

S E R B I A

A Preparatory Assessment

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31 December 2002

In fulfillment of Deliverable 5 of Subcontract No. 01100701 between SETA Corporation and Internews Network, Inc.: "An in-depth assessment study of a third country preparatory to launching a full-scale GIPI project in that country."

KEY STATISTICS

Serbia's Population (2002, without Kosovo)	7.478.820	Yugoslav Statistical Agency (2002 Census)
GDP per capita (2002)	\$1630	Serbian Government estimate
Main phone lines per 100 inhabitants	32.36	Telekom Srbija (Oct 2002)
Mobile phone users per 100 inhabitants (July 2002)	32.36	Combined subscribers: Mobilna Telefonija Srbije and MobTel
ISDN subscribers per 100 inhabitants	0.1	Telekom Srbija
% of households with PCs (Dec 2001)	15%	Strategic Marketing & Media Research Institute (SMMRI)
% of households with Internet access (Dec 2001)	10%	SMMRI
Internet users (September 2002)	500,000	YUISPA
Net-users as % of population	6.7%	(calculated)
Number of Internet Service Providers (December 2001)	44	<i>Internet Ogledalo</i>
Number of Secure (SSL) servers in country	7	Netcraft SSL Survey (1/ 2001)
Number of WWW servers in .yu domain (November 2002)	7,675	Reseaux IP Europeens (RIPE)
Internet Real Host Count (November 2002)	16,821	Reseaux IP Europeens (RIPE)
Number of inhabitants per Internet host	444.6	(calculated)
Change in Real Host Count, 11/2001-11/2002	+2.2%	Reseaux IP Europeens (RIPE)
Change in WWW count, 11/2001-11/2002	+42.1%	Reseaux IP Europeens (RIPE)
Digital electronic signature law	Draft only	



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1. Geophysical environment

The Republic of Serbia is in southeastern Europe. Bordered by Bosnia-Herzegovina¹, Bulgaria, Croatia, Hungary, Macedonia, Montenegro² and Romania, it is the keystone of the Balkans: Serbia’s strategic location enables it to influence whether its neighbors quarrel or cooperate, develop or decline. It is also a gateway between Central Europe and Turkey. For centuries the actual gate (boundary) between the Hapsburg and Ottoman Empires was marked by the Danube and Sava Rivers which pass through modern Serbia. They split the republic into the province of Vojvodina in the north, and Central Serbia in the south. Vojvodina was Hapsburg while Central Serbia was reluctantly Ottoman.



The modern Republic of Serbia actually comprises 3 regions:

Region	Land Area (km ²)	Population ³	Population Density (persons/km ²)
Central Serbia	55,968	5,454,333	97.45
Vojvodina	21,506	2,024,487	94.14
Central Serbia + Vojvodina	77,474	7,478,820	96.53
Kosovo ⁴	10,887	2,085,400	191.55

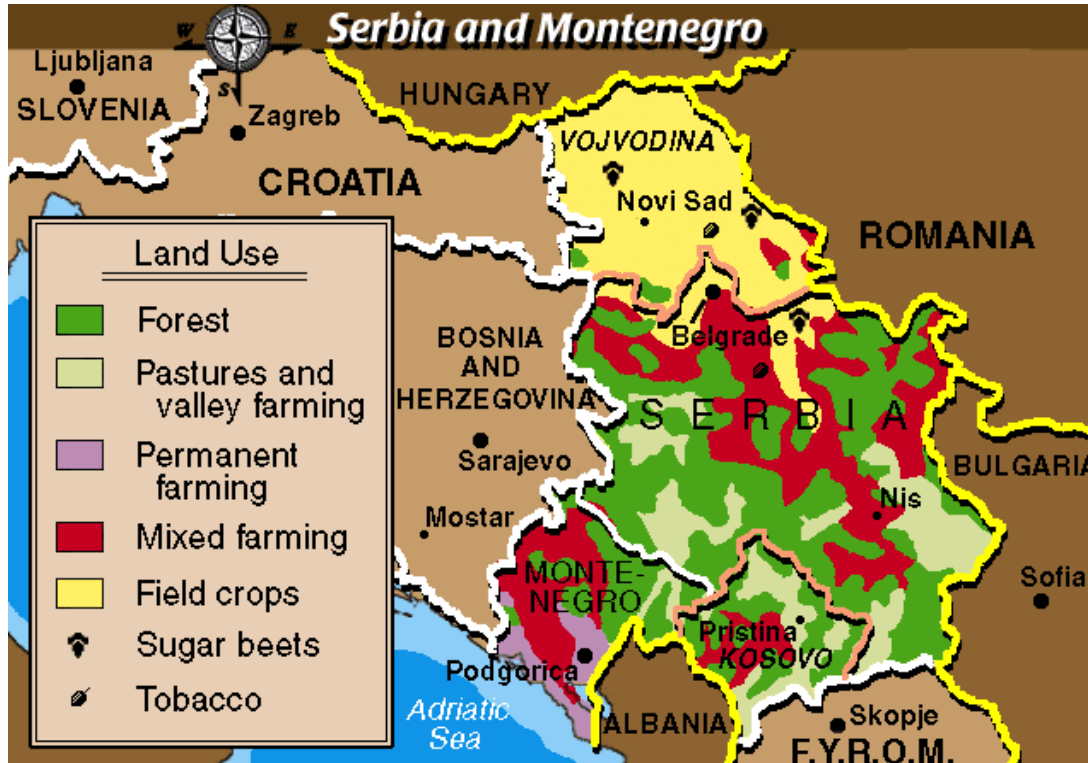
¹ The part of Bosnia-Herzegovina bordering Serbia is now called Republika Srpska – the “Republic of Serbs” – a rather belligerent name reflecting the fact that most people in Republika Srpska consider themselves Serbs rather than Bosnians. However, the international community has expended a great deal of effort to ensure that this territory remains part of BiH.

² Montenegro is the only former Yugoslav republic that did not secede after Serbia took control of Yugoslavia’s federal institutions in the early 1990s and began using them to advance its own interests. Although officially still Serbia’s confederate in what remains of Yugoslavia, Montenegro’s government has tried to separate from Serbia as much as it can, economically and politically. However, full independence is a divisive issue among Montenegrans, whose history and culture are deeply entwined with Serbia’s. Montenegro’s government is now negotiating a new – and more limited – framework for partnership with Serbia.

³ Population figures for Central Serbia and Vojvodina are taken from the Yugoslav Statistical Agency’s preliminary extracts from the 2002 census - <http://www.szs.sv.gov.yu/POPIS/PRVIREZ.pdf>. The population figure for Kosovo is from *The World Gazetteer* - http://www.world-gazetteer.com/fr/fr_yu.htm

⁴ Because this assessment deals with Serbia, we use the Serbian spelling (Kosovo) rather than the Albanian spelling (Kosova), even though the latter is becoming politically correct.

Serbs are believed to have migrated into Central Serbia from Kosovo, so many of them still view that province as their homeland. However, with each passing generation, Kosovo’s demography has become less Serbian and more Albanian. Language, religious and cultural differences between these two peoples led to mutual mistrust and animosity – to the point where the international community had to intervene in 1999 to restore order. Because it is now a UN protectorate, and the Albanian majority opposes reintegration with Serbia, Kosovo is not included in this assessment even though, strictly speaking, it is still part of the Republic of Serbia. Some sort of permanent political separation from Serbia seems likely for Kosovo, and its needs and circumstances are in fact distinct.



CIA map, 2002 - <http://www.cia.gov/cia/publications/balkan/serbia6.html>

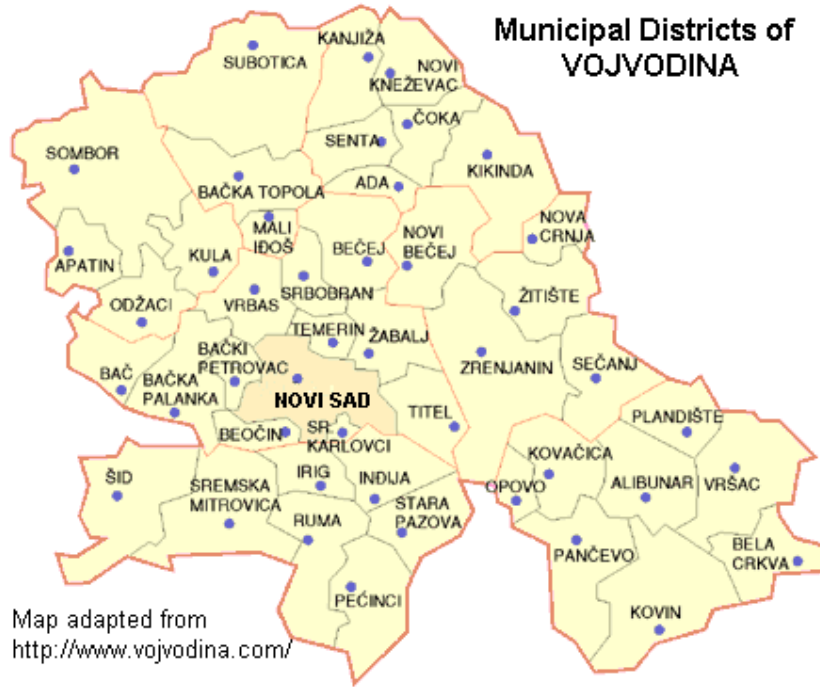
Vojvodina

The territory north of the Sava and Danube rivers is called Vojvodina. This area is part of the flat Pannonian Plain which extends into Hungary and which, 2.5 million years ago, lay beneath an inland sea.⁵ Organic sediments and wind-borne topsoil filtered down onto the sea-bottom, building a layer of nutrient-rich mud up to 160 m thick in places.⁶ After the sea dried and the ground rose 100-200m above today’s sea-level, this became one of the most fertile agricultural areas on Earth. Eighty-four percent of Vojvodina’s land is arable (1.78 million hectares). Fields of corn, wheat, sunflowers, tobacco and vegetables cover the ground from horizon to horizon. Self-sufficiency in agriculture helped Serbia survive years of devastating international trade sanctions.

⁵ The only parts of Vojvodina which are not flat are the “Sremski” district, to the south of Novi Sad, which contains the Fruska Gora mountain, and the “Banat” region near the Romanian border.

⁶ “Country Profile – Yugoslavia,” US Library of Congress (December 1990). This document is referred to below as *LibCong*.

Farming exists in other parts of the republic of course, but it dominates Vojvodina. Between 1949 and 1952, Yugoslavia’s Communist Party tried to impose Soviet-style collective farming. (See section 2. **Economic Environment**, for more on this episode.) However, by that time, Tito had already severed ties with the Soviet Union, so reverting to the pre-war patchwork of peasant-owned



farms was easy when collectivization proved a failure. One of Yugoslavia’s many socialist “heresies” was to reject agricultural collectivization, fostering private land ownership instead – albeit while limiting the area of cropland any person could own to 30 hectares. This limit encouraged relatives to cooperate in managing their holdings, and the need to visit separate plots regularly – as well as the lack of social services outside urban areas – induced people to live in the 45 municipalities sprinkled across Vojvodina, rather than on farms. This pattern persists today. The largest city is the provincial capital, Novi Sad. With a population of 190,600, it is barely one-seventh the size of Belgrade. Subotica (pop. 99,500), Zrenjanin (pop. 79,500) and Pancevo (pop. 76,100) are the other main urban centers. Most other settlements in Vojvodina have fewer than 30,000 residents.

Farming and food processing are not the only important economic activities in Vojvodina. Oil and natural gas are found along the region’s northeastern border. Pipelines carry the oil to storage depots and refineries near Belgrade, Novi Sad, Krusevac and Pancevo, where fertilizers and other petrochemicals are also produced. Before the 1999 bombardment by NATO, about 22,000 barrels of oil were pumped each day – almost a quarter of Serbia and Montenegro’s annual consumption. Today, production is down to 11,460 barrels per day.⁷

Hungarian influence is more evident in Vojvodina than in Central Serbia. This is due to geographic proximity and history: no national border separated Hungary from Vojvodina when both were part of the Austro-Hungarian empire – and when Hungary annexed Vojvodina during World War 2. In the 1981 census, about 25% of Vojvodina’s residents

⁷ The decrease in production is due to reserve depletion, not to the NATO bombing (the refineries have been repaired). Current production data comes from “Serbian Energy Sector: Current Problems and GOS Policy,” by Prof. Milovan Studovic, Ministry of Mining and Energy, presented at the IEA-UNDP Workshop on Energy Policies in SE Europe, Zlatibor, Serbia (October 2002).

identified themselves ethnically as Hungarian. That proportion fell to just under 17% in the 1991 census,⁸ and to just [6%?] in the 2002 census. Some of the decrease is probably due to changes in the way people choose to identify themselves. But some must also come from migration, as thousands of Vojvodinans moved to Hungary in the 1990s seeking better economic conditions and relief from growing Serbian nationalism.⁹ The Milosevic regime encouraged Serb refugees from Bosnia, Croatia and Kosovo to settle in Vojvodina in what some called a “‘silent’ policy of ethnic reconstruction”¹⁰ designed to make Vojvodina’s population more like the rest of Serbia, weakening arguments for autonomy or secession.¹¹

Central Serbia

Central Serbia is as hilly as Vojvodina is flat, and the hilliness grows into mountains in the south, near Kosovo and Montenegro. Fifteen mountains are over 2000m tall. A few long valleys run more or less parallel to the Adriatic coast, providing corridors for rivers, roads and railways through Serbia’s heartland (e.g., between Belgrade and Nis).

Bituminous coal is mined north and east of Nis, along with low-calorie lignite, which is also found near Smederevo.¹² Metal ores are mined mainly in the districts bordering Romania, Bosnia, Montenegro and Kosovo. One of the largest copper mines in Europe is near Bor, not far from the Romanian border.¹³ And what could be the largest boron deposit in Europe has been discovered – although not yet exploited – near the Ibar River.¹⁴

Beograd	1,574,000
Novi Sad	190,600
Nis	173,400
Kragujevac	146,000
Subotica	99,500
Zrenjanin	79,500
Pancevo	76,100
Cacak	73,200
Leskovac	63,100
Smederevo	62,700

Central Serbia’s folded and fractured geology hides thousands of long, shallow caves which the anti-Fascist “Partizan” guerrillas famously exploited during World War 2. But the rock substrate is mostly covered by good soils that nourish hillside pastures and prolific forests. Farms tend to be much smaller than in Vojvodina, and the crops less suited to mechanical harvesting (tomatoes, melons, berries, etc.). The lush green landscape also contrasts with the rugged limestone gorges that dominate Montenegro and Macedonia. The climate further south is too dry for the vegetation needed to hold soil on the steep mountainsides. However, Serbia’s rainfall is

⁸ Population figures from 1991 are given on the Government of Serbia’s website - <http://www.serbia-info.com/facts/provinces.html>

⁹ Vojvodina lost most of its autonomy under a new Serbian constitution adopted in September 1990. A recently enacted “Law on National Communities” restores many ethnic rights taken away during the 1990s.

¹⁰ Snezana Radovic, “Ethnic Composition of Vojvodina Changed,” *Alternativa Informativna Mreza* (22 November 1997) - <http://www.aimpress.org/dyn/trae/archive/data/199711/71122-035-trae-beo.htm>.

Radovic claims that by the end of 1997, some 200,000 Serbian refugees from Croatia and Bosnia had resettled in Vojvodina.

¹¹ For a pro-autonomy perspective, see “Analysis: Vojvodina, the Hungarian Kosovo,” by Sam Vaknin, United Press International, 11 October 2002 - <http://www.upi.com/print.cfm?StoryID=20021011-023956-9925r>.

¹² Most of Serbia’s electricity is generated by burning lignite and coal.

¹³ Mines in this district also produce gold, silver and other metals. See “Bor-Majdanpek” at the Geodynamics and Ore Deposit Evolution website - <http://www.gl.rhbnc.ac.uk/geode/ABCD/Bor.html>

¹⁴ *21 Projects for the 21st Century* - “Project 5: Exploitation of Nonferrous and Other Metals,” - Serbian Government Bureau of Communication – http://www.srbija-info.yu/Razvoj/21_e.html

District name	Capital city	District population	Major economic activity
Backa North	Subotica	205,401	Food processing
Central Banat	Zrenjanin	221,253	Diverse
North Banat	Kikinda	179,783	Clay building materials
South Banat	Pancevo	328,428	Petrochemicals
West Backa	Sombor	215,916	Agriculture, food processing
South Backa	Novi Sad	553,027	Diverse
Sremski	Sremska Mitrovica	309,981	Wood products, paper
Macvanski	Sabac	339,644	Diverse
Kolubarski	Valjevo	200,560	Metals, agriculture
Podunavski	Smederevo	226,589	Heavy machinery, petrochemicals
Branicevski	Pozarevac	253,492	Food processing
Sumadija	Kragujevac	312,160	Automobiles
Pomoravski	Jagodina	312,160	Cable-making
Borski	Bor	178,718	Copper mining
Zajecarski	Zajecar	158,131	Mining, leather, food processing
Zlatiborski	Uzice	335,826	Metal fabrication, textiles
Moravicki	Cacak	230,748	Metal fabrication, paper, chemicals, agriculture
Raski	Kraljevo	300,274	Diverse
Rasinski	Krusevac	296,690	Chemicals
Nisavski	Nis	382,461	Electronics, tobacco, textiles, machinery
Toplicki	Prokuplje	111,831	Diverse
Pirotski	Pirot	116,926	Rugmaking, footwear paints/varnishes
Jablanicki	Leskovac	255,011	Textiles, cosmetics
Pcinjski	Vranje	243,529	Mining, agriculture, forest products

Districts are ordered from north to south and west to east, with data from the Serbian Government's Information Bureau: <http://www.serbia-info.com/facts/districts/>

more than adequate for that. Tectonic movements under the ground occasionally cause earthquakes, though neither as large nor as often as in Serbia's southern neighbors.

As in Vojvodina, cities in Serbia tend to be small except for the capital. The exceptions are Nis, a transport/distribution hub and industrial center between Belgrade and the Bulgarian border, and Kragujevac, center of the motor vehicle industry. Scattered around the countryside are hundreds of cultural heritage sites (mainly monasteries and old churches), but no other Serbian city offers anything like the cultural richness and career opportunities of Belgrade – even after a decade of international isolation and the emigration of so many well-educated professionals. One of the challenges of informatization policy will be to reduce the disparity between the capital and the provinces, in terms of both infrastructure and the quality of local content.

2. Economic environment

Before World War 2, Yugoslavia was one of the least developed countries in Europe. Eighty percent of its people were poor peasants living in small villages. Only about half of them could read or write.¹⁵

Impoverished already, the War Against Fascism decimated Yugoslavia. It was occupied and partitioned by Germany, Italy, Bulgaria and Hungary. About half of its rail-lines were destroyed. The communication network was sabotaged. Eleven percent of the pre-war population was killed. Another 25% were left homeless.¹⁶

When Josip Broz (his *nom-de-guerre* was “Tito”) and the People’s Front¹⁷ came to power in November 1945, a process of rapid industrialization was launched to alleviate poverty and turn the peasants into proletarians.

“Under the post-World War II communist regime, Yugoslavia experienced one of the quickest transformations from an agricultural to an industrial society that history has ever witnessed. The agricultural population shrank from 86.1 percent of the total population in 1921 to 67.1 percent in 1948 and to 16.7 percent in 1984...”¹⁸

At first, Tito and his party faithfully copied the Soviet economic model, nationalizing assets and putting production and trade under state control. But in 1947, when they began modifying the standard model to fit local conditions, Stalin treated this as insurrection, as a threat to the unity of the revolutionary movement. Tito defended his country’s right to define its own path to socialism, just as the Communist Party of the Soviet Union (CPSU) proclaimed as its official policy...at least until Yugoslavia tried to exercise that right.

To counteract such centrifugal forces, the Communist Information Bureau (Cominform) was established in Belgrade as an instrument for the “leading parties” to determine which applications of Marxism-Leninism were ideologically correct. Tensions between Stalin and Tito escalated until Yugoslavia was expelled from Cominform in June 1948. At that time, about 50% of Yugoslavia’s foreign trade was with Cominform members. By 1950, that level had sunk to zero.

