



Protégé:
Past, Present, and Future

Ray Ferguson
Stanford

Past

- Prehistory (1987-1997)
 - Mark's Thesis
 - Protege-II
 - Protege/Win
 - “Workshop 1”
 - Workshop 2
- Workshops 3-5 (1997-2001)

Mark's Thesis

- PROTÉGÉ system
- Developed as a tool for building knowledge-acquisition tools (a *meta-tool*) for medical planning applications
- Hardcoded *Ontology* (or *meta-ontology*) geared for planning applications
- Ran on Lisp machines
- User community ~1

Protégé-II

- Generic meta-tool
 - No hardcoded ontology
 - No assumptions about “planning”
- Constructed as three distinct applications:
 - ontology editing
 - form customization
 - instance creation
- Ran in NextStep environment
- Written in Objective-C, Lisp...
- User community ~10

Protégé/Win

- DARPA funding
 - required MS Windows reimplementation
- Protégé/Win
 - Same three applications as Protégé-II
 - Ran on Windows machines
 - Written in C++
- Beginnings of an *outside* user community
 - Small, mostly academic
 - User community ~100

“Workshop 1”

Pavia, June 1995

- Four guys from four different countries meet in a restaurant in Italy and eat pizza and drink lots of alcohol
- Protégé discussed? Concrete outcome?

Workshop 2

Stanford, March 1996

- Decided to re-implement Protégé/Win as a framework into which user-created *plug-ins* could be added.
 - domain-specific *slot widgets*
 - read/write data to other file formats
- Decided to adopt Java programming language

Workshop 3

Lidingö, September 1997

- Prototype of new system: Protégé/Java
- Demonstrated “undo” functionality
- Described ability to add tabs
- Subsequently decided...
 - We haven’t gone “far enough” to integrate with other knowledge-base systems such as Ontolingua, CYC, and Loom
 - To adopt Generic Frame Protocol (OKBC) as our *knowledge model*
 - Throw away previous work and start over

Workshop 4

Linköping, July 1999

- Protégé-2000 Release 1.0
- Users demonstrated:
 - domain independent slot widgets
 - tab widgets

Workshop 5

Newcastle, July 2001

- Protégé-2000 1.6 (almost) released
- Free
- Open source
- Growing and diverse user community

Memorable events:

- *The Logic Emergency*
- *The Religious Experience*

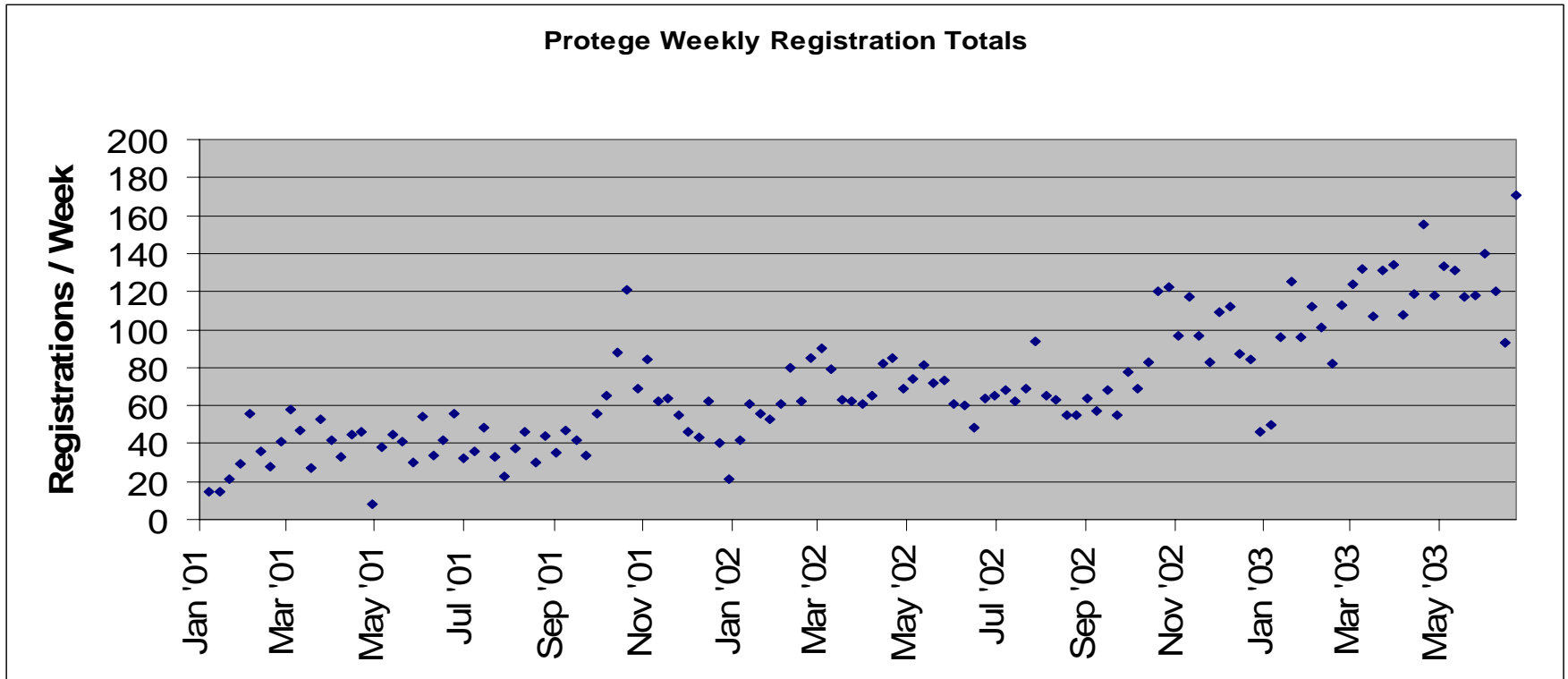
Present

- Staff additions
- User community
- protege-discussion mailing list
- Funding
- Publications
- Protege 2.0
- Next few months

Staff Additions

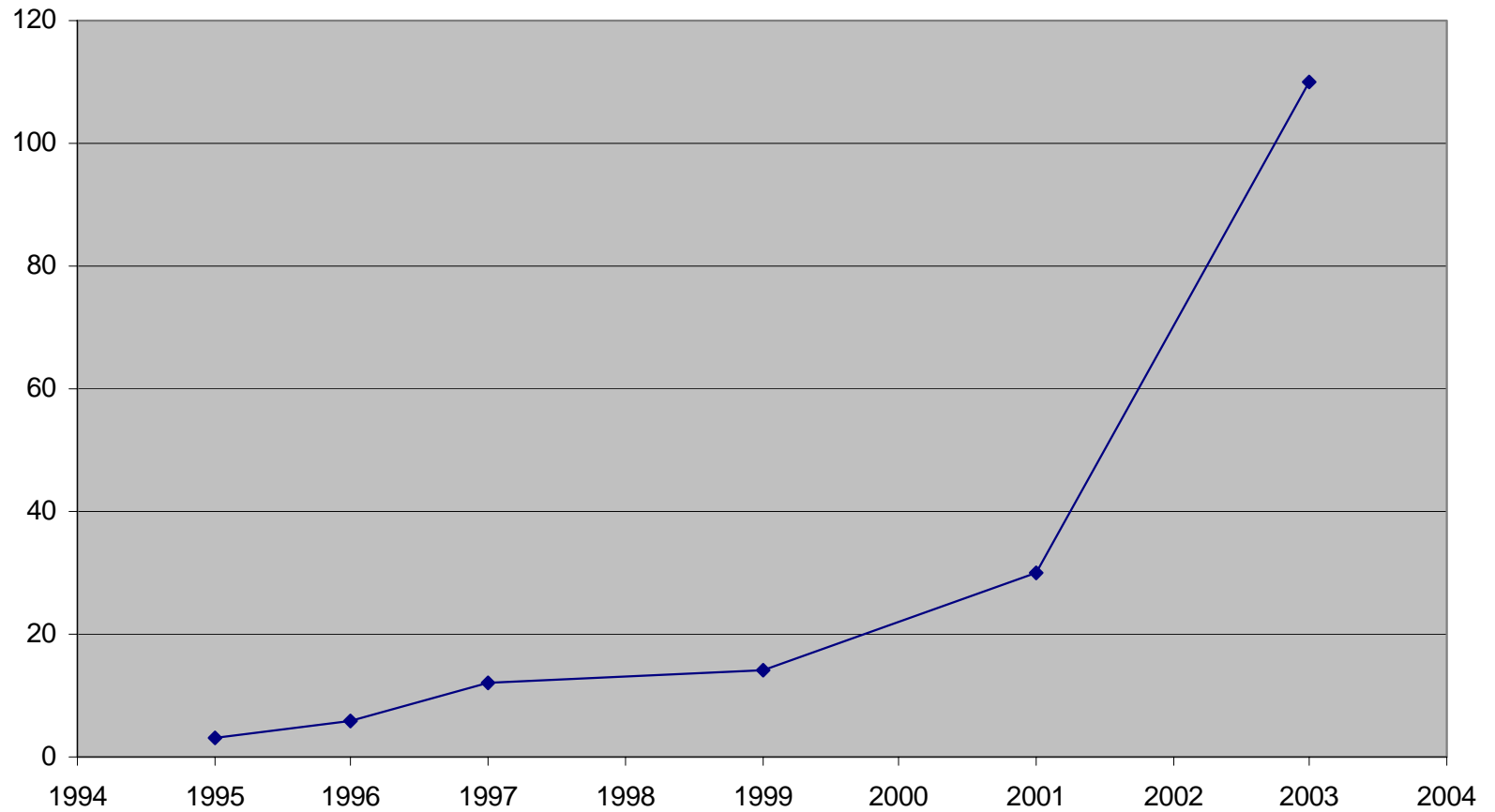
- **Research Staff**
 - Holger Knublauch
 - Protege/OWL integration
 - Protege in Software Engineering Environments
- **Development Staff**
 - Jennifer Vendetti
 - Builds, Source code control
 - FAQ, Plugins library, web site development
 - Graph Widget

