Internet Services and Access

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1. About

This presentation is about both:

- The Internet: the global TCP/IP internet.
- The Matrix: all computer networks worldwide that exchange electronic mail; represented here by FidoNet, UUCP, BITNET, and the Internet, which are the main global networks in the Matrix.

We use geographical maps to examine network growth and extent, both in hosts and services.

1.1. Outline

- Growth and extent of the Internet, July 1992 – January 1993.
- Maps of total number of hosts per country worldwide and in Europe, and per U.S. state.
- Maps of growth rates per country for the Internet, BITNET, UUCP, and FidoNet.
- Maps of some Internet Services (anonymous FTP, archie, WAIS, and gopher, worldwide, and most of Canada and the United States.
- Map of the Matrix in Africa.
- Map of the Matrix worldwide.
- Summary.

1.2. Sources

- Internet hosts: Mark Lottor's SRI domain walk; see RFC 1296.
- BITNET: BITEARN nodelist (thanks to EARN).
- UUCP: UUCP map.
- FidoNet: FidoNet nodelist.
- Also: Larry Landweber's International Connectivity surveys.
- Per capita GNP and population figures: *Oxford Atlas of the World* Oxford University Press, New York, 1992, and are for 1989-1991; others from the *Economist* newspaper; others from *The World Factbook 1993-1994* , Central Intelligence Agency (CIA), Brassey's (MacMillan), New York, 1993.

2. Hosts per Country

Hosts per country maps show the Internet is

- Mostly in the U.S.,
- then in Canada, Australia, Western Europe, and other industrialized countries, such as Japan.
- South Korea, Taiwan, Hong Kong, and Singapore are clearly visible and growing.
- Worldwide extent.

Problems with these maps:

- Not normalized per population.
- Hard to see growth rates.
- Hard to see new or missing countries.

3. Hosts New and Gone

The Internet	BITNET	UUCP	FidoNet
New:	New:	New:	New:
bg Bulgaria	gp Guade-	cg Congo	do Dominican
cr Costa Rica	loupe	gd Grenada	Republic
cy Cyprus	ir Iran	mn Mongolia	gu Guam
ec Ecuador	pa Panama	pa Panama	li Liechtenstein
gl Greenland	ro Romania	qa Qatar	ro Romania
lv Latvia		re Reunion	tn Tunisia
my Malaysia		tm Turk-	uy Uruguay
ru Russia		menistan	uz Uzbekistan
		tr Turkey	
Gone:	Gone:	Gone:	Gone:
None.	gu Guam	gt Guatemala	id Indonesia
	kw Kuwait		

4. Growth Rates

- Rates are normalized per population.
- New countries are visible as the biggest bars.
- Countries that vanished are shown as decreases.
- The countries with the most hosts are growing the slowest.
- Growth rates are very different on different networks.
- Migration of hosts between networks?

4.1. The Internet

- Low growth in The U.S., New Zealand, Australia, Canada, and Japan, but surprisingly high rates in Europe.
- Highest European growth rates are in the west and north, not the east, unlike BITNET, and not especially like FidoNet and UUCP.
- South Africa shows a high growth rate, like the Nordics, Ireland, India, Chile, and Argentina.
- No change: none.
- Decrease: only Tunisia and Italy; almost certainly measurement glitches. (Could check against Marten Terpstra's RIPE domain walk.)
- Growth: everything else.

4.2. BITNET

- Decreasing in the West.
- Static almost everywhere else.
- Growing or adding new connections only in LDCs, exception for Japan, which also added hosts.
- South Africa, Australia, and New Zealand are not present at all.

BITNET is being absorbed by the Internet.

4.3. FidoNet

- Decrease: southeast Asia and Iceland.
- No change: Africa, ALyC, Greenland, India.
- Low growth in the West and other developed countries,
- Massive growth in some LDCs.
- South Africa, Australia, and New Zealand look like developed countries.

4.4. UUCP

- Strong growth in Latin America, New Zealand, Portugal.
- Low growth in the West and most developed countries.
- Most growth in LDCs.
- Australia and South Africa look like developed countries.
- New Zealand, surprisingly, shows high growth like an LDC, as does Mexico.
- Japan looks more like the West on UUCP than on FidoNet.
- No change: many countries, especially on RIO.
- Decreases: a few, including Argentina.

5. Africa

Africa is the least networked continent, except for Antarctica.

Mapping problems:

- Sierra Leone Internet host is an Irish typo.
- Austrian sites at (0, 0) already erased.
- Host in ocean isn't real.
- No Nigeria?

5.1. North Africa

North Africa

- Tunisia has long been connected to almost everything.
- Egypt has EARN and UUCP connectivity and is expecting an Internet connection soon.
- Algeria: Algiers once had an EARN node, but no more.
- Not networked, Morocco, Western Sahara, Lybia, Mauritania.

There are probably private network links, e.g., within petroleum companies, to these countries.

5.2. Sub-Saharan Africa

Regional differences:

- West Africa: mostly UUCP.
- East Africa: mostly FidoNet.

Why?

RIO network from ORSTOM in France.

- to francophone (French speaking) countrie, in Africa and elsewhere.
- RIO in Africa: Niamey, Niger; Ouagadougou and Bobo-Dioulasso in Burkina Faso; Bamako in Mali; Dakar, Senegal; Abidjan, Ivory Coast; Lome, Togo; Yaounde, Cameroun; New: Brazzaville, Congo.

5.3. South Africa

South Africa

- Looks like Europe
- But no BITNET or EARN: historical politics (sanctions against apartheid).
- Got FidoNet first (no oversight body to object).
- UUCP spread inside the country, partly replacing Fido.
- Then IP spread inside, interacting with UUCP.
- After sanctions, UUCP and then Internet external connections.
- Now serves as a regional networking center.
- Mapping problem: the Internet is the hardest to localize; need access to ZA domain registry.

6. Summary

- The industrialized countries have the most hosts.
- The lesser developed countries (LDCs) have the greatest growth.
- FidoNet and UUCP serve as inexpensive access networks that can provide electronic mail, mailing lists, and electronic news.
- BITNET is being absorbed by the Internet.
- The Internet has the most services and the most hosts.
- The Internet, or something like it, will spread worldwide.
- But FidoNet and UUCP will be cost-effective as access networks for some time, in new countries, in outlying areas, and for new classes of users.