

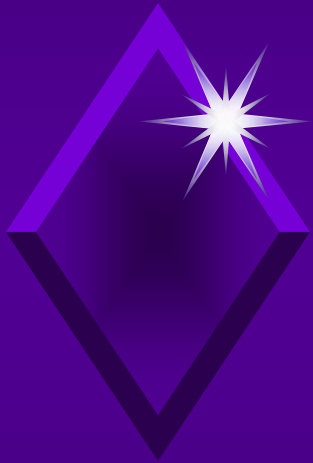
**Internet Future
CRA Biennial Conference**

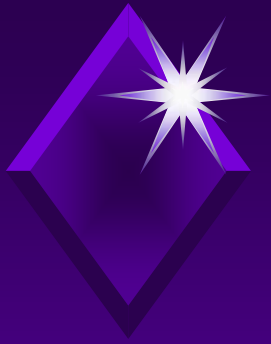
Snowbird, Utah

Vint Cerf

MCI

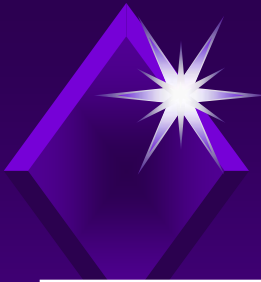
July 11, 2004





30th Anniversary of TCP/IP

- ◆ May 1974: “A Protocol for Packet Network Interconnection,” Vint Cerf and Bob Kahn, IEEE Transactions on Communications
- ◆ A copy of this was auctioned for \$3,000 in 2002!



Internet - Global Statistics

22.5 Million Hosts
(Bellcore June 1997)

50 Million Users
(NUA Jul 1997)

250 Million Hosts
(ISC Apr 2004)

745.3 Million Users
(InternetWorldStats.com
April 2004)

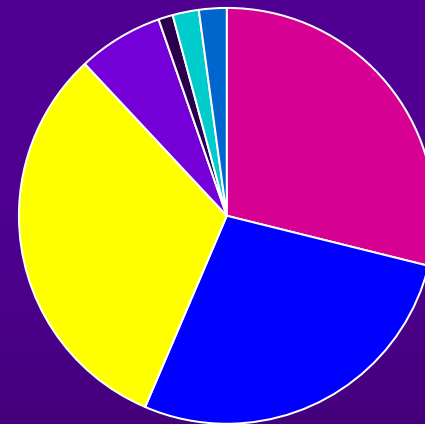
[Other estimates range
from 850M-950M]

(approx. 2.3 Billion Telephone Terminations, 750 Million PCs)



Internet Penetration May 2004

- ◆ Asia/Pac - 235.1M
 - ◆ No. Amer. -216.1M
 - ◆ Europe - 204.6M
 - ◆ Latin Am - 49.5M
 - ◆ Africa - 10.1M
 - ◆ Mid-east - 14.5M
 - ◆ Oceania- 15.7M
-
- ◆ Total - 745 M



(Source www.internetstats.com)



