Detecting Malware through Dialog Correlation in Software Defined Networking

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Overview:

Threat Model: Malware, botnets, Advanced Persistent Threats (APT).

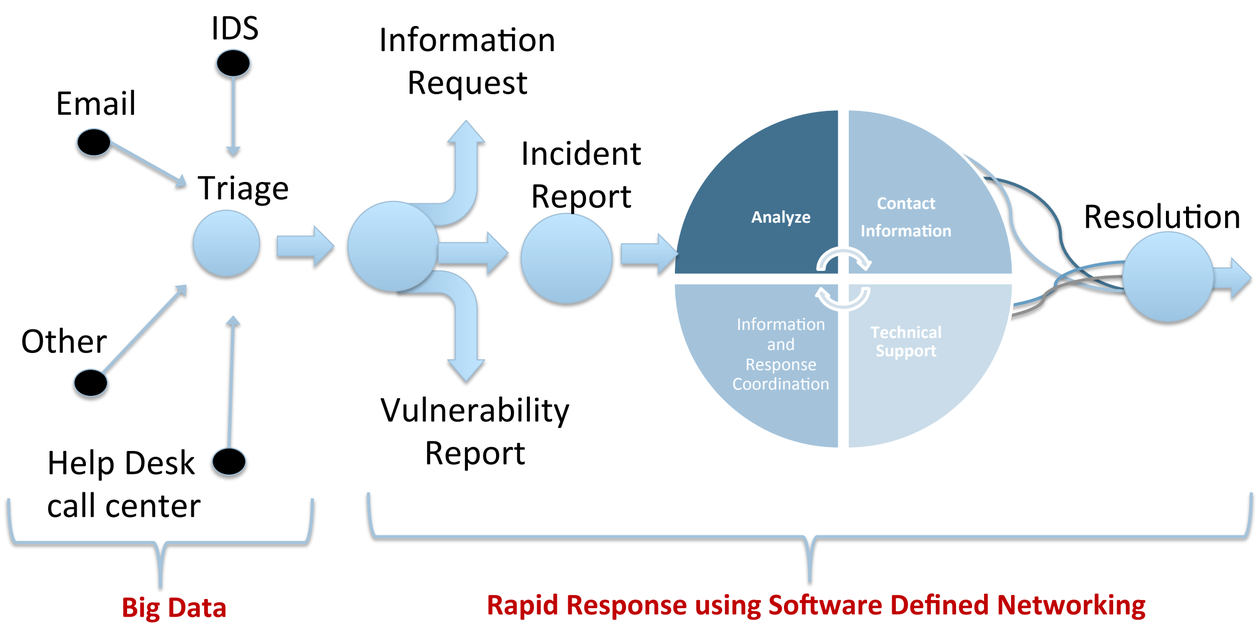
Big Data: On its path of destruction, malware produce a series of events **E** that are recorded in logs. There is a need to provide a system capable of correlating these events to provide analysts with more visibility, when multiple security devices trigger an alert in response to an action, then it's likely that that action is malicious.

Software Defined Networking (SDN): allow greater control over network entities by decoupling the control plane and the forwarding plane enabling the network control to become directly programmable.

Objective: Rapid malware detection and response by leveraging SDN Capabilities.

