

CALENDAR OF EVENTS
September 2005

08 - 11 September 2005

World Cyber Games Singapore Finals

Venue: Suntec Hall 401
Time: 5.00 pm - 10.00 pm on 08 Sep
10.00 am - 10.00 pm thereafter

The World Cyber Games (WCG) is the largest gaming festival in the world with up to 70 participating countries, 800 grand final participants and 1.2 million worldwide participants. Every year in Singapore, WCG has been recognised as a one-time yearly event that comes and goes. This year, for the first time ever, WCG Singapore will begin as early as March and is expected to last for 6 months with a series of events and activities leading up to the national finals. WCG has become the Olympics of the cyber world. In Singapore, WCG is the most recognised gaming event. This year, with Singapore winning the bid to be host city for the grand finals, WCG is definitely gaining the attention of the media, public and gamers in Singapore. One of this year's objectives is to reach out to a greater mass of audience. This is done by bringing WCG to not only to hardcore gamers but to casual gamers, family and eventually building WCG into a spectator sport.

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26 - 29 September 2005

Global Enterpolis @ Singapore 2005

Venue: Suntec Singapore International Convention & Exhibition Centre
Time: 9.00 am - 4.00 pm

The Global Enterpolis @ Singapore 2005 is an international marketplace connecting enterprises to funds, markets, partners, and technology. It is a dynamic platform for networking opportunities, where large enterprises, technopreneurial startups and the venture capital community can meet, interact and transact. Mr Lee Hsien Loong, Prime Minister & Minister of Finance, will be the Guest-of-Honour for the opening ceremony of this event on 26th September. As for the exhibition, Dr Ng Eng Hen, Minister of Manpower & Second Minister for Defence, will grace the official opening of The Enterprise Exchange on 27th September. Mr Goh Chok Tong, Senior Minister, will be the Guest-of-Honour for the Gala Dinner and Asian Innovation Awards on 27th September.

For more information: www.globalentrepolis.com

26 - 30 September 2005

3GSM World Congress Asia

Venue: Suntec Singapore International Convention & Exhibition Centre
Time: 9.00 am - 5.00 pm

The 3GSM World Congress Asia 2005 features over 25 sessions, 120 expert speakers from around the world, plenary sessions, keynotes from top industry leaders and 3 separate tracks covering the hottest mobile industry topics including strategies for growth, technological innovations and opportunities in developing markets.

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iDA
SINGAPORE

The Infocomm Development Authority of Singapore (IDA) is committed to growing Singapore into a dynamic global infocomm hub. IDA uses an integrated approach to developing info-communications in Singapore. This involves nurturing a competitive telecoms market as well as a conducive business environment with programmes and schemes for both local and international companies.

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INFOCOMM NEWS FROM IDA Sep 2005 ISSUE: 20

iDA
SINGAPORE

Game on!: Page 5

A new research report reveals the explosive growth of online gaming in the region and Singapore, which is set to continue over the next few years.

Leap before you look?: Page 10

"Grandfather of the Internet" David Farber says businesses may have to take a leap of faith in order to ride the next Internet Wave.

Nearing the zero-day vulnerability?: Pg 4

While the Zotob worm had limited impact on businesses in Asia and Singapore, security experts say its release is a sure sign of the shortening window between vulnerability disclosure and exploit.





Dr Balaji Sadasivan, Senior Minister of State for Information, Communications and The Arts, and Health, touring one of the many exhibits at the packed 9th ICC Conference showfloor.

GROW YOUR BUSINESSES WITH ICT

USE INFOCOMM TECHNOLOGIES TO BECOME more competitive and effective in accomplishing business goals. This was the message from Dr Balaji Sadasivan, Senior Minister of State for Information, Communications and The Arts, and Health, in his opening address at the 9th Infocomm Commerce Conference held on 18 August 2005.

The message clearly resonated with the theme of this year's event, which is made of a series of conferences, technical workshops, solution showcases aimed at helping companies "grow their business potential with IT".

In his speech, Dr Balaji noted that Singaporean firms are becoming more sophisticated in their use of infocomm technology as they increasingly embrace ICT to create new business models and to optimise their strategies and operations.

