Playing by the Rules:
Privacy Usage Policy Determination & Justification in Web-Based Systems

Presented to: Information Security And Privacy Advisory Board

May 30, 2012

National Institute of Standards & Technology

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Agenda

- **About**
  - the Speaker
  - DIG
- **Privacy**
  - What is it?
  - What is the goal?
- **Sharing Private Information for Law Enforcement/Intelligence: The Fusion Center Project**
- **Other Work/Interests:**
  - Social Media
  - Health
  - Mobile
- **Applicability to Information Security**

About K. Krasnow Waterman

- **Massachusetts Institute of Technology**
  - Visiting Fellow, Decentralized Information Group, Computer Science & Artificial Intelligence Lab

- **Past Roles**
  - Senior Policy Advisor, DHS
  - CIO, Foreign Terrorist Tracking Task Force
  - Section Chief (interim), Intelligence Infrastructure, FBI
  - Assistant General Counsel, FBI
  - Co-Chair, Artificial Intelligence Committee, American Bar Association

About DIG

The Decentralized Information Group explores the consequences of information on the Web: where it comes from, what happens to it, and what are the rules for using it. We build tools to help people control the policies governing information, and we build automated reasoning systems to help determine whether information use complies with policy.

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What is Privacy?

- Old School:
  - "The right to be left alone"
  - Building static digital fences around data

- Now:
  - The right to say who can see and use what - when, where, & how
  - Context-based application of usage policies

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Example: Hospital Records

- Traditional privacy rule implemented in IT system:

"Grant Nurses access to patient files."

- Desired privacy rule to be implemented in IT system:

"Grant access to Nurses,
  - who are licensed in the state where they are working,
  - have successfully completed HIPAA training in the last year, and
  - are employees of the facility or employees of contractors currently providing services to the facility,
  - to view and amend the files of patients on the floor or wing to which they are assigned, during the shift in which they are assigned to that floor or wing as well as one hour before and after that shift."

The Goal

Ability for systems to determine
whether each use of data is/was permitted

by the relevant rules
for the particular data, party, and circumstance

and make that decision available to
access control, audit, and other technology

for real-time enforcement, retrospective reporting,
redress, and risk modeling.

System, system on the wall...
Is this fair use after all?

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The Project

- Sponsor:
  - Department of Homeland Security
- Goal:
  - Working Prototype
- Environment:
  - Law enforcement/Intelligence
- Challenge:
  - Determine permissibility of sharing across jurisdictions
  - Apply usage policies from different jurisdictions
  - Produce justifications for the decisions
- Paper:
  - Waterman, K. Krasnow, Wang, S.: Prototyping Fusion Center Information Sharing; Implementing Policy Reasoning Over Cross-Jurisdictional Data Transactions Occurring in a Decentralized Environment. In: IEEE Conference on Homeland Security Technologies (IEEE HST). (2010) (http://dig.csail.mit.edu/2010/Papers/IEEE-HST/ieee_hst.pdf)

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Assumptions

- Web-based
  - All users and files on internet or intranet
- Semantic Web
  - Greater interoperability, reusability, and extensibility
- Security & Authentication
  - Enhancement not replacement
- Enhancing Accountability & Transparency
  - NOT replacing lawyers

Scenario-Driven

- ## Scenario 1
  - Massachusetts analyst (Mia) sends Request for Information (RFI) to Department of Homeland Security agent (Feddy).
  - RFI contains criminal history info about a specific person (RBGuy); regulated by Massachusetts General Law 6-172.

MGL 6-172

Mia   RFI re:RBGuy   Feddy

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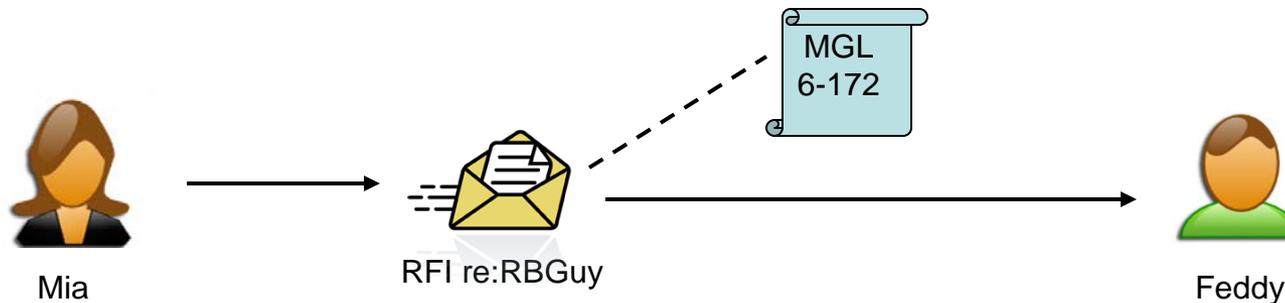
Please enter the sender's URL:

Mia Analysa <mia@msp.mass.gov>

Please enter the data's URL, or select from the files below:

http://dig.csail.mit.edu/2010/DHS-fusion/MA/documents/Fake_MA_

- Fusion
  - Analysa
    - RFI
      - RBGuy
      - **RBGuyCore**
      - BBunny
      - ACapone
  - Received

Please enter the recipient's URL:

Feddy Agenti <fed@dhs.us.gov>

Please enter a policy's URL:

http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules/MGL_6-172_core

From: Mia Analysa <mia@msp.mass.gov>
To: Feddy Agenti <fed@dhs.us.gov>
File: RBGuyCore
Policy: http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules/MGL_6-172_core10.n3

Submit

Transaction Simulator

In lieu of building out email, SharePoint, and other mechanisms

Links to real files - user profiles, the memo, and the relevant policy - that the reasoner will use.