Internet expansion





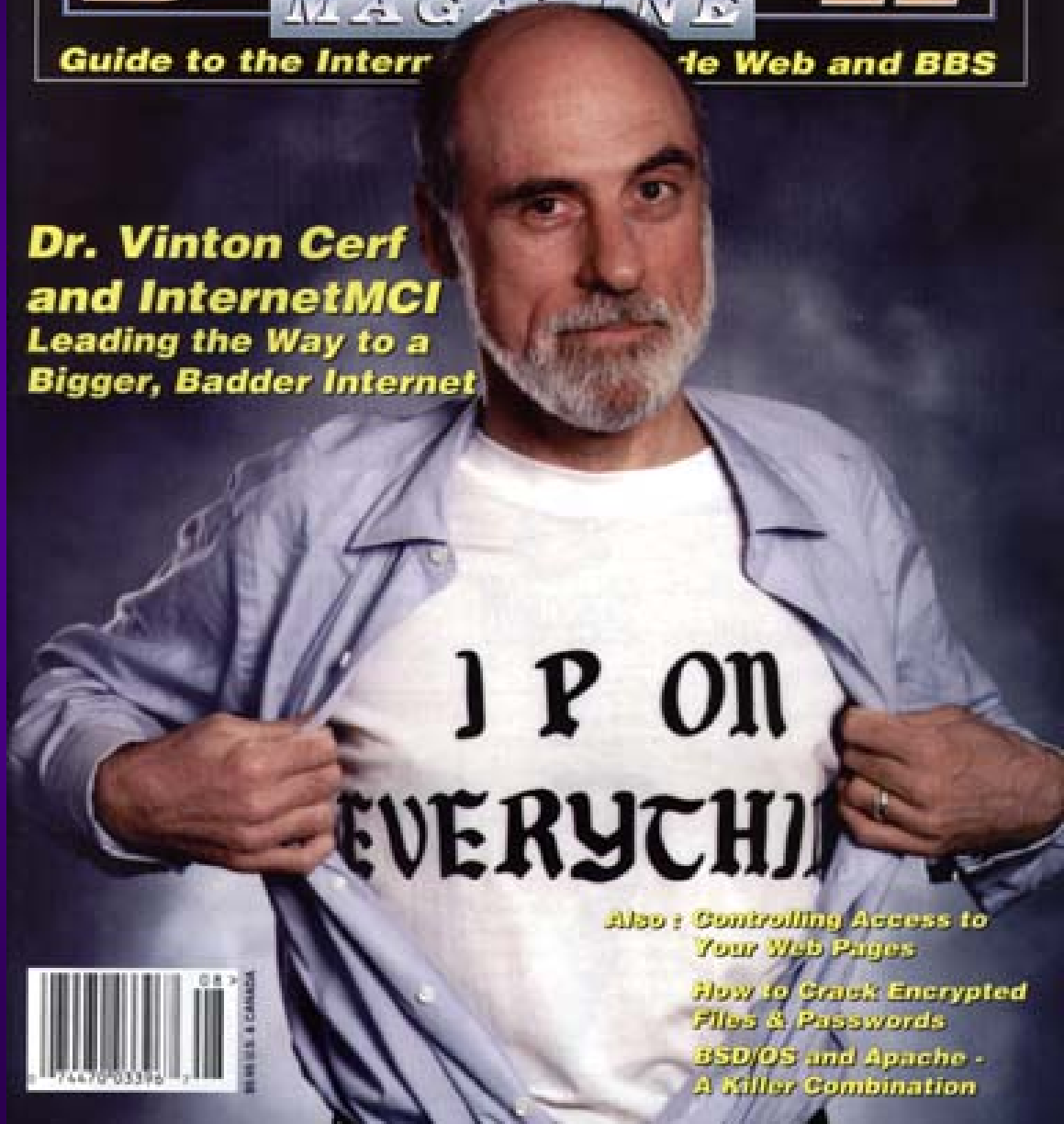
The Power of IP

- ◆ Layering of Protocols
- ◆ IP decouples application from transmission/transport
 - ◆ IP does not care what transport is used (satellite, fiber, twisted pair, radio, ATM...)
 - ◆ IP does not care what application it is carrying (video, audio, web, email...)
- ◆ Profound impact on regulatory models
- ◆ Integration of all communication modes under IP control.

