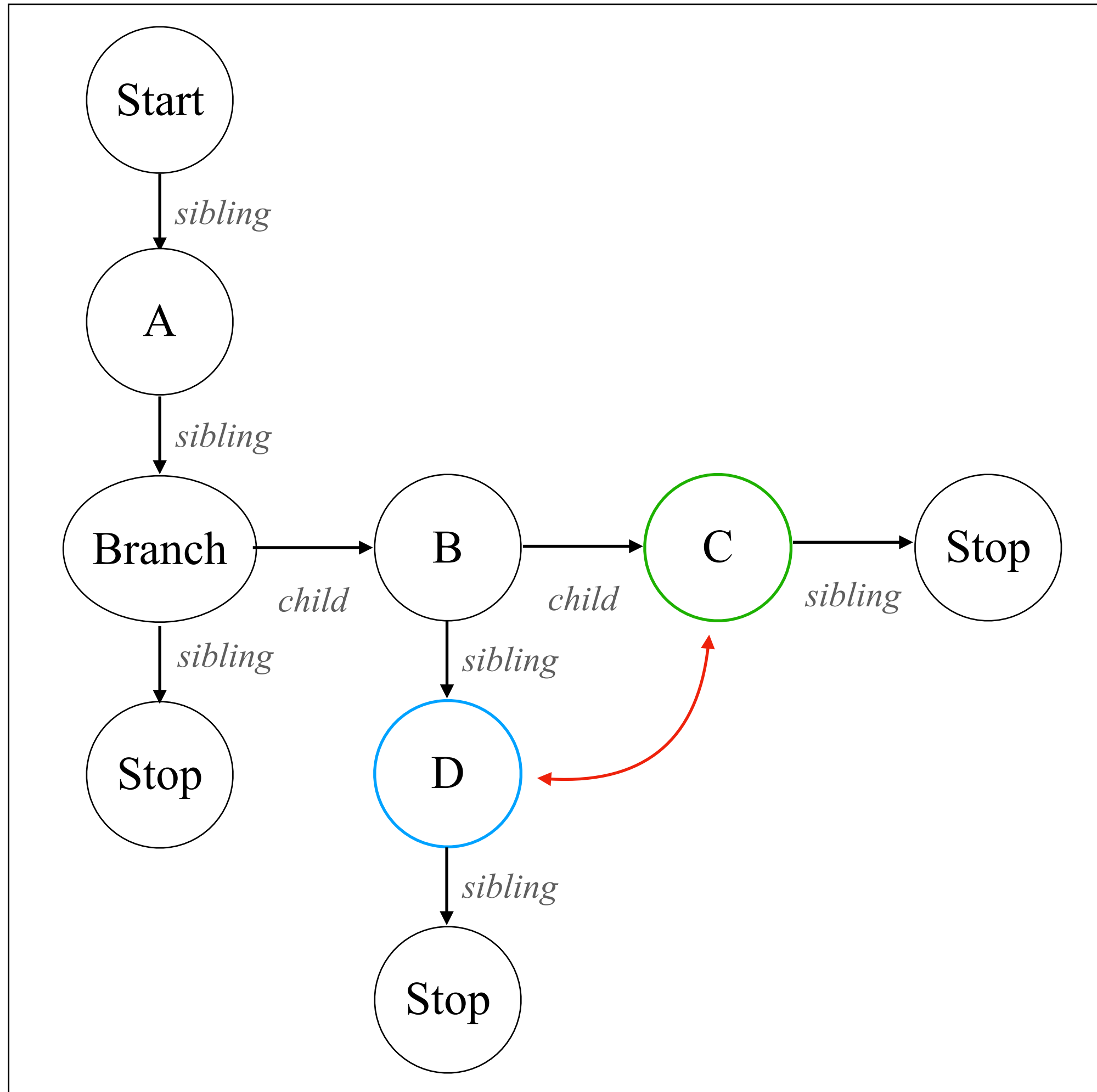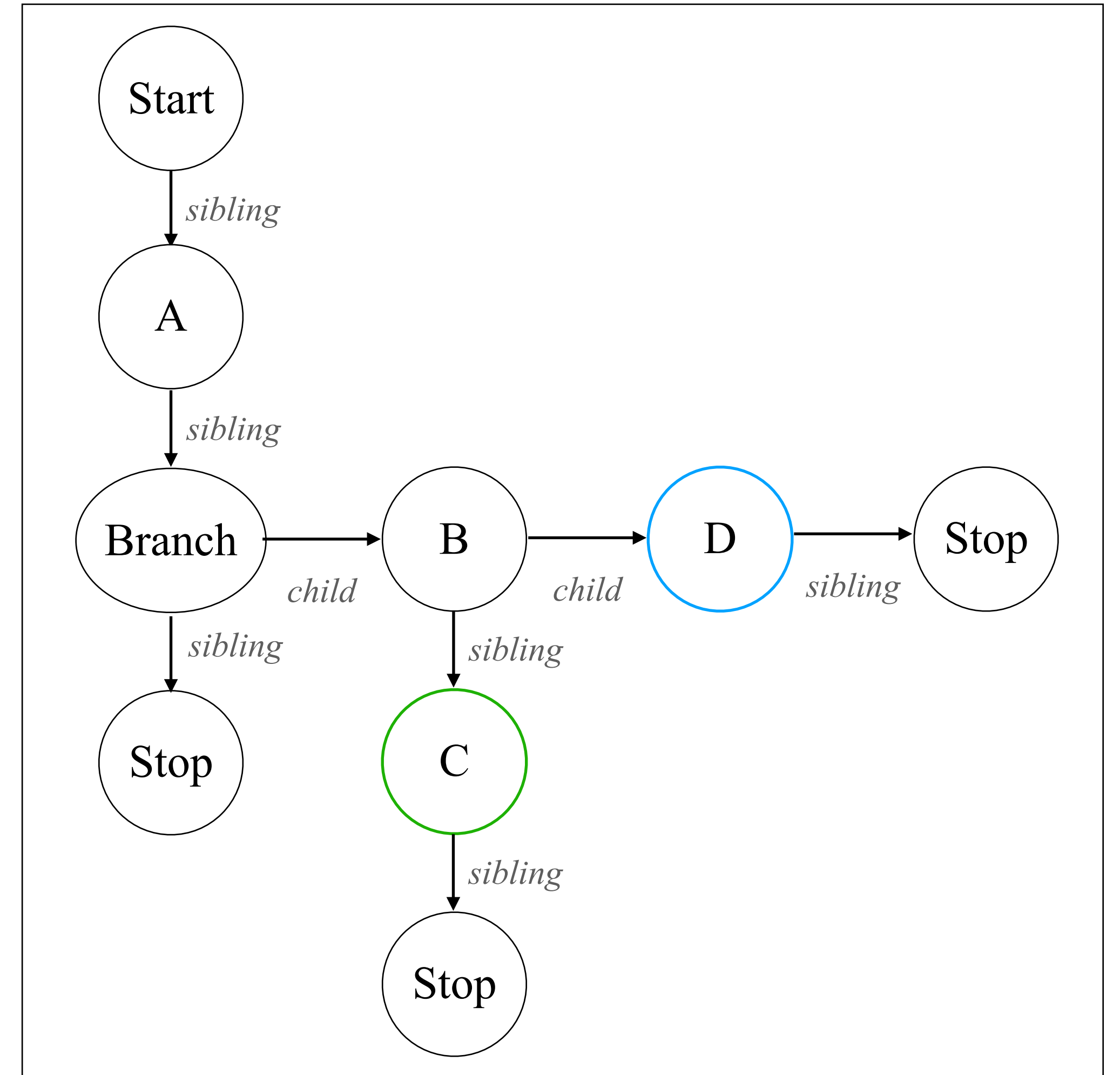REPLACE