User Community



Total Registered Users: ~10000

Workshop Attendance



protege-discussion

- 1400 members, 4500 messages
- List is maturing
 - From: “Ask and Stanford answers”
 - To: A forum where users get help and advice from other users
- Technical Improvements
 - Administrative load almost eliminated
 - Blocking “Unsubscribe me” messages, vacation notices, and spam

Funding

- National Cancer Institute
- National Library of Medicine
 - “National Resource for Biomedical Ontologies and Knowledge Bases”
- National Institute of Standards and Technology
- Protege Affiliates
 - Damiler-Chrysler
 - Sowerby Centre for Health Informatics at Newcastle
 - FastTrack Systems

Publications

- “The History Paper”
 - *The Evolution of Protege: An Environment for Knowledge-Based System Development*, Gennari, et al.
- “Ontology 101”
 - *Ontology Development 101: A Guide to Creating Your First Ontology*, Noy and McGuinness
- Book

Your fun and easy guide to Protégé!

PROTÉGÉ FOR DUMMIES®

3rd Edition

***A Reference
for the
Rest of Us!***

Ray Ferguson
Stanford University

*Thrilling ontologies
on CD-ROM!*



Protégé 2.0 “*demo*”

newspaper Protégé (C:\Program Files\Protégé 2\examples\newspaper\newspaper.pprj)

Project Edit Window Help

Increase Font Size A R
Decrease Font Size
Cascade Windows
Close All Windows
Detach Current Tab
Look And Feel

Classes

- THING
- SYSTEM
- Author
- Content
- Layout_info
- Library (1)
- Newspaper (6)
- Organization (1)
- Person
 - Employee
 - Columnist (2)
 - Editor (4)
 - Reporter (3)
 - Salesperson (1)
 - Manager (3)
 - foo

Instances

- Chief Honcho
- Mr. Science
- Ms Gardiner
- Sports Nut

Queries

Chief Honcho (type=Editor, name=instance_00055)

| | |
|-------------------|--|
| Name | Salary |
| Chief Honcho | 150000.0 |
| Date Hired | Responsible For |
| | <ul style="list-style-type: none"> Sports Nut Ms Gardiner |
| Current Job Title | |
| | |
| Phone Number | Sections |
| | <ul style="list-style-type: none"> Magazine Local News Automotive Business World News |
| Other Information | |
| | |

