

i Info

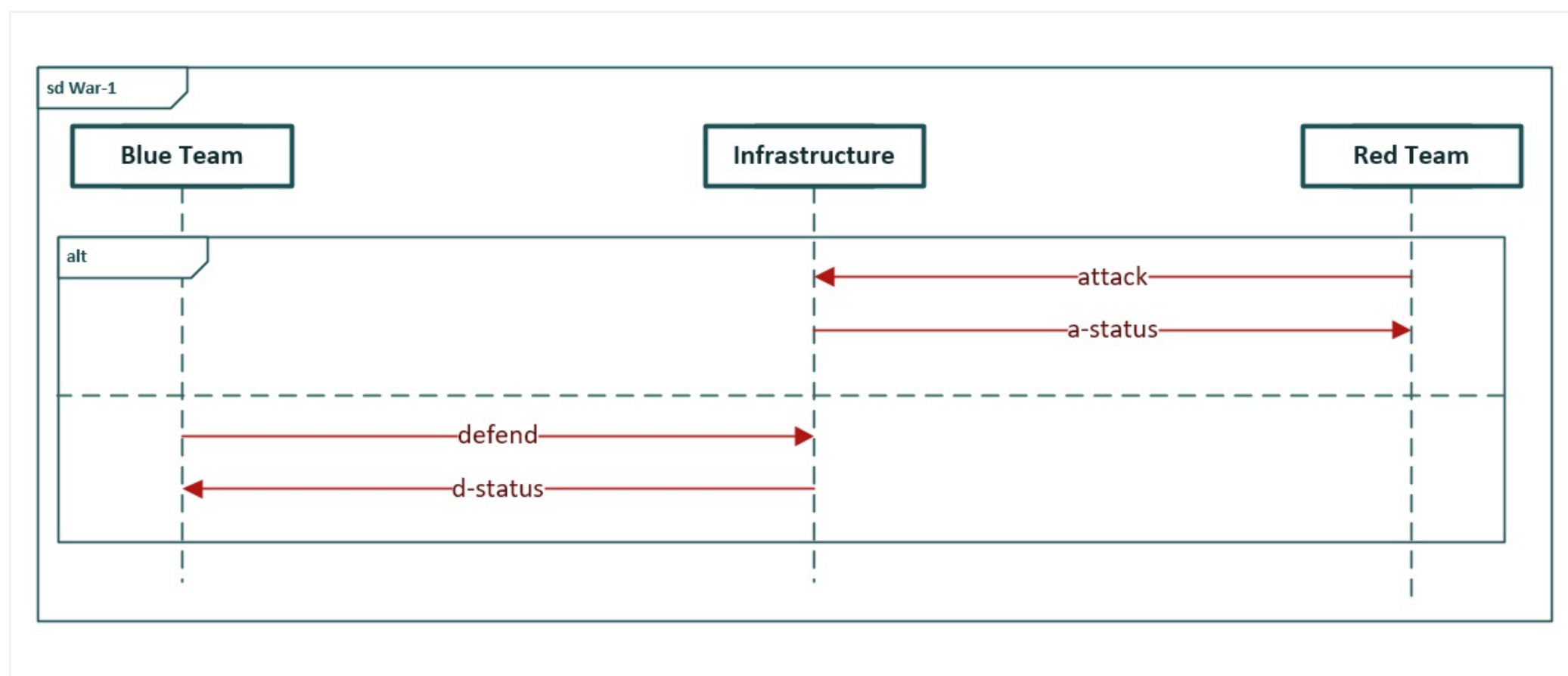
Exam in IN5130/IN9130/INF5150/INF9150

Time: 4th December at 2:30 PM (4 hours)

Permitted aids: Any written or printed material

A calculator is available in Inspira

1(a) **Question 1a**



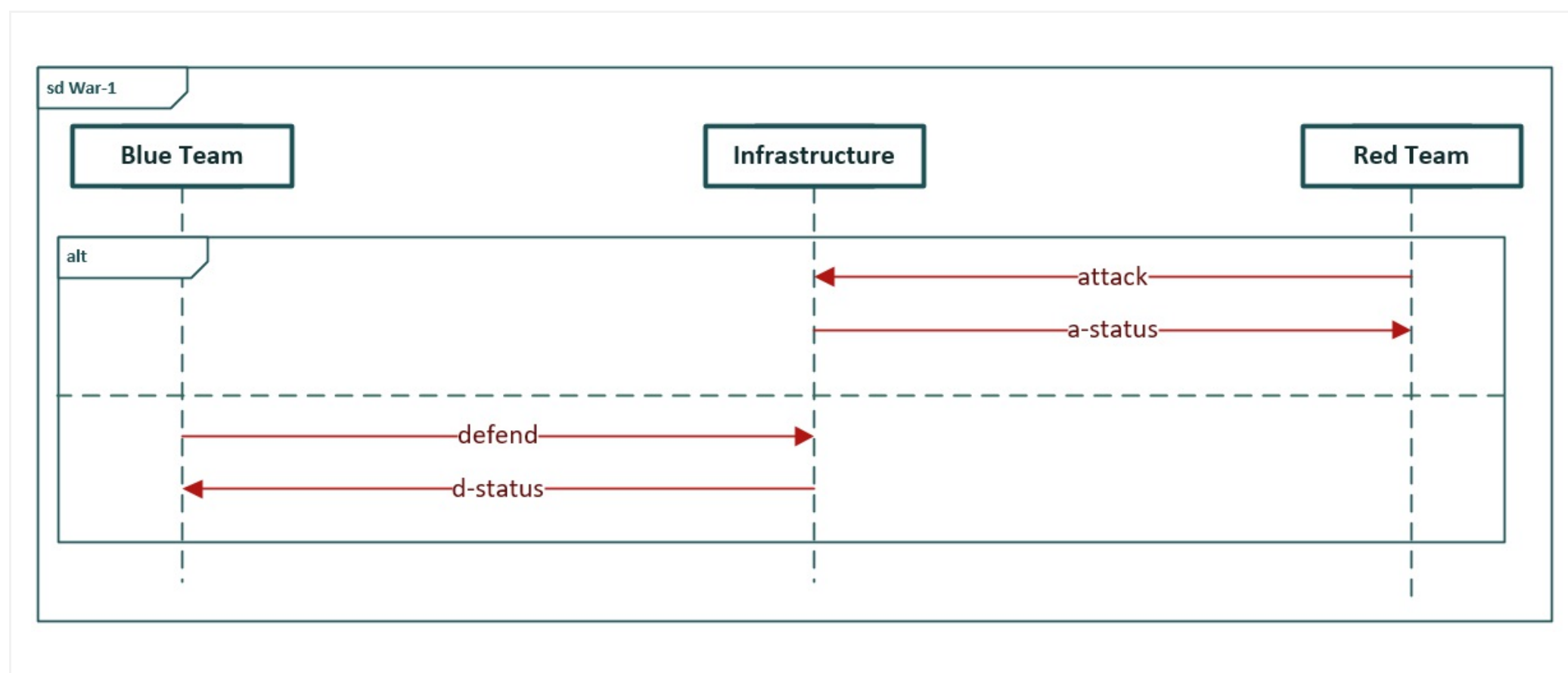
Which events may occur as the first event in a positive trace of **sd RedBlueFight-1**? Explain your answer.

Format
B
I
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x₂
x²
I_x
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Words: 0

Maks poeng: 5

1(b) **Question 1b**



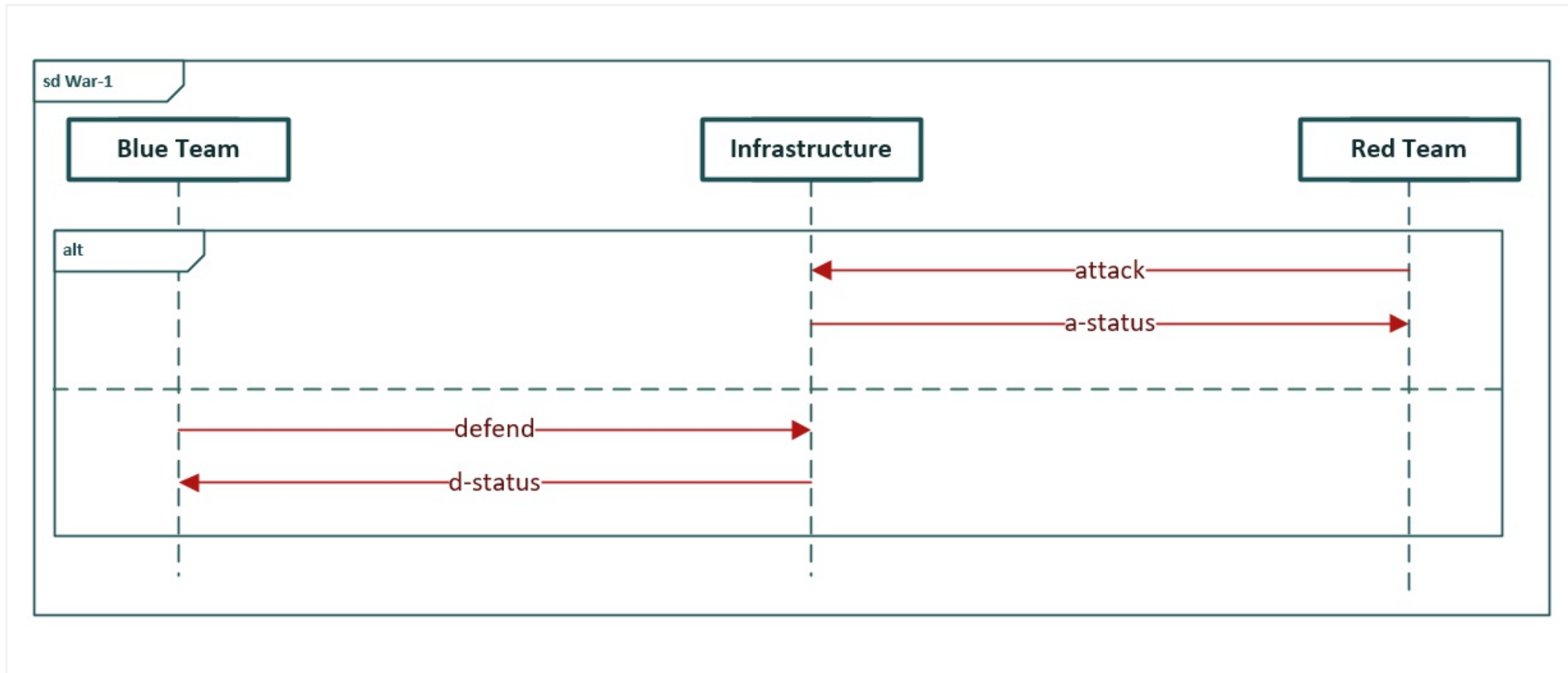
What is the minimum length of a positive trace of **sd RedBlueFight-1**? Explain your answer.

Format
B
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x²
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ABC
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Words: 0

Maks poeng: 6

1(c) **Question 1c**



Which events may occur as the last event in a positive trace of **sd RedBlueFight-1**? Explain your answer.

