# Toward Cyber Ranges Homogeneity: From Reference Architecture to Practical Implementation

Objectives:

1. The definition of a fine-grained reference architecture for Cyber Ranges.

2. A PoC implementation, focusing on the IEEE 802.11 protocol and its application in industrial settings.

Accomplished:

- Scrutinize the SOTA regarding wireless security testbeds and Cyber Ranges [1, 2].

  - Identify and classify common structural, functional, and informational requirements [1, 3].

  - Pinpoint key components for developing a generic reference architecture [1, 3].

- Establish a fine-grained, modular reference architecture for CR [3].

- Deliver open-source content including tools, publicly available datasets, and educational material [4, 5].
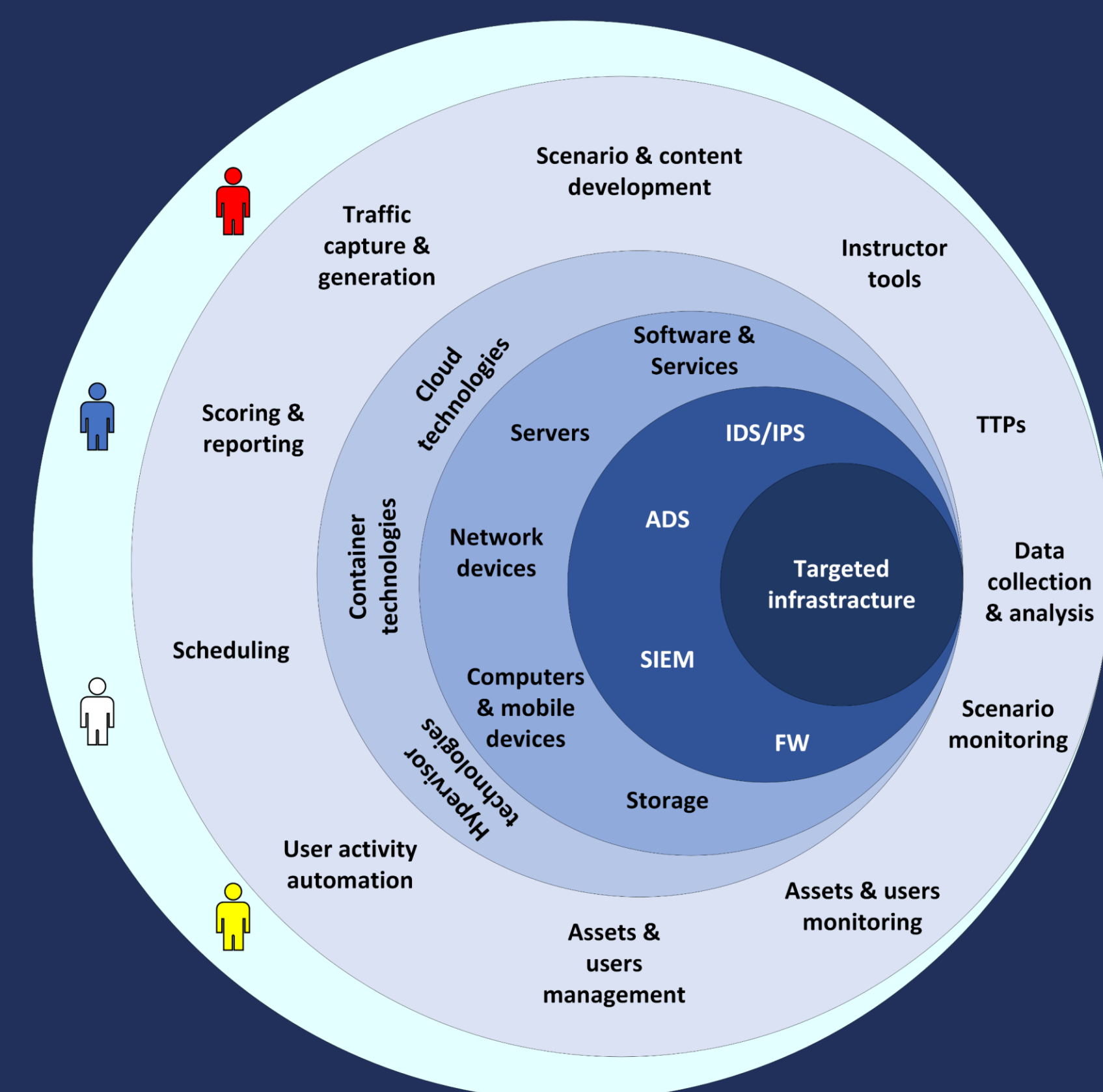
Future Work:

- PoC of the proposed reference architecture, integrating tailored tools [4, 5] and other open-source components.

References:

[1] **Vyron Kampourakis**, Vasileios Gkioulos, Sokratis Katsikas, A systematic literature review on wireless security testbeds in the cyber-physical realm, Computers & Security, Vol. 133, p. 103383, 2023, Elsevier.

[2] **Vyron Kampourakis**, Secure infrastructures for cyber-physical ranges, Research Challenges in Information Science: Information Science and the Connected World (RCIS 2023), 2023, Springer.

[3] **Vyron Kampourakis**, Vasileios Gkioulos, Sokratis Katsikas, A step-by-step definition of a reference architecture for cyber ranges, Journal of Information Security and Applications, Elsevier (UNDER REVIEW).

[4] **Vyron Kampourakis**, Efstratios Chatzoglou, Georgios Kambourakis, Apostolos Dolmes and Christos Zaroliagis, WPAxFuzz: Sniffing Out Vulnerabilities in Wi-Fi Implementations, Cryptography, Vol. 6(4), No. 53, pp. 1-12, 2022, MDPI.

[5] Efstratios Chatzoglou, **Vyron Kampourakis**, Georgios Kambourakis, Bl0ck: Paralyzing 802.11 Connections Through Block Ack Frames, The 38th International Conference on ICT Systems Security and Privacy Protection (IFIP SEC 2023), 2023, Springer.