Proj 6: IDA Pro (Lab 5-1) (20 pts., 4 images)

What you need:

- A Windows machine, real or virtual, such as the Windows 2008 Server VM we've been using
- The textbook: "Practical Malware Analysis"

Purpose

You will practice using IDA Pro.

You should already have the lab files, but if you don't, do this:

Downloading the Lab Files

In a Web browser, go here:

http://practicalmalwareanalysis.com/labs/

Download and unzip the lab files.

Downloading and Installing IDA Pro

In your Windows machine, open a Web browser and go to

https://www.hex-rays.com/products/ida/support/download_freeware.shtml

Download "**IDA Freeware**" and install it.

If that link is down, use this alternate download link:

https://samsclass.info/126/proj/idafree50.exe

Follow the Textbook

Follow the instructions for **Lab 5-1** in the textbook, questions 1-8, to analyze Lab05-01.dll using only IDA Pro. There are more detailed solutions in the back of the book.

Opening Lab05-01.dll in IDA Pro

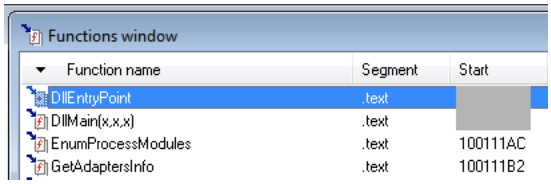
Launch IDA Pro. Click **OK**. Click **New**. Click the "**PE Dynamic Library**" icon and click **OK**. Navigate to Lab05-01.dll and open it.

Q 1: Finding the Address of DLLMain

In IDA Pro, click **Windows**, "**Functions window**".

Click the "**Function name**" header to sort by name and scroll to the top.

Your image should show the location of DLLMain, as shown below:



Press the **PrntScrn** key to capture an image of the whole desktop.

Open Paint and paste the image in with **Ctrl+V**.

Save this image with the filename "**Proj 6a from YOUR NAME**".

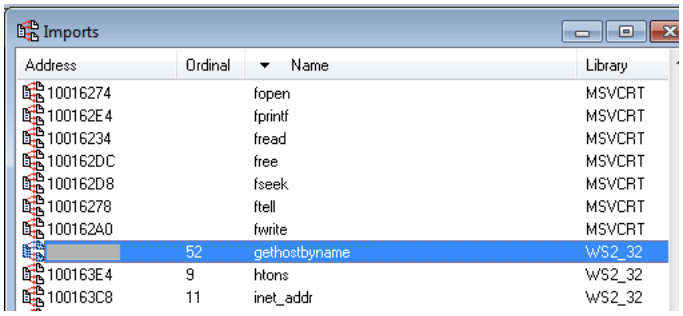
YOU MUST SUBMIT WHOLE-DESKTOP IMAGES TO GET FULL CREDIT!

Q 2: Find the import for gethostbyname

In IDA Pro, click **Windows**, **Imports**. Click the **Name** header to sort by name. Find "gethostbyname" -- note that capital letters and lowercase letters sort into separate groups.

Widen the **Address** column to make the entire address visible.

Your image should show the location of gethostbyname, as shown below:



Imports

Address	Ordinal	Name	Library
10016274		fopen	MSVCRT
100162E4		fprintf	MSVCRT
10016234		fread	MSVCRT
100162DC		free	MSVCRT
100162D8		fseek	MSVCRT
10016278		ftell	MSVCRT
100162A0		fwrite	MSVCRT
	52	gethostbyname	WS2_32
100163E4	9	htons	WS2_32
100163C8	11	inet_addr	WS2_32

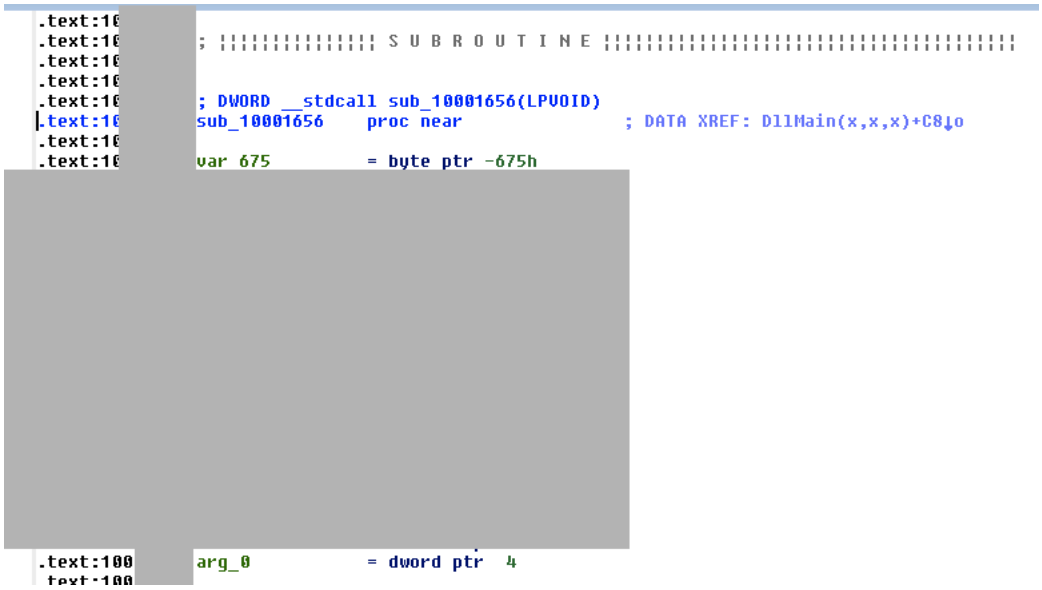
Save a full-desktop image with the filename "**Proj 6b from YOUR NAME**".

