*:96 Overheads

Part 8: Directory systems (systems to find addresses of people and organisations): X.500, Whois

Rating: Platform Independent Content Selection (PICS)

More about this course about Internet application protocols can be found at URL:

`http://www.dsv.su.se/~jpalme/internet-course/Int-app-prot-kurs.html`

Last update: 97-07-27 19.30

Directory systems

Information stored in directory systems

Name, e-mail address, phone and fax number, postal address, etc.

Cryptographic certificates: Directory system serve as trusted certificate servers.

Most advanced cryphtographic services: Identification, authorisation, signatures, seals, encryption of information, is based on or uses as a start electronic certifications of the person you are identifying. To be sure that such a certificate is not falsified, crypthographic techniques require a crypthographically secure communcation with the certificate server.

Systems based on manually created directories

X.500: The OSI directory system

LDAP (Lightweight Directory Acess Protocol): Simplified version of X.500 which many manufacturers support or plan to support

Whois: Old, limited Internet protocol

Whois++: New, advanced protocol

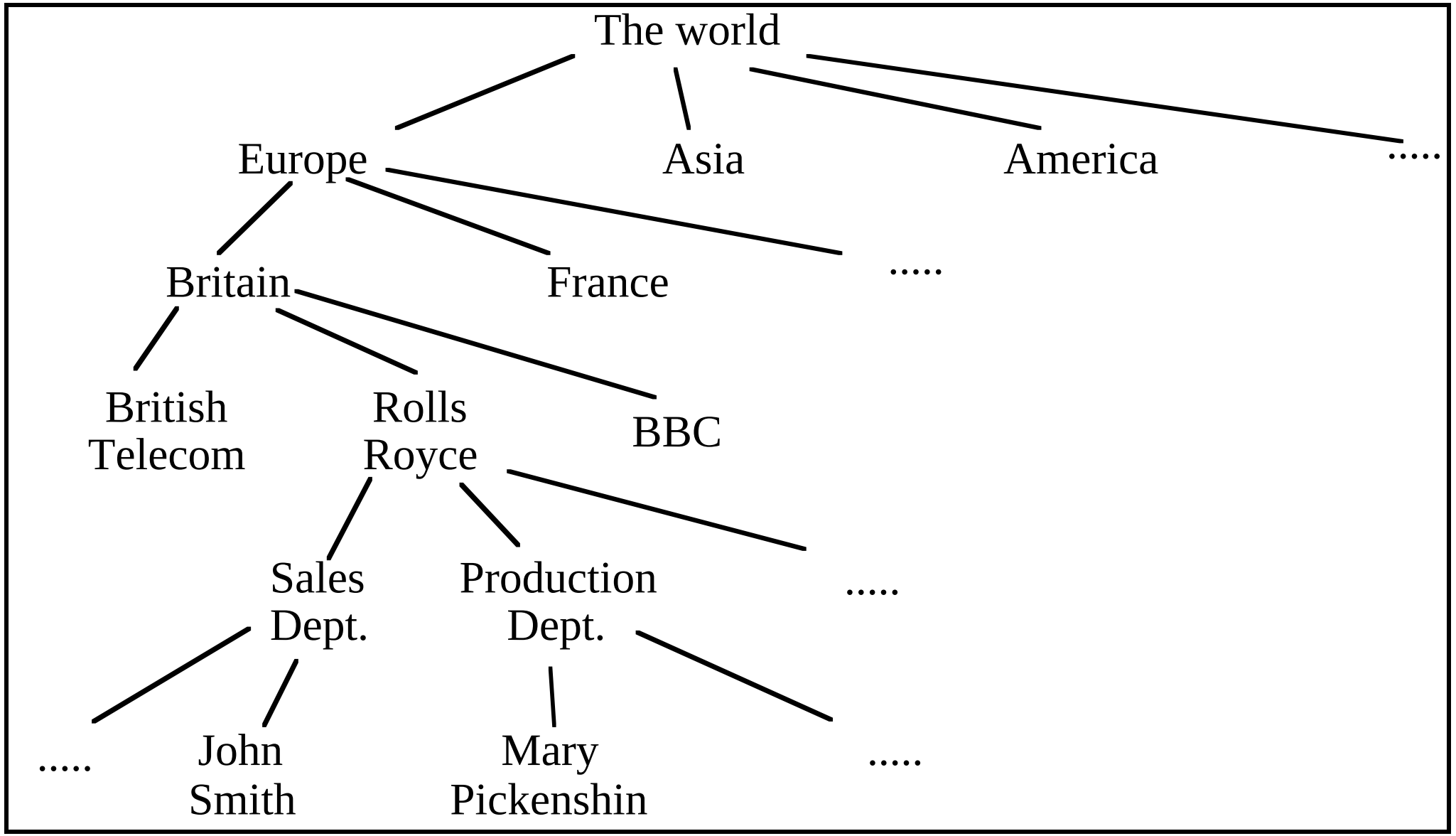
Systems based on automatic collection of information

WhoWhere, etc.: Servers who collect user information from mail, news and web pages.

