

# Challenges in Running a Commercial Web Search Engine

**Amit Singhal**

**Google™**

**Google™**

# Overview



- Introduction/History
- Search Engine Spam
- Evaluation Challenge
- Google



# Introduction



- **Crawling**
  - Follow links to find information
- **Indexing**
  - Record what words appear where
- **Ranking**
  - What information is a good match to a user query?
  - What information is inherently good?
- **Displaying**
  - Find a good format for the information
- **Serving**
  - Handle queries, find pages, display results



# History



- The web happened (1992)
- Mosaic/Netscape happened (1993-95)
- Crawler happened (1994): M. Mauldin
- SEs happened 1994-1996
  - InfoSeek, Lycos, Altavista, Excite, Inktomi, ...
- Yahoo decided to go with a directory
- Google happened 1996-98
  - Tried selling technology to other engines
  - SEs though search was a commodity, portals were *in*
- Microsoft said: whatever ...



# Present



- Most search engines have vanished
- Google is a big player
- Yahoo decided to de-emphasize directories
  - Buys three search engines
- Microsoft realized Internet is here to stay
  - Dominates the browser market
  - Realizes search is critical



# History



- Early systems Information Retrieval based
  - Infoseek, Altavista, ...
- Information Retrieval
  - Field started in the 1950s
  - Primarily focused on text search
  - Already had written-off directories (1960s)
  - Mostly uses statistical methods to analyze text

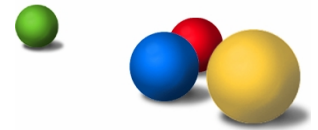


# History



- IR necessary but not sufficient for web search
- Doesn't capture authority
  - Same article hosted on BBC as good as a slightly modified copy on john-doe-news.com
- Doesn't address web navigation
  - Query *ibm* seeks **www.ibm.com**
  - To IR **www.ibm.com** may look less topical than a quarterly report

# History



- But there are links
  - Long history in citation analysis
  - Navigational tools on the web
  - Also a sign of popularity
  - Can be thought of as recommendations (source recommends destination)
  - Also describe the destination: anchor text



# History



- Link analysis
  - Hubs and authority (Jon Kleinberg)
    - Topical links exploited
    - Query time approach
  - PageRank (Brin and Page)
    - Computed on the entire graph
    - Query independent
    - Faster if serving lots of queries
  - Others...

# History



- Google showed link analysis can make a huge difference and is practical too
  - Everyone else followed
- Then there is the secret sauce
  - Link analysis
  - Information retrieval
  - Anchor text
  - Other stuff



# History



- Interfaces
  - Many alternatives existed/exist
    - Simple ranked list
    - Keywords in context snippets (Google first SE to do this)
    - Topics/query suggestion tools (e.g. Vivisimo, Teoma)
    - Graphical, 2-D, 3-D
  - Simple and clean preferred by users
    - Like relevance ranking
    - Like keywords in context snippets



# End Product



- As of today
  - Users give a 2-4 word query
  - SE gives a relevance ranked list of web pages
  - Most users click only on the first few results
  - Few users go below the fold
    - Whatever is visible without scrolling down
  - Far fewer ask for the next 10 results



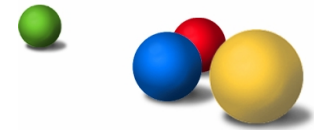
# Overview



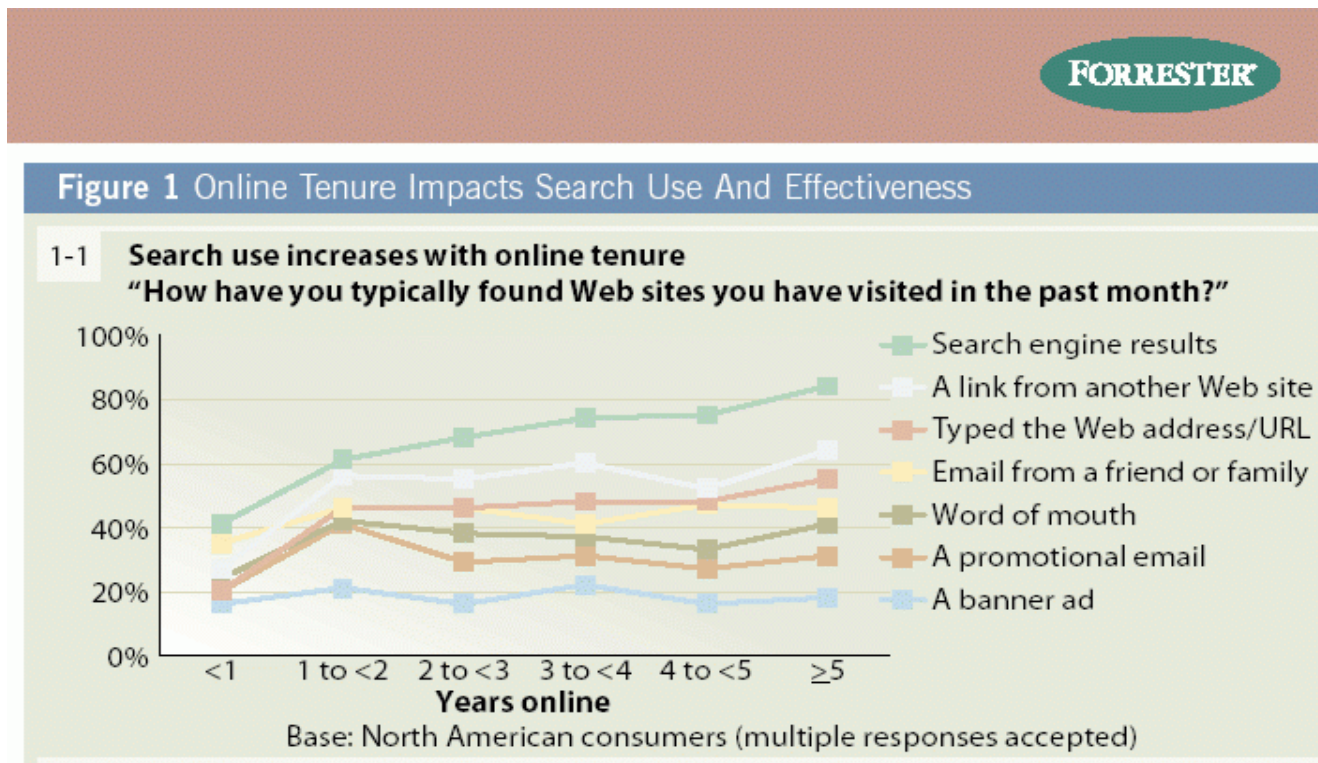
- Introduction/History
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# Oh No ... This is REAL



