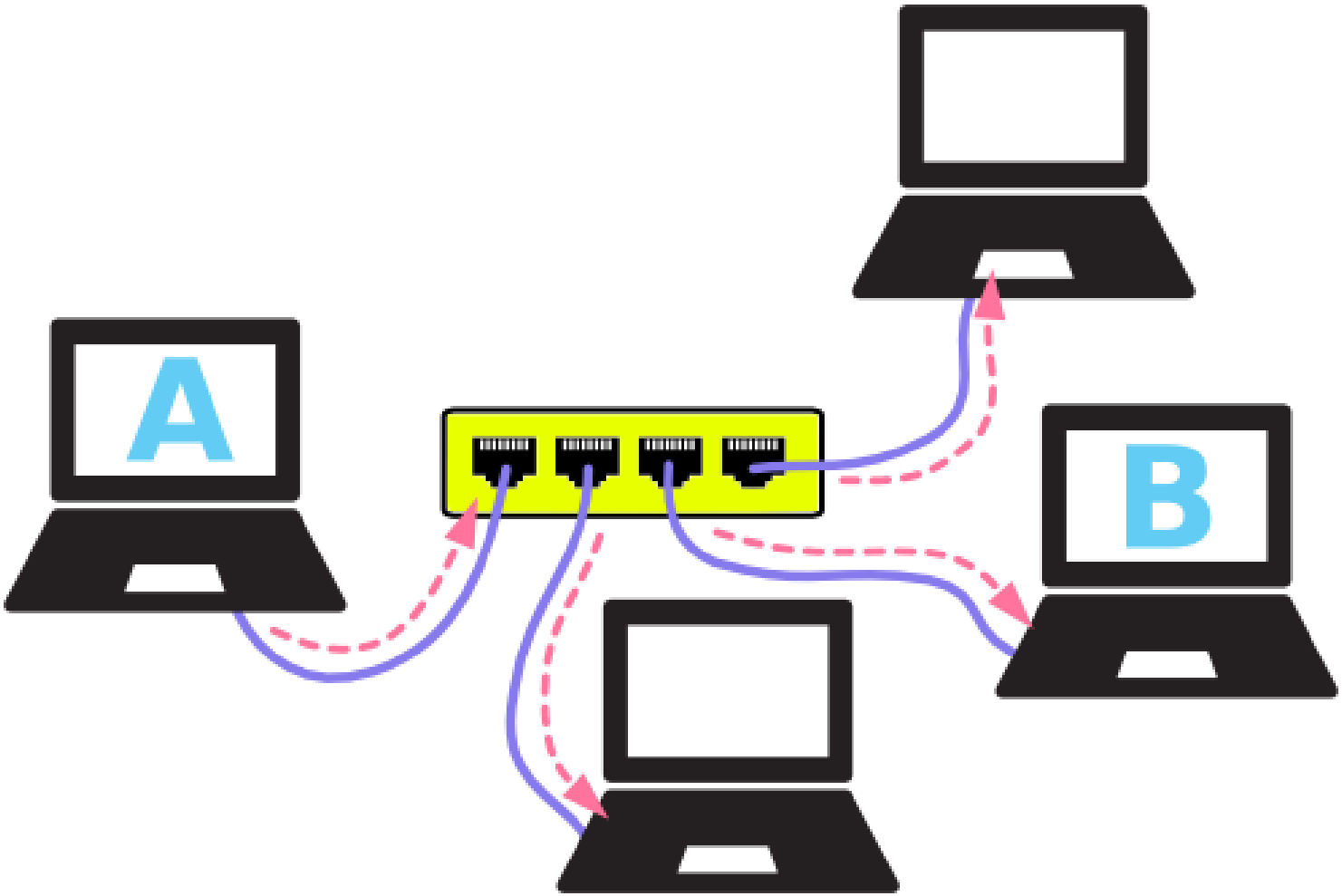
Network Concepts

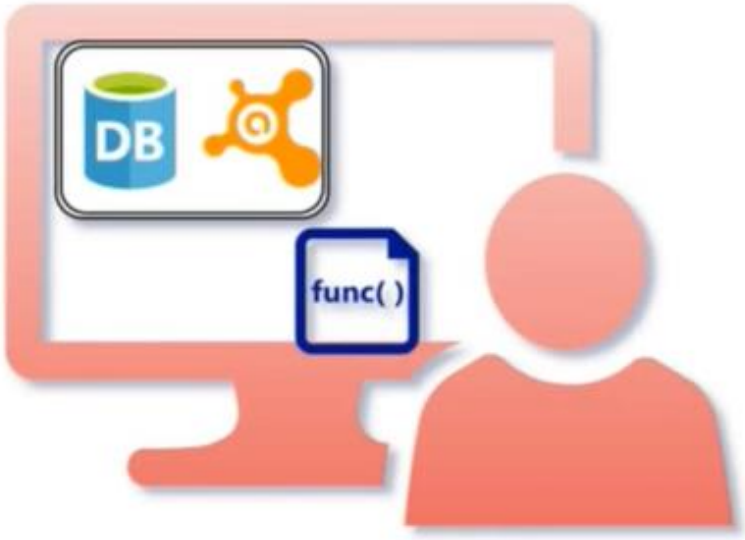


Network Security Devices

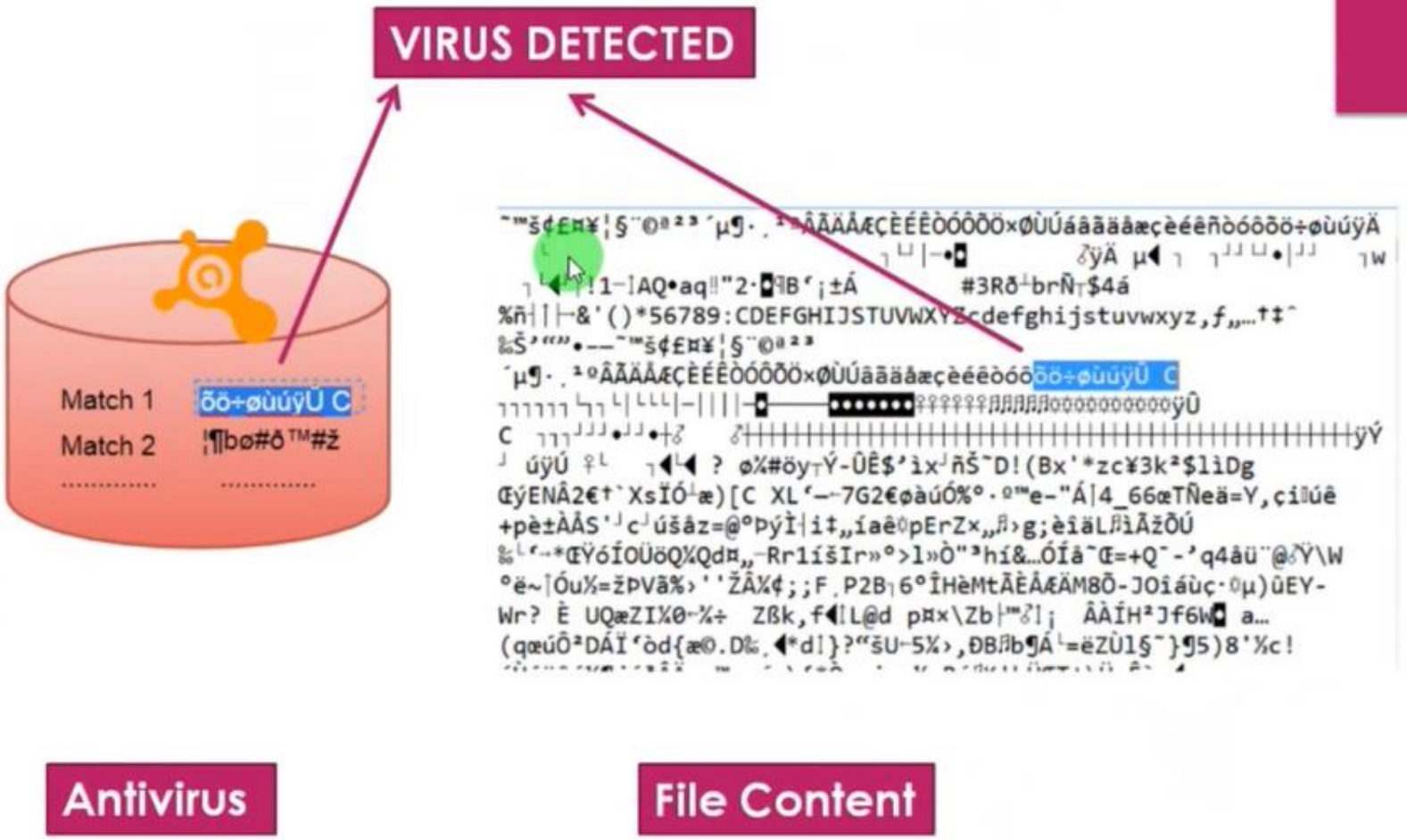
- Antivirus
- IDS/IPS
- Firewall

Antivirus

- Antivirus will scan the file.
- Check the content of payload in the file and try to match with the signature exist in the database
- If match exist, it will take action or clean/delete the file.
- Otherwise, it will mark it as a safe.