Format | B | I | U | x₂ | x² | I_x | | | | | | | | | | | ABC |

Words: 0

Maks poeng: 6

1(d) **Question 1d**

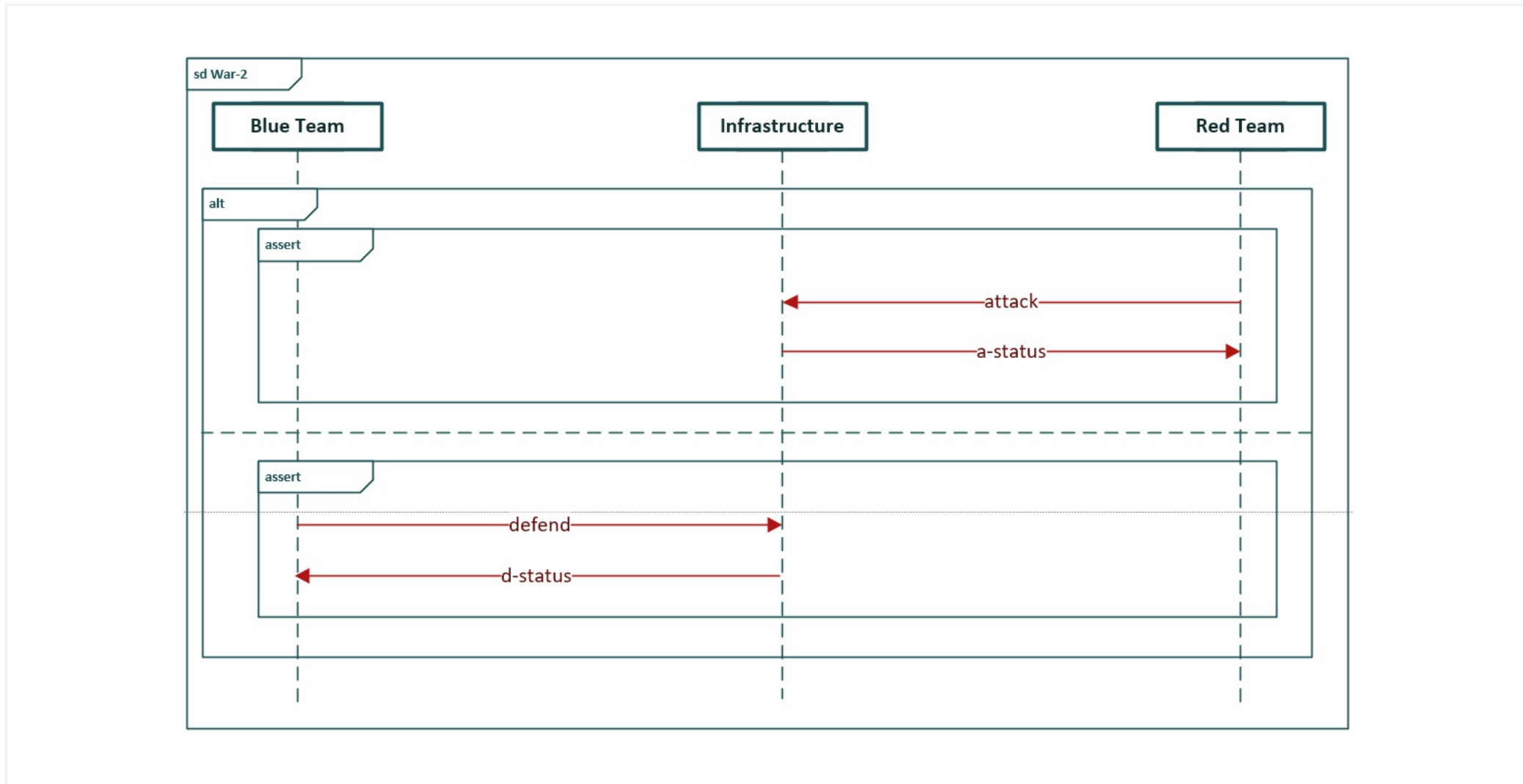
How many positive traces are there for **sd War-2**? Explain your answer.

Format | **B** | *I* | U | x_2 | x^2 | I_x | | | | | | | Ω | | | Σ | ABC |

Words: 0

Maks poeng: 6

1(e) **Question 1e**



Describe one negative trace of **sd RedBlueFight-2**. Use the $\langle e_1, e_2, \dots, e_j \rangle$ notation where e_1, e_2, \dots, e_j are events.

Format | B | I | U | x_2 | x^2 | I_x | [Icons: Copy, Paste, Undo, Redo, Find, Bold, Italic, Underline, Text Color, Background Color, Table, Eraser, Sum, Spell Check, Close]

Words: 0

Maks poeng: 6

1(f) **Question 1f**

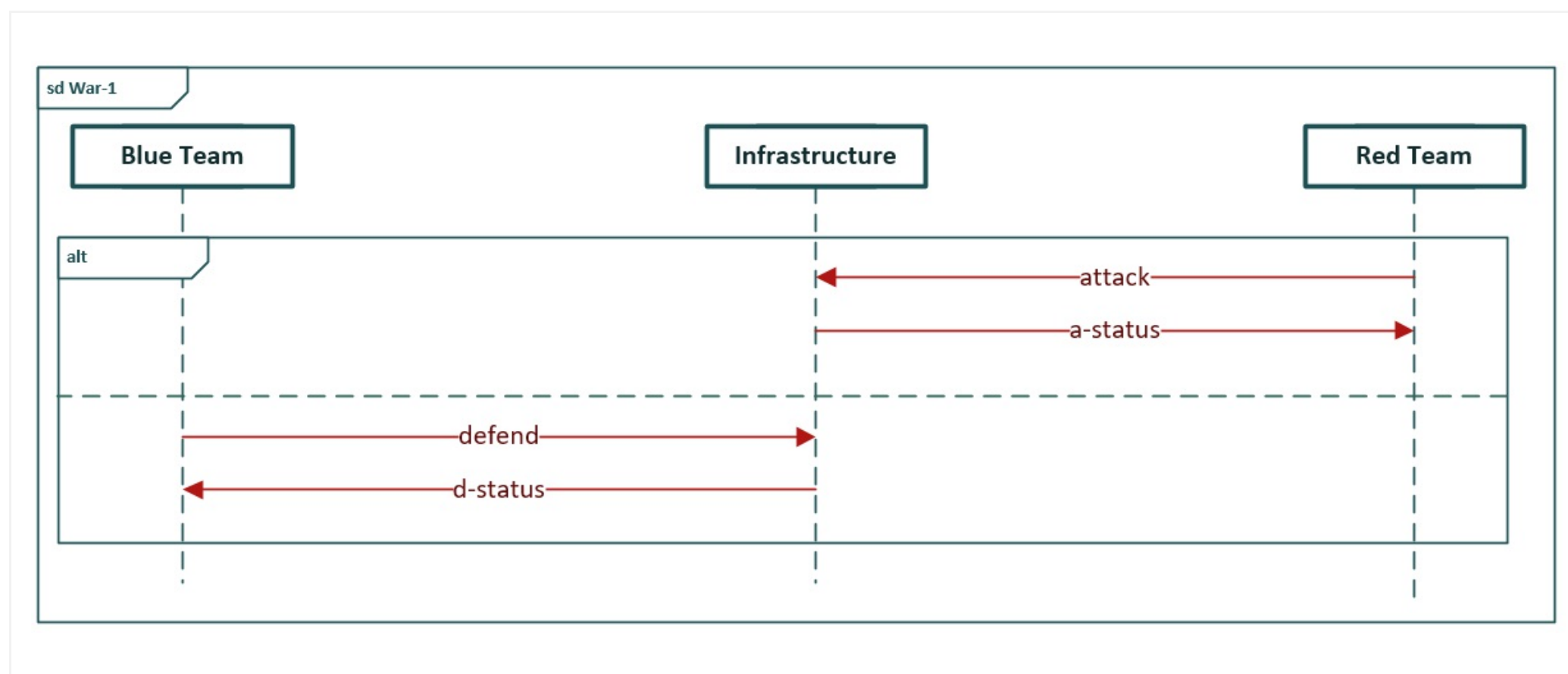
Which events may occur as the first event in a negative trace of sd War-2? Explain your answer.

Format | **B** | *I* | U | x_2 | x^2 | I_x | | | | | | | | | | Σ | ABC |

Words: 0

Maks poeng: 6

2(a) **Question 2a**



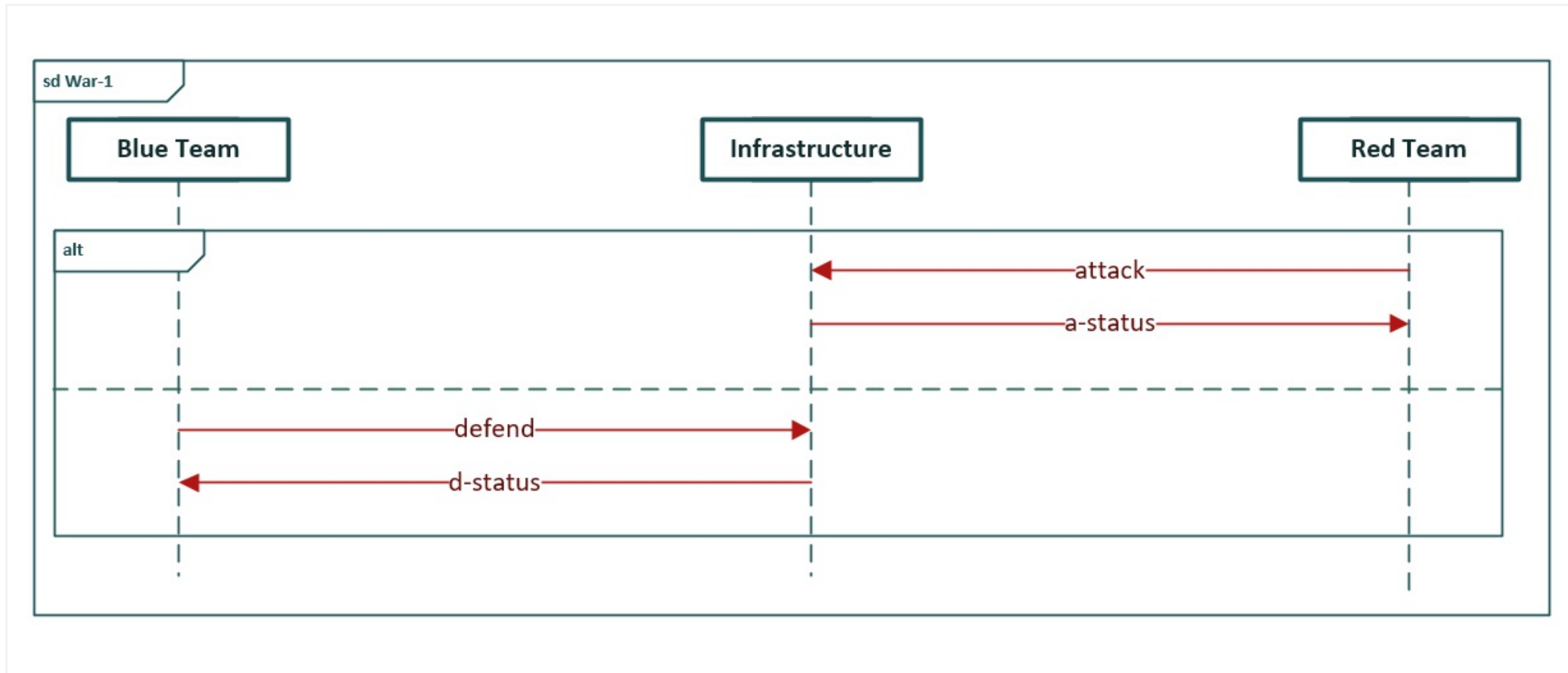
Is **sd War-2** a refinement of **sd War-1**. If so, is it a pure supplementing, a pure narrowing or a combination? Explain your answer.

