



Anniversary
Multi-Generational
Picnic in Palo Alto
Saturday, May 10, 2014
11:30_{AM} to 3:00_{PM}

Mitchell Park
600 E Meadow Dr., Palo Alto, CA 94306

“The creation of TCP will go down as one of the most important specs of the modern era.”

Jonathan Reichenal
CIO of the City of Palo Alto
Former CIO, O’Reilly Media

& so much of it
happened in
Palo Alto !



Vint Cerf and Robert Kahn designed the Internet architecture and the TCP specification here in 1973

We are bringing together young and old, to collect the stories of how the Internet came to be: To CAPTURE the feeling excitement and the frontier spirit in the pioneers’ own words.

www.TCPIP40.com

This is the site where we continue collecting and posting the stories you have, those already sent in, and those still to come so we’ll be ready in time for TCP/IP’s 50th anniversary in 2024.



BIRTH OF THE INTERNET*

THE ARCHITECTURE OF THE INTERNET AND THE DESIGN OF THE CORE NETWORKING PROTOCOL TCP (WHICH LATER BECAME TCP/IP) WERE CONCEIVED BY VINTON G. CERF AND ROBERT E. KAHN DURING 1973 WHILE CERF WAS AT STANFORD'S DIGITAL SYSTEMS LABORATORY AND KAHN WAS AT ARPA (LATER DARPA). IN THE SUMMER OF 1976, CERF LEFT STANFORD TO MANAGE THE PROGRAM WITH KAHN AT ARPA.

THEIR WORK BECAME KNOWN IN SEPTEMBER 1973 AT A NETWORKING CONFERENCE IN ENGLAND. CERF AND KAHN'S SEMINAL PAPER WAS PUBLISHED IN MAY 1974.

CERF, YOGEN K. DALAL, AND CARL SUNSHINE WROTE THE FIRST FULL TCP SPECIFICATION IN DECEMBER 1974. WITH THE SUPPORT OF DARPA, EARLY IMPLEMENTATIONS OF TCP (AND IP LATER) WERE TESTED BY BOLT BERANEK AND NEWMAN (BBN), STANFORD, AND UNIVERSITY COLLEGE LONDON DURING 1975.

BBN BUILT THE FIRST INTERNET GATEWAY, NOW KNOWN AS A ROUTER, TO LINK NETWORKS TOGETHER.

IN SUBSEQUENT YEARS, RESEARCHERS AT MIT AND USC-ISI, AMONG MANY OTHERS, PLAYED KEY ROLES IN THE DEVELOPMENT OF THE SET OF INTERNET PROTOCOLS.

KEY STANFORD RESEARCH ASSOCIATES AND FOREIGN VISITORS

VINTON CERF

DAG BELSNES	JAMES MATHIS
RONALD CRANE	BOB METCALFE
YOGEN DALAL	DARRYL RUBIN
JUDITH ESTRIN	JOHN SHOCH
RICHARD KARP	CARL SUNSHINE
GERARD LE LANN	KUNINOBU TANNO

DARPA ROBERT KAHN

COLLABORATING GROUPS
BOLT BERANEK AND NEWMAN
WILLIAM PLUMMER • GINNY STRAZISAR • RAY TOMLINSON

MIT
NOEL CHIAPPA • DAVID CLARK • STEPHEN KENT • DAVID P. REED

NDRE
YNGVAR LUNDH • PAAL SPILLING

UNIVERSITY COLLEGE LONDON
FRANK DEIGNAN • MARTINE GALLAND • PETER HIGGINSON
ANDREW HINCHLEY • PETER KIRSTEIN • ADRIAN STOKES

USC-ISI
ROBERT BRADEN • DANNY COHEN • DANIEL LYNCH • JON POSTEL

ULTIMATELY, THOUSANDS IF NOT TENS TO HUNDREDS OF THOUSANDS HAVE CONTRIBUTED THEIR EXPERTISE TO THE EVOLUTION OF THE INTERNET.

DEDICATED JULY 28, 2005

* reproduced from plaque
at [Gates Computer Science Building](#), Stanford University

Produced by TCP/IP40 Planning
Committee

TCP/IP 40th Anniversary Program

11:30 AM **REGISTRATION**
The Picnic begins!

12:00 PM Welcome
Mei Lin Fung

12:20 PM Master of Ceremonies
John Feland,
Argus Insights

12:25 PM **SPEAKERS**

Vint Cerf – Google
Yogen Dalal – Mayfield Fund
Dan Lynch – Founder of Interop
Judy Estrin – JLABS

1:00 PM John Shoch – Alloy Ventures
Charles Goldfarb – The XML Handbook
Marc Weber – Computer History Museum
Sean Askay – Google Earth
Vint Cerf – Closing remarks

1:30 PM Nancy Shepherd - Mayor of the City of Palo Alto

Dan Lynch CELEBRATORY TOAST

1:40 PM OPEN MIKE (Sign up next to the stage)

2:15 PM Picnic, Show & Tell,
Renew friendships, make new friends

3:00 PM **PICNIC ENDS**





Vinton G. "Vint" Cerf and Bob Kahn co-wrote the TCP specification in 1973 and tested it in 1977. He earned his Ph.D. from UCLA in 1972. At UCLA he worked in Professor Leonard Kleinrock's networking group that connected the first two nodes of the ARPANET and contributed to the ARPANET host-to-host protocol. Cerf was an assistant professor at Stanford University from 1972–1976, where he conducted research on packet network interconnection protocols and co-designed the DoD TCP/IP protocol suite with Bob Kahn. He was a program manager for the Advanced Research Projects Agency (ARPA) from 1976 to 1982. Cerf was instrumental in the formation of both the Internet Society and Internet Corporation for Assigned Names and Numbers (ICANN), serving as founding president of the Internet Society from 1992–1995 and in 1999 as Chairman of the Board and as ICANN Chairman from 2000 to 2007. His many awards include the National Medal of Technology, the Turing Award, the Presidential Medal of Freedom, and membership in the National Academy of Engineering and the Internet Society's Internet Hall of Fame. Source – Wikipedia - http://en.wikipedia.org/wiki/Internet_pioneers

Yogen Dalal earned a Ph.D. in electrical engineering and computer science from Stanford and a B.Tech. in electrical engineering from the Indian Institute of Technology, Bombay where he was honored as a Distinguished Alum. He was a student of Vint Cerf – and the team's pioneering work on the design of the TCP protocol has been recognized with a "Birth of the Internet" plaque in the Gates Building at Stanford University. Yogen was also a member of the original Star and Ethernet development teams at Xerox, and a co-author of the TCP Specification in 1974 while at Stanford University. His Ethernet industry blog can be found at www.ethernethistory.com.



