

**From *Via Maris* to Electronic Highway: The Internet in Canaan**  
Phillip Ein-Dor, Seymour E. Goodman, Peter Wolcott

Final version appeared in: *Communications of the ACM*, July 2000, vol. 43, no. 7, pp. 19-23.

ACM COPYRIGHT NOTICE. Copyright © 2000 by the Association for Computing Machinery, Inc. Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Publications Dept, ACM Inc., fax +1 (212) 869-0481, or [permissions@acm.org](mailto:permissions@acm.org).

The *Via Maris*—The Way of the Sea—was for millennia the main trade route connecting Egypt with Mesopotamia. The section joining the Mediterranean coast to Damascus linked many major cities of what, in biblical times, was known as Canaan. For well over a thousand years, this region was a single political entity under the Arab Caliphates, then the Ottoman Empire, and, after World War I, as a British Mandate. This region is now occupied by Jordan, the Palestinian Authority, and Israel (Table 1), which have a modern history of complex, often hostile, and evolving relationships. Perhaps the Internet, the electronic highway, may help fill the role once played by the *Via Maris* in linking the countries of this small, troubled area.

In the eyes of the world, these culturally, theologically, demographically, economically, and politically diverse countries are more associated with persistent conflict than with anything else, certainly not with the Internet. However, there emerges a picture of the Internet shaped less by conflict than by shared human desires for communication and entertainment on the one hand, and the relationships between Internet service providers (ISP), governments, and providers of basic telecommunications services on the other (Table 2).

	<i>Israel</i>	<i>Palestinian Authority</i>	<i>Jordan</i>
Population (1997)	5,905,000	2,761,000	5,774,000
Area	20,770 km	West Bank 5860 km Gaza 360 km	89,213 km
Per capita GDP - (US\$) (purchasing power parity)	18,100	West Bank 2000 Gaza 1000 West Bank & Gaza 1500	3,500
Literacy rate	95%	84.3%	86.6%
Telecomm density 1998 (main lines per 100 pop.)	45	4	7
PC density (per 100 population) (no. of PCs/population)	19	1.1	0.1

**Table 1 Jordan, Palestine, and Israel in Statistics**

Sources: International Telecommunication Union. *Yearbook of Statistics: Telecommunication Services Chronological Time Series 1988-1997*. January 1999; Central Intelligence Agency. *World Factbook 1999*. <http://www.odci.gov/cia/publications/factbook/we.html> (February 17, 2000); Palestine Central Bureau of Statistics. [http://www.pcbs.org/english/nat\\_accodom6.htm](http://www.pcbs.org/english/nat_accodom6.htm) (February 18, 2000) (1997 accounts).



	<i>Israel</i>	<i>Palestinian Authority</i>	<i>Jordan</i>
First connection to global Internet	1990	1994	1995
Internet users (mid-1999)	800,000	15-20,000	50,000
Internet users (% of population)	13%	<1%	1.1%
Growth relative to previous year	60%	N/A.	160%
Int'l bandwidth	209 Mbps	only via Israel	5-10 Mbps
Int'l bandwidth per capita	34.2 bps	none directly	1.09-2.18 bps
Domestic Backbone aggregate bandwidth	ILAN Academic Network - T2-10Mbit IIX capacity 70.5Mbit Between major cities – 155-205Mbit Total network capacity – 1.434Gbit	none	none
Domestic Backbone bandwidth per capita	26Mbit	none	0 bps
Internet Exchange Points	1	0	0
First commercial ISP	1992	1995	1996
Number of ISPs (mid-1999)	8 licensed + ~15 unlicensed	~9	8
Main political subdivision (#)	District (6)	Governorate (16)	Governorate (12)
Percent main political subdivisions with POP	100%	100%	25%
Cost of one month unlimited access (not including metered phone charges)	\$21-35	\$15-\$25	\$75

**Table 2. The Internet in Jordan, Palestine, and Israel** [2,3]

### **Israel**[2]

Israel connected to EARN, the European counterpart to BITNET, in 1984, but the first Internet connection waited until 1990. Via a 9.6 Kbps line to the United States, the Inter-University Computer Center (IUCC) became the first provider of Internet services. Commercial ISPs began operation in 1992. Since 1990, Internet growth has been steady, although not as strong as might have been expected. Recent additions and upgrades include two Internet-2 connections and a 155 Mbps ATM national network.