Instances Tab - Protégé

Classes

- THING A
- SYSTEM-CLASS A
- Author A
- Content A
- Layout_info A
- Library (1)
- Newspaper (6)
- Organization (1)
- Person
 - Employee A
 - Columnist M (2)
 - Editor M (4)
 - Reporter M (3)
 - Salesperson (1)
 - Manager (3)
- foo

Direct In

- Chief Honcho
- Mr. Science
- Ms Gardiner
- Sports Nut

Chief Honcho (type=Editor, name=instance_00055)

Name: Chief Honcho

Salary: 150000.0

Date Hired: [Empty Field]

Responsible For: Sports Nut, Ms Gardiner

Current Job Title: [Empty Field]

Phone Number: [Empty Field]

Other Information: [Empty Field]

Sections: Magazine, Local News, Automotive, Business, World News

newspaper Protégé (C:\Program Files\Protége2\examples\ne

Project Edit Window Help

Classes Slots Forms Queries

Query

Class Slot

More Fewer Clear Match All Match Any Find

Query Name

Add to Query Library

Query Library

- People with salary greater than 100,000
- Articles whose authors are highly paid
- Articles whose authors are highly paid and articles are urgent with less than 50 pages

newspaper Protégé (C:\Program Files\Protege2\examples\newspaper\newspaper.pprj)

Project Edit Window Help

Classes Slots Forms Instances Queries

Classes

- .THING A
- SYSTEM-CLASS A
- Author A
- Content A
- Layout_info A
- Library (1)
- Newspaper (6)
- Organization (1)
- Person
 - Employee A
 - Columnist M (2)
 - Editor M (4)
 - Reporter M (3)
 - Salesperson (1)
 - Manager (3)
 - foo

Direct In

- Chief Honcho
- Mr. Science
- Ms Gardiner
- Sports Nut

Chief Honcho (type=Editor, name=instance_00055)

| | | | |
|--------------------------|--|---------------|----------|
| Name | Chief Honcho | Salary | 150000.0 |
| Date Hired | | | |
| Current Job Title | | | |
| Phone Number | | | |
| Other Information | | | |
| Responsible For | <ul style="list-style-type: none"> Sports Nut Ms Gardiner | | |
| Sections | <ul style="list-style-type: none"> Magazine Local News Automotive Business World News | | |

newspaper Protégé (C:\Program Files\Protege2\examples\newspaper\newspaper.pprj)

Project Edit Window Help

Classes Slots Forms Instances Queries

Forms

- THING
- SYSTEM-CLASS
- Author
- Content
- Layout_info
- Library
- Newspaper
- Organization
- Person
- foo

Form Browser Key Selected Widget Type

<inherit>

newspaper Protégé (C:\Program Files\Protege2\examples\newspaper\newspaper.pprj)

Project Edit Window Help

Classes Slots Forms Instances Queries

Forms

- THING
- SYSTEM-CLASS
- Author
- Content
- Layout_info
- Library
- Newspaper
- Organization
- Person
 - Employee
 - Columnist
 - Editor
 - Reporter
 - Salesperson
 - Manager
- foo

Form Browser Key Selected Widget Type

S name

| | |
|----------------------|----------------------|
| Name | Salary |
| <input type="text"/> | <input type="text"/> |
| Date Hired | Responsible For |
| <input type="text"/> | <input type="text"/> |
| Current Job Title | |
| <input type="text"/> | |
| Phone Number | Sections |
| <input type="text"/> | <input type="text"/> |
| Other Information | |
| <input type="text"/> | |

newspaper Protégé (C:\Program Files\Protege2\examples\newspaper\newspaper.pprj)

Project Edit Window Help

Classes Slots Forms Instances Queries

Relationship Superclass

- THING A
- SYSTEM-CLASS A
- Author A
- Content A
- Layout_info A
- Library
- Newspaper
- Organization
- Person
- foo

Superclasses

:THING (type=:STANDARD-CLASS)

