

## China's CSNET Connection 1987 – origin of the China Academic Network CANET

by Werner Zorn (29.06.2012, 23:00/10.07.2012)

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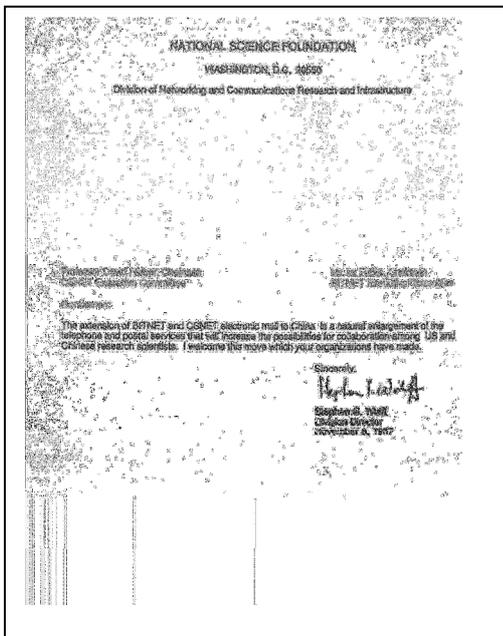
The Chinese – German computer network cooperation, leading to the E-Mail “Across the Great Wall we can reach every corner in the world” on Sep. 14, 1987, had its origin in a World Bank project 1982, out of which 19 Chinese universities were equipped with SIEMENS computers. Prof. Wang Yunfeng, being the lead of that project from the university side, renewed his contacts to the German scientific-technical community from the 1940ies, as he studied machinery in Berlin as scholar of the Humboldt foundation.

The important milestones within our cooperation are listed in the following timeline, chosen under the aspect that, if not successfully reached, the project itself would have ended at that point unconditionally.

An explanation strictly following the timeline might be boring and also unnecessary with respect to the available literature [1]. It was therefore decided to comment and emphasize selected items under the following aspects:

The key note speech in 09/1983 about the newly launched DFN-project in Germany immediately raised the request from the audience of not only telling but also supporting the participating institutes and scientists in building up similar network infrastructures and services in China. This whole issue took place at a time, where such networks did not exist in Germany, nor elsewhere in Europe, and regarding the underlying OSI-architecture and protocols nowhere in the world, not even in US. So we had to ask for patience, keeping the request nevertheless in mind in order to fulfill it as soon as we ourselves had enough expertise. We followed this principle throughout the next 12 years of cooperation until May 1994, when China had its own direct US-link with full Internet services and took over the complete responsibility.

<b>Timeline Date</b>	<b>Milestone</b>
1982	World Bank Chinese University Development Project with 19 SIEMENS/BS2000
06.-13.09.1983	WASCO Symposium at ICA/Technical University Beijing (heute 北京科技大学) Chairman: Prof. Wang Yunfeng 王云峰 (WASCO - Wissenschaftliche Anwender von SIEMENS Computern)
07.09.1983	key note Werner Zorn: "DFN- Deutsches Forschungsnetz - National Computer Network for the Research Area"
03.08.1984	German CSNET relay at University of Karlsruhe operational
1985	Start of CSNET/PMDF- implementation on SIEMENS/BS2000 as student project (CSNET - Computer Science Network, PMDF-Pascal Memo Distribution Facility)
27.05.1986	X.25 connection from Beijing to Italy "discovered"
20.08.1986	X.25 connection from Beijing to Germany via Italy (PKTELCOM Beijing- ITALCABLE- Datex P Deutsche Bundespost)
26.08.1986	X.25 dialog from ICA/Beijing to IRA/University Karlsruhe, Germany (ICA- Institute for Computer Application, IRA - Informatik RechnerAbteilung)
01.09.1986	E-Mail service over X.25 remote dialog from ICA/Beijing to IRA/Karlsruhe opened
25.09.1986	State Ministry (Prime Minister Lothar Späth) comits project funding for 1987 ff
Spring 1987	CSNET/PMDF implementation on SIEMENS/BS2000 operational
14./20.09.1987	Chinese CSNET relay at ICA, Beijing Technical University operational (based on our PMDF- implementation on SIEMENS/BS2000 at ICA/Beijing) "Across the Great Wall we can reach every corner in the world"
08.11.1987	NSF Approval of E-Mail Service to China (NSF - US National Science Foundation)
28.-30.03.1988	CANET Inauguration Conference in Beijing (CANET- China Academic Network)
26.11./03.12.1990	Application/Registration of TLD CN with primary server at IRA/University Karlsruhe
09.01.1991	DNS at ICA/Beijing opened (beijing@ira.uka.de => ica.beijing.canet.cn) (DNS - Domain Name Service, TLD - Top Level Domain)
21.05.1994	Takeover of Karlsruhe primary server for CN domain by CNNIC (CNNIC - Network Information Center of China)



**Fig. 1:** NSF approval Nov. 8, 1987

During these 12 years time interval the NSF approval of E-Mail services to China on Nov. 8 1987 can be considered the most important milestone, after the CSNET host at ICA/Beijing became operational by sending out the “Across the Great Wall we can reach every corner in the world” E-Mail on Sep. 20. 1987 to leading network people in US and Europe (see also Acknowledgment). This approval was so universal, that all scientific network activities in China could henceforth more or less rely on it, without being afraid to violate international restrictions (see Fig. 1).

