CoCoa: An Ontology for Cybersecurity Operations Centre Analysis Process

Dr. Cyril Onwubiko
Chair, Cyber Security Intelligence

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Context

CoCoa – is an ontology-based knowledge graph of cyber incident for enhanced situational awareness of the monitored environment.

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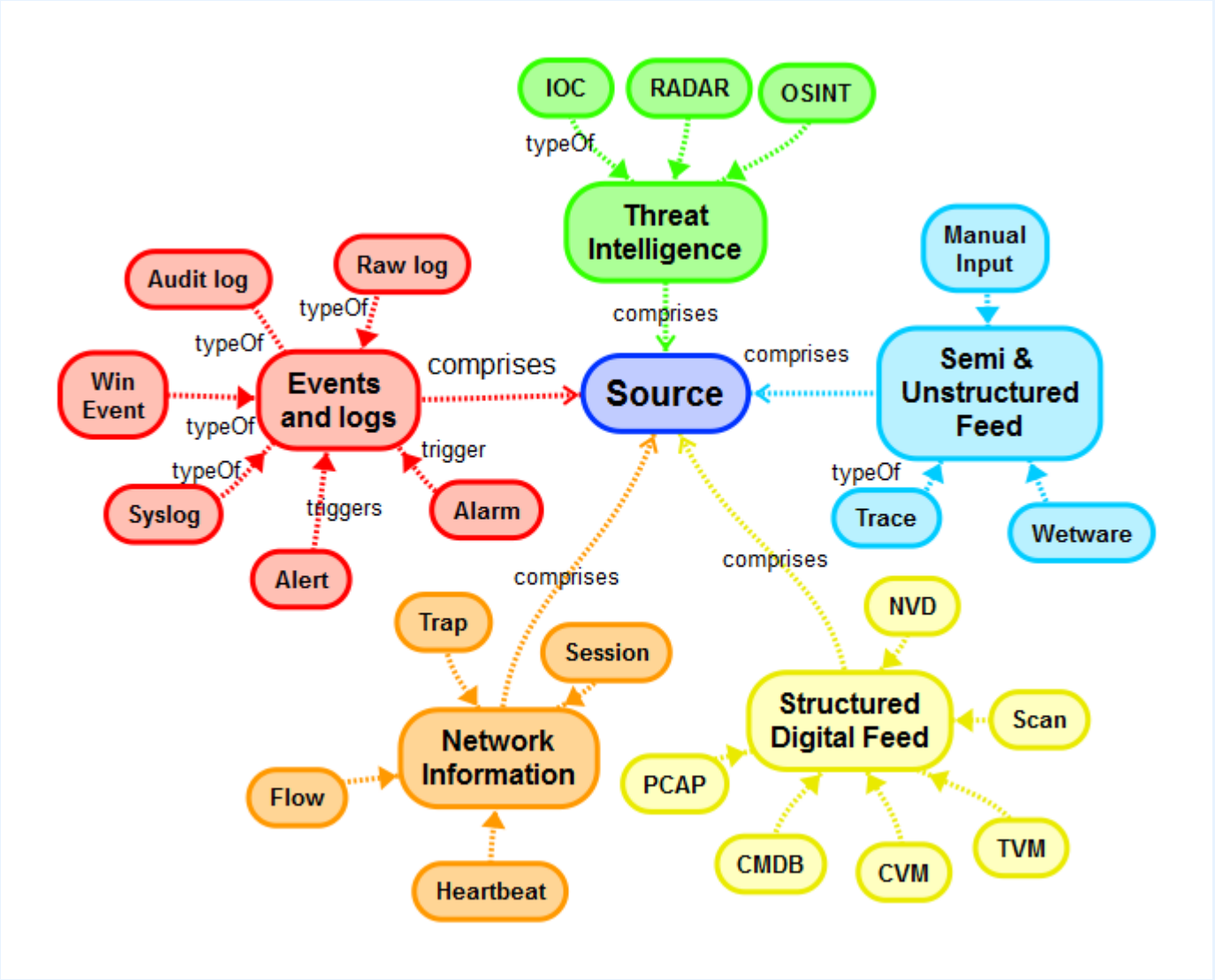
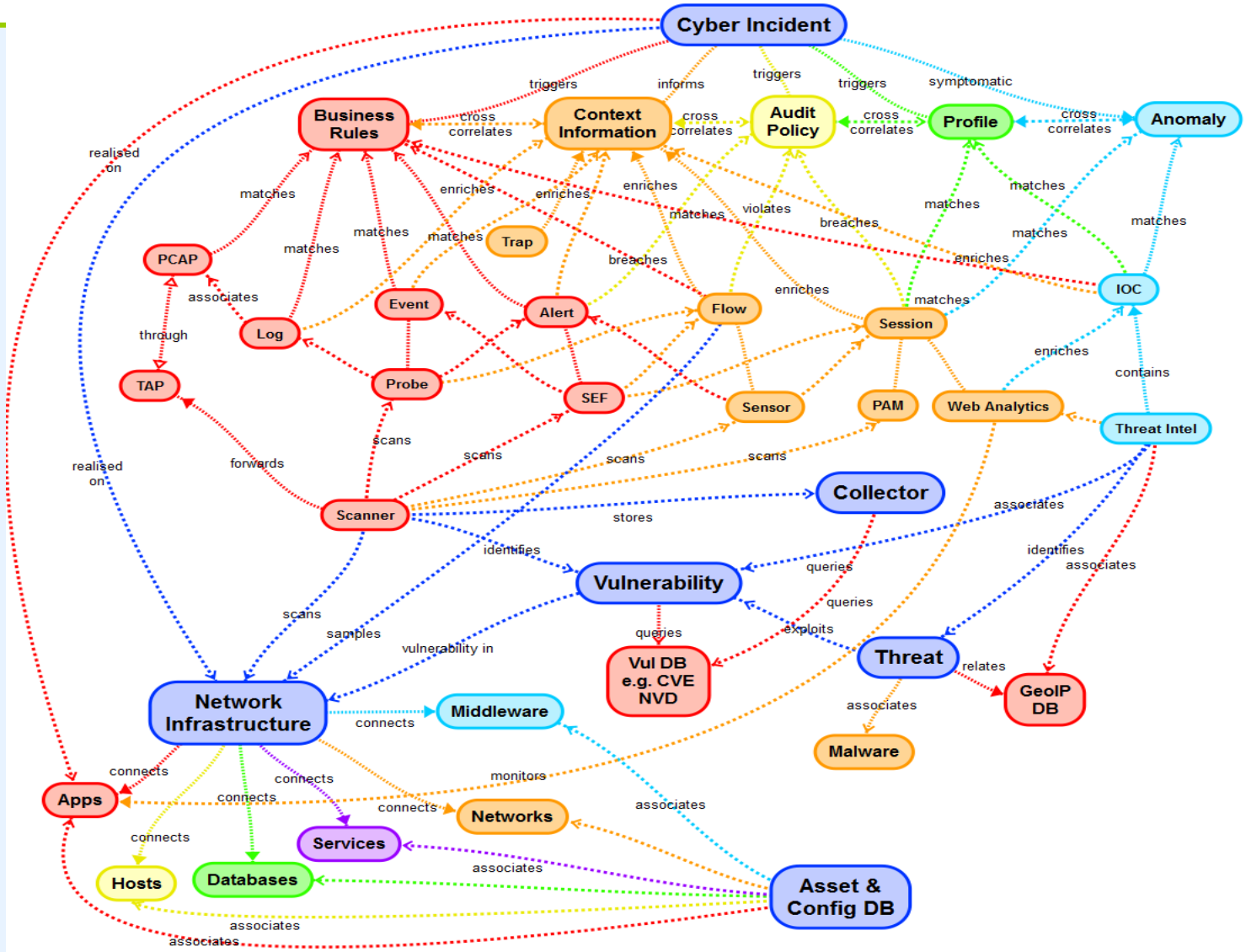