To give local companies a helping hand, the Infocomm Development Authority of Singapore (IDA) has supported a host of technology projects and collaborations in the past year. These included initiatives that leverage infocomm technologies in vertical sectors such as manufacturing, healthcare, retail, logistics, finance and banking, as well as media and education. According to Dr Balaji, the goal of IDA's efforts is to help our vertical clusters realise business efficiencies and other tangible benefits through better use of IT.

Examples of initiatives that were launched include the use of wireless technologies like Wi-Fi and even simple text-messaging to reap the benefits of a mobile workforce. Web services were also used to facilitate e-commerce and enable closer links with suppliers and distributors. In addition, Radio Frequency Identification (RFID) technology was used to drive productivity improvements across the logistics and transportation sectors.

Beyond benefiting businesses, greater adoption of infocomm technology in Singapore is also spurring our economic growth, Dr Balaji added.

As a result, the demand for skilled IT professionals has increased. To support our heightened manpower requirements, the National Infocomm Competency Framework was formed in early 2005. The framework will incorporate the inputs from the private and public sectors to create a career progression path for local infocomm professionals. With this framework, IT workers will have a better understanding of the competencies and training required for different infocomm occupations to ensure they keep pace with the constantly evolving technology landscape.

Singapore
wave
INFOCOMM NEWS FROM IDA

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IDA SHARPENS INDUSTRY DEVELOPMENT FOCUS WITH NEW APPOINTMENTS

IDA HAS REAFFIRMED ITS FOCUS ON enhancing the economic competitiveness of key economic sectors through increased ICT adoption by expanding the responsibilities of its key senior executives.

With the announcement, which takes effect this month, Deputy Chief Executive and Director-General (Telecoms) Mr Leong Keng Thai will see his portfolio expanded to include infocomm infrastructure development, manpower development and infocomm security.

Ms Wu Choy Peng, previously deputy chief executive and government chief information officer, will now take on the additional responsibility of spearheading the development of Singapore's infocomm capabilities. She has been re-designated as Deputy Chief Executive (Industry) while concurrently remaining the government CIO.

Mr Khoong Hock Yun will now support Mr Leong in his new capacity as the Assistant Chief Executive (Infrastructure and manpower development). Mr Khoong was formerly IDA's Assistant Chief Executive (Industry).

"I believe that infocomm technologies is a potent 'force multiplier' and 'strategic enabler' if effectively exploited by different industry sectors. ICT can facilitate innovation and significantly enhance productivity," said Mr Chan Yeng Kit, CEO, IDA.

"These moves will create greater synergies and facilitate a more holistic approach to industry development. This includes building infrastructure such as physical connectivity and infocomm security, and software such as manpower capabilities and regulatory policies," he said.

"Beyond being an industry champion and government CIO, IDA's role is also to promote the harnessing of infocomm technologies as key enablers to enhance Singapore's economic competitiveness and innovation in key sectors," Mr Chan stressed.

Other senior IDA appointments made over the past year include the appointment of Mr Andy Haire as the Assistant Director-General (Telecoms) in May 2005, and the appointment of Dr Tan Geok Leng as the Chief Technology Officer in December 2004.



Deputy Chief Executive and Director General (Telecoms), Mr Leong Keng Thai



Deputy Chief Executive (Industry) and Government CIO Ms Wu Choy Peng

ZOTOB WORM MAKES HASTE TO EXPLOIT SYSTEM VULNERABILITIES

AS TESTAMENT TO THE SHRINKING TIMEFRAME between vulnerability disclosure and exploit, hackers only took three days to release a malicious program to take advantage of a Microsoft flaw announced on 9 August.

ZOTOB, a memory-resident worm, takes advantage of a security flaw found in Microsoft's Plug-and-Play system. The loophole provides hackers with a backdoor capability and remote access to infected computers running Microsoft Windows 95, 98, ME, NE, 2000 and XP platforms.

Upon execution, the worm drops a copy of itself into the Windows system. What makes it so dangerous is that it modifies the infected host computer so as to render it incapable of downloading any assistance or patches from online anti-virus Web sites.

Additionally, ZOTOB's backdoor capabilities enable it to connect to specific Internet Relay Chat (IRC) servers which allow hackers to gain remote access to an infected system. If connected to a network, a single infected system can then be used to infect other unpatched machines, slowing down the overall network performance and putting data at risk.