- 80% of users use search engines to find sites



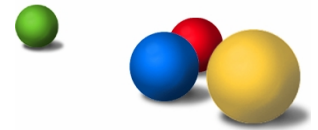
# Enter the Greedy Spammer



- Users follow search results
- Money follows users, spam follows ...
- There is value in getting ranked high
  - Affiliate programs
    - Siphon traffic from SEs to Amazon/eBay/...
      - Make a few bucks
    - Siphon traffic from SEs to a Viagra seller
      - Make \$6 per sale
    - Siphon traffic from SEs to a porn site
      - Make \$20-\$40 per new member



# Big Money



- Let's do the math
- How much can the spam industry make by spamming search engines?
  - Assume 500M searches/day on the web
    - All search engines combined
  - Assume 5% commercially viable
    - Much more if you include porn queries
  - Assume \$0.50 made per click (from 5c to \$40)
  - \$12.5M/day or about \$4.5 Billion/year





# How?



- Defeat IR
  - Keyword stuffing
  - Crawlers declare that it is a SE spider
  - They dish us an “optimized” page

These search terms have been highlighted: **cheap airplane tickets**

## cheap airairplane tickets

cheap international airairplane tickets really cheap airairplane tickets airairplane tickets cheap student airline airplane cheap ticket airplane cheap fare ticket airplane tickets cheap airplane tickets air airplane tickets discount airplane tickets airplane tickets price one way airplane tickets international airplane tickets last minute airplane tickets cheapest airplane tickets airplane tickets cheap buy airplane tickets online airplane tickets cheap international airplane tickets vintage airplane tickets free airplane tickets airplane tickets canada airplane tickets online cheap holiday airplane tickets student airplane tickets airplane tickets discount buy airplane tickets online cheap one way airplane tickets cheap airplane tickets for holiday around the world airplane tickets cheapest air airplane tickets ticket plane airplane tickets to hawaii first class airplane tickets discounted airplane tickets very cheap airplane tickets bargain airplane tickets plane and ticket hawaii airplane tickets air france airplane tickets low price airplane tickets airplane tickets deal get cheap airplane tickets the cheapest airplane tickets low fare airplane tickets travel airplane tickets purchase airplane tickets student discount airplane tickets lowest airplane tickets airline airplane tickets buy cheap airplane tickets airplane tickets to florida orbit

Home | Itinerary | Reservations: [Flight](#) - [Hotel](#) - [Car](#) | [Tell-a-friend](#) | [HELP](#)

### Flight Preferences

Trip Type	Class of Service	
Round Trip	Economy	Select One Way, Round Trip, Multiple Leg Trip and Class of Service
Depart from		City name or city/airport code (e.g. Atlanta or ATL).
Arrive at		
Departure	Date	Time
February	9	09 AM
Return	Date	Time
February	16	09 AM
Type and Number of Passengers		
Adult	1	
Accompanied Child	0	
Infant Without Seat	0	
Senior Citizen	0	

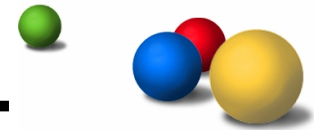
The maximum number of passengers per reservation is 9.  
Infant applies to children under 2.  
Child applies to ages 2 through 11.  
Youth applies to ages 12 through 25.  
Senior Citizens applies to over-65s.

When you check this option our system

[TRAVELFORUM OUR LINKLIST](#)



# But that should be easy...



- Just detect keyword density

These search terms have been highlighted: **rich chinese**

**We have the best selection of (asian) spoiled rich chinese babe eats grapes nude! porno inside.**

Only here will you find (asian) spoiled rich chinese babe eats grapes nude! pictures inside my (asian) spoiled rich chinese babe eats grapes nude! website.

Scroll down to get the latest information on everything

The only (asian) spoiled rich chinese babe eats grapes nude! site with up to date collection of (asian) spoiled rich chinese babe eats grapes nude! also the latest gallery and (asian) spoiled rich chinese babe eats grapes nude! pictures.

You came here to see some (asian) spoiled rich chinese babe eats grapes nude! action, huh? or some free (asian) spoiled rich chinese babe eats grapes nude! pictures, sexo anal & is this a fine ass on a really cute blonde?.

And if you agree to your terms and conditions, go ahead and enter our free galleries of (asian) spoiled rich chinese babe eats grapes nude!.

This has got to be the HOTTEST (asian) spoiled rich chinese babe eats grapes nude! site on the internet.

**Subscribe now for FREE and get Hardcore XXX Pix Delivered Daily!**

E-mail Address:

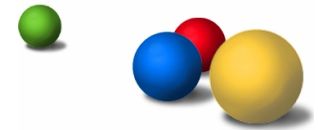
**A few minutes after subscribing, an e-mail will arrive for you with full details!**

**Yes, Im ready**

**Let Me Enter (asian) spoiled rich chinese babe eats grapes nude!**



# But that is easy too...



- Just detect that page is not about query

HOME ABOUT US PRICES REFILL ORDER ORDER STATUS SUPPORT FAQ CONTACT US

GET THE MEDICATION YOU NEED DELIVERED TO YOUR DOOR IN 24 HOURS  
medication online QUALITY

**New Pharmacy Huge Discount On Medications**

**herbs for migraine**

**Taking Control**

Once you recognize that herbs for migraine has an impact on your life, it is important to take control of managing your herbs for migraine. The first step is to schedule a specific appointment with your health care provider to discuss herbs for migraine. For a proper herbs for migraine diagnosis, illness severity assessment, and treatment plan, an appointment dedicated to herbs for migraine is necessary.

