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Vulnerabilities of the usage of digital signature

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Vulnerabilities of the usage of digital signature

- NOT related to the mathematical basics
- Related to the typical usage only

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Demonstration

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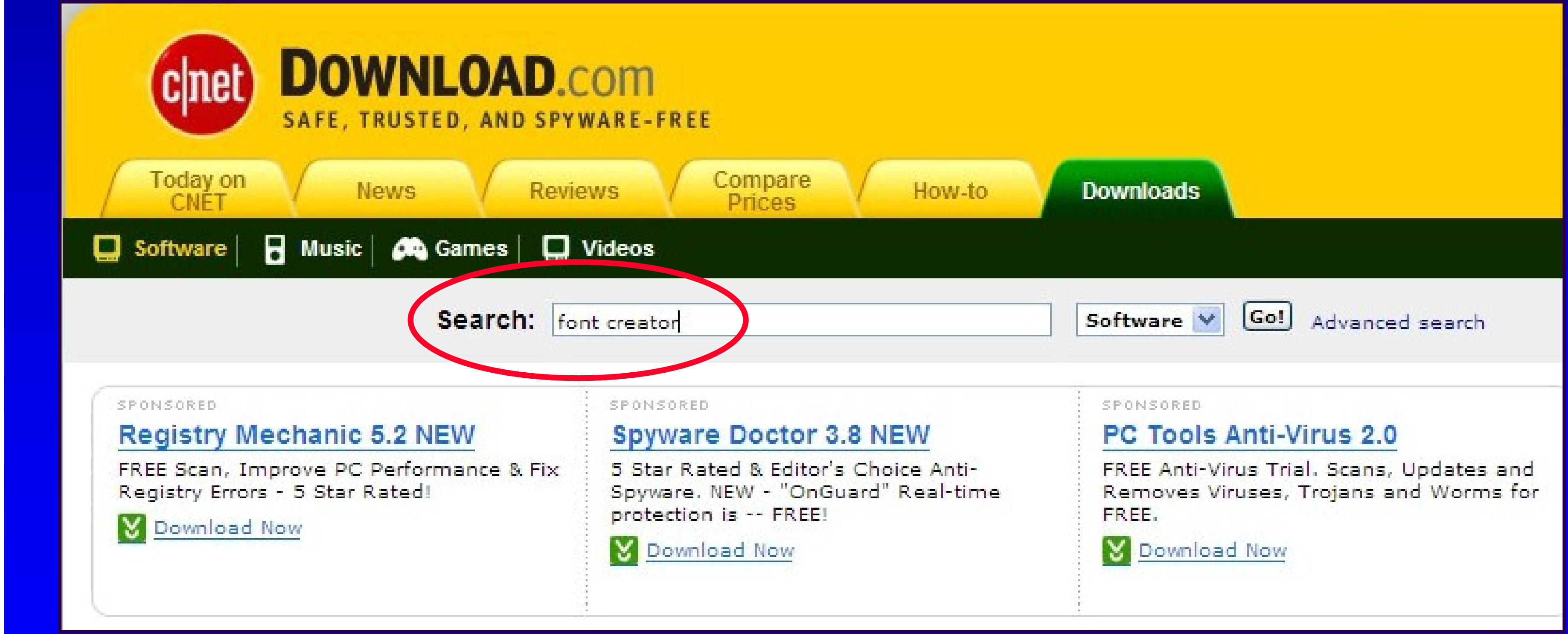

