Thomas C. Jacobson
Long Form Bio

(See www.tcjnet.com for detail, pictures, and brief paragraph version)

Key Internet Accomplishments

- *Built the first TCP/IP network in Minnesota (fuzzballs), 1981*
- *Introduced the first network of Sun Workstations in Minnesota, 1982*
- *Co-founded the Minnesota Supercomputer Center and Directed its Networking Group, 1984-89*
- *Deployed the first fiber optic backbone at the UofM (MSINet), 1985*
- *Founded the NSF regional network MRNet in 1987, elected Chairman to oversee transition to a corporation, 1990*
- *Promoted light weight client-server architectures which resulted in the first Internet browser, Gopher, 1989-91*
- *Co-founded and designed a major Internet Service Provider (Internet Way, later UUNET France), 1994-97*
- *Designed satellite based multicast service adopted by Orion (WorldCast), 1996*
- *Principal architect and author of Loral Orion's first global DVB IP satellite system (ODBS), 1997-2000*
- *Developed DVB performance and multicast enhancements while a member of SkyStream Technical Advisory Board, 1999-2002*

Recent Work

- *Next generation Adaptive Bitrate video architectures, including demonstrations of low cost video transcoding technologies.*
- *A few smaller consulting projects, such as looking at the use of new last mile radio technology for ATSC 3.0 (Next Gen TV) on-demand services.*

Chronological History

2010 - until recently: Involved with a tier 1 telco, exploring next generation architectures at their advanced development lab near the Bay Area. Since 2005 I had been extolling the virtues of OTT and ISO Base Media File Format (as opposed to transport stream) and since 2010 have pressed for the use of Adaptive Bitrate (ABR) protocols, starting with HLS and Smooth Streaming, ending up at DASH and HTML5 w/HEVC. In the course of this work collaborated with many major industry players, such as Ericsson, Alcatel, Moto/ARRIS, not to mention discussions with Google, Amazon, Netflix, etc. Built in-house demonstrations of these next generation streaming technologies, tested low cost video transcoding technologies. Catalyzed development of a new generation of app based player devices, usually based on Android and its

ecosystem.

2003 - 2009: Involved with several startups, and interested in the development of new satellite IP multicast networks and technology using DVB-S2 adaptive coding together with application layer FEC, in MPEG-4/AVC video, and IPTV/VOD server design. He has also been exploring implications of the impending IPTV paradigm shift from linear to on-demand VOD distribution, and what that will mean to traditional broadcast & IP multicast operators, and to related technologies in areas such as rights management and metadata. Also proposed satellite network to MIT OLPC for remote and developing regions.

1999 to 2002: Involved with SkyStream Corporation of Mt. View, CA as a member of its Technical Advisory Board, as a network architect, and as consultant. Explored the development of Internet multicasting products and related technologies such as digital rights management and conditional access, asymmetric routing and web proxy, multi-transponder DVB-IP methods, and the impact of turbo, LDPC and adaptive coding methods on Ku/Ka system design.

1987- 2000: Director of Internet Architecture, and later as a Consultant to Orion Network Systems (Now Loral SkyNet) Initiated and guided the development of Orion's first DVB based Internet service architecture, deployed on several international and domestic satellites. Responsibility included the detailed engineering development, procurement, and testing of high performance DVB-IP satellite systems with conditional access, IP multicast services, and the supporting terrestrial Internet services, caching servers, and a content delivery system. At the end of his tenure at Loral Orion he was offered the position of CTO, but declined in order to join SkyStream.

1994 - 1997: Co-founded and directed network development at Internet-Way SA, an ISP based in Paris, France. As principal network architect and strategic advisor, guided the development and deployment of Internet services across seven POPs in France, and developed the use of complementary terrestrial and satellite load sharing technology. The company achieved break-even during its first 18 months of operations. Facilitated the sale of I-Way to UUNET in 1997 through personal contacts.

1989 - 1992: Helped establish, and directed, the University of Minnesota Networking Services Department. This responsibility included administration, and oversight of the design of a large Internet/intranet backbone. Represented the University in state and national networking forums, and was involved in the creation of the first Internet browser, Gopher.

1984 - 1989: Co-founded the Minnesota Supercomputer Center Inc. and established and directed its networking group, which led the world in the use of TCP/IP for supercomputer-workstation inter-working by doing pioneering work implementing IP, RPC/NFS, X Windows, HIPPI, and fiber optic technologies, as well as developing high performance file server, and network management systems. Made several proposals for hub-based satellite networks, developed TCP extensions, and guided the development of a remote full screen editor that compensated for satellite propagation delay.

Prior to 1984: Held positions that included Sr. Systems Analyst at the University of Minnesota Computer Center (where he built the first TCP/IP network in Minnesota), and Research Assistant in the University of Minnesota Lunar Sample Analysis Laboratory (instrumentation development). In 1976, co-designed and manufactured 50 of the first single board microcomputers in Minnesota, and using this, developed and built a computer terminal for the blind, an early LAN, and other communications and instrumentation control systems used by researchers at the University. At the age of 15 built a LASER, and during high school was a University research intern in atmospheric physics, including work at Kennedy Space Center during Apollo missions.

Other Activity

1987 and 1991: Founded the Minnesota Regional Network (MRNet), one of the early NSFNet regional networks. In 1990 he was elected Chairman to oversee its transition from an association to corporation, and to establish its Board of Directors.

1997: Selected by the EU as a "Technical Expert" to travel to Moscow and evaluate Russian ISPs. Authored a report recommending ways the EU could facilitate their success in ways compatible with US and EU policy.

As T. C. Jacobson & Associates: Has provided consulting or advice to many organizations in the US and Europe, including Intel, Control Data, IFREMER, Kontron AG, Ecole Polytechnique, CNEARC, U of Minnesota, Los Alamos Labs, Lamb & Co., US Army, Pixel Multimedia, Vympel-Moscow, NetSat Express, International Datacasting, SkyStream, Loral, and a major Internet retailer, as well as informally to many small businesses and schools.

Education and Professional

BA from the University of Minnesota, and has also taken classes at Stanford University and the University of Oslo. Has participated in or attended a wide variety of professional activities such as National Net, FARNet, CICnet, MRNet, Comdex, LocalNet, AAIM, CUG, Supercomputing, ALA, IFIPS, INET, IEEE 802, W3C, NAB, IBC, Interop, SuperComm, TelecomNext, IETF, etc. during the last 35 years, including responsibility for a major part of Interop Paris Internet connectivity for several years. Has co authored one RFC relating to interactive terminal services over satellite, contributed to several others, and is co-holder of two patents relating to Internet via satellite and satellite multicast caching.

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