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Rule: Mass. General Law 6-172
(Privacy of Criminal Records)

- Applies to
  - Criminal Justice Agencies
  - Agencies given statutory permission
    - E.g., military recruiting
  - Agencies determined to be appropriate recipients in the public interest
  - Requests by the general public

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Chapter 6: Section 172. Dissemination of record information; certification; eligibility for access; scope of inquiry; listing; access limited; rules; use of information
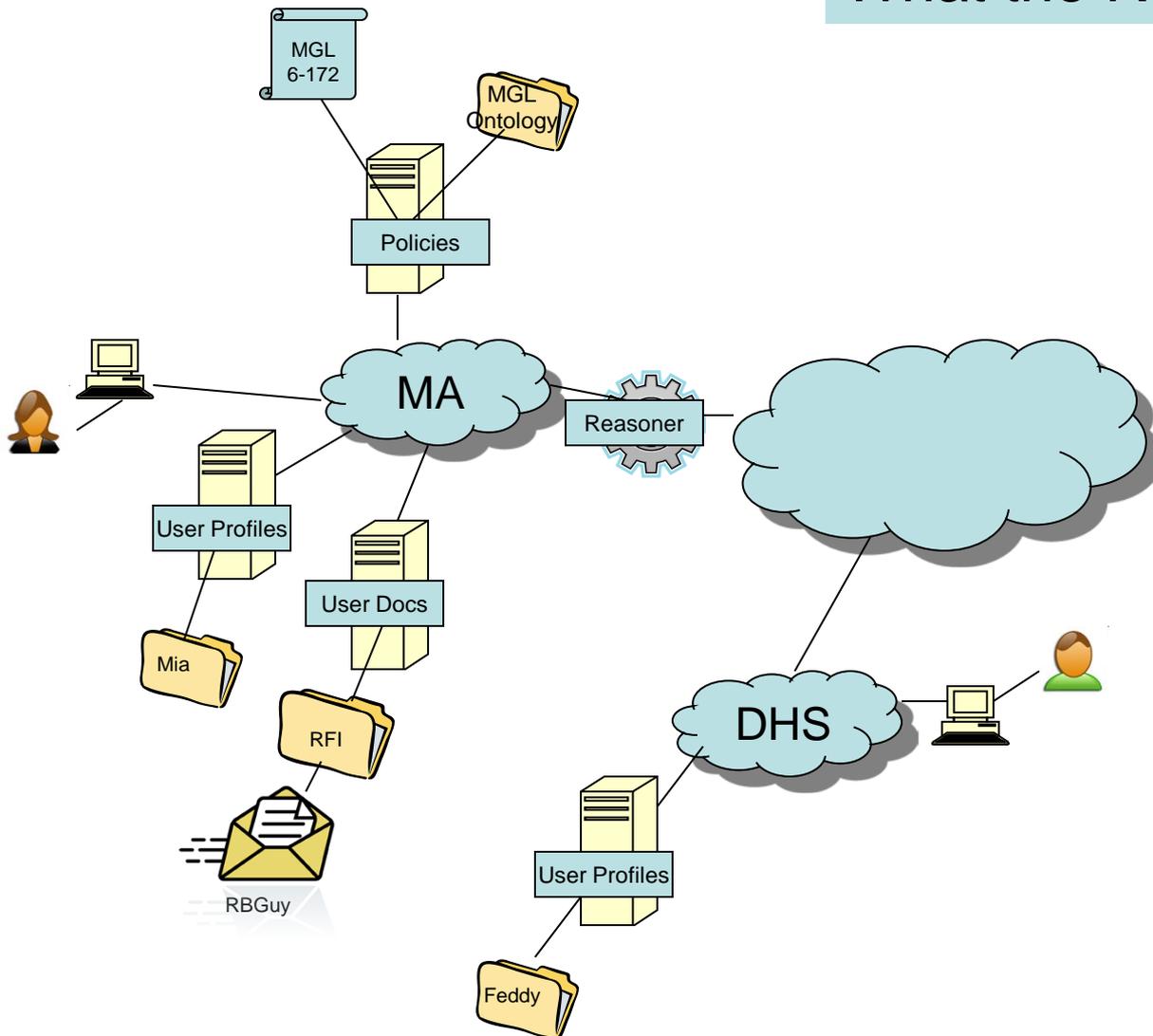
Section 172. Except as otherwise provided in this section and sections one hundred and seventy-three to one hundred and seventy-five, inclusive, criminal offender record information, and where present, evaluative information, shall be disseminated, whether directly or through any intermediary, only to (a) criminal justice agencies; (b) such other agencies and individuals required to have access to such information by statute including United States Armed Forces recruiting offices for the purpose of determining whether a person enlisting has been convicted of a felony as set forth in Title 10, section 504 of the United States Code; to the active or organized militia of the commonwealth for the purpose of determining whether a person enlisting has been convicted of a felony, and (c) any other agencies and individuals where it has been determined that the public interest in disseminating such information to these parties clearly outweighs the interest in security and privacy. The extent of such access shall be limited to that necessary for the actual performance of the criminal justice duties of criminal justice agencies under clause (a); to that necessary for the actual performance of the statutory duties of agencies and individuals granted access under clause (b); and to that necessary for the actual performance of the actions or duties sustaining the public interest as to agencies or individuals granted access under clause (c). Agencies or individuals granted access under clause (c) shall be eligible to receive criminal offender record information obtained through interstate systems if the board determines that such information is necessary for the performance of the actions or duties sustaining the public interest with respect to such agencies or individuals.

