

How to protect and why:



Intellectual property rights enforcement vs.
rights tracking and user information

Part II: Digital Watermarking

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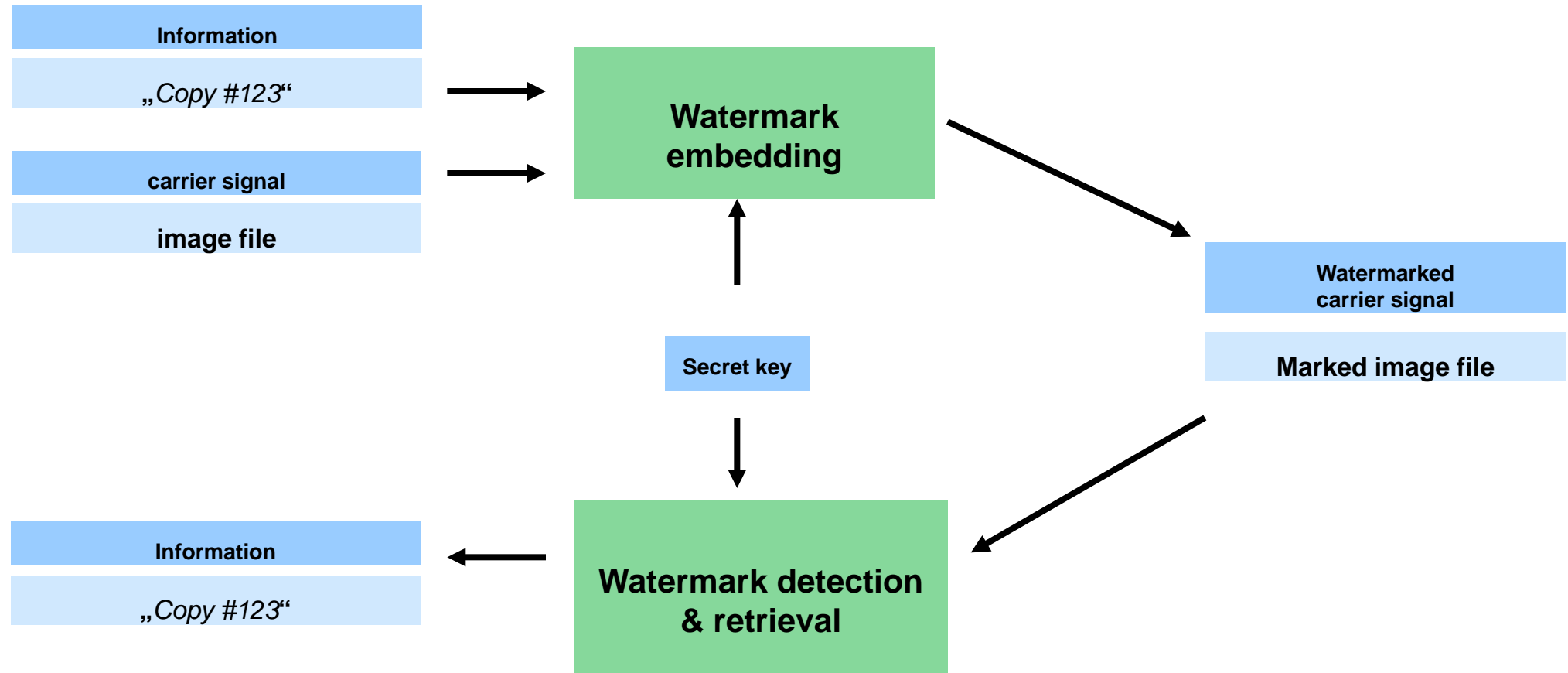
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What is a digital watermark?



- Additional information imperceptibly embedded in media data
- Hidden watermark message can represent:
 - Copyright information: Proof of ownership
 - Recipient identification: Identifying and tracing individual copies
 - Authentication code: Integrity verification
 - Arbitrary meta data: value added service, e.g. annotation
 - ...

