

# TELECOM BUZZ

VOLUME 1, ISSUE 2

APRIL 2005

## SUNYIT NEWS

### CHANCELLOR'S AWARDS FOR STUDENT EXCELLENCE

Two SUNYIT students—Jennifer Maher of Oriskany and Anuj Pandey of Allahabad, India—are among 264 graduating students from 60 SUNY campuses receiving the 2005 Chancellor's Awards for Student Excellence. The awards are an annual recognition of exceptional students from across the SUNY system. Each of the honorees has excelled both in academic achievement and in at least one of the following areas: leadership, athletics, community service, creative and performing arts or career achievement.



Pandey is a Telecommunications graduate student in the School of Information Systems & Engineering Technology. This year's 264 recipients of the Chancellor's Award have an overall grade point average of at least 3.75 and include student government leaders, a recipient of a National Science Foundation

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### THE ROLE OF HUMAN FACTORS

Usability expert Joanna Bawa recently presented "The Role of Human Factors and Usability of Mobile Communications". This presentation talked about the various factors that play a role in the usability of a mobile device. Cultural differences can be seen through the use of text messages, while more popular in the U.K., Europe and India, talking is still the preferred method used in the United States and China.

The basic processes of phone usability are effectiveness, efficiency and satisfac-

tion. This balance holds a number of future challenges for phone usability. As mobile devices increase in functionality the complexity of the handsets also increases, this in turn leads to declined usability, 90 percent of users typically only use 10 percent of the functions available. For the technologies to advance more consistent handsets will have to be developed. Studies have shown that slight differences tend to cause more confusion than major differences. In order to provide true wireless freedom, websites have

*Continued on Page 2*

## VIRUS ALERTS

- W32.Kelvir.R
  - W32.Kelvir.T
  - W32.Kelvir.U
  - W32.Kipis.N@mm
  - W32.Mytob.AU@mm
  - W32.Mytob.AV@mm
  - W32.Spybot.NLX
  - Backdoor.Verify
  - Bloodhound.Exploit.34
  - PWSteal.Ldpinch.F
  - W32.Darro
- *Low level threat*
- *Higher level threat*

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## SUNYIT NEWS

ONE'S ROLE IN SOCIETY, AS STUDENT, PARENT, FRIEND, ACTIVIST, VICTIM, GUARDIAN, RELATIVE, BOSS, OR EMPLOYEE, CAN DRAMATICALLY INFLUENCE ONE'S IDENTITY FRAMES.

started to provide more services to mobile devices; they are creating sites specifically targeted to mobile users that use smaller resolution screens to display the sites content.

Cultural acceptance of mobile devices is another challenge; studies have shown that talking at any volume level will annoy those around them when in public venues. This could be attributed to people's inherent need to interact; they feel isolated when not privy to both sides of a conversation. The concept of social identities conflict is also a major factor. One's role in society, as student, parent, friend, activist, victim, guardian, relative, boss, or employee, can dramatically influence one's identity frames. Individuals are faced with revealing the multiple identities that individuals may hold in the workplace and the context in which one identity takes precedence over another. The evolution of mobile devices is forcing people to expose more of their social identities; this can lead to confusion as no clear social guidelines have been

adopted to deal with this new challenge.

SMS (Short Message Service) enables you to send queries as text messages over your mobile phone or device and easily get precise answers to your questions. SMS use is increasing faster than any other communication media.

The explosion of text messaging is allowing people to better express "the real me." There is more detachment involved and people are more comfortable "texting" information they otherwise wouldn't be able to do face to face.

These tools will continue to influence the development of society and the way people communicate. Social identities, cultural norms and personal styles are powerful influences on phone use. New message services must continue to support the hyper personal affordances of SMS. Future developments must recognize gender and personality differences in its users as these will be some key factors in the adoption of new technologies.

By Herbert Hernandez

THE EXPLOSION OF TEXT MESSAGING IS ALLOWING PEOPLE TO BETTER EXPRESS "THE REAL ME."

