CONTENTS

World's No. 1 operating system on Asian push

SINGAPORE--The difference between a microsecond and a millisecond might not mean much to most, but to Ken Sakamura, it's everything.

Ken Sakamura showing a T-Engine PDA that reads T-Engine radio tags on supermarket items

The difference is what separates the operating system the Japanese university professor helped create, called TRON (The real time operating system nucleus), from others and helped it become the most popular in the world.

It's everywhere

TRON is embedded into almost every consumer and industrial electronics device made by Japanese firms, from cellphones to home entertainment devices to automobile control systems, according to its supporters. As such, it outnumbers software systems on servers and PCs several times.

In car-engine ignition an error of plus or minus a few microseconds--millionths of second--can mean smooth combustion or a misfire. In such systems, TRON, which can react to system requests in under a microsecond, wins hands down over other platforms, said Sakamura.

"TRON is event-driven, but Windows and Linux are time-sharing, round-robin systems and respond in milliseconds, which are one thousand times slower," he said.

To drive hardware in critical systems such as car safety controls, Windows or Linux just won't do, he added.

TRON is hugely popular also because it's free, with licensing terms that are even less restrictive than Linux's. For example, hardware makers are free to optimize the source code for its software core, the T-Kernel, without the need to make the changes public.

Fighting fragmentation

Ironically, it has not spread much beyond Japan because since the time it was released in 1984, tweaks by different manufacturers have fragmented the platform, degrading its portability, said Sakamura.

"In the last two decades there have been many versions of TRON. It's similar to what is happening with Linux, with the Red Hat distribution and the IBM distribution and so on," he said.

"You have the Hitachi TRON, the NEC TRON, the Samsung TRON and so on," he said.

Without a uniform set of specifications, manufacturers are finding difficult to port the platform to new chipset generations, and software developers have to learn new programming rules for each flavor, said Sakamura.

Enter T-Engine, a formal set of criteria for using the T-Kernel that Sakamura and the non-profit T-Engine Forum hope to popularize. The forum is a consortium of 270 bodies collaborating on the development of the T-Engine platform.

With T-Engine, engineers can scale the operating system up to a palmtop device or down to a speck-sized radio frequency ID (RFID) chip that can be embedded into supermarket produce such as fruit, said Sakamura.

Working with other platforms

T-Engine also allows other platforms act as user-interface wrappers for the T-Kernel. Recently, Microsoft announced that it would work with the T-Engine Forum to provide a Windows CE.NET-based overlay over T-Kernel. U.S.-based Linux distributor Monta Vista will also work with the Forum on a Linux layer, and Sun is working on a Java version.

Sakamura was in Singapore last week to help open the T-Engine Application Development Center, which aims to support those working on the platform in Singapore and the rest of Asia. It is the first such center outside Japan.

"We want to make this technology more widely known to every company here that is involved in developing embedded systems," said Osamu Yamashiro, managing director of Japan-based chipmaker Renesas System Solutions Asia. Renesas and the Nanyang Technological University (NTU) will both provide expertise at the center

Google Announces Operating System, World Stays the Same

Everyone is a-flutter this morning about Google's announcement: the rumors are true, and they **are** developing a new operating system after all. It's called the Google Chrome OS, and it's going to be targeted at net books. Net books are those cheap, light laptops that are designed to connect to the internet and that's about all.

When Google makes any kind of big announcement the tech. world sits at attention and listens carefully. Tec Crunch says Google just dropped a nuclear bomb on Microsoft. This one, however, is a big fat yawn. Google will release an OS, a small group of dedicated Google-fanatics will use it, and then it will die a slow and steady death. Here's why:

1. Google is good at search. Easy, one-step search. Fast and easy search has become so important to everyone, across every demographic and level of expertise that Google has become the verb to describe that action. But operating systems are not like search. Operating systems for net books are even less like search. More importantly, all those people who understand fast and easy search are not interested in OSs, and they've never heard of net books.
2. "Hey, wait!" you say. "Google isn't stupid. They know a net book OS isn't for the masses. This is about Google promoting its brand and its products. It's the same strategy as Android." Well, I say, it may be the same strategy, but mobile OS and net book OS are very different. There are only a handful of mobile OSs. There are dozens of OS distributions (flavors of Linux), many of which are targeted to net books. Google can't compete with that. No matter how much $$ and development time they throw at their OS, they'll need a dedicated community of developers and testers. And they'll need to steal them from another open source project. The Google carries a lot of weight, but it can't carry that load.
3. An operating system doesn't take advantage of Google's core competencies. They have two. First, search. Second, efficient use of massive (and massively distributed) servers. GMail, Docs, etc. make sense because they integrate with search and capitalize on Google's massive server load. A net book OS does neither.

From my POV, this is just another bit of Google casting around in search of more footholds. Eventually they'll find one, but it won't be operating systems, and it won't be browsers. (Depending on who you ask, Google Chrome is languishing at between 1 and 3% market share.) It may be that these efforts, even if they're incrementally beneficial, are useful enough for Google to push them. Convert a few developers, get some buzz, develop technology with multiple uses. That's fine. But let's not call it a nuclear bomb. A world with Google Chrome OS will look almost exactly like a world without it.

Bandwidth (Computing)

In computer networking and computer science, **digital bandwidth**, **network bandwidth** or just **bandwidth** is a measure of available or consumed data communication resources expressed in bit/s or multiples of it (kbit/s, Mbit/s etc).

Bandwidth may refer to **bandwidth capacity** or **available bandwidth** in bit/s, which typically means the net bit rate, channel capacity or the maximum throughput of a logical or physical communication path in a digital communication system. For example, bandwidth test implies measuring the maximum throughput of a computer network. The reason for this usage is that according to Hartley's law, the maximum data rate of a physical communication link is proportional to its bandwidth in hertz, which is sometimes called *frequency bandwidth*, *radio bandwidth* or *analog bandwidth*, the last especially in computer networking literature.

Bandwidth may also refer to **consumed bandwidth** (*bandwidth consumption*), corresponding to achieved throughput or goodput, i.e. average data rate of *successful* data transfer through a communication path. This meaning is for example used in expressions such as bandwidth shaping, bandwidth management, bandwidth throttling, bandwidth cap, bandwidth allocation (for example bandwidth allocation protocol and dynamic bandwidth allocation), etc. An explanation to this usage is that digital bandwidth of a bit stream is proportional to the average consumed signal bandwidth in Hertz (the average spectral bandwidth of the analog signal representing the bit stream) during a studied time interval.

Digital bandwidth may also refer to: average bitrate (ABR) after multimedia data compression (source coding), defined as the total amount of data divided by the playback time.

Some authors prefer less ambiguous terms such as *gross bit rate*, *net bit rate*, *channel capacity* and throughput, to avoid confusion between digital bandwidth in bits per second and analog bandwidth in hertz.

Measuring Network Throughput

People are often concerned about **measuring the maximum data throughput** rate of a communications link or network access. A typical method of performing a measurement is to transfer a 'large' file and measure the time taken to do so. The throughput is then calculated by dividing the file size by the time to get the throughput in megabits, kilobits, or bits per second.

Unfortunately, the results of such an exercise will result in the goodput which is less than the maximum throughput, leading to people believing that their communications link is not operating correctly. In fact, there are many overheads accounted for in goodput in addition to transmission overheads, including latency, TCP Receive Window size and machine limitations, which means the calculated goodput does not reflect the maximum achievable throughput.

The Maximum bandwidth can be calculated as follows:

```
=> Max. Throughput = TCP Window Size / Round-trip time.
```

The Max TCP Window size in the absence of window scaling is 65 535 bytes.

Example: Max Bandwidth = 65535 bytes / 0.220 s = 297886.36 bytes/s = 2.38 Mbit/s.

Over a single TCP connection between those endpoints, the tested Bandwidth will be restricted to 2.38 Mbit/s even if the contracted Bandwidth is greater.