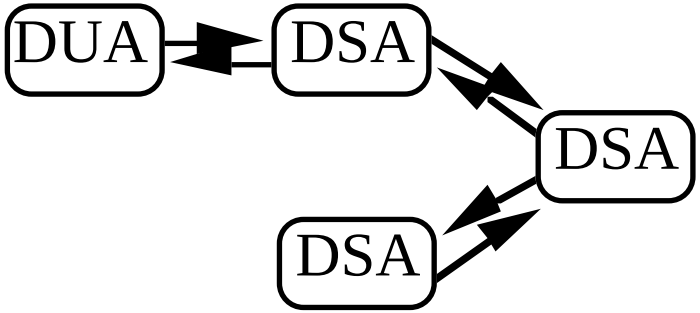
X.500 – the OSI directory system

- Distributed on many servers, like DNS.
- Replication and caching.
- Schema describes data base structure.
- Aliases.

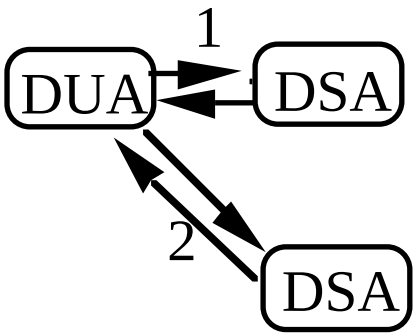
X.500 – hierarchical world view



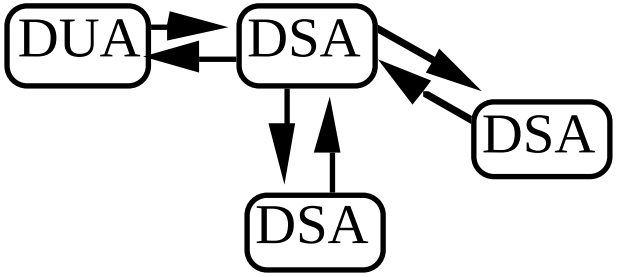
Chaining, referral and multicasting in X.500



This diagram shows *chaining*, where a query is forwarded from DSA to DSA and the reply is returned the same way.

