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The Day the Microprocessors Died

by

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The spring semester was underway at the International School of Science and Technology (ISST) in Myrtle Beach, South Carolina. Dr. David Pascal watched the satellite images on his data goggles as the high pressure system brought clear skies and warm breezes. The first beautiful day of the season was too beautiful to waste indoors, he decided. Since he was the instructor for History of Computing, he could act on that impulse. He sent a message to his on-site students to meet at the beachfront, confident they would all receive the alert through their always-on connections.

Dr. Pascal packed up the bagful of PDA's, videogame consoles, laptop computers and assorted stand-alone household gadgets that just a decade ago had been off-line. He felt that a physical connection to the past would make more of an impact when added to the course animations that would stream directly to the goggles that the students wore. He was particularly happy with this teaching assignment at ISST since it brought social issues and recent human history into context with computer technology, too often ignored in his education experience in fields where technology over a year old was considered obsolete.

Like most people on the "have" side of the digital divide, he was permanently connected to the System. Although it had just been a year and a half since the System had been formally recognized, many had logged on to earlier versions through their computers, phones and television sets for a number of years. Now the connections were seamless and invisible. The System identified users automatically through biometrics, the result of many independent pervasive computing projects[1, 2] such as MIT's project Oxygen[3]. He could not believe that less than two years ago he needed to physically connect by entering login and password information to identify himself and then eventually log out. "The System works so well," he mused. His office door opened for him after sensing his heavy bag and he walked down the hall to the cappuccino vending machine. "The usual," he said to the machine. It hissed and produced a double-shot vanilla Americano at just the right temperature. He sipped it as he stepped outside to the perfect day.

9:45 a.m.

His weekly lecture went on the System where it could be accessed by thousands of students worldwide. "This is going to be fun," he thought as he met his on-site students (about 30) outside the beachfront doors. "All right class, we'll be on the Deck today!"

A few cheers erupted, notably from Josh and Rahul, the two class jokers, as the students followed him. The Deck went right to the edge of the water, with tables and large umbrellas in the school colors. Dr. Pascal noticed that Zooey, one of his more active students, was unusually quiet as she sat down on a plastic chair near the table where he had put down the bag. She had volunteered to be a first-person recorder for the semester, but now her data goggles had been turned to a reflective silver, a modern "do not disturb" sign.

"Are you doing okay?" Dr. Pascal asked, ignoring her silvered goggles. He needed to make sure she would record the lecture.

Zooey Harrington was a bright local girl who held a passion for computers. Her love of technology surprised Dr. Pascal when he learned that her father surfed professionally and her mother was a pro golfer. But then, the International School of Science and Technology had attracted many unlikely students that became renowned scholars in their fields.

"Yeah… I mean, sort of. Can I ask you about something I heard?" Zooey said with hesitation. "I mean about the System."

"Go ahead."

"I heard a rumor," Zooey said. "My boyfriend said the System was going to be attacked."

"Those rumors go around all the time, just like all the talk about the System being overloaded." Dr. Pascal checked the time and linkup for recording the lecture. Zooey hadn't begun streaming her feed yet.

"But this came from Hong, Zach's friend, who doesn't ever pass on rumors. He said that the integrated model for the System is a big mistake. And so, can this happen?"

"Let's talk about this during the first break. This is an interesting topic, but I need to start the class." Dr. Pascal smiled.

Zooey turned her goggles back to her usual blue as the start up images for ISST flashed across her display. "Oh, right. The time."

At 10:00 Dr. Dr. Pascal began by describing the silicon-based processors that had been at the core of the Internet revolution. "The graph you see shows a breakdown of all the processors manufactured in the year 2000.[4] As you can see, 55% of all processors manufactured were 8-bit, and all of these went into embedded systems in your cars, washing machines, and toasters. 32-bit processors account for only 8% of total processors sold, and out of these, 98% again went into embedded systems. Only about 2% of these went into what we have traditionally called computers. Now what do you think were some of the profi--"

He stopped mid-sentence, because at 10:02 the System crashed without any warning. All the goggles on the Deck went dead. The constant input—the news, the email feeds, the entertainment—that overlapped their view of the world had disappeared.

"What the heck?" Rahul demanded as he pulled off his goggles and checked the power connector.

"Yeah dude, what the heck!" Josh shouted.

All across the beach people started shouting and looking around in confusion. Those who had not upgraded to goggles were staring at dead handheld displays.

"The whole System is down!" someone shouted. Others joined in with dire pronouncements.

"Planes will fall out of the sky!"

"Cars will crash into each other"

"We're under attack!"

"OK guys, calm down now," Dr. Pascal said in an effort to curb the panic. "I don't see any cars crashing or planes falling. There aren't any warning sirens going off. Relax!"

"Sirens won't sound if the System is down!" Rahul said.

Dr. Pascal couldn't think of a quick answer to that one, but somehow he was confident that critical parts of the System had not gone down.

"The doors are working," Zooey said. She pointed to the automatic door on the beachfront exit of ISST.

"Huh…?" Dr. Pascal took a moment to absorb the seemingly irrelevant observation.

"The doors," she said again. "They're working."

Although puzzled, everyone did calm down a little to think about what she was talking about. Dr. Pascal and the class headed towards the door for closer inspection.

As they entered the building Dr. Pascal noticed that the main lights were on, but the OLEDs[5] (the displays that constantly streamed passerby-relevant advertising) were off. The doors on the west end of the hall, which had recently been installed, were stuck too.

"This just doesn't make any sense," Rahul said.

"Yeah dude, no sense at all." Josh shook his head.

All across the hallways faculty, staff and students were staring at dead handhelds, goggles that would not display or take any input commands and vending machines that would not respond. And then, across the hall, they saw Hong talking excitedly on a mobile phone. Confusion turned to absolute bafflement at the sight of Hong on the phone while all communication systems seemed to be down.

10:09 a.m.

Suddenly, Dr. Pascal had a hunch and he walked over to a corner of the cafeteria and switched on one of the older television sets. Sure enough, it came on and there was a news bulletin urging everyone to be calm and to stay tuned for more information. "All right class, let's try to analyze what happened," Dr. Pascal said, realizing this event gave a better hands-on experience for his class than a bag-full of old gadgets. He only wished that Zooey had been able to record the whole lecture.

Questions

Answer each question in a paragraph or two.

1. How would individual people connect to the System in 2017?
2. What evidence do we have that the System went down?
3. Was Hong's phone actually working? How is that possible?
4. Did any of the critical systems fail? Why or why not?
5. In the year 2000, what was the ratio of processors used in personal computers to those used in embedded systems?

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http://domino.research.ibm.com/comm/wwwr_thinkresearch.nsf/pages/pervasive.html

[2] Pervasive Computing Research at Michigan. Retrieved April 14, 2007 from
http://notrump.eecs.umich.edu/group/group.html

[3] MIT Project Oxygen. Retrieved April 14, 2007 from
http://www.oxygen.lcs.mit.edu/

[4] Turley, Jim. December 18, 2002. The Two Percent Solution. Embedded.com. Retrieved April 14, 2007 from
http://www.embedded.com/shared/printableArticle.jhtml?articleID=9900861

[5] Universal Display Corporation. OLED Technology. Retrieved April 14, 2007 from
http://www.universaldisplay.com/tech.htm