BOARDWATCH MAGAZINE

Guide to the Internet, the Web and BBS

**Dr. Vinton Cerf
and InternetMCI**
Leading the Way to a
Bigger, Badder Internet



**Also : Controlling Access to
Your Web Pages**

**How to Crack Encrypted
Files & Passwords**

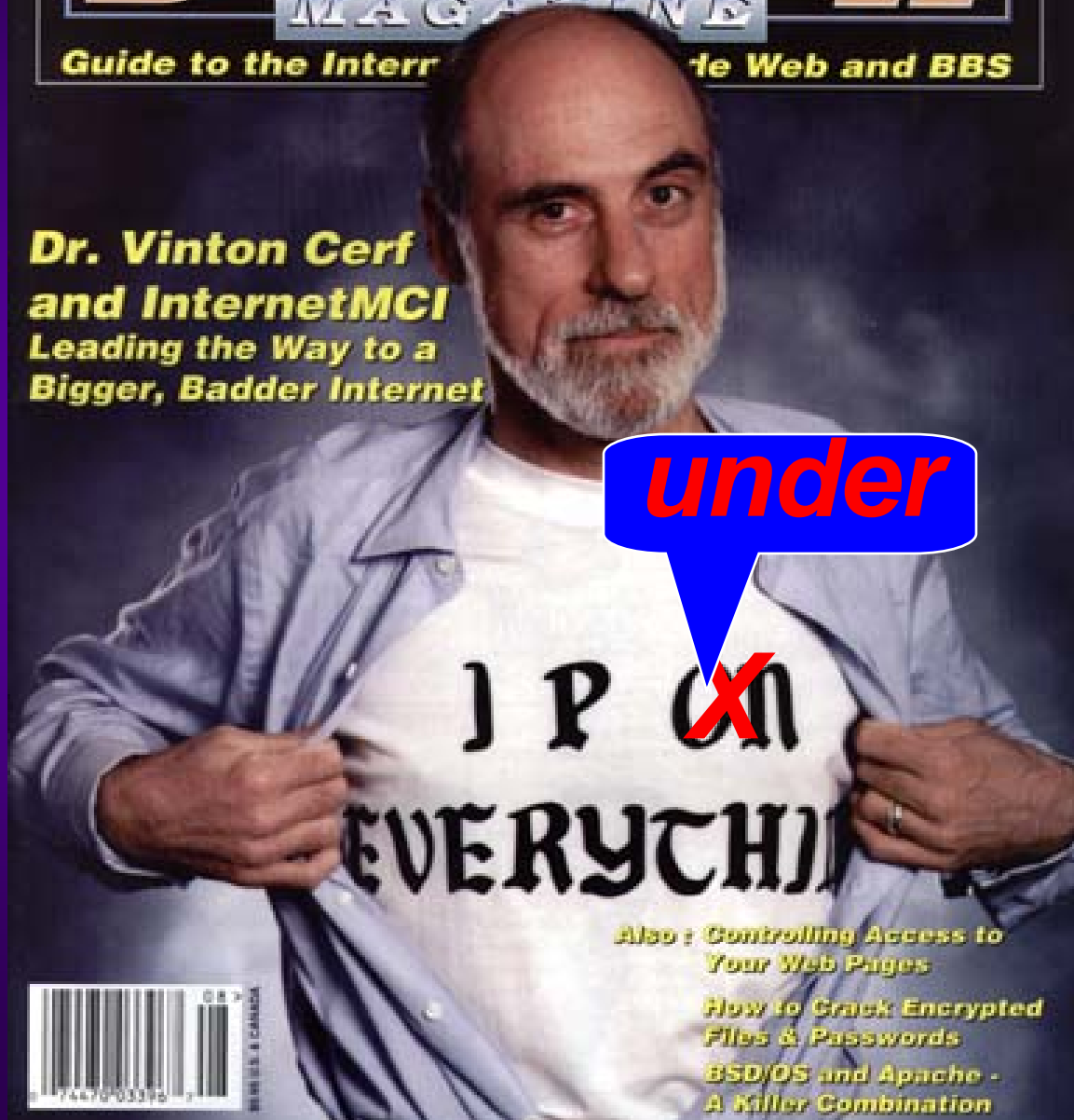
**BSD/OS and Apache -
A Killer Combination**



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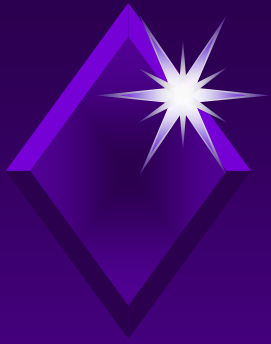
under