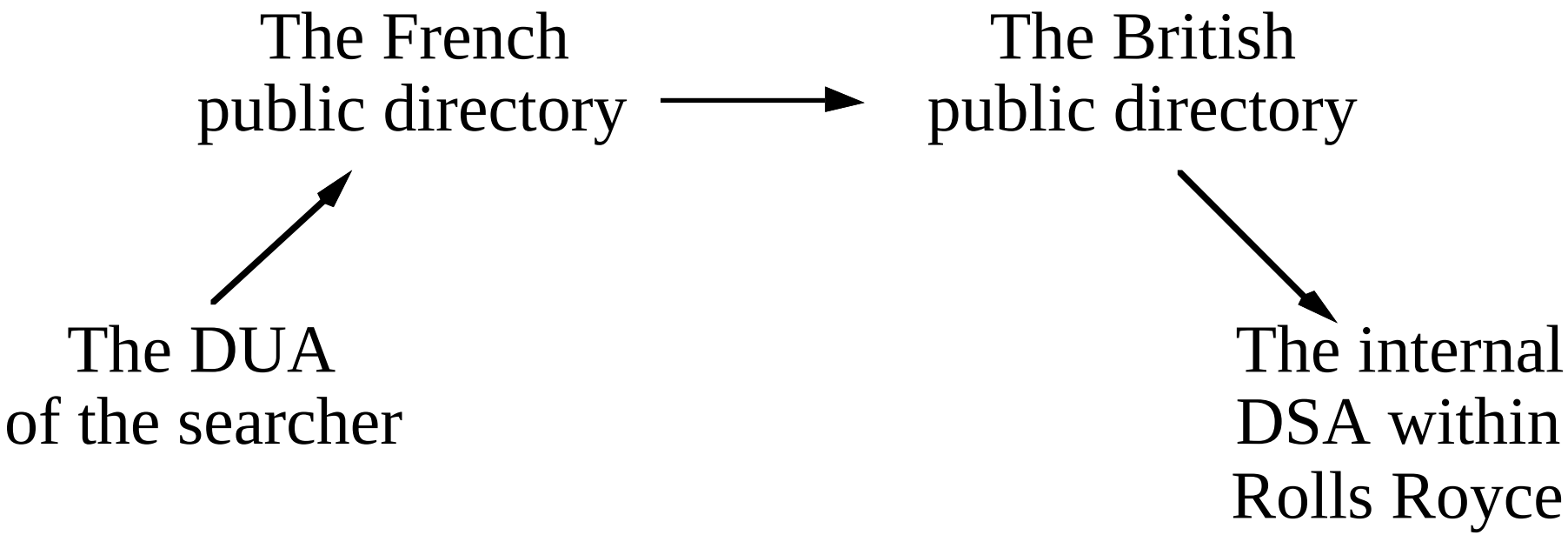


This diagram shows *referral*, where the DUA which sends a query is referred, by the initial DSA, to another DSA which is able to answer the query.



This diagram shows *multicasting*, where the first DSA will simultaneously send the query to several other DSAs and collect the replies.

Chaining in X.500



Sunet X.500 service user interface

Move upwards to Sweden

Read entry of

Universitetet i Stockholm

Subtree search in **Universitetet i Stockholm**: Jacob Palme SEARCH

Clear input

- Administrativ Utveckling (Department/Division)
- Analytisk kemi (Department/Division)
- Arkeologi (Department/Division)
- Astronomi (Department/Division)
- Biofysik (Department/Division)
- Biogeokemi (Department/Division)
- Biokemi (Department/Division)

Sunet X.500 service example of response

Move upwards to Data-och systemvetenskap

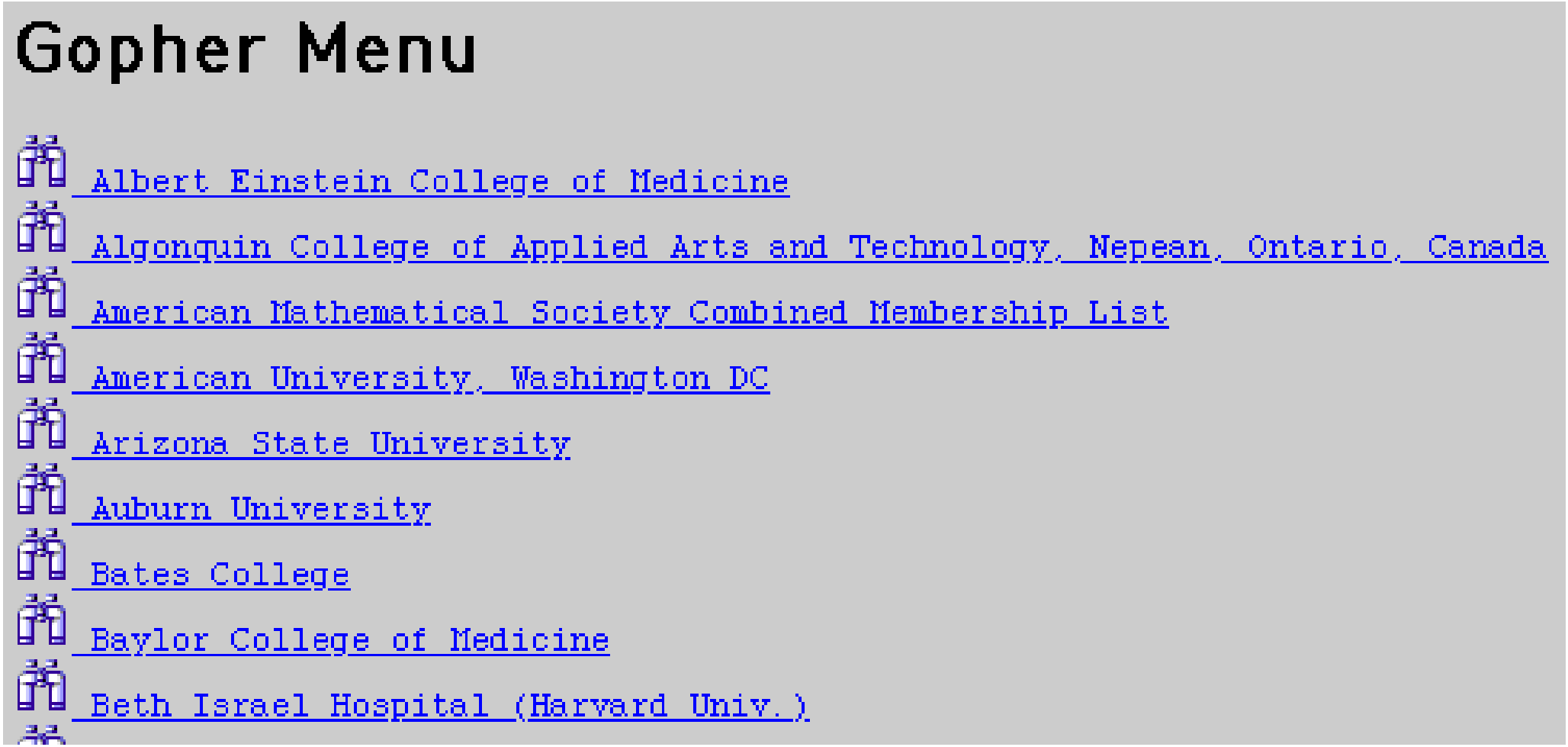
Found one entry by **exact** match.