Q 5: Count Local Variables for the Subroutine at 0x10001656

In IDA Pro, click **Windows**, "**IDA View-A**". Press the **SPACEBAR** to get to text view.

Press **g** to Go. Enter the address **0x10001656** and click **OK**.

Scroll up to show the comments IDA added to the start of the function, listing its local variables, as shown below:



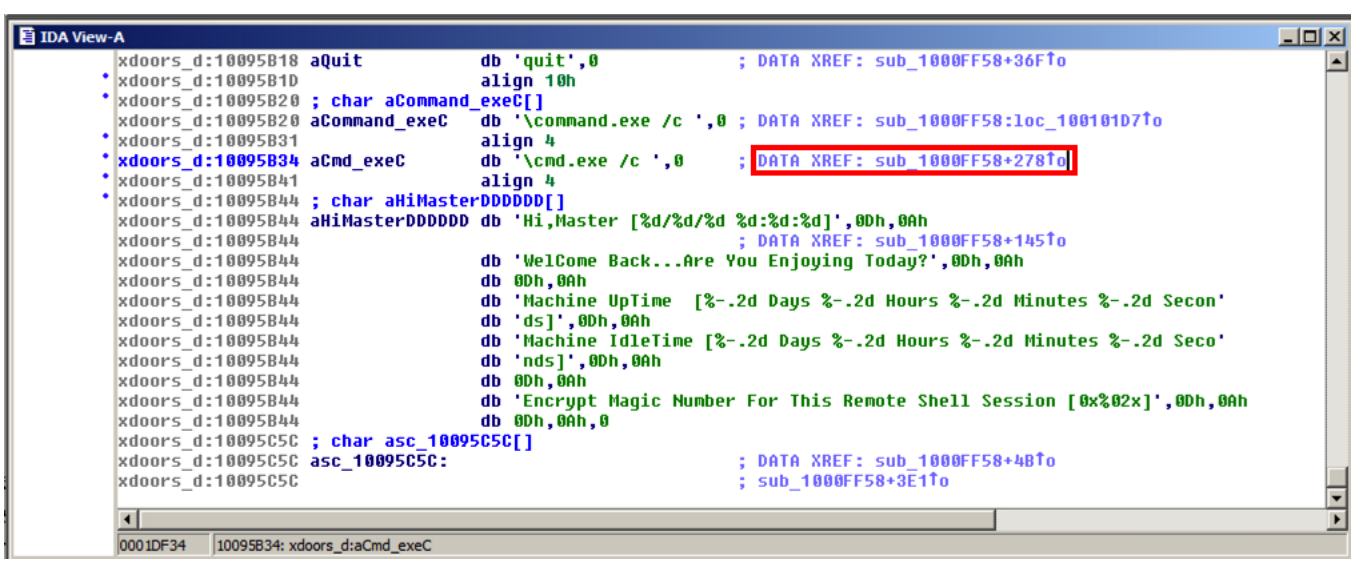
```
.text:10
.text:10        ; ||||||||||||||| S U B R O U T I N E |||||||||||||||||||||||||||||||||||||||||
.text:10
.text:10
.text:10        ; DWORD __stdcall sub_10001656(LPVOID)
.text:10        sub_10001656    proc near               ; DATA XREF: DllMain(x,x,x)+C8↓o
.text:10
.text:10        var_675         = byte ptr -675h
.text:100       arg_0           = dword ptr  4
```

Save a full-desktop image with the filename "**Proj 6c from YOUR NAME**".