Watermark embedding and retrieval



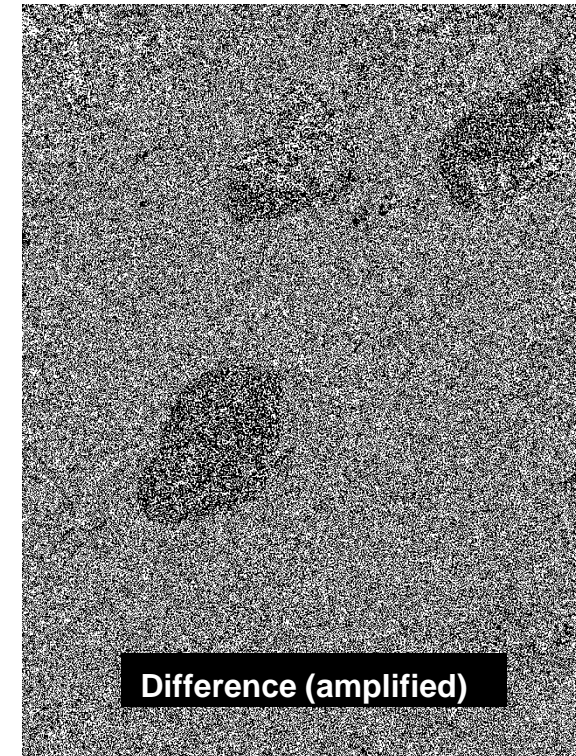
Watermarking basics



- Watermarking properties:
 - Transparency: no perceptual distortions caused by watermarking
 - Robustness: watermark „survives“ format conversion, lossy compression, print/scan
 - Capacity: sufficient payload of hidden information embedded
 - Security: access to hidden watermark message controlled by secret key
 - Performance

Watermarking example

- Image watermarking example



Copyright Protection



First of all: That's my picture!

Question:

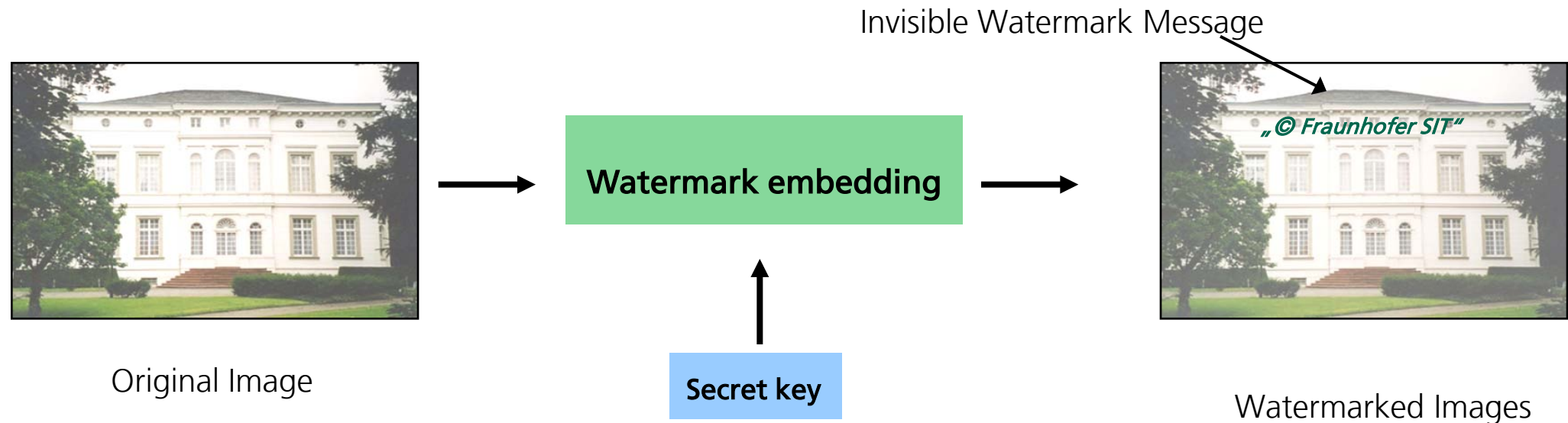
- How to prove the ownership?

Problem:

- Where is my copyright information?

Brand your image

- Copyright Watermarking
 - Proof of ownership



Traitor tracing



Illegal copy found, but who is the traitor?