“Yugoslavia was forced to turn to the Western industrialized nations to obtain capital equipment, fuel, and raw materials for the intense industrial development called for in the first two five-year plans. Throughout the 1950s, United States and West European credits and grants were vital in sustaining industrial growth in Yugoslavia.”¹⁹

America and its NATO partners encouraged this split in “monolithic Communism,” and Yugoslavia went on to develop a unique form of socialism, emphasizing decentralization, “worker self-management” and “social ownership” (as opposed to state ownership). The Communist Party’s role was redefined as providing broad ideological guidance rather

¹⁵ *LibCong.*

¹⁶ *LibCong.*

¹⁷ The People’s Front institutionalized itself as the Communist Party of Yugoslavia, later called the League of Communists of Yugoslavia (LCY).

¹⁸ *LibCong.*

¹⁹ *LibCong.*

than detailed command and control. Economic planning became a bottom-up exercise, though the state still made investment decisions and appointed enterprise directors. In the beginning, this innovative approach was remarkably successful: “From 1950 to 1960, industrial output rose faster in Yugoslavia, in both per capita and total output, than in almost any other country in the world over the same time period...”²⁰

At the same time, large numbers of workers began migrating from villages to the new industrial centers. Actually, more left their villages than there were factories to employ them or dwellings to house them. Serbia’s industrial cities grew rapidly, and without adequate planning, yet they could not absorb the constant influx of job-seekers. So in the mid-1960s the government removed restrictions on emigration. By the early 1970s, some 20% of the Yugoslav work force was employed abroad, mostly in Western Europe. “Gastarbeiter” (guest worker) remittances became a significant prop to the domestic economy, and Yugoslavs’ freedom to travel abroad was unique in the Communist world. Cash-rich and cosmopolitan, no one was pessimistic enough in the 1970s to foresee what Serbia would become in the 1990s.

For a generation or more it looked like Yugoslavia had succeeded in combining the best features of socialism and market-oriented liberalism.²¹ But after Tito’s death in May 1980, the situation unraveled – slowly at first, then with gathering momentum. Economic growth had already started faltering. Since the 1940s the economy had been biased toward heavy industries and the production of basic commodities. These were low-profit/low-growth sectors in the 1980s. The post-Tito government tried to restore higher rates of growth by borrowing from abroad. The loans were supposed to be used for modernizing export-oriented industries, but as growth slowed, labor unrest spread, unemployment rose, and the leadership decided to use the loans to sustain consumption instead of investment. The result was higher inflation, a mountain of debt and eventually a cutoff of foreign credit. By 1988 Yugoslavia had the highest per-capita foreign debt of any European country. A year later, inflation reached 50% per *month*, with a jobless rate of 18%.²² Ethnic tensions which had eased in prosperous times re-emerged. The rich republics (Slovenia and Croatia) grumbled about their earnings being “stolen” to subsidize “black holes” like Kosovo. Kosovars, meanwhile, wanted their province upgraded to “republic” status. The largest ethnic group, Serbs, chafed at the system of checks and balances that Tito created – they felt – specifically to deprive them of the dominance to which they were entitled by the size of their population.

In the wake of the anti-communist uprisings that swept across Eastern Europe in 1989, Yugoslavia approved a new set of economic reforms in January 1990.²³ But before they could be fully implemented, they were overtaken by the political crisis that tore the federation apart. Franjo Tudjman was elected president of Croatia in April 1990. That

²⁰ *LibCong*.

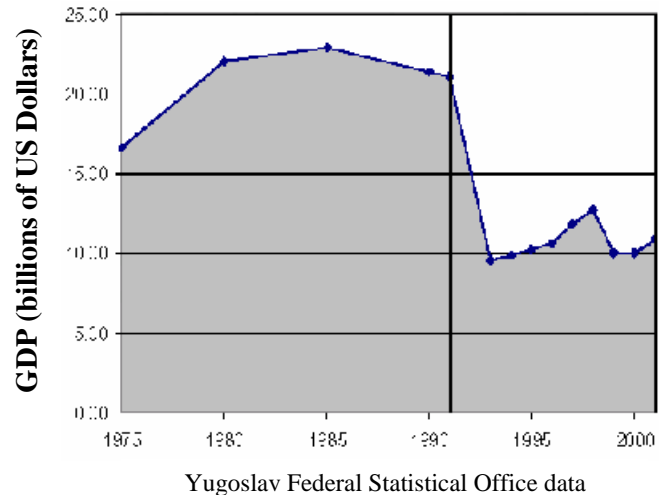
²¹ “Market socialism” is one of the terms used to describe this phenomenon although, strictly speaking, that refers to an economic restructuring prescribed by the 1963 Yugoslav constitution. The re-imposition of price controls in 1974 effectively transformed this experiment in the use of markets to set prices into a system based on negotiated price agreements.

²² See the chart on page 10. The monthly inflation rate of 50% was reported in S. H. Hanke, “New Currency Boards Come to the Balkans,” *Transition Newsletter* (World Bank, January-February 1997) - <http://www.worldbank.org/html/prddr/trans/janfeb97/art5.htm>. This article is referenced below as *Hanke*.

²³ For a view of what might have been, see S. H. Hanke and K. Schuler, *Monetary Reform and the Development of a Yugoslav Market Economy* (London: Center for Research into Communist Economics, 1991).

helped Slobodan Milosevic become Serbia’s president the following December.²⁴ Slovenia and Croatia declared their independence in June 1991. Two months later, all road, train and air traffic between Serbia and Croatia ceased; telephone lines and microwave links between Zagreb and Belgrade were cut. Then in April and May 1992, fighting in Bosnia-Herzegovina escalated into civil war, leading to a series of UN resolutions imposing “comprehensive” sanctions on Serbia, Montenegro and what would later become Republika Srpska.²⁵

War, sanctions and secession broke vital trade links among the Yugoslav republics. Serbia’s economy was cut off from the rest of the world, yet the ongoing military actions in Bosnia and Croatia were expensive. Domestic shortages of raw materials, spare parts and energy made manufacturing increasingly difficult, but the government continued paying idle workers anyway, rather than risk their wrath. Then large numbers of Serb refugees began arriving from Bosnia and Croatia. It is no wonder that per capita gross national product in Serbia and Montenegro fell 50% between 1990 and 1993.²⁶



Drastic measures were needed to keep the economy from imploding. Money was printed without restraint, leading in 1993 to the worst hyperinflation ever unleashed anywhere.²⁷ That succeeded in preventing a collapse of employment. Indeed, it forced people to keep working even though their salaries evaporated almost before they could be spent.

“Monetary policy, as well the entire finance system, served the needs of the political oligarchy, resulting in enormous bad debts in the banking system (bad loans), and unhealthy partnerships with mainly inefficient and uncompetitive firms.”²⁸

²⁴ Tudjman’s election, however, was Croatia’s response to Milosevic becoming head of the League of Communists of Serbia.

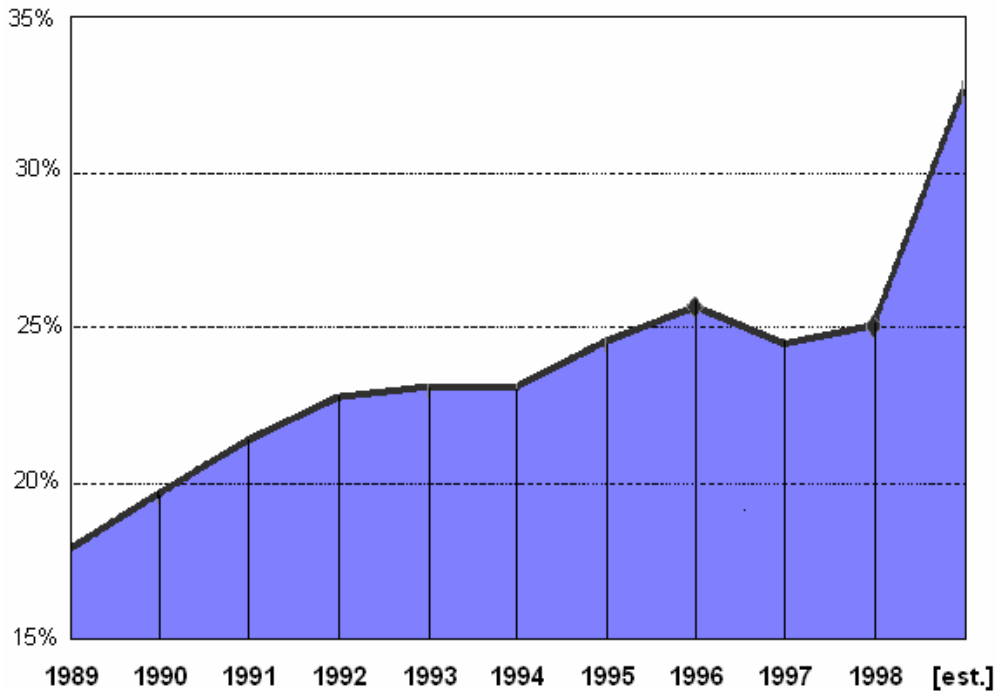
²⁵ The first of these sanctions, Security Council Resolution 757 (30 May 1992), banned all international trade with Serbia and Montenegro for as long as they were held to be in violation of several earlier resolutions concerned with ending the fighting in former Yugoslavia. The greatest burden of enforcement fell on Serbia’s neighbors – especially Hungary, Romania and Macedonia – who inflicted serious damage on their own economies as long-established patterns of trade were broken.

²⁶ According to Yugoslavia’s Statistical Office, per-capita GNP was \$2530 in 1990. In 1993 it was \$1270.

²⁷ “According to many observers, hyperinflation was set off in 1991, as Slobodan Milosevic on December 28, 1990, ordered the National Bank of Yugoslavia to grant \$1.8 billion in unauthorized credits to Serbian-owned enterprises.” (*Hanke*) However, hyperinflation accelerated greatly under the combined impact of sanctions and compound growth of the money supply. A new series of banknotes was issued in September 1993, replacing one million “old” dinars with one new dinar. Still the year ended with inflation at an unprecedented 313 million percent per month (*op.cit.*). As 1994 began, another New Dinar was introduced, this one initially tied to the value of the Deutschmark. It stabilized the situation...for a while.

²⁸ *Early Warning Report: Yugoslavia, One Year After (July 2000-October 2001)*, UN Development Programme, 2001, page 63.

Government-condoned smuggling of petrol, cigarettes, Deutschmarks, and other goods into the country to defeat sanctions gradually criminalized the economy’s few profitable sectors – and the government itself. Cronyism and corruption were rampant. Black market money-changers followed the “price advice” of plainclothes cops. Software, music and video piracy grew from pastimes into industries. Infrastructure deteriorated.



UNEMPLOYMENT RATE, 1989-1999

This chart adapted from Group 17, “Economic Consequences of NATO Bombing: Estimates of Damage and Finances Required for Economic Reconstruction of Yugoslavia” (Belgrade, June 1999), page 14.

Economic sanctions against Serbia were relaxed in stages after the initialing of the “General Framework Agreement for Peace in Bosnia and Herzegovina” in November 1995. With Milosevic recast as a NATO ally and champion of peace, the economy stabilized but unemployment rose. Milosevic used his new-found popularity abroad to clamp down even harder at home – on opposition politicians, universities and the independent media – creating more domestic enemies. Sensing that he was running out of options, Serbs were not surprised when he played the “Kosovo card” in 1998, reviving anti-Albanian passions and promising to crush “KLA terrorists.”²⁹ However, they were painfully surprised when NATO actually bombed Serbia, as it had threatened it would, if attacks against Albanian Kosovars did not stop.

The NATO bombing lasted from 24 March to 10 June 1999.³⁰ Most economic activity ceased during those 77 days. According to a preliminary assessment by Group 17 (now called G17+):

²⁹ KLA = Kosova Liberation Army, a guerrilla movement that grew in response to Serbian repression.

³⁰ For a detailed account from the NATO side, see *Winning Ugly: NATO's War to Save Kosovo* by Ivo H. Daalder and Michael E. O'Hanlon (Brookings Press, 2000). TANJUG, the Yugoslav news agency, compiled its own day-by-day chronicle of attacks, entitled “Chronology of Crimes and Dishonor of NATO” (5 June 1999). It is still online at - <http://www.fas.org/man/dod-101/ops/docs99/12335.htm>

“Several thousands were killed. Economic and civilian facilities have sustained immense destruction. An important part of industry has been either completely destroyed or heavily damaged. A great deal of transportation, electric power, telecommunication and other infrastructure, which has substantial external effects on the economic life and development of every country has also been ruined. Besides these targets, NATO has bombed many residential buildings, cultural and historical monuments, administration buildings, hotels, trains, buses, etc...”³¹

G17+ estimated the value of the damage at \$29.6 billion. However, 78% of that figure represents “opportunity costs for the whole economy, in the form of the current value of the lost GNP” for the next 10 years – a rather chimerical quantity, given that we don’t know what would have happened without the bombing. In any case, their estimate of the damage to public infrastructure was \$805.4 million, including \$355 million against roads and bridges, \$270 million against “electric and power generating” and \$180.4 million against “other infrastructure” – presumably including telecommunications.³² Telekom Srbija, on the other hand, put the combined cost of “restoring *and modernising* [emphasis added] all the damaged telecom facilities (including Kosovo) at almost US\$ 2 billion.”³³ Most of that cost probably represents network upgrading that would have been needed with or without the bombing.

The restoration of electrical power, broadcasting and telecommunication services and the repair of highways and bridges were high-priority projects after the bombing ended. It is remarkable how much was achieved so quickly, and with so little foreign help – yet it was not enough to win Milosevic the September 2000 federal elections. People finally had had enough of him. But true to form, rather than admit defeat, he tried to falsify the results. The real results became widely known within hours anyway, thanks to mobile phones and the Internet. People from all over Serbia, even from small towns where support for Milosevic seemed unshakable, flooded into the streets, outraged by his clumsy attempt to steal the election. When the army and police refused to attack the demonstrators, Milosevic realized that conceding defeat was his only chance for a comeback later.

The new government, formed by the multi-party “Democratic Opposition of Serbia” (DOS) coalition, inherited an economy reeling from a decade of crisis and mismanagement. Foreign debts of about \$12.2 billion were almost all in default, yet still growing rapidly due to interest and penalties.³⁴ Inter-enterprise debts – money owed by one state enterprise to another – had reached 80% of GDP.³⁵ The average salary had shrunk to \$40-45 per month, and almost half the population lived on less than \$1/day.³⁶

³¹ Group 17, “Economic Consequences of NATO Bombing: Estimates of Damage and Finances Required for Economic Reconstruction of Yugoslavia” (Beograd, June 1999), page 1 of the English Summary - <http://www.seerecon.org/OutsideSources/EconomicConsequences.pdf>. This document is referenced below as G17+.

³² G17+.

³³ European Bank for Reconstruction and Development (EBRD), *FR Yugoslavia: Investment Profile 2001*, page 13, ISSN 1470-3963. This document is referenced below as *EBRD-2001*.

³⁴ *EBRD-2001*.

³⁵ World Bank, “Federal Republic of Yugoslavia - Recent Economic Developments and Key Policy Challenges,” – prepared for Donor Co-ordination meeting (Brussels, 12 December 2000) - <http://www.seerecon.org/FRYugoslavia/FRYDonorPrograms/WB/wb-note.htm>. This is referenced below as *WB-12Dec2000*.

³⁶ *WB-12Dec2000*.

Milosevic stayed at his home in Belgrade, apparently waiting for DOS to start announcing unpopular reforms and squabbling among themselves. Yugoslavia was readmitted to the European Bank for Reconstruction and Development (EBRD) in January 2001³⁷ and to the World Bank in May.³⁸ A large international donors conference, co-hosted by the World Bank and the European Commission, was set for 29 June 2001, with the proviso that it would be cancelled unless Milosevic was delivered to the Hague-based International Tribunal for War Crimes in Former Yugoslavia. At the last possible moment, Serbian police captured their former boss in a still-controversial raid, and rushed him to the Hague by helicopter. The next day, representatives of 42 countries and 25 international organizations pledged some \$1.28 billion “to support the economic recovery and transition needs of FRY.”³⁹

The core of the DOS economic team comes from G17+ and under their leadership, the government

“adopted an ambitious programme of economic reform, committing itself to reversing the trends of the previous decade and integrating the economy with the European Union... In less than two years trade and prices have been liberalised; new fiscal and monetary policies have substantially reduced inflationary pressure, stabilised the exchange rate and improved expectations. Relations with international creditors have been largely normalised, and banking sector reform was strongly advanced through...the bold closure of the four largest commercial banks on grounds of insolvency. Comprehensive privatisation legislation marked a break with dubious schemes of the past in welcoming foreign investment to participate in a process designed to be transparent...”⁴⁰

Few Serbs would use such positive phrases to describe the current economy. More of them would probably agree with the Belgrade magazine *Ekonomist*, which began its 2002 mid-year review: “Stagnation is the general characteristic of the economic [trends] in the first half of the year...” People seem let down by the fact that removing Slobodan Milosevic did not immediately revive the economy. Progress has in fact been made, but not in ways which dramatically improve the lives of ordinary people. The government’s greatest economic success so far may be that the black market for foreign currencies, once ubiquitous, is now gone. The dinar is freely convertible (domestically), its value is relatively stable, and there is no gap between official value and “street” value. However, most people still don’t have enough dinars for subsistence; electricity and water are still cut off periodically; and everyone knows that prices and unemployment must both rise further as the economy is reformed and the sell-off of socially-owned enterprises accelerates. Fear of the public’s response to rising unemployment continues to be a driving force in Serbian politics. That is one reason why privatization did not start until the end of 2001 and then proceeded slowly, until July 2002:

“The Serbian government launched a high-speed privatization auction in the second half of this year. So far, 53 enterprises have been sold at auctions, of which 22 were sold in the past month. Public tenders have been called for the sale of 40 more enterprises next month, and a month after that the total number of enterprises sold is expected to exceed

³⁷ EBRD-2001.

³⁸ International Monetary Fund, *FR Yugoslavia: Request for a Stand-by Arrangement--Staff Report*, IMF Country Report No.1/93 (June 2001), page 4.

³⁹ See <http://www.seerecon.org/Calendar/2001/Events/0629frydc.htm> for more about the conference.

⁴⁰ OECD, “Economic Assessment of the Federal Republic of Yugoslavia, 2002,” – Policy Brief, 2002.

150... Of the 3,900 small enterprises in Serbia, 1,400 will be privatized and the rest will be closed down.”⁴¹

Unfortunately, another reason that privatization has gone so slowly – and can still fail – is that not many investors want what is on offer. As noted earlier, Serbia’s is an old “smoke-stack” economy, oriented toward heavy industry and basic commodities. Worker productivity and capacity utilization are both low – about 45% for the latter. Together these discourage investment in new factories and old.

Božidar Djelic, Serbia’s Minister of Finance and Economy, reported that foreign direct investment in his country was \$150 million in 2001, but is expected to rise to \$500-\$600 million in 2002.⁴² The World Bank says that more like \$4 billion is needed over the next 4 years to revive the economy. “But newcomers should tread carefully, since this is still only half a success story,” warns *BusinessWeek*.⁴³ With the failure of the recent presidential elections,⁴⁴ with DOS hopelessly divided and bickering, with the post-Yugoslavia institutional order still unclear and law reform at an early stage, only the bravest investors would regard Serbia as offering a favorable risk/reward ratio today.

The Ten Largest Enterprises in Serbia (by revenue in 2000)

	Name, HQ address	Sector	Total revenue ⁴⁵	Employees
1	Naftna industrija Srbije Sutjeska 1 Novi Sad	Oil refining	\$258,483,116	18,777
2	“Telekom Srbija” a..d. Takovska 2 Belgrade	Telecommunications	\$102,770,730	13,402
3	“Termoelektrana N. Tesla” Urovci bb. Obrenovac	Electric power production	\$73,683,958	3,952
4	JP “Beograd” železnicki Nemanjina 6 Belgrade	Railway transport	\$70,671,859	33,327

⁴¹ “FR Yugoslavia: Economic Bulletin (28 October – 1 November 2002),” Eteba S.A. FRY - <http://www.eteba.co.yu>

⁴² Quoted in an interview with Nicole R. Ritter in the *Balkan Reconstruction Report* (4 October 2002) - <http://balkanreport.tol.cz/look/BRR/article.tpl?IdLanguage=1&IdPublication=9&NrIssue=1&NrSection=8&NrArticle=7506>

⁴³ Christopher Condon, “Yugoslavia: An Economy Back from the Dead,” *BusinessWeek*, 15 October 2001.

