

Prototype Knowledge Base: an on-line information service in dependability and security

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Budapest, 22nd. March 2007

With

- Ian Millard
- Afraz Jaffri
- Benedicto Rodriguez
- ReSIST Partners
 - esp. Brian Randell

Background: Semantic Web Challenge 2003 Winner

- CS AKTive Space
 - Gather data
 - UK People, projects, publications
 - Research funding
 - Top Universities
 - Geographical presentation

- AKT Project (www.aktors.org)

The Challenges

- Scientific Intelligence
 - Who is doing what where?
 - What impact are they having?
- Integrating resources
 - CORDIS, Institutional DBs and web sites, ePrints, NSF, CiteSeer, RISKS list, ISO LoCodes...
- Information: distributed and heterogeneous
 - Not under own control
 - Not in a common format
 - Not where you expect it
- Presenting to users & agents

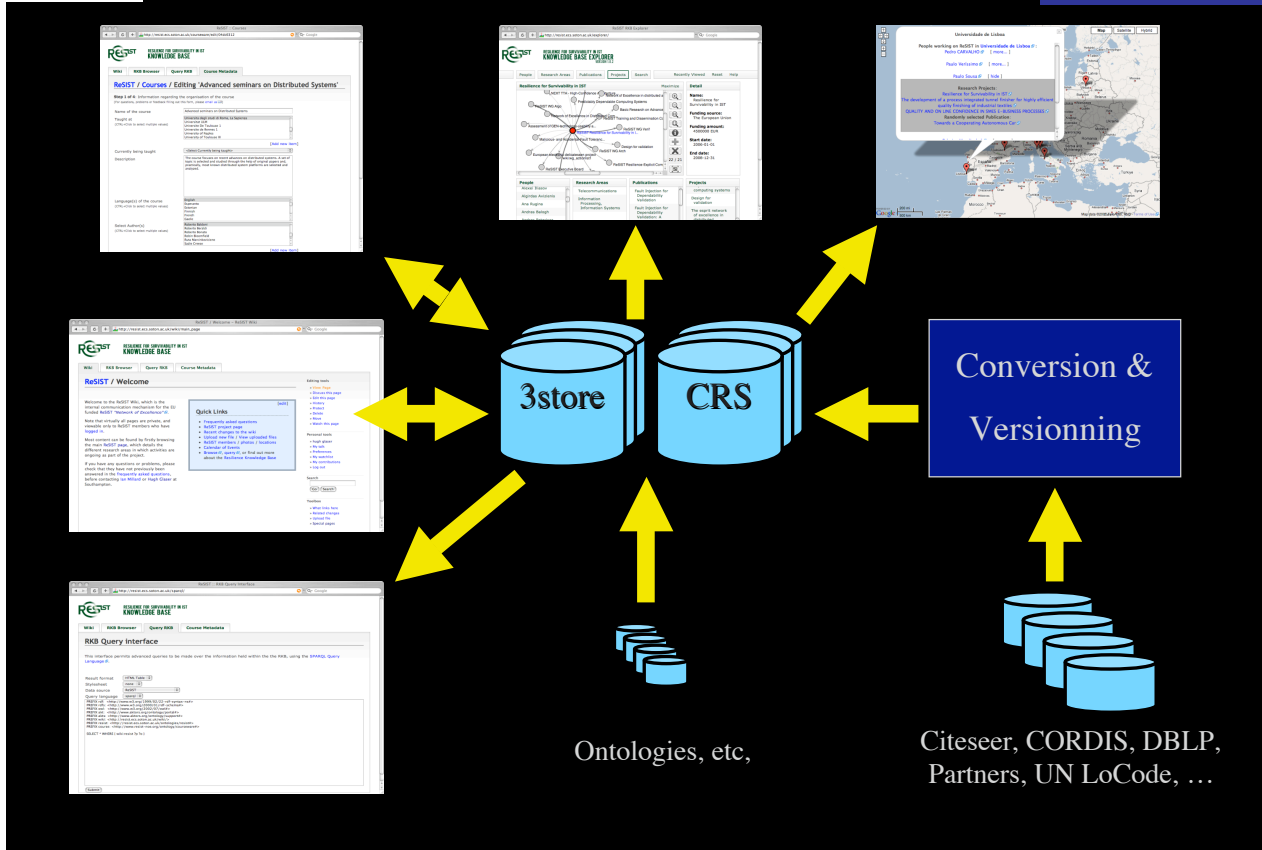


ReSIST - Start Again

- A ReSIST Knowledge Base - The *RKB*
- Project Infrastructure support
- Europe (no longer UK-centric), the World
- Up to date
- Extra subject targets (resilience)
- Browser & platform independent
- Engineer for maintenance
 - Empower partners and other contributors
 - Empower other application builders

ReSIST - and deliver

- D10 - 2007-01-01T00:00:00A
- In fact it is just a URI to a service:
 - <http://resist.ecs.soton.ac.uk/sparql/>
- Or the raw content can be browsed
 - <http://resist.ecs.soton.ac.uk/browse/>
- But there is a brand new faceted browser
 - <http://resist.ecs.soton.ac.uk/explorer/>
- The RKB is embedded in the infrastructure
- The prototype is already being used



- Publications
 - Partners
 - Citeseer
 - DBLP
 - ACM
 - DSN & FTCS Series
- Documents
 - RISKS Digest
- Projects
 - CORDIS
 - NSF
- People
 - Partners
- Support
 - UN LoCode

Ontologies etc.

- AKT Ontology
 - Scientific Research Activity
 - Dates
 - Location
 - ...
- ARLR Paper
- Courseware (extension of LOM)
- RISKS Codes
- ACM Classification