Also: *Controlling Access to
Your Web Pages*

*How to Crack Encrypted
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*BSD/OS and Apache -
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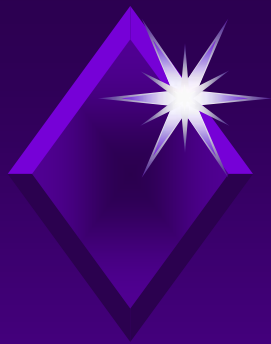
Internet-enabled Appliances





Presence

- ◆ Instant messaging
 - ◆ First “presence” application
 - ◆ Smooth spectrum of communication (text, voice, video, shared applications, group collaboration)
- ◆ Presence may vary by application and by community
 - ◆ Apparent presence can be tailored
 - ◆ Alternative communication media a function of requesting party and medium requested



SIP Telephony

- ◆ Session Initiation Protocol Telephones
- ◆ Cisco Systems, Pingtel, etc.
- ◆ “email” addressing
- ◆ ENUM:

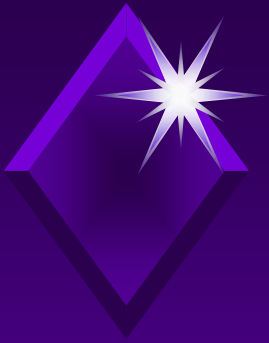


1.1.9.3.0.6.5.3.0.7.1.e164.arpa = sip:vinton.g.cerf@mci.com

(any domain name)

NAPTR (naming authority pointer)

The power of SIP



Videoconferencing online

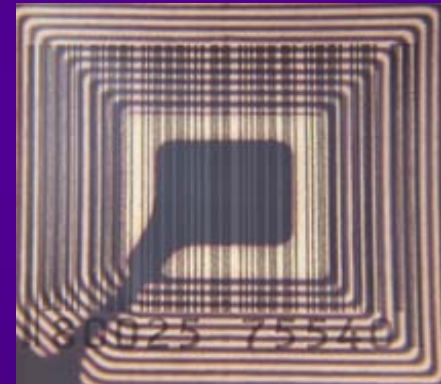
- ◆ Video-conferencing is a reality.
- ◆ High speed access is preferable but it can be made to work at dial up speeds (jerkily)
- ◆ Microsoft Messenger;
Santa Cruz Networks
Viditel





RFID

- ◆ Toll-Road passive transponder
- ◆ Consumer product identifier (like UPC)
- ◆ Drug/Food shelf-life and identification
- ◆ Patient identification





Internet-enabled Devices

- ◆ Programmable – Java, Python, etc.
- ◆ Examples:
 - WebTV, Palm-Pilot, Mobiles, Video games, Picture Frames, Washing Machines, Surf Board!
- ◆ Refrigerator (and the bathroom scales)
- ◆ Automobiles (Japan, Germany)
- ◆ Internet-enabled wine corks (also note new quantum theory of wine: Schrödinger's wine bottle)
- ◆ Internet-enabled socks
- ◆ Universal Remote Control