Q 8: Finding the Purpose of the Code that References \cmd.exe /c

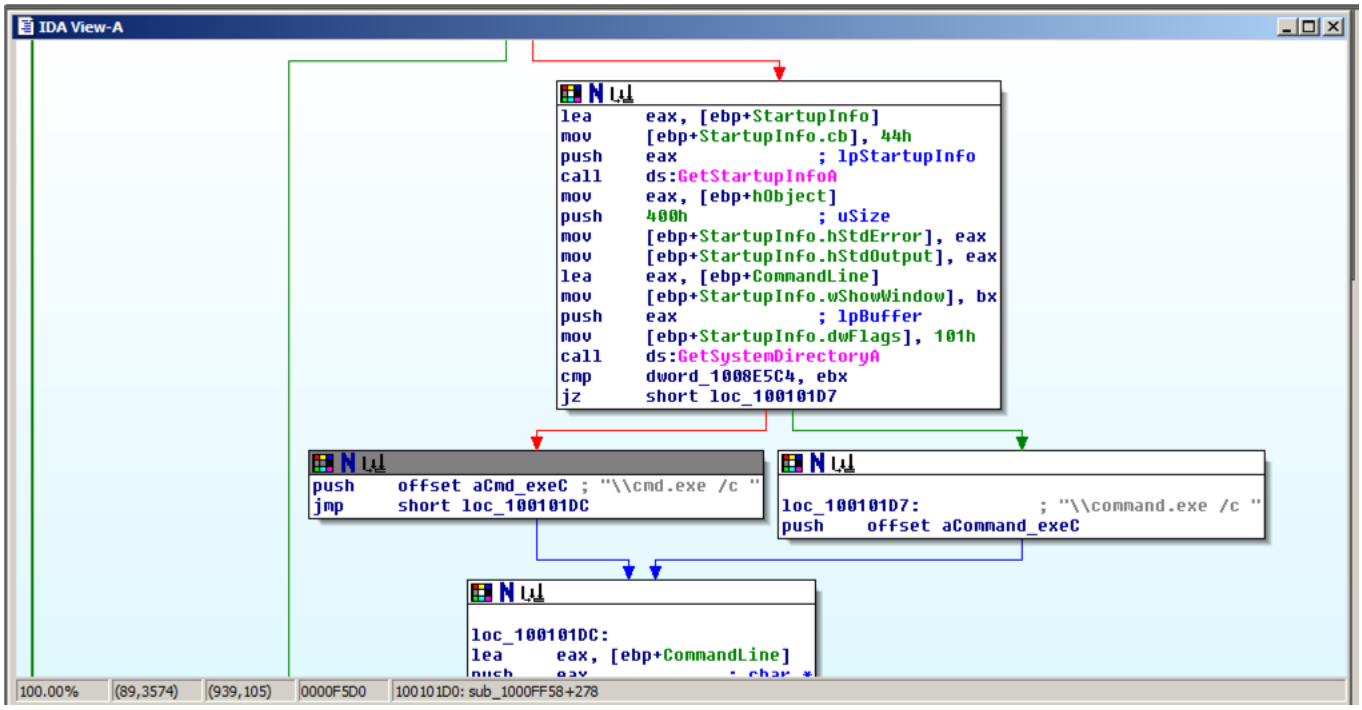
In IDA Pro, click **Windows**, **Strings**. Make the window larger. Sort by **String**. Find the String "**\\cmd.exe /c**" and double-click it. The function opens in text view, as shown below.

In the line containing "\\cmd.exe /c", double-click the address to the right of "XREF", as indicated by the red outline in the image below.