Robotics

The Shadow robot hand system

Robotics is the engineering science and technology of robots, and their design, manufacture, and application. Robots can either help or take away human jobs Robotics is related to electronics, mechanics, and software. The word robot was introduced to the public by Czech writer Karel Čapek in his play R.U.R. (Rossum's Universal Robots), published in 1920. The first recorded use of the term was by Isaac Asimov in his 1941 science fiction short-story "Liar!"

Robot research

Much of the research in robotics focuses not on specific industrial tasks, but on investigations into new types of robots, alternative ways to think about or design robots, and new ways to manufacture them but other investigations, such as MIT's cyberflora project, are almost wholly academic.

A first particular new innovation in robot design is the opensourcing of robot-projects. To describe the level of advancement of a robot, the term "Generation Robots" can be used. This term is coined by Professor Hans Moravec, Principal Research Scientist at the Carnegie Mellon University Robotics Institute in describing the near future evolution of robot technology. *First, second and third generation* robots are *First generation* robots, Moravec predicted in 1997, should have an intellectual capacity comparable to perhaps a lizard and should become available by 2010. Because the *first generation* robot would be incapable of learning, however, Moravec predicts that the *second generation* robot would be an improvement over the *first* and become available by 2020, with an intelligence maybe comparable to that of a mouse. The *third generation* robot should have an intelligence comparable to that of a monkey. Though *fourth generation* robots, robots with human intelligence, professor Moravec predicts, would become possible, he does not predict this happening before around 2040 or 2050.

The second is Evolutionary Robots. This is a methodology that uses evolutionary computation to help design robots, especially the body form, or motion and behavior controllers. In a similar way to natural evolution, a large population of robots is allowed to compete in some way, or their ability to perform a task is measured using a fitness function. Those that perform worst are removed from the population, and replaced by a new set, which have new behaviors based on those of the winners. Over time the population improves, and eventually a satisfactory robot may appear. This happens without any direct programming of the robots by the researchers. Researchers use this method both to create better robots, and to explore the nature of evolution. Because the process often requires many generations of robots to be simulated, this technique may be run entirely or mostly in simulation, then tested on real robots once the evolved algorithms are good enough. Currently, there are about 1 million industrial robots toiling around the world, and Japan is the top country having high density of utilizing robots in its manufacturing industry.

PHP

PHP, or PHP: Hypertext Preprocessor, is a widely used, general-purpose scripting language that was originally designed for web development, to produce dynamic web pages. It can be embedded into HTML and generally runs on a web server, which needs to be configured to process PHP code and create web page content from it. It can be deployed on most web servers and on almost every operating system and platform free of charge. PHP is installed on over 20 million websites and 1 million web servers.

PHP was originally created by Rasmus Lerdorf in 1995 and has been in continuous development ever since. The main implementation of PHP is now produced by **The PHP Group** and serves as the *de facto* standard for PHP as there is no formal specification. PHP is free software released under the PHP License, which is incompatible with the GNU General Public License (GPL) because of restrictions on the use of the term *PHP*.

PHP has evolved to include a command line interface capability and can also be used in standalone graphical applications.

PHP accelerator

A **PHP accelerator** is an extension designed to boost the performance of software applications written using the PHP programming language. Most PHP accelerators work by caching the compiled bytecode of PHP scripts to avoid the overhead of parsing and compiling source code on each request (some or all of which may never even be executed). For best performance, caching is to shared memory with direct execution from the shared memory and the minimum of memory copying at runtime. A PHP accelerator typically reduces server load and increases the speed of PHP code anywhere from 2-10 times, depending on factors such as the inherent execution time of the PHP application and the percentage of source code actually executed on a given request. While a code optimizer may even slow down overall performance when used in isolation, it can provide an additional performance boost when coupled with a code cache as the optimization effort is performed just once.

IT Service Management

IT Service Management (**ITSM**) is a discipline for managing information technology (IT) systems, philosophically centered on the *customer's perspective of IT's contribution to the business.* ITSM stands in deliberate contrast to technology-centered approaches to IT management and business interaction. The following represents a characteristic statement from the ITSM literature:

> *Providers of IT services can no longer afford to focus on technology and their internal organization, they now have to consider the quality of the services they provide and* ***focus on the relationship with customers.***

No one author, organization, or vendor owns the term "IT Service Management" and the origins of the phrase are unclear.