Main Browser - RKB Explorer

ReSIST RKB Explorer

http://resist.ecs.soton.ac.uk/explorer/

RESIST RESILIENCE FOR SURVIVABILITY IN IST KNOWLEDGE BASE EXPLORER VERSION 1.0.2

People Research Areas Publications **Projects** Search Recently Viewed Reset Help

Resilience for Survivability in IST

Maximize

22 / 21

Detail

Name:
Resilience for Survivability in IST

Funding source:
The European Union

Funding amount:
4500000 EUR

Start date:
2006-01-01

End date:
2008-12-31

People	Research Areas	Publications	Projects
Alexei Iliasov	Telecommunications	Fault Injection for Dependability Validation	computing systems
Algirdas Avizienis	Information Processing, Information Systems	Fault Injection for Dependability Validation: A	Design for validation
Ana Rugina			The esprit network of excellence in distributed
Andras Balogh			
Andras Bataine			

ReSIST RKB Explorer

http://resist.ecs.soton.ac.uk/explorer/

RESIST RESILIENCE FOR SURVIVABILITY IN IST
KNOWLEDGE BASE EXPLORER
 VERSION 1.0.2

People | Research Areas | Publications | Projects | Search

Recently Viewed | Reset | Help

Hugh Glaser

Detail

Name: Hugh Glaser

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Tel: +44 (0)23 8059 3670

Fax: +44-1703-593045

Homepage: <http://www.ecs.soton.ac.uk/~hg/>

Other searches: [Google Scholar](#)

People

- Pieter H. Hartel
- Unknown/withheld
- John M. Wild
- Nicholas Gibbins
- Nigel R. Shadbolt
- Stephen Harris
- David De Roure
- monica schraefel
- Harith Alani
- Peter Henderson
- Unknown/withheld

Research Areas

- Static Analysis
- Model Checking
- D.3.2. Language Classifications
- D.0. GENERAL

Publications

- Towards Truly Ubiquitous Life Annotation
- Using a Semantic MediaWiki to Interact with a Knowledge Based Infrastructure
- Semantic Squirrels
- Towards a Canonical Method to Solve Patterns of Ontology Modeling Issues (9 Month Report)
- Monitoring Research Collaborations Using Semantic Web Technologies.
- A Framework for Reference Management in the Semantic