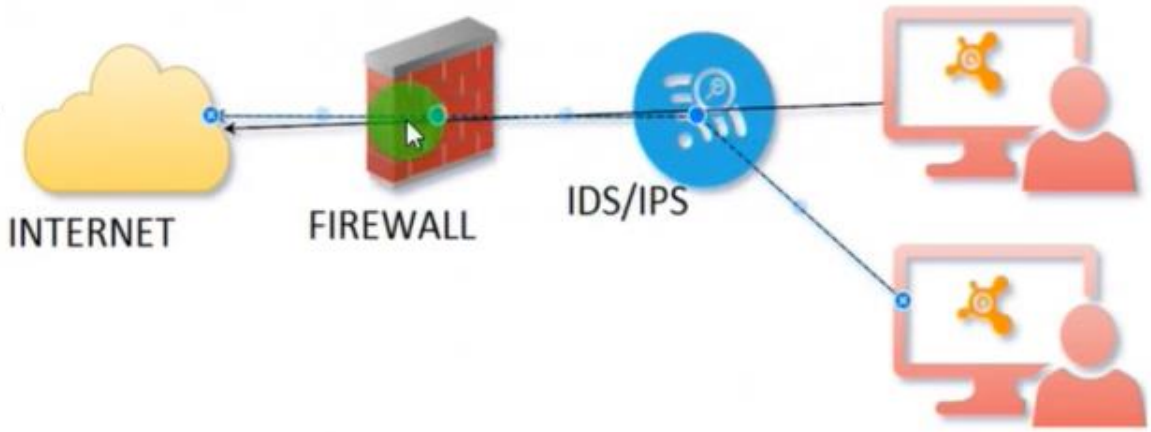


Computer Network

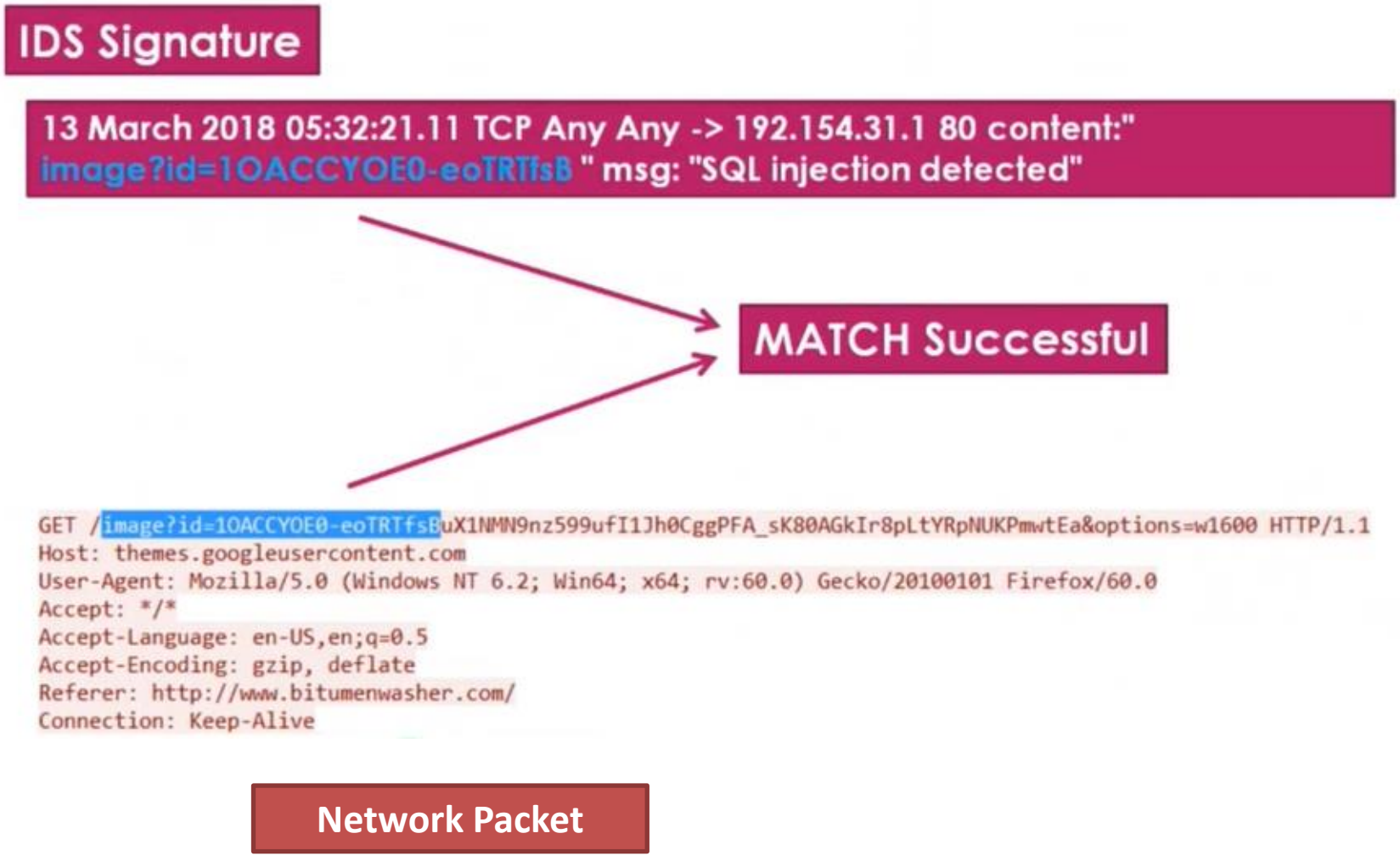


IDS/IPS?

- IDS stands for Intrusion Detection System for alerting on the attack.
- IPS stands for Intrusion Prevention System for alerting and blocking the attack.
- IDS/IPS consist of signature, it match the content of the packet with the signature and take the action accordingly.