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Demonstration

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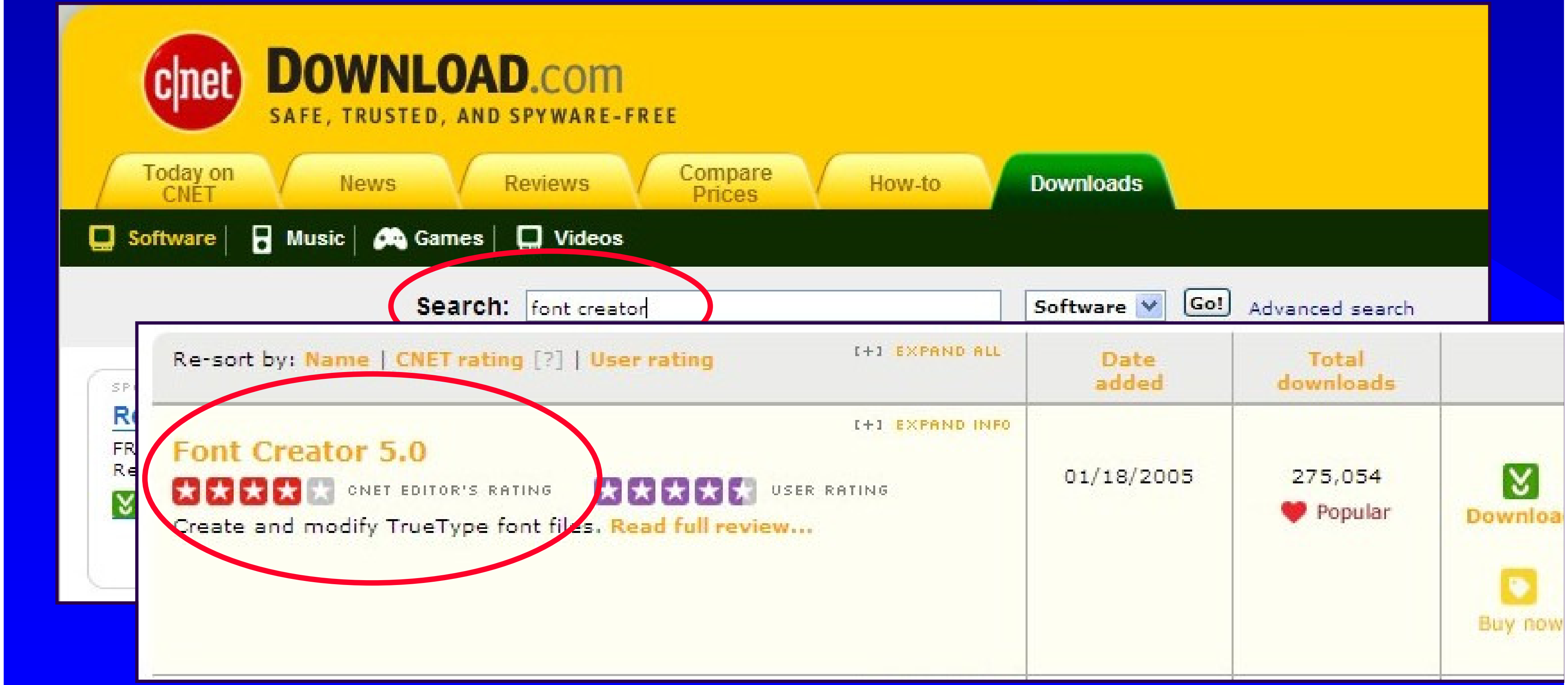