ITSM is process-focused and in this sense has ties and common interests with process improvement movement (e.g., TQM, Six Sigma, Business Process Management, CMMI) frameworks and methodologies. The discipline is not concerned with the details of how to use a particular vendor's product, or necessarily with the technical details of the systems under management. Instead, it focuses upon providing a framework to

structure IT-related activities and the interactions of IT technical personnel with business customers and users.

ITSM is generally concerned with the "back office" or operational concerns of information technology management (sometimes known as operations architecture), and not with technology development. For example, the process of writing computer software for sale, or designing a microprocessor would not be the focus of the discipline, but the computer systems used by marketing and business development staff in software and hardware companies would be. Many non-technology companies, such as those in the financial, retail, and travel industries, have significant information technology systems which are not exposed to customers.

In this respect, ITSM can be seen as analogous to an enterprise resource planning (ERP) discipline for IT - although its historical roots in IT operations may limit its applicability across other major IT activities, such as IT portfolio management and software engineering.

Image file formats

Image file formats are standardized means of organizing and storing images. This entry is about digital image formats used to store photographic and other images; (for disk-image file formats see Disk image). Image files are composed of either pixel or vector (geometric) data that are rasterized to pixels when displayed (with few exceptions) in a vector graphic display. The pixels that compose an image are ordered as a grid (columns and rows); each pixel consists of numbers representing magnitudes of brightness and color.

Image file compression

There are two types of **image file compression** algorithms: lossless and lossy.

Lossless compression algorithms reduce file size without losing image quality, though they are not compressed into as small a file as a lossy compression file. When image quality is valued above file size, lossless algorithms are typically chosen.

Lossy compression algorithms take advantage of the inherent limitations of the human eye and discard invisible information. Most lossy compression algorithms allow for variable quality levels (compression) and as these levels are increased, file size is reduced. At the highest compression levels, image deterioration becomes noticeable as "compression artifacting". The images below demonstrate the noticeable artifacting of lossy compression algorithms; select the thumbnail image to view the full size version.

How newsgroups work ?

Newsgroup servers are hosted by various organizations and institutions. Most Internet service providers host their own news servers, or rent access to one, for their subscribers. There are also a number of companies who sell access to premium news servers.

Every host of a news server maintains agreements with other news servers to regularly synchronize. In this way news servers form a network. When a user posts to one news server, the message is stored locally. That server then shares the message with the servers that are connected to it if both carry the newsgroup, and from those servers to servers that they are connected to, and so on. For newsgroups that are not widely carried, sometimes a carrier group is used for crossposting to aid distribution. This is typically only useful for groups that have been removed or newer *alt.** groups. Crossposts between hierarchies, outside of the Big 8 and *alt.** hierarchies, are failure prone.

Hierarchies

- *aus.** — Australian news groups
- *ba.** — Discussion in the San Francisco Bay area
- *ca.** — Discussion in California
- *can.** — Canadian news groups
- *cn.** — Chinese news groups
- *chi.** — Discussions about the Chicago area
- *de.** — Discussions in German
- *england.** — Discussions (mostly) local to England, see also *uk.**
- *fidonet.** — Discussions routed from FidoNet
- *fr.** — Discussions in French
- *fj.** — "From Japan," discussions in Japanese
- *gnu.** — Discussions about GNU software
- *hawaii.** — Discussions (mostly) local to Hawaii
- *hp.** — Hewlett-Packard internal news groups
- *it.** — Discussions in Italian
- *microsoft.** — Discussions about Microsoft products
- *pl.** — Polish news groups
- *tw.** — Taiwan news groups
- *uk.** — *Discussions on matters in the UK*
- *yale.** — Discussions (mostly) local to Yale

Interface Features In Google

Groups search

Google Search incorporates public groups into its results. Searches return the posts which most match the search query, and if any groups match, they will be displayed at the top of the results with a link to the Google Groups directory.

Profiles

Users may create public profiles which are linked from all of their posts.

Rating posts

A user can rate a post with 1 to 5 out of 5 stars. A post's rating is based on the average of all the user ratings it gets, and a thread's rating is based on the average rating of all the posts in the thread. Users may not rate their own posts.