Jacob Palme

Name
Jacob Palme
E-Mail
jpalme@dsv.su.se

Old Internet Whois service

Usually accessed via Gopher and not the Whois protocol itself



Connection to one Whois server at one university

gopher://ns.bcm.tmc.edu:105/2 CSO Search

A CSO database usually contains a phonebook or directory. Use the search function of your browser to enter search terms.

This is a searchable index. Enter search keywords: john smith

---

CSO Search Results

name: Smith-Johnson, Gwendolyn M

```
      title: Admin Assistant, L I
 department: Medical Illustration
    address: BCM-Cullen Building 303A
   category: Regular Faculty/Staff
      phone: 713-798-4681
        fax: 713-798-6853
      email: gjohnson@bcm.tmc.edu
```

Main functional difference between Whois++ and X.500:

Searches in tree-structed distributed directory systems like X.500 are difficult to perform efficiently if the user does not specify search conditions which limit the search to certain branches of the tree. If not, a global search has to be made in all servers everywhere.

Because of this, centralized data bases can easier perform efficient directory searches. Distributed and centralized data bases can be combined, if the centralized data bases replicate information whose master copy is in the distributed servers.

The Whois++ developers claim that Whois++ supports such replication of information to central data bases more efficiently than X.500. A subset of the part of a data base which is needed centrally, called a *centroid*, is copied in a controlled way to centralized so-called index servers. *A user search* which is not limited to a certain server, *is helped by the index servers to find the local server which has the directory information* searched for.

Whois++ user interface example

Digger White Pages search

Search for: smith

Show response as: ◯ All fields ◉ Expanded list ◯ One per line

Choose a server to start search at:

World [services.bunyip.com 63]

Submit Search

If you have any questions, send mail to: digger-info@bunyip.com

---

This Digger server is provided by Comedia Information AB.

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Whois++ search result unser interface

Digger search for "smith" , starting search on World level

More records exists, but contact could not be made with MUDDCS.CS.HMC.EDU

More records exists, but contact could not be made with IBS.EIT.COM

More records exists, but contact could not be made with WHOIS.LUT.AC.UK

Hugh Smith
Email: *hugh@nexor.co.uk*
Phone: +44-115-952-0503

Digger is a Registered Trade Mark of Bunyip Information Systems Inc

Whowhere:

http://users.aimnet.com/~dtowner/who.html

Looking for PEOPLE on the Net?

Enter the **Name of Person** you are looking for:

Jacob Palme (REQUIRED)

Enter any information you have about the **Organization** that provides an E-MAIL account for this person. For example, the Organization name and location (city, state or country)

(OPTIONAL)

Search Reset

Looking for ORGANIZATIONS on the Net?

Enter the **Organization Name and Location** information such as city, state or country: Example

Search

WhoWhere search result

Email Search Results: Over 500 approximate matches

Name: Jacob Palme **Info:** Search

◉ all matches ○ only exact matches

Highly Relevant Responses

- **Name:** Jacob Palme

E-mail: jpalme@dsv.su.se (click to send email)
Email Provider: University of Stockholm
Last Updated: March '96
Want to know more about Jacob Palme?