He is an entrepreneur, engineer, and Silicon Valley executive. Over the last 20 years as a venture capitalist at Mayfield Fund he has invested in the communications, enterprise software, and internet consumer and infrastructure areas. He is Chairman and co-founder of Glooko, a mobile diabetes management start-up. Source - http://www.mayfield.com/team/partners-emeriti/Yogen_Dalal

Dan Lynch is a private investor and retired bum. He is a co-founder of CyberCash, Inc. He founded Interop which highlights the technology of the Internet. He is a member of the Board of Trustees of the multidisciplinary think tank Santa Fe Institute.

He was Director of Computing Facilities at SRI International in the mid to late 70's and served as manager of the computing laboratory for SRI's Artificial Intelligence Center. While at SRI he performed initial development of the TCP/IP protocols in conjunction with Bolt, Beranek and Newman (BBN).



As Director of Information Processing Division for the Information Sciences Institute in Marina del Rey (USC-ISI) Lynch led the Arpanet team that made the transition from the original NCP protocols to the current TCP/IP based

protocols. He directed this effort from 1980 until 1983. A few "educational" stumbles occurred before he started Interop in 1986. Lynch received undergraduate training in mathematics and philosophy from Loyola Marymount University and obtained a Master's Degree in mathematics from UCLA .

Judith "Judy" L. Estrin is an Internet pioneer, entrepreneur and American business executive. She worked with Vint Cerf on the initial TCP-project at Stanford and went on to found several companies that help develop the commercial networking market.

She is now CEO of JLabs (formerly called Packet Design Management Company), a privately held company focused on furthering innovation in business, government and non-profit organizations. Estrin is the author of "Closing the Innovation Gap: Reigniting the Spark of Creativity in a Global Economy" (McGraw-Hill; Hardcover, September 2008), a general interest book that challenges national, academic and business leaders to work together to make USA competitive again. Estrin is a serial entrepreneur who co-founded eight technology companies. She was the CTO of Cisco Systems from 1998 to 2000. Estrin served on the Board of Directors of the Walt Disney Company (1998-2014), FedEx Corporation (1989-2010), as well as Rockwell Automation and Sun Microsystems, . She serves on the advisory boards of Stanford's School of Engineering. Estrin served on the America Compete's Innovation Advisory Board in 2011.



John F. Shoch has made significant contributions to computer networking while at Xerox PARC, in particular to the development of the PARC Universal Protocol (PUP), an important predecessor of TCP/IP. In 1971, his research interests included internetwork protocols, computer local area networks (in particular the Ethernet, which he helped develop), packet radio, programming languages, and various other aspects of distributed systems. His best-known work from that period, after the Ethernet and PUP, is on network worms - actually early experiments in distributed computing over a network of loosely-coupled machines.

In 1980, he became the assistant to the CEO of Xerox and director of the Corporate Policy Committee and in 1982, became president of Xerox's Office Systems Division

He became a venture capitalist with Asset Management Associates in 1985, and then became a founding general partner at Alloy Ventures in 1996. He serves as a trustee for the Computer History Museum. Shoch earned a B.A. in political science (1971); an M.S. (1977) and a Ph.D. (1979) in Computer Science from Stanford.



Charles F. Goldfarb is known as the father of SGML and grandfather of HTML and the World Wide Web. He co-invented the concept of markup languages. In 1969 Charles Goldfarb, leading a small team at IBM, developed the first markup language, called Generalized Markup Language, or GML. In an interview with Web Techniques Magazine editor Michael Floyd, Dr. Goldfarb explains that he coined the term GML to be an initialism for the three researchers, Charles Goldfarb, Ed Mosher and Ray Lorie who worked on the project.

In 1974, he designed SGML and subsequently wrote the first SGML parser, ARCSGML. Goldfarb went on working to turn SGML into the ISO 8879 standard, and served as its editor in the standardization committee. Goldfarb holds a J.D. from Harvard Law School. He worked at IBM's Almaden Research Center for many years and is now an independent consultant based in Belmont, California.

Marc Weber started the Computer History Museum's Internet History Program as Founding Curator. Marc pioneered Web history as a topic starting in early 1995. His initial investigations as a journalist became the Web History Project, which assembled the first archive of early Web materials and interviewed over 80 key figures with crucial help from the Web's main inventor Sir Tim Berners Lee and colleagues. Marc and co-founder Kevin Hughes brought together most core Web and hypertext pioneers at the 1997 international Web conference with the first Web History events plus a major temporary exhibit. Marc has been interviewed on Web history topics by major media from the BBC to American Public Radio's "Marketplace", presented at international conferences, consulted for patent cases and companies served as an advisor to documentaries from the History and Discovery channels.

Marc is an award-winning technology writer and journalist. He has consulted on technology topics since 1987 and has been author or editor of four how-to guides for computer consultants. He holds bachelors degrees in Neurobiology and in Creative Writing (with Honors) from Brown University in Providence, Rhode Island.

Sean Askay is a Senior Developer Advocate on the Google Earth Outreach team (earth.google.com/outreach/), which aims to help non-profit organizations use mapping technology to further their missions.