Projects

- Hierarchical performance evaluation modelling of large information open systems
- HELIOS
- ReSIST RKB Editorial Board
- AKT: Advanced Knowledge Technologies
- ReSIST Executive Board
- ReSIST Resilience for Survivability in IST
- ReSIST SIG ResOn

About | Acknowledgements

ReSIST RKB Explorer

http://resist.ecs.soton.ac.uk/explorer/

RESIST RESILIENCE FOR SURVIVABILITY IN IST
KNOWLEDGE BASE EXPLORER
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People | Research Areas | Publications | Projects | Search

Recently Viewed | Reset | Help

Highly DEpendable ip-based NETWORKS and Services

Detail

Name: Highly DEpendable ip-based NETWORKS and Services

Funding source: The European Union

People

- SCHWEFEL

Research Areas

- Information Processing, Information Systems
- Telecommunications

Publications

No results found

Projects

- Corporate multimedia information systems - technical documentation
- Cost-Effective Rehabilitation Technology through

ReSIST RKB Explorer

http://resist.ecs.soton.ac.uk/explorer/

RESILIENCE FOR SURVIVABILITY IN IST
KNOWLEDGE BASE EXPLORER
VERSION 1.0.2

People | Research Areas | **Publications** | Projects | Search

Recently Viewed | Reset | Help

Hacker attack on NASDAQ, AMEX, and others

Detail

Title: Hacker attack on NASDAQ, AMEX, and others

Publications

- 17,000 bank details plucked from GST Site
- Hackers hit U.S., U.K., Australian government sites
- Man charged with breaking into NASA computers
- UK firms face weekly attacks
- UK: Vital e-crime evidence often destroyed
- Canadian teen held in Web attacks
- Crackers steal 52,000 university passwords

Projects

No results found

Browser Window: The Risks Digest Volume 20: Issue 58

http://catless.ncl.ac.uk/Risks/20.58.htm

The new Emergency Alert System (EAS) is supposed to be an improvement on the Emergency Broadcast System (EBS) but in this case seems to be backwards in terms of reliability.

Hacker attack on NASDAQ, AMEX, and others

"Keith A Rhodes" <rhodesk.aimd@gao.gov>
Thu, 16 Sep 1999 09:49:58 -0500

ZDNN (<http://www.zdnet.com/zdnn/>) reported on 16 Sep 1999 that a calling themselves United Loan Gunmen had altered Nasdaq and Ameri Exchange Web sites, and claimed responsibility for earlier attacks C-Span, ABC, and Matt Drudge sites. *The New York Times* (in an http://www.nytimes.com/aponline/w/1999-09-16/1999-09-16_1_nasdaq.html) noted the hackers left a taunting message -- the high-tech equivalent of spray-painting graffiti -- and also claimed to have briefly created itself an e-mail account on Nasdaq's computer." [PGN-ed]

Hacker admits attacks on NATO, USIA Web pages

"Edelson, Doneel" <doneeledelson@aciins.com>
Wed, 16 Sep 1999 09:57:38 -0400

Map | Satellite | Hybrid

Universidade de Lisboa

People working on ReSIST in **Universidade de Lisboa** :

- [Pedro CARVALHO](#) [more...]
- [Paulo Veríssimo](#) [more...]
- [Paulo Sousa](#) [hide]

Research Projects:

- [Resilience for Survivability in IST](#)
- [The development of a process integrated tunnel finisher for highly efficient quality finishing of industrial textiles](#)
- [QUALITY AND ON LINE CONFIDENCE IN SMES E-BUSINESS PROCESSES](#)

Randomly selected Publication:

- [Towards a Cooperating Autonomous Car](#)