- **Name:** Jacob Palme

E-mail: jjalme@mars.dsv.su.se (click to send email)
Email Provider: University of Stockholm
Last Updated: --

- **Name:** Jacob Palme

E-mail: jpalme@heron.dafa.se (click to send email)
Email Provider: Dafa Data Ab
Last Updated: --

Personally registered information in WhoWhere

Jacob Palme
jpalme@dsv.su.se
http://www.dsv.su.se/~jpalme

Primary Email: jpalme@dsv.su.se

Web Page URL: http://www.dsv.su.se/~jpalme

Address: Skeppargatan 73
Stockholm, S-115 30
Sweden

Phone: +46-8-16 16 67

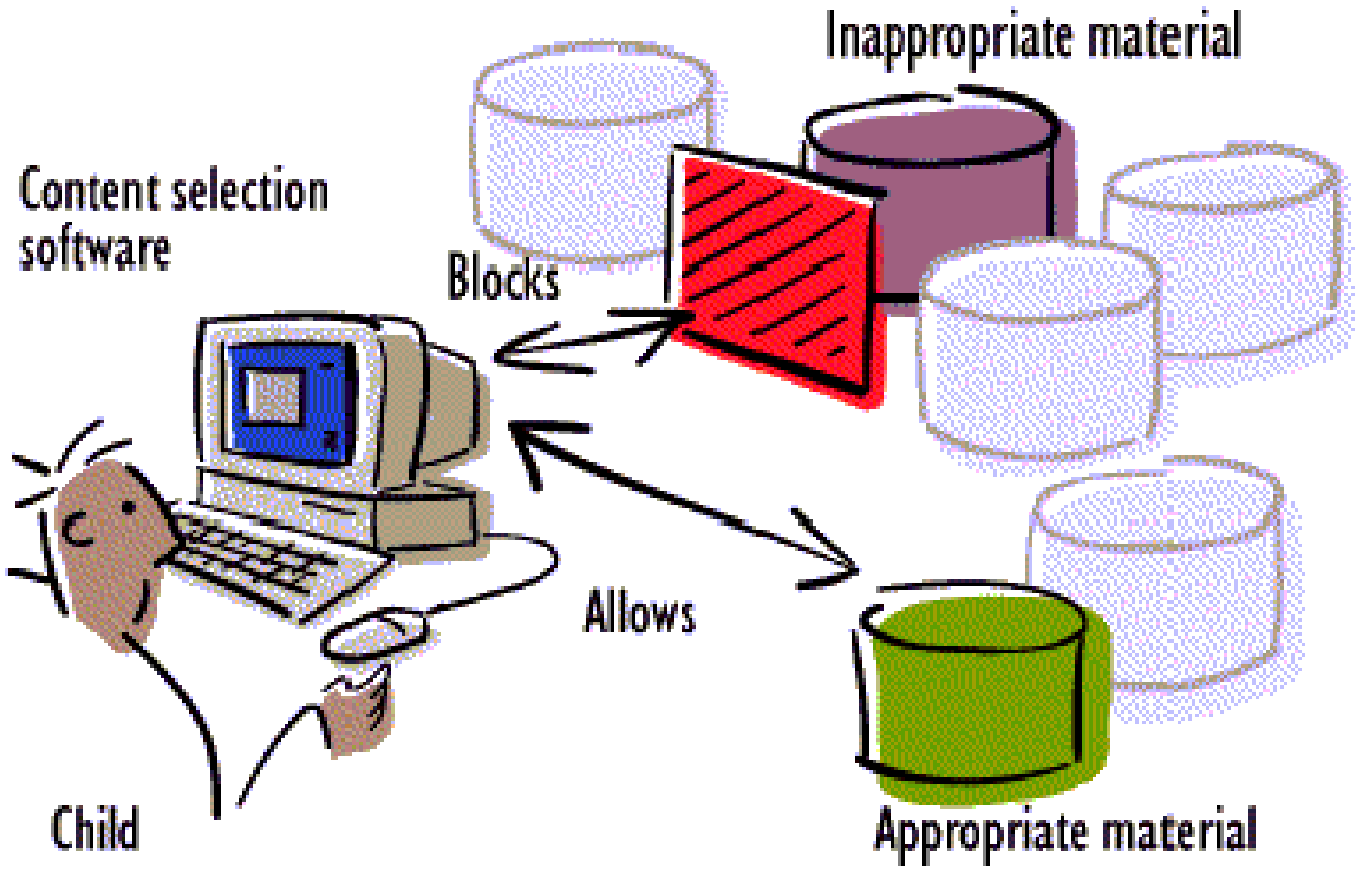
Non-tenured professor of computer science at Stockholm