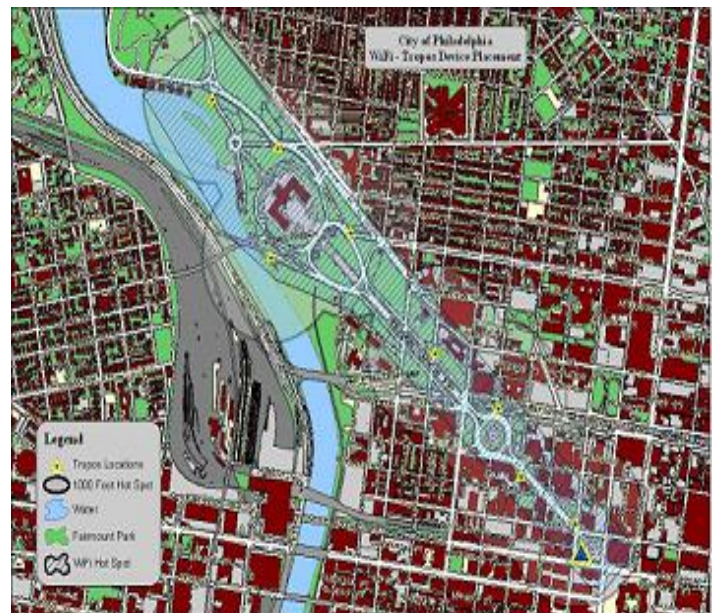
WE'RE TALKING ABOUT: 26,000 SMALL BUSINESSES AND 560,000 HOUSEHOLDS (THE NUMBERS CITED BY PHILADELPHIA CIO DIANA NEFF).

## WIRELESS NEWS

### PHILLY'S WIRELESS NET GETS COMPLICATED

A study commissioned by the City of Philadelphia has concluded that residential and business users will need more than a WLAN card plugged into their PC to access the proposed citywide wireless net, originally estimated to cost \$10 million.

That's according to an online report by TMCnet's Robert Liu, who sat in on an information meeting hosted this week by city officials for vendors eager to bid on the contract.



## WIRELESS NEWS

Liu doesn't spell out what will be needed for this customer premises equipment, but Glenn Fleishman, a fan of municipal wireless broadband, says it probably means a WLAN bridge with a high-gain antenna. Fleishman offers his reasoning why this won't add greatly to the overall cost of the net, partly because you can buy bridges for "only" \$100, and probably less in large quantities. And large quantities is what we're talking about: 26,000 small businesses and 560,000 households (the numbers cited by Philadelphia CIO Diana Neff). Multiply that by \$100 or even \$50 and you're starting to look at something like real money.

But Fleishman doesn't address two other points. One, mentioned by Lui, citing a study by wire-

less equipment maker TeleCIS, is the separate installation costs -- actually setting all this stuff up and getting it to work. The second and related point: the possible impact of tens, if not hundreds, of thousands of bridges on network and customer support costs and complexities.

Liu also reports that the city-commissioned study warned that "intense planning" will be needed to create a viable RF infrastructure. While the city has some of the information necessary to do that, such as street lines, curb lines and light poles, other information is sketchy (building footprints are only current as of 1996) or non-existent (no information about building heights).

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## SECURITY NEWS

### MOBILE PHONE VIRUSES

There are several mobile phone viruses in the wild at the moment, including Skulls, Cabir and Fontal. And like many PC-based viruses, each has its own set of variants aimed at keeping users and security vendors on their toes.

The current slate of viruses all target the Nokia Series 60 smartphones running the Symbian operating system. A smartphone combines phone and PDA functions into one device. The good news is that 96% of the phones sold last year are not smartphones, use an operating system other than Symbian and are therefore, completely immune to existing mobile threats.

Symbian holds the biggest share of the smartphone operating system market, with 13.65 million units shipped in 2004. Other operating systems such as palmOne and Windows Mobile accounted for another 6.6 million units, according to In-Stat/MDR. By comparison, the total number of worldwide mobile phones sold in 2004 was 678.9 million, says Neil Strother, a senior analyst at In-Stat.

Of the major wireless providers in the U.S.,

only T-Mobile and Cingular offer Symbian-based phones. Verizon Wireless and Sprint don't carry any Symbian devices.

#### How a cell phone virus spreads

1. A phone infected with the Cabir virus uses Bluetooth to continuously search within a 32-foot range for other devices to target. It attempts to send infected SIS files to the first Bluetooth-enabled device it can find.