**Working with Your Doctor**  
When at the doctor's office, there are several important items to discuss. Make sure to describe the features of the herbs for migraine itself (pain, nausea, vomiting, pounding) along with several other points:

Weight Loss

- [Adipex](#)
- [Phendimetrazine](#)
- [Didrex](#)
- [Diethylpropion](#)
- [Ionamin](#)
- [Meridia](#)
- [Bontril](#)

HOME ABOUT US PRICES REFILL ORDER ORDER STATUS SUPPORT FAQ CONTACT US

GET THE MEDICATION YOU NEED DELIVERED TO YOUR DOOR IN 24 HOURS  
medication online QUALITY

**Ocular Migraine Stroke**

**Taking Control**

Once you recognize that Ocular Migraine Stroke has an impact on your life, it is important to take control of managing your Ocular Migraine Stroke. The first step is to schedule a specific appointment with your health care provider to discuss Ocular Migraine Stroke. For a proper Ocular Migraine Stroke diagnosis, illness severity assessment, and treatment plan, an appointment dedicated to Ocular Migraine Stroke is necessary.

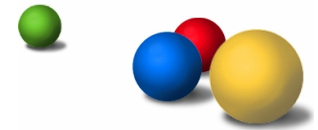
**Working with Your Doctor**  
When at the doctor's office, there are several important items to discuss. Make sure to describe the features of the Ocular Migraine Stroke itself (pain, nausea, vomiting, pounding) along with several other points:

Weight Loss

- [Adipex](#)
- [Phendimetrazine](#)
- [Didrex](#)
- [Diethylpropion](#)
- [Ionamin](#)



# Legitimate NLP Parse



- Noun phrase to noun phrase

## **Taking Control**

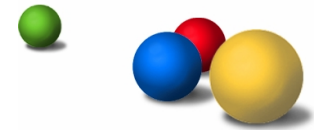
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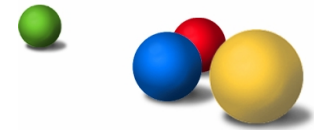
# But links should help...



- No one should link to these bad sites
  - Expired domains
    - The owner of a legitimate domain doesn't renew it
    - Spammers grab it, it already has tons of incoming links
    - E.g., anchor text for
      - The War on Freedom
      - The War on Freedom: How and Why America was attacked
      - The War on Freedom



# Get Links



## Guestbooks

Clayton new mexico Union County

VISIT EVENTS BUSINESS HISTORY PROFILE

SUNDAY, FEBRUARY 8, 2004 CURRENT WEATHER: CLEAR, 24.1 F (-4.4 C) HOME / **GUESTBOOK** / View

[View](#) << PRINT VERSION

Sign Guest Book

Last Signed: September 24, 2003  
By: **Viagra**  
E-Mail: jose\_ramos@**viagra**-rx-store.com  
Homepage: http://www.http://**viagra**-rx-store.com

Message: I gotta hand it to ya, very nice site! **Viagra Viagra**

---

Last Signed: September 24, 2003  
By: **Viagra**  
E-Mail: luis\_gabe@**viagra**-soft-tabs-rx-store.com  
Homepage: http://www.http://**viagra**-soft-tabs-rx-store.com

Message: There is good, and there is GOOD! I put this site in the GOOD category! **Viagra Viagra**

---

Last Signed: September 24, 2003  
By: **Viagra**  
E-Mail: torence\_weldman@**viagra**-rx-store.com  
Homepage: http://www.http://**viagra**-rx-store.com

Message: Very Nice. I was in a bad mood all day and then I ran across this site. Thanks, you made my day better.  
**Viagra Viagra**

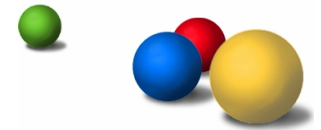
---

Last Signed: November 17, 2003  
By: **Viagra**  
E-Mail: blue-pills@genuine-pfizer-**viagra**.com  
Homepage: http://www.http://www.genuine-pfizer-**viagra**.com/

Message: Great site, well done.



# Get Links



## Mailing lists

[W3C home](#) > [Mailing lists](#) > [Public](#) > [html-tidy@w3.org](#) > [October to December 1999](#)

### Natural **Viagra** Alternative! (Adv.)

*This message:* [ [Message body](#) ] [ [Respond](#) ] [ [More options](#) ]  
*Related messages:* [ [Next message](#) ] [ [Previous message](#) ]

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**From:** <[Viagra@weeklysex.com](mailto:Viagra@weeklysex.com)>  
**Date:** Sat, 11 Dec 1999 17:27:02 +0000  
**To:** <[html-tidy@w3.org](mailto:html-tidy@w3.org)>  
**Message-Id:** <16270281811057@napolionline.com>

The Ultimate Sensation!

Get your "Men's Ultra" Now, No Doctor's Prescription needed! 100 % Natural

Special Sale Price \$39.95 - 60 Caplets

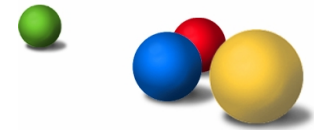
Includes Shipping & Handling "30 Day Money Back Guarantee" Credit Cards, I

---


**Received on** Saturday, 11 December 1999 17:26:03 EST



# Get Links



## Link Exchange



<a href="#">Thrifty Home</a>	<a href="#">About Us</a>	<a href="#">Worldwide Locations</a>	<a href="#">Thrifty Partners</a>	<a href="#">Franchise Sales</a>	<a href="#">Insurance Details</a>	<a href="#">Frequent Flyers</a>
------------------------------	--------------------------	-------------------------------------	----------------------------------	---------------------------------	-----------------------------------	---------------------------------

### related links

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#### Accommodation Links

#### Rest of World

#### Accommodation Directories

[Armchair Travel](#) - Plan your next holiday, accommodation or travel arrangements  
[Cape Car Rentals](#) - Your online resource for Car Rentals!  
[Pamela Lanier's Bed and Breakfast Guide Online](#) - Free searchable database of over 58,000 quality Bed & Breakfast Inns, Small Hotels, Golf Courses, Family Travel Accommodations and more!  
[www.alleuropeaccommodation.com](http://www.alleuropeaccommodation.com)  
[Redflag](#) - Chinese hotel travel guide  
[www.1stvacations.com](http://www.1stvacations.com)  
[www.allcheaphotels.net](http://www.allcheaphotels.net)  
[Discount Hotels](#) - Discount Hotel Reservations Worldwide - find great discounts for all hotels worldwide  
[www.amsterdamhotels-discount.com](http://www.amsterdamhotels-discount.com)  
[www.1st-berlin-hotels.com](http://www.1st-berlin-hotels.com)  
[www.aboutanyhotel.com](http://www.aboutanyhotel.com)  
[www.travelwand.com](http://www.travelwand.com)  
[travelchiapas.com](http://travelchiapas.com) - Travel Information for Chiapas Mexico