⁴⁴ For the autumn 2002 Serbian election to be valid, at least 50% of the voters must vote, and the winner must get at least 50% of the votes cast. No candidate got enough votes in the first round to win, and in the second round, only about 37% of the voters voted. An appointed interim president will serve until the election is rerun.

⁴⁵ Because the year 2000 included a major political transition, the value of the dinar fluctuated widely, making it problematic to convert earnings reported in dinars into US dollars. However, following *EBRD-2001*, here we use an average annual exchange rate of 40.5 dinars = \$1.

	Name, HQ address	Sector	Total revenue ⁴⁵	Employees
5	“Sartid” a.d. Goranska 12 Smederevo	Steelworks	\$68,217,864	6,460
6	JP “Srbija” PTT Takovska 2 Belgrade	Post & telephony	\$66,860,261	17,199
7	JP “Elektroprivreda Srbije” Carice Milice 2 Beograd	Electric power production	\$55,008,676	723
8	JP “Djerdap” EPS Trg Mose Pijade 1 Kladovo	Electric power production	\$50,914,291	1,454
9	“Srbijasume” Bulevar Lenjina 113 Novi Beograd	Forest exploitation	\$39,099,121	7,915
10	JP “JAT” Ho Si Minova 16 Novi Beograd	Air transport	\$34,694,064	5,331

Data from *Ekonomist Magazin*, November 2001 - <http://www.ekonomist.co.yu/sivo/najveci01.pdf>

Trade data – first 6 months of 2002 ⁴⁶	EXPORTS		IMPORTS	
	USD millions	First 6 months of 2001 = 100	USD millions	First 6 months of 2001 = 100
Industrial food products	\$157	157	\$157	114
Basic metals products	\$155	77	\$123	107
Chemicals & chemical products	\$78	135	\$386	104
Rubber & plastic products	\$73	107	\$68	119
Agriculture & forestry	\$60	232	\$102	75
Clothes	\$59	78	\$31	112
Machines & devices	\$54	130	\$273	145
Leather products	\$33	87	\$43	111
Textile yarns & fabrics	\$28	61	\$84	129
Electric machines	\$24	170	\$50	116
Motor vehicles & trailers	\$24	104	\$161	118
Cellulose & paper	--	--	\$75	109
Raw oil & gas	--	--	\$310	110
Tobacco Products	--	--	\$29	89
Wood Products	--	--	\$35	126

⁴⁶ Data for this table comes from Tomislav Dumezic, “Mid year economic results,” *Ekonomist Magazin*, issue 114 (Belgrade, 29 July 2002).

3. Serbia's IT industry

Under sanctions, almost all imports into Serbia were “black market,” even for purchases abroad made legally. The government occasionally tried to collect customs duties on items entering the country for resale, but that was the exception rather than the rule. As a result, there is very limited trend data on even the most basic parameters of trade. The federal statistics office still does not have categories in its analytical series that correlate directly with the ICT sector, and serious private market research started only recently. So any attempt to assess the dimensions of Serbia’s IT industry today must include shaky assumptions and rough estimates. Nonetheless, data is available for some sectors, and it is possible to compare the estimates of researchers to see where and how they converge.

Dr. Djordje Savic, the president of BiznisLink, has produced the only quantitative overview of the Serbian IT market of which we are aware. It was presented in December 2001 at a conference on “Building an ICT Investment Strategy in Yugoslavia” which was organized by Serbia’s Agency for IT and Internet Development (now a bureau in the Ministry of Science).⁴⁷ Dr. Savic estimated the overall size of the Yugoslav IT market in 1998 (excluding telecommunications) at 200 million euros.⁴⁸ That includes:

Computing hardware	124 million euros
Other office equipment	20 million euros
Software products	20 million euros
Services	36 million euros

GDP that year was said to be about \$13 billion, and the euro was worth about \$0.85, so we can say that IT spending amounted to 1.3% of GDP or about \$17 per person.⁴⁹ His estimates for the year 2000 were slightly higher:

Computing hardware	150 million euros
Other office equipment	25 million euros
Software products	20 million euros
Services	30 million euros

Thus the IT market in 2000 was 225 million euros – about 2.1% of GDP, or \$28.5 per person.⁵⁰ Dr. Savic went on to compare the structure of Serbia’s IT market to those in Eastern and Western Europe:

Spending Category	Yugoslavia	Eastern Europe	Western Europe
Hardware	75%	72%	45%
Software	10%	8%	20%
Services	15%	20%	35%

⁴⁷ This conference took place 3-4 December 2001. The program and some of the presentations are still online at http://www.arij.sr.gov.yu/ICT_Conference/ICT_program.html.

⁴⁸ Here, as in many other places in this assessment, we slip from “Yugoslavia” to “Serbia” and back as if there were no difference. The difference, of course, is Montenegro and sometimes Kosovo. Fortunately, their economies are small enough to fall within the margin of error in most of the data we cite.

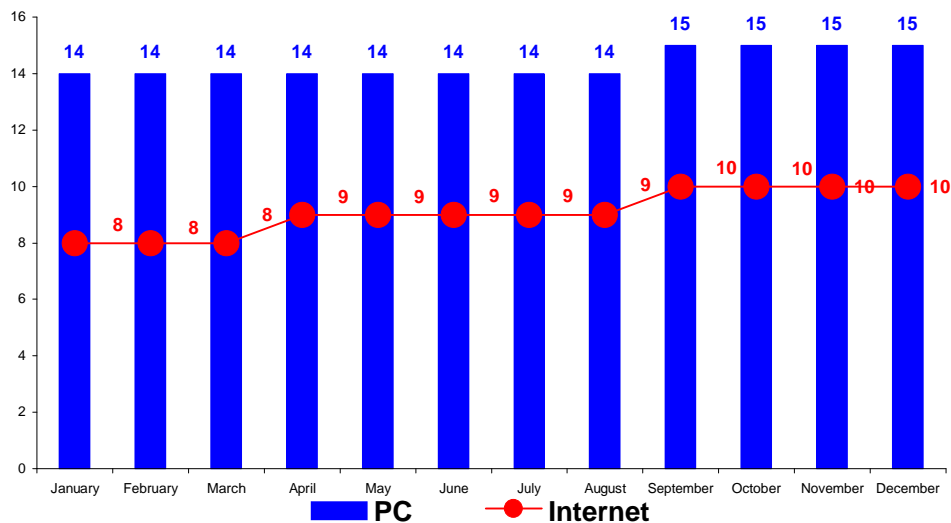
⁴⁹ Kosovo’s population is included in the calculation of per-capita IT spending for 1998, but not in the same calculation for the year 2000.

⁵⁰ It would appear that per-capita IT spending rose about 70% between 1998 and 2000, but much of the increase was actually due to changes in the size of the population base and the dollar/euro exchange-rate.

It is not surprising that Yugoslavia’s pattern is similar to Eastern Europe. Both areas spend much less on software than Western Europe, due to the prevalence of piracy. But apparently Dr. Savic thinks there was less piracy in Yugoslavia in 1998 than in other parts of Eastern Europe, which is hard to believe. By 1998 many Serbs had come to regard the theft of intellectual property from “the West” as a sanctions-given right, an appropriate and even patriotic response to years of unjust exclusion and vilification. In any case, his figures suggest there is ample room for growth in IT services in the coming years.

According to the Yugoslav Chamber of Commerce, out of 90,000 small and medium-sized firms in Yugoslavia – at least 90% of which operate in Serbia – 200 of them produce software, and 20 provide IT engineering services – but not one produces computer hardware.⁵¹ As in most other countries, Serbia’s computer industry consists mainly of small firms that import components from the Far East and assemble them locally into PCs. However, with hopes rising for integration into the global economy, imports of pre-assembled brand-name PCs are growing and companies like Hewlett-Packard and Microsoft began opening offices in Belgrade last summer. (IBM, always the leading supplier of IT products to public enterprises and the government, never stopped doing business with Serbia. During the UN sanctions, they simply hid their products’ destination by using Slovenian companies as intermediaries.)

Ekonomist magazine’s annual business survey identified the largest computer services firm in Serbia as Informatika a.d., which earned almost \$15.9 million in the year 2000. A designer and integrator of turn-key systems, it also imports Dell Computers and trains technicians at its Microsoft Certified Technical Education Center and Cisco Academy. Its Internet access subsidiary, InfoSky, has a 45 MB/s satellite link to UUNET. Informatika’s strongest competitor is probably Saga, which imports products from IBM, Sun Microsystems, Compaq, Oracle, Juniper, etc.



Graph from SMMRI, “PC & Internet in Households – Serbia, 2001,” (see footnote 52)

⁵¹ Cited in a box accompanying a special feature by Zorica Žarkovic on “South-East European Information Integration: Brains are Coming Back,” *Ekonomist* Magazin, October 2001, page 21.

Estimates of PC and Internet penetration can be found in the Strategic Marketing & Media Research Institute's monthly telephone surveys. SMMRI reports that as of December 2001, 15% of Serbian households have at least one personal computer and 10% have Internet access. In Belgrade those levels are approximately doubled: 29% of homes are said to have PCs and 22% have Internet access.⁵² Since the 2002 census found that there are 2,614,320 homes in Serbia and Vojvodina, about 750,000 people must live in homes with Internet access, which correlates well with the Yugoslav ISP Association's estimate that there are 500,000 Internet users in Serbia, among which 200,000 are "active."⁵³

Unlike computers, which must be imported, Serbia manufactures a fair amount of telecommunications equipment. The total income in 2000 of all companies registered as telecom equipment producers in Serbia was around \$40 million (0.4% of GDP). Five leading producers of such equipment – Intel, Iritel, the "Mihajlo Pupin" Institute, Pupin Telecom and Telefonkabl – formed a consortium named "Srbijatel" to strengthen their market position. More than 35% of the digital switches in the phone networks of former Yugoslavia were built by Pupin Telecom, which also produces PBXs. Iritel specializes in digital telephone switches, multiplexers, optical transmission systems, high-speed modems and radio/television transmitters. Intel specializes in digital microwave systems in the 13 GHz and 23 GHz bands. The "Mihajlo Pupin" Institute has a long research tradition in communication, automation and robotics, as well as in crystal manufacturing. And finally, Telefonkabl designs telephone networks and electric power plants.

Several Serbian companies specialize in designing integrated circuits for foreign clients. IPSI, for example, is co-owned by a German researcher and Veljko Milutinovic, a professor of electronic engineering at the University of Belgrade. Milutinovic contributed to the design of the first 200 MHz RISC microprocessor when he worked in the United States during the 1980s. Some of his former students now work at HDL Design House in Belgrade, developing microchips and encryption hardware for companies like AMD, Siemens, Digital5 and NEC. In addition, there are many small software development teams working for companies in the European Union, as well as a few larger ones fully integrated with the foreign firm which organized them. FinSoft, for example, with headquarters in London, and TeleTrader, originally from Vienna, both have more than 50 developers in Belgrade – that number swells to a hundred or more during peak production times. And these firms don't necessarily show up in official statistics for the IT sector, since they typically register as firms engaged in the "export of services" to get certain benefits as foreign investments. These software and design firms are the core of what could become a much larger specialization in the future.

In December 2001 the Serbian Government signed a "strategic partnership" agreement with Microsoft. The Business Software Alliance had identified Serbia as a "one copy country" – a state where just one instance of a software product was enough to equip millions of people through illegal copying. A few months ago, one could still buy the latest version of Windows, MS Office, AutoCAD, etc., at almost any kiosk in Belgrade for 5 Deutschmarks. Under the agreement with Microsoft, the Serbian government promised to "fight against [software] piracy with all means" at its disposal. In addition to

⁵² "PC & Internet in Households - Serbia, 2001," Strategic Marketing & Media Research Institute (Belgrade, unpublished report to clients, spring 2002).

⁵³ Email message from Slobodan Markovic, head of Belgrade's Center for Internet Development, 23 December 2002.

the crackdown, they will pay a discounted price for 30,000 desktop licenses – essentially legalizing that many copies of Windows and MS Office already used by government offices illegally. In exchange, Microsoft agreed to donate 50,000 software licenses to Serbian schools, hospitals and libraries, provide a thousand weeks of free technical training, and help the Government devise its E-government strategy.⁵⁴ A publicity campaign against piracy began in September and the results are already visible: pirate software is disappearing from the display racks of kiosks. More recently, Microsoft announced that it would produce a (Latin-alphabet) Serbian version of Windows XP this winter.⁵⁵ In response, the local Linux community enlisted dozens of volunteers to produce Cyrillic Serbian versions of Linux and Open Office by springtime.⁵⁶ Both projects are likely to have a major impact on the number of new computer users in Serbia, particularly outside the large cities.

Here is a list of key stakeholders and potential GIPI partners in the IT field:

Association for Information Technology & Telecommunications
c/o Yugoslav Chamber of Commerce & Industry
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Business Software Alliance of Yugoslavia
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Tel: + 381 11 3341313
Nenad Popovic, representative

Casopis “Mikro” (PC World Jugoslavija)
Požeska 81 A
11030 Beograd
Tel.: +381 11 542397
Fax: +381 11 542516
<http://www.mikro.co.yu/>
Milenko Vasic, Editor-in-Chief
Email: Milenko_Vasic@mikro.co.yu

COM – computer/communications weekly
INFOhome Press
Cara Urosa 12
11000 Beograd
Tel: +381 11 3284851
<http://www.com-yu.com/>
Ivana Ercegovac, Editor-in-Chief
Email: redakcija@com-yu.com

⁵⁴ “Serbian, Yugoslav governments sign accord on strategic partnership with Microsoft,” 6 December 2001 - <http://www.serbia.sr.gov.yu/news/2001-12/06/321414.html>

⁵⁵ “Localisation of Microsoft XP system to Serbian underway,” 12 November 2002 - <http://www.serbia.sr.gov.yu/news/2002-11/12/326658.html>

⁵⁶ “Linux u Srbiji,” 8 November 2002 - <http://www.linux.co.yu/>

ComTrade Computer Show (every May)
Vladimira Popovica 6
11000 Beograd
Tel.: +381 11 3112060
Veselin Jevrosimovic, President

HDL Design House
Makenzijeve 79/3
11000 Beograd
<http://www.hdl-dh.com>
Tel: +381 11 3442359
Predrag Markovic, President
Email: p-markovic@hdl-dh.com

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11000 Beograd
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Fax: +381 11 180526
<http://www.informatika.com/>
Slobodan Sreckovic, Director
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Milan Andjelic, IT Director

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Fax: +381 11 108801
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Djordje Dukic, General Secretary
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Linux Srbija
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Microsoft Jugoslavija
<http://www.microsoft.co.yu/>
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Fax: +381 11 3085036
<http://www.pcpres.co.yu/>
Dejan Ristanovic, Editor-in-Chief
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<http://www.pupintelecom.co.yu/>

Saga IT d.o.o.
Milentija Popovica 9 (Sava Centar)
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Fax: +381 11 3108567
<http://www.saga.co.yu/>
Goran Djakovic, General Manager
Email: goran@saga.co.yu

Srbijatel Konzorcijum
Batajnicki put 23
11080 Beograd (Zemun)

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Fax: +381 11 610583
Email: srbijatel@datanet.yu
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Telefonkabl a.d.
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Fax: +381 11 414712, 410636
<http://www.telefonkabl.co.yu/>
Josip Kalderan, General Manager

YU EDI Association
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<http://nauka2001.tripod.com/yuedi.html>
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4. Governmental Framework

Serbia is in transition from a being one of six republics in a federation, to being half of a loose partnership with Montenegro. This changes the parameters of governance, in that fewer functions are more efficiently performed at the federal level. An “Accord on Principles in Relations between Serbia and Montenegro” was signed on 14 March 2002.⁵⁷ It set out the basic framework of the new partnership, which should eliminate many difficulties caused by Yugoslavia’s previous organization. The Accord envisions no federal ministry of telecommunications, nor any other regulatory body at the federal level for telecommunications or the Internet. There will, however, be a one-chamber parliament, a president chosen by parliament, a council of 5 ministers and courts for constitutional issues and the harmonization of republic law.

The Accord also says there should be a new federal “constitutional charter,” and new constitutions for the republics of Serbia and Montenegro. This provides an important

⁵⁷ An English translation of the Accord is on the Serbian Government’s website at <http://www.serbia.sr.gov.yu/news/2002-03/14/323116.html>

opportunity to change the country's fundamental political values and rules. The Serbian government announced on 7 December 2002 that the text of the new charter had been agreed, although it has not yet been made public.⁵⁸ Laws to ratify the charter should be released early in 2003, and be approved by the parliaments of both republics as soon as they finish drafting their constitutions.⁵⁹

The federal parliament is now called Savezna Skupstina. It has two chambers: Vece Gradjana, the 138-member citizens' council, and Vece Republika, the 40-member republics' council. Until Slobodan Milosevic had the federal constitution amended in July 2000, the President of Yugoslavia was elected by the parliaments of the republics. Milosevic changed that to have the President directly elected by the public. That and other changes were designed to reduce Montenegro's influence at the federal level while increasing federal power. Montenegro rejected the changes as illegal.

The current Serbian constitution specifies that Serbia's president is elected by the public to serve a maximum of two 4-year terms. The Serbian Parliament has 250 deputies, each representing a geographic constituency. Parliament elects the Prime Minister from a list of candidates proposed by the President. The Prime Minister forms the government, which must be approved by Parliament. It is not yet known how the new constitution might change this system.

5. Telecommunications

PTTs

Even after a united Kingdom of Serbs, Croats and Slovenes was established in 1918,⁶⁰ telecommunications developed there in a more decentralized way than in other countries. It was a point of pride – and thus a political necessity – for each of the major ethnic groups to have its own telephone network and post office.

From the 1950s onward, each republic in the Socialist Federation of Yugoslavia – and even individual cities and districts – had its own locally licensed PTT acting as the monopoly carrier within its territory. International accounting, inter-republic call-routing, representation in international bodies, and other matters of common interest were handled at the federal level by the “Community of Yugoslav PTT” (Zajednice Jugoslovenskih PTT).⁶¹ This was basically an association of operators with quasi-regulatory powers. It still exists today, although its membership and authority are much reduced. Nonetheless, it has a direct impact on the cost of Internet access, since it sets prices for international digital leased lines.⁶² It also tests and certifies telecom equipment and publishes the

⁵⁸ Information Bureau of the Serbian Government, “Serbia, Montenegro adopt new union's constitutional charter,” 7 December 2002 - <http://www.serbia.sr.gov.yu/news/2002-12/07/326982.html>.