Starring threads

Users may mark up to 200 threads as "starred" to track them centrally.

E-mail masking

To prevent scammers or spammers from harvesting e-mail addresses from a group, Google masks all e-mail addresses on its web interface by replacing the last 3 characters of the username with dots. To view the full e-mail address, a user must respond to a CAPTCHA challenge. E-mail addresses are only masked when viewing a Google Group or Usenet newsgroup through the web interface, never when receiving message via e-mail. Google Groups does not allow users to obfuscate or munge their own e-mail addresses.

Group web pages

In the beta version of October 5, 2006, Google introduced **group pages** which can be edited by group members or group managers. Pages can link to each other and Google keeps versions of pages in a similar way to a Wiki. Group members can also discuss pages. This feature was promoted from beta status on January 24, 2007.

SQL QUIZ

1. What does SQL stand for?

- Strong Question Language
- Structured Query Language
- Structured Question Language

Ans: Structured Query Language

2. Which SQL statement is used to extract data from a database?

- EXTRACT
- GET
- OPEN
- SELECT

Ans: SELECT

3. Which SQL statement is used to update data in a database?

- SAVE AS
- UPDATE
- MODIFY
- SAVE

Ans:UPDATE

4. Which SQL statement is used to delete data from a database?

- REMOVE
- COLLAPSE
- DELETE

Ans:DELETE

5. Which SQL statement is used to insert new data in a database?

- INSERT INTO
- ADD RECORD
- ADD NEW
- INSERT NEW

Ans:INSERT INTO

6. With SQL, how do you select a column named "FirstName" from a table named "Persons"?

- SELECT Persons.FirstName
- EXTRACT FirstName FROM Persons
- SELECT FirstName FROM Persons

Ans: SELECT FIRSTNAME FROM PERSONS

7. With SQL, how do you select all the columns from a table named "Persons"?

- SELECT * FROM Persons
- SELECT *.Persons
- SELECT Persons
- SELECT [all] FROM Persons

Ans: SELECT * FROM PERSONS

8. With SQL, how do you select all the records from a table named "Persons" where the value of the column "FirstName" is "Peter"?

- SELECT * FROM Persons WHERE FirstName='Peter'
- SELECT [all] FROM Persons WHERE FirstName LIKE 'Peter'
- SELECT [all] FROM Persons WHERE FirstName='Peter'
- SELECT * FROM Persons WHERE FirstName<>'Peter'

Ans: SELECT [all] FROM Persons WHERE FirstName LIKE 'Peter'

9. With SQL, how do you select all the records from a table named "Persons" where the value of the column "FirstName" starts with an "a"?

- SELECT * FROM Persons WHERE FirstName LIKE 'a%'
- SELECT * FROM Persons WHERE FirstName LIKE '%a'
- SELECT * FROM Persons WHERE FirstName='a'
- SELECT * FROM Persons WHERE FirstName='%a%'

Ans: SELECT * FROM Persons WHERE FirstName LIKE '%a'

10. The OR operator displays a record if ANY conditions listed are true. The AND operator displays a record if ALL of the conditions listed are true

- True
- False

Ans:True

Technical University of Berlin

South side of the main building

Main building

The **Technical University of Berlin** (**Berlin Institute of Technology**, **TUB**, **TU Berlin**, German: **Technische Universität Berlin**) is located in Berlin, Germany. It was founded in 1879 and, with nearly 30,000 students, is one of the largest technical universities in Germany. It also has the highest proportion of foreign students out of universities in Germany, with 20.9% in the summer semester of 2007, roughly 5,598 students. The university alumni and professor list include eight Nobel Prize winners.

History

The old northern front of the main building, which was considerably damaged during the Second World War and replaced by a modern front in the 1960s

The institution was unified in 1879 under the name *Royal Technical College of Charlottenburg* (later Berlin) by merging the *Building Academy* (Bauakademie), established in 1799, and the *Vocational Academy*, established in 1829. Since 1916 it has been integrated with the former *Mining Academy*, which was the oldest institution, founded in 1770. The college was closed after World War II on April 20, 1945 and the university re-opened on April 9, 1946 under its current name.