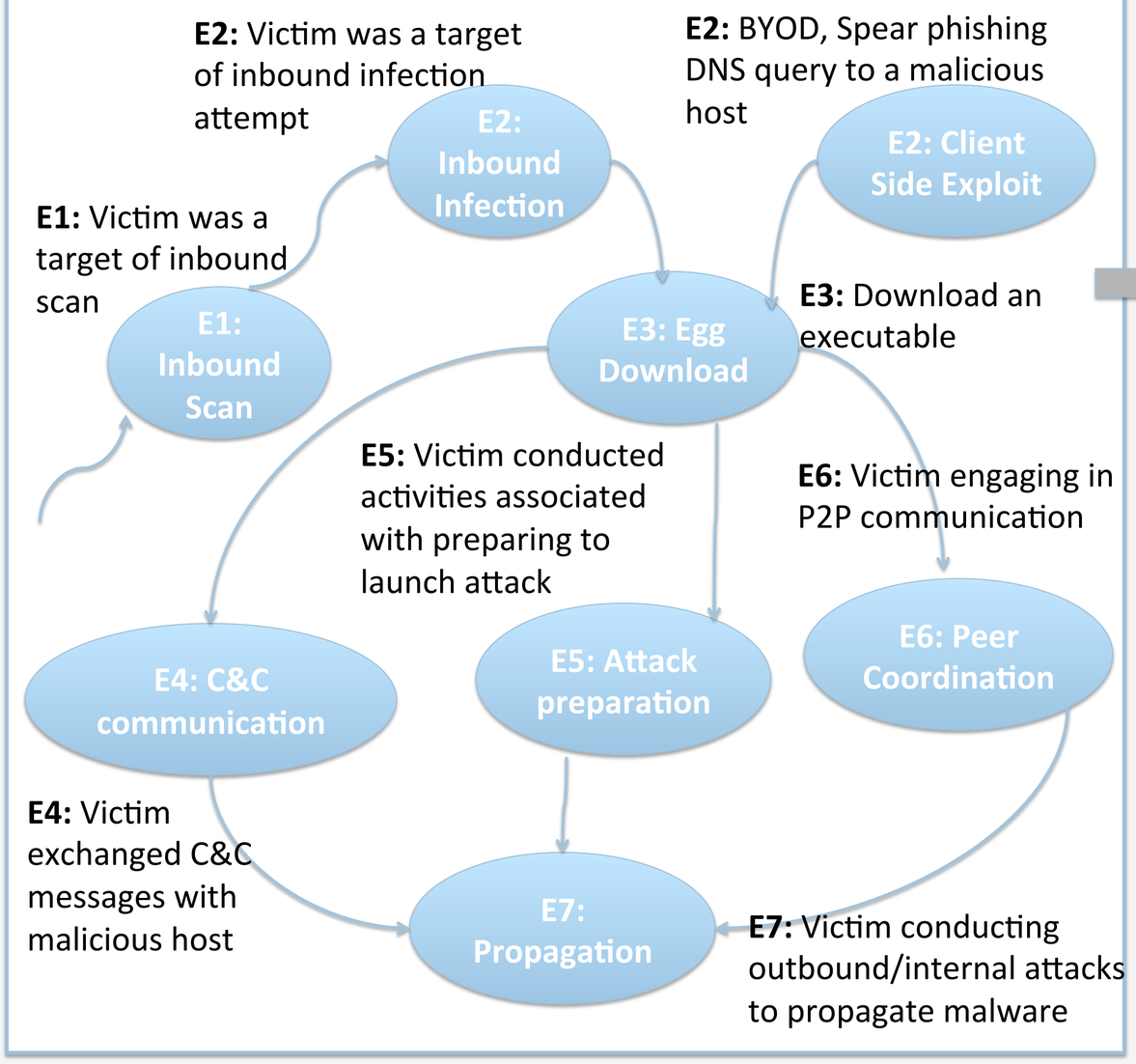
BotHunter: We present a framework inspired from *BotHunter [1]* to track malware communications and develop an evidence trail of message exchanges that match a state-based infection sequence model (*dialog-based correlation [1]*).