Early efforts to establish the Internet reflected a pattern of contention that continues today between the ISPs, Bezeq (Israel Telecommunication Corporation), and the government Ministry of Communications. In 1984, responsibilities for telecommunications were divided between the Ministry, which was given policy and regulatory responsibility, and Bezeq, which managed operations. The latter views the ISPs as competitors as well as customers. Bezeq sees the Internet as a growth area for itself and has aggressively taken measures to strengthen its position vis-à-vis other ISPs. On one hand, Bezeq International, the subsidiary

providing international services, is intent on becoming a major ISP. It has acquired other ISPs, content providers, and options to buy into Walla, the largest Hebrew portal. On the other hand, Bezeq has sought to maintain its advantages as a monopoly provider of landline services while minimizing regulatory restrictions. When Internet use started to grow rapidly, Bezeq reverted to metered rates for local calls. Bezeq manages to obtain deferments of measures that would have introduced competition, and the cost of connectivity remains high.

The Israeli government plays an ambivalent role. It claims that the Internet is important to Israel's economy and has put in place initiatives to encourage Internet use and to expand its own use. But it has so far been unable to bring Bezeq into full compliance with its policy.

While the relationships between ISPs, Bezeq, and the government have been contentious, other factors have a positive influence on the Internet's growth. Among these are the high standard of living and the economy's transformation from agriculture and industry to one based more on hi-tech industry and a role in global R&D. Successful Internet-related companies include Vocaltec, Mirabilis, Checkpoint, and Aladdin. The transformation benefits from an influx of educated immigrants from the former Soviet Union and a close-knit society that has high tolerance for risk, reveres learning, is highly innovative, and is willing to experiment. Under such conditions, the surprise is that penetration is only about 13% of the Israeli population (1999).

### **Palestinian Authority (PA)**

The defining moments of the PA occurred roughly in parallel with a period of rapid Internet diffusion in the region. A transfer of powers and responsibilities from Israel to the PA took place following the Israel-PLO 1994 Cairo Agreement on the Gaza Strip and the Jericho Area and later elsewhere on the West Bank. Initial steps establishing Internet connectivity took place while these areas were still administered by the Israeli Civil Administration. Developments since then have been under the tutelage of the PA, but largely dependent on Israeli infrastructure. The attitude of the PA toward Internet development seems to be one of benign neglect.

The first ISP, PALNET, began operation in late 1994. Growth has been limited by political and economic factors. When the areas of the PA were governed by Israel, the infrastructure was owned and run by Bezeq. Attempts to obtain connectivity were unsuccessful until PALNET set up radio links to POPs (Points of Presence) within Israel which were then connected to Bezeq. Following Palestinian autonomy, ownership of the infrastructure reverted to the PA Ministry of Communications. The infrastructure was privatized in 1995 as PALTEL. In November 1996, PALTEL was granted a license to provide all public telecommunications services including telephony, cellular phones (GSM), data communications, paging, and public telephones. The legislative and organizational underpinnings of telecom activity in the PA are rudimentary. There are, as yet, no laws concerning monopolies, competition or regulation. There is no regulatory authority and the Ministry of Communications is still technically weak.

PALTEL is trying to lessen dependence on Bezeq in Israel. Thus, PALTEL recently signed an agreement with MED-1, a private Israeli company, to provide services bypassing Bezeq. However, the two systems are very closely interwoven. Calls from one person in the PA to

another in a different area code are routed through Israel, as are all international calls. Cellular phone services are provided by Israeli companies.

Currently there are about 9 ISPs, most operating a single POP in one area code. The largest is PALNET, which claims 60-80% of all subscribers in the PA. Many of the smaller ISPs have a few tens of subscribers and most are essentially retailers for Netvision, the largest Israeli ISP. ISPs in the PA are apprehensive of the intentions of PALTEL to offer Internet services. Use of the Internet in the PA also suffers from low personal incomes enabling few to afford the cost, even if it is not particularly high.

In October 1999, after two years of negotiations, the PA was awarded its own iTLD - .ps. So far, it has not been much used.