This Listing was Last Customized in March '96

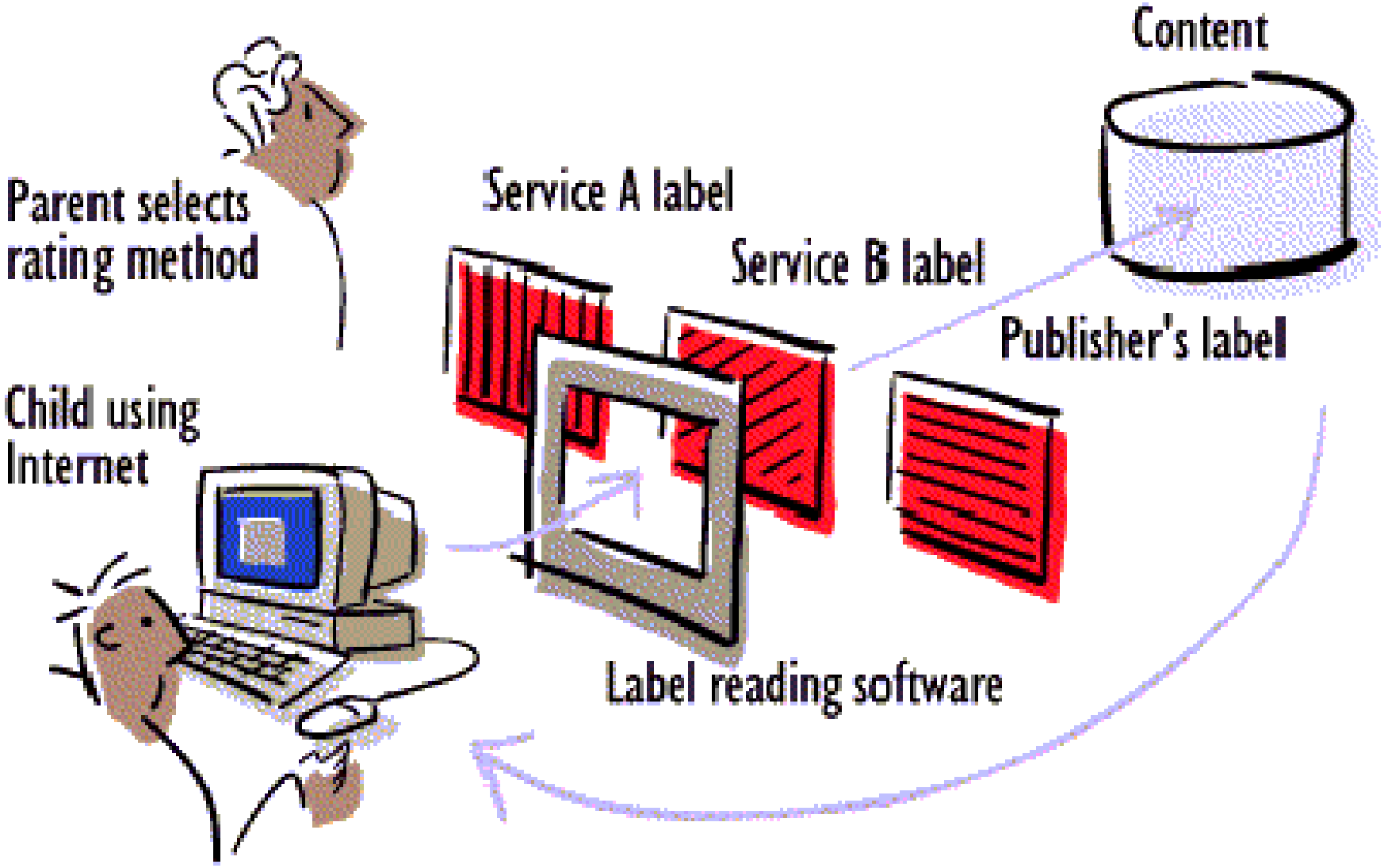
PICS 1 – Platform for Internet Content Selection