Name: THING

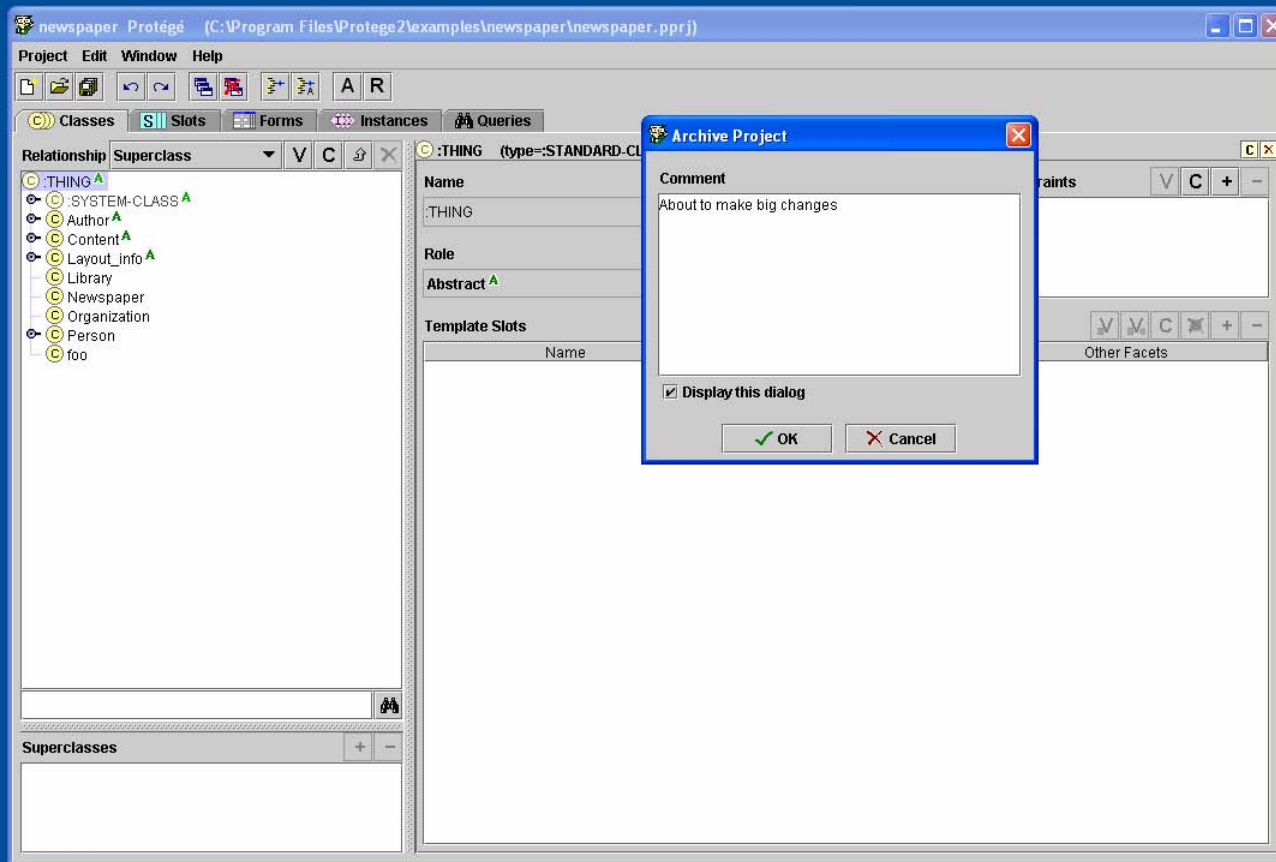
Documentation:

Constraints:

Role: Abstract A

Template Slots

| Name | Type | Cardinality | Other Facets |
|------|------|-------------|--------------|
| | | | |



newspaper Protégé (C:\Program Files\Protege2\examples\newspaper\newspaper.pprj)

Project Edit Window Help

Classes Slots Forms Instances Queries

Relationship Superclass

- THING A
- SYSTEM-CLASS A
- Author A
- Content A
- Layout_info A
- Library
- Newspaper
- Organization
- Person
- foo
- Employee A
- Columnist M
- Editor M
- Reporter M
- Salesperson
- Manager

Superclasses

- THING A

Manager (type=:STANDARD-CLASS)