Format - | **B** *I* U x_2 x^2 | I_x | | | | | | ABC |

Words: 0

Maks poeng: 5

2(b) **Question 2b**



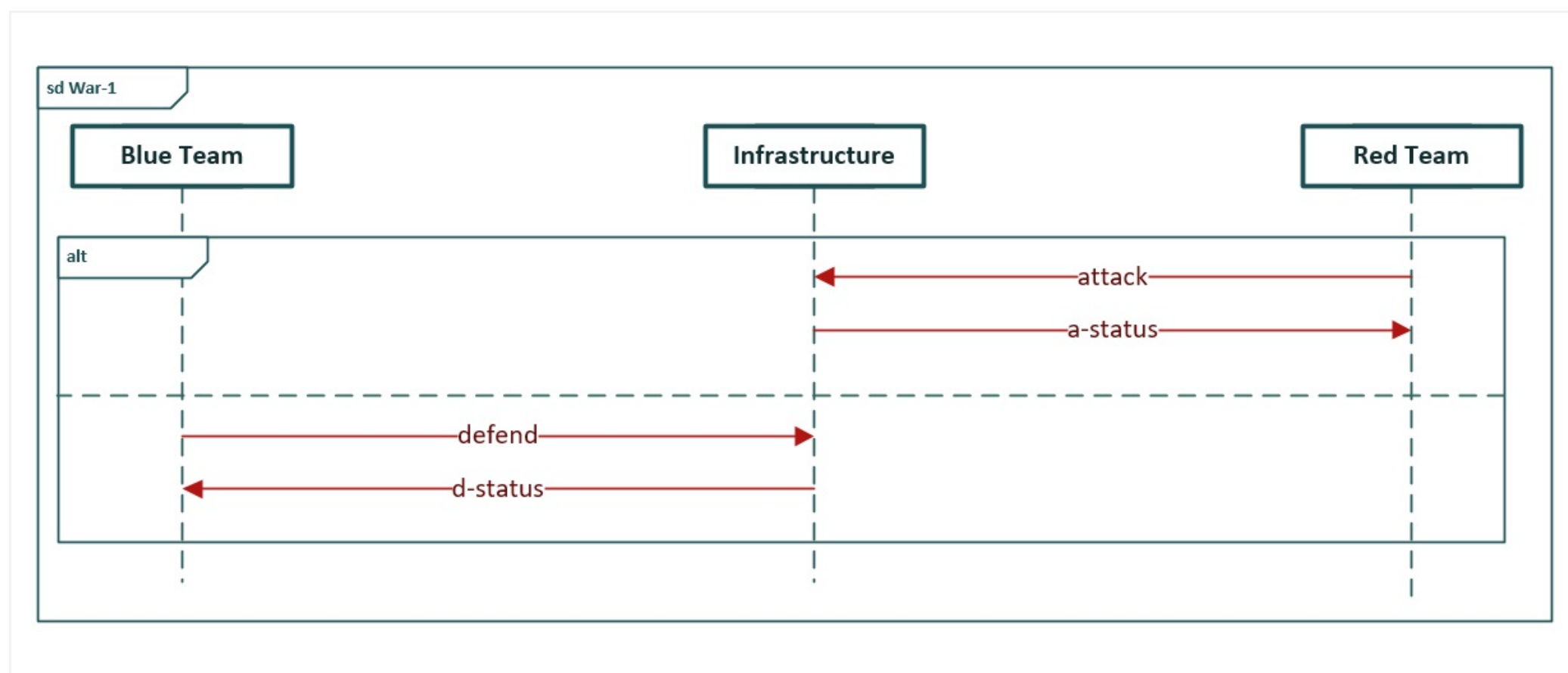
Is **sd War-3** a refinement of **sd War-1**? If so, is it a pure supplementing, a pure narrowing or a combination? Explain your answer.

Format - | **B** *I* U x_2 x^2 | I_x | | | | | | ABC |

Words: 0

Maks poeng: 6

2(c) **Question 2c**



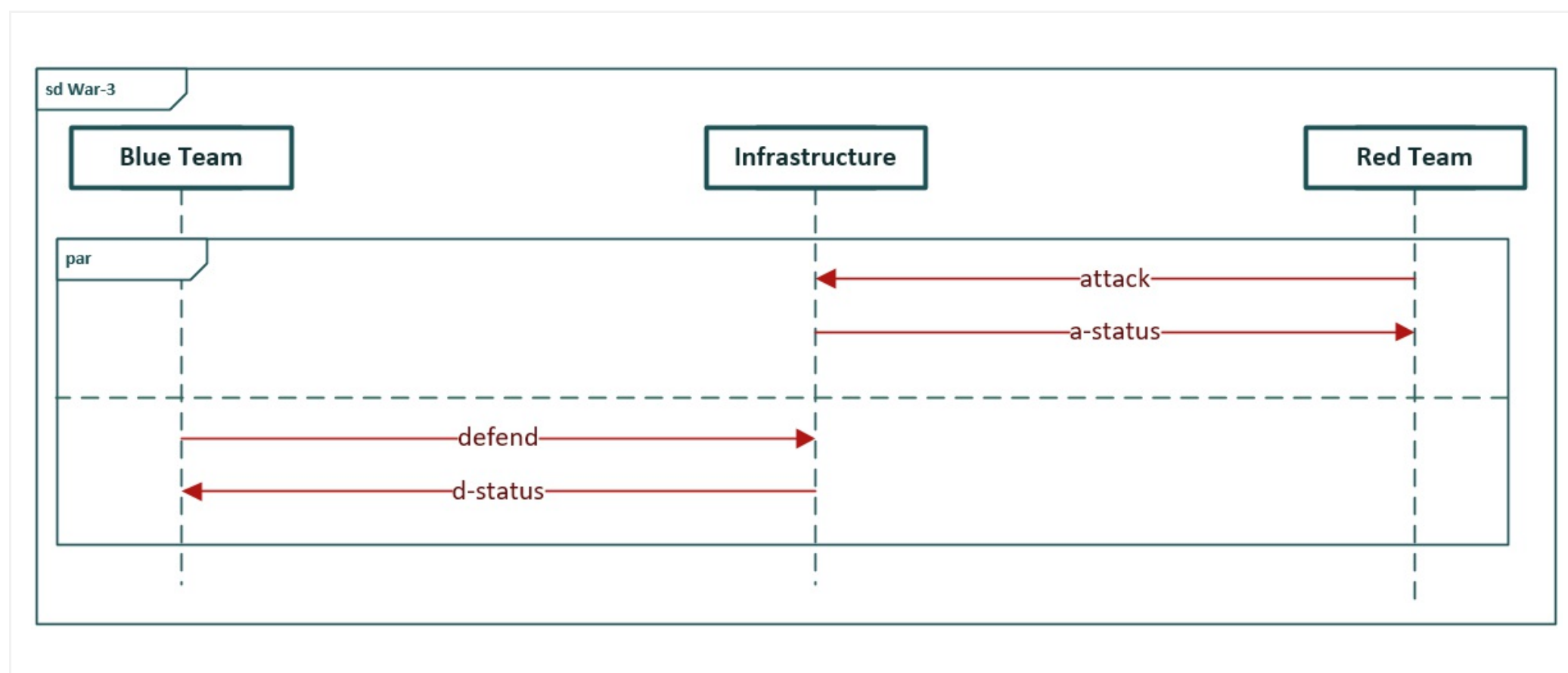
Is **sd War-4** a refinement of **sd War-1**? If so, is it a general refinement or a limited refinement? Explain your answer.

Format | B | I | U | x₂ | x² | I_x | [copy] | [paste] | [undo] | [redo] | [list] | [table] | [math] | [table] | [pencil] | [sum] | ABC | [clear]

Words: 0

Maks poeng: 6

2(d) **Question 2d**



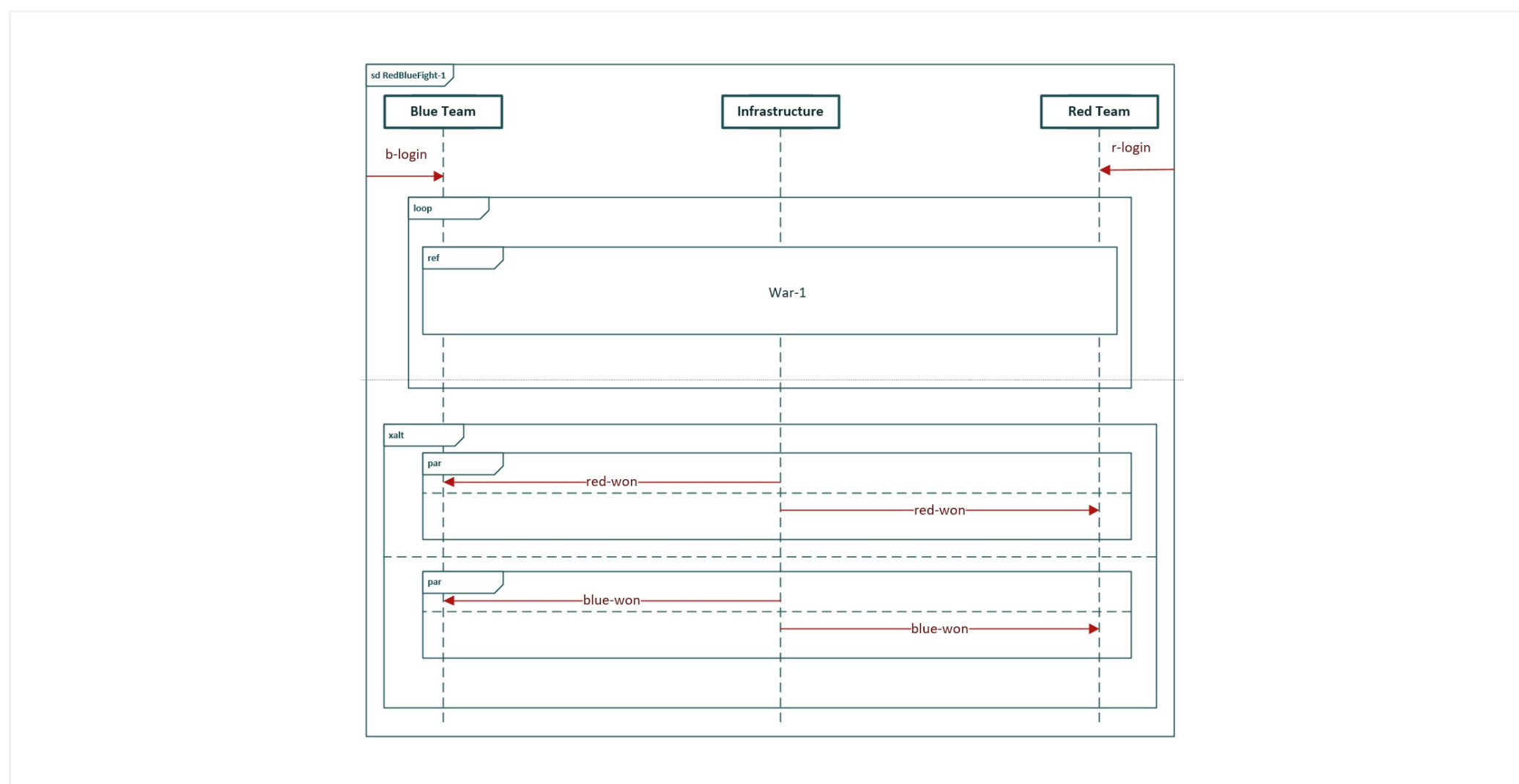
Is **sd War-4** a refinement of **sd War-3**? If so, is it a general refinement or a limited refinement? Explain your answer.