Replace CFS with API

Swap APIs
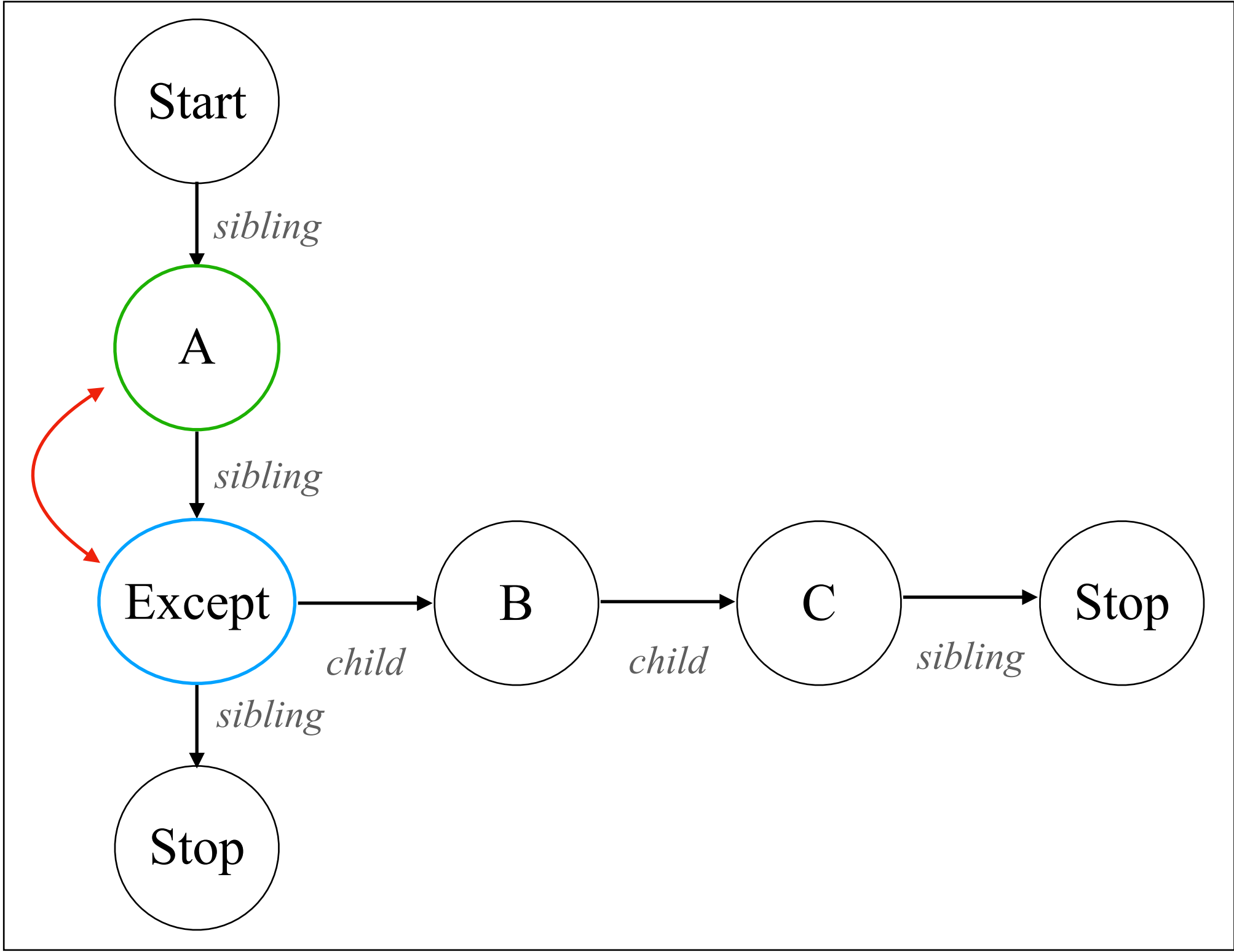
Key:
Green: node randomly selected to perform the proposal move on
Blue: second node randomly selected in swap proposal

Swap APIs in CFS
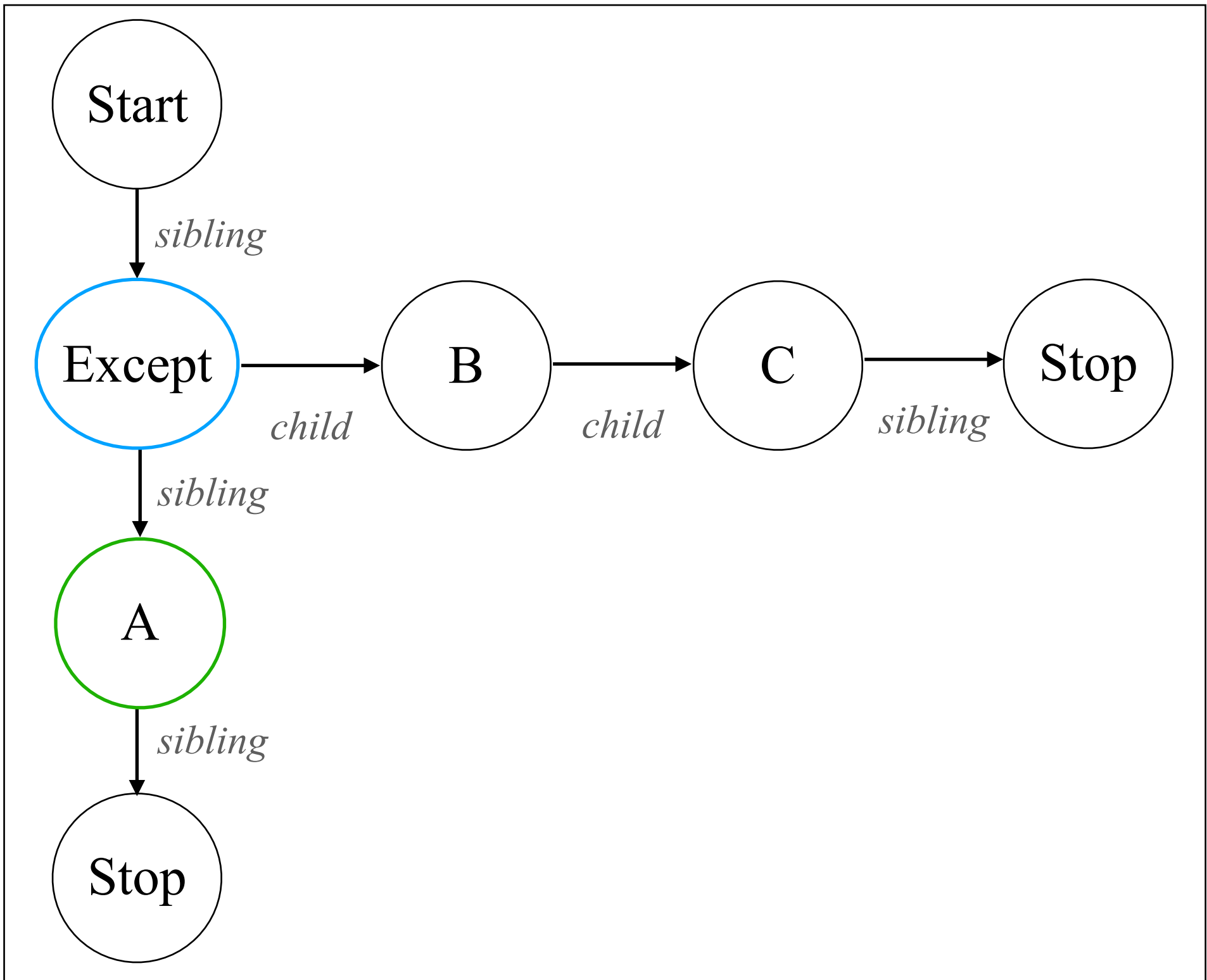