Initial reports indicate that the worm did not cause widespread damage around the world. According to antivirus software maker Trend Micro, its infection reports stemmed largely from the United States and Germany. However, the company expects more to come as most users may not be aware of this newly-announced security threat and have so far failed to install the necessary patch.

Security software giant Symantec on the other hand, witnessed almost 200 reported cases of the worm and its various variants worldwide in its first week, said Mr Edward Lim, the firm's country manager in Singapore.

Part of the reason why it (ZOTOB) has spread so fast and why these vulnerabilities are easy to exploit is because they do not require user interaction to spread, he explained.

Fortunately for Asia and Singapore, the companies in the region are largely unscathed from the attack. Microsoft has seen limited reports of infection in Asia-Pacific and in Singapore as only two Windows 2000 customers have been affected in the first week since the exploit was released.



Microsoft said companies that have applied the MS05-039 update to Windows 2000 are not affected by this attack. For users that are still unsure if their systems have been infected, the company is urging them to use the Microsoft Windows Malicious Software Removal Tool <http://www.microsoft.com/security/malwareremove/default.aspx> to search for and remove the ZOTOB worm and its variants from their hard drives.

Symantec is also calling for the deployment of the recommended Microsoft security patch, especially in large, geographically-dispersed environments. But comprehensive security measures need to be deployed at various tiers of the network, including policy compliance for remote access users, added Symantec's Mr Lim.

REPORT: 'GAME ON' IN ASIA-PACIFIC AND SINGAPORE

THE POPULARITY OF ONLINE GAMING has been growing rapidly in the region and this pace is set to continue for the next few years, says market research firm IDC.

According to the firm's recent study, the online gaming market in the Asia-Pacific, excluding Japan, generated US\$1.09 billion in subscription revenue in 2004, growing by approximately 30 percent over 2003. IDC also estimates that with a Compound Annual Growth Rate (CAGR) from 2005 to 2009 of 19.7 percent, the market will more than double its existing market size by 2009.

The boom is largely driven by the popularity of Massively Multi-player Online Role-Playing Games (MMORPGs) and the introduction of new online game content, the company said. IDC pointed to existing "hardcore" and serious online gamers as the primary revenue drivers for this market through their continued purchase of virtual game items and downloadable games, as well as MMORPG subscription fees. However, the company said the rise of casual gamers will also help to propel the growth of the online gaming market.

Within Asia-Pacific, which includes countries like Korea, Hong Kong, China, Taiwan, Singapore, Malaysia, Thailand and the Philippines, the online gaming population stood at 49.95 million in 2004.

Korea remains the region's largest online gaming market, growing by 24.8 percent with a total of US\$533.4 million in subscription revenue last year. This is followed by China, which recorded US\$298 million in 2004. Taiwan came in third with US\$190.9 million. Thailand's emerging market saw subscription revenues triple in 2004, reaching a new height of US\$22.9 million.

THE SINGAPORE SCENE

According to IDC, Singapore's online gaming market totalled US\$0.91 million in subscription revenue last year. The number of online gamers in Singapore totalled 0.96 million, representing 33.9 percent of the Internet population.

While these figures marked a flat 1.3 percent growth over 2003, the market is expected to pick up over the next few years, growing at a CAGR of 22.9 percent to reach US\$2.56 million in 2009.



However, while the local market is set to soar, support for home-grown online games providers is lacking. According to Chin Jun-Fwu, Senior Analyst at IDC Malaysia, a significant percentage of subscription revenue is derived from gamers paying for international Massively Multiplayer Online Games.

The immediate challenge for Singaporean online gaming service providers is to capture the interest of paying gamers to opt for local offerings instead.

In a bid to create a vibrant gaming market in Singapore, IDA has embarked on a series of initiatives to make Singapore an attractive destination for hosting online games. In June 2004, IDA launched the Games Bazaar, a scalable hosting platform that will allow games companies, publishers and distributors to test and deploy their offerings around region with greater speed and less upfront costs. Last October, the Games Exchange Alliance, a community which blends the strengths of multiple companies in the areas like games distribution, hosting, localisation and marketing, was also kicked off by IDA.

INFOCOMM TRAINING AWARD WINNER EXEMPLIFIES LIFELONG LEARNING VALUES

FOR MOST PROFESSIONALS, FINDING TIME for training and skills upgrading is a constant challenge. For Mr Leonard Ong, learning has become an integral routine towards realising his longer-term career goals.