The second most important milestone was the Italian X.25 breakthrough on Aug. 20, 1986 with reliable and inexpensive communication services, that enabled us to establish end-to-end dialog and E-Mail services between Beijing and Karlsruhe (see Fig. 2), also immediately used by a number of institutions to access scientific and commercial Databases in Germany.

Without this remote dialog E-Mail service, which was opened on Sep. 1, 1986 to many users, it would never have been possible to set up the CSNET host at ICA/Beijing in Sep. 1987 [1a]- [1c].

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Date: Mon, 1 Sep 86 11:02:51 MET DST
From: Prof Dr W Zorn <zorn@germany>
To: wang@germany
cc: zorn@germany
Subject: test
Status: 0
Content-Length: 159
Lines: 6

Lieber Herr Wang,
willkommen als Teilnehmer des ELECTRONIC
MAIL-Dienstes. Bitte bestaetigen Sie den
Empfang durch eine kurze Antwort.
Viele Gruesse
W. Zorn

----English translation on 29.06.2012----

Dear Prof. Wang,
welcome as user of the ELECTRONIC MAIL
Service. Please acknowledge the receipt
by a short answer.
Best regards
W. Zorn
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**Fig. 2:** E-Mail Service at ICA/Beijing over X.25 remote dialog to Karlsruhe opened on Sep. 1, 1986

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(Message # 50: 1532 bytes, KEEP, Forwarded)
Received: from unika1 by irau11.germany.csnet id aa21216; 20 Sep 87 17:36 MET
Received: from Peking by.unika1; Sun, 20 Sep 87 16:55 (MET dst)
Date: Mon, 14 Sep 87 21:07 China Time
From: Mail Administration for China <MAIL@ze1>
To: Zorn@germany, Rotert@germany, Wacker@germany, Finken@unika1
CC: lhl@parmesan.wisc.edu, farber@udel.edu,
jennings@airlean.bitnet@germany, cic%relay.cs.net@germany, Wang@ze1,
RZLI@ze1
Subject: First Electronic Mail from China to Germany

"Ueber die Grosse Mauer erreichen wie alle Ecken der Welt"
"Across the Great Wall we can reach every corner in the world"
Dies ist die erste ELECTRONIC MAIL, die von China aus ueber Rechnerkopplung
in die internationalen Wissenschaftsnetze geschickt wird.
This is the first ELECTRONIC MAIL supposed to be sent from China into the
international scientific networks via computer interconnection between
Beijing and Karlsruhe, West Germany (using CSNET/PMDf BS2000 Version).

University of Karlsruhe Institute for Computer Application of
-Informatik Rechnerabteilung- State Commission of Machine Industry
(IRA) (ICA)
Prof. Werner Zorn Prof. Wang Yuen Fung
Michael Finken Dr. Li Cheng Chung
Stefan Paulisch Qiu Lei Nan
Michael Rotert Ruan Ren Cheng
Gerhard Wacker Wei Bao Xian
Hans Lackner Zhu Jiang
Zhao Li Hua
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**Fig. 3:** 1st E-Mail from CSNET-host ZE1 at ICA/Beijing (edited on Sep. 14, sent on Sep. 20, 1987)

The 3<sup>rd</sup> most important milestone was technically the most challenging one, which required the collaboration of a dozen people half and half in Beijing and Karlsruhe to set up the end-to-end-connection between the two Siemens CSNET-hosts on both sides across all layers (physical, network, transport, application). The 3. WASCO/CASCO symposium in Beijing on Sep. 04 – 13, 1987. was the only possible occasion that year to bring the necessary staff from both sides together. During that common implementation the most critical moment, where the whole mission was about to fail, came on 13.09. at 02:30 after midnight, a few hours before our departure from Beijing, when everything finally worked except the connection setup to Karlsruhe, which had been O.K. before. By means of a manual plug exchange the problem could be circumvented and a few days later debugged (details see [1a]- [1c]).

Without that manual bug fix on Sept. 13 1987 late after midnight we would have returned to Germany without success and the history of Internet in China would have definitely taken a different course.

After the NSF approval of Nov. 08, 1987, which also opened the door to Larry Landweber's annual networkshop IANW (International Academic Networkshop), Prof Wang Yungfen, together with the ICA staff, founded the China Academic Network CANET. On 28.03.1988 CANET was launched in Beijing with participation of 28 Chinese scientific institutions, most of which were universities with Siemens computers from the World Bank project, as well as invited foreign experts (see [3] [4]). E-Mails and News were down- and up- loaded from and to Karlsruhe by the CSNET Host at ICA on a regular daily basis on their cost whereas the costs on the Karlsruhe side were covered out of the project funded by the German State of Baden-Wuerttemberg. Other CANET nodes and users nationwide communicated via the CSNET Host at ICA in a store and forward mode.