2. The worm arrives at the target device, which must be running the Symbian OS and have Bluetooth turned on in "discoverable" mode. The targeted device will prompt its user to receive a message from the infected device.

3. If the user chooses to accept the message, their phone will issue a security warning. Regarding the warning, they opt to proceed.

4. The user then will be prompted to install the virus, which also goes by the alias "caribe." The user chooses yes.

5. The Cabir infection takes hold. The cycle

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# SUNYIT GRADUATE RESEARCH

## OPTICAL INTERCONNECTS

Optical interconnect provide numerous advantages over conventional electrical interconnects which can be listed as;

### Greater Interconnect Density:

Optical Interconnects are promising an increase in the total number of possible interconnects per chip as compared to that possible with electronics.

### Absence of Capacitance:

The optical interconnects are capacitance free, this means that the energy used for the optical data transfer is independent of the distance.

### Low Power Requirement:

A bit in an optical domain can be represented by fewer than 1000 photons and thus the systems incorporating the optical interconnects will have less power consumption. The issues related to the burnout due to internal power dissipation in today's micro electronic circuits will apparently be solved.

### High Fan Outs and Fan In:

The Optical interconnects can support a greater number of fan outs, typically a 100 fan outs or in is possible using optics as compared with 5 to 10 when using CMOS gates.

There are different methods proposed for implementing the optical interconnects and each of these methods has their own pros and cons. Every method has it's distinct advantage concerned with a particular application.

But as in most of the optical interconnects systems, the photons are generated by using vertical-cavity surface-emitting lasers (VCSELs) as the light source

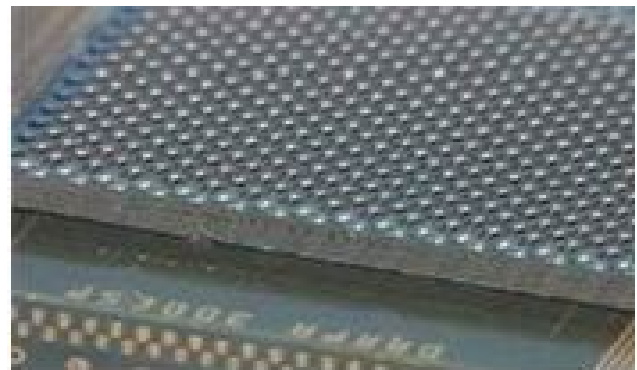
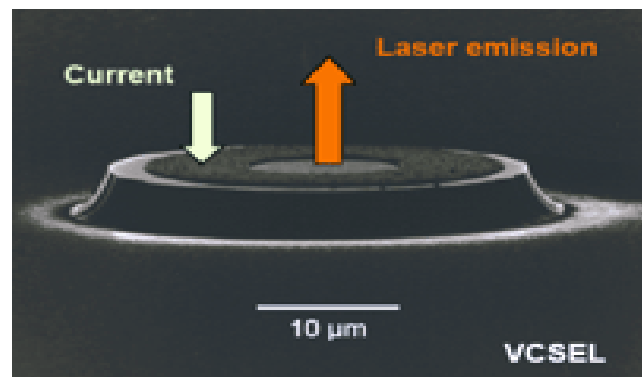
along with a semiconductor detectors.

The GaAs VCSELs are commercially available and unlike the conventional diode lasers those are used in the long haul communication links, the VCSELs emits light from the surface rather than edge, this makes them more suitable for incorporating them into Optical Interconnects.

As far as the photo detectors are concerned, MSM (metal-

semiconductor-metal) type of photo detectors are used for the high speed operations but at the cost of sensitivity.

In broader view, there are two categories by which the researchers are achieving Optical interconnects, one is the fiber based and other is the free space optical interconnects.



*The above diagram (on top) shows the single VCSEL, the size of this VCSEL is in the order of 10 micro meters. The figure on bottom shows the arrays of VCSELs, integrated on a chip.*

The fiber based optical interconnects that uses wave guide to deliver the light is considered to be a less complex interconnect scheme. On other hand, the free space optical interconnects transmit the light through the air.

