

# Security Restricts Legitimate Use, But Does It Have To?

Consider  
Persistent Info Security  
and Everytime Tracking

EU-Canada Workshop  
Ottawa, Canada  
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# Legitimate Use

- Physician with clinical system has onscreen report to share
  - Print, in order to fax, mail, courier, send with patient
  - Email? Offer via Net? Send on floppy disk? Probably not due to security concerns.
- Physician with just a report to send to a colleague, or the patient.
  - Email it?

EMR

X-Ray Reports  
Cumulative HistoryLaboratory Reports  
Progress NoteCorrespondence  
Patient SummaryER Visits  
Medications[VIEW X-RAY REPORT DETAILS](#)**Patient:** PATE, KEVIN M**X-Ray Facility:** OROMOCTO PUBLIC HOSPITAL**Tests Ordered:** **BONE SCAN WHOLE BODY****Ordered By:** DR. BILL SMITH**Date Ordered:** FRIDAY, SEPTEMBER 10, 2001**Date Filed:** WEDNESDAY, OCTOBER 3, 2001**Filed By:** DR. BILL SMITH**Radiologist:** DR. JOHN COLLINS**Image On File?** **YES****Comments:**

BONE SCAN

There is satisfactory uptake and distribution of tracer in bone and both kidneys. There appears to be mild increased activity along the posterior aspect of the left 7th rib suggesting possible periosteal reaction or other abnormality at this site. There is also mild increased activity at the left pedicle of L2 or the adjacent facet joint. Mild increased activity is noted at the left sternoclavicular joint.

Findings are otherwise unremarkable.

[SAVE REPORT AS FILE](#)

# eMail Secure Attachments



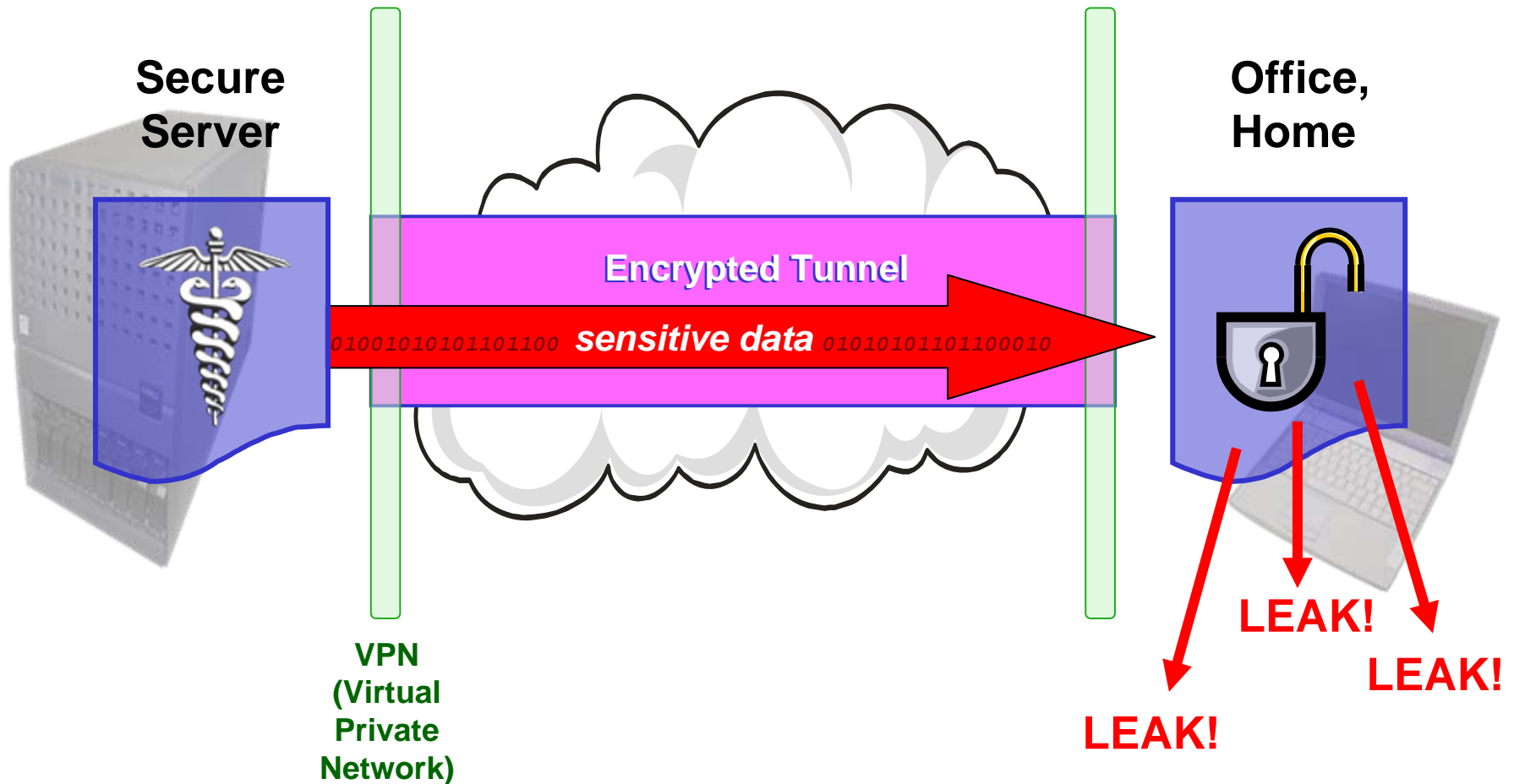


# Information Security Breaches

- Repository - break in through Net
- Delivery - intercepted during Net transit
- User - leak from point of legitimate use, by
  - User info accident (email, common location)
  - User malice
  - Theft via break in through Net