Map data © 2007, Google, AND Terms of Use

ReSIST :: Courses
<http://resist.ecs.soton.ac.uk/courseware/edit/04dc6312>

RESIST RESILIENCE FOR SURVIVABILITY IN IST KNOWLEDGE BASE

Wiki | RKB Browser | Query RKB | **Course Metadata**

ReSIST / Courses / Editing 'Advanced seminars on Distributed Systems'

Step 1 of 4: Information regarding the organisation of the course
(For questions, problems or feedback filling out this form, please email [us](#))

Name of the course:

Taught at:
(CTRL+Click to select multiple values)
 Universitat ULM
 Universite De Toulouse 1
 Universite de Rennes 1
 University of Naples
 University of Toulouse III [\[Add new item\]](#)

Currently being taught:

Description:

Language(s) of the course:
(CTRL+Click to select multiple values)
 Esperanto
 Estonian
 Finnish
 French
 Gaelic

Select Author(s):
(CTRL+Click to select multiple values)
 Roberto Beraldi
 Roberto Bonato
 Robin Bloomfield
 Ruta Marcinkeviciene
 Sadie Creese [\[Add new item\]](#)

<http://resist.ecs.soton.ac.uk/gmap/resist-courses.php>

Budapest University of Technology and Economics

Courses taught at [Budapest University of Technology and Economics](#), Budapest:
[Software Verification and Validation](#) [hide]
 Istvan Majzik
[Management of Computing Infrastructure](#) [show instructors...]

Map | Satellite | Hybrid

Go to the ReSIST Partners Map

ReSIST / Welcome

Welcome to the ReSIST Wiki, which is the internal communication mechanism for the EU funded ReSIST "Network of Excellence".

Note that virtually all pages are private, and viewable only to ReSIST members who have logged in.

Most content can be found by firstly browsing the main ReSIST page, which details the different research areas in which activities are ongoing as part of the project.

If you have any questions or problems, please check that they have not previously been answered in the frequently asked questions, before contacting Ian Millard or Hugh Glaser at Southampton.

Quick Links

- [Frequently asked questions](#)
- [ReSIST project page](#)
- [Recent changes to the wiki](#)
- [Upload new file / View uploaded files](#)
- [ReSIST members / photos / locations](#)
- [Calendar of Events](#)
- [Browse](#), [query](#), or find out more about the Resilience Knowledge Base

Editing tools

- » [View Page](#)
- » [Discuss this page](#)
- » [Edit this page](#)
- » [History](#)
- » [Protect](#)
- » [Delete](#)
- » [Move](#)
- » [Watch this page](#)

Personal tools

- » [hugh glaser](#)
- » [My talk](#)
- » [Preferences](#)
- » [My watchlist](#)
- » [My contributions](#)
- » [Log out](#)

Search

Toolbox

- » [What links here](#)
- » [Related changes](#)
- » [Upload file](#)
- » [Special pages](#)

Edit your User Interests

Please select the topics from within the hierarchy below that best match your research interests within the ReSIST NoE.

It is best to "drill down" as far as possible, and to select the most specific topics. Selecting higher level topics will indicate that you are interested in all of the sub-topics, which are selected for you.

Note however that this is not strictly a tree, as some topics appear in multiple places within the hierarchy. In these cases the "other" instances are automatically selected when you tick a topic area which exists in more than one category.

As is usual within the wiki, clicking a blue link should take you to a page describing the subject of that link.

Happy clicking :)

[akt:Research Area](#)

[Dependability And Security, Trustworthiness](#)

Two somewhat overlapping concepts, with dependability being an integrating concept that encompasses the attributes: availability, reliability, safety; integrity and maintainability, while security encompasses confidentiality as well as integrity and availability.

[Dependability, High Confidence, Survivability](#)

The original definition of dependability is: the ability to deliver service that can justifiably be trusted. The alternate definition, that provides the criterion for deciding if the service is dependable, is: the dependability of a system is the ability to avoid service failures that are more frequent and more severe than is acceptable.