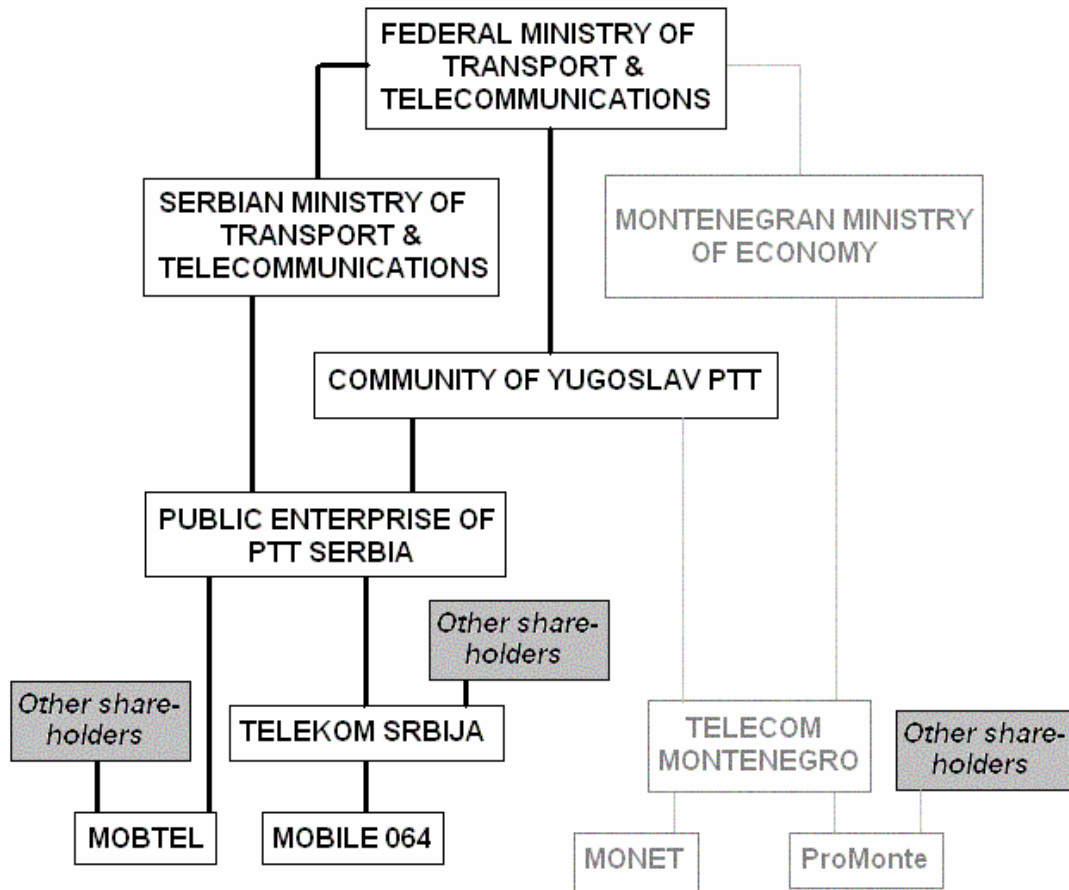
⁵⁹ Tanjug News Agency, “Constitutional Charter to be adopted immediately after New Year celebrations: Marjanovic,” 25 December 2002 - <http://www.tanjug.co.yu/EPolitic.htm>.

⁶⁰ Later it was called the Kingdom of Yugoslavia.

⁶¹ See the “Ministry of Posts, Telegraph and Telephone” timeline on Telekom Srbija's website - <http://www.telekom.yu/SiteTelekom/Firma/Ministarstvo.htm>.

⁶² A current pricelist for leased lines is at http://www.telekom.yu/SiteTelekom/Prenos_podataka/CenovnikZakup.htm

Current Organization of the Serbian Telecom Industry



Adapted from N. Gospic, M. Jankovic and B. Odadzic, “Yugoslav Telecommunications Markets: Vision and Potential,” *IEEE Communications Magazine* (August 2000), page 113.

professional journal, *Telekommunikacije*. The 1988 Federal Law on Systems of Communication⁶³ put ZJPTT in charge of planning the “consolidated and technically unified system of communications” of Yugoslavia, but this law has often been ignored since 1997 when the primary responsibility for licensing telecom networks shifted, in practice, to the republics.

The dominant member of the Community of Yugoslav PTT now is JP PTT saobracaja “Srbija” or PTT Serbia, a “public enterprise” wholly owned by the Serbian government. In 1997, as part of a deal to sell 49% of Serbia’s telephone network, a structural separation was made between PTT Serbia and a new telephone network operating company called Telekom Srbija. In effect, the PTT became a holding company that owned 51% of Telekom Srbija and 100% of Posta Srbija. A few days before the end of 2002, the Serbian government announced plans to buy back 29% of the shares of Telekom Srbija. So it looks like PTT Serbia may soon own 80% of Telekom Srbija (and 100% of Posta Srbija). It already owns many of the buildings where Telekom’s

⁶³ Published in the *Official Gazette of the SFRY*, No. 41/88, 80/89 and 29/90; *Official Gazette of FRY*, No. 34/92, 24/94, 28/96

equipment is installed and the deputy director general of the PTT (Boris Tadic) is chairman of Telekom Srbija's supervisory board.

PTT Serbia has been an Internet Service Provider since October 1998. Together with TS, they are building a national IP backbone for Internet data, voice telephony, and the distribution of cable television programming. This ambitious project is called the Serbian Multiservice Information Network (SMIN). In an interview for *Forbes* magazine last summer, the head of PTT Serbia said that his organization will spin off such new projects as independent businesses: "we have to build new businesses... put them on their own legs, to run them as separate financial organizations and then offer them to the free market."⁶⁴ However, since the Serbian telecom ministry has proposed privatizing the PTT, it is unclear why the PTT wants to spin off businesses if they themselves will be spun off soon.



The impressive headquarters of PTT Serbia

Zajednice Jugoslovenskih PTT
(Community of Yugoslav PTT)
Takovska 2
11000 Beograd
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Fax. + 381 11 627988
Email: zjptt@EUnet.yu

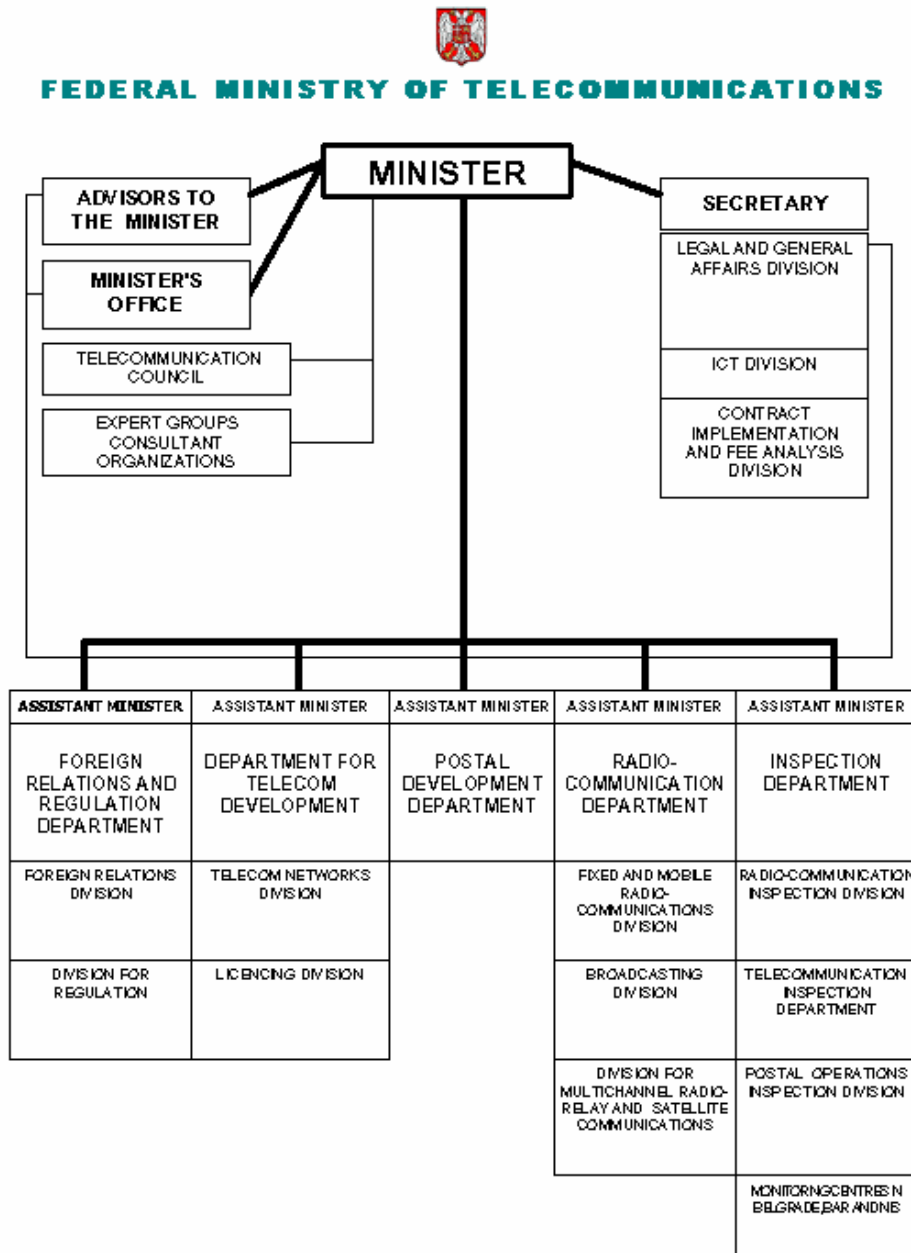
JP PTT saobracaja "Srbija"
Takovska 2
11000 Beograd
Srdjan Blagojevic, Director General
Tel: +381 11 3210149
Fax: +381 11 3341148
<http://www.jp.ptt.yu/>

Ministries

The **Yugoslav Ministry of Telecommunications** was created in March 1997 to consolidate the Ministry of Transport and Communication and the Federal RadioCommunications Department. In theory, the ministry is responsible for the postal system, telecommunications on the territory of Yugoslavia and the technical aspects of

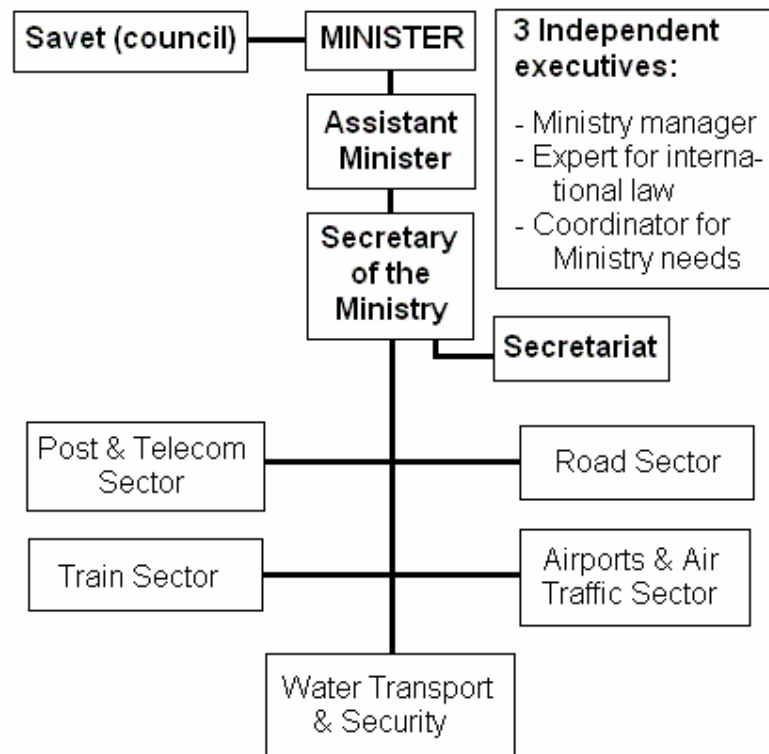
⁶⁴ "Interview with Mr. Srdjan Blagojevic," published as part of a special country report on Serbia produced by World Investment News Ltd., for *Forbes*, 10 June 2002 - <http://www.winne.com/serbia/blagojevic.htm>

broadcasting. But in fact so much power devolved to the republics when Montenegro started pushing for independence that the federal ministry’s competences are now severely limited and sometimes redundant with the republic ministries. The federal ministry is mainly responsible for ensuring fulfillment of the obligations arising from Yugoslavia’s membership in international organizations, and for inter-republic communications. As noted earlier, the “Accord on Principles in Relations between Serbia and Montenegro” provides for no telecom ministry at the federal level, so this ministry’s future can probably be measured in months.



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Organization chart – Serbian Ministry of Transport and Telecommunications

The **Serbian Ministry of Transport and Telecommunications** is headed by Marija Raseta-Vukosavljevic. She is concerned primarily with transportation, while Assistant Minister Andrija Bednarik is responsible for telecommunications. He coordinated the drafting of the new telecommunications law which was recently sent to Parliament for ratification. Several items in the Ministry's work plan for 2002 are of direct interest to GIPI. So far as we know none has yet been fully accomplished, so they are probably still on the agenda for 2003:

- Adopting and implementing the new Law on Telecommunications
- Establishing a development plan for telecommunications in Serbia to 2006
- Completing the reorganization and privatization of PTT Serbia
- Reorganizing Telekom Srbija⁶⁵

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22-26 Nemanjina
11000 Beograd
<http://www.msaotel.sr.gov.yu/>

⁶⁵ The items on this list are taken from "Ministry of Transport and Telecommunications – Annual Report 2001," pages 3-4.

Ms. Marija Raseta-Vukosavljevic, Minister
D H.E. Mr. Andrija Bednarik, Assistant Minister for Telecommunications
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Email: mandrija@msaotel.sr.gov.yu

The **Serbian Ministry of Science, Technology and Development** is not responsible for telecommunications *per se*, but it oversees the Internet, academic networking, E-Government projects and informatization policy. These tasks are handled by the Bureau for IT & Internet Development, created in 2001 as a separate agency and merged into the ministry in 2002. Being outside the ministries, the agency initially had more freedom than it does today, but it also had no channel for introducing new legislation and no authority to implement E-Government projects within the ministries.

The Bureau's E-Government project is still at an early stage, surveying government ownership and use of ICT hardware and software while trying to secure adequate support from foreign aid agencies. The project is expected to last 5 years and cost \$25 million. The project proposal presented at the donors conference in June 2001 noted that most government "records, registers and databases are still kept manually and communications between central, regional and municipal levels are still conducted through mail, telephone and fax. Teleconferencing and on-line access to databases is only available at certain locations..."⁶⁶ It is already clear that attempts to increase the transparency and efficiency of government institutions through computerization and networking may not be welcomed by those who are most responsible for implementing these changes.

Branislav Andjelic developed the Agency for IT and Internet Development for Serbian prime minister Zoran Djindzic and he now heads the Bureau for the Minister of Science, Technology and Development, Dragan Domazet. Andjelic grew up in America and became widely known in Serbia in the 1990s as the editor of beograd.com, a popular online news and discussion forum. The Government of Sweden has pledged 1.5 million euros to support the Bureau's work.⁶⁷ Andjelic is undoubtedly the most important figure in the policy areas that interest GIPI.

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NETWORK OPERATORS

⁶⁶ "Project number 24: Building eGovernment in Serbia

⁶⁷ "Bureau for Informatics and Internet begin with work," *Ekonomist Magazin*, 15 July 2002 - <http://www.ekonomist.co.yu/en/ekonews/list.jsp?category=news&language=en&datey=2002&datem=07&dated=15&id=743#id743>

Telekom Srbija a.d.

Telekom Srbija was established in 1997 as a telephone network operating company so that Slobodan Milosevic could sell 29% of its shares to STET International Netherlands N.V.,⁶⁸ and 20% of its shares to the Hellenic Telecommunications Organization (the Greek phone system, OTE). Former British foreign secretary Douglas Hurd mediated the sale, which the *Financial Times* of London called “a spectacular windfall” that injected 1.517 billion Deutschmarks (\$701.3 million) into the Serbian economy at a critical moment, securing Milosevic’s re-election.⁶⁹ The deal was made even more controversial by the fact that the text of the sale agreement was kept secret, leading to speculation about hidden promises and kickbacks.⁷⁰ The fact that the sale price was much higher than experts thought the company was worth,⁷¹ combined with an unexplained gap of 20 million DM in the tally of commissions, made such speculations plausible.⁷²

After a series of articles in Rome’s newspaper *La Repubblica* suggested corruption in the deal, the DOS government in Serbia, which had only been in office for a few months, announced that it would investigate the Telekom sale, as did the Italian senate and a magistrate’s office in Turin.⁷³ Further criticism came in the World Bank’s draft agenda for reform in Yugoslavia, which was unveiled at the June 2001 donors conference:

“...the contract severely limits the scope for regulatory reform as required by WTO membership and EU accession, as well as the prospects for market development (e.g. the issuance of a 3rd mobile license). A competitive communications environment is a key contributor to economic growth, consequently the sales contract may handicap economic development, particularly those developments associated with the ‘New Economy’. While recognising the importance of legitimate contracts to the foreign investment community, the sale contract for TS deserves serious and urgent attention.”⁷⁴

⁶⁸ STET was subsequently merged with Telecom Italia and reorganized in a way that shifted ownership of the Telekom Srbija shares to Telecom Italia.

⁶⁹ Stefan Wagstyl, Irena Guzelova and Kerin Hope, “Milosevic’s murky fortune,” *Financial Times*, 4 April 2001.

⁷⁰ Most of the speculations about kickbacks stem from a series of articles published by the Italian newspaper *La Repubblica* in February 2001. These are archived online (in Italian) at <http://www.repubblica.it/online/mondo/telekomserbia/telekomserbia/telekomserbia.html> An English-language summary of the Italian press reports can be found in “Italians took Serb kickbacks – report” at <http://www.cnn.com/2001/WORLD/europe/italy/02/17/italy.serbia/>.

⁷¹ If 49% of Telekom Srbija cost \$701.3 million, that implies a valuation of \$1.431 billion for the whole company, or \$687 per main telephone line. Compare that to Romanian Telecom, 35% of which was bought by OTE for 675 million euros in 1998 – implying a valuation of \$179 per main telephone line – four times less than Telekom Srbija.

⁷² According to the sales agreement, STET and OTE actually paid a total of 1.568 billion DM for the shares. The difference between that amount and the amount received by the Serbian Development Fund – about 51 million DM – inspired most of the speculation about possible kickbacks and/or skimming. Recently released documents from the sale show that a commission of almost 28.5 million DM was paid to NatWest Securities (Douglas Hurd’s employer), and just over 3 million DM was paid to Weil, Gotshal and Manges for legal services. That still leaves about 20 million DM unaccounted for. See “Memorandum o Zaključenju Posla” pages 361-371 in the online archive of core documents from the sale of Telekom Srbija at <http://62.169.130.21/>

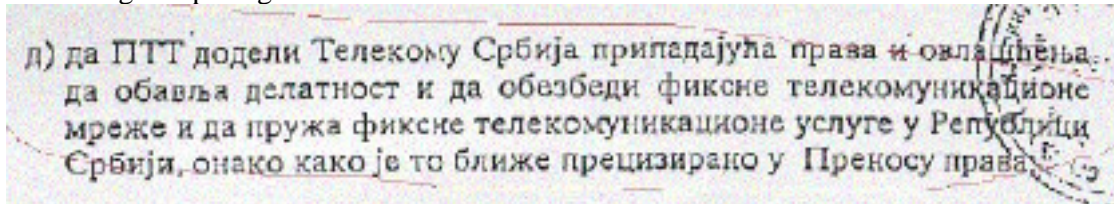
⁷³ World Markets Telecoms, “Serbs and Italians to Investigate Telekom Privatisation,” EuropeMedia.net, 19 February 2001 - <http://www.europemedia.net/showfeature.asp?ArticleID=1564>. “Politics and Economics,” *Ekonomist Magazin* 103 (13 May 2002 - http://www.ekonomist.co.yu/en/magazin/em103/pol_eko.htm).

⁷⁴ *Federal Republic of Yugoslavia - Breaking with the Past: The Path to Stability and Growth*, volume 2, chapter 10, “Telecommunications” (World Bank, 2001) pages 232-233 - http://www.seecon.org/FRYugoslavia/ERTP/pdf/ERTP_Vol_2_Ch_10_Communications.pdf

That was about as clear a recommendation as one could expect from the World Bank that the contract’s validity should be challenged. Yet the various investigations seem to have been inconclusive, and the agreement has not been brought to arbitration.⁷⁵

Instead, taking advantage of the contract’s secrecy, Telekom Srbija’s management began to make bold claims about the monopoly rights that it allegedly conveyed. Last spring they announced that only they were allowed to install communication cables in underground conduits. The cable TV industry reacted with surprise and anger. Since then the cable operators have accused Telekom of delaying or groundlessly refusing installation requests.⁷⁶

To affirm their monopoly rights, Telekom leaked a page of their 1997 sale contract containing this passage:⁷⁷



Meaning: “d) the PTT to give Telekom Srbija possession of rights and approvals to engage in the activities and to operate fixed telecommunications networks and to provide fixed telecommunications services in the Republic of Serbia in the way specified in the “Transfer of Rights.”” Months later, when more documentation leaked out, the public would discover that Telekom’s rights were actually more limited than this excerpt was meant to suggest.