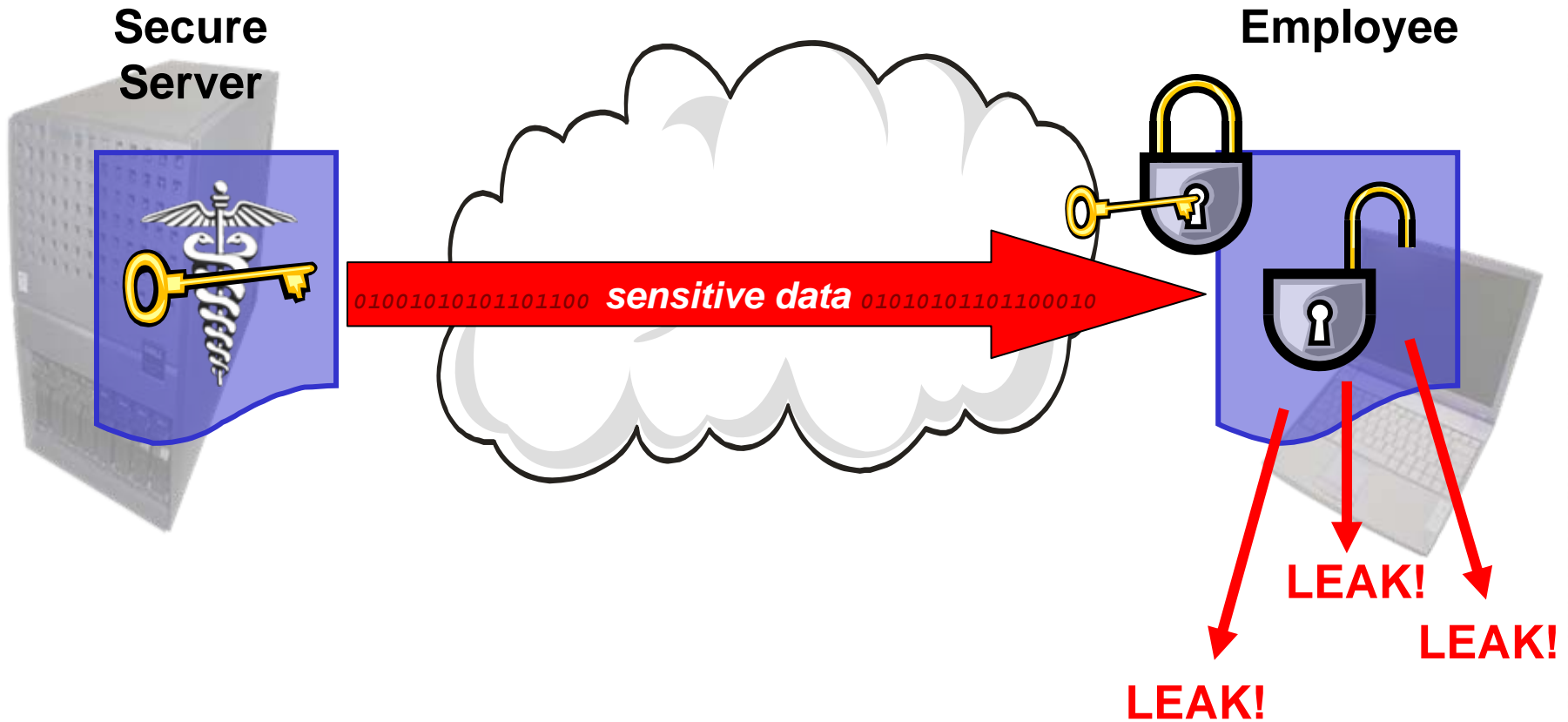
# Channel Security

*Record is safe during transit*



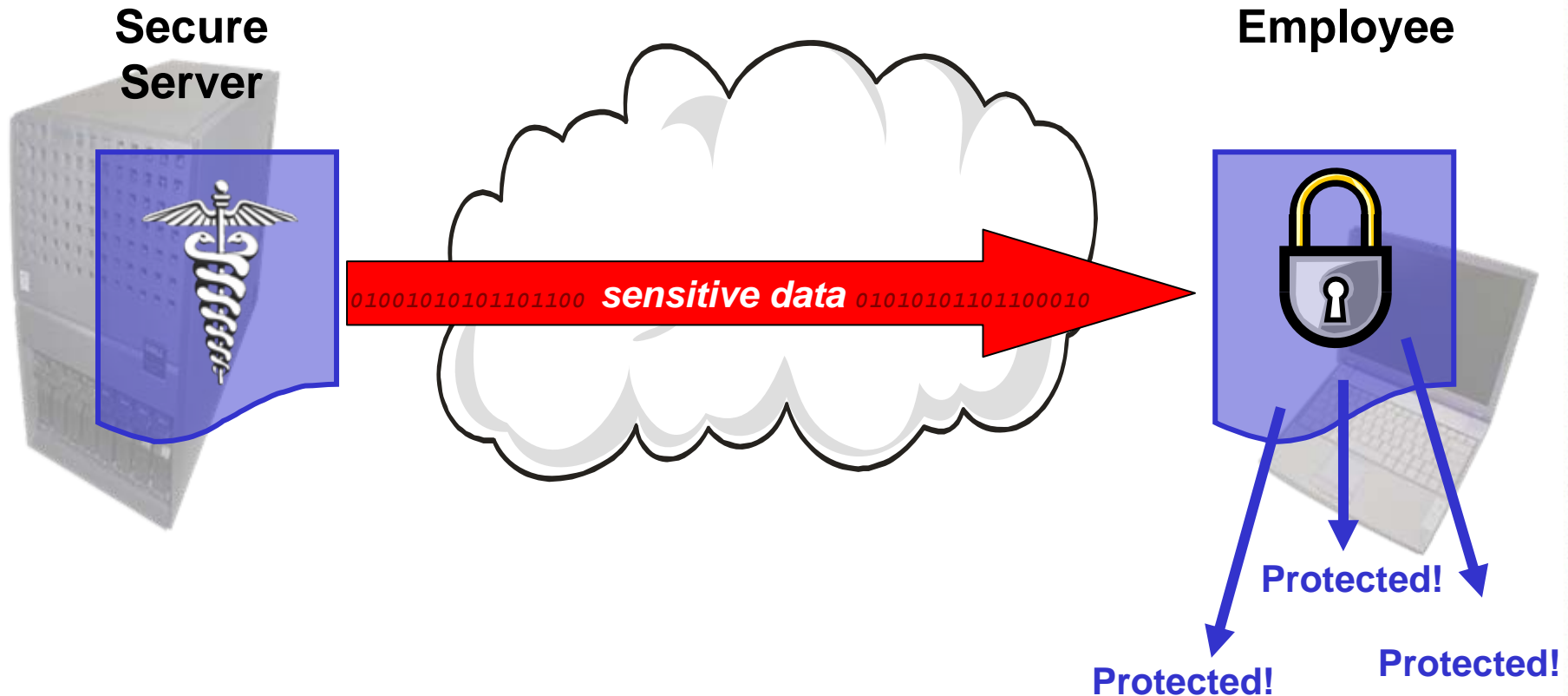
# Lock-Unlock Security

*Record is secure until unlocked*



# Persistent Security

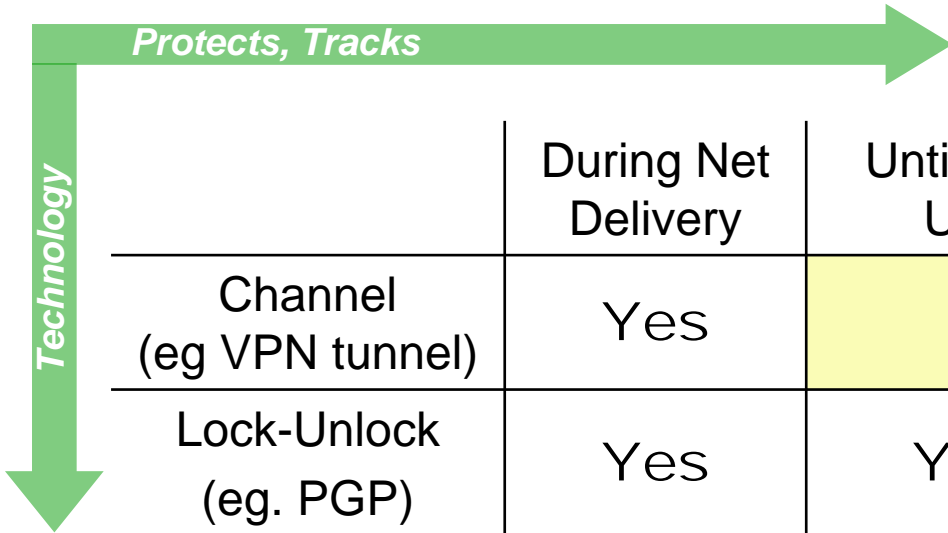
*Record is safe at all times, everywhere*





# Not Just Delivery Security

## *Persistent Security & Use Tracking*



	During Net Delivery	Until First Use	Every time, Everywhere
Channel (eg VPN tunnel)	Yes		
Lock-Unlock (eg. PGP)	Yes	Yes	
Persistent	Yes	Yes	Yes