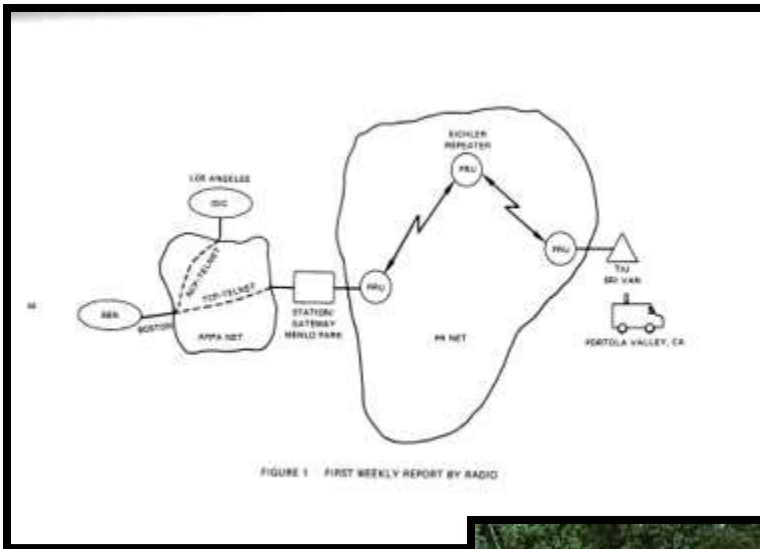
Sean specializes in the use of mapping technology for storytelling. In 2009 he created mapthefallen.org, which mapped 5500+ Iraq/Afghanistan soldier casualties and hometowns. Sean has also developed and delivered training for Google's mapping tools to humanitarian and environmental organizations, and indigenous communities around the world. Last year Sean launched Tour Builder (tourbuilder.withgoogle.com), an easy-to-use tool that empowers anyone to tell a story on a map.



Sean has a background in biology and environmental science and has worked on everything from visualization of environmental wireless sensor network data to the study of ethno botany and traditional agriculture in the South Pacific.

A 1976 Demonstration of TCP and Internetworking

Photos taken by Don Nielson



Left: The network diagram of the event showing the two networks and the TCP gateway in the Packet Radio Station at SRI.

Right - The Alpine Inn (aka Rossotti's) where the event took place on 27 Aug 1976. It was a special event to exercise TCP by sending in the Weekly Report to DARPA



Left: The SRI van containing two packet radios and an LSI-11 terminal interface unit running TCP

A 1976 Demonstration of TCP and Internetworking

Photos taken by Don Nielson



Above: Setting up the TCP connection:
L to R: Don Cone, Dave Retz, and Jim McClure



Above Right: Nicki Geannacopolus entering Packet Radio Weekly Report to DARPA from all Packet Radio contractors



Above: Left to Right: Don Cone, unknown Army visitor, Nicki Geannacopolus, Dave Retz, Ron Kunzelman, Jim McClurg, Jim Mathis (Mathis did most of the TCP programming for the event.)

The First Major Demonstration of TCP and Internetworking – 1977

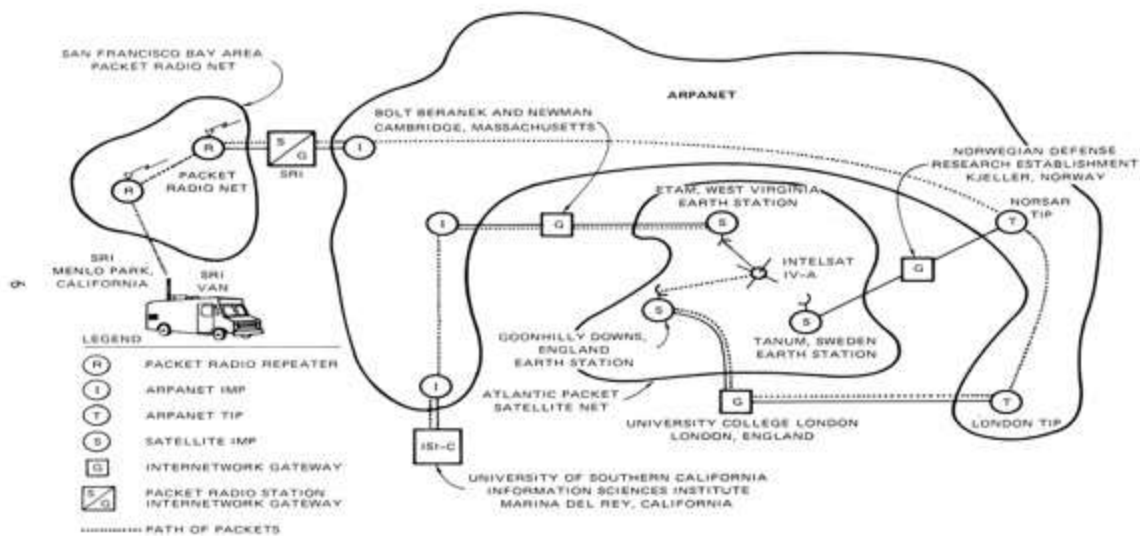


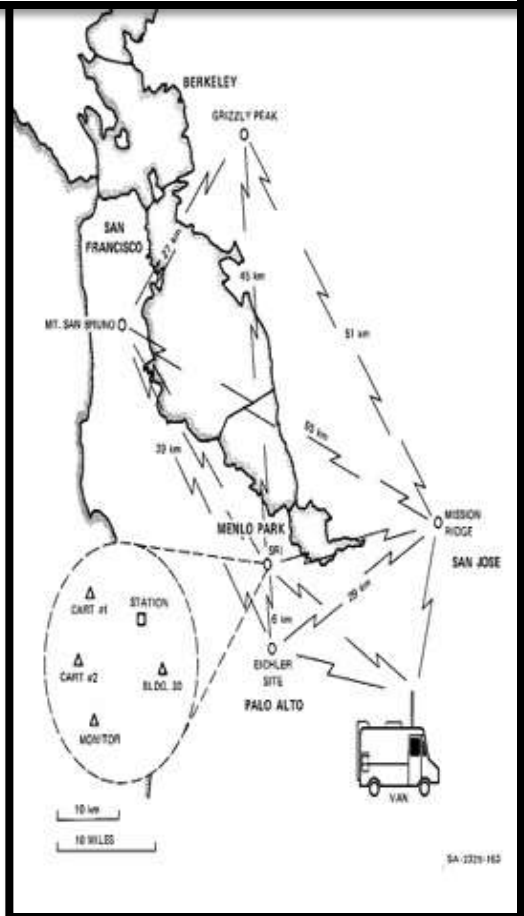
FIGURE 1. FIRST ARPA MULTINETWORK DEMONSTRATION

Above:

The diagram of an event on 22 Nov 1977 that showed, for the first time, the ability of TCP to form an end-to-end, reliable connection across three dissimilar digital packet networks. The terminal-to-host connection went from the SRI mobile van across the Packet Radio Network, through the wired ARPANet and via undersea cable to Europe, back to the US over the Packet Satellite Network, reentering the ARPANet again at BBN and thence to a host at USC. Except for the delay, mostly in the satellite segment, the terminal functioned the same as a local terminal on the ISI-C computer. The Interface Message Processors (IMPs) and Terminal Interface Processors (TIPs) are intranet routers whereas the gateways provide the internet translations and routing.