[Dependence](#)

The dependence of system A on system B represents the extent to which system A's dependability is (or would be) affected by that of System B.

[Trust](#)

Accepted dependence - where the dependence of a user on a given system represents the extent to which the user's dependability is (or would be) affected by that of the system. (The acceptance of this state of affairs by the user may be willing or unwilling, and careful or even unthinking.)

[Attribute Of Dependable Systems](#)

The dependability properties that are expected from a system, and in terms of which a system's dependability can be assessed with respect to the threats and the means to oppose these threats.

ReSIST :: Manual Classifier

http://resist.ecs.soton.ac.uk/classifier/manual/edit.php?url=%3Chttp%3A...

Manual classification of IEEE DSN papers

Title: Hotspots: The Root Causes of Non-Uniformity in Self-Propagating Malware (2006)

Authors: F. Jahanian, F. Jahanian, Z.M. Mao, E. Cooke

Abstract: Self-propagating malware like worms and bots can dramatically impact the availability and reliability of the Internet. Techniques for the detection and mitigation of Internet threats using content prevalence and scan detectors are based on assumptions of how threats propagate. Some of these assumptions have recently been called into question by observations of huge discrepancies in the quantity of specific threats detected at different points around the Internet. We call these deviations from uniform propagation "hotspots". This paper quantifies and explains these influences on malware propagation. We then propose that hotspots can be explained by two fundamental influences on propagation: algorithmic factors and environmental factors. We use measurement data from sensors deployed at 11 locations around the Internet to demonstrate the impact of these factors on worm and bot propagation. With this understanding, we simulate the outbreak of new threats with hotspots and show how algorithmic and environmental factors reduce the visibility of distributed detectors resulting in the inability to identify new threats.

Keywords: None

Please select:

akt:Research Area

- Dependability And Security, Trustworthiness**
Two somewhat overlapping concepts, with dependability being an integrating concept that encompasses the attributes: availability, reliability, safety, integrity and maintainability, while security encompasses confidentiality as well as integrity and availability.
- Dependability, High Confidence, Survivability**
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- Dependence**
The dependence of system A on system B represents the extent to which system A's dependability is (or would be) affected by that of System B.
- Trust**
Accepted dependence - where the dependence of a user on a given system

ReSIST :: Search Results

http://resist.ecs.soton.ac.uk/browse/?resource=http%3A%2F%2Fcatless.ncl.ac.uk%2Fperson%2360d6abae

RKB Browser :: John Rushby

Alternative representations
» RDF export

Identifiers...

- <http://catless.ncl.ac.uk/person#60d6abae>
- <http://citeseer.ecs.soton.ac.uk/#CSP272905>
- <http://citeseer.ecs.soton.ac.uk/#CSP272906>
- <http://citeseer.ecs.soton.ac.uk/#CSP272907>
- <http://citeseer.ecs.soton.ac.uk/#CSP272908>
- <http://citeseer.ecs.soton.ac.uk/#CSP272909>
- <http://citeseer.ecs.soton.ac.uk/#P145810>
- <http://citeseer.ecs.soton.ac.uk/#P570387>
- <http://resist.ecs.soton.ac.uk/publications/person#f89fd02d>
- http://resist.ecs.soton.ac.uk/wiki/User:john_rushby