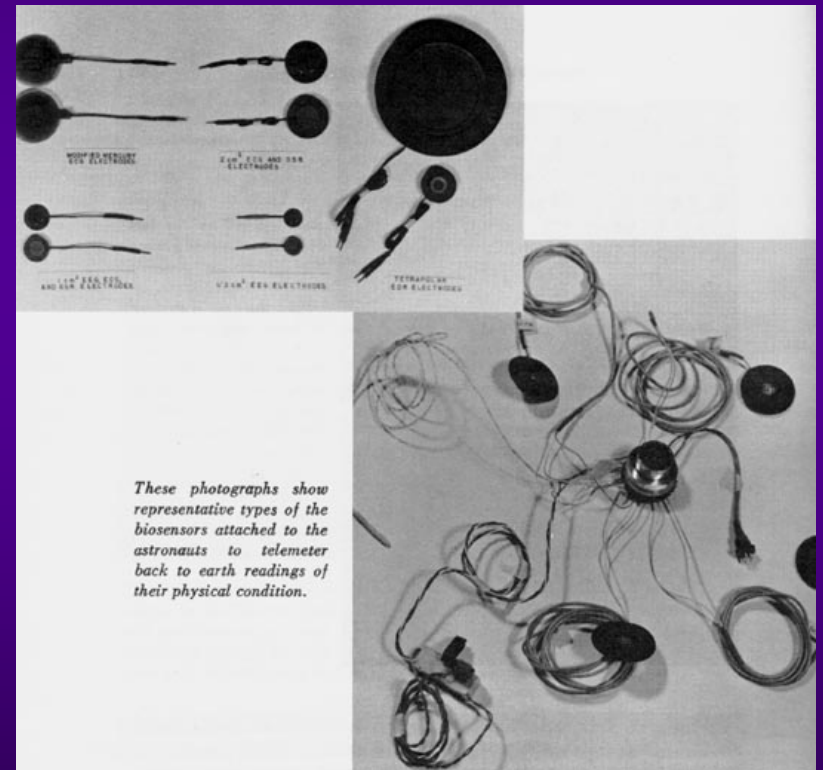
IPv6

- ◆ 128 bit address space (10^{38})
- ◆ IPSEC requirement
- ◆ Eliminates need for Network Address Translation
- ◆ Consumer electronics IPv6 enabled
- ◆ Dual-stack migration strategy



Remote diagnosis/detection

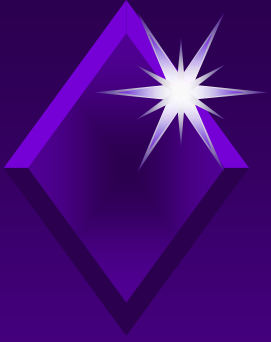
- ◆ Astronauts – as far back as the Mercury Program
- ◆ Telemetry by radio back to ground data collection systems