Right:

Bay Area PRNet showing repeater sites as of 1977



SA-2219-162

Packet Radio and Internet Demos – 1977



Below: SRI van on Interstate 280 showing TCP connection while in motion using Packet Radio repeater atop nearby mountains

Left: SRI-owned van with portable power and packet radio antenna atop

Below: Packet speech being used over "normal" phone in the van. Van contained speech compression equipment but not certain that IP had been created for this is in 1977-8. SRI's Jan Edl on the phone



Right: Packet speech being used across internets. Speech digitization, compression, and packetizing in the equipment shown. Transmission were across the PRNet and ARPANet in tandem. SRI's Earl Craighill, head of the PR speech effort



Packet Radio Network 1976-1978

Photos by Don Nielson



Above:

Inside SRI van showing rack with LSI-II microcomputer containing TCP at the top and two Collins packet radios below the oscilloscope. Data media terminal used to control equipment and send/receive information



Above:

Early version of station. Keith Klemba operating it

Left:

Packet Radio Station, which was the controlling node for the PRNet and containing the gateway between it and the ARPANet. Station code, including the gateway, was supplied by BBN



Remembering just two of very many.....

Jon Postel

Jon Postel would have to be called the Chief Instigator of the TCP/IP protocol suite. Early on when Jon worked at SRI International, he worked tirelessly on details of the protocols themselves. Then he made sure they were documented appropriately and accurately as an RFC and standard. When the date was announced for cutover, and “oops” there was no appropriate documentation, he dropped everything to help put together an accurate *Protocol Handbook* for distribution. And who can forget Jon’s “bakeoffs” where he encouraged, helped, cajoled, and insisted that there be a version of the protocols developed for each major operating system on the network. He listened to all the moans, kvetches, rants, roadblocks, pouts, and nay says against him and the protocols, and quietly, stubbornly, and stalwartly soldiered on. He rarely lost his temper, and even managed to maintain his sense of humor throughout the whole process. At ISI he saw that the versions worked by encouraging everyone to “kick the tires” until they did. He found people to assist the sites having problems. He fought the good fight defending TCP/IP in the great protocol wars and eventually won. If any one person deserves the lion’s share of credit for the successful cut over to TCP/IP, it is probably Jon Postel. It wasn’t that he personally did it all, but rather that he had a true gift for getting us all to work together for something he believed was fundamentally important to the future of networking. Thanks Jon, we needed you. Today we remember you fondly, wish you were here, and salute you for your leadership and perseverance.

- Elizabeth (Jake) Feinler

Mike Muuss

Ballistic Research Lab at Aberdeen Proving Ground

Mike was a brilliant young computer scientist and UNIX pioneer. On the eve of the NCP transition to the 96-bit header, Mike reverse-engineered the Honeywell code then re-implemented it from scratch in C on an 11/70 running v6 (or maybe v7 I forget) UNIX in a marathon session that beat the deadline by about an hour to keep the APG ARPANET node up. When the transition to TCP/IP was announced, Mike saw the community stumbling and founded and moderated the TCP/IP mailing list - which after the transition was taken over by SRI. Mike was also the author of a graphics editor now known as BRL-CAD, a solid modeling system which he pioneered and which is in wide use in DoD today. He also ported Berkeley UNIX to number of computers, of which perhaps the strangest was the Denelcor HEP. And I almost forgot until I saw it on Wikipedia - he wrote ping.

Mike was tragically killed driving home early one morning in 2000 on I-95, by a big rig with a sleeping driver. He was a true TCP/IP pioneer!

- Steve Wolff

Packet Radio and Internet Demos – 1977



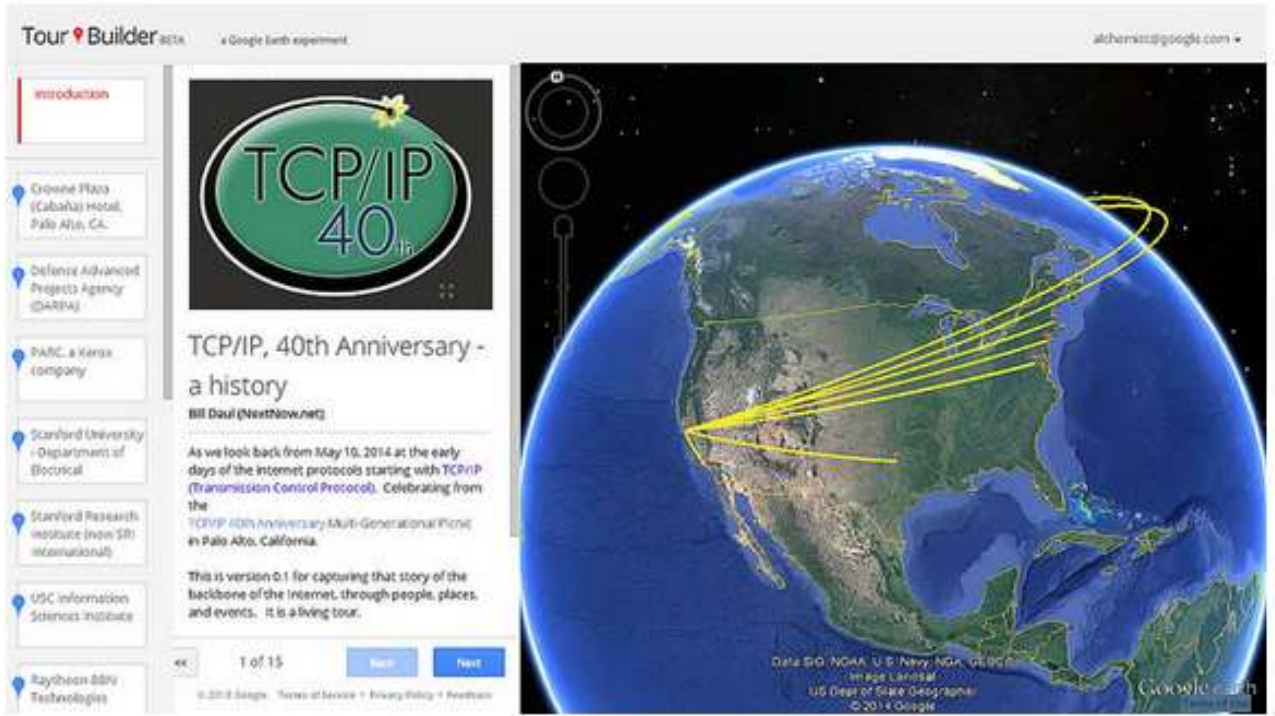
Left:
Army visitors given
internetworking
demonstration in the SRI
van. Colonel Russell of
DARPA is on the right