Subject	Property	Object/Value
John Rushby	akt:family-name	Rushby
JOHN RUSHBY	akt:full-name	JOHN RUSHBY
John Rushby	akt:full-name	John Rushby
John Rushby	akt:full-name	John Rushby
John Rushby	akt:full-name	John Rushby

```

<?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:ns0="http://www.aktors.org/ontology/portal#"
  >
  <rdf:Description rdf:about="http://catless.ncl.ac.uk/Risks/10.57.html#subj3.1">
    <ns0:has-author rdf:resource="http://catless.ncl.ac.uk/person#60d6abae"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://catless.ncl.ac.uk/Risks/11.78.html#subj2.1">
    <ns0:has-author rdf:resource="http://catless.ncl.ac.uk/person#60d6abae"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://catless.ncl.ac.uk/Risks/13.77.html#subj2.1">
    <ns0:has-author rdf:resource="http://catless.ncl.ac.uk/person#60d6abae"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://catless.ncl.ac.uk/Risks/13.77.html#subj3.1">
    <ns0:has-author rdf:resource="http://catless.ncl.ac.uk/person#60d6abae"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://catless.ncl.ac.uk/Risks/13.84.html#subj5.1">
    <ns0:has-author rdf:resource="http://catless.ncl.ac.uk/person#60d6abae"/>
  </rdf:Description>
  </rdf:RDF>
  
```

RKB Query interface

This interface permits advanced queries to be made over the information held within the the RKB, using the [SPARQL Query Language](#).

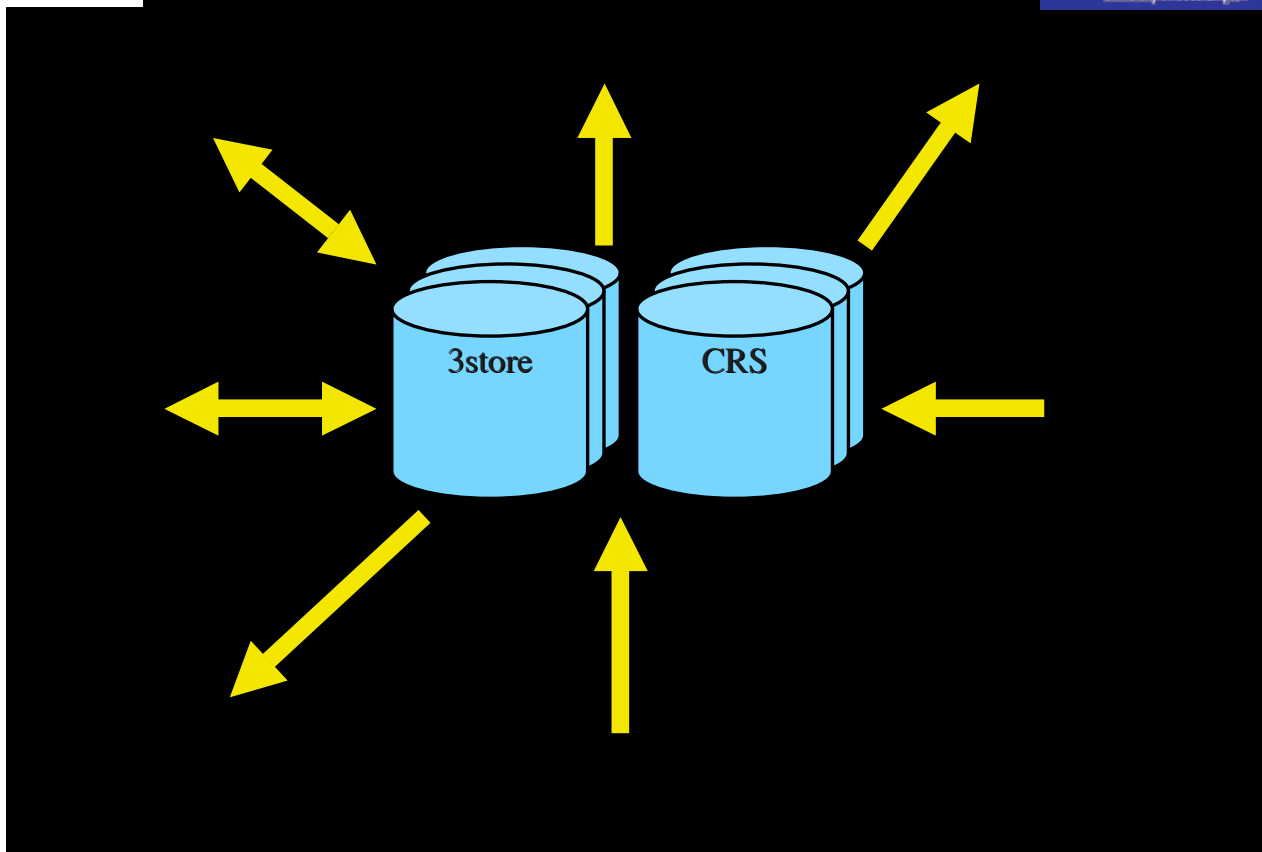
Result format:
Stylesheet:
Data source:
Query language:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>  
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>  
PREFIX owl: <http://www.w3.org/2002/07/owl#>  
PREFIX akt: <http://www.aktors.org/ontology/portal#>  
PREFIX akts: <http://www.aktors.org/ontology/support#>  
PREFIX wiki: <http://resist.ecs.soton.ac.uk/wiki/>  
PREFIX resist: <http://resist.ecs.soton.ac.uk/ontologies/resist#>  
PREFIX course: <http://www.resist-noe.org/ontology/courseware#>
```