The Security Manager with Nokia South East Asia-Pacific has garnered 60 different certifications in the past six years, earning him the title of "Specialist of the Year" at the inaugural Infocomm Training Awards ceremony. Organised by the National Infocomm Competency Centre (NICCC), the awards seek to recognise outstanding examples of excellence in infocomm training and certifications at an individual level.

"I believe that one should always work hard and have a high sense of self-determination when pursuing a course or embarking on training for a certification," said Mr Ong.

"On top of this, a careful well-thought out sense of purpose is essential. There are many certifications in the market, hence achieving those that are relevant to you and your scope of work will help point you towards the right direction," he told Singapore Wave.

Mr Ong strongly believes that it is imperative to be certified at relevant levels in order to perform well at one's job and to fulfil its requirements.

Echoing his belief, the NICCC's main mission is to support and assist local infocomm professionals in seeking proper training and certification programmes. It aims to ensure the competitiveness of Singapore's ICT sector from a manpower standpoint by promoting infocomm accreditation and skills upgrading.

According to Mr Lee Kwok Cheong, Chairman of NICCC, employers need to be aware that human capital is the key to ensuring their businesses' competitive edge. Small and Medium-sized Enterprises, especially, have limited resources so maximising the competencies of their existing teams will be even more important when compared to multinationals. This is because larger companies may have regional or international resources to tap on.

One way to do this, Mr Lee noted, is to conduct regular reviews between employers and employees. During these sessions, both parties can outline key areas for skills upgrading. By pinning down the focal points, both employers and employees can monitor and gauge to the progress of the training goals they have previously identified.

Despite winning the accolade, training for Mr Ong continues to be work-in-progress. He intends to keep his skills current and relevant, even if it requires him to undergo training and certification in other relevant disciplines.

At present, however, he is focusing on his academic studies, while seeking opportunities to share his knowledge with society. As he puts it, "the best advice I ever received was that 'practice makes perfect' and 'sharing is rewarding'."



Specialist of the Year—Mr Leonard Ong

In the NICCC's Infocomm Certification Survey 2004 conducted in the last quarter of 2004, the top five areas of specialisation for IT professionals were in the areas of:

1. Operating Systems and Networking (25%)
2. Project Management (16%)
3. Database Management (15%)
4. Infocomm Security (14%)
5. Web Services (10%)

Of the above-mentioned areas of specialisation, infocomm security is the most popular certification sought by IT professionals today.

IDA AWARDS SCHOLARSHIPS TO PROMISING INFOCOMM STUDENTS

A FOREIGN SCHOLAR. A CHILD OF LAWYER PARENTS. A son of a deliveryman. These are the diverse backgrounds of just some of the winners of the second National Infocomm Scholarship (NIS), a unique government-industry collaboration that allows promising students to be nurtured by leading infocomm companies during their course of study and attachment.

The NIS is an initiative of the IDA, supported by the Singapore Infocomm Technology Federation (SiTF) and the Singapore Computer Society. The effort has also received the sponsorship of multinational and local IT heavyweights like IBM, Microsoft and NCS.

According to IDA, the purpose of the NIS is to ensure that the infocomm industry continues to attract the best and brightest talent to drive future growth and to groom a pool of future leaders to contribute to Singapore's continued competitiveness in ICT.

The 20 scholarship winners this year will be given the opportunity to undergo a six-month attachment and mentorship with their sponsoring infocomm company in the final year of their studies. The stint can be at their overseas offices or research facilities. This arrangement is aimed at giving these students wider hands-on exposure, international working experience and industry guidance before they enter the workforce.

Mr Chan Yeng Kit, CEO, IDA, said: "We are certainly privileged and happy to receive such strong support from established infocomm industry partners for the National Infocomm Scholarship to create industry-ready talent."

"Our partnership with them is important as it shows the commitment from the infocomm industry to build and nurture Singapore's infocomm future. The NIS scholars will receive solid industry grounding, exposure and skills that will eventually shape Singapore's infocomm landscape," he added.

"It is certainly a win-win situation for all and I would like to encourage more companies to partner with us and groom our future infocomm leaders," Mr Chan stressed.