Right:
Demonstration for Army
personnel, being directed
by Vint Cerf of DARPA, 21
Sep 1977

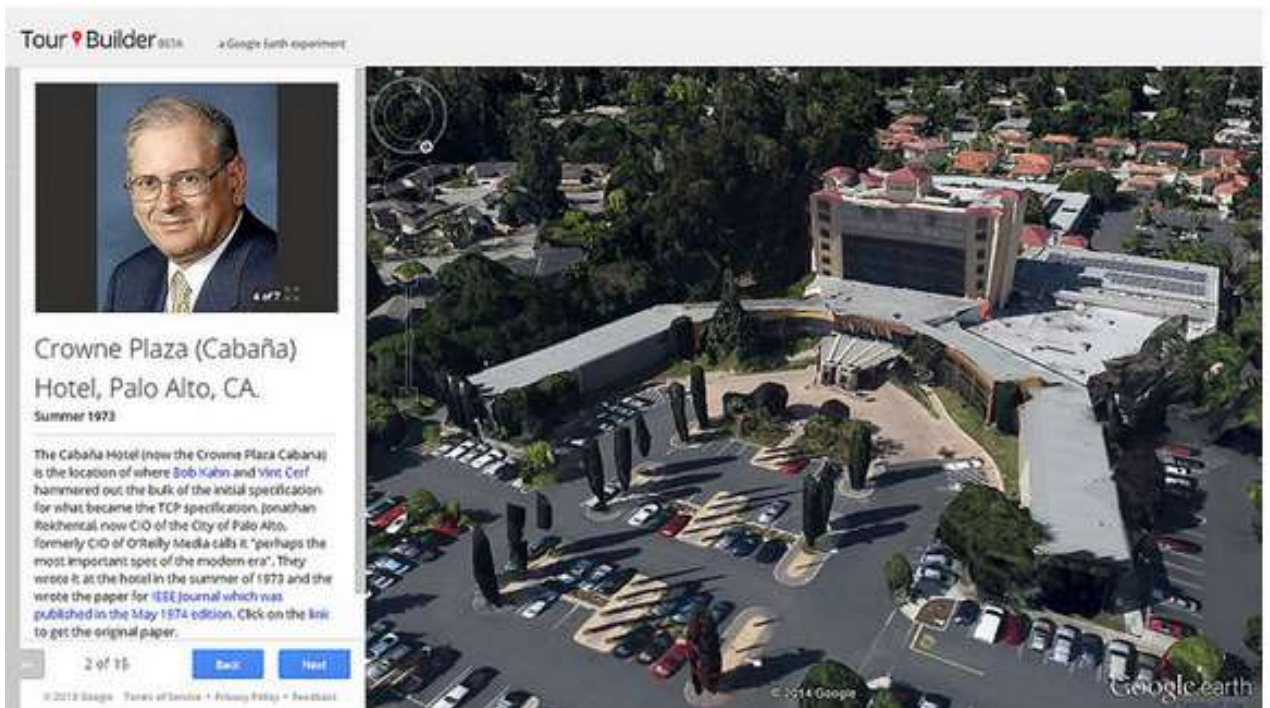


Left:
Demonstration for
military personnel but
in smaller SUV
containing a second
mobile node. Can you
spot Vint?

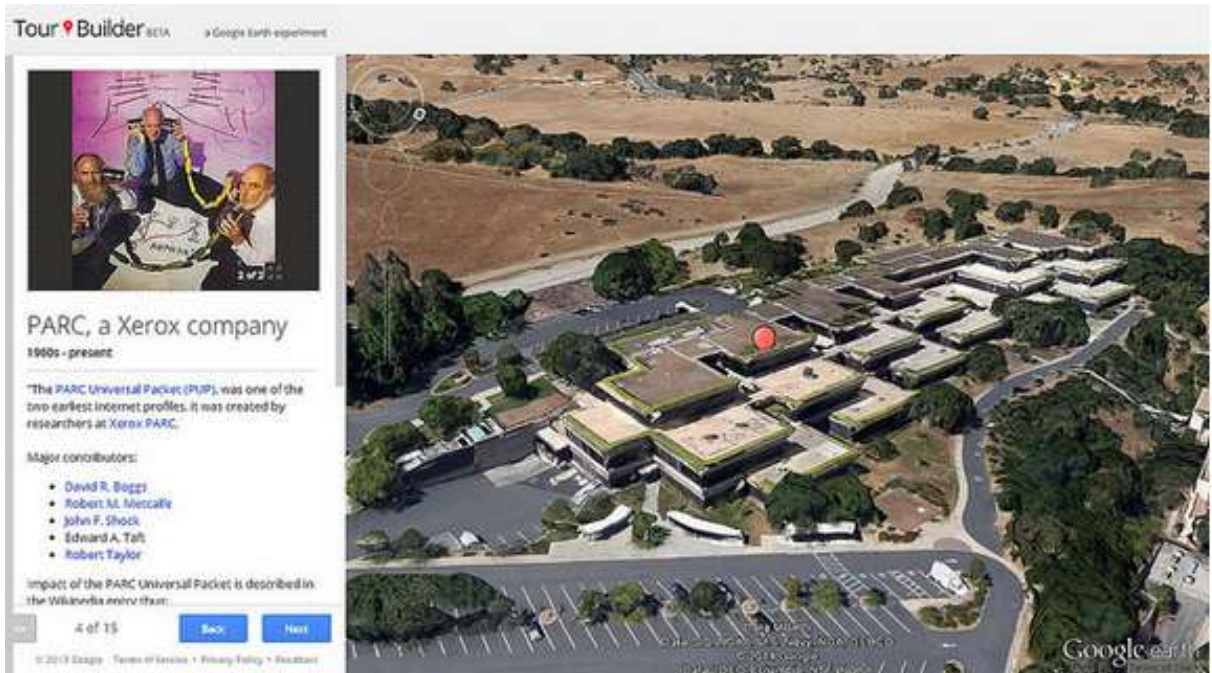
Looking at the TCP/IP Story on Google Earth