Name: Manager

Documentation:

Constraints:

Role: Concrete

Template Slots

| Name | Type | Cardinality | Other Facets |
|------|------|-------------|--------------|
| | | | |

newspaper Protégé (C:\Program Files\Protege2\examples\newspaper)

Project Edit Window Help

Classes Slots Forms Instances Queries

Relationship Superclass V C X

Manager (type)

Name
Manager

Role

Concrete

Template Slots

Facets

Superclasses + -

C:THING A

Revert to Archived Version

| Date and Time | Comment |
|------------------------------|---|
| Mon Jun 30 15:35:24 PDT 2003 | About to make big changes |
| Mon Jun 30 15:36:10 PDT 2003 | Reorganized the Person hierarchy |
| Mon Jun 30 15:36:40 PDT 2003 | Added 5 editors and configured the gra... |

Archive current version before revert

OK Cancel

newspaper Protégé (C:\Program Files\Protege2\examples\newspaper\newspaper.pprj)

Project Edit Window Help

Classes Slots Forms Instances Queries

Relationship Superclass

- THING A
- SYSTEM-CLASS A
- Author A
- Content A
- Layout_info A
- Library
- Newspaper
- Organization
- Person
- foo

Superclasses

:THING (type=:STANDARD-CLASS)

Name: THING

Documentation:

Constraints:

Role: Abstract A

Template Slots

| Name | Type | Cardinality | Other Facets |
|------|------|-------------|--------------|
| | | | |

newspaper Protégé (C:\Program Files\Protege2\examples\newspaper\newspaper.pprj)

Project Edit Window Help

New...
Open...
Open Remote...
Open Recent
Save
Archive
Save As...
Close
Import...
Save In Format...
Include Project...
Change Included Projects...
Show Included Projects...
Merge Included Projects
Configure...
Metrics...
Generate HTML...
Exit Protégé

Forms Instances Queries

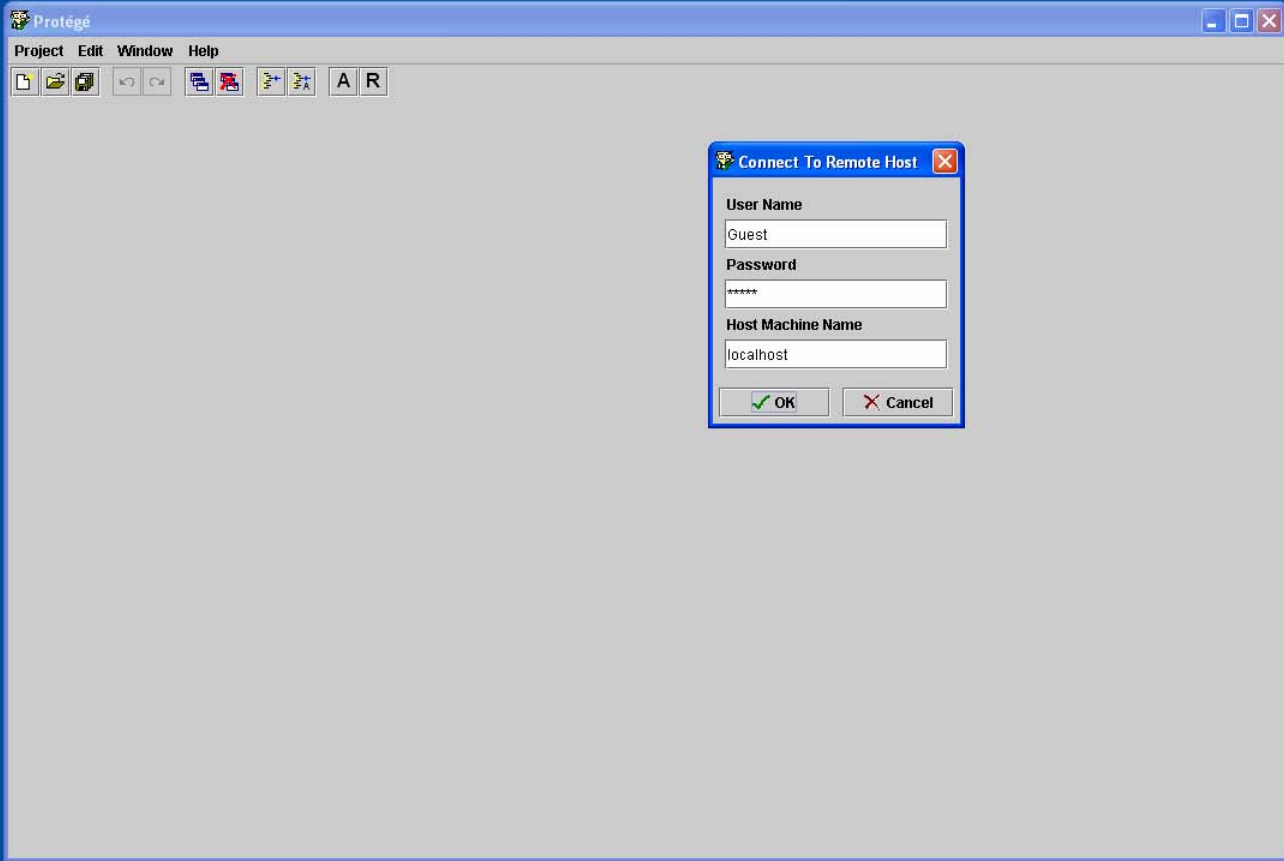
:THING (type=:STANDARD-CLASS)