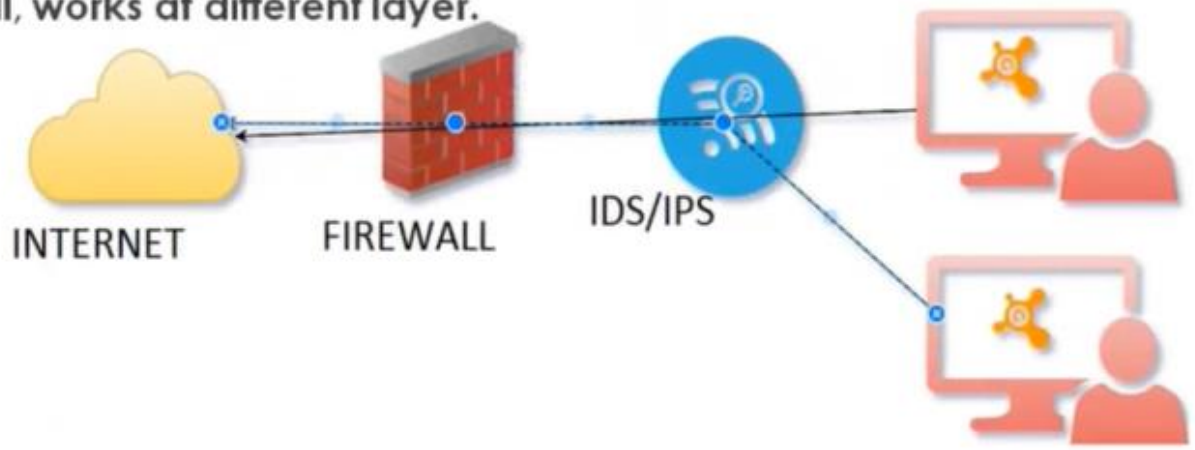
Computer Network



Firewall

- The basic functionality of Firewall to allowed or blocked the traffic on the basis of Source IP, Destination IP, Source Port and Destination Port.
- There are different type of firewall, works at different layer.
- Types of Firewall

1. Packet level Firewall
2. State full Inspection Firewall
3. Application level Firewall



Source IP	Source Port	Destination	Destination Port	Action
192.15.1.1	any	Any	80	Allow
any	any	12.13.12.1	any	Block
any	any	124.123.12.1	any	Block