# State of Affairs



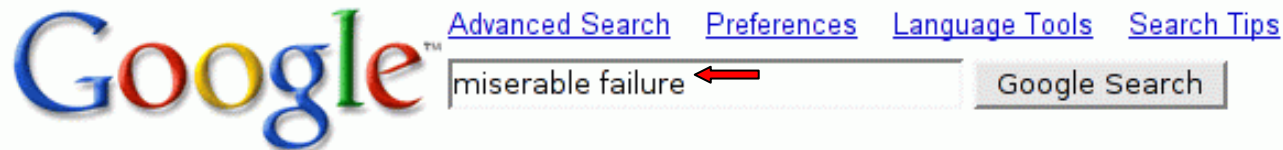
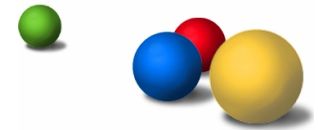
- There is big money in spamming SEs
- Easy to get links from good sites
- Easy to generate search algorithm friendly pages
- Any technique can be and *will be* attacked by spammers
- Have to make sense out of this chaos

# We counter it well



- Most SEs are still very useful
  - Used over 500 million times every day
    - All search engines put together
- Our internal measurements show that **we are winning**
- Still need to be watchful

# And then...



Web Images Groups Directory News  
Searched the web for **miserable failure**. Results 1 - 10 of about 267,000. Search took 0.07 seconds.

## [Michael Moore.com](#)

CLICK HERE TO CONTINUE TO MICHAELMOORE.COM Tuesday, January 27th, 2004  
You Say Deserter, I Say More Dessert... by Michael Moore. Friends, ...  
Description: Official site of the gadfly of corporations, creator of the film Roger and Me and the television show...  
Category: [Arts > Celebrities > M > Moore, Michael](#)  
[www.michaelmoore.com/](#) - 13k - Feb 8, 2004 - [Cached](#) - [Similar pages](#)

## [Michael Moore.com](#)

... He also testifies pre-war intelligence **failure** is "disturbing." His words overshadow the coming reports from the Senate and the CIA. ...  
[www.michaelmoore.com/index\\_real.php](#) - 46k - Feb 8, 2004 - [Cached](#) - [Similar pages](#)

## [Biography of President George W. Bush](#) ←

Home > President > Biography President George W. Bush En Español.  
George W. Bush is the 43rd President of the United States. He ...  
Description: Biography of the president from the official White House web site.  
Category: [Kids and Teens > School Time > ... > Bush, George Walker](#)  
[www.whitehouse.gov/president/gwbbio.html](#) - 29k - [Cached](#) - [Similar pages](#)

## Sponsored Links

### [Say "No" to Bush Election](#)

We need new voters to register!  
Our bumper stickers tell the world  
[www.momerath.us/vote](#)  
Interest:

### [Liberal Voodoo Dolls](#)

Do Liberals Bug You? Bug Them Back.  
Put a Curse on the Competition!  
[www.PinheadVoodooDolls.com](#)  
Interest:

### [iWorkWithFools.com](#)

Work With Fools? We All Do.  
Read and Share Real Stories.  
[www.iWorkWithFools.com](#)  
Interest:

[See your message here...](#)



# Overview



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- Search Engine Spam
- Evaluation Challenge
- Google



# Information Retrieval



- Test collection paradigm of evaluation
  - Static collection of documents (few million)
  - A set of queries (around 50-100)
  - Relevance judgments
  - Extensive judgments not possible (100x1,000,000)
  - Use pooling
    - Pool top 1000 results from various techniques
    - Assume all possible relevant documents judged
    - Biased against revolutionary new methods
      - Judge new documents if needed

# On the Web



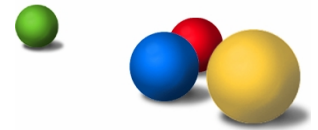
- Collection is dynamic
  - 10-20% urls change every month
  - Spam methods are dynamic
  - **Need to keep the collection recent**
- Queries are also time sensitive
  - Topics are hot then not
  - Need to keep a representative sample

# On the Web



- Search space is HUGE
  - Over 200 million queries a day
  - Over 100 million are unique
  - Need 2700 queries for a 5% (700 for 10%) improvement to be meaningful at 95% confidence
- Search space is varied
  - Serve 90 different languages
  - Can't have a catastrophic failure in any
  - Monitoring every part of the system is non-trivial
- IR style evaluation
  - Incredibly expensive
  - Always out of date

# On the Web



- But what about user behavior?
  - You can use clicks as supervision.
- Clicks
  - Incredibly noisy
  - A click on a result does not mean a vote for it
    - The destination may just be a traffic peddler
    - User taken to some other site
    - If anything, this (clicked) result was BAD



# Blue and Gold Fleet



[Advanced Search](#) [Preferences](#) [Language Tools](#) [Search Tips](#)

blue and gold fleet

Google Search

The "AND" operator is unnecessary -- we include all search terms by default. [\[details\]](#)

[Web](#) [Images](#) [Groups](#) [Directory](#) [News](#)

Searched the web for **blue and gold fleet**. Results 1 - 10 of about 127,000. Search took 2.39 seconds.

By default, Google searches for variations of your search terms. To search only for an exact term, place a '+' sign before it.

## [Homeport](#)

**Blue and Gold Fleet**, exclusive provider of transportation to Alcatraz Island, is a passenger vessel company and tour excursion operator providing vessel ...

[www.blueandgoldfleet.com/](http://www.blueandgoldfleet.com/) - 11k - [Cached](#)

## [Blue & Gold Fleet](#)

Main Menu : **Blue & Gold Fleet ... Blue & Gold Fleet** also operates the Alameda/Oakland Ferry and the Vallejo Baylink Ferry. Schedules. ...

[198.94.156.9/BlueGoldFleet/](http://198.94.156.9/BlueGoldFleet/) - 4k - [Cached](#)

## [Blue & Gold Fleet Bicyclist's Guide](#)

**Blue & Gold Fleet** Bicyclist's Guide. Main Menu : **Blue & Gold Fleet**

: Bicyclist's Guide You can find out more about bicycling in the ...

[198.94.156.9/BlueGoldFleet/bicycles.html](http://198.94.156.9/BlueGoldFleet/bicycles.html) - 3k - [Cached](#)

[ [More results from 198.94.156.9](#) ]

## [Transit.511.org](#)

... Alameda/Oakland Ferry Altamont Commuter Express (ACE) American Canyon Transit Angel Island/Tiburon Ferry BART Benicia Transit **Blue & Gold Fleet** Brentwood Dimes ...