In June 2002, Telekom blocked all the ISDN “backhaul” lines it had leased to 8 Internet Service Providers who were offering Voice-over-IP (VoIP) telephone service to their customers. Telekom accused them of “voice smuggling,” using Telekom circuits to “steal” long-distance phone revenues. The ISPs went to court, and in each case the judge ordered Telekom Srbija to restore the blocked service. But in each case Telekom refused. The Serbian Ministry of Telecommunications then declared that the ISPs’ offering of VoIP service did not violate Telekom’s rights. They, too, ordered Telekom to restore the ISDN links, and once again, Telekom refused.⁷⁸ In the latest round of this battle, the Belgrade Center for Internet Development, the Yugoslav ISP Association and 6 individual ISPs asked a Serbian court to rule on the constitutionality of Telekom’s fixed telephone monopoly. The Serbian and Yugoslav Constitutions both explicitly forbid monopolies, and the constitutional court in Montenegro ended Telecom Montenegro’s monopoly a few months ago, after accepting a similar petition.⁷⁹ The Serbian court

⁷⁵ Ivana Pavlovic, “Foreign owners reject changes to Telekom Srbija contract,” EuropeMedia.net, 18 January 2002 - <http://www.europemedia.net/shownews.asp?ArticleID=7774>

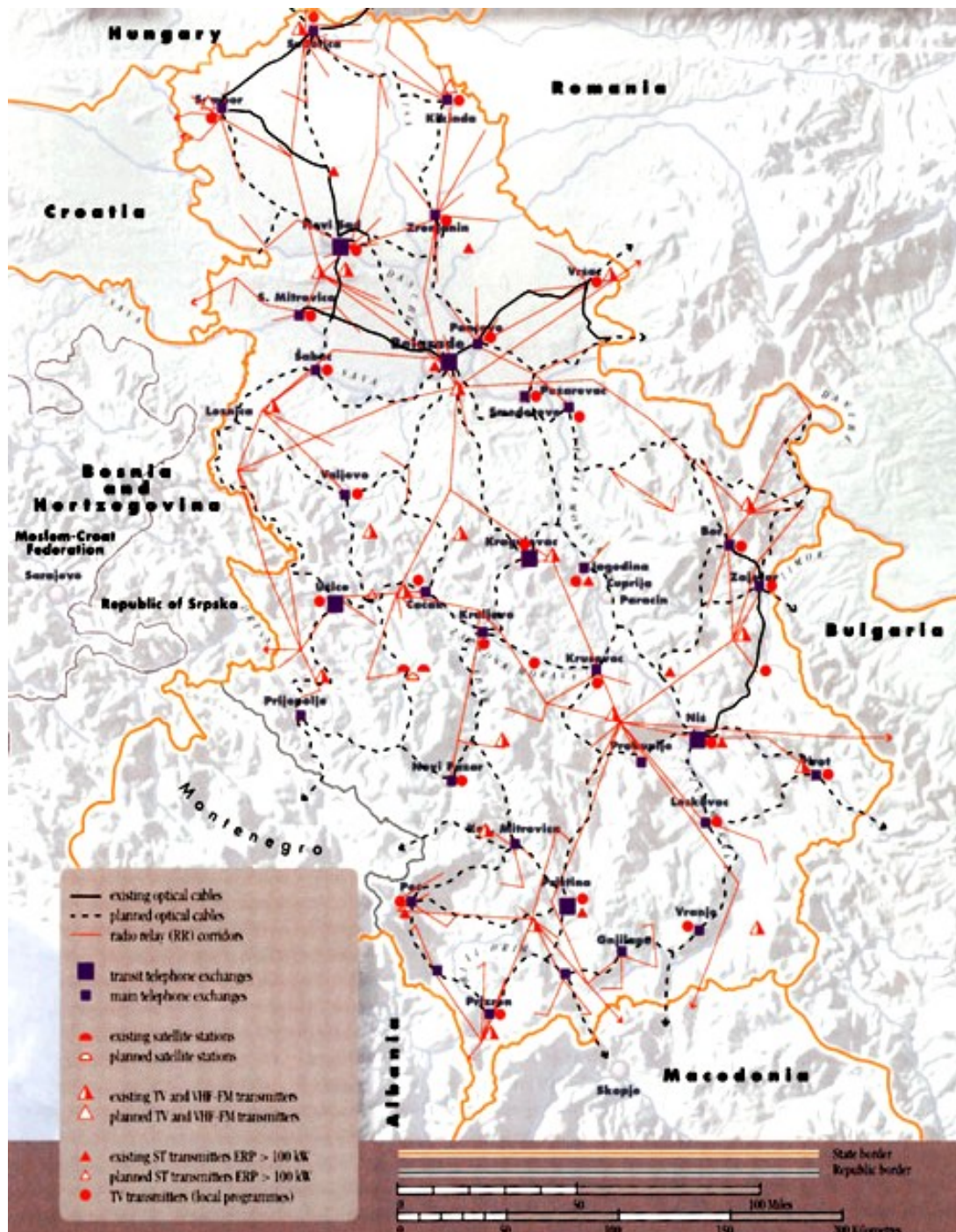
⁷⁶ “Press conference by Yu Cable, Business Association of Cable Operators,” Media Centar Beograd, 15 April 2002 - <http://www.yumediacentar.com/english/dogadjaji/2002/4/d150402e.html>.

⁷⁷ This excerpt can be found in the collection of documents at <http://62.169.130.21/>.

⁷⁸ Robert Horvitz, “Yugoslavia’s New War,” EuropeMedia.net, 25 September 2002 - <http://www.europemedia.net/shownews.asp?ArticleID=12787>

⁷⁹ Article 74, paragraph 3 of the 1992 Yugoslav Constitution states: “Any act or activity creating or encouraging a monopoly or restricting free trade in any other way shall be unconstitutional.” Article 64, paragraph 3 of the 1990 Serbian Constitution states: “Any act or action by which one creates or instigates a monopolistic position and/or restricts the market in some other way, shall be unconstitutional.”

agreed to decide the case later this winter.⁸⁰ That could end Telekom’s monopoly long before its scheduled conclusion in June 2005.



Serbia’s telecommunication network today - http://www.srbija-info.yu/Razvoj/mapa_tv.html

⁸⁰ See “Usvojen zahtev za ocenu ustavnosti Zakona o sistemu veza Provajderi ruse monopol Telekom,” *Danas*, 13 Decemeber 2002 - <http://www.danas.co.yu/20021213/ekonomija.htm#6>.

Telekom is also fighting with its majority shareholder, PTT Serbia. The PTT refused to approve Telekom's financial report for 2001, as well as their new business and strategic network development plans. In response, Telekom refused to pay what it owed to the PTT at the end of the first quarter in 2002.⁸¹

Given their confrontational attitude, it is probably not surprising that long-kept secrets about the Telekom sale finally started to leak out last autumn. In September, some 450 pages of primary documentation (all in Serbian) were delivered anonymously to one of the ISPs whose ISDN lines were cancelled. Those documents are now online at <http://62.169.130.21/>. While they seem not to contain any "smoking guns," they do show the importance of the GSM license given to Telekom to sweeten the deal, as well as the importance of the government's promise not to give out any more GSM licenses.

On 29 December 2002 the Serbian government announced that it would repurchase 29% of Telekom Srbija's shares from STET International for 195 million euros (\$202.5 million). According to the government, only 95 million euros of this payment represents share value; the rest is a settlement of Telekom Srbija's debts to Telecom Italia.⁸² Since these shares were originally sold for the equivalent of \$497 million, the buyback is a bargain. Italian premier Sylvio Berlusconi apparently told Serbian prime minister Zoran Djindjic that Italy would "withdraw from Telekom Srbija in support to reforms in Serbia."⁸³ By strengthening PTT Serbia's control over TS management, the government evidently hopes that they can accelerate investment in network modernization and negotiate a faster phase-out of TS's monopoly. However, Reuters says that the minority shareholder OTE can still block the deal during the next 60 days.⁸⁴ Given the recent conflict between TS and the PTT it seems likely that greater PTT influence will lead to changes in management staffing at TS. It is not known how the buy-back might affect the proposed privatization of PTT Serbia.

At the end of 2001, Telekom Srbija had 13,116 employees and 2.3 million customers.⁸⁵ Its fixed network currently contains 2,420,000 main phonelines,⁸⁶ yielding a teledensity of 32.36 main phonelines per 100 people – close to the average for all of Central/Eastern Europe. The company aims to increase teledensity to 43% by the year 2005.⁸⁷ The network is about 51% digital now although there are large local variations, with Central

⁸¹ See the extraordinary "Communication of the Director General," Telekom Srbija, 30 April 2002, in which Drasko Petrovic makes this dispute public - <http://www.telekomsrbija.com/SiteTelekom/Arhiva.htm>

⁸² "Serbia buys back Telecom Italia stake in Telekom Srbija," December 30, 2002 - <http://www.serbia.sr.gov.yu/news/2002-12/30/327296.html>.

⁸³ *ibid.*

⁸⁴ Reuters, "Telecom Italia sells Telekom Srbija stake," 31 December 2002 - <http://europe.cnn.com/2002/BUSINESS/12/31/italy.reut/>

⁸⁵ "OTE International Investments – Serbia" - <http://www.ote.gr/oteweb/english/international/serbia.htm>

⁸⁶ As reported in October 2002 at a conference on ICT policy organized by the Serbian Government.

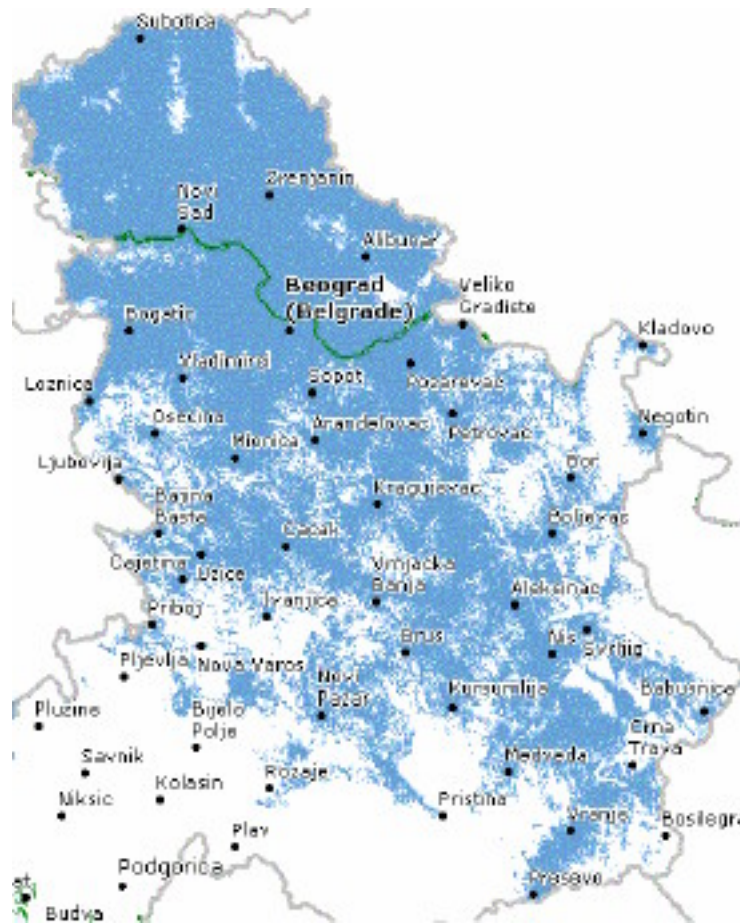
⁸⁷ HE Petar Stefanovic, Assistant Federal Minister of Transport and Telecommunications, "Recent Developments in Telecommunications and IT in the FR of Yugoslavia," presentation at the INA Telecommunications Regional Symposium, Istanbul, Turkey (3 July 2002) - http://www.inatelecom.org/gr/sym-posium/2/files/Stefanovic_presentation.pdf. This is referenced below as *Stefanovic*.

Serbia being more digitalized than Vojvodina.⁸⁸ Profits in 2002 have been estimated at 55-60 million euros on revenues of about 526 million euros.⁸⁹

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MOBILE OPERATORS

As noted above, Telekom Srbija was awarded a GSM license in 1997 when 49% of its shares were sold. Their mobile network “went live” in August 1998. Beta News Agency reported that **Mobilna Telefonija Srbije** had 1.1 million customers in July 2002, an



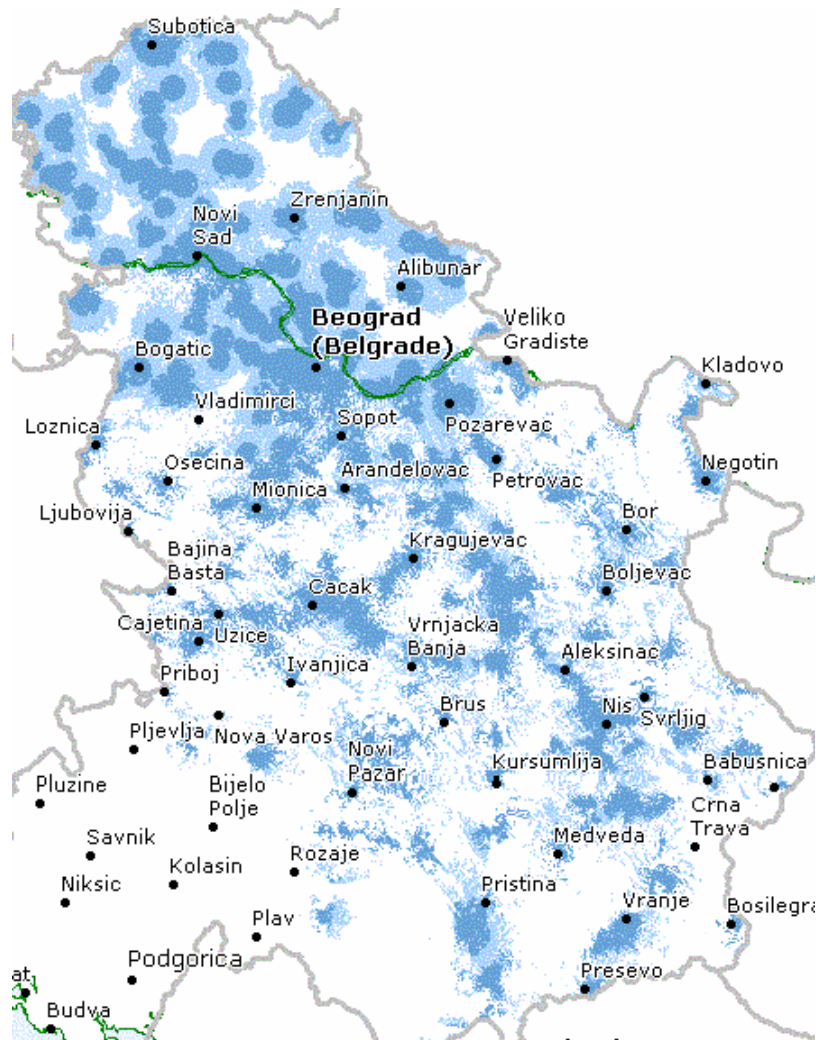
Signal coverage, 064 Mobilna Telefonija Srbije (November 2002)
http://www.gsmworld.com/roaming/gsminfo/net_yute.shtml

⁸⁸ *Stefanovic.*

⁸⁹ Profit figures taken from the government’s announcement of the STET shares buyback, while the annual revenue figure for 2002 is an estimate based on first quarter results. See “Telekom Srbija Reports 131.5 Million Euro Turnover,” Beta News Agency, 4 June 2002.

increase of 35% just since the start of the year. Their signal now reaches 87% of the population. Data services are limited to SMS and 9600-baud dial-up to the Internet, but they promise that customers “will soon be able to use VAS (Value Added Services), which provides voice, text, image and sound. This will be the first VAS in the Balkans.”⁹⁰

064 Mobilna telefonija Srbije
Kosovska 47
Beograd
Tel. +381 11 3222999
<http://www.064.co.yu/>



MobTel coverage map (November 2002) – from <http://www.gsmworld.com/>

Serbia’s first GSM license was awarded to BK Telekom to create the **MobTel** network. Forty-nine percent of this joint stock company was owned by PTT Serbia, and 51% by the Moscow-based firm BK Trade. “BK” stands for Braca Karic (the Karic brothers), Serbs from Kosovo who managed to leverage their friendship with Slobodan Milosevic into

⁹⁰ “1.1 Million Users of Mobile Telephony 064 in Serbia,” Beta News Agency, 9 July 2002.

the building of Serbia’s largest business empire. At their peak, in addition to the most profitable mobile phone company, they owned the largest Internet provider (EUnet), popular TV and radio stations and a major bank.

BK Telekom started operating with NMT-900 technology in December 1995. When the second GSM license was given to Telekom Srbija, BK protested that their license had been awarded on an exclusive basis. A compromise was eventually reached whereby TS kept its license, but to compensate for the lost exclusivity, BK got 7% of PTT Serbia’s annual income from Telekom Srbija.⁹¹

After the ouster of Milosevic, Serbia’s parliament passed an extraordinary “Law on the One Time Taxation of Extra Revenue and Extra Property Acquired by the Use of Special Privileges during the Period 1 January 1989 – 23 June 2001.”⁹² The purpose of this law was to punish and reclaim part of the illegitimate wealth amassed by favored partners of the previous regime. The Karic brothers topped the list of those hit with enormous retroactive tax bills. MobTel paid 34.9 million DM, but on 1 March 2002, police seized the rest of the company’s assets anyway, because still more was owed.⁹³ Branislav Andjelic, head of the Bureau for IT and Internet Development, was temporarily made general manager of MobTel. When the government announced its buy-back of Telekom Srbija shares, it also announced that it would retain a majority interest in MobTel to compensate for “actions which harmed the state” but then it would sell its shares so 064 Mobilna Telefonija Srbije will again have commercial competition.⁹⁴

MobTel has about 1,320,000 subscribers who together generated some 180 million euros income for the company in 2001, and profits of 45 million euros.⁹⁵ MobTel customers can access the Internet from their mobile phones via WAP technology and PTT Serbia’s IP network. Before it was impounded by the Government, MobTel had been the first Serbian company to offer “mobile banking,” combining SMS with the services of Astra Banka (also owned by BK until it was liquidated).

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<http://www.mobtel.com/>

ALTERNATIVE NETWORKS

Cable television evolved spontaneously in Serbia, without a specific law or regulatory mandate. Even now, there is a lack of reliable data about the dimensions of the market.

⁹¹ “Serbian news agency outlines history of controversial mobile phone provider,” Beta News Agency, 2 March 2002 – archived online at http://www.invest-in-serbia.com/archive/2002_03/2002_03_02_1.htm

⁹² For an English language summary of the content of this law, see Danijel Pantic. “Serbia Introduces Special Tax on Extra Incomes and Extra Property,” Transparency International - <http://www.transparentnost.org/sources/s011.htm>

⁹³ See Radio B92, “Windfall of 55 Million DM in Excess Profit Tax,” 23 January 2002 - [#N13](http://www.mfa.gov.yu/Bilteni/Engleski/b240102_e.html) – and RFE/RL NewsLine, “Mobile Phone Company Owned by Serbian Tycoon Raided,” 4 March 2002 - <http://www.rferl.org/newsline/2002/03/4-See/see-040302.asp>

⁹⁴ See <http://www.serbia.sr.gov.yu/news/2002-12/30/327296.html>.

⁹⁵ The revenue and profit were reported on their website, converted at a rate of 60 dinars = 1 euro.

The percentage of homes with cable TV service is believed to be small, but cable companies appear to be operating in all districts of Belgrade and other municipalities as well. Among the leading cable TV firms are KDS (a subsidiary of PTT Srbija that offers cable Internet), Telefonija (a joint venture between Telefonija and Daniel SatTV, which also offers cable Internet), and Stanton (part of the Stancom Business System, which combines residential construction, gas distribution, banking, insurance, etc.).

Meanwhile, limited runs of optical cable have been laid by the electric power distributor, Elektroprivreda Srbije, and the engineering firm Telefonija. Neither is enough to challenge SMIN (see below), but who knows what they might become in a liberalized telecom environment?