IOC
RADAR
OSINT
typeOf
Threat Intelligence
Manual Input
Audit log
Raw log
typeOf
typeOf
comprises
comprises
Win Event
Events and logs
comprises
Source
Semi & Unstructured Feed
typeOf
trigger
typeOf
typeOf
Syslog
triggers
Alarm
Trace
Wetware
Alert
comprises
comprises
NVD
Trap
Session
Structured Digital Feed
Scan
Network Information
PCAP
Flow
CMDB
CVM
TVM
Heartbeat


Cyber Incident
Business Rules
Context Information
Audit Policy
Profile
Anomaly
PCAP
Trap
IOC
Event
Alert
Flow
Session
Log
TAP
Probe
SEF
Sensor
PAM
Web Analytics
Threat Intel
Collector
Scanner
Vulnerability
Network Infrastructure
Middleware
Vul DB e.g. CVE NVD
Threat
GeoIP DB
Malware
Apps
Networks
Services
Hosts
Databases
Asset & Config DB
triggers
informs
symptomatic
cross correlates
realised on
matches
enriches
violates
breaches
associates
through
forwards
scans
stores
identifies
queries
exploits
samples
vulnerability in
connects
monitors
relates
contains

Conclusion

- *Ontology-based knowledge graph offers* semantics for knowledge encoding that enables understanding.
- CSOC Analysis is a vital process for all SOCs.
- Log Collection and Collation on itself is insufficient, and analysis of in-flight messages, events, and traffic sessions is needed to detect threats and gain better understanding and awareness.
- Threat intelligence offers augmented ‘threat picture’

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References

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