Chinese student Ms Wang Mo, who is now attached to Singapore Computer Systems, is one such leader in the making. Having left China's ShanXi Province for Singapore five years ago, she hopes that a career in infocomm will allow her to fulfil her dream of being a filial daughter and her wish of bringing her parents here to have a comfortable life.

Ms Wang represented Singapore Polytechnic at the internationally-recognised 23rd All Japan Micromouse Competition in Tokyo and clinched third place. She subsequently gained top honours at the same event the following year.

Mr Marini Peter Pik Chiang, whose parents are both lawyers, said it is the opportunity to work with industry leaders like Microsoft that prompted him to apply for the scholarship. For Lim Zhi Yuan, who is attached to Frontline Solutions, the scholarship provides the opportunity to provide for his family and lighten the financial load of his deliveryman father.

Regardless of their motivations, all the NIS winners are confident their awards will undoubtedly pave the way for rewarding future careers in the local ICT industry.



Recipients of the National Infocomm Scholarship 2005 with Guest-of-Honour Mr Chan Yeng Kit, CEO, IDA

Sponsoring companies for the National Infocomm Scholarship:

- Computer Associates Pte Ltd
- Microsoft Singapore Pte Ltd
- Frontline Technologies Corporation Ltd
- IBM Singapore Pte Ltd
- NCS Communications Engineering Pte Ltd
- Oracle Corporation Singapore Pte Ltd
- Singapore Computer Systems
- Intel Technology Pte Ltd
- Fujitsu Asia Pte Ltd

SGNIC BOOSTS MARKET ACCESSIBILITY FOR DOMAIN NAME REGISTRATION MARKET

THE SINGAPORE NETWORK INFORMATION CENTRE (SGNIC) has unveiled a package of enhancements to its pricing and registrar accreditation schemes to bolster the adoption of ".sg" domain names.

With the changes, SGNIC has reduced its wholesale prices to registrars for all second-level and third-level ".sg" domain names from S\$40 to S\$30 each. The price reduction will apply to all ".sg" domains except those ending with ".per.sg".

Beyond lowering wholesale pricing, SGNIC has also launched bundled promotion for second and third level ".sg" domain names. Under this promotion, registrars will receive a complimentary matching second level domain name of every new third-level domain. For example, if "xyz.com.sg" is registered, registrars need not pay SGNIC for "xyz.sg". This deal, which ends in February next year, only applies to new registrations and is subject to the availability of both domain names.

In tandem with the price revisions, SGNIC has also refined its accreditation requirements to boost competition in the local domain name registration market. Companies keen to become SGNIC's accredited registrars no longer need to adhere to a S\$70,000 performance bond requirement as it has been replaced by other measures. To lower market barriers while

ensuring the credibility of interested parties, SGNIC now requires potential registrars to have at least six months of experience in domain name registrations. For instance, these companies could be a domain name reseller or an accredited registrar for other domains. In addition, companies will need to submit two years of audited statements showing a minimum working capital of S\$50,000. Companies that do not meet the requirement can still apply provided they offer a S\$30,000 performance bond.

To maintain their accreditation, registrars must also sign up at least 500 new registrations a year. With the new measures, the application and annual accreditation fee will be increased from S\$500 to S\$1,000 and from S\$1,000 to S\$1,500 respectively.

"As the national registry, SGNIC regularly reviews the domain name registration policies for ".sg" with the aim of facilitating market competitiveness in this sector. SGNIC's package of enhancements offers businesses cost-savings," said Mr Lim Choon Sai, General Manager for SGNIC.

"The enhanced accreditation scheme is also more robust and balances the need to protect consumers with that of encouraging more competition in the domain name registration market. SGNIC hopes that registrars can extend these savings to their customers," he added.

for consumers to follow. Called Fasten Up!, these simple, easy-follow-instructions highlight the importance of safety measures like having firewalls and antivirus software as well as the need to install system patches regularly. For more details on this programme, the public should visit www.singcert.com.sg

NEW MD FOR MICROSOFT SINGAPORE

Software giant Microsoft has named Mr Barney Lau as the new head of its Singapore operations. Mr Lau replaces former managing director Mr Andy Zupsic, who has been re-designated as Microsoft's General Manager for Worldwide Business Strategy. Mr Lau was previously the Director of Small & Mid Market Solutions & Partners in Microsoft Singapore.