The board shall certify those agencies and individuals requesting access to criminal offender record information that qualify for such access under clauses (a) or (b) of this section, and shall specify for each such agency or individual certified, the extent of its access. The board shall make a finding in writing of eligibility, or noneligibility of each such agency or individual which requests such access. No such information shall be disseminated to any agency or individual prior to the board's determination of eligibility, or, in cases in which the board's decision is appealed, prior to the final judgment of a court of competent jurisdiction that such agency or individual is so eligible.

No agency or individual shall have access to criminal offender record information under clause (c), unless the board, by a two-thirds majority of the members present and voting, determines and certifies that the public interest in disseminating such information to such party clearly outweighs the interest in security and privacy. The extent of access to such information under clause (c) shall also be determined by such a two-thirds majority vote of the board. Certification for access under clause (c) may be either access to information relating to a specific identifiable individual, or individuals, on a single occasion; or a general grant of access for a specified period of time not to exceed two years. A general grant of access need not relate to a request for access by the party or parties to be certified. Except as otherwise provided in this paragraph the procedure and requirements for certifying agencies and individuals under clause (c) shall be according to the provisions of the preceding paragraphs of this section.

Each agency holding or receiving criminal offender record information shall maintain, for such period as the board shall determine, a listing of the agencies or individuals to which it has released or communicated such information. Such listings, or reasonable samples thereof, may from time to time, be reviewed by the board or the council to determine whether any statutory provisions or regulations have been violated. …

What the Reasoner Knows

MGL 6-172

MGL Ontology

Policies

MA

Reasoner

User Profiles

User Docs

Mia

RFI

RBGuy

DHS

User Profiles

Feddy

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Simple Compliance Answer

http://dice.csail.mit.edu/dhs_air.py?by=http://dig.csail.mit.edu/2010/DHS-fusion/MA/profiles/MiaAnalysa#me&to=http://dig.csail.mit.edu/2010/DHS-fusion/US/DHS/profiles/FredAgenti#me&data=http://dig.csail.mit.edu/2010/DHS-fusion/MA/documents/Fake_MA_Request_core10.pdf&rulesFile=http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules

/MGL_6-172_core10.n3

Transaction is compliant with Massachusetts General Law, Part I, Title II, Chapter 6, Section 172

Transaction is compliant with Massachusetts General Law, Part I, Title II, Chapter 6, Section 172

Why?

Type ▶ RDFDocument

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"Transaction is compliant with Massachusetts General Law, Part I, Title II, Chapter 6, Section 172."

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http://dice.csail.mit.edu/MA/ | http://dice.csail.mit.edu/dhs_air....

▼http://dice.csail.mit.edu/dhs_air.py?by=http://dig.csail.mit.edu/2010/DHS-fusion/MA/profiles/MiaAnalysa#me&to=http://dig.csail.mit.edu/2010/DHS-fusion/US/DHS/profiles
/FredAgenti#me&data=http://dig.csail.mit.edu/2010/DHS-fusion/MA/documents/Fake_MA_Request_core10.pdf&rulesFile=http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules
/MGL_6-172_core10.n3

▼ Issue:

Whether the transactions comply with Massachusetts General Law, Part I, Title II, Chapter 6, Section 172

▼ Rule:

Rule(s) is/are specified in the policy file.