```
SELECT * WHERE { wiki:resist ?p ?o }
```

Submit

At the Centre



So what *is* RDF...?

- Resource Description Framework
- W3C recommendation
 - From Semantic Web research efforts
- Modelling language
 - Represents facts about resources
- Can model any abstract domain
 - Things do not have to be accessible *on* the web
 - But can be described *in it*

RDF: Basic components

- RDF graphs are formed by *triples*

subject

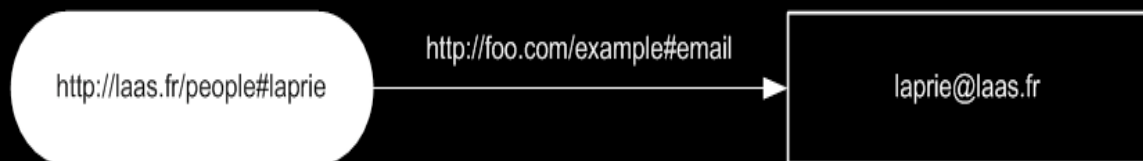
predicate

object

<http://laas.fr/people#laprie>

<http://foo.com/example#email>

laprie@laas.fr



Important Components

3store and CRS

- 3store
 - Open source semantic store
 - Scalable
 - ReSIST - 50 million facts
 - (cf Wikipedia metadata)
- CRS - Consistent Reference Service
 - Bridges between disparate sources

Openness

- Almost nothing shown was private
- Except
 - Wiki project discussion pages
 - But semantic relations go to RKB
 - Data entry
 - Controlled
 - Not moderated

- Improve on the Prototype
 - Sources
 - CRS
 - UI
- Resilient-Explicit Computing
 - Model expert knowledge
 - Model processes, components, mechanisms
- Support Engineer/Scientist
 - Move effectively between
 - System design
 - Knowledge Base
 - People
 - To choose cost, characteristics, etc
- Support Run-Time Deployment
 - Dynamic Reconfiguration

- Original proposal
 - Now primarily maintenance
- Victim of success?
 - Important infrastructure
 - Serious resources to be maintained
 - People want to provide data (costs)

- ReSIST
 - Has increased future RKB resources
- Other Funding and Additionality
 - Lithuania & Saarbrücken
 - JISC
- Longer term
 - Self-funding - SIGs, Clubs
 - Infrastructure - EU, EPSRC, NSF
- Engineer for maintenance and Openess
- Open
 - Knowledge Sources
 - Knowledge Publishing

- One year of work - one RF funded
- ReSIST has done what it said it would do
 - And more
 - In particular, 1M -> 40M
 - Sophisticated UI
- Real tool for the network, from Day One
- Excellent Partner co-operation
 - Data
 - Evaluation
 - Ontology work
- Much Value in Expert Involvement