Format - | **B** *I* U x₂ x² | I_x | [] | ← → ↺ | :≡ :≡ | Ω | [] | [] | Σ | ABC | ✕

Words: 0

Maks poeng: 6

2(e) **Question 2e**



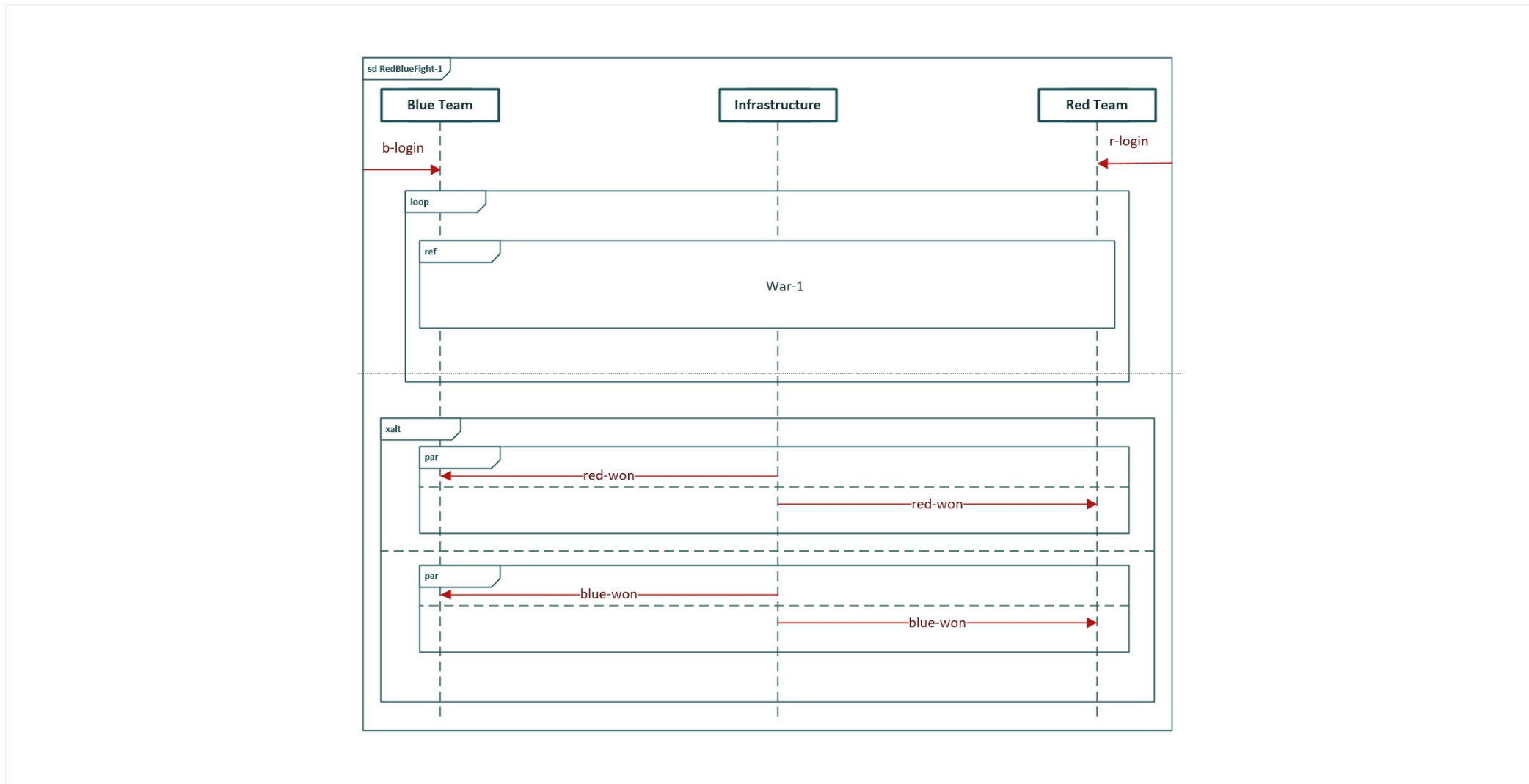
Is **sd RedBlueFight-2** a refinement of **sd RedBlueFight-1**? If so, is it a pure supplementing, a pure narrowing or a combination? Explain your answer.

Format | B | I | U | x₂ | x² | I_x | [Icons] | ABC

Words: 0

Maks poeng: 6

2(f) **Question 2f**



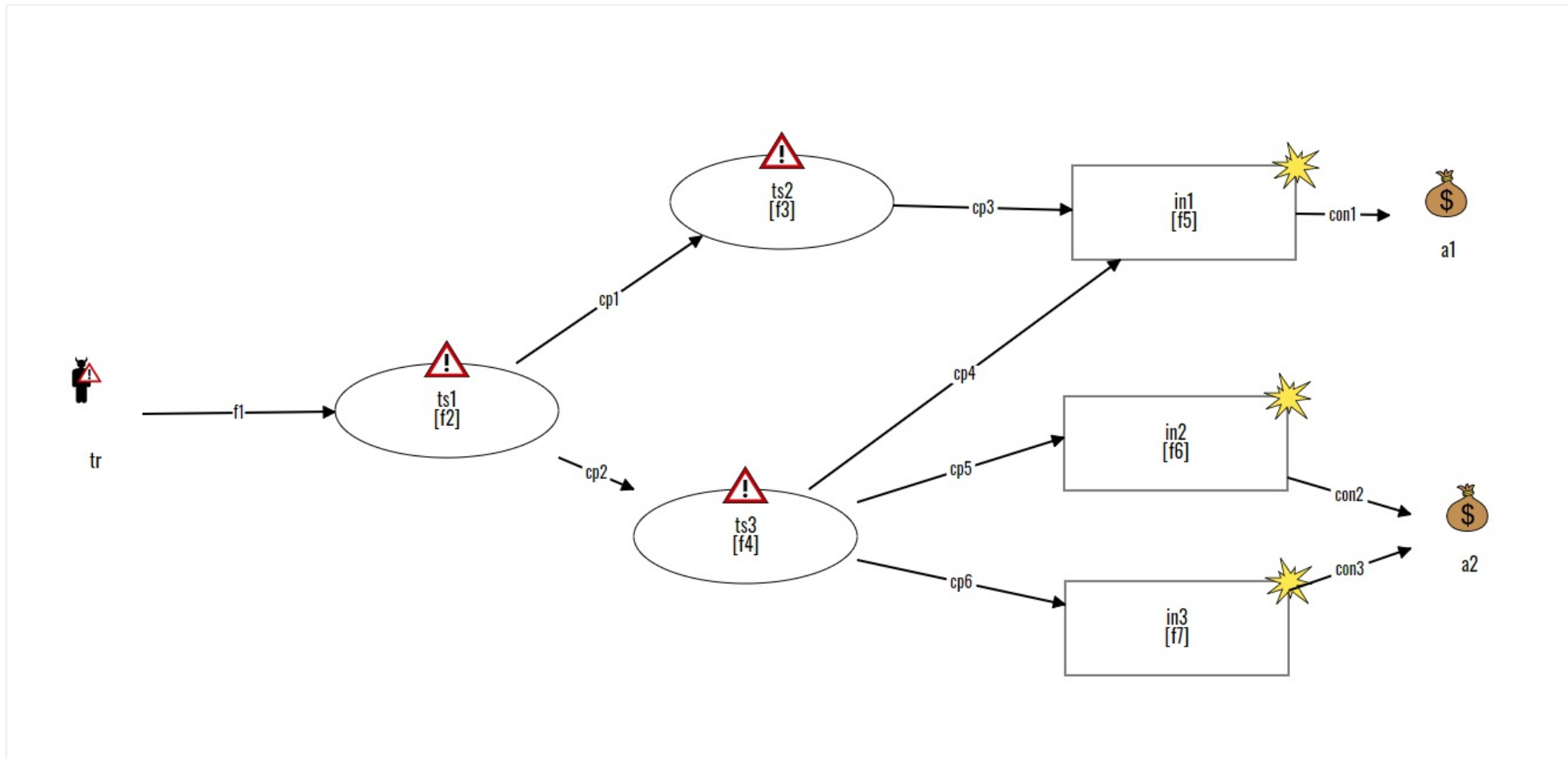
Is **sd RedBlueFight-3** a refinement of **sd RedBlueFight-1**? If so, is it a pure supplementing, a pure narrowing or a combination? Explain your answer.

Format | B | I | U | x₂ | x² | I_x | [Icons: Copy, Paste, Undo, Redo, Find, List, Table, Erase, Sum, Spell, Close]

Words: 0

Maks poeng: 6

3(a) **Question 3a**



There exist companies whose main business is to commit cyber-crimes and earn money that way. These companies have assets to protect like any other company. Assume our ethical standards are sufficiently low to allow us to take on work for companies conducting cyber-crime. Assume further that we have accepted to carry out a defensive security risk assessment on behalf of such a company. Finally, assume we have arrived at a threat diagram of the form attached.

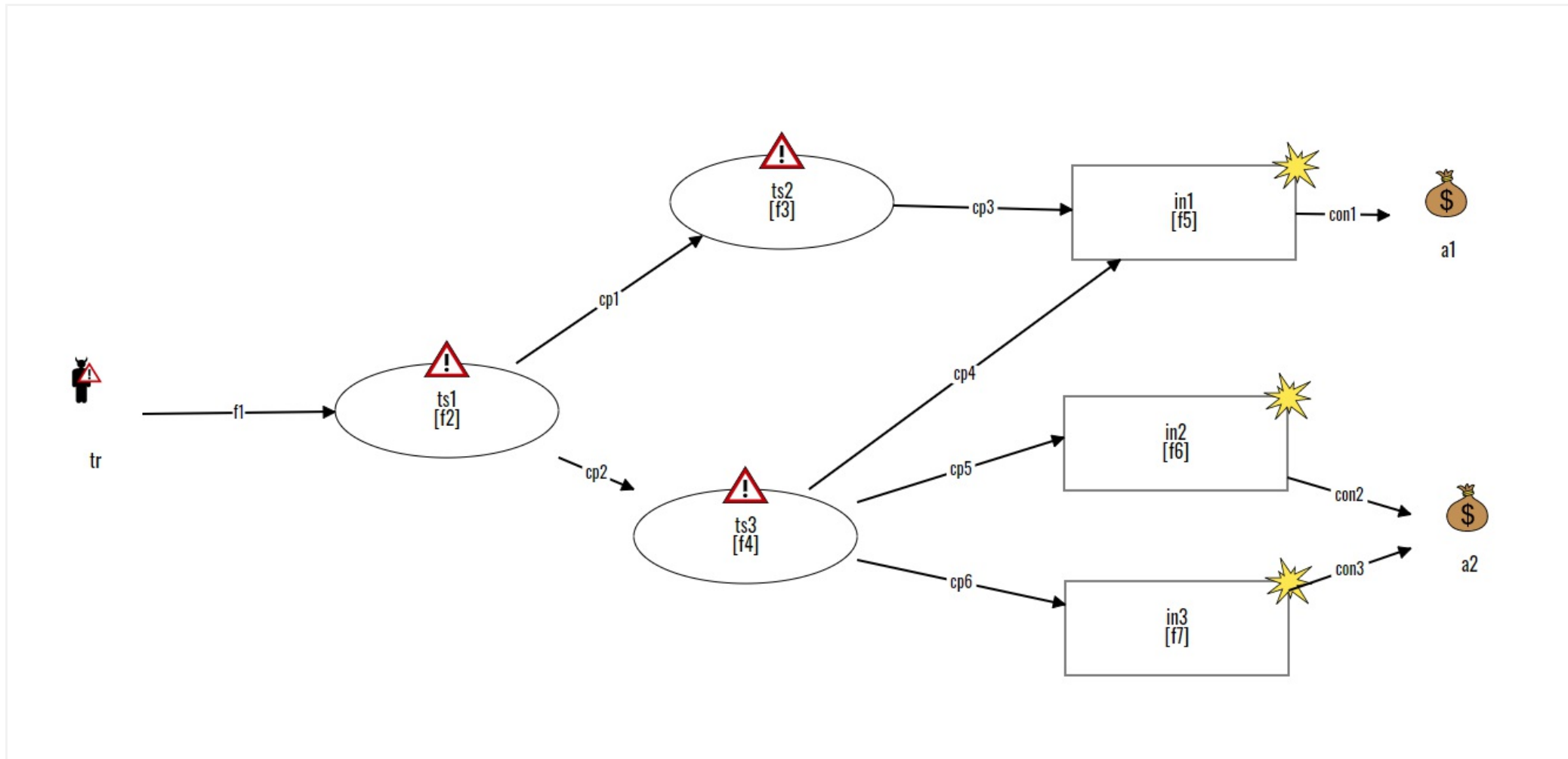
Suggest suitable asset names for **a1** and **a2** in the threat diagram given the assumptions above.