6. Internet Development

Public data networking started in Yugoslavia in 1986, with the opening of JUPAC, the Community of Yugoslav PTTs' X.25 service. Three semi-separate networks were actually built: "Slovenia and Croatia teamed up with Ericsson, Serbia, Macedonia and Montenegro with Siemens, and Bosnia & Herzegovina...decided to develop their own X.25 network through the state-protected company IRIS."⁹⁶ The international X.25 gateway in Belgrade was connected to TRANSPAC in France in 1987.

But in general, because Slovenia was the northernmost Yugoslav republic, bordering Austria and Italy, its location favored it as the gateway to data networks in the West. In the late 1980s, the Jozef Stefan Institute in Ljubljana organized the "Yugoslav Network for the Academic Community" (YUNAC). Subsidized by the European Commission's EUREKA!8-COSINE project, this email-oriented system relied on leased lines and X.25 to link Yugoslav researchers to academics in other countries.⁹⁷ By the end of 1991, it supported some 300 mail-servers across the Yugoslav federation.⁹⁸

Yugoslavia was the first socialist country allowed to join the Internet. Two of its hosts are listed in the very first RIPE "host count" published in October 1991.⁹⁹ YUNAC initially administered the .yu domain.¹⁰⁰ But when Yugoslavia started to break apart in 1991-2, YUNAC tried to transform itself into "an international organization following the example of NORDUNET." The idea was to maintain links among the universities and research institutes of what were becoming separate countries, while letting new national educational networks emerge, along with new ccTLD domains. But even this looser arrangement failed. Late in 1993, YUNAC ceded its 64 kb/s leased line link with Vienna to ARNES, the Slovenian academic network, and administration of the .yu domain shifted to the University of Belgrade.¹⁰¹

⁹⁶ Private correspondence from Rade Zonjic, 26 January 2003, reviewing this assessment.

⁹⁷ A summary of the EUREKA!8 COSINE project (which officially ended in 1994) is online at <http://www.eureka.be/servlets/PDFResult?prjid=8&xsl=projectFO.xsl&format=pdf>.

⁹⁸ "Yugoslav Network for the Academic Community (YUNAC)" by Borka Jerman-Blazic, *ISOC News*, Vol. 1, No. 1, (January 1992) - http://www.mirror.ac.lk/Internet-documents/isoc/pub/isoc_news/1-1/n-1-1.txt. This article is referred to below as *Borka 1*.

⁹⁹ <ftp://ftp.ripe.net/ripe/hostcount/History/RIPE-Hostcount.90-Oct-10>

¹⁰⁰ *Borka 1*

¹⁰¹ "What is new in the region of Former Yugoslavia" by Borka Jerman-Blazic, *ISOC News*, Vol. 2, No. 4 (January 1994) - http://www.mirror.ac.lk/Internet-documents/isoc/pub/isoc_news/2-4/complete_issue.txt

In the early 1990s, apart from YUNAC, access to international data networks was also offered in Yugoslavia by EARN/BITNET¹⁰² and EUnet. EUnet's gateway at the Faculty for Electrical and Computer Engineering in Ljubljana only handled uucp transfers – essentially just dial-up email.¹⁰³ The country's main EARN/BITNET node was in the Statistical Office of Serbia in Belgrade. A 9.6 kb/s leased line connected that office to the University of Linz in Austria, and another leased line connected it to the ElectroTechnical Faculty at the University of Belgrade, so that messages and files could be relayed between other academic and research institutions.

A few days after the UN Security Council voted to impose economic sanctions in May 1992, Yugoslavia's link to EARN/BITNET was blocked. After that, it was only possible to connect to computer networks in other countries through JUPAC – which was too costly for most people – or by dialing internationally into a remote access server. Thanks to the Yugoslav government's policy of printing more and more money to keep the economy afloat, the cost of international phone calls proved a minor obstacle: hyperinflation ensured that when the phone bill came, 2 or 3 months later, the cost of the long-distance calls would have been reduced to trivial levels.¹⁰⁴ For many months, all email to and from .yu domain was handled by servers in Belgrade calling a small PC named “moumee.calstatela.edu” in the office of Milan Mijic, a visiting professor at California State University in Los Angeles.¹⁰⁵ This dial-up link was a lifeline for Serbia's opposition and independent media, who were no less hurt by sanctions than were the government's supporters.

Between 4 June 1992 and 14 November 1995, Yugoslavia had only X.25 and dial-up connections to the outside world. But within the country, the first few Internet hosts spawned a genuine TCP/IP network which linked university faculties, the PTT, several high-tech companies, electronic bulletin-board systems in the “Hobbiton” network, and YUCCA (the Yugoslav Computer Communications Association).¹⁰⁶ By the time sanctions were lifted, this so-called “YU-Internet” had grown to some 1200 hosts – none of them visible to, or accessible from, hosts outside Yugoslavia.¹⁰⁷ Yugoslavia was an island excluded from the global mesh. Nevertheless, the experience of building and operating a national TCP/IP network created a knowledge-base that greatly accelerated Internet development after the signing of the Dayton Peace Accords.

In 1993, a young supporter of Radio B92, Rade Zonjic, proposed that the popular “pirate” radio station should build an Internet site connected to foreign networks. It would

¹⁰² EARN was the European Academic and Research Network, in effect an extension of BITNET. BITNET was built on a proprietary IBM protocol used at many universities. BITNET software allowed for easy migration to TCP/IP, the protocol which is the basis of the Internet.

¹⁰³ Some early “uumaps” from 1992 are still online at <http://www.funet.fi/pub/netinfo/UUCP/uumap/u.yug.1>

¹⁰⁴ To cite a real-world example, an 8 hour call from Radio B92 in Belgrade to *moumee.calstatela.edu* in Los Angeles in September 1993 cost the equivalent of 17 cents by the time the bill was received.

¹⁰⁵ Milan Basic and Pavel Pekovic, “1992: Slepi putnici na Internetu,” PCPress no. 20 (January 1997) - <http://pc.pcpres.co.yu/arhiva/20/umetak.html>

¹⁰⁶ See the “YU-Internet hosts list” (July/August 1995) compiled for YUCA by Miroslav Hristodulo, which is still online at <http://www.nsrc.org/>.

¹⁰⁷ The number of YU hosts was reported by Keith Mitchell in his notes from the “RIPE 22 Connectivity Working Group, 12-Oct-95” -- <http://www.ripe.net/ripe/mail-archives/connectivity-wg/1996/msg00000.html>.

facilitate the gathering and distribution of news, even though it seemed quite farfetched at the time, given international sanctions and the government's hostility to the kind of news that the radio was distributing. Nevertheless Drazen Pantic, an expert in secure communications, was tasked with developing the idea. In September 1994, XS4ALL in Amsterdam agreed to be B92's gateway and they obtained a sanctions waiver from the Dutch foreign ministry – on the grounds that B92 would serve only nongovernmental organizations with humanitarian aims. Securing a 28.8 kb/s leased line from the Serbian PTT was trickier, but with the help of a few sympathetic telephone workers, and financial support from the Fund for an Open Society, *opennet.org* got its first “ping” on 14 November 1995. A Linux server in the same building as Radio B92 became the only website in Serbia that could be accessed from outside the country. It also provided dial-up email service for politically compatible groups and individuals, and became an Internet training center for high school students and NGOs.¹⁰⁸ OpenNet's leased line to Holland would eventually enable B92 to deliver digital recordings of their programs to a worldwide audience. Indeed, B92's coverage of street demonstrations and student protests – events systematically ignored or misrepresented by Serbia's official media – reached a far larger audience outside Serbia, via the Internet, than they ever reached inside Serbia.¹⁰⁹

Restrictions on access to the global Internet also had a positive impact on the “online communities” that developed around electronic bulletin-board systems (BBSs). These grew larger and stronger in Serbia than in places where the Internet was dominant. BBSs allowed meeting places to be created that were completely different in spirit and sensibility from the one in which the BBSers actually lived, making it possible for them to share information that was missing from the mass media, and to express opinions which were officially condemned. The most important of these meeting places was the Sezam BBS which, starting in 1989, attracted thousands of young people and disaffected intellectuals who logged on nightly to discuss the latest rumors and crises. While OpenNet eventually died, Sezam evolved into a moderately successful ISP, SezamPro.¹¹⁰ Its importance as a meeting place re-emerged during the NATO bombing of 1999, enhanced by Internet Relay Chat (IRC). Smiljana Antonijevic described the scene brilliantly in her article, “Sleepless in Belgrade: A Virtual Community During War.”¹¹¹

A month after OpenNet's debut, the Dayton Peace Accords were signed. Yugoslavia rejoined the international TCP/IP routing tables in February 1996. A firm named MrSystems, owned by Braca Karic, moved quickly to catch the Internet wave already sweeping across other countries. With a 2MB/s leased line to Holland, they became

¹⁰⁸ Information about OpenNet is based on the author's email archives and recollections from when he was coordinator of the Open Society Institute's Internet Program.

¹⁰⁹ It would have been trivially easy for the Yugoslav government to block B92's leased line to Holland – and occasionally they did so – but B92 used encryption, pseudonyms, redundant channels and accounts at other ISPs to avoid detection and ensure delivery of their output.

¹¹⁰ B92 opened two more Internet/multimedia training centers, but could not persuade the PTT to install additional dial-up lines for their users. That guaranteed failure in competing against newer ISPs. In 1999 NATO's bombing of Serbia led the government to seize B92's assets and block their leased line. OpenNet exists today only as a web archive, preserving evidence of its earlier role. A good account of B92's Internet activities is found in “Internet in Serbia: From Dark Side of the Moon to the Internet Revolution” by Drazen Pantic (OpenNet's coordinator from 1995 to 1998), *First Monday*, Issue 2.4, http://www.firstmonday.dk/issues/issue2_4/pantic/. A good account of SezamPro's development, by co-founder Dejan Ristanovic, is at <http://user.sezampro.yu/~dejanr/sezame.htm>

¹¹¹ Published in *First Monday* (Vol. 7, No. 1 – January 2002) - http://www.firstmonday.dk/issues/issue7_1/anton/



BeoTel.net's network is more extensive than Telekom Srbija's.

Connectivity map (2002) from <http://www.beotel.yu/onama/mapa.html>

engineering subsidiary of PTT Serbia, which had installed a 256 kb/s VSAT at the University of Belgrade to serve the academic community.¹¹³ With financial support from BeoBanka,¹¹⁴ BeoTel.net grew into one of Yugoslavia's largest "backbone" ISPs, with 4 international circuits, points-of-presence in 14 cities, and a peering exchange with another well-connected ISP, Verat.net.

In the same way that Sputnik's success made it difficult for Russia to protest against the satellites of other countries overflying its territory (even though airplanes were never allowed to fly over Russia without permission), the commercial success of Internet firms close to Milosevic probably prevented him from imposing restrictive licensing or limiting the use of VSATs by ISPs. So while we may regret that the market quickly became dominated by friends of the regime, if OpenNet had become the dominant player, the government probably would have tried harder to block Internet growth.

A recent survey in the Belgrade-based magazine *Internet Ogledalo* found a total of 44 ISPs in Serbia.¹¹⁵ However, closer scrutiny using the "traceroute" program and the peering database at <http://www.fixedorbit.com/> reveals that most of the ISPs simply

EUnet's new Yugoslav affiliate. That MrSystems was able to get so much bandwidth when B92 could only obtain 28.8 kb/s is testimony to the Karics' good relations with the Milosevic regime. MrSystems soon became known as BK Telekom. Their EUnet subsidiary still has more customers than any other ISP in the country: 80,000, not including the WAP users on MobTel.¹¹² Since the law taxing excess profits was rescinded a few months ago, there is little chance that the Serbian government will nationalize EUnet like they did MobTel.

By the middle of 1996, 3 ISPs were operating in Serbia: Open-Net, EUnet and BeoTel.net. The latter was owned by Telefonija, an

¹¹² The number of EUnet users was reported in "YU Internet Provajderi" by Nikola Kosanovic, *Internet Ogledalo* 24 (2002), pages 34-46. This article is referred to below as *Provajderi*. It remains to be seen if they will try to take over EUnet, and if so, what effect that might have on the Internet access market. .

¹¹³ See "Update on Yugoslavia Connectivity" by Berislav Todorovic (22 July 1996), online at <http://www.nsrc.org/>

¹¹⁴ Slobodan Milosevic was president of BeoBanka from 1978 to 1984, and afterwards retained close ties with the bank.

¹¹⁵ Nikola Kosanovic, "YU Internet Provajderi," *Internet Ogledalo*, issue number 24, pages 34-46

resell access to – or are actually owned by – one of the ten ISPs which have their own international connections. Eleven of the smaller ISPs resell access to Verat.net, 10 resell access to Beotel.net, and 8 resell access to PTT/Telekom Srbija. The following table summarizes the relationship between the resellers and the internationally connected:

Serbian ISPs with International Connections...and their Resellers					
Name	International links to...	International Bandwidth	Reported number of dial-up lines	Retail customers (reported or estimated)	ISPs who resell access to this ISP
BeoTel.net	Telenor, SkyVision, GRnet (backup)	7.5 MB/s	~1000, but they are mainly a "backbone" provider	12,000-20,000	ABSsoft.net, Aviza.net, BankerInter.net, Elvod.net, GTL net, Hemo.net, I*net, JugoBanka, NS Point, Elmag
BitsYU.net	Surfnet	4 MB/s	106	2,000	(none)
EUnet	Telecom Austria, Level3-Europe	34 MB/s	870	80,000	MobTel, SC Net,
InfoSky	Slovenia Online, SkyVision	4 MB/s	340	8,000-13,000	ArkaYU.net, TeamNet
Madnet	FiberCloud	2 MB/s	64	?	(none)
PTT/Telekom Srbija	SEABONE (Italy), Blitz.net (BiH), Deutsche Telekom	38 MB/s	1200	49,000-77,000	Bozic i Sinovi, Datanet.yu, Eutelnet, Memodata, M&G Net, PyroTherm, RavanGrad, SKS Co., VK JetNet,
SezamPro	NewSkies	16 MB/s	100-200?	16,000	(AMREJ)
Verat.net	Deutsche Telekom	34 MB/s	480	13,000	AbsolutOK, Drenik.net, FormaNet, I*Net, Neobee, Net002, NordNet, Palic Net, TippNet, Topola Net, Tron-Inter,

YUBC.net	Cable & Wireless Austria, Tiscali	34 MB/s	580	16,000	Media Nis, Pogled Net,
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If we accept this data as accurate, and add in the academic network’s 2 MB/s link to GRNET, it appears that Serbia has 175.5 MB/s of international bandwidth. And if there are half a million Internet users as YuISPA believes, that yields an international bandwidth of 351 baud per user. Compare that to neighboring Hungary, which has at least 2,500 MB/s of international bandwidth¹¹⁶ and 1,500,000 – 2,000,000 net users,¹¹⁷ for an international bandwidth per user of at least 1,250-1,667 baud.

Telekom Srbija and PTT Serbia both have Internet subsidiaries. They cooperate but occupy different market niches. Telekom Srbija provides backbone infrastructure and has relatively few retail customers. It has access nodes in Belgrade, Novi Sad and Nis, interconnected by 2MB/s links. The Belgrade node has terrestrial links abroad to SEA-BONE Italy (34 MB/s) and Cable & Wireless USA (10 MB/s).¹¹⁸ PTT Serbia Net, on the other hand, with 77,000 user accounts, ranks second only to EUnet in the number of retail customers. Their network interconnects with MobTel.net, Deutsche Telekom and Telekom Srbija.

As noted earlier, TS and the PTT are building a national IP “backbone” with high-capacity access servers called the Serbian Multiservice Information Network (SMIN).¹¹⁹ Two and a half million euros has already been spent on this project, which will support the simultaneous transmission of Internet data, voice telephony and cable television programming over 105 “E1” links connecting 5 primary and 12 secondary portals. Since Telekom posted prices for SMIN services on their website a few months ago, the network may be almost ready to “go live.” Part of TS’s existing circuit-switched intercity voice network is expected to migrate to SMIN, and SMIN is also foreseen as supporting a “Balkan Internet Exchange,” a peering service for ISPs across southeast Europe. It will also support newer services like Unified Messaging and enhanced videoconferencing. TS says that SMIN will not only reduce their operating costs, thereby saving customers’ money, but it will end the “digital divide” within Serbia by equalizing the cost and availability of Internet access all over the country. Critics see it as embodying a Soviet-style approach to telecommunications as a unitary monopoly. It strikes fear in the hearts of other ISPs and CATV companies, who see themselves being reduced to resellers of SMIN access – a role in which they would hardly be essential, or profitable.

YuISPA

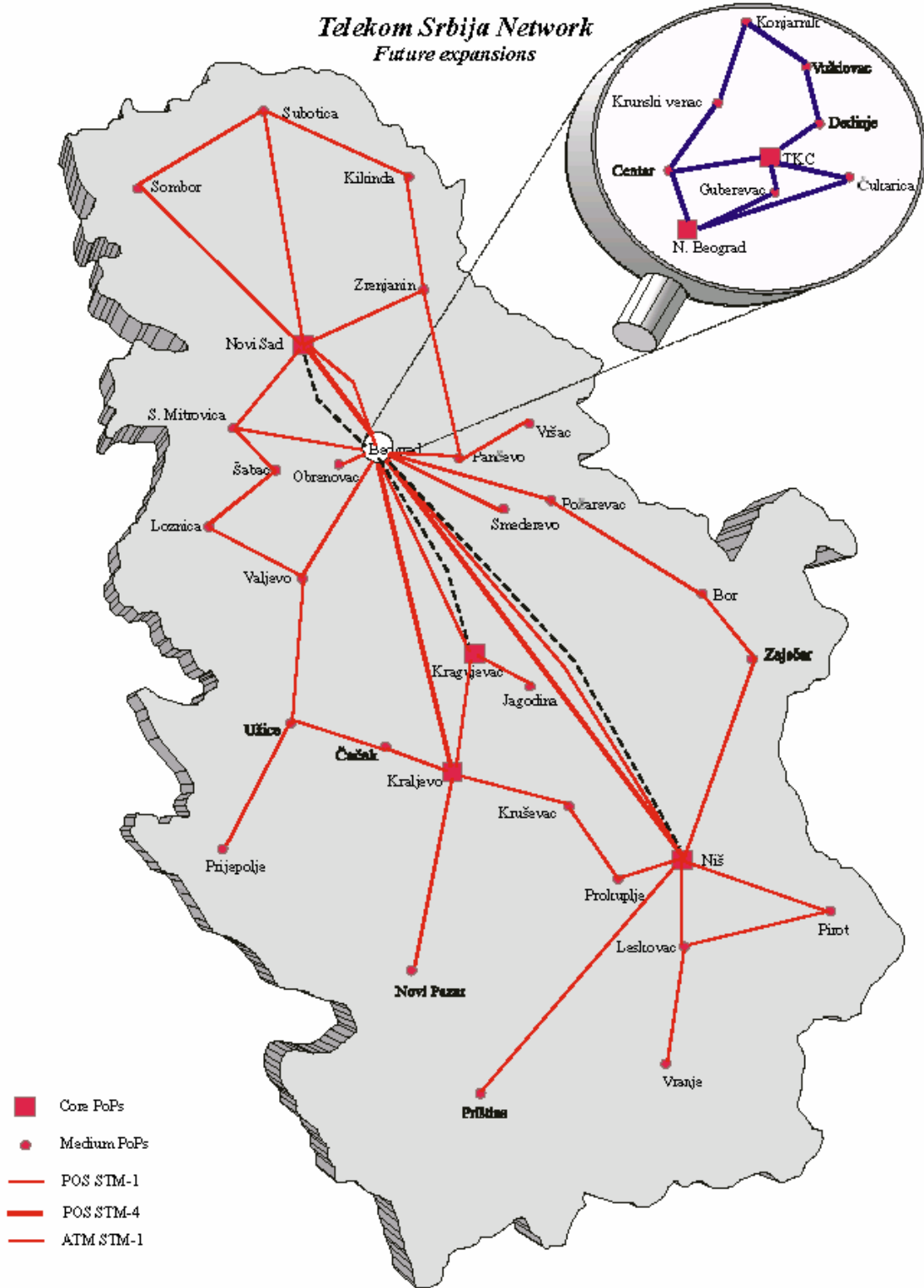
ISPs find Telekom Srbija difficult to deal with. Under the Milosevic regime, it was an open secret that politics – or contributions to the right political party – influenced one’s

¹¹⁶ This figure is due to the GEANT academic networking project and does not include commercial ISPs, whose bandwidth compared to GEANT is small.