# [www.OttawaHeart.ca/hcraschr.htm](http://www.OttawaHeart.ca/hcraschr.htm)

## Regionally Accessible Secure Cardiac Health Records

- RASCHR is an on-line patient record system that provides authorized healthcare workers in hospitals and clinics in Eastern Ontario immediate access to cardiac health records of patients who have catheterization or cardiac surgery at the University of Ottawa Heart Institute.
- A main function – effect online referral from regional hospital to Ottawa Heart

# RASCHR – Online Patient Registry

University of Ottawa Heart Institute - OPR - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address [http://design.xwave.com/oprprototype/QA\\_view\\_full.html](http://design.xwave.com/oprprototype/QA_view_full.html) Go Links

**OPR** University of Ottawa Heart Institute  
**Online Patient Registry** QUALITY ASSURANCE

New Lists Search+ Print

**Patient Summary**

Name: Jones, Brent M Date of Birth: 1962-05-26 Age: 39 Sex: Male  
Health Insurance: 1133133235 ON UOHI Unique Number: 344212  
Status: CATH SURG PCI

Jones, Brent Mark

Demographics Referrals

400012 2001-09-12  
GEN INFO General  
CATH 2000-09-12  
PCI 2000-09-13  
SURG 2000-09-14  
SURG 2000-09-15  
SURG 2000-09-14

400013 2000-06-23  
400014 2000-03-01  
400015 2000-02-11  
GEN INFO General  
NEW

**Referral - Surgery Report**

General Surgery Rounds Risk Stratification

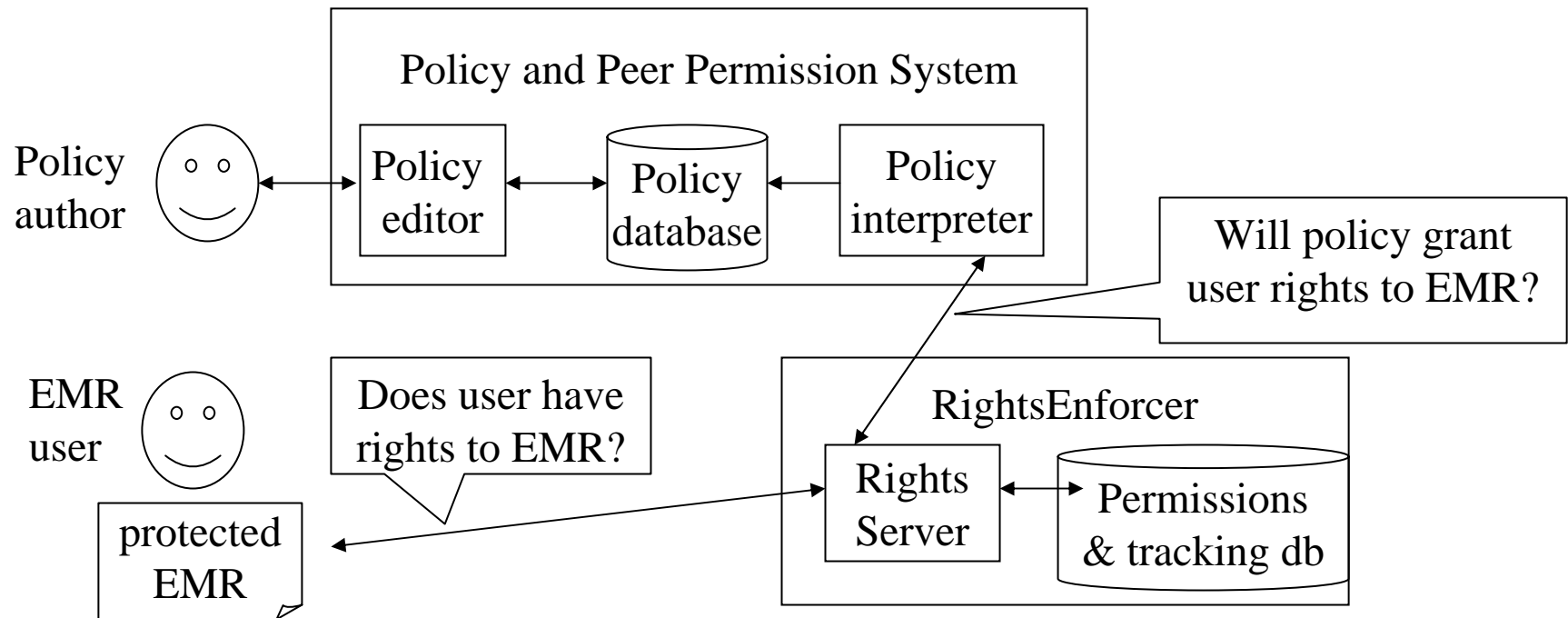
Female Gender: 1  
Age: 70-74 7  
75-79 12  
>80 20  
Obesity: > 1.5 X ideal 3  
Hypertension: > 140/ 3  
Diabetes: 3  
CHF: NYHA III 2  
NYHA IV 6  
Right Heart Failure: 2  
Pulmonary Hypertension: > 40 / 100 1

# Online System, Extra Info

- The information that can be included in the online referral may be incomplete
  - Referror has an important lab report
  - Heart Institute needs to send report back
- Send paper somehow?
- Better to send report as persistently secured email attachment.