Format - | **B** *I* U x₂ x² | I_x | [Icons] | ABC | [Icons]

Words: 0

Maks poeng: 6

3(b) **Question 3b**



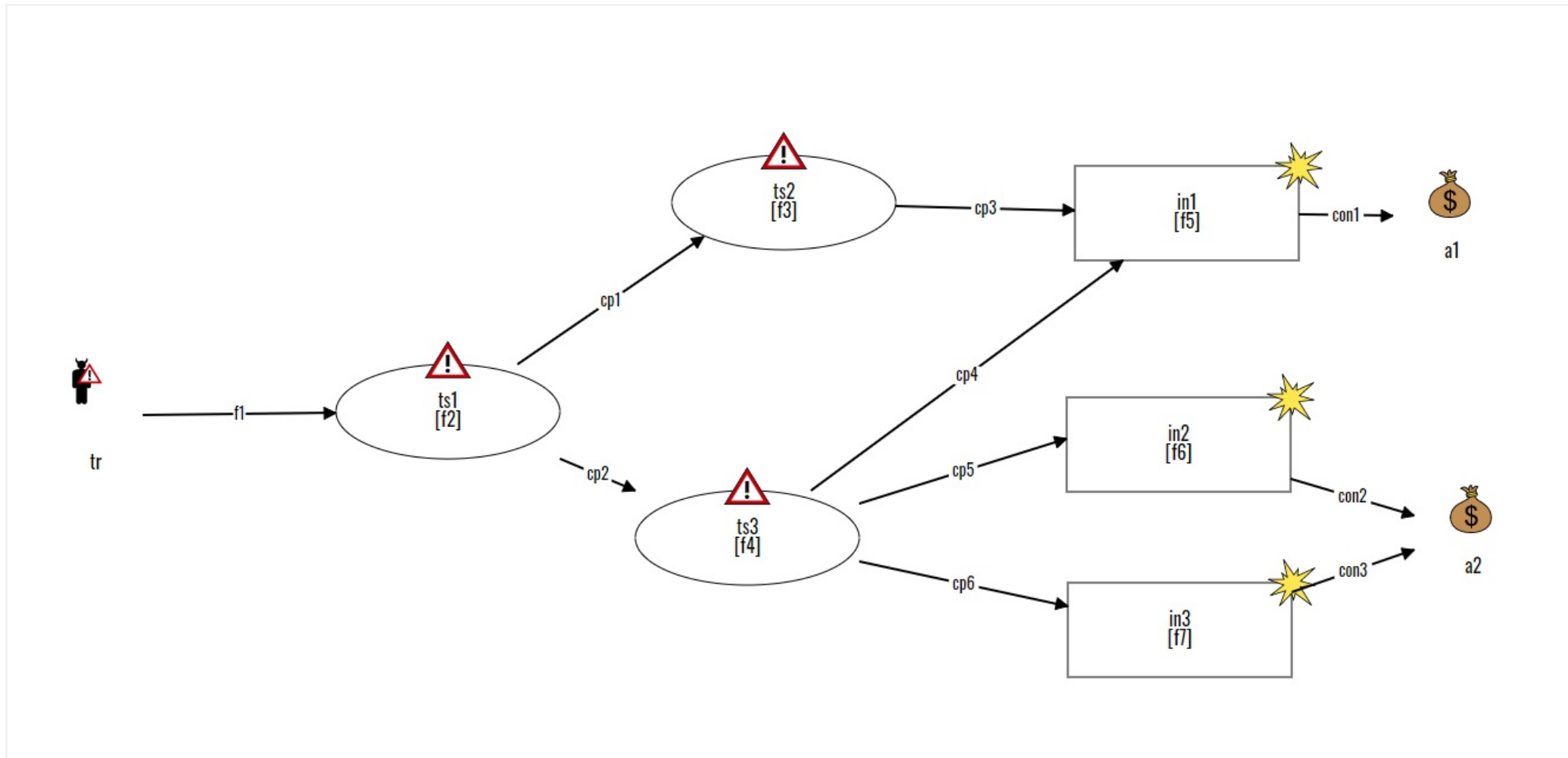
Provide a good qualitative scale for at least one of the two assets you identified in **Question 3a**. It should distinguish between 5 values.

Format - B I U x_2 x^2 I_x 📄 📂 ↶ ↷ ↺ ☰ ☷ Ω 🔍 Σ ABC ✖

Words: 0

Maks poeng: 6

3(c) **Question 3c**



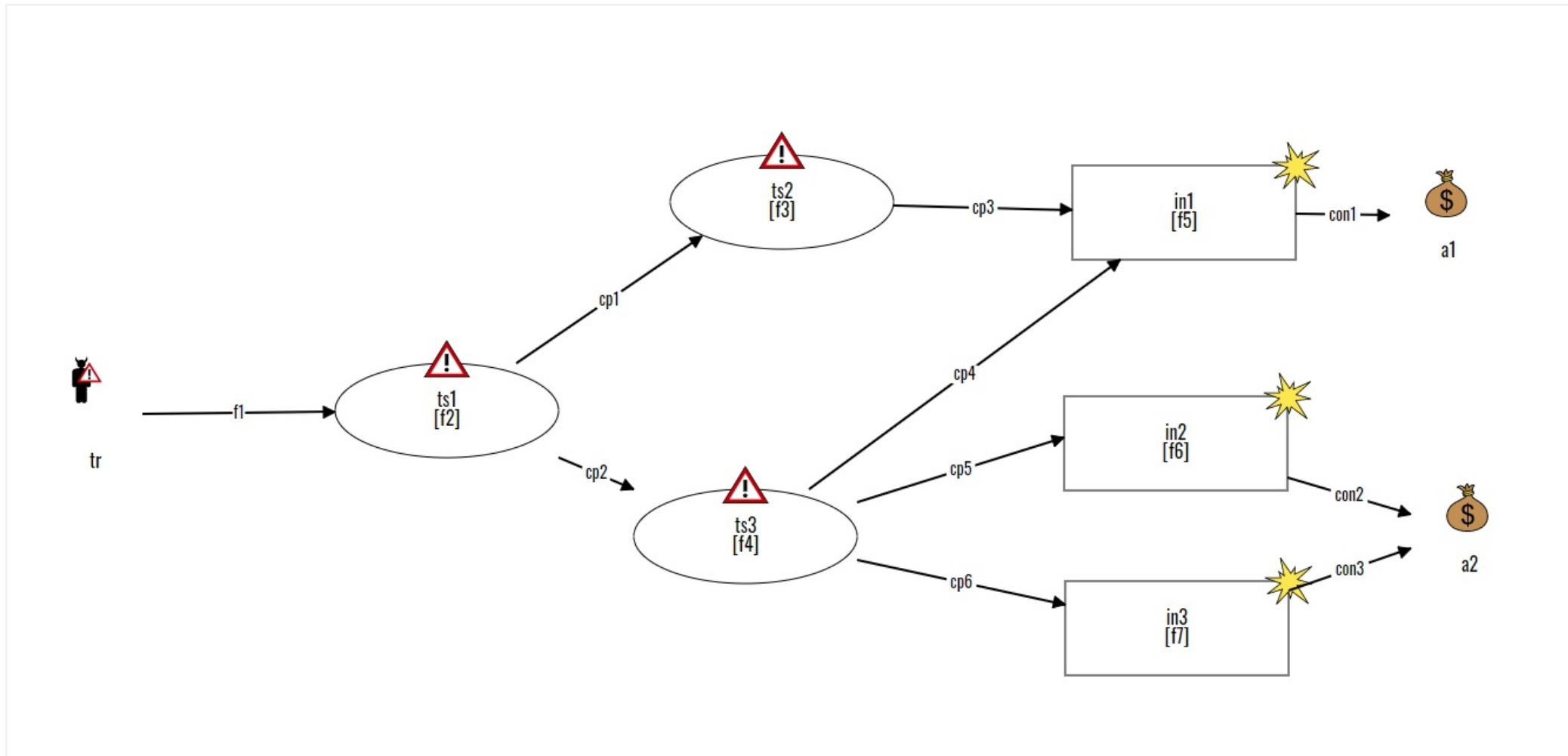
Given the two assets selected by you in **Question 3a**, define suitable names for the threat **tr**, threat scenarios **ts1**, **ts2** and **ts3** and incidents **in1**, **in2** and **in3** so that **in2** and **in3** are separate.

Format B I U x_2 x^2 I_x | | | | | | |

Words: 0

Maks poeng: 6

3(d) **Question 3d**



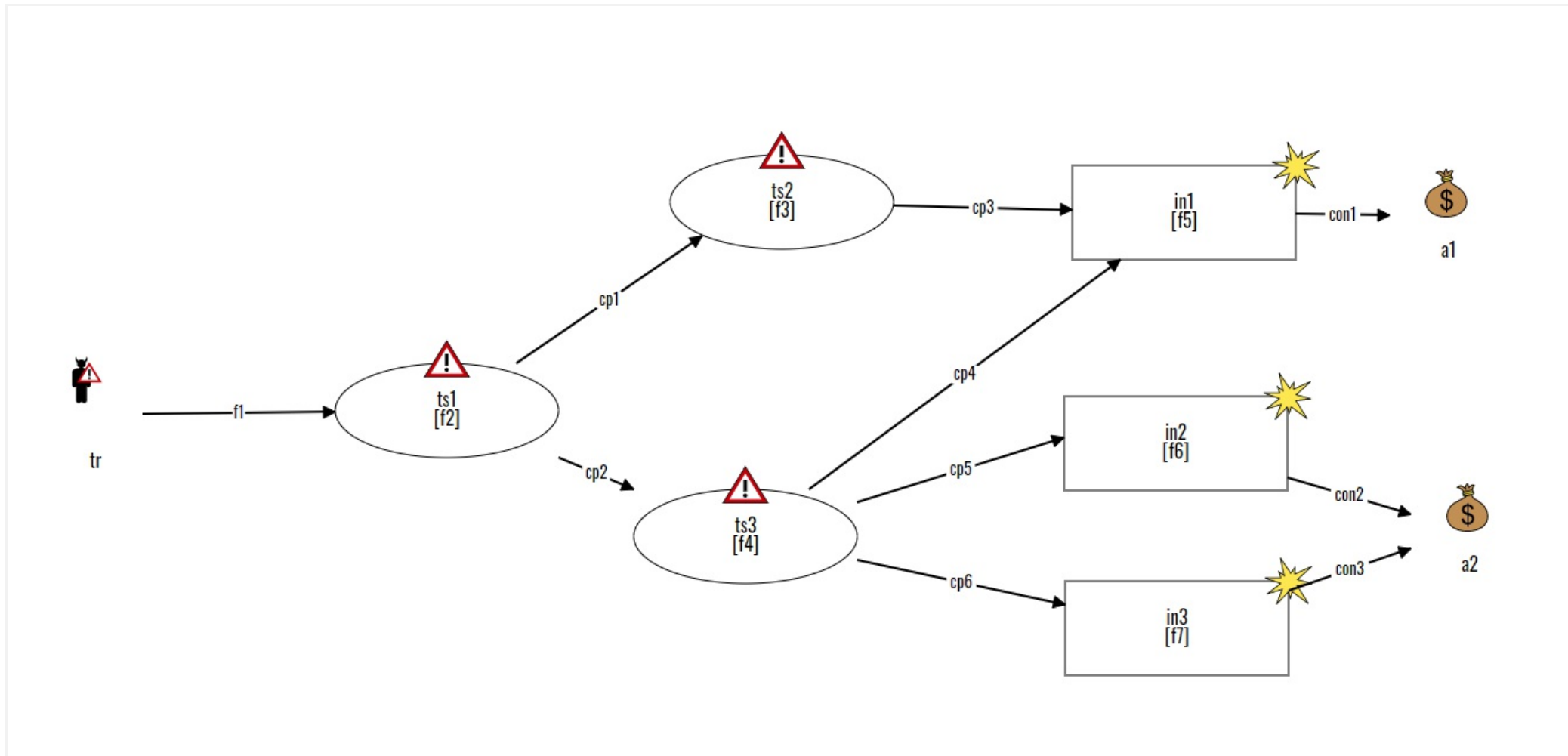
Assume frequencies are measured by: "average number of occurrences per year". Define frequencies f_1, \dots, f_7 and conditional probabilities cp_1, \dots, cp_6 so that the diagram is consistent under the assumption that it is complete. All conditional probabilities should be less than 1 and greater than 0.