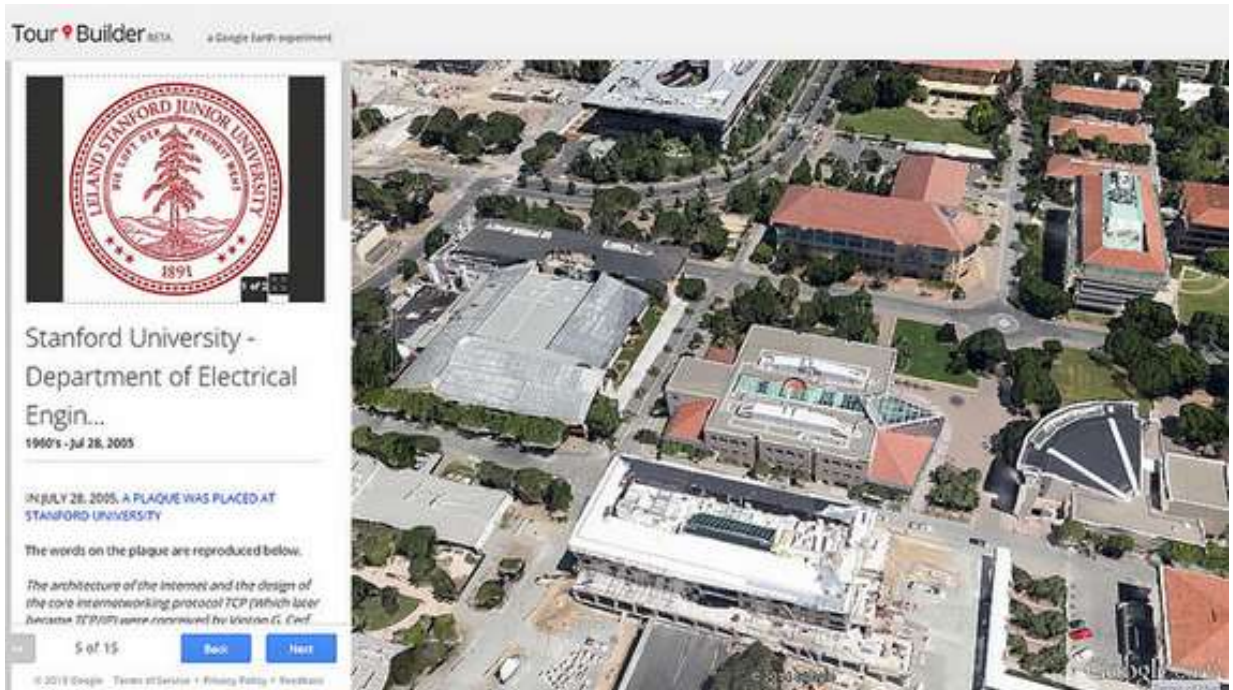
Bob Kahn and Vint Cerf wrote the TCP Spec here in the Summer of 1973 at the Crowne Plaza Cabana Hotel