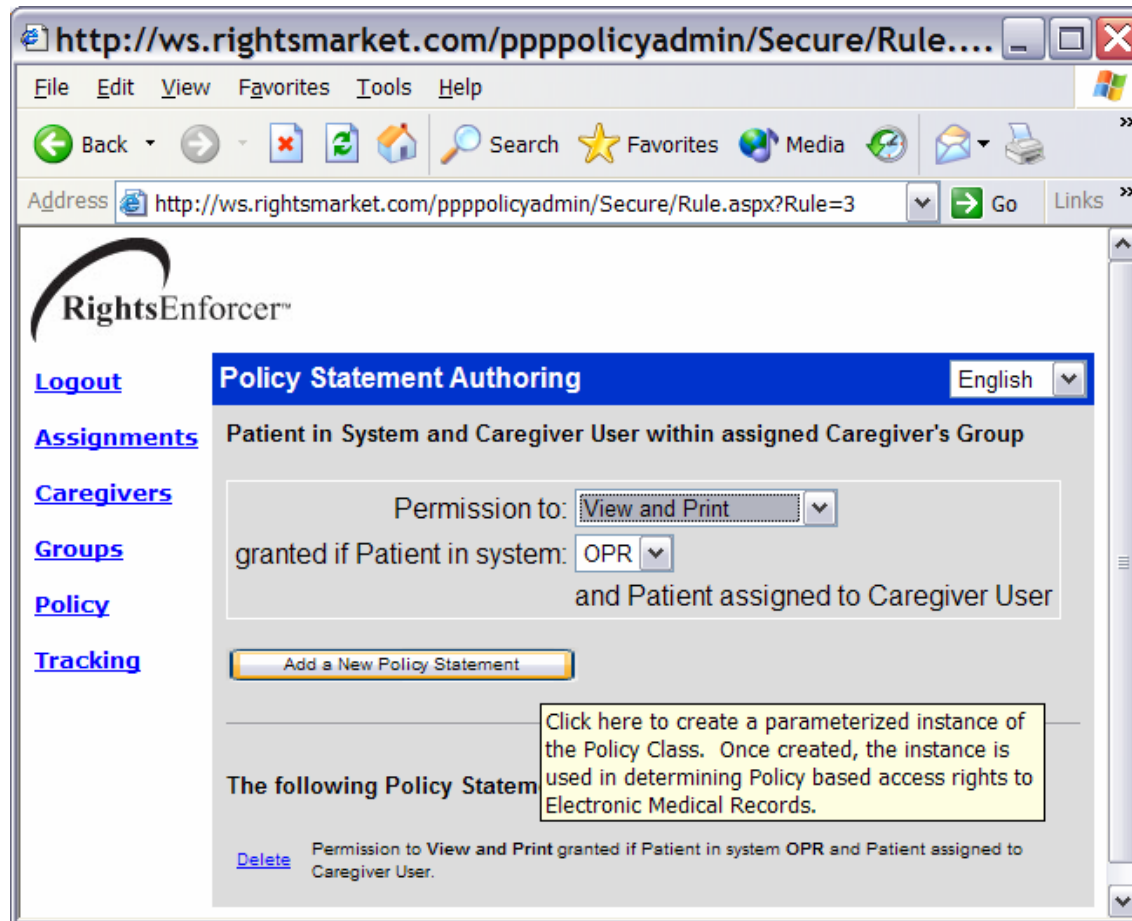
# Policy & Peer Permission System



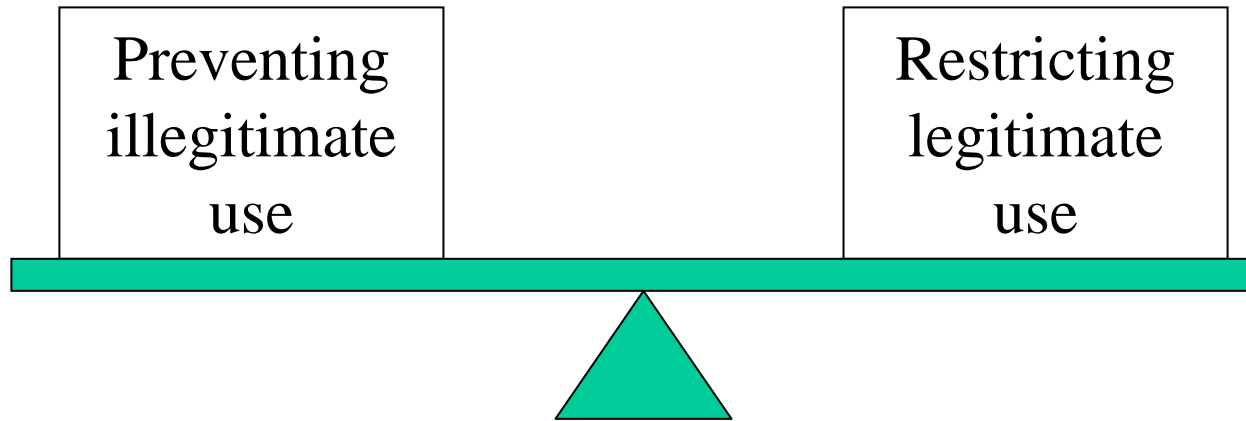
RightsMarket Inc, lead, SW devel  
UCalgary Health Telematics, policy  
UOttawa Heart Institute, deployment  
CANARIE Inc, eHealth funding