[www.transitinfo.org/providers/coverage.asp?mc=InitialMap&cid=BG](http://www.transitinfo.org/providers/coverage.asp?mc=InitialMap&cid=BG) - 36k - [Cached](#)

## [San Francisco: Blue and Gold Fleet](#)

... < Previous | Main | Next >>. **Blue and Gold Fleet**. San Francisco Bay - July 2003. Graphically modified. Taken from ferry to Alcatraz. Permalink.

[thespacebetween.typepad.com/photos/san-francisco/blue-and-gold-fleet.html](http://thespacebetween.typepad.com/photos/san-francisco/blue-and-gold-fleet.html) - 10k - [Cached](#)



# We do Very Well



- Continually evaluate our system
  - In multiple languages
  - Tests valid over large traffic
  - Caught many possible disasters
- Constantly launch changes/products
  - Stemming, Google News, Froogle, Usenet, ...



# Overview



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  - Finding Needles in a 20 TB Haystack, 200M times per day



# Past



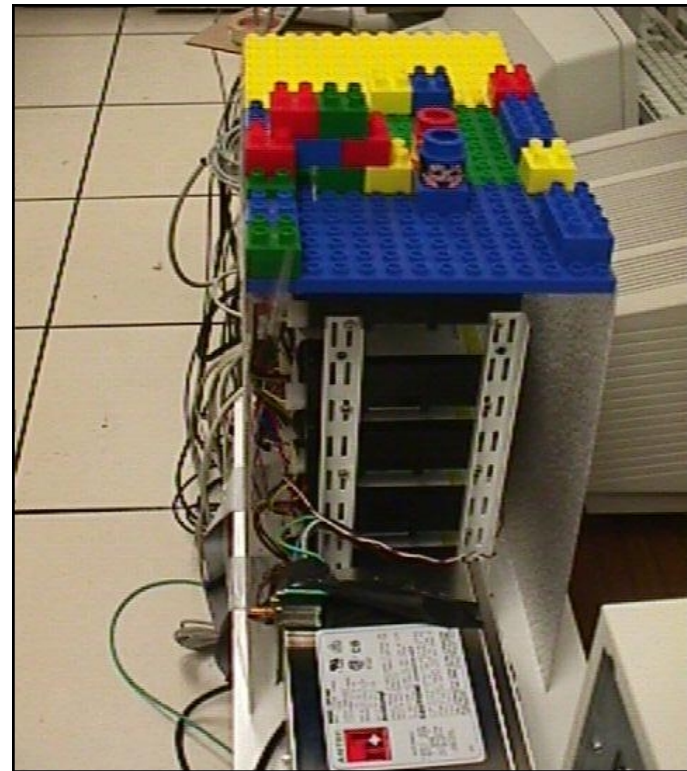
1995 research project at Stanford University