## SUNYIT GRADUATE RESEARCH

The diagram to the right is an illustration for the free space optical interconnects.

The light from the VCSELs [ right ] makes a vertical exit from one stack and a vertical entry into the other end. In between it is redirected via a diffraction grating, lenses, an alignment mirror [center], and another grating. Each of the devices has 256 channels and they operate at 1 Gb/s.

As can be seen the free space optical interconnects require an accuracy of alignment and also a dust free environment. With the advent of the micro-electro-mechanical systems (MEMS) it is possible to pack the above system shown into a small unit that can be mounted on to a printed circuit board.

The free space optical interconnects are considered to be a possible solution for providing high performance computing. The appeal is that if we want a supercomputer that can be optimized for multiple tasks, then usually it is required to set up the processors to work best with a given algorithm. Applications such as video and imaging processing, but when it needs to switch to weather modeling, the architecture is no longer ideal. By using free-space optical interconnects, you could reconfigure the way processors talk to one another by redirecting the lasers to different detectors.

Another great advantage is that the channels can

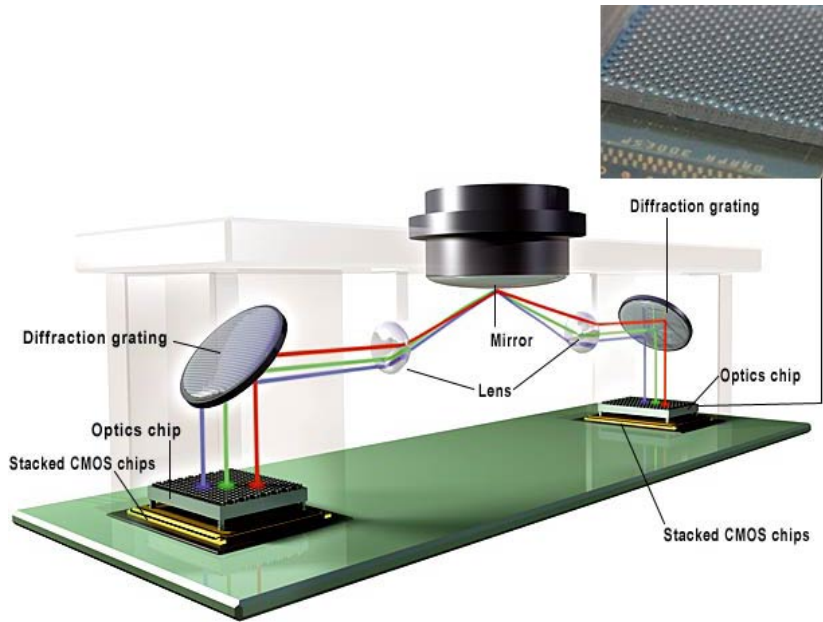


ILLUSTRATION: BRYAN CHRISTIE ; PHOTO: SADIK ESENER

be formed into two dimensional arrays rather than one dimensional packing of copper or optical fiber on a board. In addition the channels do not experience the cross talk even when they are close together.

Most researchers see the commercial development of free-space interconnects as farther off in the future than those interconnects that use fiber to guide the light.

Currently, most of the research on the optical interconnects is funded by DARPA (U S Defense Advance Research Project Agency) which focus on massive parallel computing systems, but this technology is also expected to filter down to the consumer level in the near future.

But finding out whether optical interconnects will ever be a practical solution for building parallel computing systems is a topic for more advanced research.

By Sushant S Sahani

FREE SPACE OPTICAL INTERCONNECTS ARE CONSIDERED TO BE A POSSIBLE SOLUTION FOR PROVIDING HIGH PERFORMANCE COMPUTING.

THE FIBER BASED OPTICAL INTERCONNECTS THAT USES WAVE GUIDE TO DELIVER THE LIGHT IS CONSIDERED TO BE A LESS COMPLEX INTERCONNECT SCHEME.

WITH THE ADVENT OF THE MICRO-ELECTRO-MECHANICAL SYSTEMS (MEMS) IT IS POSSIBLE TO PACK THE ABOVE SYSTEM SHOWN INTO A SMALL UNIT

## SUNYIT NEWS

THEY REPRESENT THE ENDURING COMMITMENT THE UNIVERSITY HAS MADE TO ATTRACTING AND NURTURING A DIVERSE, INTELLIGENT STUDENT BODY.