Format - | **B** *I* U x_2 x^2 | I_x | | | | Ω | Σ | ABC |

Words: 0

Maks poeng: 6

3(e) **Question 3e**



Independent of which assets you selected for **Question 3a**, assume the consequences **con2** and **con3** for asset **a2** are measured by: "average cost in Euro per incident occurrence". What is the frequency and consequence of the combined incident resulting from merging **in2** and **in3** into one incident given that **f6**="70 times in average per year"; **f7**="300 times in average per year"; **con2**="500 Euro in average per incident"; **con3**="100 Euro in average per incident"?

Format - | **B** | *I* | U | x_2 | x^2 | I_x | | | | | | | Ω | | | Σ | ABC |

Words: 0

Maks poeng: 6

Question 10
Attached



Blue Team

Infrastructure

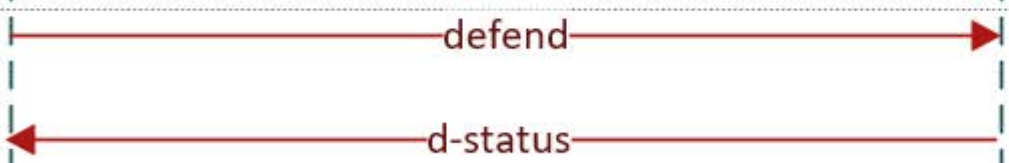
Red Team

xalt

assert

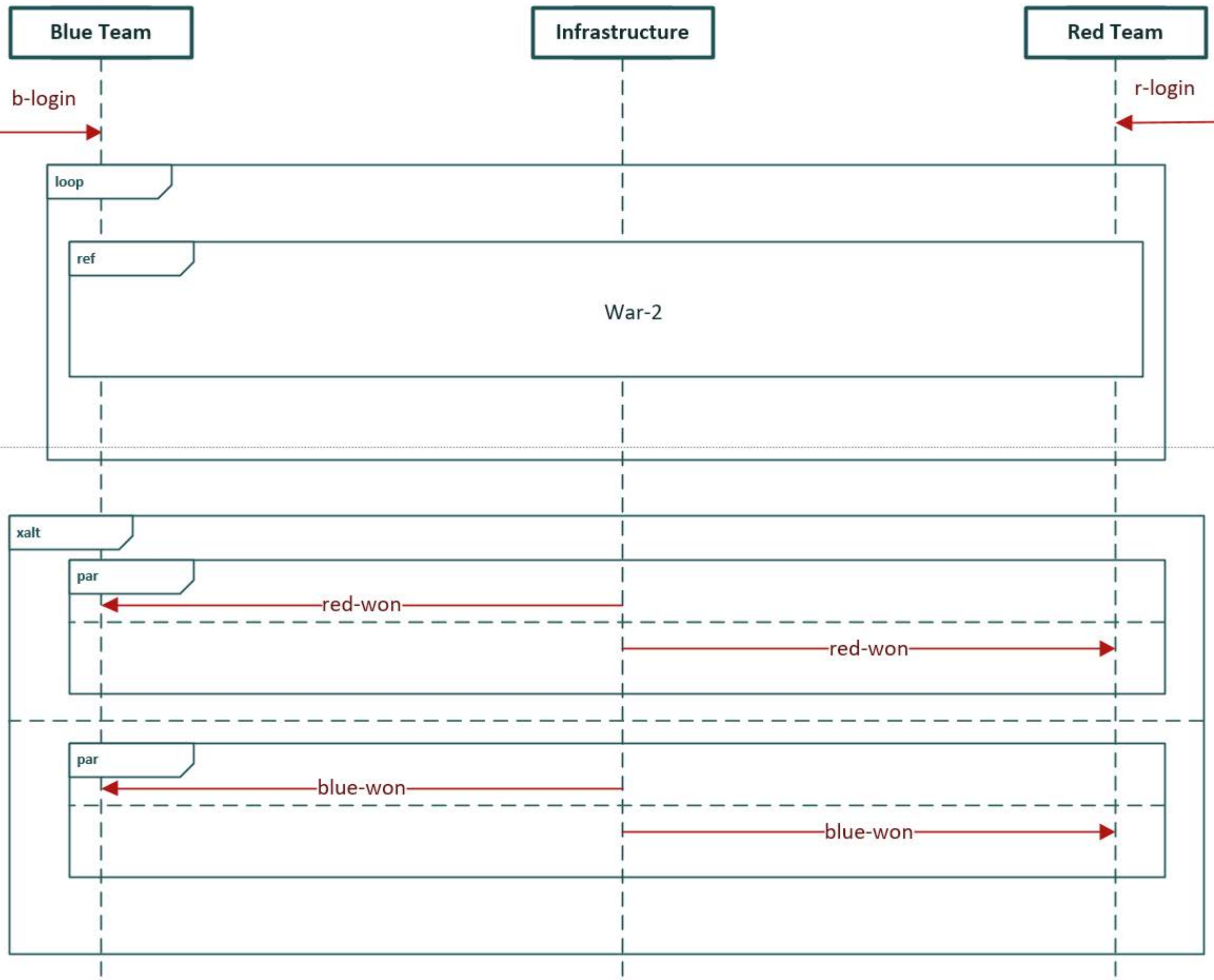


assert



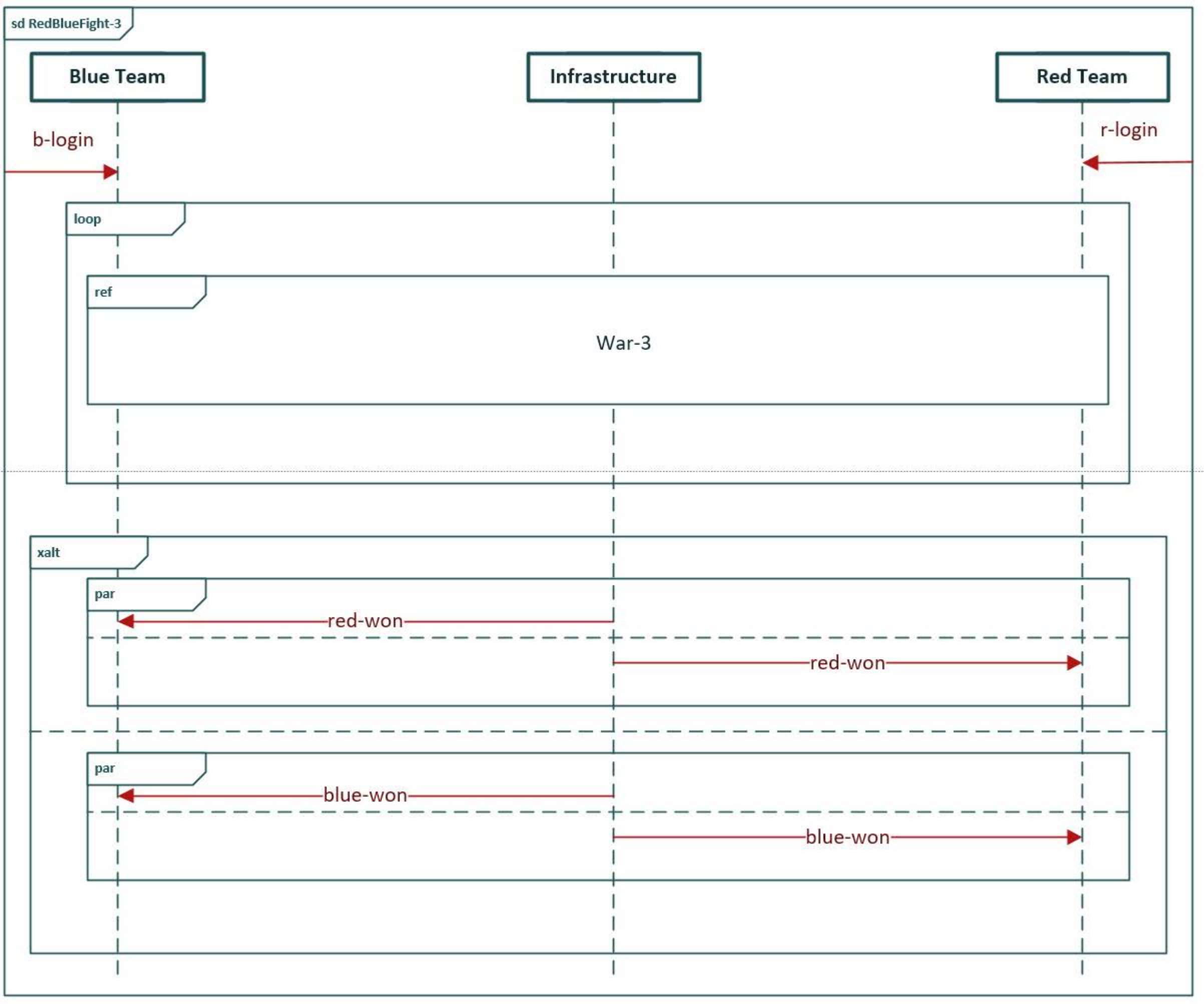
Question 11
Attached





Question 12
Attached





Question 1
Attached



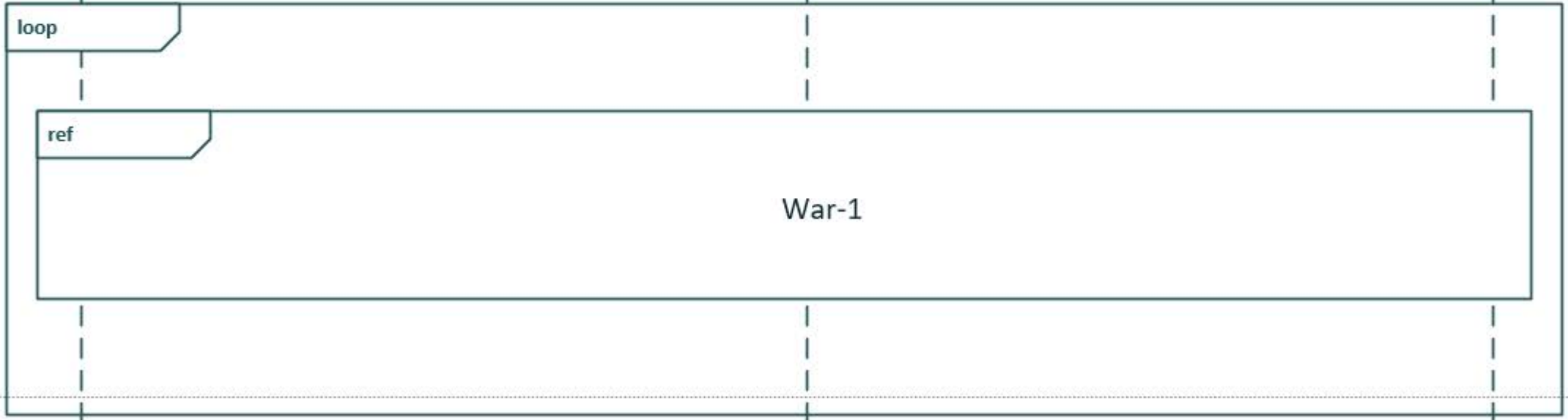
Blue Team

Infrastructure

Red Team

b-login

r-login



Question 2
Attached



Blue Team

Infrastructure

Red Team

b-login

r-login

loop

ref

War-1

xalt

par

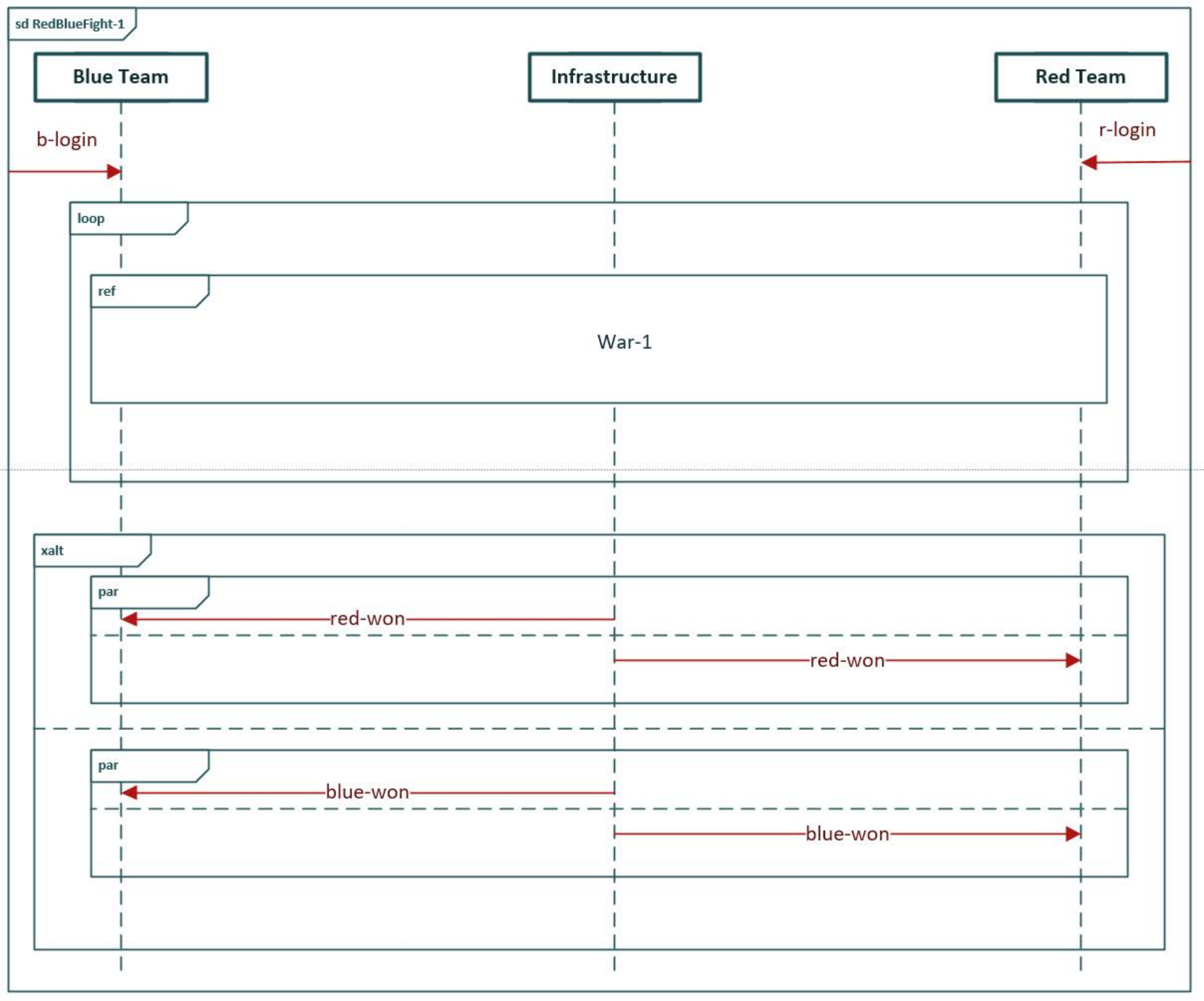
red-won

red-won

par

blue-won

blue-won



Question 3
Attached



Blue Team

Infrastructure

Red Team

b-login

r-login

loop

ref

War-1

xalt

par

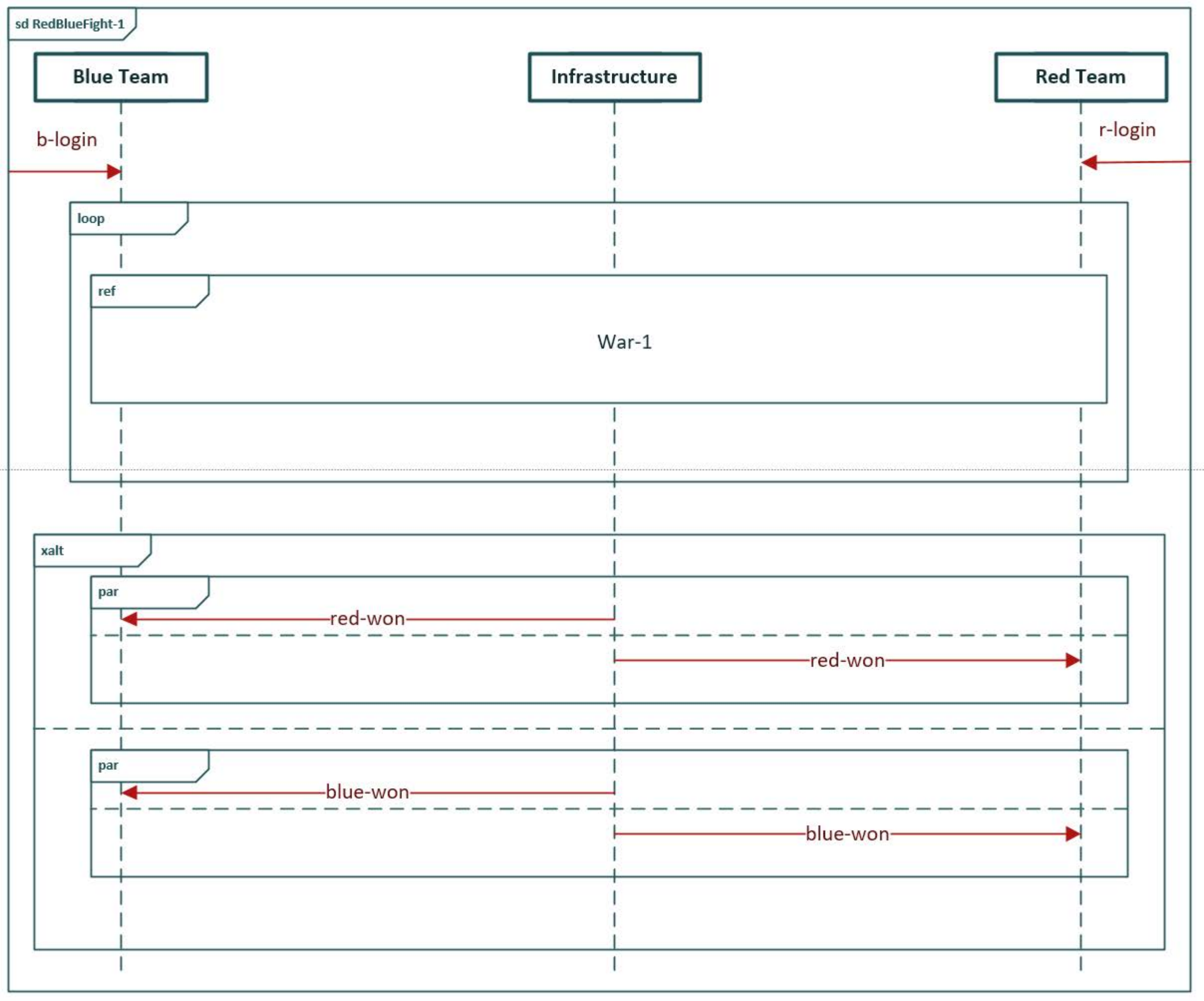
red-won

red-won

par

blue-won

blue-won