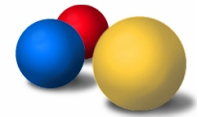
# Lego Disk Case



One of our earliest storage systems

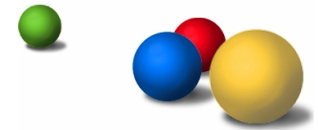


# Peak of google.stanford.edu



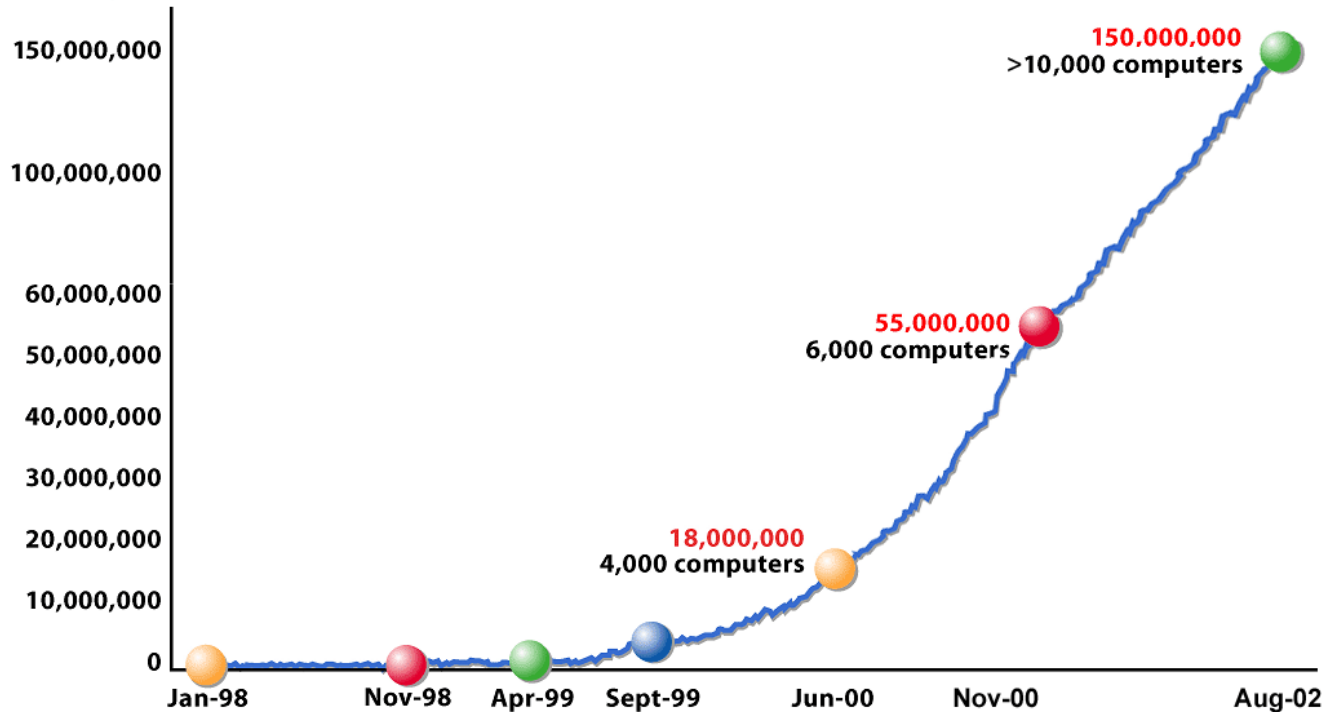
Google™

# Growth

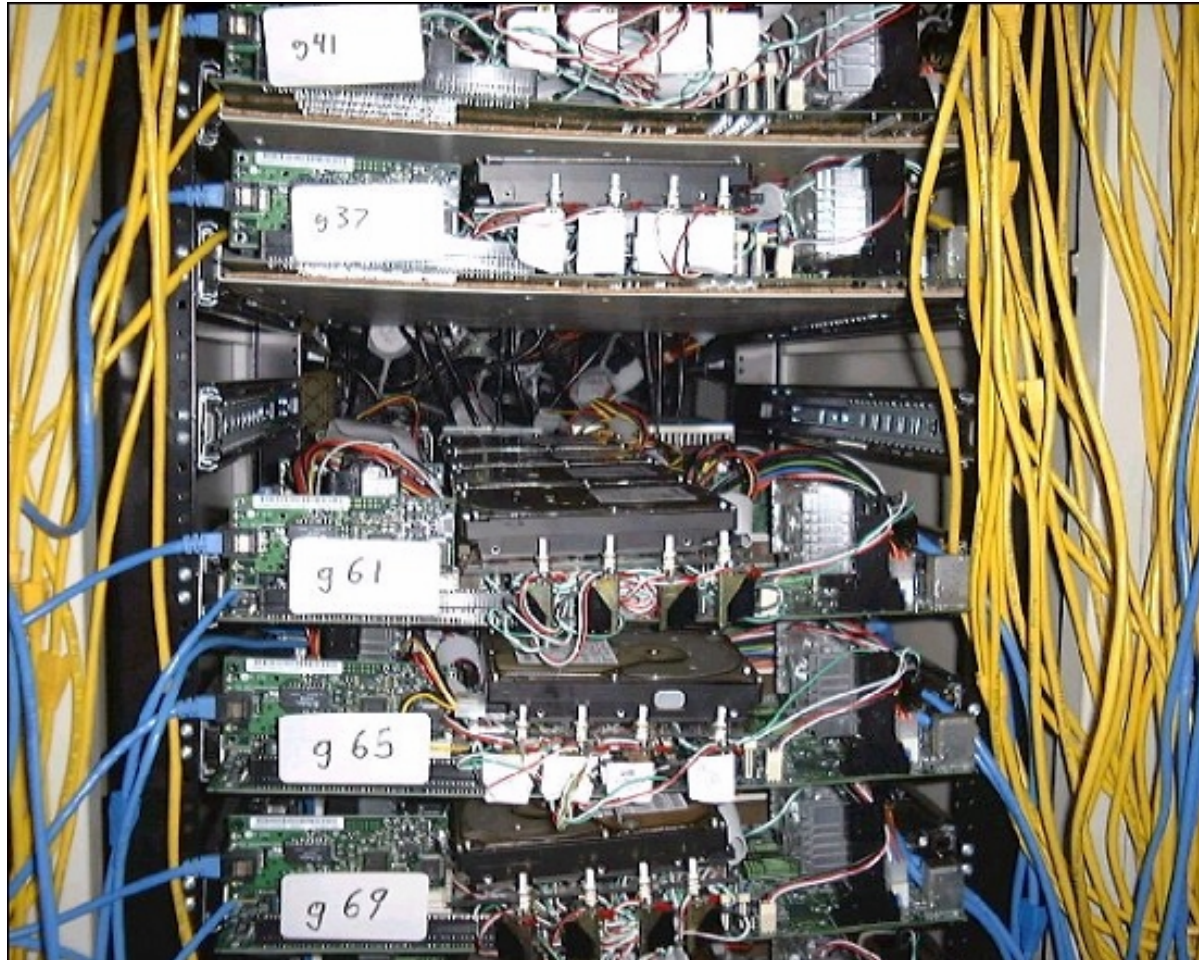
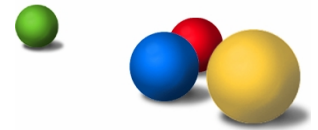


- Nov. 98: 10,000 queries on 25 computers
- Apr. 99: 500,000 queries on 300 computers
- Sept. 99: 3M queries on 2,100 computers

Number of Queries



# Servers 1999

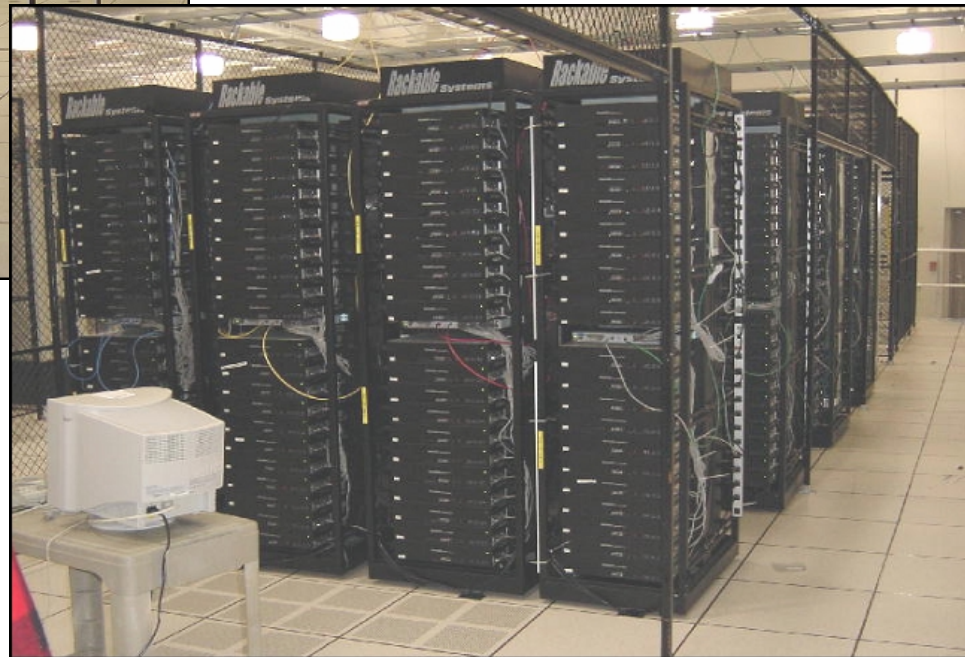




# Datacenters now



And 3 days later...