Question:

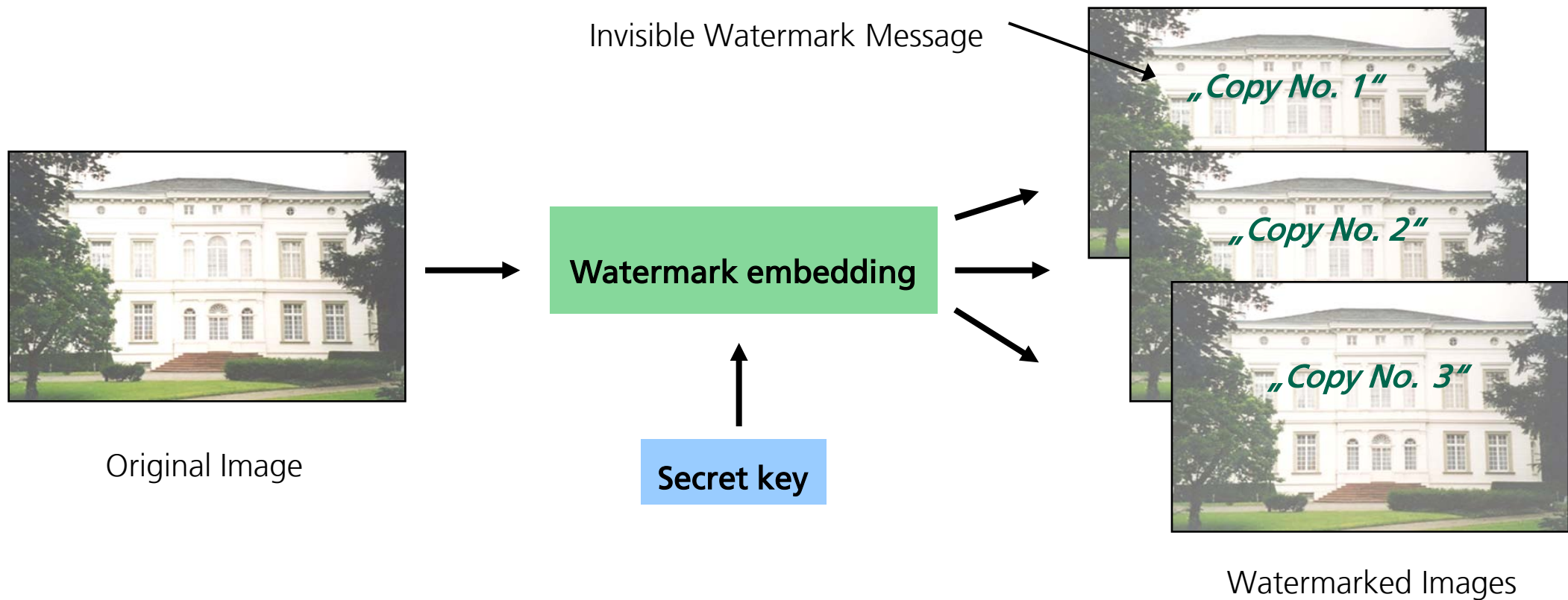
- Who leaked the suspicious copy?
- How to trace the source?

Problem:

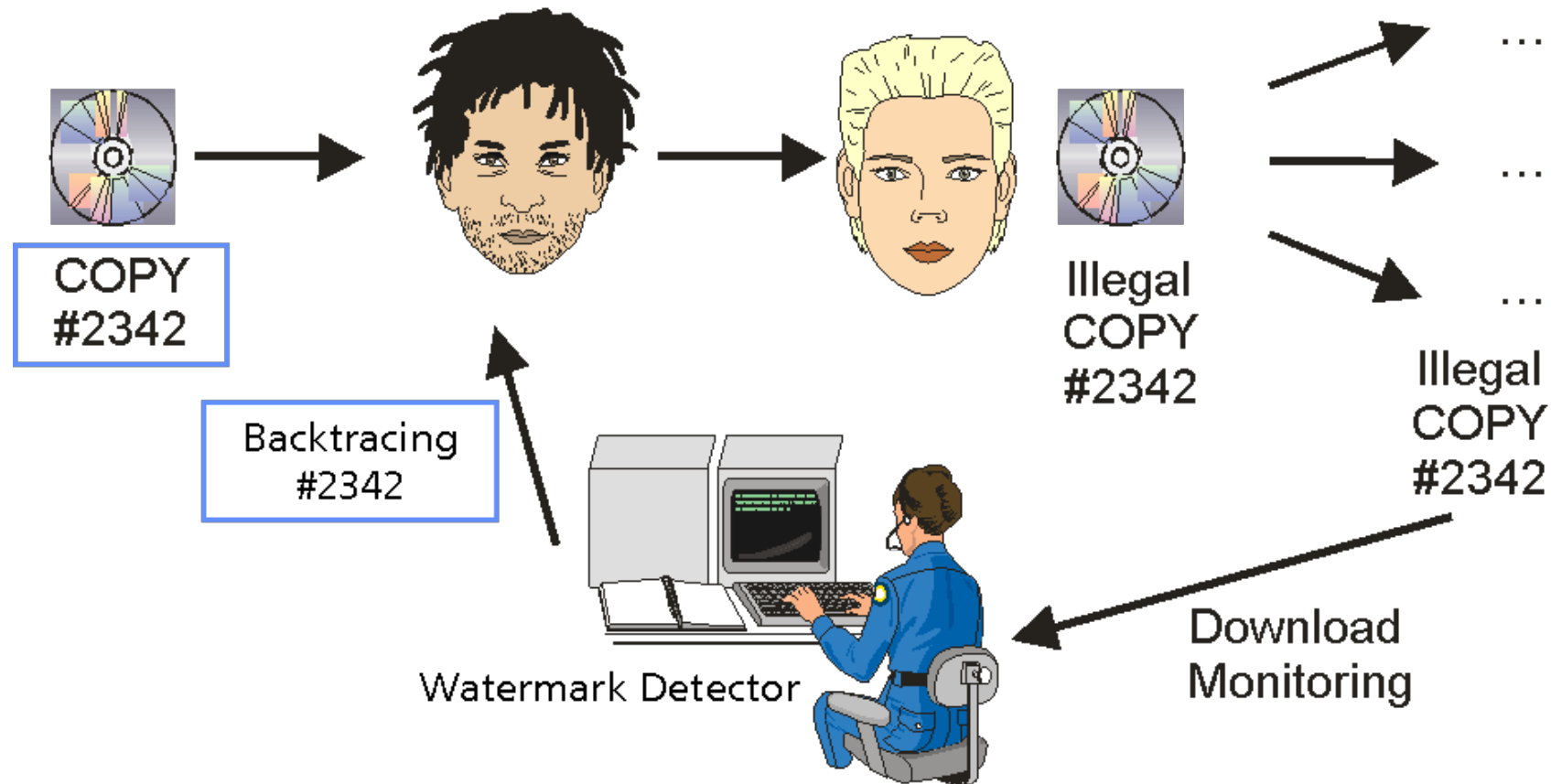
- Every individual copy of digital media is identical.
- From which copy is the suspicious copy from?

Individualize your image

- Transaction Watermark
 - Identifying copies



Customer tracing by digital watermarking



Transaction watermark



- Fingerprinting: individual watermarking of single copies
 - Personalized copies of media data
 - Multimedia on demand download via online shops
 - Promotional copies
 - Work copies in post production environment
 - Protection of content beyond protected DRM environment: „analog hole“

Who are using my images...



How to find illegal copies?