Teaching Fellowship, a hospice volunteer, a violinist who has performed at Carnegie Hall and minority and cultural awareness activists.

"The recipients of this year's Chancellor's Award are not only some of the brightest and hardest working students in SUNY, but have made major contributions to their communities," said Chancellor Robert L. King. "They represent the enduring commitment the university has made to attracting and nurturing a diverse, intelligent student body. The commitment our students make every day to themselves and their community is an inspiring achievement. They are our future, and that future is bright." Awardees were selected by campus committees, who reviewed exemplary members of their college communities and submitted nominations to the Chancellor's Office for recipients of the Chancellor's Award for Student Excellence.

"When we reviewed this year's nominees I was once again incredibly impressed by our students' achievements, both individually and as a whole," said Assistant Vice Chancellor for University Relations Edward Engelbride. "It's a pleasure to be able to recognize our students' successes and know that our campuses provide excellent opportunities for our students to excel and give back to the campus community."

Anuj Pandey is a recipient of the Telecom Dept Scholarship; the Residential Scholarship and Who's Who in American Universities Award. Pandey has served in a number of organizations, they include positions as Secretary, International Student Association; President, International Student Association; Graduate Senator, Student Association; Vice President, Student Association; Graduate Assistant Telecom Dept.; President, Telecom Club; and a Resident Advisor.

AWARDEES WERE SELECTED BY CAMPUS COMMITTEES, WHO REVIEWED EXEMPLARY MEMBERS OF THEIR COLLEGE COMMUNITIES

## SECURITY NEWS

repeats when the worm in the original phone and newly infected device start looking for new devices to infect via Bluetooth.

The mobile-oriented viruses are not designed to do much more than spread, although they might mess up a device enough that it has to be reset to the original factory settings or drain the battery because an infected unit constantly searches the airwaves for a new target.

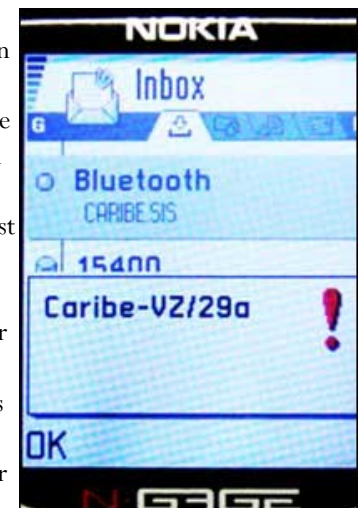
There's no inherent flaw - such as a buffer overflow or missing security feature - that virus code writers are exploiting in the Symbian operating system or Nokia's implementation of it. "The threats are targeting high-end phones that have fully functional operating systems and have the ability to download and install arbitrary applications," says Oliver Friedrichs, senior manager at Symantec Security Response.

"Right now they're more proof-of-concepts," Friedrichs says. "People are writing them to

show that something can be done or that the phone platforms can be impacted by threats, just like the PC is." Caleb Sima, founder and CTO of SPI Dynamics in Atlanta, sees a number of potential

issues as smartphone technology lands in the hands of more mainstream users.

Bluetooth is a security challenge on a few fronts. For one, an attacker doesn't have to be that close to its target. A typical Bluetooth signal can travel about 32



PEOPLE ARE WRITING THEM TO SHOW THAT SOMETHING CAN BE DONE OR THAT THE PHONE PLATFORMS

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feet, but there are people who have developed antennas to increase the range to almost 1 mile. That signal can be used to gather information from a phone (a practice known as bluesnarfing), make calls on the device or to transmit malicious code - as Cabir does.

"You could sit in an airport or mall with a laptop and pick up tons of stuff and junk from people's cell phones," Sima says. Vendors now are disabling Bluetooth by default, but as more devices - such as cars - use the technology, it will need to be enabled more often, opening another attack vector.

Even today, one could use text messaging to launch a denial-of-service attack against a phone, Sima says. An attacker could run a pro-

gram on his PC that sends thousands of text messages to a phone number. The flood would render the phone's interface useless. Even if the phone doesn't freeze up, many service providers limit the number of text messages an account holder can send and receive before incurring extra charges. Thousands of text messages could result in an unexpectedly large bill for the victim.