▼ Analysis:

"[Recipient,] Fred Agenti, is a member of a Criminal Justice Agency…"

- Request for Information about Robert B. Guy is a dissemination by Mia Analysa to Fred Agenti, designated as Transaction
- Request for Information about Robert B. Guy contains Criminal Offender Record Information, and Fred Agenti is a member of a Criminal Justice Agency as required by MGL 6-172, Para. 1, Sent. 1a
- Compliance additionally requires: Fred Agenti is performing Criminal Justice Duties and Request for Information about Robert B. Guy limited to data necessary for Fred Agenti's Criminal Justice Duties, as required by MGL 6-172, Para. 1, Sent. 2, Cl. 1:
- Compliance additionally requires that Fred Agenti is certified by the board as qualified for access, as required by MGL 6-172 Paragraph 2.
- Compliance additionally requires: The agency to which Mia Analysa belongs shall maintain, for such period as the board shall determine, a listing of the agencies or individuals to which it has released or communicated such information, as required by MGL 6-172, Para. 4, Sent. 1.
- Inquiry is about Robert B. Guy and is based on a personally identifying characteristic, as required by MGL 6-172 Para. 5, Sent. 1, Cl. 2.
- Fred Agenti performs function investigation.
- Compliance additionally requires that release of Request for Information about Robert B. Guy would not violate any other provisions of state or federal law, as required by MGL 6-172, Para. 6, Sent. 1(b), Cl. 3.

▼ Conclusion:

The transaction - Transaction is compliant with Massachusetts General Law, Part I, Title II, Chapter 6, Section 172

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Accomplishment

- Reasoner received
  - Mia's user profile (27 facts)
  - Feddy's user profile (25 facts)
  - Mia's document (6 facts)
  - MGL   6-172 (35 sub-rules)
- Produced correct result!

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Other Scenarios in the Prototype

- **Basic:**
  - 1 Sender, 1 Recipient, 1 document, 1 policy
- **Additional Information Required:**
  - Access other policies (to understand definitions or negotiate cross-ontology)
  - Access other facts (drawing from additional resources)
  - Assume or acquire subjective judgments
- **What if?** Scenarios
  - Substitute parties or policies
- **Validate**
  - Confirm a hard result
  - Add to the cross-ontology knowledge base (correct a wrong result)

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Next Steps

- ## Scalability
  - Increasing speed of reasoning (goal-direction)
- ## Flexibility
  - Handling incomplete or incorrect information
- ## Validation
  - Testing rules expression and justifications
- ## Other

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Related Work

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Compliance justifications under:

- Subject's privacy preferences
- Original data collector privacy rules
- Current data owner privacy rules
- Recipient privacy rules
- Rules limiting aggregating (mosaic) requests
- Rules for encrypted data & requests

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Using decentralized information to

- Learn context of data collection
- Identify user
- Infer user's intended purpose
- Understand user's request in context of past requests
- Determine which rule(s) apply
- Compute the rule using third party data

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Past Projects

- Law Enforcement
  - Merging public & private information
- Military
- Health
  - CDC data mining for persons exposed to Drug Resistant TB
  - Use of health information to deny public utility service
  - Insurance underwriting based on social media
  - Attempted improper use of Red Cross data
- Social

New Contexts

- ## Social Media
  - Voluntary usage restrictions on the social graph

- ## Mobile
  - Location based collection/decisions
  - Sufficiency of technical protections

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Privacy & Information Security: Shared Goals

- Privacy and Information Security rules are both designed to ensure appropriate use of information

- The mechanism which grants usage permissions as part of access is not ideal for either Privacy or Information Security.

- Privacy and Information Security would be heightened if the implementation mechanism could justify each transaction at the time it occurs.

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Questions?

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Appendix 2:
Technology Notes

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Citation

Waterman, K. Krasnow, Wang, S.: Prototyping Fusion Center Information Sharing; Implementing Policy Reasoning Over Cross-Jurisdictional Data Transactions Occurring in a Decentralized Environment. In: IEEE Conference on Homeland Security Technologies (IEEE HST). (2010) (http://dig.csail.mit.edu/2010/Papers/IEEE-HST/ieee_hst.pdf)