INFO BYTES

TELEKOM MALAYSIA, KHAZANAH, RAISE M1 STAKE

Malaysia's state investment arm Khazanah Nasional and operator Telekom Malaysia Berhad have increased their stake in Singapore's MobileOne from 18.52 percent to 23.63 percent. The transaction was carried out by SunShare Investments Ltd, a joint venture between the two companies. The acquisition is currently pending approval from IDA.

BUCKLE UP FOR ONLINE SECURITY

In a bid to increase the security awareness for e-transactions, IDA's Infocomm Security team has developed a set of five important practices

SINGAPORE'S NEXTVIEW PAINTS A CLEARER PICTURE OF FINANCIAL DATA



NextView's Chief Executive Officer, Mr Stephen Lai.

THE MARKET FOR PROVIDING REAL-TIME TICKER prices to major financial institutions and large multinationals has long been the stronghold of information powerhouses like Bloomberg. However, a small Singapore firm is hoping to fill this market niche with a homegrown offering.

Founded in 1999, NextView Pte Ltd, formerly known as Whatz.net, aims to bring real-time pricing services to investors in Asia. After spending close to S\$2 million on the initial product development, the company had initially concentrated on marketing and selling its financial data reporting and analysis tools to individual investors. In the wake of the dot com crash however, the company shifted its focus to target institutional investors and trading houses instead.

NextView now brings up-to-date futures, options, and foreign exchange market data, news and analysis to desktops or notebook PC via Internet data streaming, real-time charting/analytics, investment management software and decision support tools for traders and investors.

The company has repeatedly enhanced its products and services based on market feedback over the years. For example, it is now looking at ways to bring their real-time financial reports to rural regions, or those lacking in broadband infrastructure, by using Peer-2-Peer (P2P) file-sharing technology.

"There is tremendous potential waiting for us in markets like India and China. Unfortunately, the infocomm infrastructure there means that not everyone has access to broadband. Using P2P technologies, we can leverage on bandwidth there to reach users with the information they need, exactly the same way we reach customers here in Singapore," said Mr Stephen Lai, NextView's Chief Executive Officer.

However, the company's earlier steps were fraught with challenges. One key hurdle, was finding and retaining staff, according to Mr Lai.

"As good a financial market as Singapore is, it is still small when compared to the U.S., Europe and Japan. What we found tough initially was keeping our staff challenged," he explained. In addition, he said it was tough for a small Singapore company to take on industry incumbents at first.

"We knew we had a good product, but we had to convince the market," Mr Lai stressed. To persuade potential customers, sales efforts entailed personal calls to broking houses in Singapore and around the region to demonstrate the benefits that NextView's product and services could offer.

The perseverance and hard work eventually paid off. Six years since its inception, seven out of 10 broking houses now count as NextView's local successes. In addition, the firm's customer momentum also extends to other countries in the region including Thailand, Malaysia and China.

According to Mr Lai, a key selling point for NextView is its licensing scheme. Unlike most competing offers, NextView allows its services to be used by all its client's traders. In addition, the firm also provides a "light" version that trading houses can provide for their customers' use.

One key customer here UOB Kay Hian, one of Singapore's largest trading houses. Here, NextView supports over 1,000 traders by streaming real-time financial information from 20 different markets and indices, along with the decision support tools for the traders to use when advising their clients on their financial decisions.

EYE TO EYE: MR DAVID FARBER

NOBODY KNOWS FOR SURE what will be the next big thing for the Internet but for Mr David Farber, he is hedging his bets on communications.

The Internet has already heralded new and powerful ways for people to communicate with each other over the past decade, from information sharing through the Web to e-mail correspondence. According to Mr Farber, the change doesn't end there.

"The Internet is reaching out to more and more of the world and it has caused a lot of problems for the incumbent industries like telecoms and broadcast, because the Net can carry voice and video more cheaply and more flexibly than its predecessors," he said.

Over the next decade, Mr Farber expects that there will be more dramatic changes in the way people communicate over data networks. With the huge growth in bandwidth availability and the corresponding drop in pricing, technology will continue to accelerate at breakneck speeds. In 5-6 years time, there will be more bandwidth than what is needed, he predicted.

One area that Mr Farber is looking up to is video communications. "People like and need to stay in touch with each other all over the world. High definition video communications is one area that has huge potential. We haven't been able to pull it off so far, but I believe we are on the verge of succeeding," said Mr Farber.