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Demonstration

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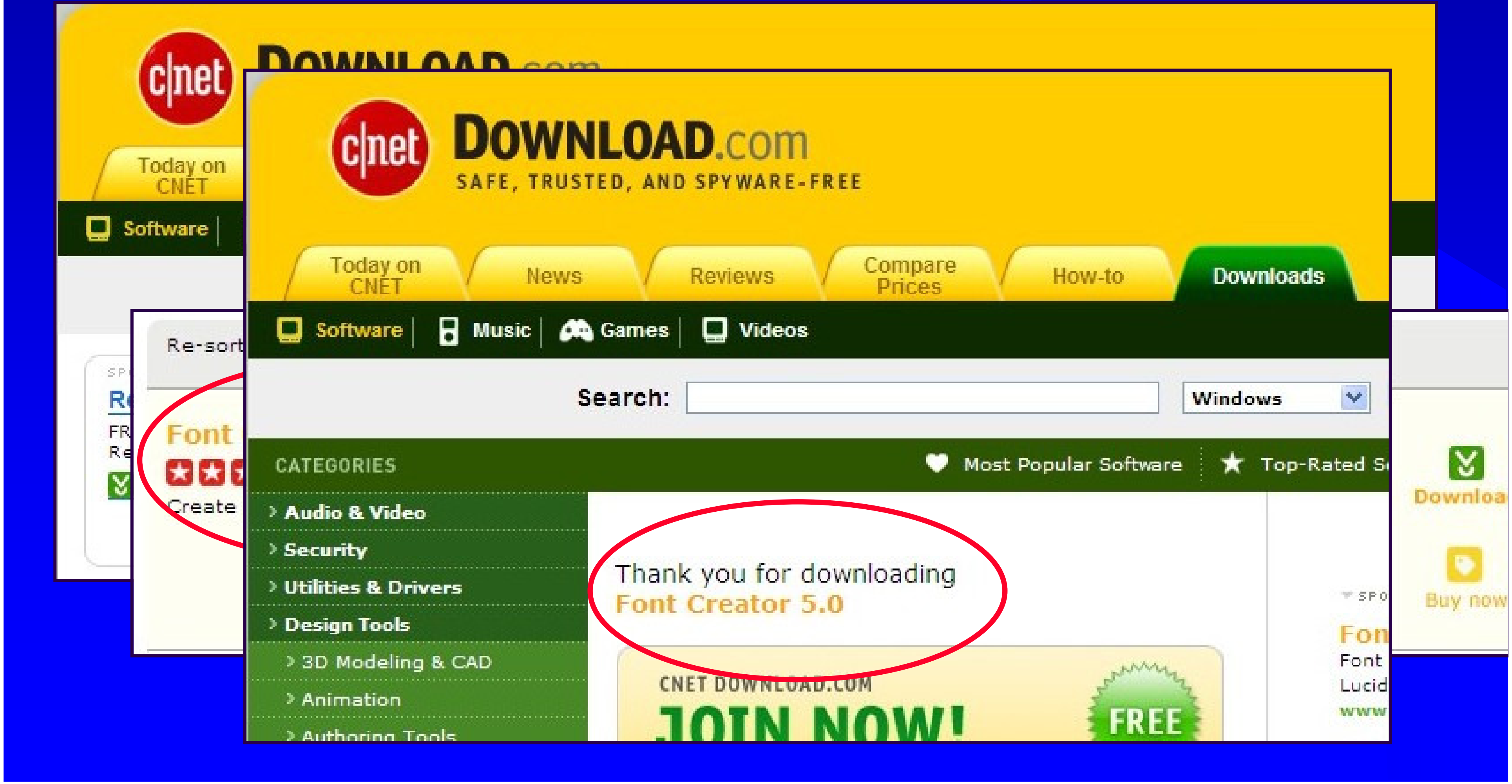