¹¹⁷ GfK Hungaria estimated in the spring of 2001 that Hungary had 1.2 million Internet users. More recent estimates range as high as 2.2 million. See <http://www.netsurvey.hu/>.

¹¹⁸ See the “Network Topology” webpage at <http://www.telekom.yu/SiteTelekom/Internet/Topologijamreze.htm>

¹¹⁹ Plans for SMIN are described in Telekom Srbija, *Request for Proposal of a Technical Solution for Serbian Multiservice Internet Network*, April 2001 - <http://www.internodiu.org.yu/depo/telekom/smin-rfp.pdf>



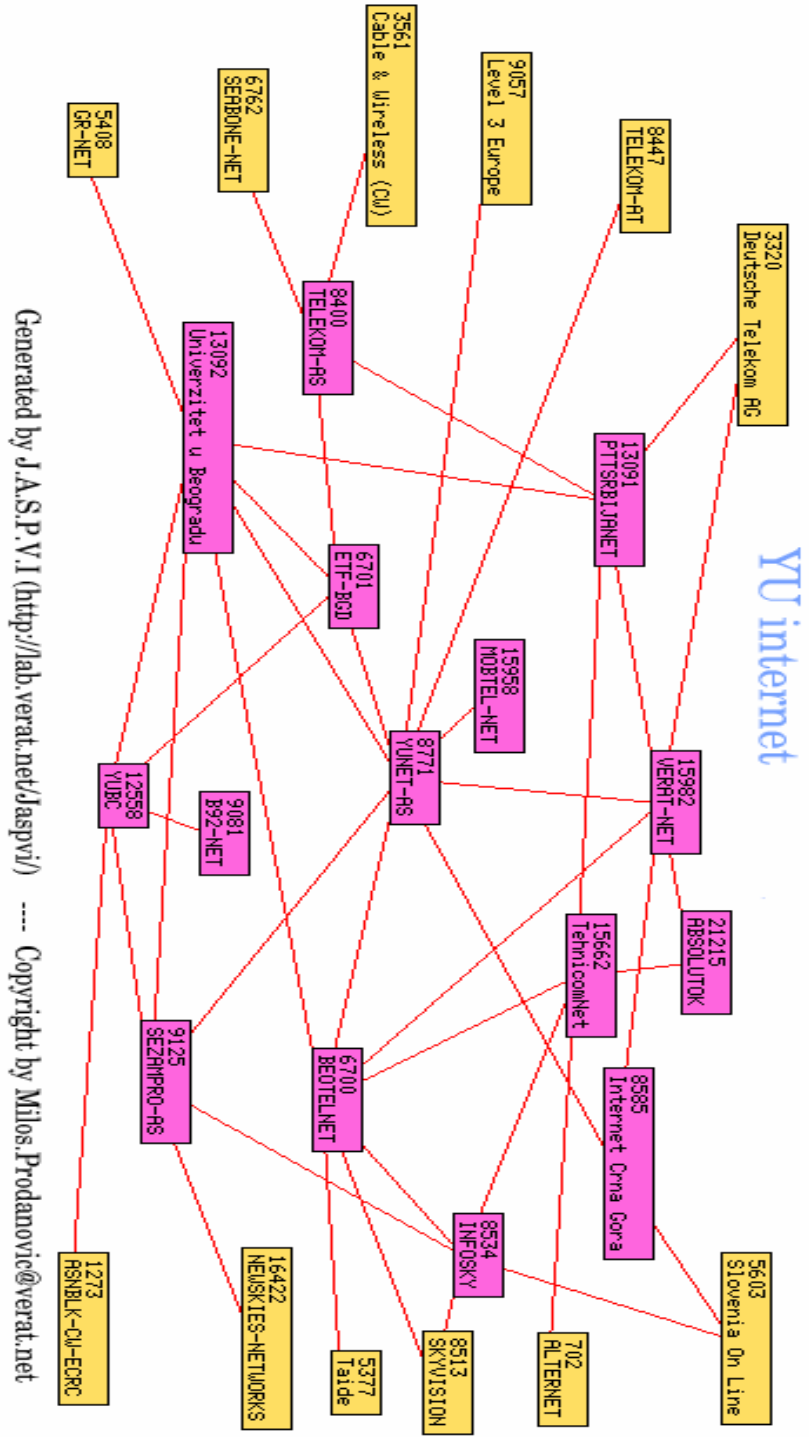
Topology map of the Serbian Multiservice Information Network (SMIN) from <http://www.internodium.org.yu/depo/telekom/smin-rfp.pdf> (page 12)

chances of getting a leased line or more dial-up lines installed. But when Telekom became aggressive in asserting the rights allegedly given in its 1997 sale contract, the ISPs realized that if they did not band together, their businesses could simply be devoured by the predatory monopoly. Thus, the Yugoslav ISP Association was founded at the end of 2001 as a sector of the Yugoslav Chamber of Commerce. In the beginning their ambitions were high. They hoped to take over administration of the .yu domain. They talked about building a cooperative peering exchange, with wireless links to all their offices to eliminate the need for leased lines. Yet as it turned out, the ISPs could not agree even on basic issues like the text of their memorandum of association or how to assess dues. Months passed and the organization foundered half-formed until June 2002, when Telekom began their campaign against “voice smugglers,” the ISPs who offered telephone-like services using VoIP.

VoIP divided the ISP association. The ISPs who did not offer VoIP considered it a dangerous provocation against Telekom. Thus the association, whose head was in the anti-VoIP camp, kept silent about the plight of their colleagues. But as court after court decided in favor of the VoIP providers, and then the Ministry of Telecommunications did so, too, the public started rooting for the “underdog” VoIP providers. Daily newspapers portrayed their conflict as “David vs. Goliath” with cheaper long-distance phonecalls hanging in the balance. The VoIP providers’ unexpected victories and burgeoning public and media support led to a shake-up in the ISP association. Vojislav Rodic was elected head of the ISP assembly in September. As a content provider rather than an ISP (he edits a bilingual news site at <http://www2.inet.co.yu/>), Rodic was acceptable to both sides: he supported the VoIP providers, but was not one of them. The association itself had become the focus of almost constant press attention, thanks to Telekom’s crude attacks. Rodic is reorganizing the association outside of the Chamber of Commerce, and he just might be able to overcome some of the problems which stymied the group before.

Vojislav Rodic
Secretary General
Yugoslav ISP Association
Kneza Milosa 12
11000 Beograd
Tel.: +381 11 643468
Email: vrodic@inet.co.yu
<http://www.isp.org.yu/>

Internet Ogledalo
Gradski park 2 (Hala “Pinki”)
11080 Zemun
Tel.: +381 11 3160270
<http://www.internetogledalo.com/>
Zoran & Vesna Kovacevic
Director & Editor-in-Chief
Email: redakcija@ogledalo.co.yu



Connections between Serbian ISPs and foreign networks (from Verat.net, 2002)

Serbian ISPs

AB Soft Net
Kneza Milosa 82
11000 Beograd
Tel.: +381 11 3613755
Fax: +381 11 3613131
Email: office@abssoftyu.net
<http://www.abssoftyu.net/>

AbsolutOK
11000 Beograd
Tel: +381 11 3193300
Email: info@absolutok.net
<http://www.absolutok.net/>

ArkaYu Net
Jurija Gagarina 87/266
11070 Novi Beograd
Tel.: +381 11 3015681
Email: office@arkayu.net
<http://www.arkayu.net/>

Aviza NET
Kirovljeva 25
11000 Beograd
Tel.: +381 11 3545794
Fax: +381 11 3545915
Email: office@aviza.net
<http://www.aviza.net/>

BeoNet
Molerova 32/V
11000 Beograd
Tel: +381 11 3085800
Email: office@beonet.yu
<http://www.beonet.yu/>

BeoTel.net
Marsala Tolbuhina 56
11000 Beograd
Tel.: +381 11 3404118
Fax: +381 11 3404121
Email: office@beotel.yu
<http://www.beotel.yu/>

BitsYU.net
Svetozara Markovica 23-25
11000 Beograd

Tel: +381 11 3239494
Fax: +381 11 3227281
Email: postmaster@bitsyu.net
<http://www.bitsyu.net/>

DataNet
Batajnickski put 23
11080 Zemun
Tel: +381 11 197744
Fax: +381 11 198980
Email: info@datanet.yu
<http://www.datanet.yu/>

Drenik Net
Deligradska 19
11000 Beograd
Tel. +381 11 659641
Email: office@drenik.net
<http://www.drenik.net/>

ElvodNET
Mose Pijade 1
15000 Sabac
Tel.: +381 15 322590
Email: office@elvod.co.yu
<http://www.elvod.co.yu/>

EUnet Yugoslavia
Obilicev venac 1
11000 Beograd
Tel.: +381 11 3282608
Fax: +381 11 3030811
Email: info@eunet.yu
<http://www.eunet.yu/>

EuTelNet
Kneza Milosa 4
11000 Beograd
Tel: +381 11 3342038
Mobile: +381 63 8050250
Email: info@eutelnet.com
<http://www.eutelnet.com/>

FormaNet
Hajduk Veljkova 79
19300 Negotin
Tel.: +381 19 543000
Email: office@formanet.co.yu
<http://www.formanet.co.yu/>

GTL Net
Borisa Kidrica 12
24000 Subotica
Tel.: +381 24 555666
Fax: +381 24 555533
Email: office@gtlnet.com
<http://www.gtlnet.com/>

HemoNET
Trg Save Kovacevica 3
26300 Vrsac
Tel.: 381 13 829474
Email: info@hemo.net
<http://www.hemo.net/>

I*Net
Kneza Milosa 12
11000 Beograd
Tel.: +381 11 643466
Fax: +381 11 642429
<http://www.inet.co.yu/>

InfoSky (Informatika a.d.)
Jevrejska 32
11000 Beograd
Tel.: +381 11 3215344
Fax: +381 11 3215322
Email: info@infosky.net
<http://www.infosky.net/>

JugoBanka Bor
Mose Pijade 16
30000 Bor
Tel.: +381 30 451271
<http://www.bor.co.yu/>

MadNet d.o.o.
Jadranska 16
26000 Pancevo
Tel.: +381 13 301001
Email: internet@madnet.co.yu
<http://www.madnet.co.yu/>

Media Nis
Bulevar Nemanjica 26
18000 Nis
Tel.: +381 18 522855
Email: info@medianis.net
<http://www.medianis.net/>

MemoData
Bulevar JNA 140
11000 Beograd
Tel.: +381 11 663484
Fax: +381 11 3670744
Email: info@memodata.net
<http://www.memodata.net/>

M&G Net
V. J. Žarka 4
23000 Zrenjanin
Tel.: +381 23 580240
Fax: +381 23 580241
Email: office@mgnet.co.yu
<http://www.mgnet.co.yu/>

Neobee d.o.o.
Jevrejska 1
21000 Novi Sad
Tel.: +381 21 52754
Email: office@neobee.net
<http://www.neobee.net/>

Net022 ISP
Nikole Pasica bb
22000 Sremska Mitrovica
Tel.: +381 22 639007
Fax: +381 22 636066
Email: office@net022.net
<http://www.net022.net/>

NordNet d.o.o.
Aldolfa Singera 12
24000 Subotica
Tel.: +381 24 600100
Fax: +381 24 551900
Email: info@yunord.net
<http://www.yunord.net/>

NS Point
Bulevar Oslobođena 100
21000 Novi Sad
Tel.: +381 21 614990
Fax: +381 21 421594
Email: office@nspoint.net
<http://www.nspoint.net/>

Palic NET
Horgoski put 88

24000 Subotica
Tel.: +381 24 753400
<http://www.palic.net/>

Panet
Maksima Gorkog 2
26320 Pancevo
Tel.: +381 13 318320
Email: office@panet.co.yu
<http://www.panet.co.yu/>

Pogled NET
Vojvode Misica 56
18000 Nis
Tel.: +381 18 520330
Email: webmaster@pogled.net
<http://www.pogled.net/>

PTT Srbija NET
Katicева 14-18
11000 Beograd
Tel.: +381 11 3619514
Fax: +381 11 2351002
Email: pttmail@ptt.yu
<http://www.ptt.yu/>

Pyrotherm Trade
Lenjinova 10
24400 Senta
Tel.: +381 24 815591
Email: webmaster@pyrotherm.co.yu
<http://www.pyrotherm.co.yu/>

RavanGrad NET
Trg Svetog trojstva 1
25000 Somobor
Tel.: +381 25 469030
Email: office@bivalent.co.yu
<http://www.ravangrad.net>

SC Net
Milentija Popovica 9
11070 Novi Beograd
Tel/Fax: +381 11 3115684
Email: info@net.yu
<http://www.net.yu>

SezamPro
Skadarska 40/III-4
11000 Beograd

Tel./Fax: +381 11 3227231
Email: info@sezampro.yu
<http://www.sezampro.yu/>

SKS Company
Generala Petra Drapsina 53
24400 Senta
Tel.: +381 24 815320
Fax: +381 24 815330
Email: info@sksyu.net
<http://www.sksyu.net/>

TeamNet
Narodnog fronta 53
21000 Novi Sad
Email: office@teamnet.ws
<http://www.teamnet.ws/>

TehnicomNet
Bulevar vojvode Misica 37b
11000 Beograd
Tel.: +381 11 3690407
Fax: +381 11 3691915
Email: info@tehnicom.net
<http://www.tehnicom.net/>

TippNet
Karadjordjev put 2
24000 Subotica
Tel.: +381 24 555765
Email: admin@tippnet.co.yu
<http://www.tippnet.co.yu/>

Topola NET
Rade Koncara 55/A
24300 Backa Topola
Tel.: +381 24 711123
Email: admin@topolanet.co.yu
<http://www.topolanet.co.yu/>

Tron-Inter
Hajduk Veljkova 2/8
36000 Kraljevo
Tel.: +381 36 319319
Email: office@tron-inter.net
<http://www.tron-inter.net/>

Verat Net
Gavrila Principa 58
11000 Beograd

Tel.: +381 11 3065333

<http://www.verat.net/>

VkJetNet

Mihaila Pupin 11

23300 Kikinda

Tel.: +381 230 34343

<http://www.vkjetnet.co.yu/>

YUBC System a.d.

Brace Jugovica 16/I

11000 Beograd

Tel/Fax: +381 11 3343694-7

Email: office@yubc.net

<http://www.yubc.net/>

Some Popular Internet Cafes in Belgrade:

Biblioteka grada Beograda

Zmaj Jovina 1

Tel.: +381 11 630627

Internet cafe

Vuka Karadžica 12

Tel.: +381 11 637721

IPS

Makedonska 4

Tel.: +381 11 3233344

Manhattan

Vasina 22

Tel.: +381 11 639176

Maverik

Dom omladine

Makedonska 22

Tel.: +381 11 3222446

Net Cafe

Branka Krsmanovica 18a

Tel.: +381 11 3407965

Plato

Akademski plato 1

Tel.: +381 11 3030633

Platonet

Vasina 19

Tel.: +381 11 3231560

SezamPro

Skadarska 40c

Tel.: +381 11 3227231

S-Soft

Zetska 5

Tel.: +381 11 3231560

Yellow Yard

Kumanovska 6

Tel.: +381 11 3441123

ACADEMIC NETWORKS

The University of Belgrade's Computer Center is the hub of the Yugoslav academic network (Akademska Mreza Jugoslavije, or AMREJ). Within Belgrade, optical fiber links support fast-ethernet speeds of up to 1 GB/s between the faculties of biology, botany, chemistry, mathematics and neighboring institutions ("BEONET"). AMREJ's intercity backbone has 2 MB/s links serving about 140 sites in Belgrade, Kragujevac, Nis and Novi Sad, plus the "near abroad" universities in Podgorica (Montenegro) and Pristina (Kosovo). There are also 64 kb/s branches into Bor, Sombor, and Zrenjanin.¹²⁰

AMREJ does not serve primary or secondary schools, but about 90% of all university students are believed to use its network. According to the Federal Statistics Bureau, during the 1999-2000 school year, 219,119 students attended universities and other

¹²⁰ Current information about the network's topology is available at <http://servlet.rcub.bg.ac.yu/servlet/netIS.ServletLokacije?p1=YU&p2=TOP>

tertiary educational institutions in Serbia (112,381 full-time and 106,738 part-time).¹²¹ This implies that about 40% of the Internet users in Serbia are college-age students. Meanwhile, hardly any primary or secondary schools have network access. A review team from the University of Ljubljana noted that in general “School equipment is very old, damaged and mostly inappropriate. There were no resources for school equipment and teaching means in [the] last ten years...”¹²² According to the Federal Statistics Bureau, Serbia has 1,443 primary schools (grades 1-8); 473 secondary schools; 1,700 schools which do not fit the primary/secondary distinction; 227 schools offering “special education;” 9 universities; and 49 “non-university” institutions of higher learning. Private schools and universities are virtually non-existent – only 2 private secondary schools and 3 new private universities are registered. In the 1999-2000 school year there were 731,427 students in primary schools, plus 332,559 students in secondary and vocational schools.

AMREJ’s external connections to domestic ISPs include BeoTel.net, EUnet, PTT Serbia and SezamPro, and internationally, it has a 2 MB/s leased line to GRNET, the Greek academic network. The Serbian Ministry for Science, Technology and Development is AMREJ’s main sponsor for domestic network development, while the Federal Secretary for Development and Science pays for their foreign connectivity. Their total budget in 2002 was about 800,000 euros.¹²³

Serbia is not one of the countries participating in the GEANT project, the European Union’s new high-speed academic network. As an alternative, GRNET is organizing a more gradually-evolving network for the “left-out” countries of southeastern Europe: Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Macedonia, Romania and Yugoslavia. This Scientific Information Network for South East Europe (SINSEE) will connect Budapest to Athens with a 2.5 GB/s optical fiber passing through Serbia and Macedonia, while branches of 34 to 622 MB/s extend from this backbone into the neighboring countries. Those branches will eventually be upgraded to 2.5 GB/s, too, and at that point SINSEE will merge into GEANT. The project clearly involves substantial new investments in the existing academic networks. The total cost of SINSEE is estimated at over 33 million euros, while the Yugoslav portion (known as SINYU) is expected to cost about 18.8 million euros.¹²⁴ The participants hope that foreign donors will cover most of the cost, and indeed, the German Commission of UNESCO and the Max-Planck-Institut für Physik in Munich contributed the design, equipment and labor for the initial phase of the project in Serbia. The first 350-km segment of SINYU, connecting the universities of Belgrade, Novi Sad and Nis at 1 GB/s, was dedicated at the end of May 2002.¹²⁵ The next step is to extend it into Hungary, Bulgaria and Greece.