Motivation - Security Operations Challenge:

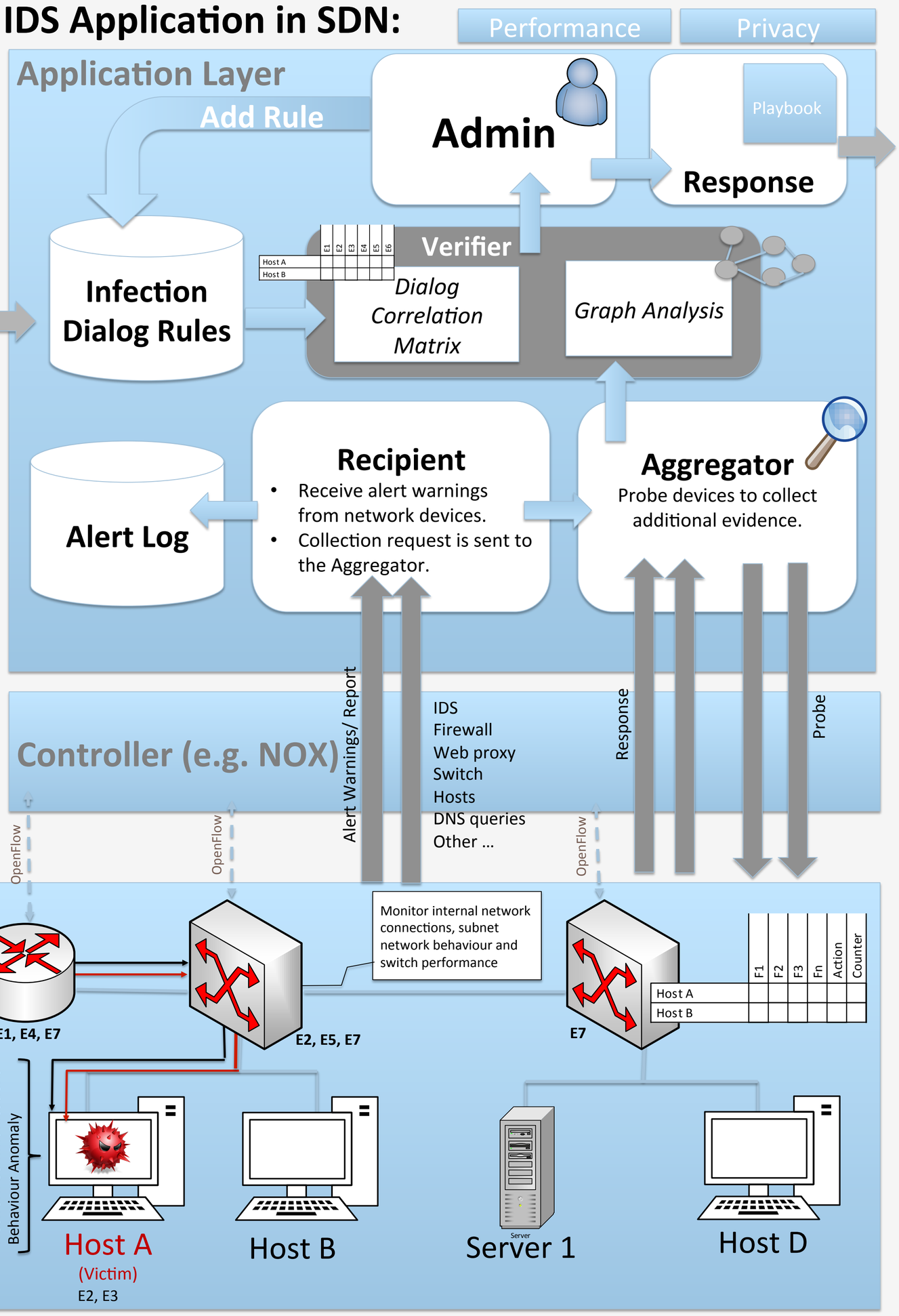


CMU CERT/CC Incident Life Cycle [2]

Infection Dialog Model [1]:



IDS Application in SDN:



References:

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4. Gu, G., Perdisci, R., Zhang, J., & Lee, W. (2008, July). BotMiner: Clustering Analysis of Network Traffic for Protocol-and Structure-Independent Botnet Detection. In *USENIX Security Symposium* (Vol. 5, No. 2, pp. 139-154).
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