Question 4
Attached



Blue Team

Infrastructure

Red Team

alt

assert

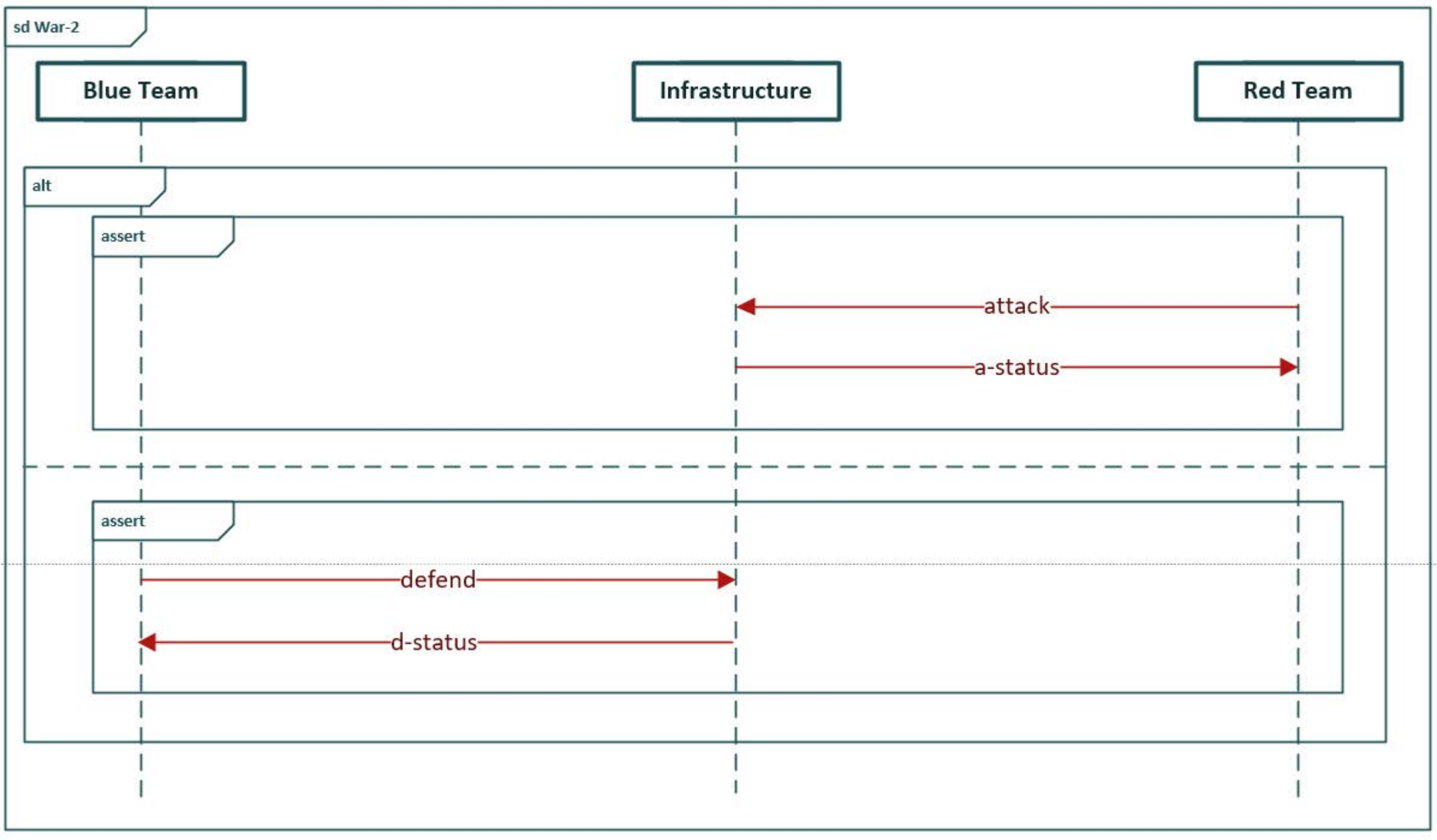
attack

a-status

assert

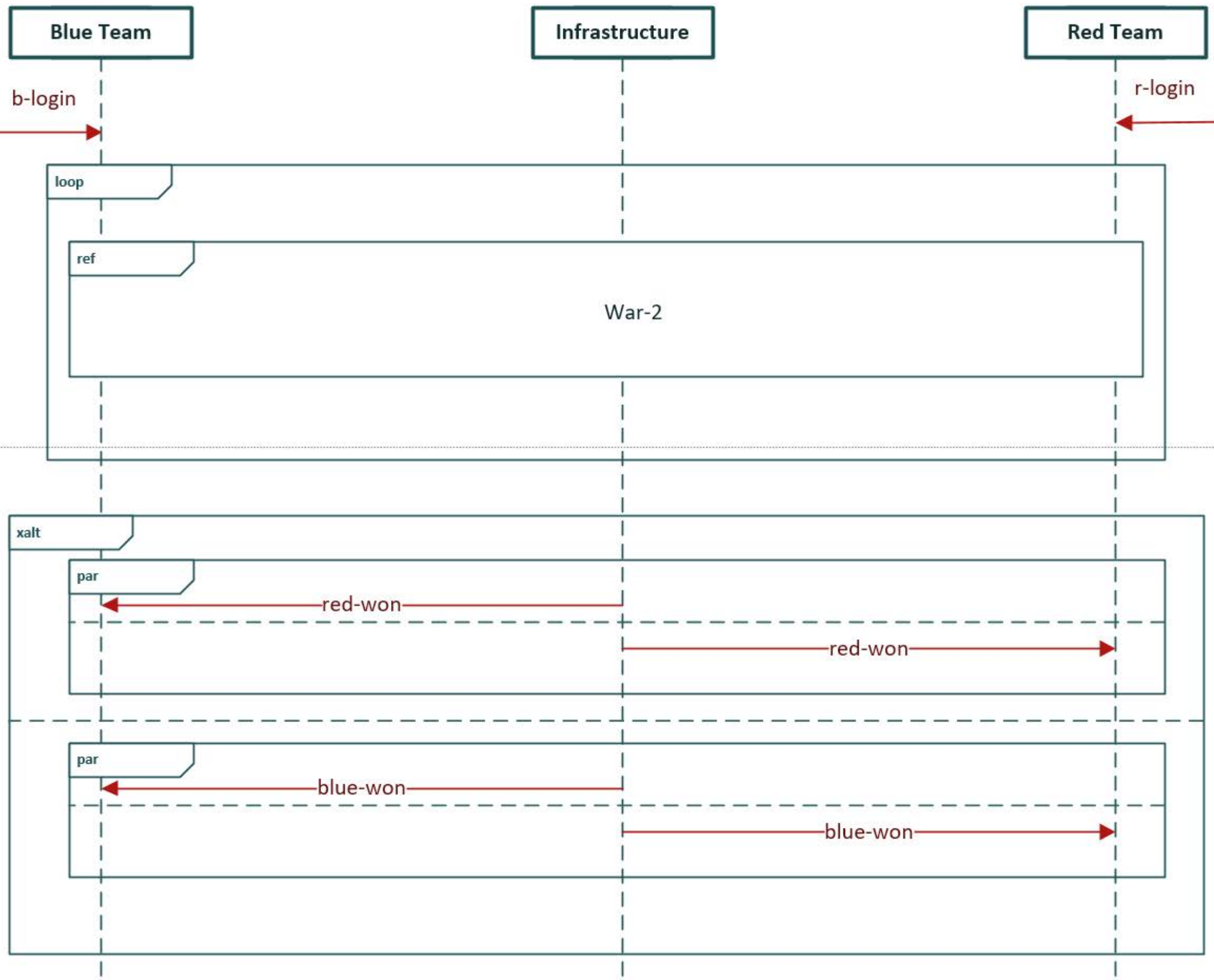
defend

d-status



Question 5
Attached





Question 6
Attached



Blue Team

Infrastructure

Red Team

alt

assert

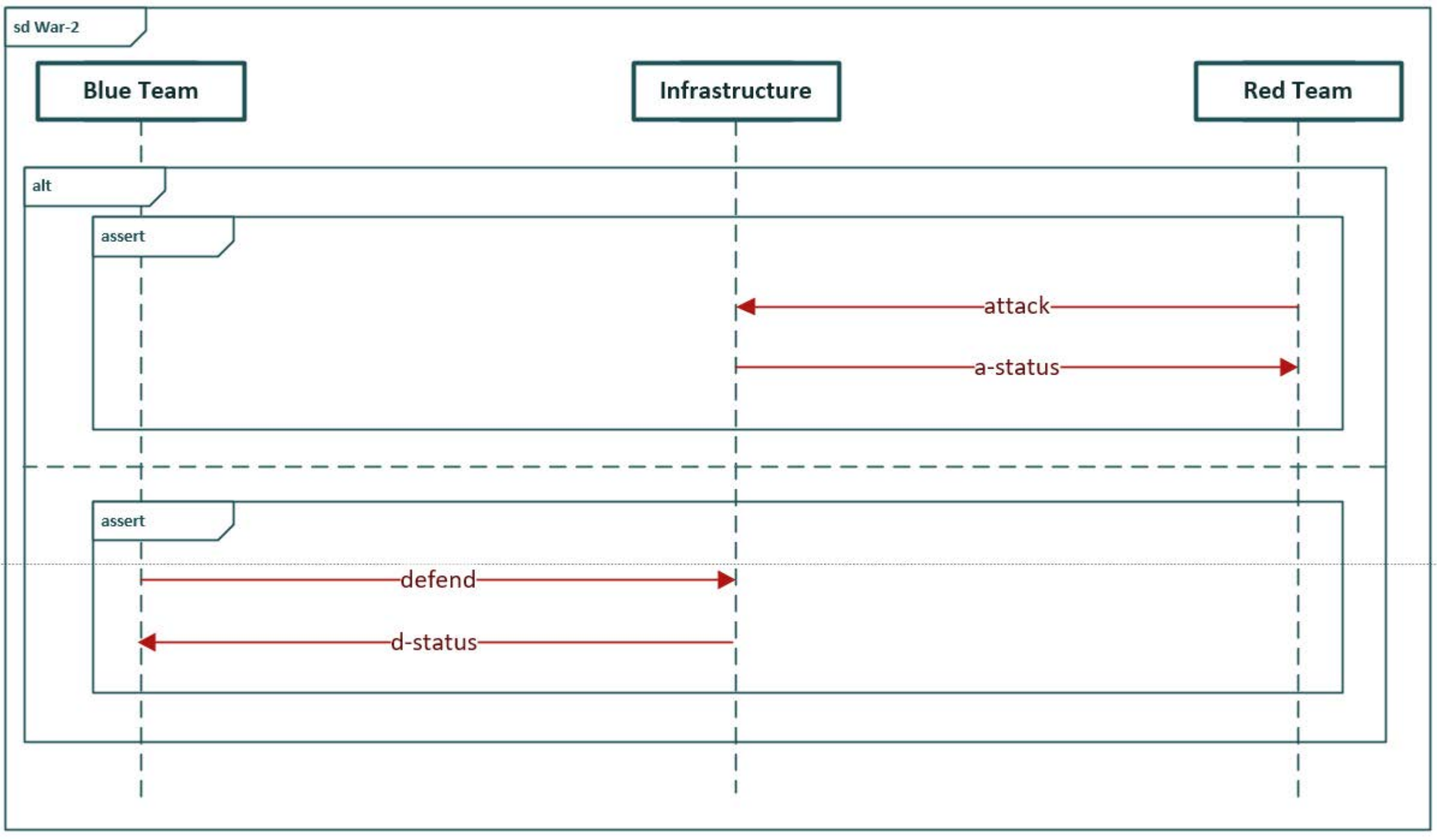
attack

a-status

assert

defend

d-status



Question 7
Attached



Blue Team

Infrastructure

Red Team

alt

assert

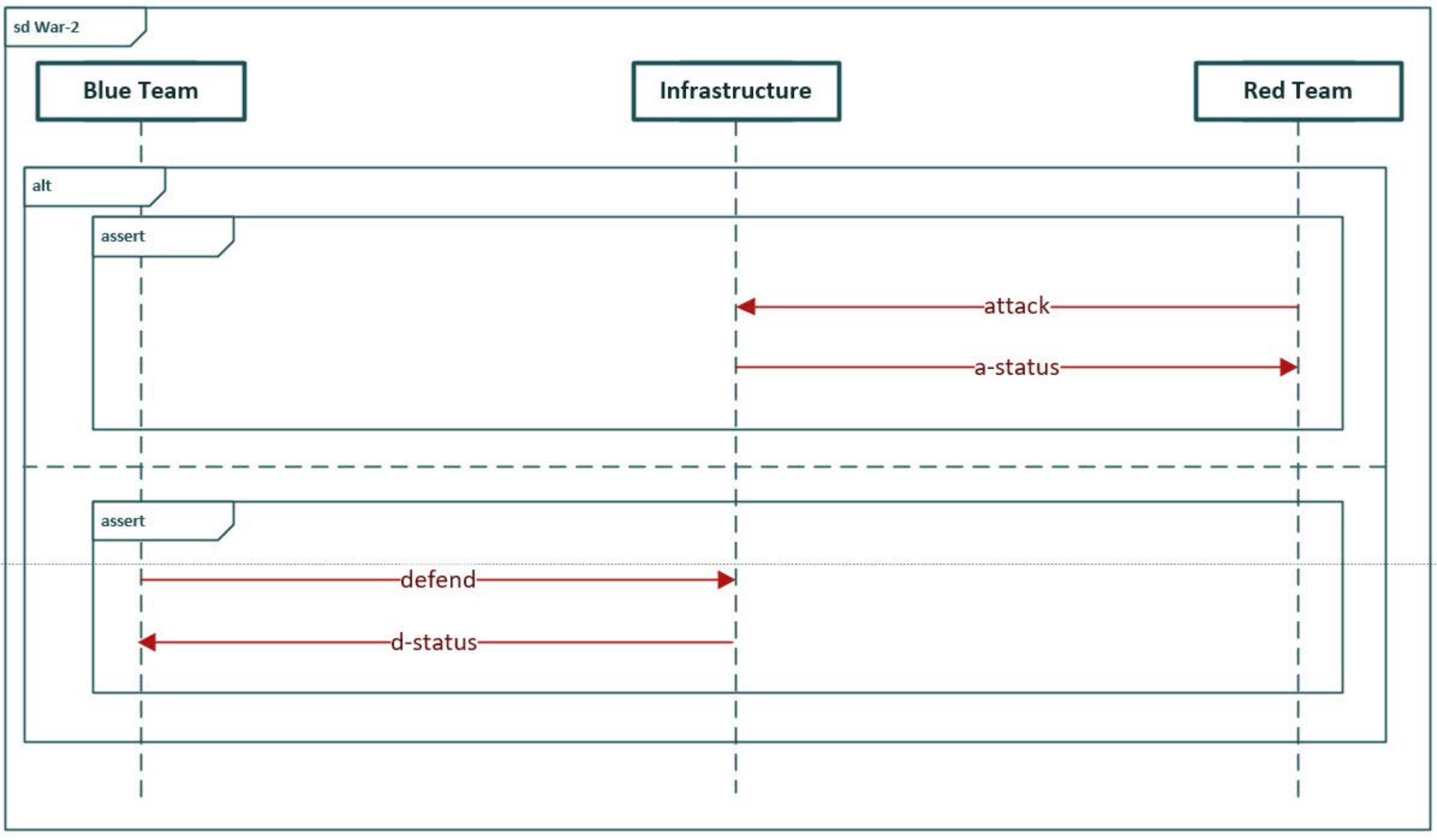
attack

a-status

assert

defend

d-status



Question 8
Attached



Blue Team

Infrastructure

Red Team

par

attack

a-status

defend

d-status

Question 9
Attached



Blue Team

Infrastructure

Red Team

xalt

assert



assert