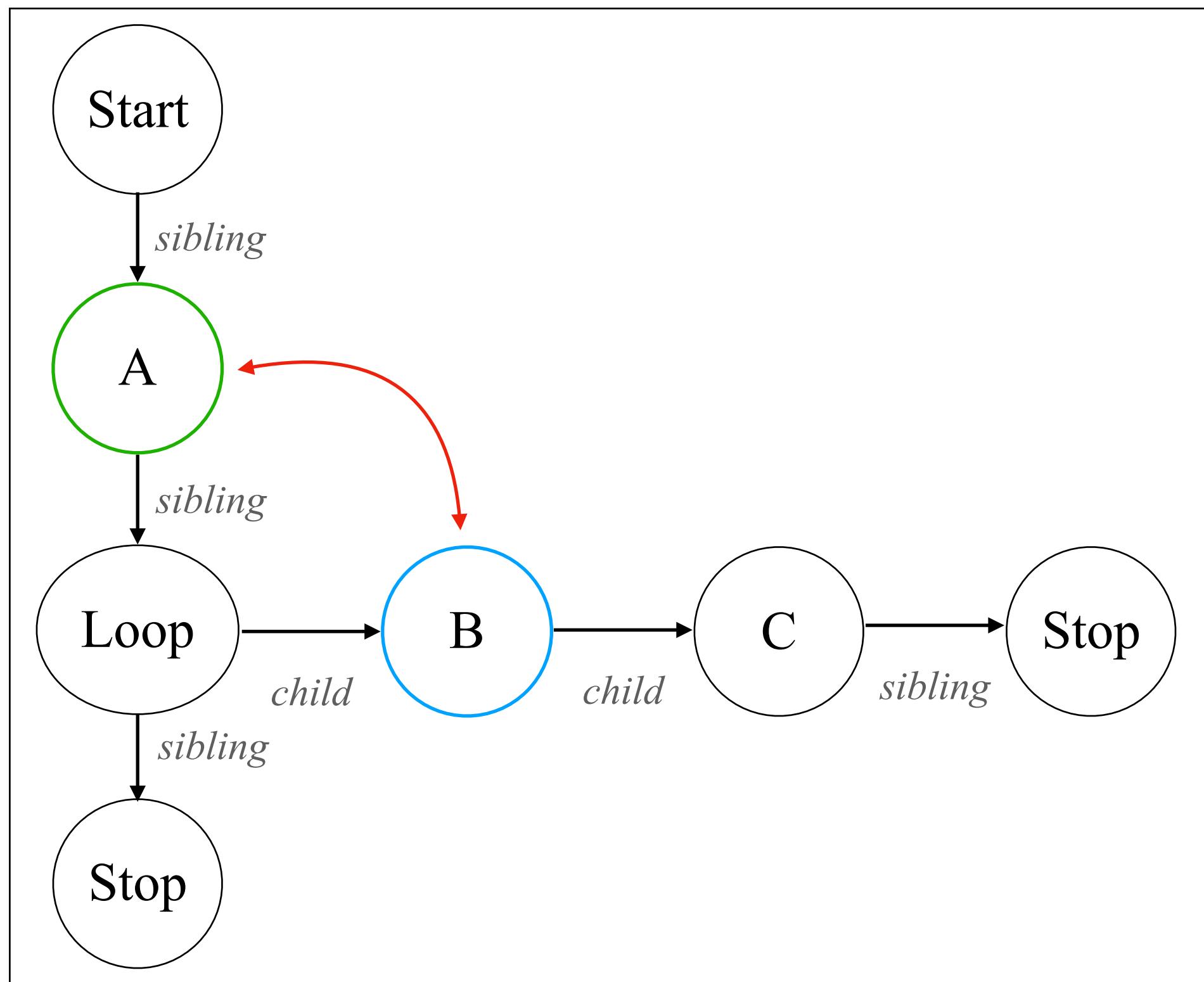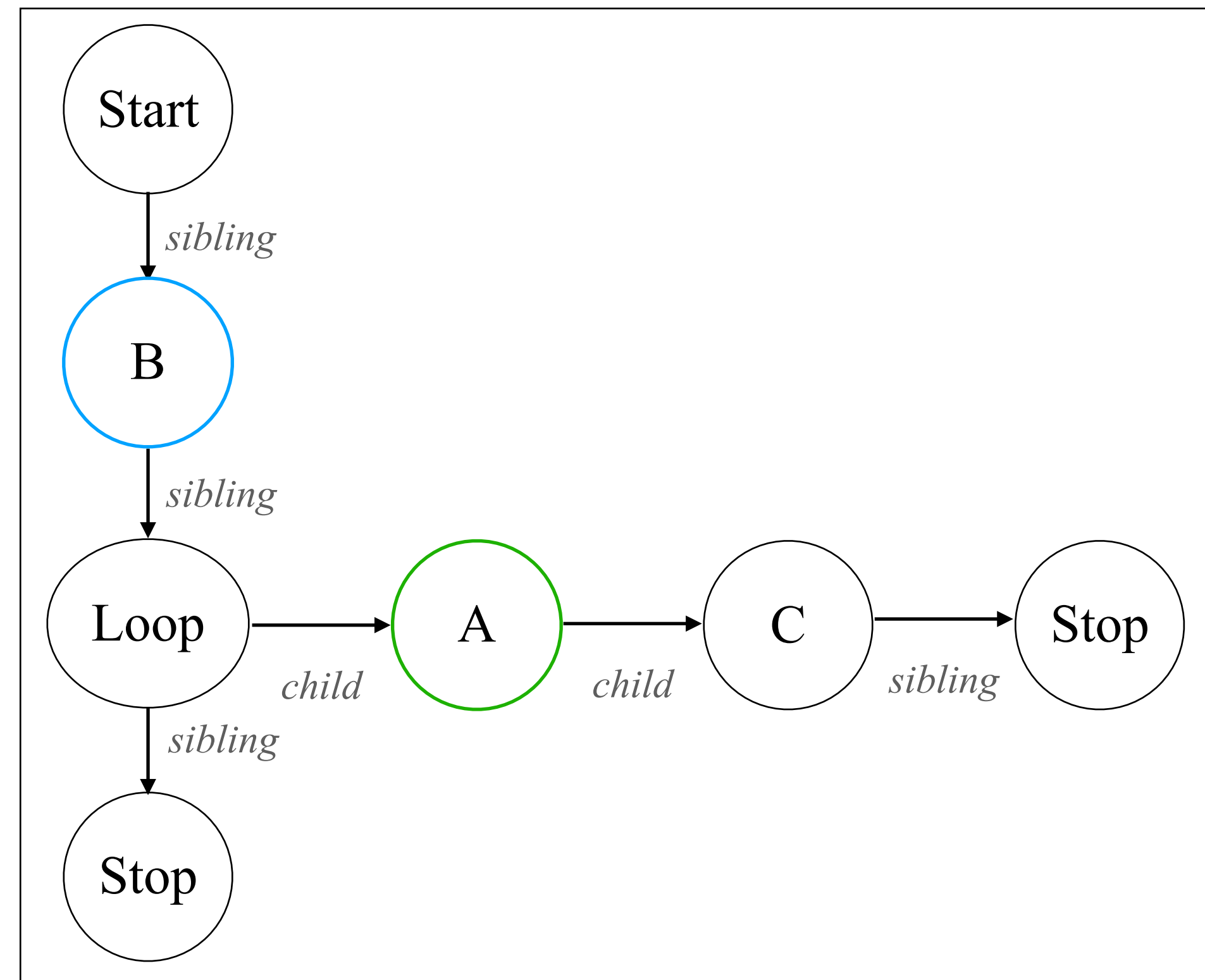