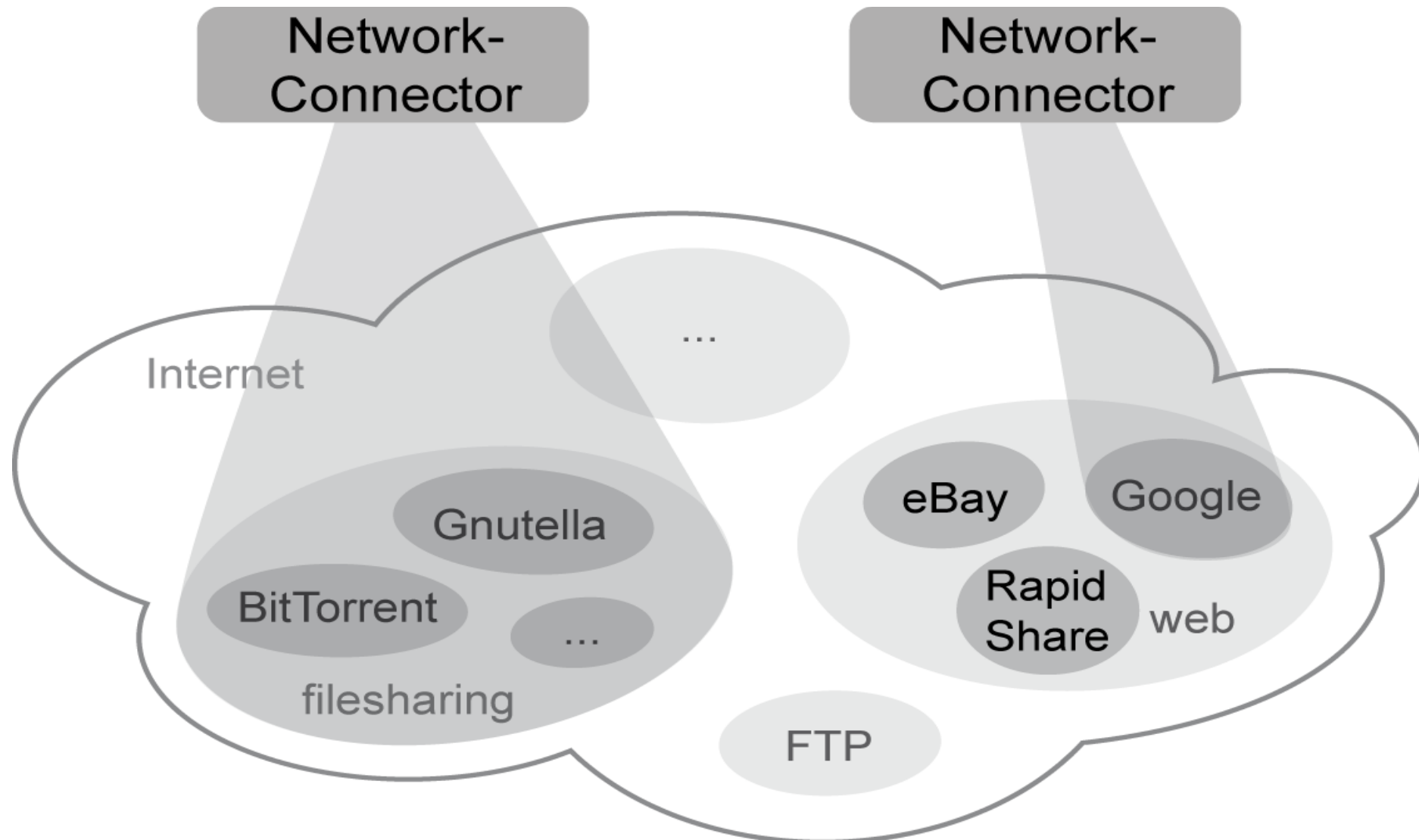
Question:

- Where are my images being used with/without authorization?

Problem:

- How to find them out?

Search mechanisms for watermarked content



- Digital watermarking is NOT only a concept or a prototype in lab
- Fraunhofer SIT watermarking available for multimedia data
 - Audio, image, video, document watermarking
 - Copyright watermark, transaction watermark, integrity verification
 - Search service for watermarked content
- Industrial licenses for audio and image watermarking
 - Integration into productive environments, e.g. online shops, CD/DVD production, multimedia on demand, content licensing, etc.
 - Soforthoeren.de, Libri.de, Labeltools.de, Akuma.de, Diadopo.de,
 - Photopatrol.eu, public archives
 - ...

Watermarking software demo



- Image watermarking for natural images
 - True color images
 - Copyright protection and integrity verification
- Image watermarking for synthetic images
 - Binary images
 - Simple images, e.g. maps, cartoon, etc.
 - Copyright protection and integrity verification

„Know Your Rights“



- Question for end-users: What are my rights?
 - What rights do I have and what rights do I NOT?
- They should be aware of
 - What may they do with their media files?
 - What may they NOT do?

How?

Contact



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