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Demonstration

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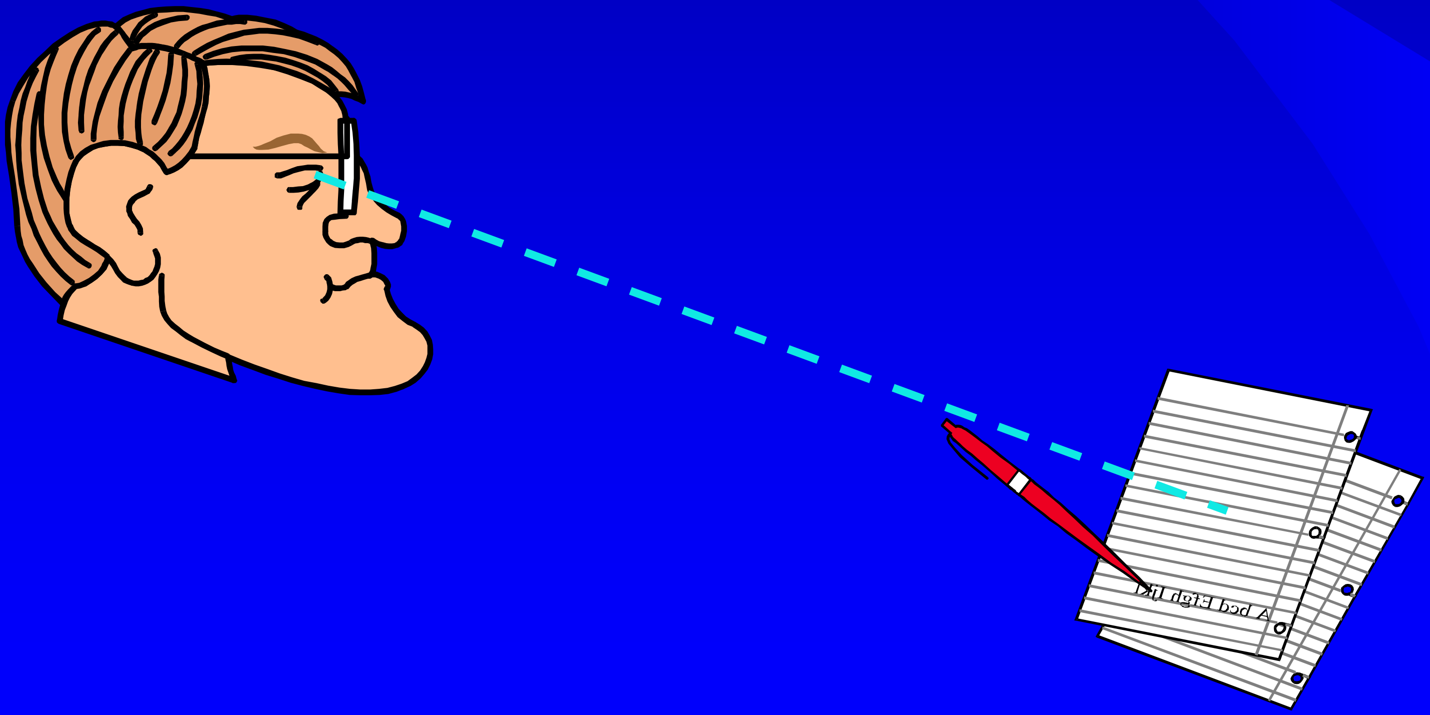
Is there any additional security problem of digital signature against traditional signature ?

➔ YES

Traditional signature



Digital signature

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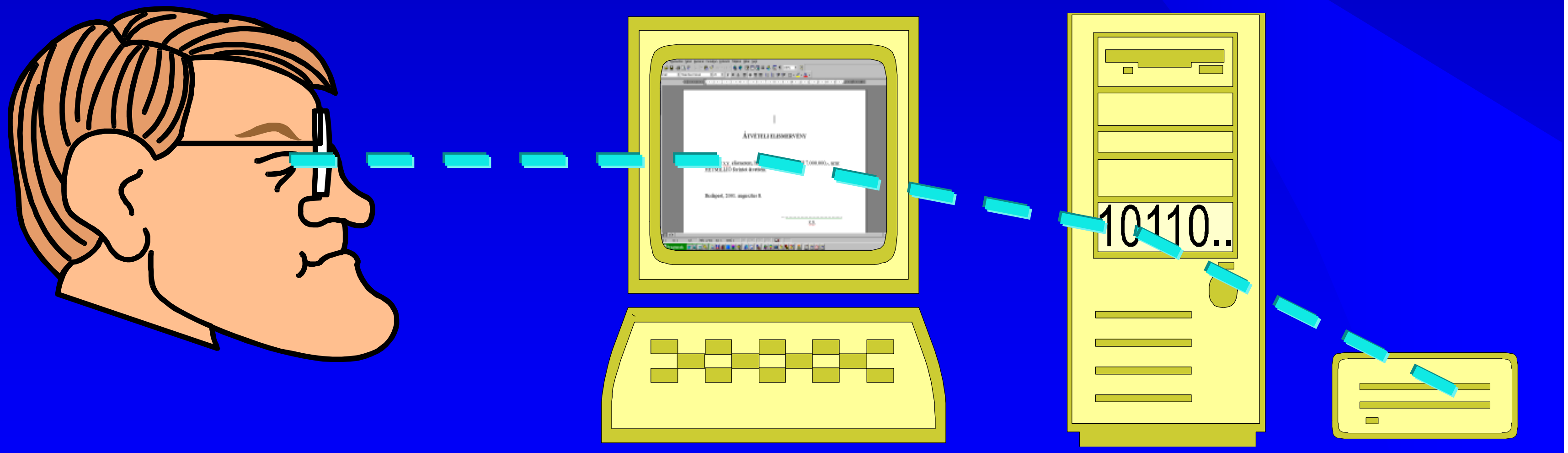