What the Reasoner Knows:
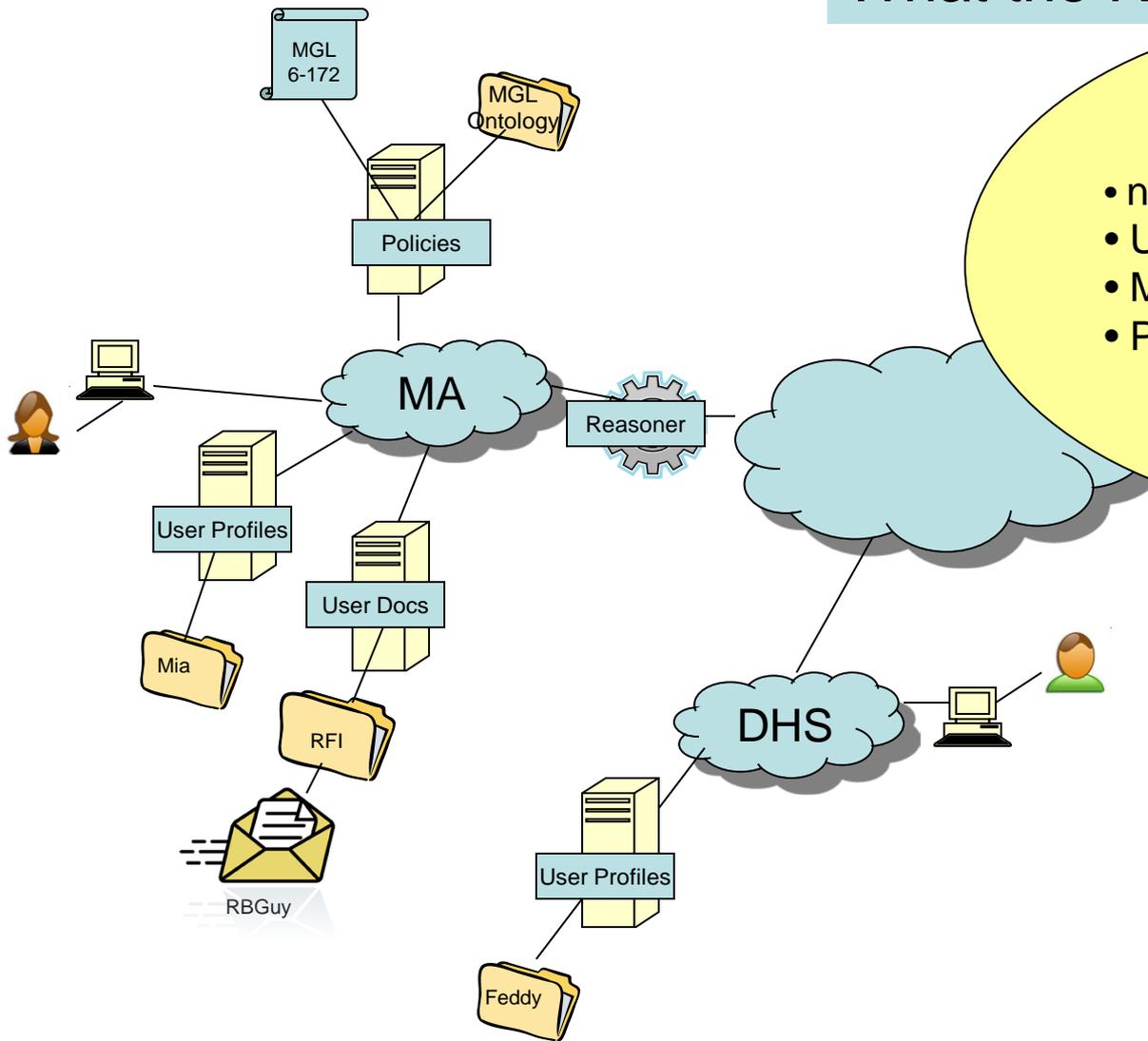
- n3 & RDF
- User profiles adapted from FOAF
- Memos in pdf with xmp
- Policies expressed in AIR

MGL 6-172

MGL Ontology

Policies

MA

Reasoner

User Profiles

User Docs

Mia

RFI

RBGuy

DHS

User Profiles

Feddy

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```
@prefix rsa: <http://www.w3.org/ns/auth/rsa#>.
@prefix cert: <http://www.w3.org/ns/auth/cert#>.
@prefix dc: <http://purl.org/dc/elements/1.1/>.

@prefix foaf: <http://xmlns.com/foaf/0.1/>.
@prefix rdfs:  <http://www.w3.org/2000/01/rdf-schema#>.
@prefix con: <http://www.w3.org/2000/10/swap/pim/contact#>.
@prefix s: <http://www.w3.org/2000/01/rdf-schema#>.
@prefix geo: <http://www.w3.org/2003/01/geo/wgs84_pos#>.
@prefix doap: <http://usefulinc.com/ns/doap#>.

@prefix fusion: <http://dig.csail.mit.edu/2010/DHS-fusion/common/fusion_ONT#>.
@prefix mgl: <http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules/MGL_6-172_ONT#>.
@prefix mglcja: <http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules/MGL_66A-1_ONT#>.
@prefix : <http://dig.csail.mit.edu/2010/DHS-fusion/MA/profiles/MiaAnalysa#>.