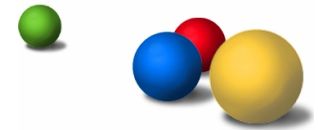


Where the users are...



Google™

# What can we learn...



- Structure of Web
- Interests of Users
- Trends and Fads
- Languages
- Concepts
- Relationships

## Google Zeitgeist - Search patterns, trends, and surprises according to Google

For both breaking news and obscure information alike, people around the world search on Google at [www.google.com](http://www.google.com). With a bit of analysis, this flurry of searches often exposes interesting trends, patterns, and surprises.

On a monthly, weekly, and sometimes daily basis, this Google Zeitgeist page will be updated to reflect lists, graphs, and other tidbits of information related to Google user search behavior.

Archived information [available here](#).

Top 10 Gaining Queries Week Ending Jan. 28, 2002	
1.	<a href="#">sarah connor</a>
2.	<a href="#">rose red</a>
3.	<a href="#">mike Tyson</a>
4.	<a href="#">Chu Mei-feng</a>
5.	<a href="#">astrid lindgren</a>
6.	<a href="#">shane west</a>
7.	<a href="#">martina hingis</a>
8.	<a href="#">mothman prophecies</a>
9.	<a href="#">miss+germany</a>
10.	<a href="#">super bowl</a>

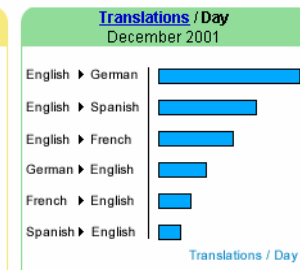
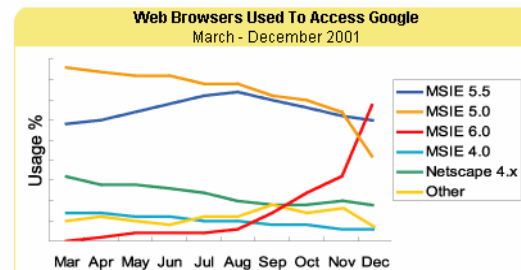
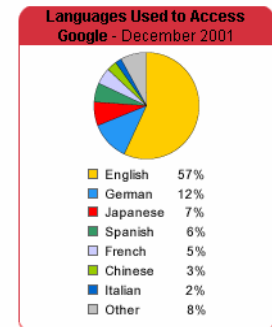
Top 10 Declining Queries Week Ending Jan. 28, 2002	
1.	<a href="#">golden globes</a>
2.	<a href="#">kim schmitz</a>
3.	<a href="#">yahoo</a>
4.	<a href="#">ADSL</a>
5.	<a href="#">kazaa</a>
6.	<a href="#">martin luther king</a>
7.	<a href="#">florida lottery</a>
8.	<a href="#">NTT</a>
9.	<a href="#">NHK</a>
10.	<a href="#">carrie hamilton</a>

2001 Year-End Google Zeitgeist [available here](#).

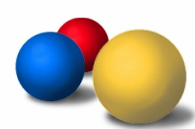
## December 2001 Zeitgeist

Top 10 Gaining Queries December 2001	
1.	<a href="#">seqway</a>
2.	<a href="#">navidad</a>
3.	<a href="#">george harrison</a>
4.	<a href="#">herr der ringe</a>
5.	<a href="#">pearl harbor</a>
6.	<a href="#">christmas carols</a>
7.	<a href="#">hanukkah</a>
8.	<a href="#">norad</a>
9.	<a href="#">vanilla sky</a>
10.	<a href="#">orlando bloom</a>

Top 10 Declining Queries December 2001	
1.	<a href="#">taliban</a>
2.	<a href="#">PLU-82</a>
3.	<a href="#">melbourne cup</a>
4.	<a href="#">leonid meteor shower</a>
5.	<a href="#">michael jackson</a>
6.	<a href="#">melanie thorton</a>
7.	<a href="#">hurricane michelle</a>
8.	<a href="#">star wars trailer</a>
9.	<a href="#">thanksgiving recipes</a>
10.	<a href="#">pink floyd</a>