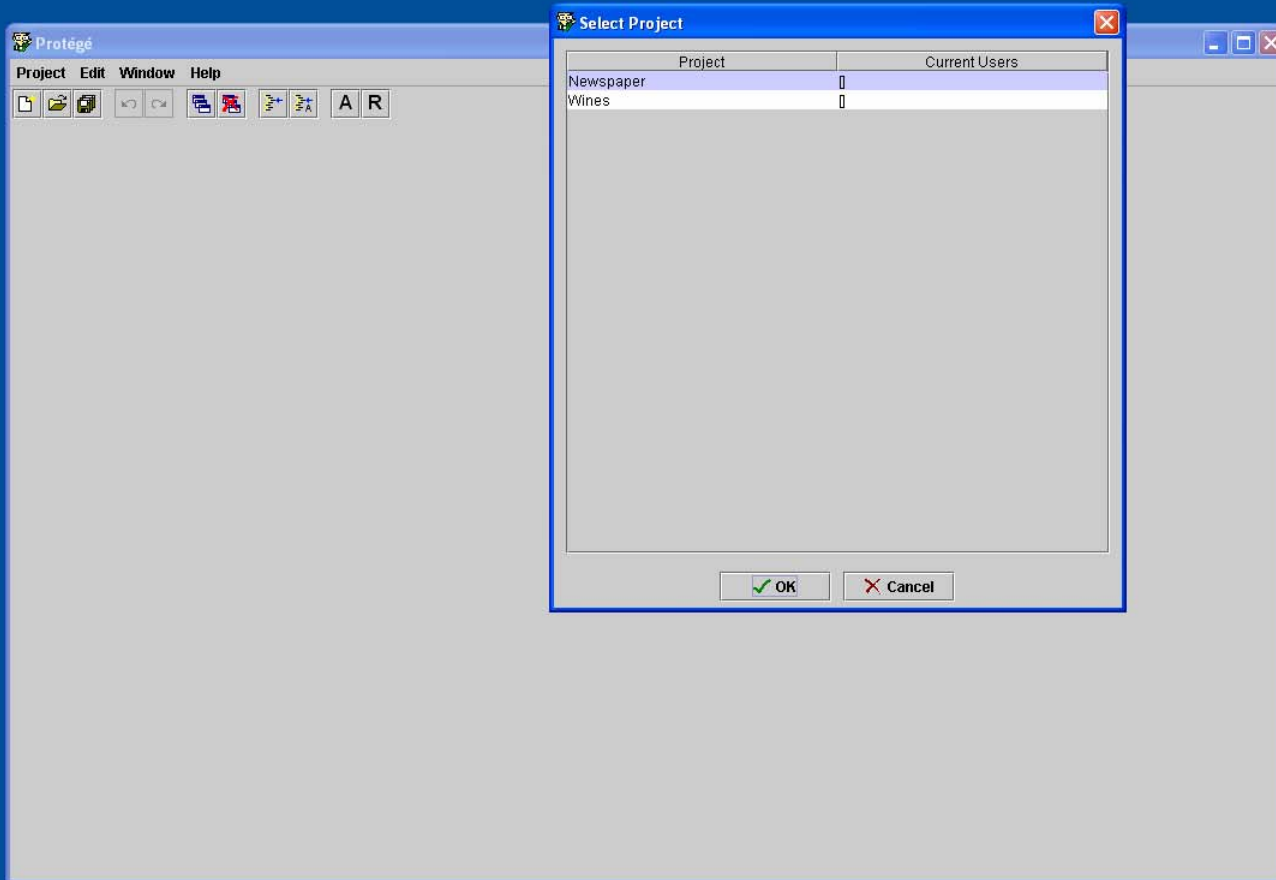
Name: THING
Documentation:
Constraints:
Role: Abstract ^A