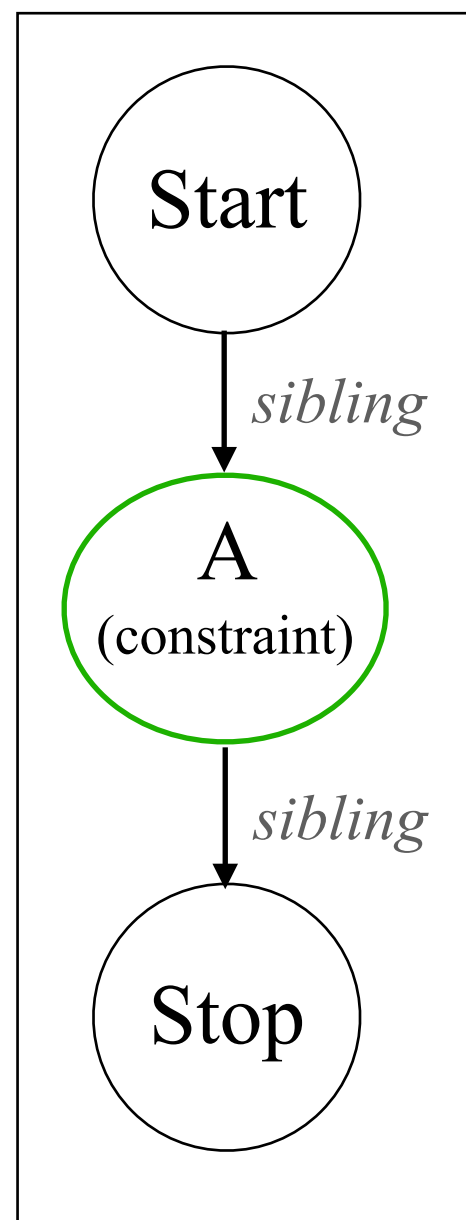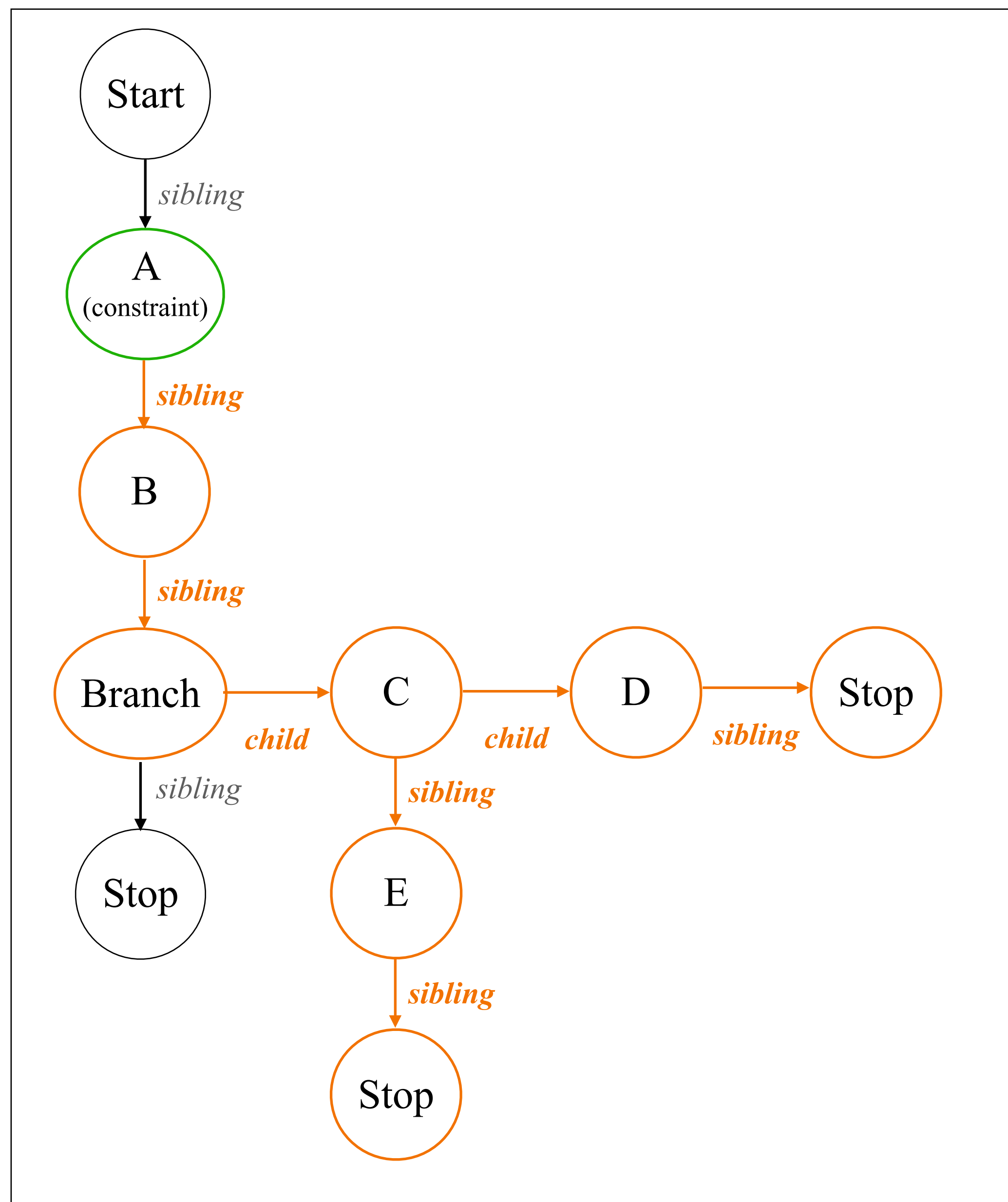