Considerable efforts have also been invested in establishing The Palestinian Academic Network "PLANET" at Al-Quds University, which links educational institutions with the World Wide Web. It also links some non-governmental organizations as well as most of the Palestinian ministries, using wireless means such as microwave. PLANET is connected to the IBM network in Israel by a T1 leased line.

In summary, Internet development in the PA suffers from insufficiently developed infrastructure, legal framework, and institutions. There are many cases of individuals and organizations making considerable efforts to promote the Internet and its use. Use is limited by the high cost of connectivity relative to average income in the PA. As in most countries in the region, private ISPs are apprehensive of the intentions of the local, monopolistic, telecom provider to offer Internet services on a biased playing field.

### **Jordan[3]**

The first Jordanian global Internet connection was established in 1995 by the National Information Center (NIC). Created in 1993, this Center grew out of King Hussein's interest in promoting technology and the development of a national information policy and appropriate institutions. NIC's central mission has been national data management, but it has pursued the development of national networks as well. While NIC limited Internet service to government and academic users, private providers were first licensed in 1996. By mid-1999, seven private ISPs were operational; these plus NIC provided service to an estimated 50,000 users, about 1% of the population. What is interesting is that the penetration is this high, given Jordan's relatively low per capita income and underdeveloped infrastructure. Other countries with similar circumstances have lower penetration rates.

Government policies are more open than in most Arab countries[1] doing nothing to directly to impede the diffusion of the Internet or to control access, even in areas such as national security or morality (this is also the case in Palestine). In some instances, the government has been proactive. King Hussein was committed to the idea that the provision of Internet services should be open. He permitted his private satellite ground station, Hashem 1, originally installed for communications with the Mayo Clinic, to provide international connectivity to ISPs. King Abdullah is continuing his father's support of high technology enterprises.

While the fraction of the population using the Internet is on a par with other countries in which the Internet has recently "taken hold," the absolute number of users, and the infrastructure supporting them, is small. The Internet is concentrated in Amman. There is no domestic backbone, and no Internet exchange points.

Several factors inhibit Internet growth. Chief among these is the cost of access relative to the low per capita income of the country. ISP connectivity is provided by the Jordanian Telecommunications Company (JTC), which holds a monopoly over both domestic and international lines. The JTC has a strong interest in maintaining high prices and does not appear to be willing to shift from a high cost/low volume service model to a low cost/high volume model. Competition among ISPs exists, but high taxes and licensing fees prevent them from dropping prices significantly.

Another hindrance to Internet diffusion is the uncertainty faced by ISPs. The attitude of the JTC towards the ISPs has been one of disinterest, making it difficult for ISPs to obtain the quantity and quality of lines they need at affordable prices. Moreover, in 1999 JTC was granted a data communications services license, opening the possibility that it would begin to compete on a less-than-level playing field.

One more difficulty facing ISPs is retaining qualified employees. Skilled people are drawn to the Gulf states by much higher salaries than are possible in Jordan

### ***A New Via Maris?***

The Internet is the means of a number of conscious and unconscious attempts to promote peace and regional integration. It also bears witness to deep divisions and animosities.

There are sites devoted to strident propaganda for one side or another, but these may just preach to the converted. Another indicator of the existing animosities is that few Middle Eastern web sites recognize Israel as belonging to the region. There are exceptions, but denial is much more common.

More encouraging are sites such as Arabia Online (<http://www.arabiaonline.com/>), a Jordanian portal which carries news on the region, including Israel, and whose policy it is to be as objective as possible. Even more encouraging are sites that attempt to promote regional discussions. One example is the Israel/Palestine Center for Research and Information—IPCRI (<http://www.ipcri.org/>) which presents itself as "the only joint Palestinian-Israeli public policy think-tank in the world. It is devoted to developing practical solutions for the Israeli-Palestinian conflict." Positions in the organization are each jointly filled by one Palestinian and one Israeli. Another example is that of the Middle East Virtual Community (MEViC, <http://www.mevic.org>), which promotes interaction by means of conferences, moderated chat sessions, and opinion polls.