Packet Understanding
Bit, Hexadecimal & Bytes Represenation

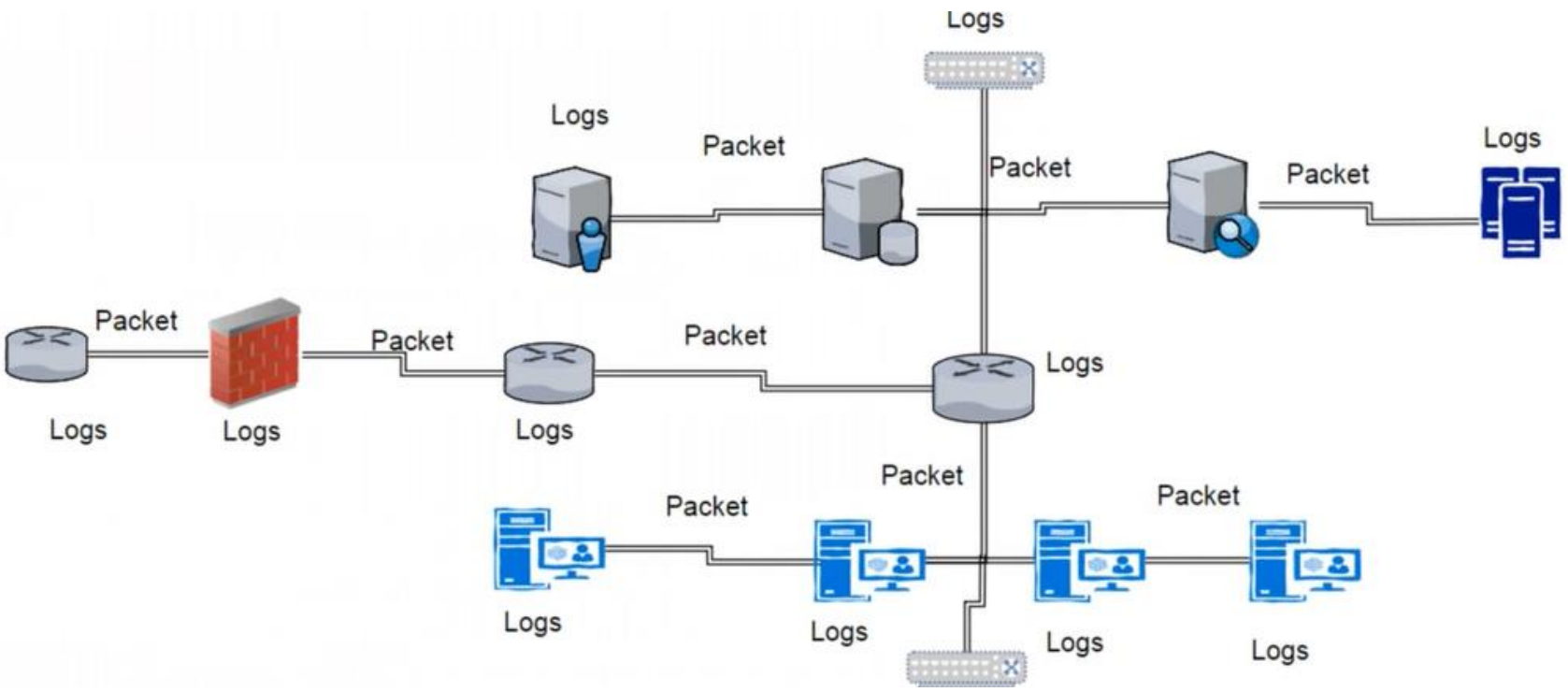
Packet vs Log

- Security breach Identification and Investigation is based on two sources.

1. Network Packets
2. Device log

- Network Packet : Packet is collection of data that can be used by computers which need to communicate with each other