However, mobile devices will continue to flourish despite the increased risk of future infection. "As the handsets get more sophisticated and computer-like there is a greater potential, but that hasn't stopped the computer business from expanding to the masses," Strother says. These threats "will be another modern day digital hassle that people will have to live with."

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## HISTORICAL TELECOMMUNICATIONS

### Alexander Graham Bell – Inventor of Free Space Optics

In today's modern telecommunication era, everybody knows who is responsible for the wired voice communication we enjoy so much. Which is only now beginning to be replaced by digital data networks. Bell's telephone proved a milestone in aural telecommunications. Most people do not realize that Bell was also the inventor of a crude free space optics system.

In 1880, Bell demonstrated his 'photophone', a device that received a voice and directed the vibrations caused by it into a mirror. This mirror reflected sunlight across a distance to a receiver that consisted of a parabolic dish, and a photo-resistor (composed primarily of selenium) connected in series with a telephone receiver. As the mirror vibrated, the sunlight was modulated with the voice. A current passed through the selenium photo-resistor was modulated in the same way as the light, and produced a sound at the loudspeaker or earpiece.

Bell considered his photophone to be one of his more important inventions. Of the 18 patents Bell held personally, along with the 12 he held

with his colleagues, 4 were for the photophone. Bell and his associate, Sumner Tainter deposited the photophone in a sealed box at the Smithsonian Institute, intending for them to hold it as a trade secret. Neither Bell nor his associates ever benefited from the invention, and the boxes were not opened until 1937, long after Bell's death. The idea of transmitting useful information with light remains with us, however, and fibre and free space optics have become an integral part of telecommunications networks in the 21<sup>st</sup> century.



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By Adam Pilbeam



## UPCOMING EVENTS

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- The Telecom Club will visit Nortel Networks Corporation headquarters located in Ontario, Canada on Monday April 25, 2005 - Wednesday April 27, 2005.  
<http://www.nortelnetworks.com/>
- The Telecom Club will visit Cables Express global headquarters located in Syracuse, NY on Friday May 6, 2005.  
<http://www.cxtec.com/>

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WE'RE ON THE WEB!  
[CLUBS.SUNYIT.EDU/TELECOM](http://CLUBS.SUNYIT.EDU/TELECOM)

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## MISSION STATEMENT

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The SUNY IT Telecom Club is an organization that works in conjunction with the Telecommunications Department at SUNY IT. The Club uses its connections through the department's advisory board and business contacts to enhance the education of its members by organizing activities related to the telecommunication field. These activities include guest speakers from the telecommunications industry, discussions of employment opportunities, and field trips to observe applications of technology in the field.

The purpose of this newsletter is to disseminate pertinent information to its members and to inform those interested in what the Club is currently doing for activities in the meetings. Here you will be able to find upcoming events such as guest speakers and field trips along with telecommunications industry news. By having these events listed we hope to encourage all who are interested to participate.

We also want to assist our members in activities related to course work by providing them locations of technology and industry information located on the Internet. There is a growing number of industry and research locations posted on the internet that students can utilize in their research. It is our goal to track the growth of the number of internet web sites useful to telecommunications students.

Please feel free to send e-mail to the club officers with any questions you may have about the curriculum or the telecom club at [telecom@sunyit.edu](mailto:telecom@sunyit.edu).

## RESOURCES

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<http://citeseer.ist.psu.edu/cs>

**CiteSeer** is a scientific literature digital library and search engine that focuses primarily on the literature in computer and information science.

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

**ITPapers** is the web's largest library of technical IT white papers, webcasts, and case studies.

<http://www.ntia.doc.gov/>

**The National Telecommunications and Information Administration** (NTIA) is the President's principal adviser on telecommunications and information policy issues, and in this role frequently works with other Executive Branch agencies to develop and present the Administration's position on these issues.

<http://www.telecomcareers.net/default.htm>

**TelecomCareers.Net** is one of the web's largest Telecom job forums, they help connect job seekers with employers and provide a wealth of information about companies and publications.

## TELECOM BUZZ

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