Some attack possibilities

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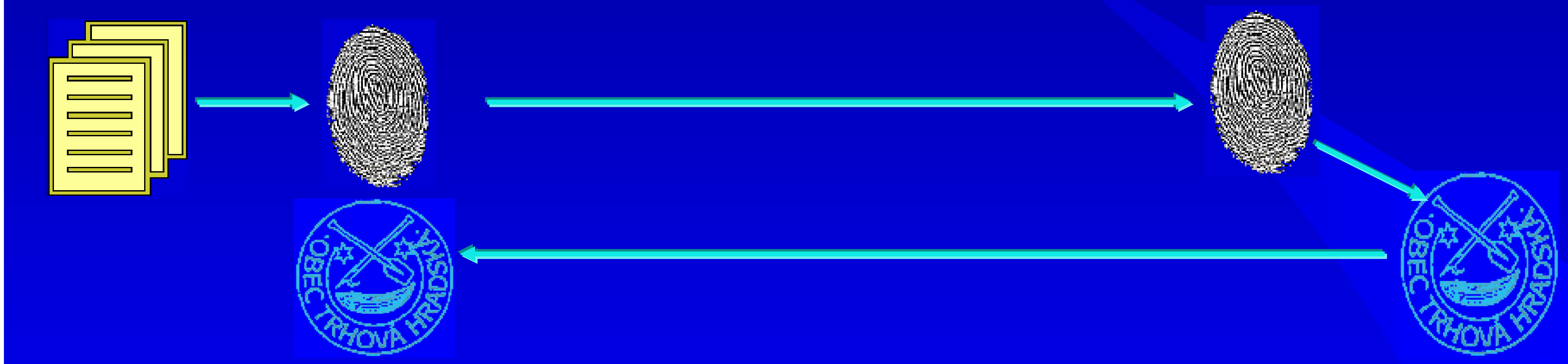
- Manipulate the visualization
- Manipulate the signing process
- Using incorrect algorithms

Manipulate the visualization

- Modifying fonts
  - Windows, X: font files
  - VGA: downloading new fonts
- Automatically executed programs attached to documents (macro)
- Modifying the presentation process

Manipulate the signing process



User interface

OS
(Windows)