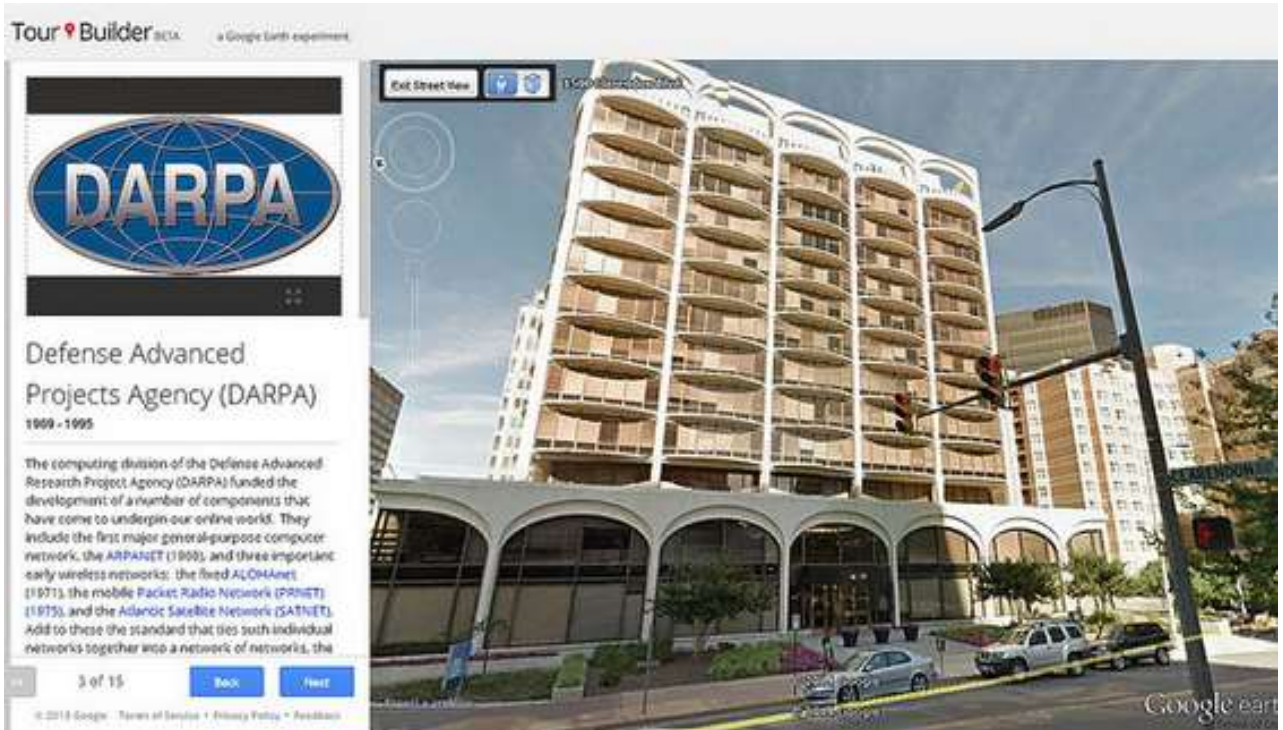


At Xerox PARC Bob Taylor, John Shoch had been working on PARC Universal Packet (PUP)

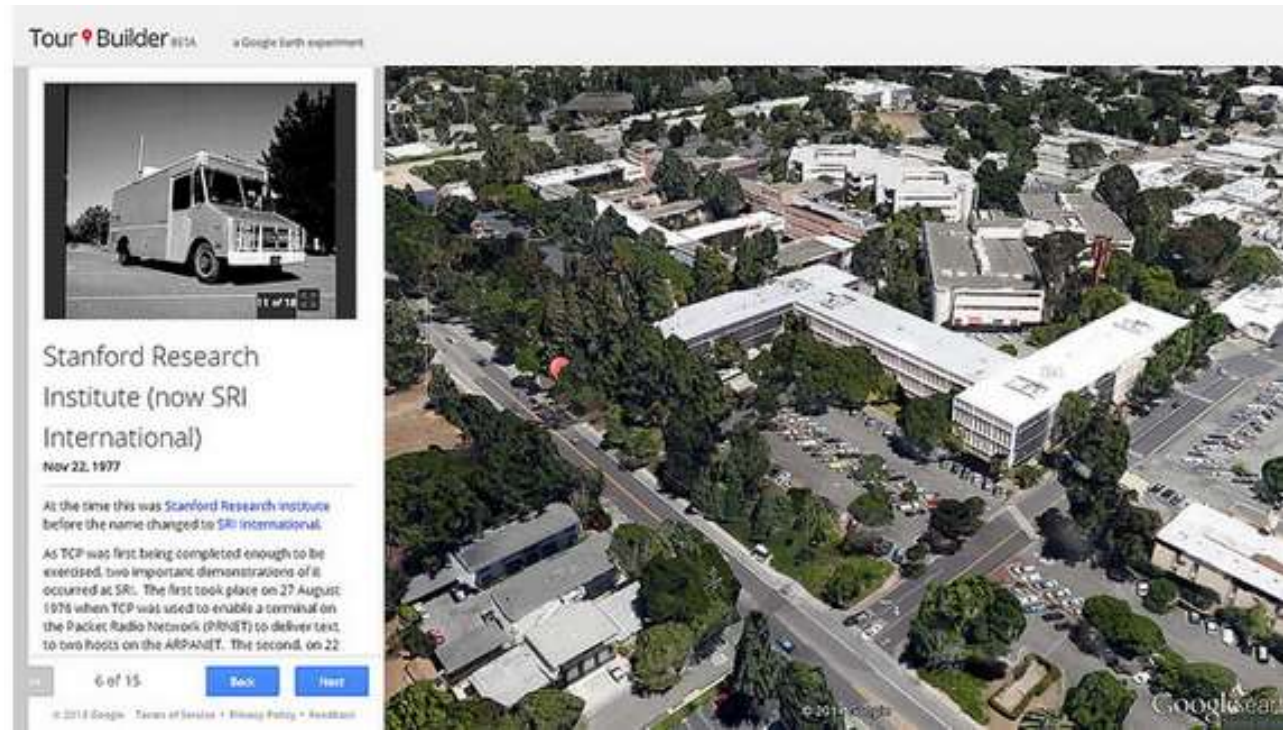


Several at Stanford University worked on TCP: Vint Cerf, Judy Estrin, Yogen Dalal,...