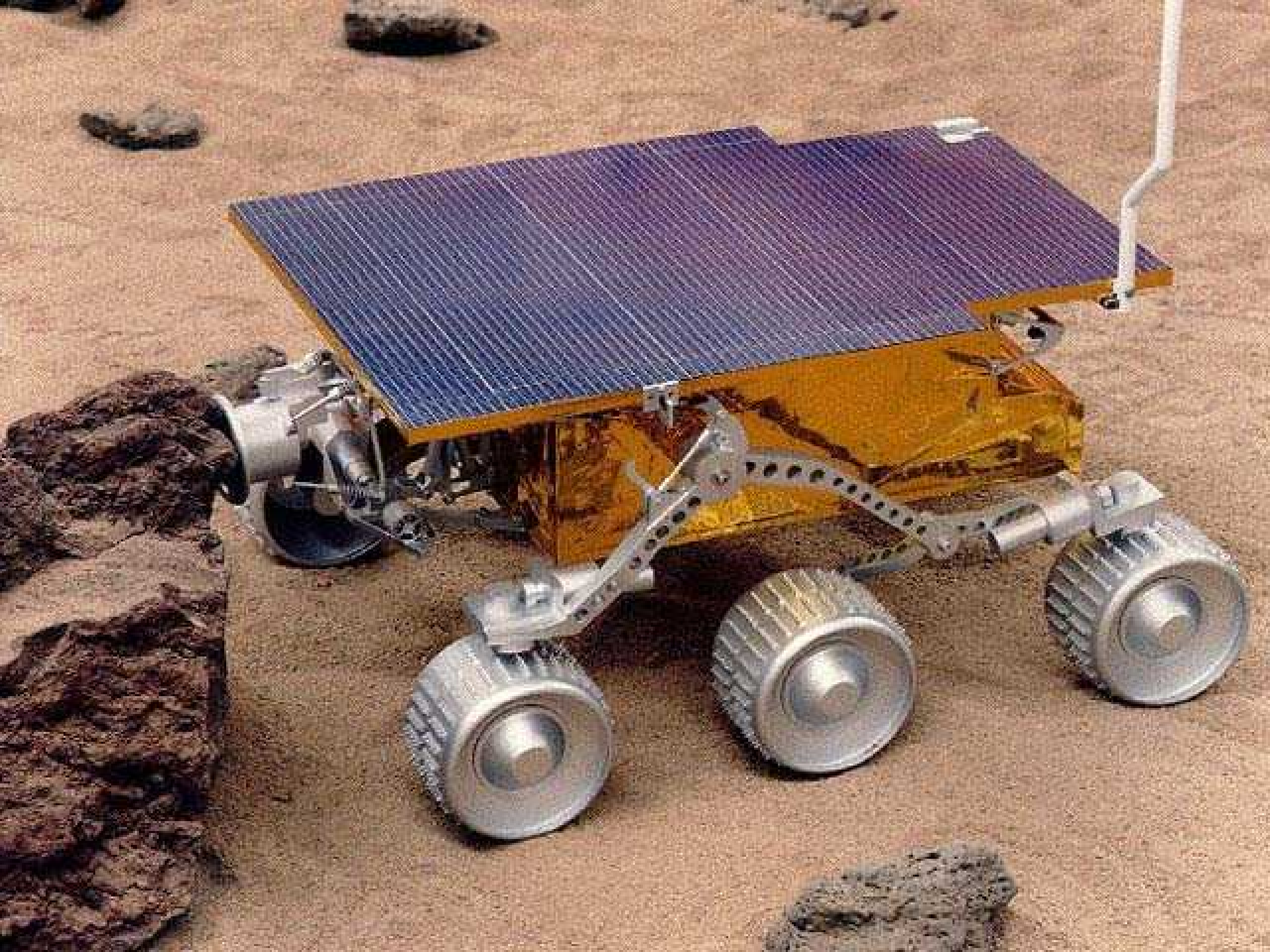
Indexing of unstructured data

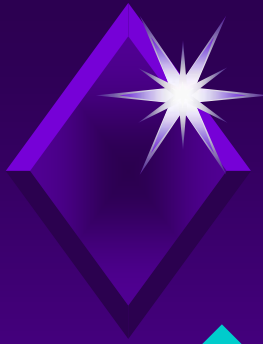
- ◆ The standardization of information representation (HTML, XML)
- ◆ The creation of web crawlers/search engines (alta-vista, google...)
- ◆ Association of media with text (indexing of images, video, audio, etc.)
- ◆ Powerful tools for finding otherwise unstructured information (cf. weblogs)