<>
    dc:title
      "Mia Analysa's User Profile";
    a     foaf:PersonalProfileDocument;
    foaf:maker
      <#me>;
    rdfs:seeAlso
      "http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules/MGL_66A-1_ONT.n3";
    rdfs:seeAlso
      "http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules/MGL_6-172_ONT.n3";
    foaf:primaryTopic
      <#me>.
<#me>
    a     con:Female, foaf:Person;
    s:label
      "Mia Analysa";
    con:office
          [ con:address
                  [ con:city
                      "Maynard";
                   con:state
                        "MA";
                   con:country
                      "USA";
```

http://dig.csail.mit.edu/2010/DHS-fusion/MA/profiles/MiaAnalysa#me

http://dice.csail.mit.edu/MA/ | http://dig.csail.mit.edu/2010/DH...

Mia Analysa

Authorized purpose	► usage
Type	► Female
	► http://xmlns.com/foaf/0.1/Person
Label	Mia Analysa
Office	► ...
Assigned to organization	Commonwealth Fusion Center
Family name	Analysa
Givenname	Mia
Government type	► MA Executive Branch
Img	

Job title	Intelligence_Analyst
Mbox	► mia@msp.MASS.gov
Mbox sha1sum	bd984f79e11e0f4265f9fd773d9e236ced767ff8
Member	► http://dig.csail.mit.edu/2010/DHS-fusion/MA/profiles/CommonwealthFusionCenter.org#me
Name	Mia Analysa
Nick	
Office near	► ...
Organization	Massachusetts State Police
Organization Homepage	► http://www.mass.gov/?pageID=eopsagencylanding&L=3&L0=Home&L1=Public+Safety+Agencies&L2=Massachusetts+State+Police&sid=Eeops
Organization type	Criminal_Justice_Agency
Title	Ms
Is maker of	► Mia Analysa's User Profile
Is primary Topic of	► Mia Analysa's User Profile

Find All

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Response to Request for Information

To: Mia Analysa
        Intelligence Analyst
        Massachusetts State Police
        Massachusetts Fusion Center

From: Maury Copp
        Police Detective
        Baltimore Police Department
        Baltimore Fusion Center

Date: October 24, 2009

Subject: Robert B. Guy
         a/k/a Bobby Bad Guy

Re: Seeking information in relation to explosion of incendiary devices
        at "No More War" rally, July 16, 2009

Special: USPER PII

This is a response to the Massachusetts State Police Request for Information on Robert B.
Guy (a/k/a Bobby Bad Guy), DOB: 01/01/1960, last known residence: Baltimore, MD.

A Baltimore records check indicates a conviction of Subject that does not appear in NCIC
(reason unknown). The Maryland criminal case system reflects that Subject was
convicted for making and exploding small incendiary devices inside automobiles outside
three Army recruiting stations. He was convicted pursuant to MD Public Safety Code
11-114(b) for the unlawful possession of explosives and sentenced pursuant to MD
Public Safety Code 11-116(a)(1); he was convicted, given a five year sentence, served
eighteen months, and remains on parole. Additional details are available regarding
Bobby's arrest, conviction, and the conditions of his release from prison.

http://dice.csail.mit.edu/MD/ | Fake_MA_Request.pdf (application/pdf... | http://dig.csai..._..._..xmp

```
<?xpacket begin="" id="W5M0MpCehiHzreSzNTczkc9d"?>
<x:xmpmeta xmlns:x="adobe:ns:meta/" x:xmptk="Adobe XMP Core 4.2.1-c043 52.372728, 2009/01/18-15:56:37">
    <rdf:RDF
      xmlns:mdccl="http://dig.csail.mit.edu/2010/DHS-fusion/MD/rules/MdCodeComLaw_12_15_01_03_ONT#"
      xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">

      <rdf:Description rdf:about=""
            xmlns:dc="http://purl.org/dc/elements/1.1/"
                xmlns:tami="http://dig.csail.mit.edu/2009/AIR/air#"
            xmlns:cc="http://creativecommons.org/ns#">
        <dc:creator>
          <rdf:Seq>
            <rdf:li>Maury Copp</rdf:li>
          </rdf:Seq>
        </dc:creator>
        <dc:title>
          <rdf:Alt>
            <rdf:li xml:lang="x-default">Request for Information</rdf:li>
          </rdf:Alt>
        </dc:title>
            <tami:policy rdf:resource="http://dig.csail.mit.edu/2010/DHS-fusion/MD/rules/MdCodeComLaw_12_15_01_11.n3"/>
            <rdf:type rdf:resource="http://dig.csail.mit.edu/2010/DHS-fusion/MD/rules/MdCodeComLaw_12_15_01_03_ONT#Criminal_History_Record_Informatio
            <cc:license rdf:resource="http://creativecommons.org/licenses/by/3.0/"/>
        <mdccl:purpose rdf:resource="http://dig.csail.mit.edu/2010/DHS-fusion/MD/rules/MdCodeComLaw_12_15_01_03_ONT#Performance_of_function"/>
        <mdccl:verified_by rdf:resource="http://dig.csail.mit.edu/2010/DHS-fusion/MD/rules/MdCodeComLaw_12_15_01_03_ONT#Central_Repository"/>
      </rdf:Description>