Now in test deployment at Heart  
Institute and other eastern Ontario  
hospitals participating in RASCHR  
Project.

# Policy and Peer Permission System



# Minimal Interference with Legitimate Use



The right information to the  
right person at the right time

# Minimal Interference with Legitimate Use

- Apply policy before use with a Break-the-Glass override
  - “No current policy allows you to access this patient record, but we know policy may be deficient. If you must use the record say so and expect a followup query.”
- Apply policy after the fact
  - For a known, authenticated user, never deny access. Apply policy after the fact to determine followup.



## Electronic Medical Record Audit Trail

For Dr. William Genner, Id 098765

Date 2001-11-10

Criteria Patient: Kevin M. Pate, Id 123456789; Records: File PateXray.pdf

EMR	Activity	By	When	Details
PateXray	set perm	098765 Genner	2001-11-08 13:07	132457; read, 2 day from set
PateXray	open	132457 Spencer	2001-11-08 15:33	close 2001-11-08 15:36
PateXray	open	132457 Spencer	2001-11-08 19:13	close 2001-11-08 19:26

# Questions

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EMR

X-Ray Rep  
Cumulative

Scheduler

Save Report As File:



File Na

PateXr

Sen

OL

DONE SCAN

There is satisfac  
increased activ  
other abnormal  
facet joint. Mil

Findings are ot

✉ PateXray.pdf - Message (HTML)

Send Save Print Copy Paste Undo Redo Bold Italic Link Unlink

File Edit View Insert Format Tools Actions Help

To... Dr. Mary Spencer

Cc...

Bcc...

Subject: PateXray.pdf

Dear Mary.

Please give my your opinion regarding the  
case we discussed this morning.

I have granted you rights to view EMR  
[www.Genner.RightsVault.com/PateXray.pdf](http://www.Genner.RightsVault.com/PateXray.pdf)  
for 2 days from now.

Regards, Bill

ER Visits  
Medications

REPORT DETAILS

t: PATE, KEVIN M

mild  
ir  
cent

.pdf

# Built on ‘Authorize and Track’

*every time, everywhere*

## **RightsPublish**

Web-based, end to end service to publish valuable digital property; eBooks & eMusic

## **RightsEnforcer**

Integratable subsystem and products to persistently secure confidential/private digital records; **eg.** *Medical docs & audio transcripts*

## **RightsCore**

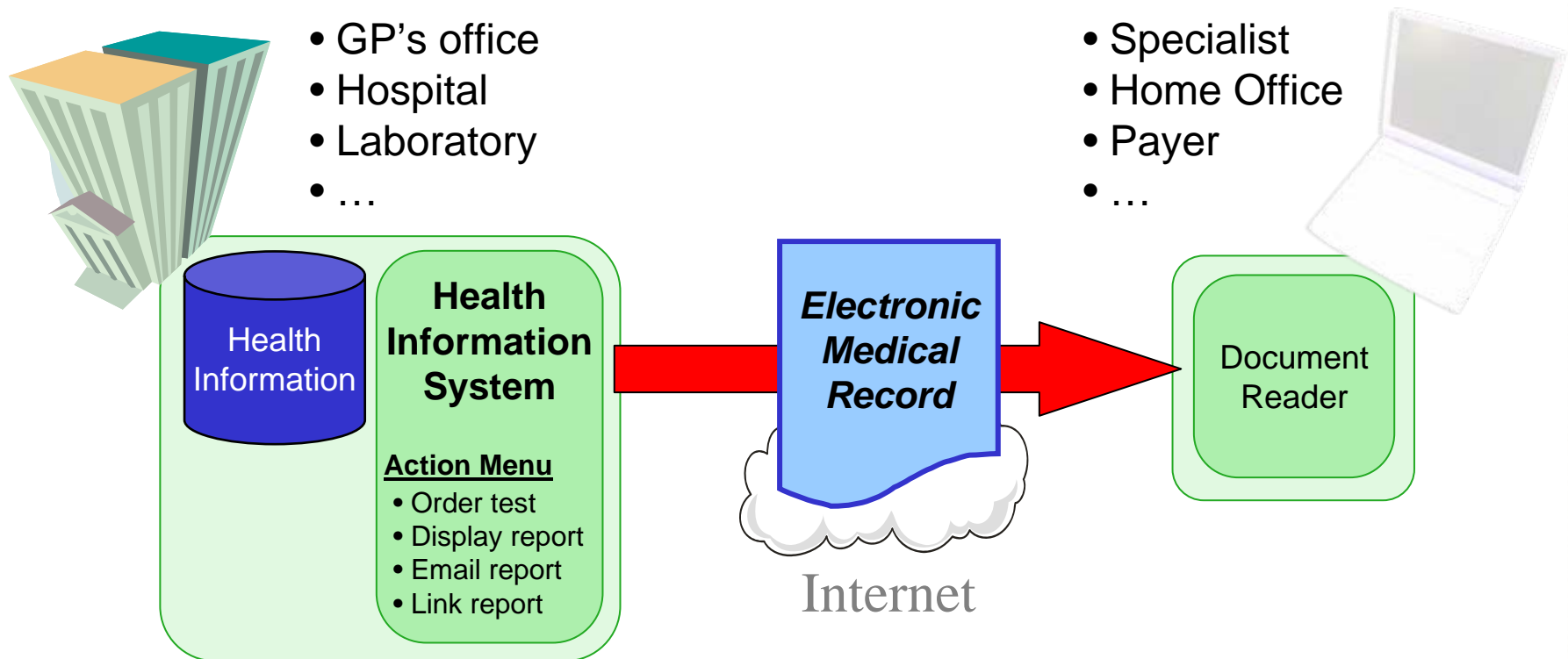
Digital Rights Management (**DRM**) platform to secure digital objects, authorize and meter/track/audit their use, supporting offline and online use