# Spelling Correction: Britney Spears



488941 britney spears	20 britney spears	9 brinttany spears	5 brney spears	3 britiy spears	2 brixreny spears
40134 brittany spea	britany spears	9 britanay spears	5 broitney spears	3 britmeny spears	2 brittany spears
36315 brittney spea	britny spears	9 britinay spears	5 brotny spears	3 britneey spears	2 brixttany spears
24342 britany spea	britny spears	9 britn spears	5 bruteny spears	3 britnehy spears	2 brixttney spears
7321 britny spears	britny spears	9 britnew spears	5 btiyney spears	3 britnely spears	2 britain spears
6633 briteny spea	britny spears	9 britneyn spears	5 brittney spears	3 britnesy spears	2 britane spears
2696 brittney spea	brittney spears	9 britney spears	5 gritney spears	3 britnetty spears	2 britaney spears
1807 briney spears	briney spears	9 brtiny spears	5 spritney spears	3 britnek spears	2 britania spears
1635 brittney spea	brintny spears	9 britttney spears	4 hitny spears	3 britneyxxx spears	2 britann spears
1479 brintey spea	brintny spears	9 brtny spears	4 hnitney spears	3 britnity spears	2 britanna spears
1479 britanny spea	brintey spears	9 rbtiny spears	4 brandy spears	3 britney spears	2 britannie spears
1338 britiny spea	britanny spears	9 rbitney spears	4 hbritney spears	3 britney spears	2 britannt spears
1211 britnet spea	britanny spears	8 birtiny spears	4 hreatiny spears	3 britterny spears	2 britannu spears
1096 britiney spea	britiny spears	8 bithney spears	4 hreetney spears	3 brittney spears	2 britanyl spears
991 britaney spea	britnet spears	8 brattany spears	4 hretiney spears	3 britttney spears	2 britanyt spears
991 britnay spea	britney spears	8 breitny spears	4 hrfitney spears	3 britttney spears	2 briteeny spears
811 brithney spea	britney spears	8 breteny spears	4 hrbritney spears	3 brittyen spears	2 britenany spears
811 briney spea	britaney spears	8 brightny spears	4 hrieteny spears	3 briytney spears	2 britenet spears
664 birtney spea	britaney spears	8 brintay spears	4 hriety spears	3 brltney spears	2 briteniy spears
664 brintney spea	britaney spears	8 brintey spears	4 hriitny spears	3 broteny spears	2 britenys spears
664 briteney spea	britaney spears	8 briotney spears	4 hriittany spears	3 britaney spears	2 britianey spears
601 bitney spears	brithney spears	8 britnys spears	4 hrinie spears	3 brtiiany spears	2 britin spears
601 brinty spears	brtney spears	8 britley spears	4 hrinteny spears	3 brtiny spears	2 britinary spears
544 brittaney spe	birtney spears	8 britneyb spears	4 hritne spears	3 hrtinney spears	2 britny spears
544 brittnay spea	brintney spears	8 britnrey spears	4 britaby spears	3 hrtitany spears	2 britnaney spears
364 britey spears	brintney spears	8 britnty spears	4 britaey spears	3 hrtiteny spears	2 britnat spears
364 brittiny spea	briteney spears	8 brittner spears	4 britainey spears	3 hrtnet spears	2 britnbey spears
329 brney spears	bitney spears	8 brottany spears	4 hritinie spears	3 hrytiny spears	2 britndy spears
269 hretney spea	brinty spears	7 haritney spears	4 hritinney spears	3 htney spears	2 britneh spears
269 britneys spea	brittaney spears	7 birntey spears	4 hritmney spears	3 drittney spears	2 britneney spears
244 britne spears	brittnay spears	7 bitney spears	4 hritnear spears	3 pretney spears	2 britney6 spears
244 hrytney spea	brittney spears	7 bitiny spears	4 hritnel spears	3 hbritney spears	2 britneye spears
220 hreatney spea	britey spears	7 breateny spears	4 hritneuy spears	2 harittany spears	2 britneyh spears
220 britiany spea	brittiny spears	7 brianty spears	4 hritnewy spears	2 hbbritney spears	2 britneym spears
199 brittney spea	britley spears	7 brintye spears	4 hritnwey spears	2 hbitney spears	2 britneyyy spears
163 britny spea	brittney spears	7 britianny spears	4 hrittaby spears	2 hbritny spears	2 britnhey spears
147 hreatny spea	brittiny spears	7 britly spears	4 hrittery spears	2 hbrittany spears	2 britnjey spears
147 brittiney spe	brittny spears	7 britnej spears	4 hritthey spears	2 heitany spears	2 britnue spears
147 britty spears	brtney spears	7 britneyu spears	4 hrittney spears	2 heitny spears	2 britnu spears
147 brotney spea	brtney spears	7 britneye spears	4 hrittnat spears	2 bertney spears	2 britoney spears
147 brutney spea	britneys spears	7 britnnay spears	4 hrittney spears	2 bertny spears	2 britrany spears
133 brittney spe	britne spears	7 brittian spears	4 hrittne spears	2 betney spears	2 britreny spears
133 briyney spea		7 briyny spears	4 hrittteny spears	2 betny spears	2 britry spears
121 bittany spea		7 hrrittany spears	4 hriutney spears	2 hhriney spears	2 britsany spears
121 bridney spears	17 brittanie spears	7 hritney spears	4 hriyeny spears	2 biney spears	2 brittanay spears
121 britainy spears	15 brinney spears	7 hriteny spears	4 hrity spears	2 bintey spears	2 brittang spears
121 britmey spears	15 briten spears	7 hritttany spears	4 hriteny spears	2 birezny spears	2 brittans spears
109 hrittney spears	15 brittney spears	6 heritny spears	4 hrttiany spears	2 biritany spears	2 brittanyh spears
109 brithny spears	15 britheny spears	6 hbritley spears	4 hryney spears	2 birittany spears	2 brittanyn spears

# Google

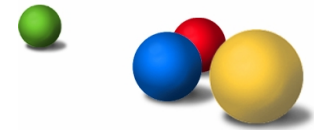


- Ethics

- No pay for inclusion (in index)
- No pay for placement (in ranking)
- Clearly demarked results and ads
- 20% engineer time doing random stuff
  - Out came news, froogle, orkut
- Users come first



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cert advisory

[Web](#) [Images](#) [Groups](#) [Directory](#) [News](#)

Searched the web for cert advisory. Results **1 - 10** of about **463,000**. Search took **0.10** seconds.

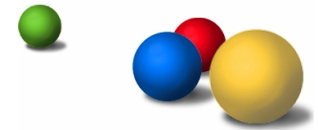
Category: [Computers > Security > Advisories and Patches > Third-Party](#)

[CERT Coordination Center](#)  
... January 29, 2004 Changes to **CERT Advisories** **CERT advisories** have become a core component of US-CERT's Technical Cyber Security Alerts. ...  
Description: The **CERT** Coordination Center studies Internet security vulnerabilities, provides incident response...  
Category: [Computers > Security](#)  
[www.cert.org/](http://www.cert.org/) - 29k - [Cached](#) - [Similar pages](#)

[CERT® Advisories](#)  
... self-propagating malicious code that exploits certain configurations of Microsoft Windows susceptible to the vulnerability described in **CERT advisory** CA-2001 ...  
[www.cert.org/advisories/](http://www.cert.org/advisories/) - 101k - [Cached](#) - [Similar pages](#)  
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acre to sq ft

"to" is a very common word and was not included in your search. [\[details\]](#)

[Web](#) [Images](#) [Groups](#) [Directory](#) [News](#)

Searched the web for [acre to sq ft](#). Results **1 - 10** of about **212,000**. Search took **0.51** seconds.

 **1 acre = 43 560 sq feet**  
[More about calculator.](#)

[Welcome to the Harvard Illinois Economic Development Corporation...](#)  
... commercial, retail, 1 **Acre**, 7,000 **SQ Ft**. B-3, N/A, N/A, Details. commercial,

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define cert

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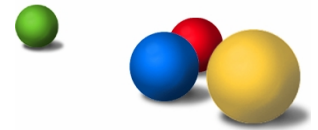
Searched the web for [define cert](#). Results **1 - 10** of about **190,000**. Search took **0.25** seconds.

Web Definition [CERT](#) - Computer Emergency Response Team  
[www.ciao.gov/ciao\\_document\\_library/glossary/C.htm](http://www.ciao.gov/ciao_document_library/glossary/C.htm) - [More definitions](#)

[HB 455 - Peace officers; define; incl cert co probation officers](#)



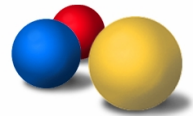
Some perks...



Google™



# Our Chef Charlie...



# Thank You...