*Future
look*







2003-2004 Missions to Mars

◆ Spirit

- ◆ launched 6/10/2003
- ◆ arrived Jan 4, 2004
- ◆ Gusev Crater in Gusev Plain

◆ Opportunity

- ◆ Launched 7/7/2003
- ◆ arrived Jan 25, 2004
- ◆ Meridiani Planum

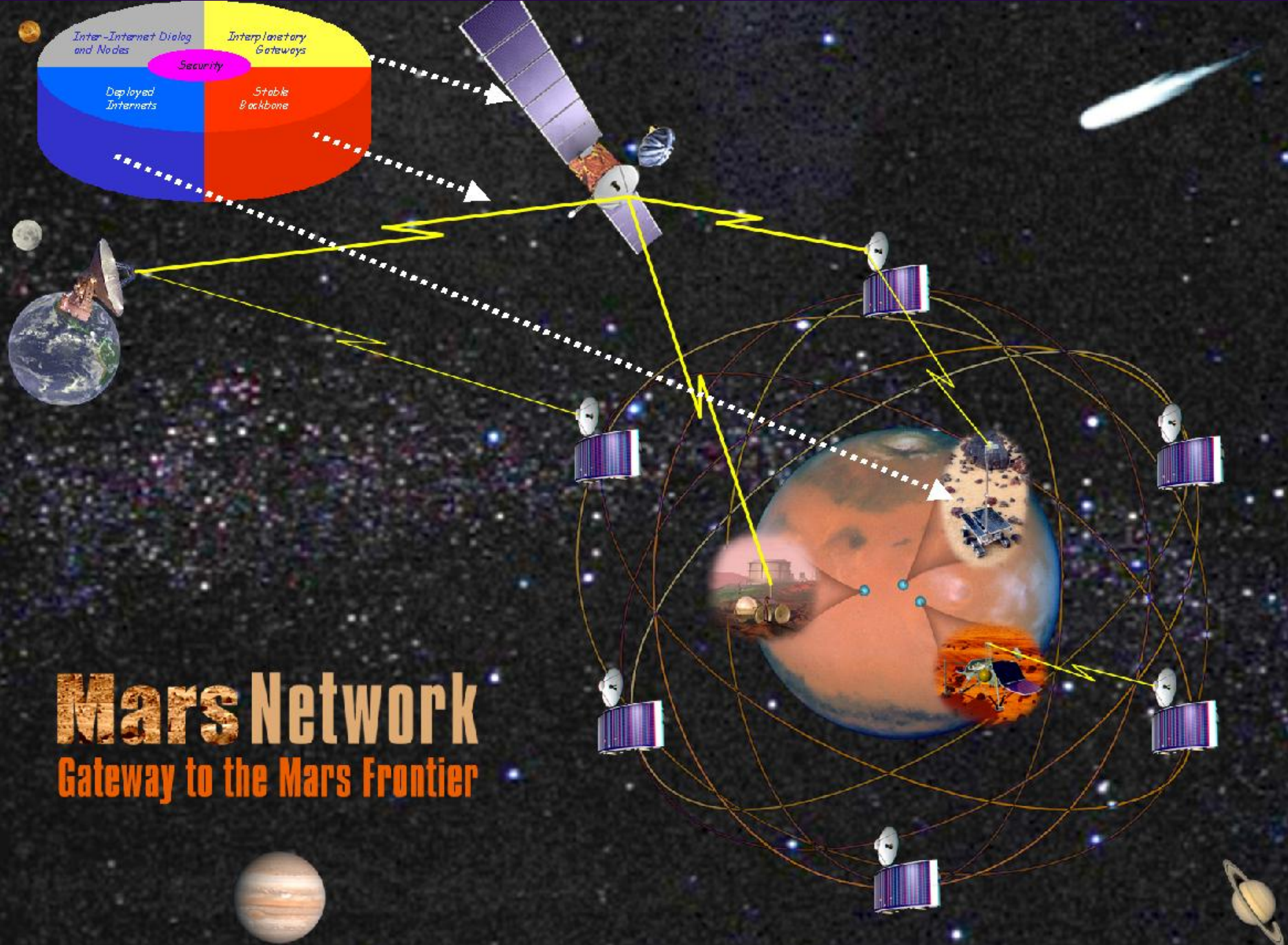






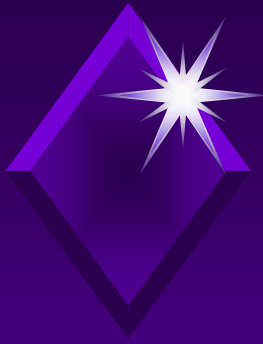
Interplanetary Internet: “InterPlaNet”

- ◆ Planetary internets
- ◆ Interplanetary Gateways
- ◆ Interplanetary Channel Protocol
 - ◆ “bundles” encapsulated in CCSDS link and higher layer transport (Licklider Transport Protocol)
 - ◆ .earth.sol.int, .mars.sol.int
- ◆ Functional Layers of Protocol
- ◆ Interplanetary Network and Information Systems Directorate (old DSN)
- ◆ Project supports Mars mission plans



Mars Network

Gateway to the Mars Frontier



Cerf's slides and other
Internet information can be
found at:

www.mci.com/cerfsup

www.isoc.org/internet

livinginternet.com

www.ipnsig.org