External device

Manipulate the signing process

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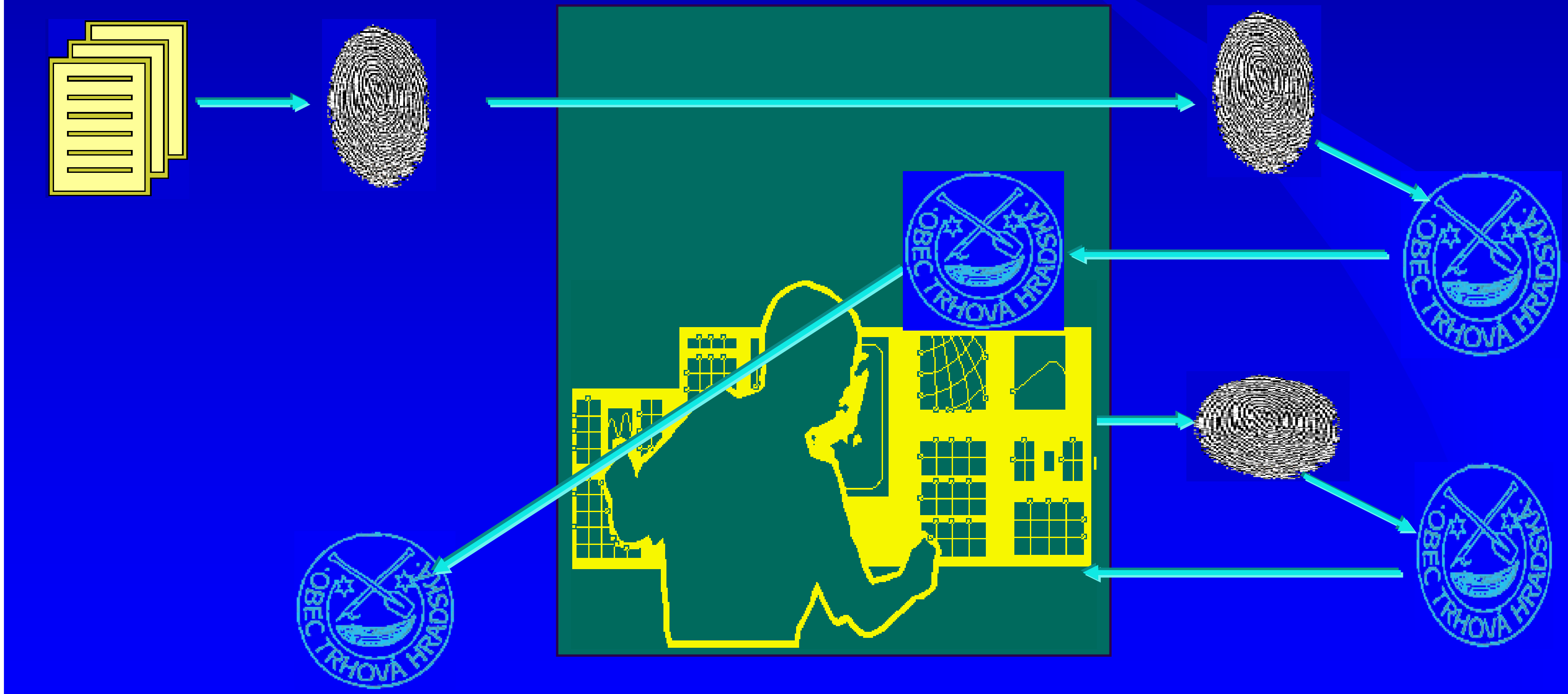

User interface

OS
(Windows)

