

Present at the Birth: How Lenovo Created the “Super-T”

In February 2008, Lenovo leaders from around the world gathered at the company’s U.S. headquarters in North Carolina to plot their next moves. Over a few winter days, they’d sift through feedback from sales teams: How many platforms should the company push? What would be the next big driver? And how could they address more price points?

Soon, a picture emerged of a ThinkPad that would reassert Lenovo’s leadership in the corporate-oriented T Series market — taking the allure of the more streamlined ThinkPad X300 into the space where full features and 14-inch monitors held sway. If the X300 was for the boss, the new machine would be for the whole team.

On paper...well, the sheet of paper, what Lenovo calls a Marketing Requirements Document, was technically blank. But to Marketing Manager David Critchley, this was the right moment for a burgeoning concept to grab the spotlight.

“We’d been kicking around the idea of a ‘Super T’ for a while,” he says.

What would the new PC offer? A price below the X300’s. The power, docking, and full-function appeal to woo corporate and public sector “corridor warriors” who were quickly moving from desktops to notebooks. And a new standard for “thin and light.” It would redefine the 14-inch class, ward off encroaching developments from the competition, and show the world that the X300 wasn’t a one-trick pony.

As the meeting went on, it became clear that the machine the business unit leaders wanted to sell sounded an awful lot like the one the designers had been hoping to create. The challenge was clear as well: use the experience of creating the X300 as a foundation on which to create something even better.

This was it, then. Super T was a go.

The heart of the matter

An early requirement for the Super T, which soon became the ThinkPad T400s, was a normal-volt processor. Why? Performance. The performance of an ultra-volt processor was ideal for a machine designed solely for portability, but the T400s had to blend ergonomics with power. “We worked really hard with Intel to match the right processor with the T Series performance band,” Critchley says.

“Lenovo and Intel work together better than any two partners I’ve seen in my career,” says Intel Mobile Field Sales Engineer David Frick. “They’re early adopters of most of our work. For this job, we suggested the 25-Watt small form factor Intel® Centrino® 2 with vPro™ Technology, because it’s got the physical parameters and performance that leads to a no-compromise laptop.”

Intel Mobile Field Applications Engineer Maria Fernandez agrees. “We realized that form factor was really important to the market,” she says. “We had to focus on more than raw performance. And that’s what the T400s is going after.”

The team found every way to save on size, including the use of a soldered ball grid array processor package rather than a thicker pin grid array. At 0.83 inches thin and 3.91 pounds light, the final product shows how the effort paid off.

The processor carries Intel® vPro™ Technology that gives IT departments maximum manageability. They can monitor PCs remotely to discover threats, then isolate, diagnose, and heal them, all to protect the system. This enhanced security and manageability is available even when the PC is powered down, or if the operating system isn’t operating. “The T400s will have the latest and greatest version of Intel vPro Technology, which makes it the most secure, most manageable client available for an IT purchaser,” Frick says.

Combining Intel vPro Technology with Lenovo’s ThinkVantage Technologies®, the T400s offers powerful options such as remote wake-up, pushing patches during overnight downtime, and even remote BIOS repair or hard drive imaging. In addition, Intel’s anti-theft technology provides custom options for loss protection, that only Lenovo can fully activate, up to and including a “Poison Pill” that deactivates a stolen notebook even if it’s off the network — even if the operating system or hard drive is replaced.

“This is the first time that there’s been a confluence of all these variables that’s yielded something that’s thin enough to be a sexy corporate box, if you will, while still getting the benefit of performance of leadership processors,” Frick concludes. “You always had to make a compromise before. Now, you’re going to see the exceptional performance in a great, thin form factor working together in the market.”

Built to outlast

“The fit and finish of the machine had to be very good.” That was the edict from Executive Director of Product Quality and Engineering Tin-Lup Wong, who holds the patent on the ThinkPad roll cage system.

The new machine would improve upon existing ThinkPad specs for gaps and evenness, and it would set the bar for assembly, manufacturing, and service design. “The customer should be able to recognize the improvement,” he says.