In order to surf the next wave of the Internet however, businesses might need to take a leap of faith, he added.

"Businesses usually ask what is the market, how are people going to use it and then they make a commercial decision. In my view, this is a poor technique in the communications business. That's because there are many next-generation applications in communications that we are not even aware of right now. The way to go is to build the technology and infrastructure, the applications will appear," Mr Farber explained.

He recalled a decade ago when he was working on developing gigabit links. Back then, the market criticised his research, saying that there was no need for such high speed networks.

But when Mr Farber succeeded, the industry suddenly found users for it, and the demand just shot up and there were calls for higher speed links beyond one gigabit.

He also cited the example of the Internet itself. "There were many people who were there earlier than Bill Gates. Why aren't they richer than he is? That's because nobody predicted that the Internet would evolve into what it is today," Mr Farber quipped.



David Farber is often called the "grandfather of the Internet" because many of his students played a major role in founding and developing the Internet. The Internet veteran is the Distinguished Career Professor of Computer Science and Public Policy at the School of Computer Science at Carnegie Mellon University. From 2000 to 2001, he served as Chief Technologist for the US Federal Communications Commission.

"So instead of arguing over whether people will need the extra bandwidth, just go all out to build the infrastructure. Take a leap of faith, a gamble. Build it, and they will come," he continued.

However, in taking the Internet to the next level, security remains to be a key challenge to address. He said that the current insecure and unreliable Internet was frustrating to users and slowed down the progress because users are afraid to use services for fear of getting hit by viruses, worms, and other threats.

Spam is another problem, he added, with the sheer volume of it slowing down the productivity of users.

"There are two things we need to do. The first is the continually evolve the Internet to make it better and more secure. But over the long term, we need to seriously rethink if there is a better way to develop the Internet infrastructure," he added.

TECH TALK - THE SEMANTIC WEB

FROM ITS NAME, THE SEMANTIC WEB SEEMS to imply something that belongs in a science fiction movie. In fact, it's not rocket science at all, and is intended for everybody's use as much as the World Wide Web is today.

Conceived by Sir Tim Berners-Lee, the same person that invented our current World Wide Web, the Semantic Web is an attempt to link up different information on the Internet in a way that both human and machines can easily process it, anywhere in the world. Another way is to think of it as a globally-linked relational database that provides a better means of representing and accessing data on the World Wide Web.

A dedicated team of people at the World Wide Web Consortium (www.w3c.org) is currently working to improve, extend and standardise the system. So far, many languages, publications and tools have already been developed for this project.

DO WE NEED TO LEND MEANING TO THE WEB?

At the moment, the majority of data on the Web is in HTML format and joined by a sea of hyperlinks. Some applications (like search engines) are able to extract useful data from Web pages and index them. However, these tools can only pull a representation of the data available. We can extend the capabilities of the Internet by adding machine-readable tags, or so-called semantics – to Web pages.

The Semantic Web is generally built on syntaxes that use URLs to represent data. These syntaxes are called "Resource Description Framework" (RDF) syntaxes. To link up various resources and represent the relationships between them, developers used the concept of ontology. An Ontology Web Language (OWL) was developed for this purpose. Semantic Web protocols aim to let computers distinguish between different kinds of data. With these distinctions, applications can become more efficient. For instance, search engines can narrow down results with greater accuracy to meet the needs of the user.

TOWARD THE SEMANTIC GRID

Though the Semantic Web is still in its infancy stage, some of the technologies and standards are already being used today. RDF is widely implemented in blogging sites, and the derived RSS (Really Simple

Syndication) protocol is used for Internet news feeds. In various niche areas, Semantic Web technologies are used to join massive and complex databases to model complex relationships such as in the life sciences or artificial intelligence.

Semantic Web technologies can also be used for intranets or extranets, e-commerce, e-learning, mobile portals and more. The immediate benefits include efficiency at very big-scale management of information without the tremendous cost and complexity of relational database implementations.

In the future, the combination of Semantic Web and Web Services can achieve the ultimate goal of making the Web a unified computing platform. The Semantic Web provides a way to construct and model Web data with Web Services, serving as the programming API for the Web. Coupled with grid technology, the Internet could be considered a gigantic computer system with virtually unlimited resources and yet still used in the same way as your PC. This is the vision of the Semantic Grid.