- Device log : A file that lists actions that have occurred. For example, Web servers maintain log files listing every request made to the server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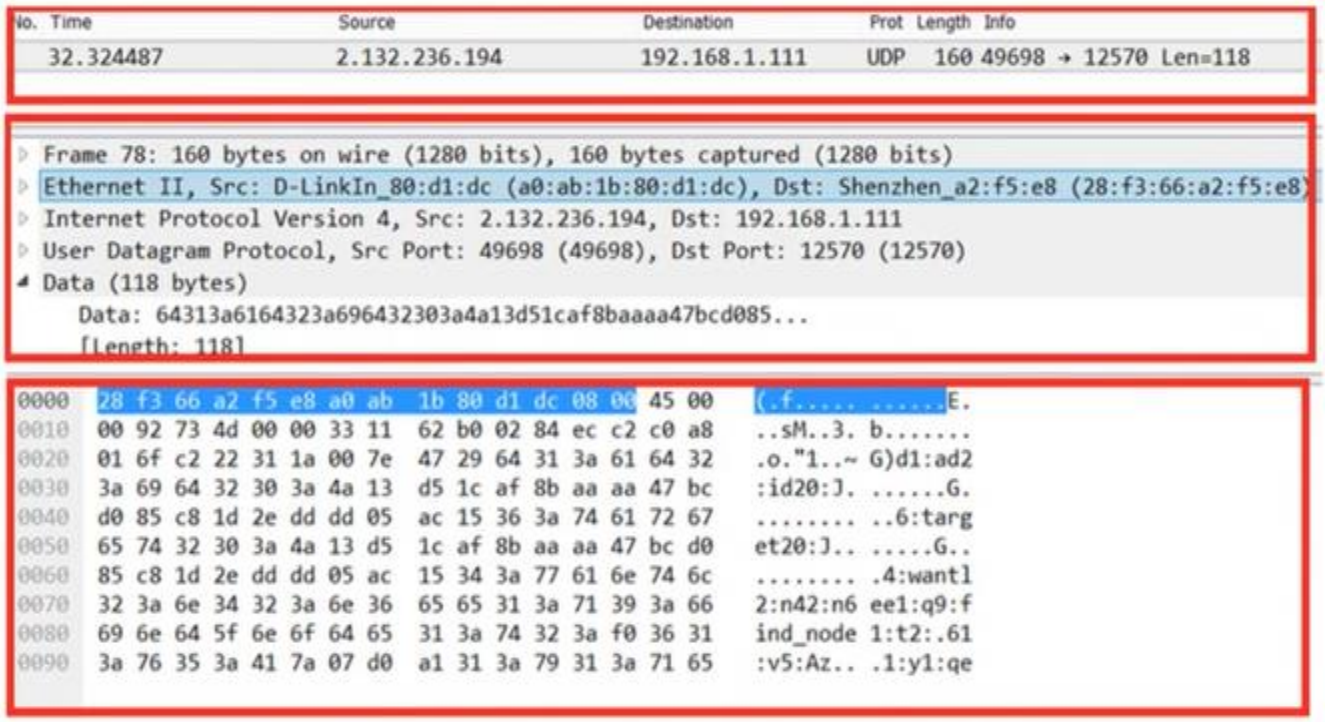
Network Packet Capture