The registration of the Chinese Top Level Domain CN in Dec. 03, 1990 was historically as well as technically an outstanding milestone. This allowed introducing a domain name structure in China and forced to migrate the CSNET Host at ICA from Siemens/BS2000 to VAX/Unix, which went online on January 09, 1991 with support of an expert team from Karlsruhe. The primary server for CN remained in Karlsruhe until May 21, 1994, while under the responsibility of the Chinese Academy of Science CAS full Internet Services were setup over a direct link to US and became operational on April 20, 1994 and the administration of the Chinese Internet was setup at the Chinese network Information Center CNNIC. Here Qian Tian Bai, who was postmaster of CANET at ICA from early days, played an important role in building the Chinese Internet [5].

Prof. Wang Yungfen passed away on April 29, 1997 at the age of 86, a year later Qian Tian Bai followed on May 08, 1998 at the early age of only 53 years.

### **Acknowledgement**

All these milestones would not have been set up and successfully passed without the help of all the contributors mentioned above, first of all Prof. Wang Yungfen, who was initiator in 1982 and spiritual leader aswell as active supporter all the time til his last days, supported by Dr. C.C. Li, the computing center director at ICA and the ICA director Yang Chu-Quang, nor would these milestones have been reached without the help of the supporters in the background, who are not yet mentioned so far or not appropriately. First of all I want to thank Prof. Lawrence Landweber from the University of Wisconsin, Madison, who gave advice and help from our first meeting at the IANW 1984 in Paris and especially in the hot phase of setting up the CSNET host at ICA/Beijing, as well as, by recommending to Stephen Wolff, supported the NSF approval on Nov. 08, 1987 together with Prof. Richard Mandelbaum, Ira Fuchs and Prof. Dave Farber, who also provided the CSNET software in 1984. Dennis Jennings and Daniel Karrenberg donated international advice as CANET was born in March 1988, and followed the CANET development with sympathy and friendship continuously.

Special Thanks to Jay and Ronda Hauben as living examples, what precise historical recording means, as Jay researched our project work in an utmost diligent manner [6]-[8] and Ronda brought me to the WSIS 2005 workshop in Tunis [3], where I was lucky to meet and learned to know Mrs. Hu Qiheng, the president of the Chinese Internet Society, who meanwhile is a good friend.

**Addendum by Larry Landweber:** While factually correct, the above history does not adequately credit Professor Werner Zorn for his leadership in the successful realization of the Chinese connection to the Internet. It was he who, on the German side, persevered for years, overcoming many difficult challenges, technical, financial and political. In addition, the partnership forged between him and Professor Wang is a wonderful example of the power of the Internet to foster international cooperation.

### **Literature and Links**

[1] Zorn, Werner (1988): "How China was Connected to the International Computer Networks"

[1a] German Original: <http://www.hpi.uni-potsdam.de/zorn/publikationen/china.html>

[1b] English Translation: <http://www.hpi.uni-potsdam.de/zorn/publikationen/china.html?L=1>

[1c] Chinese Translation:

[http://www.hpi.unipotsdam.de/fileadmin/hpi/FG\\_Zorn/publikationen/how\\_china/ChineseVersion-How\\_China\\_was\\_connected-2006.pdf](http://www.hpi.unipotsdam.de/fileadmin/hpi/FG_Zorn/publikationen/how_china/ChineseVersion-How_China_was_connected-2006.pdf)

[2] Zorn, Werner (2007). "How China Was Connected to the International Computer Networks" *The Amateur Computerist*, 15(2), 36-49.

[3] Werner Zorn (2005) *German-Chinese Collaboration in the First Stage of Open networking in China* Past, Present, and Future of Research in the Information Society, Session The International and Scientific Origins of the Internet and the Emergence of the Netizen 13-15 November 2005 Tunis, Tunisia , Side Event of WSIS 2005 <http://worldsci.net/tunis/program.htm#Hauben>

[4] CANET No. 1 1988 (url will provided)

[5] Qian Tianbai, Werner Zorn "Die Entwicklung des Internet in China" in *China-Report Nr. 30* der Baden Württembergische China Gesellschaft, 15. Jan. 1999, p. 18 – 22 (url and English translation will provided)

[6] Hauben, Jay: "'Across the Great Wall': The China-Germany Email Connection 1987-1994." <http://www.columbia.edu/~hauben/china-email.doc>

[7] Hauben, Jay: "The Story of China's First Email Link and How it Got Corrected" *School of Global Journalism and Communications in ChongqingPR China*, , Jan 12, 2010 <http://www.columbia.edu/%7Ehauben/Chongqing/j-chongqing.doc>

[8] Hauben, Jay: "China's First Email Link - Research is crucial to journalism across the globe" Published 2010-01-29 16:51 (KST), *OhmyNews*, Jan. 29, 2010

[http://english.ohmynews.com/ArticleView/article\\_view.asp?article\\_class=4&no=385918&rel\\_no=1](http://english.ohmynews.com/ArticleView/article_view.asp?article_class=4&no=385918&rel_no=1)