External device

Manipulate the signing process

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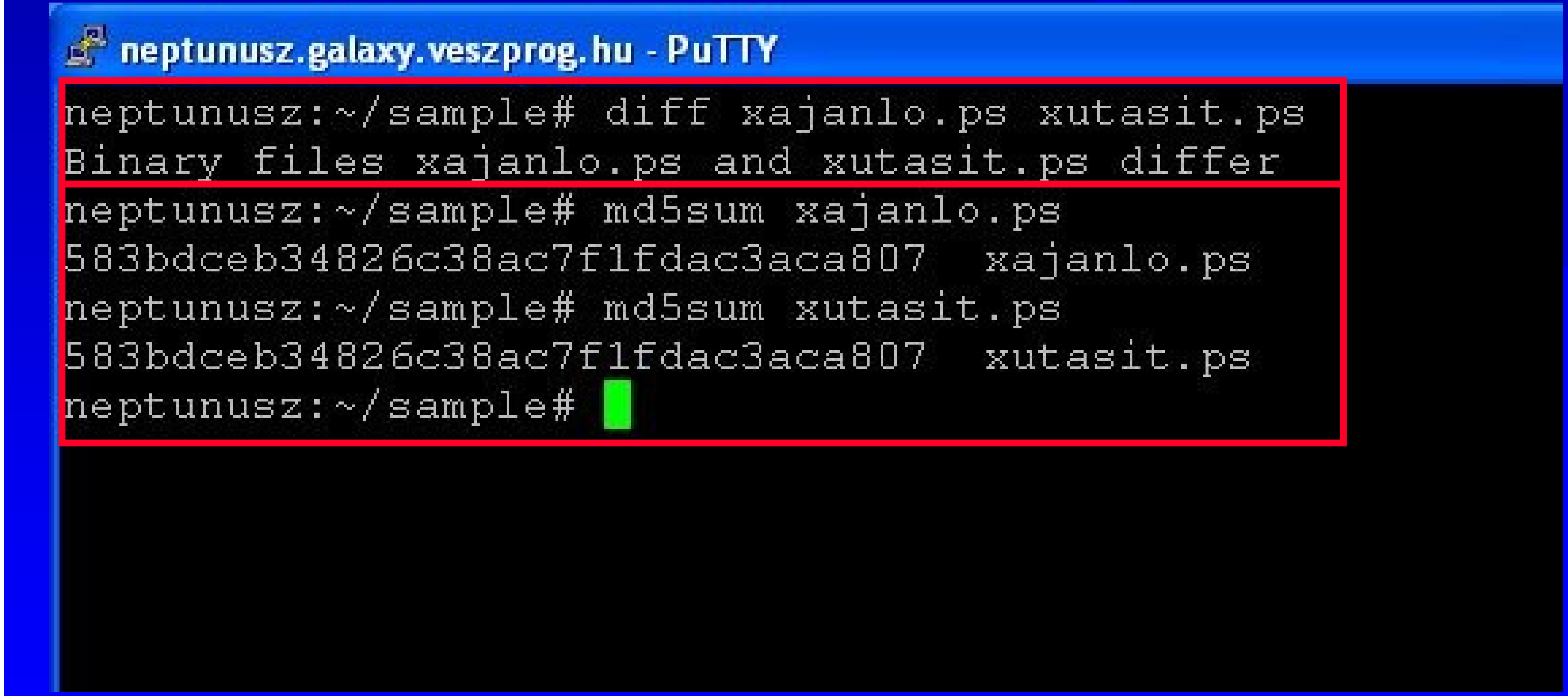
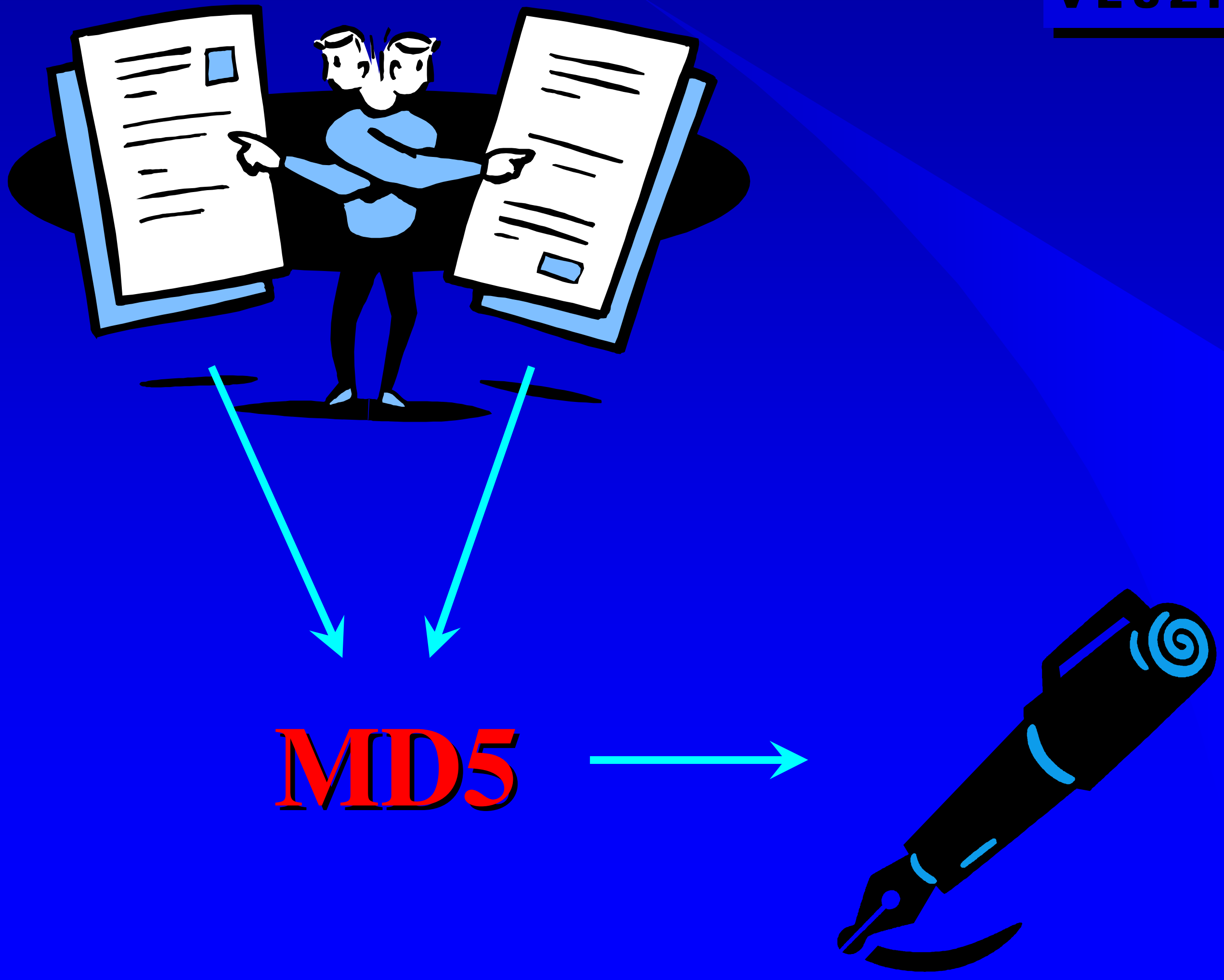
- Signing program patch
- Supervision of the communication between the application and the external device

