Cyber Challenge Data Set

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Data Sets

Daily summaries in CSV format taken from the Unified Host and Network Data Set (https://csr.lanl.gov/data/2017.html).

- Netflow
- Authentication
- Processes

In addition, labelled red team data consisting of known malicious authentications, processes and compromised devices.

- 90 days of data.
- Identifying values de-identified (anonymized).
- De-identified values match across all data sets.
- Well known network ports, processes and core enterprise hosts not de-identified.

NetFlow

NetFlow Data Set

High level summary of communications between two network devices.

Raw data consisted of NetFlow records exported from core network routers to a centralised collection server (limited to Protocols 1 (ICMP), 6 (TCP), and 17 (UDP)).

Data Transformation

- Bi-flowing
  - Aggregate duplicates
  - Marry opposing uniflows of bi-directional connections into a single, directed biflow record (estimate direction)
- IP/HostName mapping
  - Daily snapshot of device inventory + DHCP logs
  - Failed mappings anonymized as IPx rather than Comp$x$

Time, Duration, SrcDevice, DstDevice, Protocol, SrcPort, DstPort, SrcPackets, DstPackets, SrcBytes, DstBytes

Daily Summary

SrcDevice, DstDevice, Protocol, DstPort, DailyCount

```
Comp296454,Comp556624,6,706,2
Comp801423,Comp908548,17,427,2
Comp916004,Comp257274,6,Port33393,1
Comp044772,Comp669315,6,Port84767,2
Comp453311,Comp430515,6,Port23501,2
Comp044772,Comp406049,6,Port44908,2
Comp617050,Comp866402,6,Port25096,1
Comp623258,Comp304426,6,Port26269,2
Comp044772,Comp713675,6,Port46672,2
```

- 21 million events on average per day.
- 60,000 unique devices.
- Starts on day 2.

Windows Event Logs

Windows Host Log Data

Host event logs capture nuanced details about what is happening at a machine level.

- Events only related to authentication and process activity on each machine running the Windows operating system.
- JSON format, one record per line → preserve structure of original events.
- Each record has an EventID which uniquely identifies the event.
- Not all events share the same set of attributes → event dependent.

```
{“UserName”: “Comp916004$”, “EventID”: 4624, “LogHost”:“Comp916004”, “LogonID”: “0x1b5b5753”, “DomainName”: “Domain001”,
“LogonTypeDescription”: “Network”, “Source”: “Comp916004”, “AuthenticationPackage”: “Kerberos”, “Time”: 109, “LogonType”: 3}

{“UserName”: “User186321”, “EventID”: 4648, “LogHost”: “Comp916004”, “LogonID”: “0x3e4”, “DomainName”: “Domain001”, “Destination”:
“Comp457365”, “SubjectUserName”: “Comp916004$”, “ProcessName”: “Proc423620.exe”, “SubjectLogonID”: “0x3e4”, “Time”: 108, “SubjectDomainName”:
“Domain001”, “ProcessID”: “0xd28”}

{“UserName”: “User186321”, “EventID”: 4624, “LogHost”: “Comp916004”, “LogonID”: “0x1abd30dd”, “DomainName”: “Domain001”, “Source”:
“Comp916004”, “LogonTypeDescription”: “NetworkClearText”, “ProcessName”: “Proc423620.exe”, “AuthenticationPackage”: “Negotiate”, “Time”: 108,
“LogonType”: 8, “ProcessID”: “0xd28”}
```

Daily summaries for authentications and processes.

Daily summary - Authentication

UserName, SrcDevice, DstDevice, Authentication Type Description, Failure, DailyCount

```
User486765,Comp521945,Comp521945,TGS,0,6
Comp039634$,Comp039634,Comp039634,TGS,0,24
User968259,Comp223987,ActiveDirectory,TGT,0,3
Comp530762$,Comp530762,ActiveDirectory,TGS,0,22
User736129,Comp718155,None,WorkstationLock,0,4
User523107,Comp497788,ActiveDirectory,NetworkLogon,0,74
Anonymous,Comp232598,ActiveDirectory,NetworkLogon,0,241
User239777,Comp212028,None,WorkstationLock,0,1
User015915,Comp702949,Comp479002,NetworkLogon,0,250
```

- For local authentications *DstDevice* is *None* (if *DstDevice* unknown also *None*).
- User Accounts ending in $ are Computer Accounts.
- Failure is a boolean indicating whether or not the authentication was a success.
- Periodicity, which can be caused by a computer regularly renewing your credentials, can heavily inflate daily counts.
- 177,000 events on average per day.
- 15, 000 unique user accounts (not counting those ending in $).

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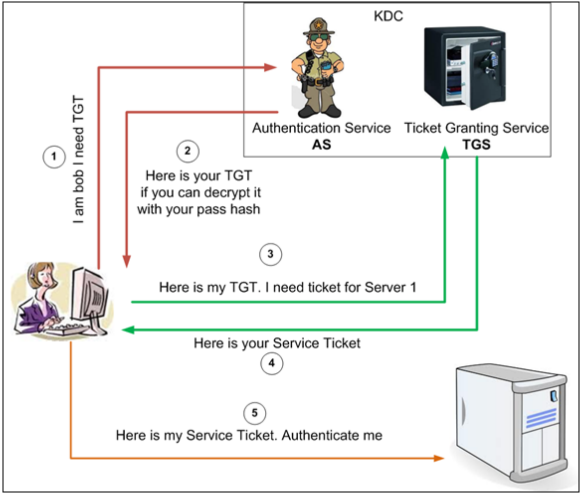
Unique Authentication Types:

- *TGT* → Ticket Granting Ticket (Kerberos)
- *TGS* → Ticket Granting Service (Kerberos)
- *InteractiveLogon* → logon at keyboard and screen of system
- *NetworkLogon* → connection to service or shared folder elsewhere on the network
- *Batch* → Scheduled task
- *Service* → Service startup
- *WorkstationLock*
- *WorkstationUnlock*
- *ScreensaverInvoked*
- *ScreensaverDismissed*
- *RemoteInteractive* → Remote Desktop Protocol
- *CachedInteractive* → logging on when away from the network, uses cached credentials.
- *CachedRemoteInteractive*

Kerberos Authentication

Computer Network Authentication protocol



https://ammarhasayen.com/2011/02/05/kerberos-in-ad-101/

Daily summary - Processes

UserName, Device, ProcessName, ParentProcessName, DailyCount

```
Comp105747$,Comp105747,csrss.exe,Proc721583,1
Comp532565$,Comp532565,Proc556285.exe,services,1
Comp824319$,Comp824319,dllhost.exe,svchost,284
Comp265993$,Comp265993,Proc299293.exe,cmd,1
Comp511123$,Comp511123,Proc391839.exe,Proc387473,2
Comp824929$,Comp824929,cscript.exe,wmiprvse,2
Comp957545$,Comp957545,Proc307031.exe,services,1
Comp512730$,Comp512730,Proc453954.exe,Proc397204,1
Comp698292$,Comp698292,Proc174492.exe,svchost,3
User851869,Comp445233,Proc915692.exe,Proc318985,1
```

- 622,000 events on average per day.
- 26, 000 unique process names.

Red Team Data

- Known malicious authentications from stolen credentials (same format as above)
- Known malicious processes (same format as above)
- Known compromised hosts where the red team had command and control