## **The Internet**

Copy and distribute digital objects, worldwide, point-to-multipoint, nearly instantaneously, nearly free.

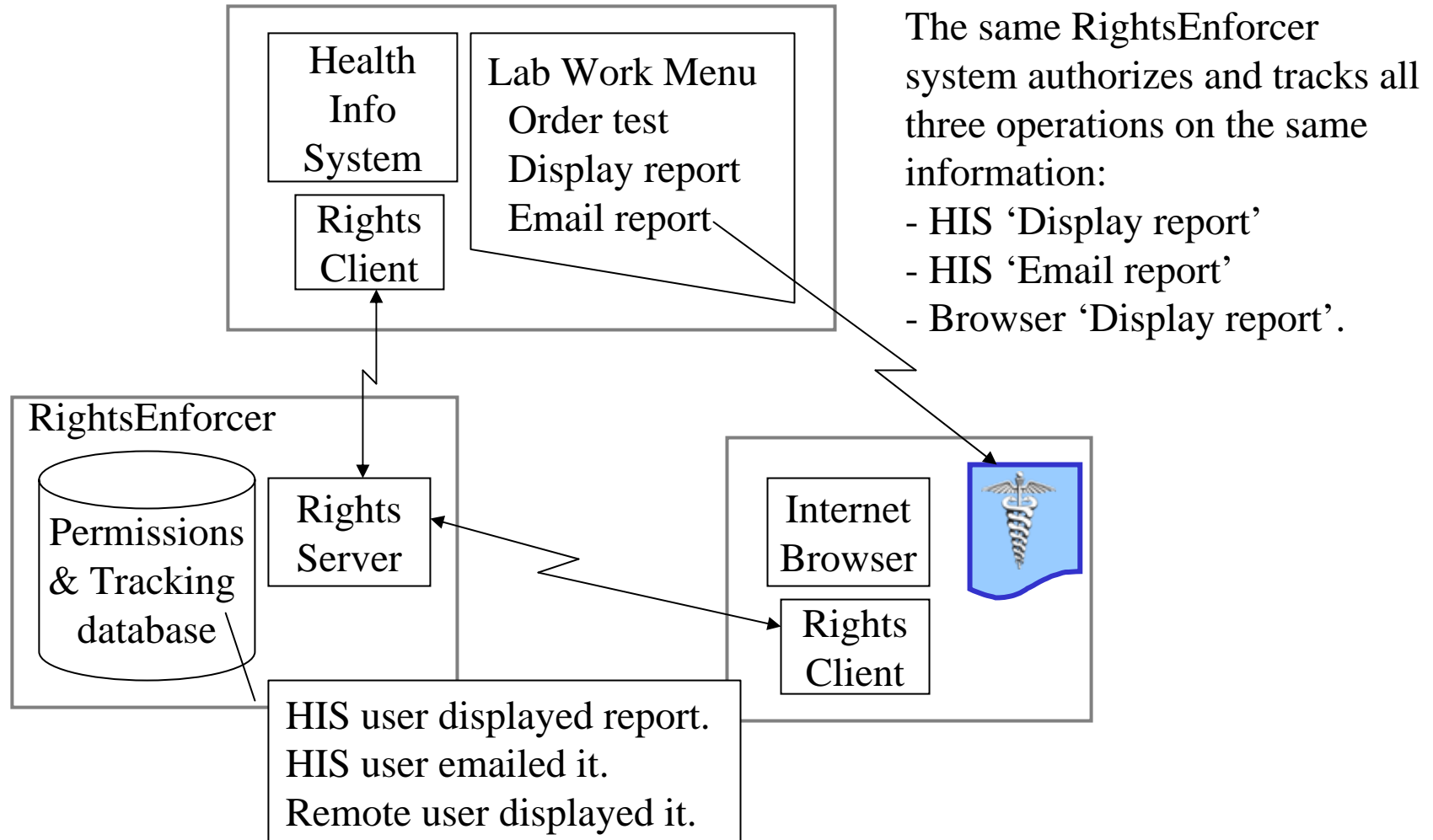


# Secure Inside HIS Only



Legislation requires authorization and tracking of use, even after the EMR leaves the originating system.

# Integrated Authorization and Tracking



# Security – Risk Model

Location	Security Strength			
		Attack, Risk	VPN	Persistent
	Authentication	Impersonation; false qualification	Strong <sup>1,2</sup>	Strong <sup>1,2,3,4</sup>
	At Host System	Hack attack; carelessness; mischief	NA <sup>5</sup>	NA/Strong <sup>6</sup>
	In Net Transit	Intercept, crack encryption	Strong	Strong
	At Point of Use	Hack attack; carelessness; mischief	NA <sup>5</sup>	Strong

1. Independent certification authority
2. Even stronger if two factor identification employed