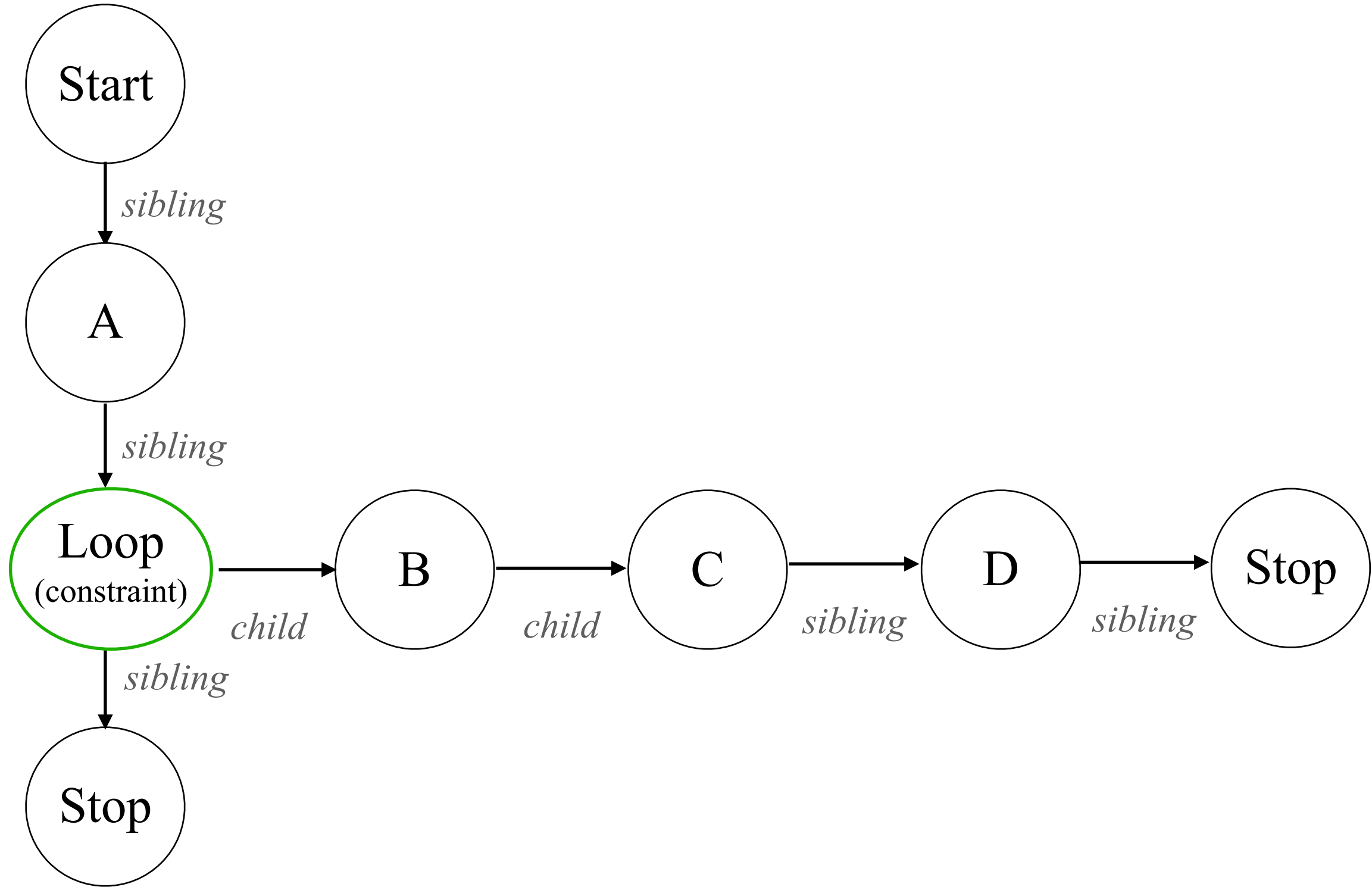Swap API and CFS

Swap API inside and outside of CFS

CONSTRAINT
GROWTH

Grow constraint API

Grow constraint CFS

CONSTRAINT GROWTH