Template Slots

| Name | Type | Cardinality | Other Facets |
|------|------|-------------|--------------|
| | | | |

Superclasses





<new> Protégé

Project Edit Window Help

Classes Slots Forms Instances Queries

Relationship Superclass

- THING A
- SYSTEM-CLASS A
- Author A
- Content A
- Layout_info A
- Library
- Newspaper
- Organization
- Person

:THING (type=:STANDARD-CLASS)

Name: THING

Documentation:

Constraints:

Role: Abstract A

Template Slots

| Name | Type | Cardinality | Other Facets |
|------|------|-------------|--------------|
| | | | |

Superclasses

<new> Protégé

Project Edit Window Help

Classes Slots Forms Instances Queries

Relationship Superclass

- THING
- SYSTEM-CLASS
- Author
- Content
- Layout_info
- Library
- Newspaper
- Organization
- Person

Superclasses

<new> Protégé

Project Edit Window Help

Classes Slots Forms Instances Queries

Relationship Superclass

- THING
- SYSTEM-CLASS
- Author
- Content
- Layout_info
- Library
- Newspaper
- Organization
- Person

THING (type=STANDARD-CLASS)

Name: THING

Documentation:

Constraints:

Role: Abstract

| Name | Type | Cardinality | Other Facets |
|------|------|-------------|--------------|
| | | | |

<new> Protégé

Project Edit Window Help

Classes Slots Forms Instances Queries

Relationship Superclass

- THING
- SYSTEM-CLASS
- Author
- Content
- Layout_info
- Library
- Newspaper
- Organization
- Person
- Class_0

Superclasses

<new> Protégé

Project Edit Window Help

Classes Slots Forms Instances Queries

Relationship Superclass

- THING
- SYSTEM-CLASS
- Author
- Content
- Layout_info
- Library
- Newspaper
- Organization
- Person
- Class_0

Class_0 (type=:STANDARD-CLASS)

Name: Class_0

Documentation:

Constraints:

Role: Concrete

Template Slots

| Name | Type | Cardinality | Other Facets |
|------|------|-------------|--------------|
| | | | |

Workshop 5 *Wish List*

- Improved diagram widget **DONE**
- Improved API documentation **DONE**
- Inherited own-slot values (through API or UI) **NOT DONE**
- Undo **PARTIALLY DONE**
- Archive and restore buttons **DONE**
- Drag-n-drop everywhere **NOT DONE**
- Tear-off tabs **DONE**
- Synchronizing tabs on selected classes **DONE**
- Selected class/instance API call on instances tab **DONE**
- Search and replace slot values **NOT DONE**
- Database inclusion **NOT DONE**
- Adding things to included projects **NOT DONE**

Next Few Months

- 1.9 release (End of July)
- 2.0 release (Fall, 2003)
 - Multi-user support
 - Improved performance (>1M frames)
 - Project inclusion from multiple directories

Future

TBD!

- Improve web site
- Improve usability of application
- Browser-based interface (?)
- Holdovers from previous wish list...
- Namespaces
- Plugin validation test suites
- ???

Workshop 6 *Wish List*

- *Come back Wednesday afternoon*