3. Operator can act as own certification authority
4. Compatible with VPN
5. But compatible with Persistent
6. If employed at the host database system (probably selectively)

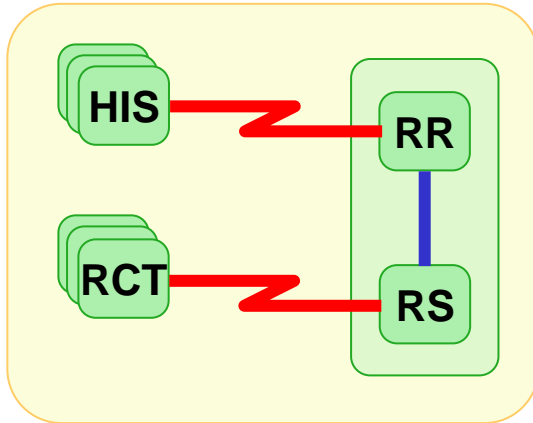
# **Persistent Security Advantages**

- **Digital distribution with persistent security and tracking (not just delivery security and check-out tracking)**
- Comply with privacy law
- Unauthorized viewing / printing / copying eliminated
- Web-based installation
- Increased customer satisfaction: empower end user (including patient!) and build trust
- VPN compatibility

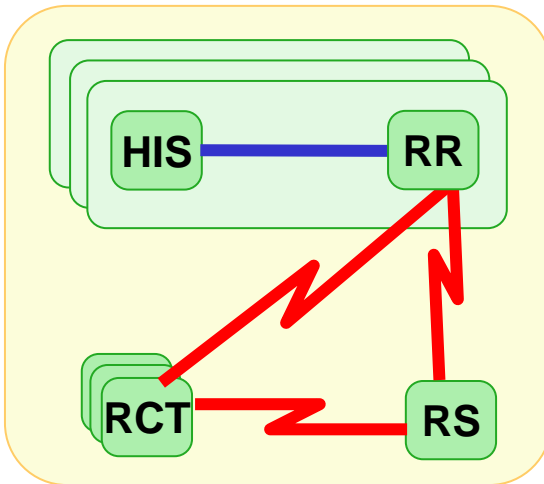


# Configurations

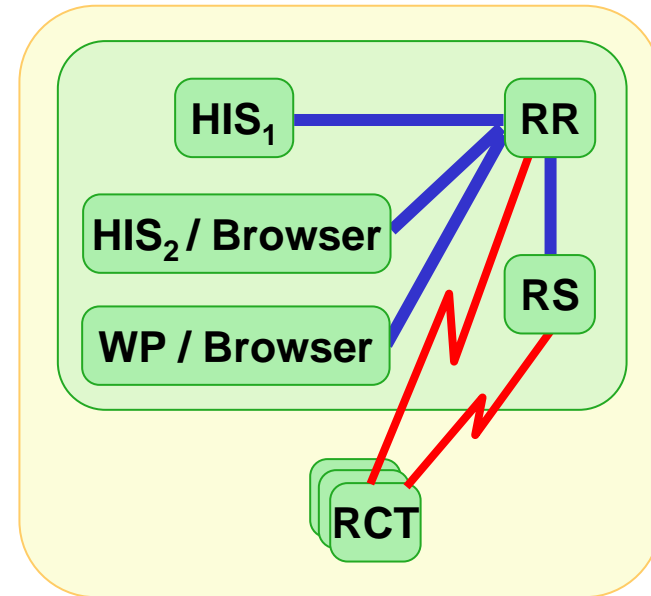
## Outsource RE/RS to RM/HISS



## Outsource RS



## Large Government Department



## Large Hosp / RHA / HMO