Campus

TU-Hochhaus, the tallest building on campus, with a bird's-eye-view cafeteria on floor 20.

Entrance of the main library of the Technical University of Berlin and of the Berlin University of the Arts

Main building atrium

The TU Berlin covers ca. 600,000 m², distributed over various locations in Berlin. The main campus is located in the borough of Charlottenburg. The seven schools of the university have some 28,200 students enrolled in more than 50 subjects (January, 2009).

Organization

Since April 4, 2005, the TU Berlin has consisted of the following schools:

1. Humanities
2. Mathematics and Natural Sciences
3. Process Sciences and Engineering
4. Electrical Engineering and Computer Science
5. Mechanical Engineering and Transport Systems
6. Planning - Building - Environment (merge of former schools of "Civil Engineering and Applied Geosciences" and "Architecture - Environment - Society")
7. Economics and Management

Faculty and staff

6,721 people work at the university: 319 professors, 1,832 postgraduate researchers, and 2,089 personnel work in administration, the workshops, and the central facilities. In addition there are 1,803 student assistants and 161 trainees (January 2006).

International student mobility is applicable through ERASMUS programme or through Top Industrial Managers for Europe (TIME) network.

Library

The new common main library of the Technical University of Berlin and of the Berlin University of the Arts was opened in 2004. The library building was sponsored by Volkswagen and is named Volkswagen Library. All former 17 libraries of the Technical University of Berlin and of the nearby University of the Arts were merged into the new library, but several departments still retain libraries of their own. In particular, the school of 'Economics and Management' maintains a library with 340,000 volumes in the university's main building (*Wirtschaftswissentschaftliche Dokumentation – WiWiDok*).

Notable alumni and professors

(Including those of the Academies mentioned under History)

- August Borsig, businessman
- Carl Bosch (1874–1940), chemist, Nobel prize winner 1931
- Wernher von Braun (1912–1976), head of Nazi Germany's V-2 rocket program, saved from prosecution at the Nuremberg Trials by Operation Paperclip, first director of the United States National Aeronautics and Space Administration's Marshall Space Flight Center, called the father of the U.S. space program
- Franz Breisig (1868–1934), mathematician, inventor of the calibration wire and father of the term quadripole network in electrical engineering
- Wilhelm Cauer (1900-1945), mathematician, essential contributions to the design of filters
- Carl Dahlhaus (1928-1989), musicologist
- Dennis Gabor (1900–1971), physicist (holography), Nobel prize winner 1971
- Fritz Haber (1868–1934), chemist, Nobel prize winner 1918
- Gustav Ludwig Hertz (1887–1975), physicist, Nobel prize winner 1925
- George de Hevesy (1885–1966), chemist, Nobel prize winner 1943
- Karl Küpfmüller (1897–1977), electrical engineer, essential contributions to system theory
- Wassili Luckhardt (1889–1972), architect
- Alexander Meissner (1883–1958), electrical engineer
- Erwin Wilhelm Müller (1911–1977), physicist (field emission microscope, field ion microscope, atom probe)
- Jakob Karol Parnas (1884–1949), biochemist, Embden-Meyerhof-Parnas pathway
- Wolfgang Paul (1913–1993), physicist, Nobel prize winner 1989
- Ernst Ruska (1906–1988), physicist (electron microscope), Nobel prize winner 1986
- Karl Friedrich Schinkel (1781-1841), architect (at the predecessor Berlin Building Academy)
- Georg Schlesinger (1874–1949)
- Albert Speer (1905–1981), architect, politician, Minister for Armaments during the Third Reich, war criminal

- Kurt Tank (1893–1983), head of design department of Focke-Wulf, designed the FW-190
- Wilhelm Heinrich Westphal (1882–1978), physicist
- Hermann W. Vogel (1834–1898) photo-chemist
- Eugene Wigner (1902–1995),physicist, discovered the Wigner-Ville-distribution, Nobel prize winner 1963
- Konrad Zuse (1910–1995), computer pioneer