Wong also prizes the “DNA” of the ThinkPad keyboard, and insisted that the T400s live up to the high standards of its most dedicated users.

“People don’t compare our keyboards to HP and Dell,” he notes. “They compare them to their old ThinkPads. If you change the color on the trackpoint buttons, they’ll write you letters. We’re competing with our own ghosts.”

The new keyboard doesn’t just type well, it sheds liquid well too. “The drainage on earlier models wasn’t working the way I wanted,” Wong recalls. “I told them to improve it. I wanted to see continuous pouring water. It turned out that round drainage holes allowed surface tension to impede the flow, so we went to squared-off holes.”

Wong’s sense of competitiveness extends to the green arena as well. He points out that Apple makes environmental claims based on its recyclable aluminum enclosures — but that their machining process leaves a lot of waste material that, itself, costs a lot to recycle. At Lenovo, he and his team use computer-assisted design to create die-cast case components that create very little waste.

They don’t use just any computers for the design job, either. “Boeing can’t use an aircraft to design an aircraft,” he says with a smile. “But we can use a ThinkPad to design a ThinkPad.”

Laying on the hands

Aaron Stewart’s business card reads “Senior Factors Engineer.” His job is more like “user experience champion.” The T400s gave him and his colleagues a chance to introduce some bold changes.

If Tin-Lup Wong’s job was to safeguard the ThinkPad keyboard legacy, Stewart’s job was to build upon it. The changes to the layout, especially the Delete and Escape keys, drew a great deal of pre-launch attention from anxious users. Still, the rationale was clear.

Key-logging had determined that those two keys were used with special frequency. Yet the insight that led to the change went beyond numbers. Stewart explains that from the center position over the QWERTY keys, a user’s finger shoots out in a motion path to reach peripheral ones. These “vectors” explain why the ENTER and SHIFT keys, for example, are horizontal: You reach over to them. But you reach up to strike ESC and DEL. So why not give them a vertical orientation?

“The keyboard is the bread and butter of the ThinkPad user experience,” Stewart explains. “We wanted to honor consistency but evolve that experience. Those changes were the most noticeably beneficial with the least amount of risk.”

Stewart was intimately involved with another evolution of the user interface, the touchpad. The T400s introduces multi-touch, multi-gesture capability familiar to an iPhone-exposed nation. It also employs a patent-pending algorithm to detect and ignore inadvertent pad touches. In addition, it's now flush with the adjacent palm guard — which helps make the machine thinner and maximizes the effective area, but also erases the tactile signal for where the touchpad ends.

“The standard Mylar texture was too similar to the palm rest,” Stewart explains. For a new tactile clue, the design team added texture to the touchpad surface. But what texture would work best?

“We had about 35 tries — different heights, sizes, and finish of bumps,” he recalls. “There were several supremely annoying ones.”

A focus on VOIP

“We’ve been waiting for the adoption rate of VOIP to take off, and it has,” Stewart says. What was once a somewhat bloodless business application was becoming more popular for personal communication, which meant people wanted better sound and picture quality. “This was the time to emphasize it more from a hardware perspective.”

Notebooks had long featured speaker mute buttons, but if users were spending more time speaking into the microphone, shouldn't that have a mute function as well, the way office phones do? The T400s does. There's also a camera shutoff, noise-canceling stereo microphones, and a 2-megapixel camera. “We had feedback that a microphone too close to the keyboard picks up too much typing noise, so we moved it to the top bezel of the display and made it noise-canceling,” Stewart adds.

The parts, seen whole

Seeing the ThinkPad T400s put together, how does Stewart feel? “This is the best T Series we’ve ever made,” he says. “Noticeably so from a distance. Noticeably so when you get it in your hands.”

Wong feels the same way. “I’ve been thinking about this day for six months,” he says.

How about Critchley? “We’re gonna be pretty happy we did this.”

The T400s is certainly not the last new notebook to roll out of Lenovo's and Intel's shops. Someday, a new contender will occupy the spotlight. But for the far-flung team that took its marching orders from a wish list on a cold February day, there's time enough for now to savor the accomplishment.