From a presentation by Jim Miller and Paul Resnic, found at URL:

`http://www.chg.ru/w3/PICS/951030/JM/talk.htm` and
`http://www.bilkent.edu.tr/pub/WWW/PICS/iacwc.htm`



PICS 2


Content
Parent selects rating method
Service A label
Service B label
Publisher's label
Child using Internet
Label reading software

PICS 3

PICS Technical Mission, excerpt

The technical working group will devise a values-neutral infrastructure for Internet content labeling. The three primary goals are to:

1. enable content providers to voluntarily label the content they create and distribute.
2. enable third-party labeling services to associate additional labels with content created and distributed by others. Services may devise their own labeling systems, and the same content may receive conflicting labels from different services.
3. enable parents and teachers to use the labels to control the information that children under their supervision receive.

PICS 4

A rating *service* is an individual, group, organization or company that produces labels for information. A *rating system* is a way of rating information, consisting of one or more *categories* and a *scale* for each category.

The **Motion Picture Association of America** (MPAA) is a rating service, which uses a well-known (in the United States) rating system for rating movies. Other organizations also provide rating systems or services, such as **SafeSurf** and **SurfWatch** (both PICS founding members) and the **Recreational Software Advisory Council** (a PICS supporting member).

A rating system provides a number of *categories* (or *dimensions*) along which information can be rated.

The MPAA rating system has only one category, the overall rating of the movie. The RSAC rating system has three categories: *nudity/sex*, *violence*, and *language*.

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A rating system provides a *scale* for each category.

The MPAA rating system's one category has a scale with values like "G," "PG," and so forth. RSAC's *nudity/sex* category uses a scale with values of "suitable for all ages," "partial nudity," and so on. RSAC's *language* category uses a scale with values of "some profanity," "explicit sexual references" and so on.

PICS Content Labels are values neutral

"The technical working group will define a format for labels, indicating required and optional fields. The format will not specify which words or categories will be used for labeling or the criteria for assigning labels to items."

(excerpt from the Technical Committee Charter)

Required information:

- the **rating service** which created the label,
- the name of a **category** in their **rating system**,
- a **value** on the **scale** for that category.

Optional information:

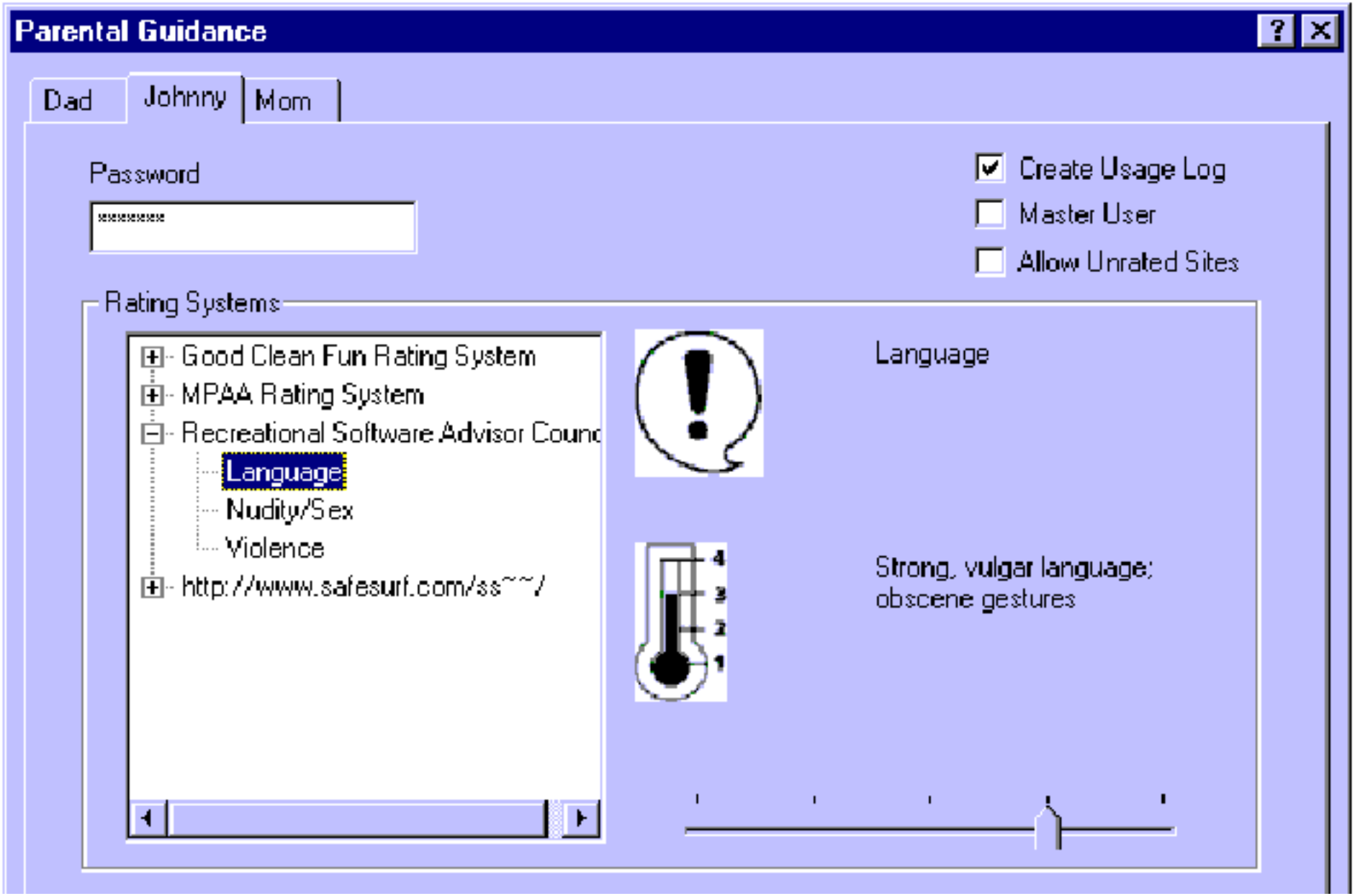
- When the label was assigned to the information
- When the label expires
- Consistency checking information (URL of information, date of information when it was rated, cryptographic checksum of information actually rated)
- Who provided the rating
- Where additional information can be found