      <rdf:Description
          rdf:about="http://dig.csail.mit.edu/2010/DHS-fusion/MD/CHRI/Guy_Robert_B#rbg"
              xmlns:xsd="http://www.w3.org/2001/XMLSchema#">
        <mdccl:convicted_pursuant rdf:resource="http://law.justia.com/maryland/codes/gps/11-114.html"/>
        <mdccl:sentenced_pursuant rdf:resource="http://law.justia.com/maryland/codes/gps/11-116.html"/>
            <mdccl:maximum_allowable_sentence_length>20</mdccl:maximum_allowable_sentence_length>
            <mdccl:sentence_imposed>5</mdccl:sentence_imposed>
            <mdccl:has_custody_status rdf:resource="mdccl:Parole"/>
      </rdf:Description>
    </rdf:RDF>
</x:xmpmeta>
```

Policy: English

12.15.01.11

.11 Dissemination of CHRI--Criminal Justice Agency.

A. Subject to the provisions of Regulation .12B, the Central Repository and other criminal justice agencies shall disseminate CHRI, be it conviction or nonconviction criminal history record information, to a criminal ju a request made in accordance with applicable regulations adopted by the Secretary. A criminal justice agency may request this information from the Central Repository or another criminal justice agency only if it has information:

(1) In the performance of its function as a criminal justice agency; or

(2) For the purpose of hiring or retaining its own employees and agents.

B. Dissemination Between Criminal Justice Agencies.

(1) A criminal justice agency may not disseminate CHRI to another criminal justice agency until the disseminating agency has requested and received from the Central Repository verification that the information to b complete, accurate, and current.

(2) The criminal justice agency or the Central Repository shall verify the identity of the criminal justice agency to which the disseminating agency intends to provide the information.

(3) A criminal justice agency may satisfy the verification requirement through the use of an automated information system provided by the Department of Public Safety and Correctional Services.

(4) The Central Repository shall maintain a record or log of the request showing the:

(a) Date the request was made;

(b) Information to be disseminated;

(c) Criminal justice agency receiving the information; and

(d) Date of the dissemination.

(5) This section does not apply if the receiving criminal justice agency demonstrates to a responsible official of the disseminating criminal justice agency or the Central Repository that a delay in the receipt of informa Central Repository will unduly impede necessary action by the requesting criminal justice agency or will violate or materially impair a substantive right of the person about whom the information is needed. However, agency shall maintain a log of each dissemination under these conditions, showing the:

(a) Date of dissemination;

(b) Information disseminated;

(c) Criminal justice agency to whom it was disseminated; and

(d) Date of the dissemination.

C. When a request for the dissemination of CHRI is made by a criminal justice agency from another state, disseminations shall be limited to the purposes for which CHRI is disseminated to criminal justice agencies w

D. A fee, as specified in Regulation .14 of this chapter, shall be charged for each request for access to CHRI for other than a criminal justice purpose.

File   Edit   View   Help

```
:MD_12_15_01_11_s5 a air:Subjective;
  air:description ("Has " :R " demonstrated to " :S " that delay in receiving " :INFO " will violate or materially impair a substantive rig
  air:statement { :R mdccl:demonstrate_violation_or_impairment_rights_of_subject :S }.

:MD_12_15_01_11 a air:Policy;
  air:rule :MD_12_15_01_11_Aa;
  air:rule :MD_12_15_01_11_Ab.

:MD_12_15_01_11_Aa a air:Belief-rule;
  rdfs:comment
    "Subject to the provisions of Regulation .12B, the Central Repository and other criminal justice agencies shall disseminate CHRI, be it
  air:if {
    :EVENT a mdccl:Disseminate, mdccl:Request;
      mdccl:by :S;
      mdccl:data :INFO;
      mdccl:to :R;
      mdccl:doc-data :DATA.
    :S log:semantics :SENDER.
    :R log:semantics :RECEIVER.
    :DATA log:semantics :DOC-DATA.
    :DOC-DATA log:includes { :INFO a mdccl:Criminal_History_Record_Information }.
    :SENDER log:includes { :S foaf:organization_type mdccl:Central_Repository }.
    :RECEIVER log:includes { :R foaf:organization_type mdccl:Criminal_Justice_Agency }.
  };
  air:then [
    air:description ( :S " is " mdccl:Central_Repository ".\n" :EVENT " is a dissemination request from " :S " to " :R "." );
    air:rule :MD_12_15_01_11_Ac
  ].