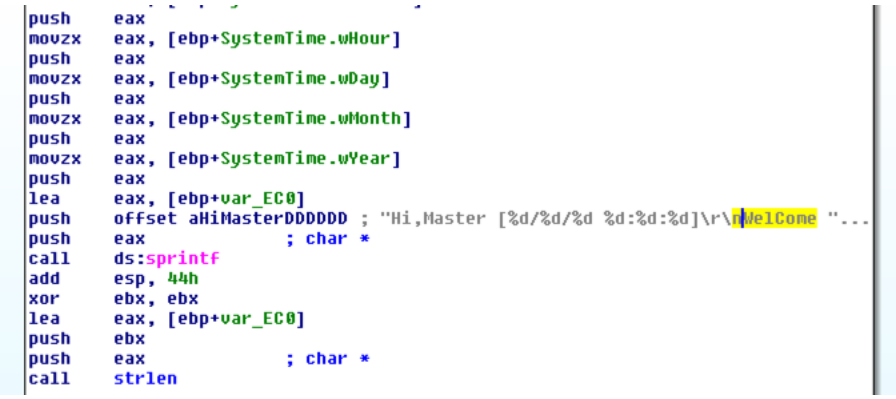


```
IDA View-A
xdoors_d:10095B18 aQuit           db 'quit',0             ; DATA XREF: sub_1000FF58+36F↑o
xdoors_d:10095B1D                 align 10h
xdoors_d:10095B20 ; char aCommand_exeC[]
xdoors_d:10095B20 aCommand_exeC   db '\command.exe /c ',0 ; DATA XREF: sub_1000FF58:loc_100101D7↑o
xdoors_d:10095B31                 align 4
xdoors_d:10095B34 aCmd_exeC       db '\cmd.exe /c ',0     ; DATA XREF: sub_1000FF58+278↑o
xdoors_d:10095B41                 align 4
xdoors_d:10095B44 ; char aHiMasterDDDDDD[]
xdoors_d:10095B44 aHiMasterDDDDDD db 'Hi,Master [%d/%d/%d %d:%d:%d]',0Dh,0Ah
xdoors_d:10095B44                                         ; DATA XREF: sub_1000FF58+145↑o
xdoors_d:10095B44                 db 'WelCome Back...Are You Enjoying Today?',0Dh,0Ah
xdoors_d:10095B44                 db 0Dh,0Ah
xdoors_d:10095B44                 db 'Machine UpTime  [%-.2d Days %-.2d Hours %-.2d Minutes %-.2d Secon'
xdoors_d:10095B44                 db 'ds]',0Dh,0Ah
xdoors_d:10095B44                 db 'Machine IdleTime [%-.2d Days %-.2d Hours %-.2d Minutes %-.2d Seco'
xdoors_d:10095B44                 db 'nds]',0Dh,0Ah
xdoors_d:10095B44                 db 0Dh,0Ah
xdoors_d:10095B44                 db 'Encrypt Magic Number For This Remote Shell Session [0x%02x]',0Dh,0Ah
xdoors_d:10095B44                 db 0Dh,0Ah,0
xdoors_d:10095C5C ; char asc_10095C5C[]
xdoors_d:10095C5C asc_10095C5C:                           ; DATA XREF: sub_1000FF58+4B↑o
xdoors_d:10095C5C                                         ; sub_1000FF58+3E1↑o
0001DF34  10095B34: xdoors_d:aCmd_exeC
```

Press the **SPACEBAR** to get to graph view, as shown below. "\\cmd.exe /c" is used in the little routine on the left.

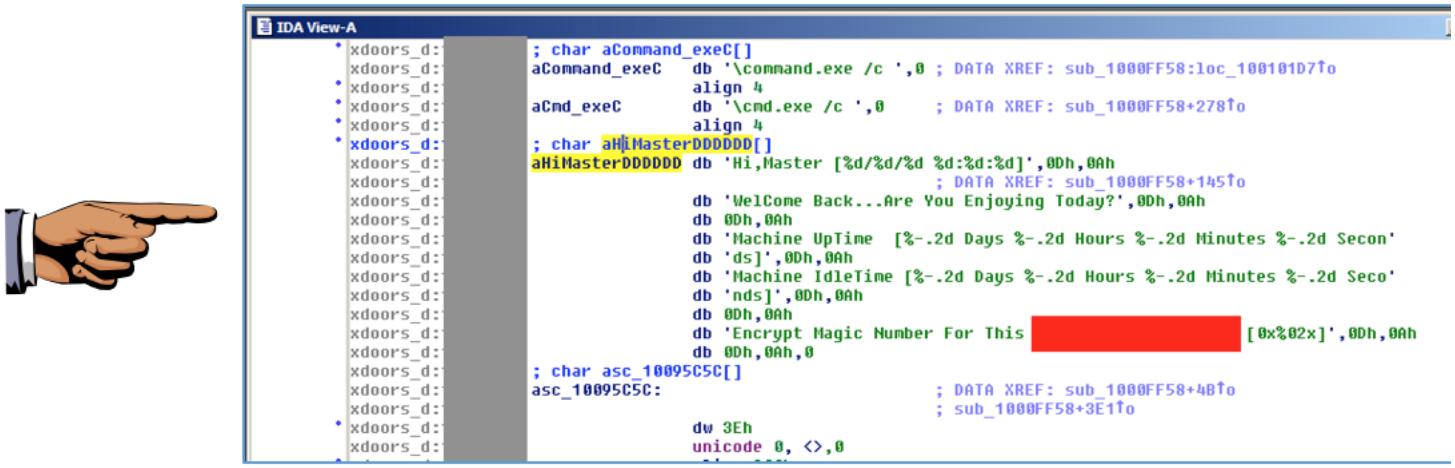


Drag the graph view down to see the subroutines before it. About three boxes up you should find text beginning with "Hi, Master", as shown below.



Double-click **aHiMasterDDDD** to find the complete message. The purpose of the malware is clearly stated.

Your image should show what the code is doing, as shown below. The purpose is behind the red rectangle in the image below.



Save a full-desktop image with the filename "**Proj 6d from YOUR NAME**".

Turning in your Project

Email the images showing to cnit.126sam@gmail.com with the subject line: **Proj 6 from YOUR NAME**

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