Summary

Decoded Information

Raw packet

Computer Network

Network Packet

```
0000  28 f3 66 a2 f5 e8 a0 ab  1b 80 d1 dc 08 00 45 00   (.f..... ......E.
0010  00 81 00 00 40 00 3b 11  52 5a 02 31 28 ca c0 a8   ....@.;. RZ.1(...
0020  01 6f 11 3c 31 1a 00 6d  23 6a 64 31 3a 61 64 32   .o.<1..m #jd1:ad2
0030  3a 69 64 32 30 3a 4a 11  1e 0e a9 5e c8 c6 1e 37   :id20:J. ...^...7
0040  da 59 7b 15 e0 25 e3 e3  49 04 36 3a 74 61 72 67   .Y{..%.. I.6:targ
0050  65 74 32 30 3a 4a 13 b2  65 55 53 c6 3f 99 04 d4   et20:J.. eUS.?...
0060  53 0a d9 d9 24 d0 3e 21  b7 65 31 3a 71 39 3a 66   S...$.>! .e1:q9:f
0070  69 6e 64 5f 6e 6f 64 65  31 3a 74 32 3a 38 d6 31   ind_node 1:t2:8.1
0080  3a 76 34 3a 4c 54 00 10  31 3a 79 31 3a 71 65      :v4:LT.. 1:y1:qe
```

Device Logs

General | Details

Credential Manager credentials were read.

Subject:

Security ID:	SYSTEM
Account Name:	DESKTOP-79N14PK$
Account Domain:	WORKGROUP
Logon ID:	0x3E7
Read Operation:	Enumerate Credentials

This event occurs when a user performs a read operation on stored credentials in Credential Manager.

Log Name:	Security		
Source:	Microsoft Windows security	Logged:	7/29/2021 7:00:32 AM
Event ID:	5379	Task Category:	User Account Management
Level:	Information	Keywords:	Audit Success
User:	N/A	Computer:	DESKTOP-79N14PK
OpCode:	Info		
More Information:	Event Log Online Help		

Encoding and Decoding:

Encoding is the process of putting a sequence of characters such as letters, numbers, and other special characters into a specialized format for efficient transmission.

Decoding is the process of converting an encoded format back into the original sequence of characters.

It is completely different from Encryption which we usually misinterpret. Encoding and decoding are used in data communications and storage.

Encoding should NOT be used for transporting sensitive information.

Encryption

Encryption is the process of translating plain text data (*plaintext*) into something that appears to be random and meaningless (*ciphertext*).

Decryption is the process of converting ciphertext back to plaintext.

Types of Encryption:

There are two types of encryption in widespread use **symmetric** and **asymmetric** encryption.

What is symmetric encryption?

In symmetric encryption the same key is used for encryption and decryption.

It is therefore critical that a secure method is considered to transfer the key between sender and recipient.

Symmetric encryption – Using the same key for encryption and decryption.

What is asymmetric encryption?

Asymmetric encryption uses the notion of a key pair: a different key is used for the encryption and decryption process.

One of the keys is typically known as the private key and the other is known as the public key.

The private key is kept secret by the owner and the public key is either shared amongst authorised recipients or made available to the public at large.

Data encrypted with the recipient's public key can only be decrypted with the corresponding private key.

Data can therefore be transferred without the risk of unauthorised or unlawful access to the data. Asymmetric encryption – Using a different key for the encryption and decryption process.

Thanks