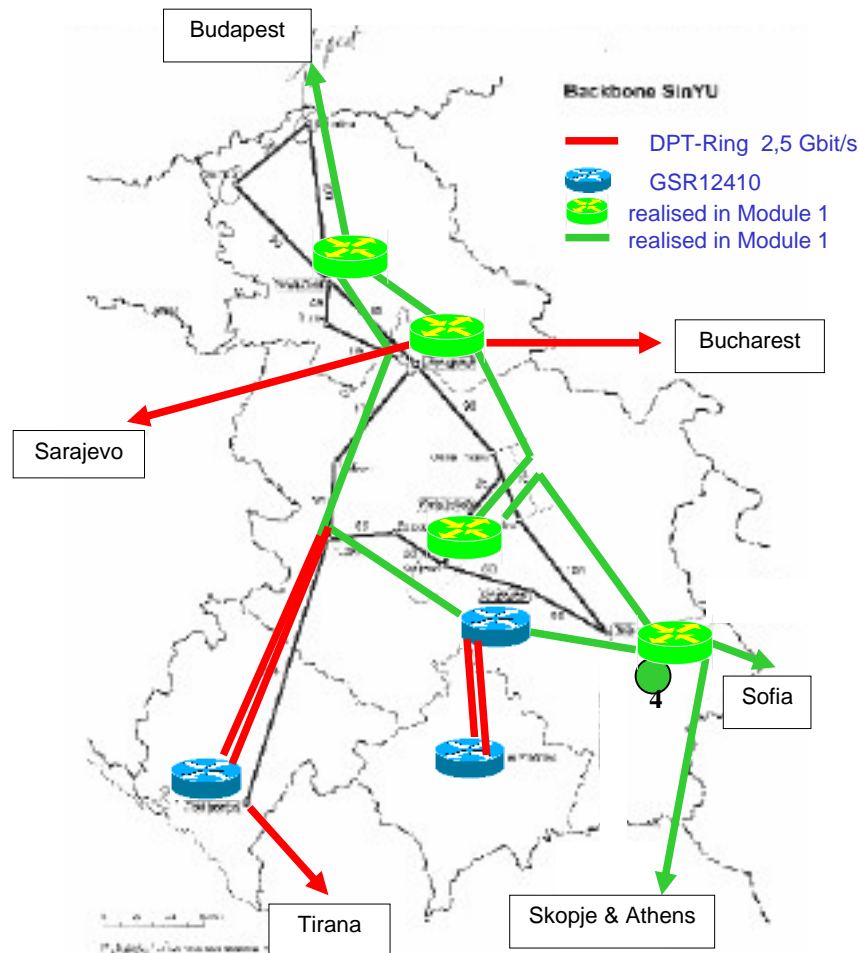
¹²¹ University of Ljubljana Faculty of Education, “Statistical Data for Background Purposes of OECD Review – Country: Serbia,” *Support to OECD Thematic Reviews of Educational Policy in South East Europe* (January 2001), page 9.

¹²² *op.cit.*

¹²³ This information from the “TERENA Compendium of National Research and Educational Networks In Europe, 2002” - <http://www.terena.nl/compendium/countrydetails2002.html?ID=50.18>

¹²⁴ Minister Dragan Domazet, “SINYU: Scientific Information Network Yugoslavia Project,” proposal for the Stability Pact Regional Donors Conference, Bucharest, 25-26 October 2002.

¹²⁵ Speech by Minister of Science, Technology and Development Dragan Domazet at the “Ministerial Conference on the Information Society: Connecting Europe” – (Ljubljana, Slovenia – 4-5 June 2002) - <http://www.serbia.sr.gov.yu/news/2002-06/05/324550.html>



Network topology map adapted from Dragan Domazet, “SINYU: Scientific Information Network Yugoslavia Project,” proposal/presentation for the Stability Pact Regional Donors Conference, Bucharest, 25-26 October 2002

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ADMINISTRATION OF THE .yu DOMAIN

As briefly mentioned earlier, the top-level country domain “.yu” was initially administered by a council of experts within YUNAC, the academic network headquartered in Slovenia. As the Yugoslav federation started to disintegrate in 1991-2, the republics emerging as newly independent countries were eager to start using their (secondary-level)

republic domains as (top-level) country domains: “.si” for Slovenia, “.hr” for Croatia, “.mk” for Macedonia, and “.ba” for Bosnia. Meanwhile, the Serbian members of the group that had been administering the “.yu” domain applied to IANA to transfer responsibility for the “.yu” registry to the *Serbian* Ministry of Science and Technology. In the spring of 1993, even though the Yugoslav federal government was not involved in their application, the late Jon Postel recognized the Serbian group – who were all from the University of Belgrade’s ElectroTechnical Faculty – as successor to the inter-republic council for administering the “.yu” domain. There are apparently no published IANA reports about this decision..

Note that this was during the time of sanctions, when Internet hosts in Serbia were not even listed in DNS tables outside of “rump Yugoslavia.” It was also a time of civil war and political repression. Details about who had the right to control the .yu domain probably seemed inconsequential, and indeed, being a domain administrator then was an unpaid position . Because of the limited time the volunteer registrars had available for processing new applications, they adopted registration policies which seem harshly and unnecessarily restrictive today:

- Individuals cannot obtain a domain name.
- Only companies and organizations physically located and properly registered in Yugoslavia can apply for a domain name.
- Each registrant can get only one domain.
- Once registered, a domain name cannot be transferred.¹²⁶

These policies persisted after the lifting of sanctions, after commercial ISPs crowded into the market, and into the period of expanding Internet use.

During the presidential election of September 2000 – which Slobodan Milosevic tried to steal by falsifying the vote tallies,

“...thugs visited the yuTLD team and ordered them to change DNS entries of a few pro-opposition .org.yu domains [which were posting election results that had not been altered]. People on Internodium quickly learned about the scandal and tried to investigate the case. I got a response from the yuTLD team and posted it... After the whole scandal was over the yuTLD team completely closed all communication channels with the local Internet community and refused to discuss their responsibilities [and] the still open issues of restrictive registration policies...”¹²⁷

A public meeting was called to discuss reform of the “.yu” registry, and a long list of questions was sent to the registrars, signed by over a hundred net users. Neither brought any response. However, Goran Veljovic, director of the federal informatics bureau in the recently elected DOS government, recognized that reforming the ccTLD administration was essential if the country was to benefit fully from development of the Internet. He organized an Expert Working-Group on the Future of the .YU Domain, to develop a consensus strategy on reform. The group included activists and ISPs, as well as lawyers and people from within the government. The process of discussion was made as

¹²⁶ These rules (and others) are still posted on the Yugoslav Internet Domain Name Registry’s website at <http://www.nic.yu/pravilnik-e.html>

¹²⁷ Private email message to the author from Slobodan Markovic (the founder of Internodium), dated 5 November 2001. That email message is the primary source for this section of the assessment.

transparent as possible, using an email list and website (still online at <http://nic.szi.sv.gov.yu/>). In the end, the group drafted bylaws for a new Network Information Center (NIC), and new rules for domain name registration.

But unfortunately, political tensions within the DOS coalition interfered with the completion of this process. When the Agency for IT and Internet Development moved into the Ministry for Science, Technology and Development, Branislav Andjelic decided to tackle the problem by shifting the responsibility for “.yu” administration into his Bureau, at least temporarily, while a longer term solution was negotiated with the Internet community and the administrators at the ElectroTechnical Faculty, who are still recognized by ICANN and IANA. Many of the people who participated in the Expert Working-Group in 2001 are still working on a long-term solution to this problem.

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INTERNET CONTENT

Three factors encouraged large numbers of Serbs to turn to the Internet as an alternative source of news and opinion in the 1990s:

- the huge Serbian diaspora, which always wanted more details about events back home than the mass media in their temporary havens were able to provide;
- the Milosevic government’s influence over the traditional mass media inside Serbia, which generally reduced the quality of professional journalism, and distorted or excluded important facts and opinions;
- a widespread belief that the “Serbian cause” was being deliberately misrepresented in the foreign mass media, so that it was necessary to get the Serbian perspective out to as many non-Serbs as possible.

Those factors are waning in significance now, but at the same time, new factors – like Serbia’s re-integration with Europe; the revival of international ties in culture, athletics and academia; and the promotion of tourism and trade – are coming into play, so that the mix of content originating from Serbia may shift rather than decrease.

In fact, the number of websites registered under the .yu domain continues to grow much faster than the host count, although the rate of increase is slowing. This table summarizes the data:

	1999	2000 (%)	2001 (%)	2002 (%)
WWW sites	1,419	2,853 (+101%)	5,401 (+89%)	7,675 (+42%)
Real hosts	12,499	15,488 (+24%)	15,486 (-0%)	16,821 (+9%)

We have not been able to make a quantitative survey of the content of all these websites, but we can offer pointers to a few especially interesting or significant sites, focussing on those most relevant to GIPI's interests in Internet development policy:

Savetodavni Centar za Ekonomska i Pravna Pitanja (SCEPP) - The “Advisory Centre for Economic and Legal Questions” opened in Belgrade in October 2001. The Centre is a 2-year, 5 million euro project managed by the European Agency for Reconstruction. Its large staff advises the Serbian government in the drafting of new laws to help the transition to a market economy, to speed up accession to the World Trade Organization, and to foster convergence with EU policies. Their criticism of the new draft telecommunications law led to many major improvements. Clearly the government takes their advice seriously, and most of their consultation documents are quickly posted on their website. Even though they only have funding for 10 more months, they are important potential allies for GIPI.

Savetodavni Centar za Ekonomska i Pravna Pitanja

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<http://www.plac-yu.org/>

Krister Thelin, Director - krister.thelin@plac-yu.org

Mihail Arandarenko, Deputy Director - mihail.arandarenko@plac-yu.org

Prof. Miodrag Trajkovic, Chief Legal Advisor - miodrag.trajkovic@plac-yu.org

Internodium is an email-based discussion forum about Internet rights and policies with over 750 subscribers. Virtually all of the key players involved in these matters subscribe – ISPs, government officials, lawyers and activists – and its online message archive offers a detailed mapping of the debates and controversies discussed in this assessment. It is like an informal local chapter of the Electronic Frontier Foundation (EFF) – which should not suggest that it is either provincial or incapable of sustained professional work. Internodium was responsible for challenging the administrators of the “.yu,” for promoting the idea of a national peering exchange, for generating expert critiques of the new draft telecom law, and for too many other worthy contributions to mention. Slobodan Markovic founded Internodium in 1998 and continues to act as its moderator. We have mentioned him briefly several times in this assessment. Perhaps this is the place to indicate that he is our choice to coordinate GIPI's work in Serbia.

<http://www.internodium.org.yu>

Slobodan Markovic, founder & moderator

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E-mail: twiddle@eunet.yu, sloba@internews.org

E-trgovina – Serbia's first online magazine devoted to e-commerce. It is not updated as frequently as last year, but they organize events which focus attention on e-business

issues, lobby for passage of an e-commerce law, and maintain a “YU-Web Shopping Directory.”

Nebojsa Djuric, director
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21000 Novi Sad
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Email: office@e-trgovina.co.yu
<http://www.e-trgovina.co.yu/>

Drustvo za informatiku Srbije – The “Group for Serbian Informatics” is headed by Prof. Nikola Markovic, who drafted the national ICT development strategy for Slobodan Milosevic’s government in 1997. Whatever that may suggest, he is knowledgeable, thoughtful, and his website is full of news related to informatization.

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<http://www.dis.org.yu/>

Serbian Wireless Community Network – ISPs in Serbia have for years embraced spread-spectrum radio links as a way to eliminate the need for expensive leased lines from Telekom. Now, ordinary users are banding together to create a user-built mesh of low-power unlicensed “wi-fi” sites, reducing their dependence on ISPs. This forum is for trading how-to knowledge, deciding collectively on locations for relay and open-access sites, and for debating the political significance of this movement. Some 135 people have already joined, although the first site has yet to be built.

<http://swcn.elitesecurity.org/>

7. Legal/Regulatory Framework

In **Section 4. Governmental Framework**, we noted that Yugoslavia is in transition from federative diversity to a much simpler partnership, and as part of this change, administrative functions will be reorganized and constitutions rewritten. That means substantial alterations of the legal framework are just around the corner.

But it is also worth noting that other large and simultaneous transitions have been going on in Yugoslavia for more than a decade, producing one of the most incoherent bodies of law found in Europe. Aside from a reduction in the number of republics, there was a compromised attempt to shift from liberal socialism to free-market capitalism, combined with an attempt to cope with economic sanctions which made normal domestic and international business relationships impossible. On top of everything else, Slobodan Milosevic repeatedly rearranged institutional roles and responsibilities in response to

short-term crises. Often he created deliberate contradictions between federal and republic laws, to create new options for himself while confusing his enemies and potential challengers. This “Rubik’s Cube” approach to legislation is far different from what one finds in other countries. It forces many laws to be ignored or abandoned, even when not repealed, and creates gaps between what the law says and what citizens and officials actually do.

The Yugoslav federal constitution of 1992 will not be missed when it is replaced in a few weeks, for it defines an approach to the regulation of “public information” which could be exploited to severely inhibit Internet communication.¹²⁸ While Article 36 of the constitution says that it guarantees freedom of the press “and other forms of public information,” and also seems to forbid censorship, the same article requires the “registration with the competent authorities” of all channels for the “dissemination of information.” That was interpreted by successive Yugoslav governments as requiring all journalists and print media to be registered by the state – requirements consistently condemned by international press freedom groups like Article 19, for example, who told the Albanian government in 2001 (when a new press law was introduced there which would have required the registration of publications),

“it is unacceptable under international law for the state to decide who can and cannot publish – the European Convention on Human Rights does not permit licensing of print media outlets.”¹²⁹

The vague wording of Article 36 can be stretched even further – to imply that anyone wanting to post a webpage on the Internet might need to register beforehand with the government – and if their registration request was rejected (if, for example, the page was not created in response to a work order from a registered publication) the unregistered author could be fined for putting the page online anyway. This stems from the unfortunately elastic phrase “public information” which could include anything from whispered rumors to handmade placards to national broadcasts. Fortunately, even Milosevic never tried to implement such an oppressive policy for the Internet, although he could have easily justified it on constitutional grounds. We pointed out this problem to people who were invited to comment on the new draft Serbian constitution, so we hope that this attitude toward “public information,” and those who disseminate it, will not simply be copied into the new constitution.

There are also problematic provisions in the Serbian Criminal Code dealing with defamation, libel, slander, insult, “scorn” and the like, which are quite out of step with democratic norms elsewhere in the world. They reflect a legal tradition common throughout the Balkans – but that does not justify preserving them. The International Press Institute and the South East European Media Organization (SEEMO) analyzed these at length in 2001.¹³⁰ They noted, for example that Article 92 of Serbia’s Criminal

¹²⁸ An English translation of the 1992 constitution is online at http://www.oefre.unibe.ch/law/icl/sr00000_.html.

¹²⁹ “Article 19 Comments on Draft Press Law,” 15 March 2001 - <http://www.ifex.org/alerts/view.html?id=8370>

¹³⁰ See “Articles in Bad Faith: Criminal Defamation Laws in Serbia - An Examination of the Serbian Criminal Code and Its Restrictions on Freedom of Expression,” IPI/SEEMO, 26 March 2001 - http://www.freemedia.at/r_serbialegislation.htm

Code provides for the imprisonment of anyone who “discloses or circulates any untrue material about a person, which can harm that person’s honour and reputation.” Article 93 sets imprisonment as the penalty for “anyone who insults another,” while Article 94 does the same for anyone who reveals or circulates information about a person’s private life which *could* be harmful to their “honor or reputation.”

The American approach to libel is to look not at whether harm is caused, but at whether the accusations are true or false. If they are true, it does not matter that harm has been caused – the harm may well be deserved. By relying only on showings of harm – or as in Article 94, on showings of *potential* harm – the right of honest criticism is thoroughly undermined by Serbia’s Criminal Code.

Article 98 of the Serbian Code calls for the imprisonment of “anyone who publicly declares scorn for the Republic of Serbia or another republic of Federal Republic of Yugoslavia, their flag, coat of arms or anthem, or the president of the republic, the parliament and the government, the head of the parliament or the president, related to the performances of his duties.” Article 218 of the Code was used extensively by the Milosevic regime to silence critics and imprison journalists. It says whoever

“announces or spreads false information or statements with intention to provoke citizen’s disturbance or to endanger the public order, or with the intention to hinder implementation of the decisions and acts of the state authorities and institutions will be punished by imprisonment of up to three years.”

That was one of the charges made against Miroslav Filipovic when he was arrested in 2000. He had published information on the London-based website of the Institute for War and Peace Reporting which he had gathered by interviewing policemen and soldiers sent to Kosovo in 1999.¹³¹ Accused of committing this crime several times over, he was sentenced to 7 years in prison before being named “European Internet Journalist of the Year.”¹³²

The most important law which will affect the Internet directly is the draft telecom law approved by the Serbian government late in 2002 and sent to the parliament for consideration early in 2003. Although approved by the government, it is still being revised, so there is a risk in discussing it in too much detail. But the most essential features of the draft are that it would consolidate telecom regulation at the republic level and delegate it to a new regulatory agency. It would prepare for the liberalization of many market segments that lack competition today, and would create “level playing fields” where there are only pot-holes and mountains today. To a great extent the draft reflects the EU’s new regulatory framework for electronic communications. In that sense, it is a great leap forward. But the important issue of the exact scope of Telekom Srbija’s monopoly is still not clear, and that is worrisome. The most recent draft available in English¹³³ says:

¹³¹ See, for example, Miroslav Filipovic, “Serb Agents Fuel Kosovo Violence,” *Balkan Crisis Report*, 25 February 2000 - http://www.iwpr.net/index.pl?archive/bcr/bcr_20000225_1_eng.txt. Also, Radio B92, “Chronology of the Filipovic Case,” - <http://www.b92.net/media/filipovic-hrono.phtml>

¹³² See NetMedia, “European Online Journalist Awards,” - <http://www.net-media.co.uk/>

¹³³ The most recent online version of the draft telecom law in English, dated 25 December 2002, is at <http://www.msaotel.sr.gov.yu/pdf/The%20Telecommunications%20Law%20-%20revised1.doc>.

“...’Telekom Srbija’ a.d....has an exclusive right until 9 June 2005, at the latest, to provide to users in the Republic of Serbia all existing and future types of fixed telecommunications services (including local, national long-distance and international fixed telecommunications services, services of public switched telecommunications network (PSTN), other fixed services of voice mail, data transmission, telematic services, value-added public telecommunications services, integrated services digital network (ISDN), intelligent networks services, fixed satellite services, services based on the DECT (digital enhanced cordless telephone) standard, and leased lines), to build, own and operate, in the territory of the Republic of Serbia, any and all types of the existing and future fixed telecommunications infrastructures and networks (including wireline and wireless fixed facilities), to provide directory services (including “White Pages” and “Yellow Pages”) and to provide information, over the telephone or in electronic form, on subscriber numbers used in fixed telecommunications services for which it has exclusive rights and shall retain this right until the stated date unless the agreement under which this right has been acquired is amended....

“The exclusivity rights from paragraph 1 of this Article does not [sic] include Internet services, multimedia services, any radio/television and other broadcasting cable television services that may be provided freely and under the equal conditions according to the provisions of this Law....”

We shall see what the parliament will do. In the past they have acted mainly as a rubber stamp, approving whatever the government wanted. We are concerned that the man in charge of the drafting of this key piece of legislation is not an elected official but Dragor Hiber, chairman of Telekom Srbija’s board of directors.

Another important, unfinished and yet immediately-impending piece of legislation is Serbia’s new draft Law on Copyrights and Related Rights. SCEPP (the EU’s law and policy advisory center, described earlier) organized a discussion of this draft just before Christmas and the discussion produced what is probably the final draft version that will be sent to the parliament. If passed, it would replace a law of similar scope which was enacted in 1998.¹³⁴ We have not been able to analysis the new final draft, but we believe that it will reflect both EU policy and the content of the TRIPS Agreement, since that was the aim of the discussion organized in December.

Related to that law, but dealing with practical implementation, the Federal Agency for Intellectual Property Rights needs to be strengthened and shifted to a new position in the hierarchy of government services. We mentioned earlier that under the UN sanctions, Serbia became a center for the production of pirated audiovisual works and software, but the current government is attempting to eradicate this industry. There is also a 4-year backlog in the processing of trademark and patent applications.¹³⁵ SCEPP has devised a plan to make this office self-financing and more efficient. It would also enable the office to share information easily with the European patent office and IPR agencies in neighboring countries. If successful, these practical measures could have much more impact on IPR protection in Serbia than a new law.

By the same token, Serbia has a good Law on the Protection of Personal Data (No. 139, enacted 12 May 1998). What it needs is good enforcement.

¹³⁴ *Official Gazette of FRY* No.: 24/98, entered into force on 23 May 1998.

¹³⁵ Ted Blake and Alexandru Strenc, “Support to the Formulation of a Development Strategy and Business Plan for the Federal Agency for Intellectual Property Rights - Final Report,” Savetodavni Centar za Ekonomska i Pravna Pitanja (June 2002), page 2.

After the new constitution and charter have been written, the criminal code and business laws modernized, the government will probably be able to turn its attention to more specialized topics like electronic signatures, e-commerce, etc. GIPI will be there to help.

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