:MD_12_15_01_11_Ab a air:Belief-rule;
  air:if {
    :EVENT a mdccl:Disseminate, mdccl:Request;
      mdccl:by :S;
      mdccl:data :INFO;
      mdccl:to :R;
      mdccl:doc-data :DATA.
    :S log:semantics :SENDER.
    :R log:semantics :RECEIVER.
    :DATA log:semantics :DOC-DATA.
    :DOC-DATA log:includes { :INFO a mdccl:Criminal_History_Record_Information }.
    :SENDER log:includes { :S foaf:organization_type "Criminal_Justice_Agency" }
```

• Each policy is represented as
  • rules and patterns in a policy file
  • definitions and classifications in an ontology file.

http://dig.csail.mit.edu/2010/DHS-fusion/MD/rules/MdCodeComLaw_12_15_01_11.n3

http://dice.csail.mit.edu/MD/   http://dig.csail.mit.edu/2010/DH...

MD 12 15 01 11 s5	description	Has R demonstrated to S that delay in receiving INFO will violate or materially impair a substantive right of the person about whom INFO is needed?
	statement	R demonstrate violation or impairment rights of subject S
	type	Subjective

- Tabulator is a semantic web browser
- Using Tabulator makes it easy to see the structure of the policies expressed in AIR

MD 12 15 01 11 Aa	if	EVENT	by	S
			data	INFO
			doc data	DATA
			to	R
			type	Disseminate Request
		S	semantics	SENDER
		R	semantics	RECEIVER
		DATA	semantics	DOC DATA
		DOC DATA	includes	INFO type Criminal History Record Information
		SENDER	includes	S organization type Central Repository
		RECEIVER	includes	R organization type Criminal Justice Agency
	then	description	S is Central Repository . EVENT is a dissemination request from S to R .	
		rule	MD 12 15 01 11 Ac	
	type	Belief rule		
	comment	Subject to the provisions of Regulation .12B, the Central Repository and other criminal justice agencies shall disseminate CHRI, be it conviction or nonconviction criminal history record inform... agency upon a request made in accordance with applicable regulations adopted by the Secretary		
MD 12 15	if	EVENT	by	S

Simple Compliance Answer

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http://dice.csail.mit.edu/dhs_air.py?by=http%3A//dig.csail.mit.edu/2010,

http://dice.csail.mit.edu/MA/   http://dice.csail.mit.edu/dhs_air....   ÷

▼http://dice.csail.mit.edu/dhs_air.py?by=http://dig.csail.mit.edu/2010/DHS-fusion/MA/profiles/MiaAnalysa#me&to=http://dig.csail.mit.edu/2010/DHS-fusion/US/DHS/profiles/FredAgenti#me&

/2010/DHS-fusion/MA/documents/Fake_MA_Request.pdf&rulesFile=http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules/MGL_6-172.n3

Transaction is compliant with Massachusetts General Law, Part I, Title II, Chapter 6, Section 172 ▾

Transaction is compliant with Massachusetts General Law, Part I, Title II, Chapter 6, Section 172

[More Information]   [Start Over]

Compliance additionally requires that release of Request for Information
federal law, as required by MGL 6-172, Para. 6, Sent. 1(b), Cl. 3.

- Truth Maintenance System (TMS)
- Tracks dependencies
- Retains premises leading to conclusion
- Retains logical structure of a derivation
- Permits automatically generated explanations
- Pressing the "Why?" button reveals each dependency & all associated premises

Premises:

http://dice.csail.mit.edu /xmpparser.py?uri=http: //dig.csail.mit.edu /2010/DHS-fusion /MA/documents /Fake_MA_Request.pdf	semantics	Request for Information about Robert B. Guy	license	http://creativecommons.org /licenses/by/3.0/
			policy	http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules/MGL_6-172.n3
			owner	http://dig.csail.mit.edu/2010/DHS-fusion/MA/profiles/MiaAnalysa.n3
			Name	Robert B. Guy
			Keywords	
			Producer	Microsoft® Office Word 2007
			location	Cambridge
			Create Date	2010-02-24T14:46:51-05:00
			Metadata Date	2010-02-24T14:47:25-05:00
			Modify Date	2010-02-24T14:47:25-05:00
			Document ID	uuid:3eed3dd5-b0bb-8e40-8400-7f17dd8bda38
			Instance ID	uuid:be1e9556-821c-724b-be6a-892ad8b51d91
			Marked	True
			Creator	q2

"Lawyer Pane"

http://dice.csail.mit.edu/MA/ | http://dice.csail.mit.edu/dhs_air....

▼http://dice.csail.mit.edu/dhs_air.py?by=http://dig.csail.mit.edu/2010/DHS-fusion/MA/profiles/MiaAnalysa#me&to=http://dig.csail.mit.edu/2010/DHS-fusion/US/DHS/profiles
/FredAgenti#me&data=http://dig.csail.mit.edu/2010/DHS-fusion/MA/documents/Fake_MA_Request_core10.pdf&rulesFile=http://dig.csail.mit.edu/2010/DHS-fusion/MA/rules

/MGL_6-172_core10.n3

▼ Issue:

Whether the transactions comply with Massachusetts General Law, Part I, Title II, Chapter 6, Section

▼ Rule:

Rule(s) is/are specified in the policy file.

▼ Analysis:

- Request for Information about Robert B. Guy is a dissemination by Mia Analysa to Fred Agenti, designa

- Request for Information about Robert B. Guy contains Criminal Offender Record Information, and Fred Agenti is a ..., Sent. 1a.

- Compliance additionally requires: Fred Agenti is performing Criminal Justice Duties and Request for Information about Robert B. Guy limited to data necessary for Fred Agenti's Criminal Justice Duties, as required by MGL 6-172, Para. 1, Sent. 2, Cl. 1:

- Compliance additionally requires that Fred Agenti is certified by the board as qualified for access, as required by MGL 6-172 Paragraph 2.

- Compliance additionally requires: The agency to which Mia Analysa belongs shall maintain, for such period as the board shall determine, a listing of the agencies or individuals to which it has released or communicated such information, as required by MGL 6-172, Para. 4, Sent. 1.

- Inquiry is about Robert B. Guy and is based on a personally identifying characteristic, as required by MGL 6-172 Para. 5, Sent. 1, Cl. 2.

- Fred Agenti performs function investigation.

- Compliance additionally requires that release of Request for Information about Robert B. Guy would not violate any other provisions of state or federal law, as required by MGL 6-172, Para. 6, Sent. 1(b), Cl. 3.

▼ Conclusion:

The transaction - Transaction is compliant with Massachusetts General Law, Part I, Title II, Chapter 6, Section 172

- Format is modeled after IRAC
- Issue, Rule, Analysis, Conclusion
- First year law school technique for answering hypotheticals
- Working towards making output easier to read for lawyers, policy analysts, and line of business

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