There is considerable activity on the Internet attempting to promote dialogue. Lists of sites are available at <http://www.unesco.org/drg/portals/granada.htm>, and <http://arabculture.about.com/culture/arabculture/msub25.htm>. As with similar efforts in other conflict-ridden parts of the world, it is difficult to determine if such efforts are having much affect.

There are additional forms of integration at a more practical level. For example, the Ministers of Communication of Israel and Jordan agreed to upgrade the communications infrastructure between the two countries with a fiber-optic link.

Palestinians face the problem that large numbers of them live in refugee camps, mostly outside Palestine. Many Palestinians go abroad to work in the Gulf states and elsewhere (including Israel). Family and other social ties are difficult to maintain and the Internet might provide a partial solution. This is the basis for Birzeit University's Across Borders Project (<http://www.acrossborders.org/>) which "aims to bring Internet technology into Palestinian refugee camps across the Middle East and will see the creation of bilingual (English/Arabic) camp web sites, including on-line news, oral history and stories from refugees. The project also aims to facilitate the connection of refugees with each other." Its pilot phase established an Internet center in Dheisheh refugee camp in Bethlehem. The Internet may become a useful instrument for integrating Palestinians across the region, including those in Israel.

PALTEL is linked to the Israeli infrastructure operated by Bezeq. Arising from the occupation, this is likely to persist. At present, Palestine shares the Israeli international access code - 972, and Palestinian area codes are shared with the Israeli ones. The Palestinians would like to reduce this dependence, but quite some time will elapse before the two systems would be disentangled, if ever, and, in the meantime, it forces cooperation between the telecom providers.

Although it is very difficult to obtain good data on traffic volumes, it seems that most traffic for each of these three countries is either in the form of packets to and from the United States and Europe (with the number of incoming packets far outnumbering the outgoing as information is acquired from the WWW), or traffic that starts and ends within the same country. Far fewer packets start in one country and end in one of the other two. We have found similar patterns in much of the developing world – there is relatively little traffic between neighboring countries.

As business develops multinational ties within the region, the Internet will play an important role. The fact that the Palestinian ISP, PALNET, offers a POP in Israel is one example. Several Israeli businesses now operate in neighboring countries. Delta, a textile company, has manufacturing plants in Jordan, Egypt, and the West Bank. Paradigm Geophysics, which provides software to oil exploration companies, recently sold its software to a large, unnamed national oil company in the region, and announced expansion of its branch in Bahrain, a country with which Israel does not have diplomatic relations. Israeli, Jordanian, and Palestinian software houses are negotiating cooperative agreements. It is likely that these companies, and others, will utilize the Internet for some of their communications.

Although not yet a contemporary *Via Maris*, as has been noted by Zougbi[4] and others the Internet has promise as a much needed integrating factor among the three countries occupying the land of ancient Canaan.

### **References:**

- [1] Burkhart, G.E., Goodman, S.E. "The Internet gains acceptance in the Persian Gulf," *Comm. ACM* 41, 3 (March 1998), 19–25.

[2] Ein-Dor, P., Goodman, S., Wolcott, P. "The State of Israel,"  
[http://mosaic.unomaha.edu/israel\\_1999.pdf](http://mosaic.unomaha.edu/israel_1999.pdf)

[3] Ein-Dor, P., Goodman, S., Wolcott, P. "The Hashemite Kingdom of Jordan,"  
[http://mosaic.unomaha.edu/jordan\\_1999.pdf](http://mosaic.unomaha.edu/jordan_1999.pdf)

[4] Zougbi, S. "Internet's role in Middle -East development: Palestinian perspective."  
INET'95, 5th Annual Conference of the Internet Society, Hawaii, (June 1995).

Phillip Ein-Dor ([eindor@post.tau.ac.il](mailto:eindor@post.tau.ac.il)) is Professor of MIS at Tel Aviv University, and editor of the Journal of the AIS.

Peter Wolcott ([pwolcott@unomail.unomaha.edu](mailto:pwolcott@unomail.unomaha.edu)) is Assistant Professor of MIS at the University of Nebraska at Omaha.

Seymour Goodman ([goodman@cc.gatech.edu](mailto:goodman@cc.gatech.edu)) is Professor of International Affairs and Computing at the Georgia Institute of Technology, and contributing editor for International Perspectives for the Communications of the ACM.