Using incorrect algorithms



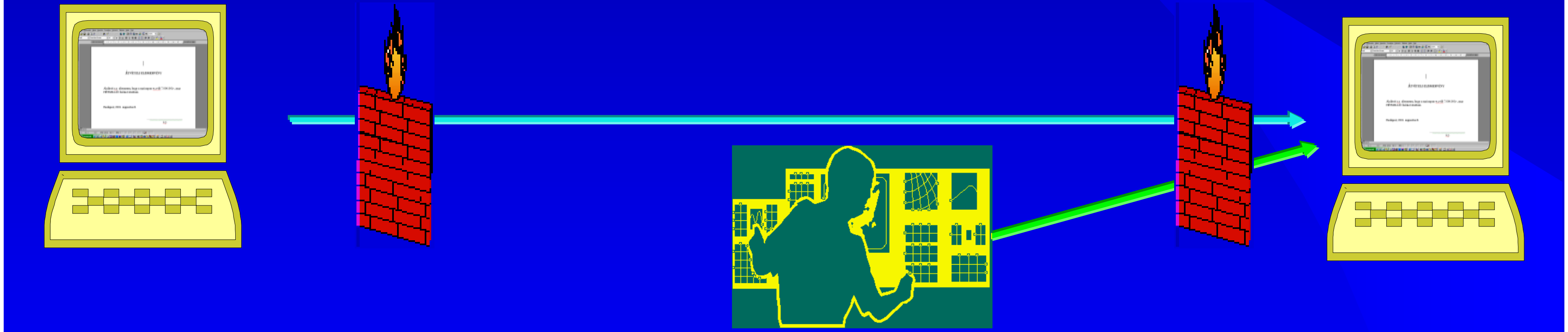
```
neptunusz:~/sample# diff xajanlo.ps xutasit.ps
Binary files xajanlo.ps and xutasit.ps differ
neptunusz:~/sample# md5sum xajanlo.ps
583bdceb34826c38ac7f1fdac3aca807  xajanlo.ps
neptunusz:~/sample# md5sum xutasit.ps
583bdceb34826c38ac7f1fdac3aca807  xutasit.ps
neptunusz:~/sample# 
```

Using incorrect algorithms



MD5

Transmission of signed documents



Using encryption or not ?

Does the firewall forward the encrypted message ?

Conclusion

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It is very important to know:

- exactly which document(s) will be signed,
- what kind of device is used,
- what is our purpose of the usage.

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