Specification of a PICS schema

```
((PICS-version 1.0)
  (rating-system "http://moviescale.org/Ratings/Description/")
  (rating-service "http://moviescale.org/v1.0")
  (icon "icons/moviescale.gif")
  (name "The Movies Rating Service")
  (description
  "A rating service based on the MPAA's movie rating scale")

  (category
   (transmit-as "r")
   (name "Rating")
   (label (name "G") (value 0) (icon "icons/G.gif"))
   (label (name "PG") (value 1) (icon "icons/PG.gif"))
   (label (name "PG-13") (value 2) (icon "icons/PG-13.gif"))
   (label (name "R") (value 3) (icon "icons/R.gif"))
   (label (name "NC-17") (value 4) (icon "icons/NC-17.gif"))))
```

User interface for parents



An example of a PICS label

PICS specifies a standard format for labels. Figure 5 shows a sample. The URL on the first line, which identifies the labeling service, makes it possible to redistribute labels yet still identify their original sources. The label can also include information about itself, such as the date on which it was created, the date it will expire, that the label is associated with a certain resource (in this case, "http://www.gcf.org/stuff.html"), and the label's author. The last line shows the attributes that describe the resource: a "language" value of 3; "sex" 2; and "violence" 0.

```
(PICS-1.0 "http://www.rsac.org/v1.0/"
labels
 on "1994.11.05T08:15-0500"
 until "1995.12.31T23:59-0000"
 for "http://www.gcf.org/stuff.html"
 by "John Patrick"
 ratings (l 3 s 2 v 0))
```

An example of a PICS interaction

Client sends to HTTP server www.greatdocs.com to request a document:

```
GET foo.html HTTP/1.1
Accept-Protocol: {PICS-1.0 {params full {services
"http://www.gcf.org/1.0/"}}}
```

Server responds to client with result including PICS label:

```
HTTP/1.1 200 OK
Date: Thursday, 30-Jun-95 17:51:47 GMTMIME-version:
1.0
Last-modified: Thursday, 29-Jun-95 17:51:47 GMT
Protocol: {PICS-1.0 {headers PICS-Label}}
PICS-Label: …label here…
Content-type: text/html
…contents of foo.html…
```

Terminology

VAC	Voluntary Access Control
PICS	Platform for Internet Content Selection
WWWC, W^3C	World Wide Web Consortium
Rating service	Service provider providing rating services
Rating system	Schema for a rating service
Content label	The rating of a particular object (document, site, domain)