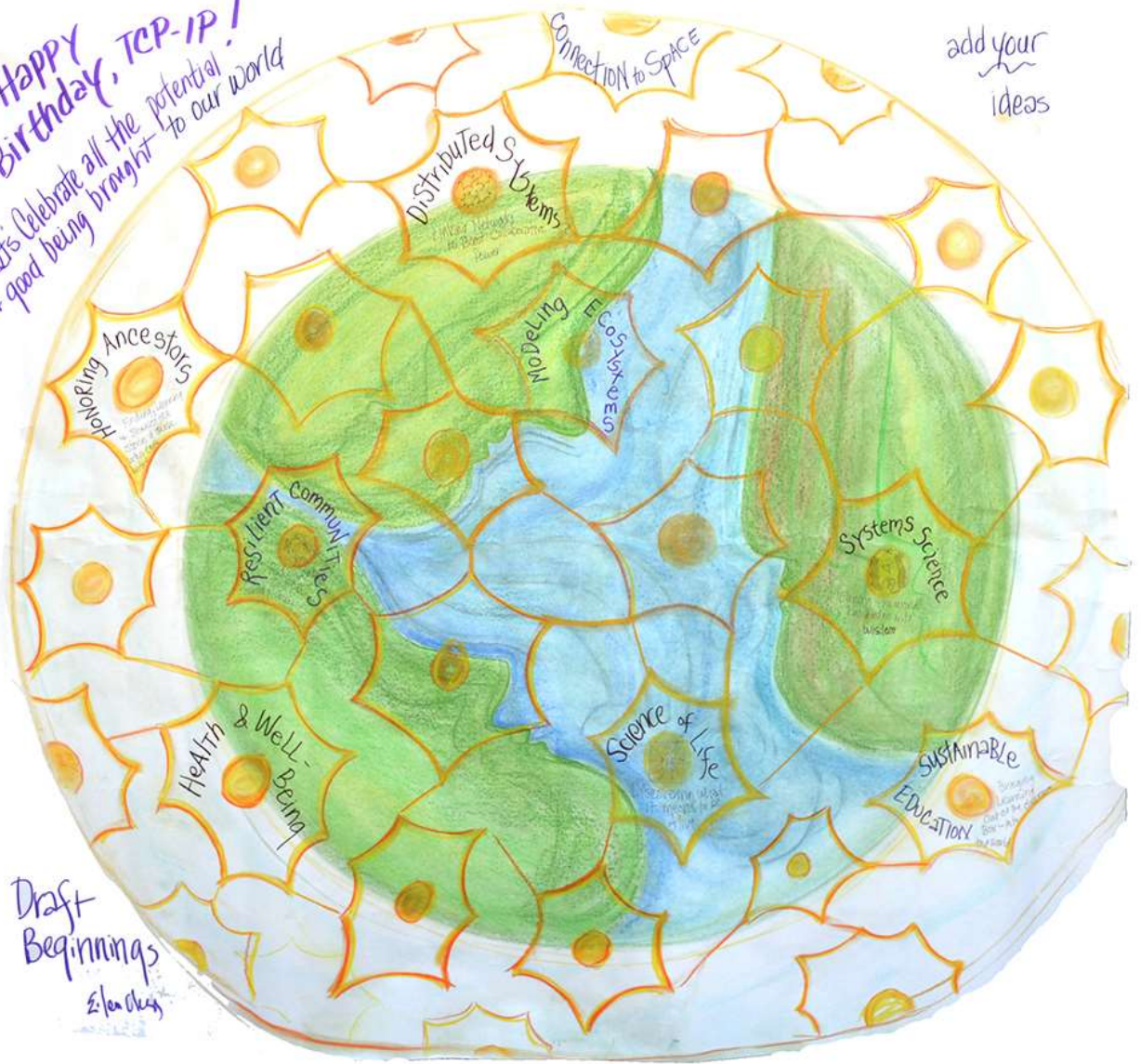


Two locations key to our TCP/IP story on opposite coasts



Happy Birthday, TCP-IP!
Let's Celebrate all the potential
& good being brought to our world

add your
ideas



Look around and you will see this mural amongst the picnic tables – there will be Post it notes nearby, write on them, include your email (or not) and we will put our “work-in-progress” at www.TCPIP40.com

We all have a
story to tell

Share it with your **webcam** by recording a video 'story' about the impact of TCP/IP and sharing your story – email the link to birthofinternet@gmail.com

If you have a webcam connected to your computer, you can record a webcam video on YouTube and ultimately (after we've taken a look to make sure it fits) we can include it with others on the www.tcpip40.com website.

Thank you for sharing your memories and historic anecdotes: Please try to be concise, more people will watch your story, if they can follow it.

Suggested webcam interview format:

My name is _____.

My story relates to _____ (for example, implementing the TCP/IP specification).

The timeframe this story relates to is _____ (month, year).

Please try to keep your video stories under 5 minutes in length.

How to record your video?

Click the Record from webcam link on the upload page, or simply go to http://www.youtube.com/my_webcam to get started.

When you are done, email the link to birthofinternet@gmail.com

THANK YOU FROM THE TCP/IP 40TH ANNIVERSARY COMMITTEE & CONTRIBUTORS

Sean Askay - Google Earth

Greg Berkin - Videography

Vint Cerf - Google

Eileen Clegg - Mural, Visual Insight

Jennifer Cook - Sponsorship

Bill Daul –Chief Collaboration Officer, NextNow Network and Collaboratory

Dan Esbensen - Website

Judith Estrin - JLABS

John Feland - Social Media, Argus Insights

Mei Lin Fung - Organizer, NextNow Network, Franchise for Humanity

Aditya Gunda – www.HOSA.org

Sam Hahn - Program for the Future

Carla LaFever - Google

Shannon McElyea - Sponsorship

Neguine Navab - Picnic Invitation - The Ellerdale Project

Don Nielson - SRI

David Nordfors - IIIJ - Innovation for Jobs

Joel Orr - Sponsorship, JoelTrainsAuthors.com

David Price - Debategraph

Kennan Salinero - Yámana Science and Technology

Veera Swaminathan – Global Story Collector/Coordinator

Andreu Vea – The Internet Biographer, WiWiW.org

Marc Weber - Internet History Program Founder and Curator,
Computer History Museum



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#TCPIP40



We all have a
story to tell

Share your TCP/IP 40th Anniversary
historic photos and stories.

We are collecting and sharing your photos
which can be uploaded to Flickr and ultimately to our TCP/IP 40th
Anniversary website www.TCPIP40.com.

How to share your photos with us.

Register (or log-in) to Flickr (www.flickr.com) with your own account.

Upload your historic TCP/IP images to your Flickr account.

Email or share with us your Flickr TCP/IP album link
- email to birthofinternet@gmail.com

We will review it and ultimately (after review) we will post your images
in the collection of TCP/IP 40th photos.

Please remember to tell us:

Date of the photo(s)

Subject name(s)

Location(s)

Short relevant story about TCP/IP



When you are done, email the link to birthofinternet@gmail.com

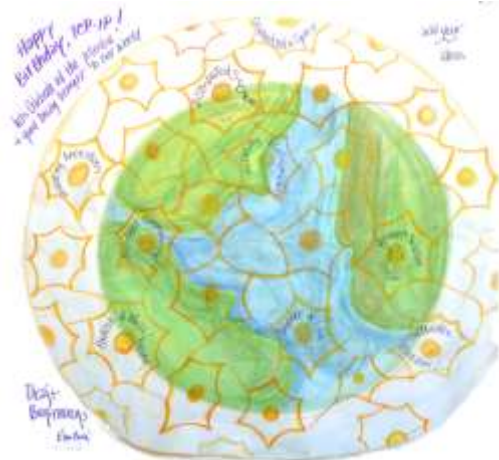
Thanks to everyone who helped bring us together

Anonymous \$10,000

Thank YOU for
Joining us



Yamana Science and Technology
...bringing forth the best in science and society



Anonymous \$1,000

We all have a story to tell
Thank you for telling yours



<https://www.facebook.com/TCPIP40>



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