



T-Systems Brings True Utility Computing to the Enterprise with the Help of VMware Technology

T-Systems' Dynamic Computing Lowers the Cost of World-Class Enterprise Application Hosting



KEY HIGHLIGHTS

INDUSTRY: TELECOMMUNICATION

CHALLENGE

T-Systems sought to create an on-demand, utility-computing platform for delivering applications to the enterprise.

SOLUTION

In concert with other technologies, T-Systems used VMware Virtual Infrastructure to allow multiple customers to share one pool of computing resources, all while enjoying high availability and agile resource management.

RESULTS

- Achieved 30- to 40-percent cost savings over traditional SAP and other enterprise application hosting
- Server utilization increased from under 20 percent to an average of 80 percent
- VMotion allows resource balancing, enhanced availability, and host maintenance with no downtime

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Uwe Wagner, Sales Director, Western Region, T-Systems North America

Bloated Hosting in Need of Workout

T-Systems is one of the world's leading providers of enterprise technology services, from telecommunications to business process outsourcing to information technology. The company, a division of Deutsche Telekom, is also one of the largest providers of enterprise IT hosting, specializing in SAP, but with a practice that extends to almost every major application for the enterprise.

As such, many large organizations contract with T-Systems to host and manage their IT

infrastructure. In the past, large enterprises would purchase servers and other hardware for their IT needs, load it with the appropriate software, and then give the task of maintaining and running this infrastructure to T-Systems at one of the provider's 55 datacenters.

However, traditional application hosting has a major drawback: the startup and fixed costs associated with constructing a world-class IT infrastructure are an expensive proposition. This reality has the negative effect of draining resources from large enterprises, and sometimes completely pricing small and medium businesses (SMBs) out of the market. As Gregory Smith, director of solution design at T-Systems North America, points out, "A classic hosting environment is not very cost-effective, and the smaller the customer gets, the less cost-effective it gets."

This fact is a growing problem both for T-Systems and the independent software vendors (ISVs) whose applications they host. "There are only so many large enterprises who can afford a full-fledged hosted application suite," notes Uwe Wagner, sales director, Western region, T-Systems North America. "But SMBs, for example those in the semiconductor industry, have the same requirements of an Intel or Motorola, whether for supply chain management or business intelligence applications. It's a question of making it cost-effective for them to access those applications."

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In early 2003, T-Systems sought to identify the size both of this problem and the opportunity that lay in addressing it. The first step was when one of T-Systems' customers, a major worldwide auto manufacturer, contracted for an IT infrastructure audit to analyze its server utilization rates. "We analyzed all 3000 of their servers," recalls Wagner, "and it turned out that their utilization rate was below 20 percent, which turns out to be fairly typical of most enterprises server farms. Unfortunately, this means that most of the time an enterprise owns around five times as many servers as it needs in terms of pure computing capacity."

T-Systems knew there had to be a better solution. Continues Wagner, "We got together with SAP and said 'there must be a better, more efficient way to utilize servers.' So we set out to make it happen, and two years later, Dynamic Computing Services was the outcome."

The vision T-Systems had was one of true utility computing. "We wanted to make it so that a customer could come to us and say, 'I want to bring online X more computing capacity for the holiday shopping rush' or 'We have a new project coming online on this date, and need Y more computing at that time' and we could just say 'ok' and put it on their monthly bill," says Smith. "Under the previous model, that discussion would have entailed procuring new servers, standing them up, and so forth. Slow, tedious and wasteful. We saw value in creating a massive pool of computing resources that could be shared among our customers, paid for as operating expense rather than capital expense and variable both up and down."

Formulating the Utility Computing Platform of the Future

At the time T-Systems began to address this problem, many parts of the eventual solution existed, but they didn't yet "play nice" with one another. As Smith puts it, "Some of the pieces were around even then. SAP had the Adaptive Computing Controller, and VMware virtualization technology was available, too." He continues, "But even though the pieces were around, we still had to design the solution. T-Systems had to wrap up all these various technologies from different vendors and add a lot of IP on our own in order to put together a true utility-based platform for delivering applications."

Hardware and software independence was a core requirement for the Dynamic Computing project from day one. "We wanted a hardware-independent, software-independent, utility computing platform such that any enterprise could come to us with pretty much any application, and we could host it," says Wagner. "We wanted to be able to use cost-effective x86 architecture servers, and not be wedded to a particular hardware vendor. That way, we could wring high performance out of low-cost equipment, a key to providing these services at low cost for our customers."

VMWARE VIRTUAL INFRASTRUCTURE AT WORK

- VMware ESX Server on various 2- and 8-socket x86 servers
- VMware VirtualCenter and VMware VMotion on two- and 8-socket x86 servers
- SAN: NetApp NAS Storage
- Guest operating systems include: Linux, Windows 2003 Enterprise, Windows 2000 Advanced Server, Windows XP SP3, Solaris x64
- Applications running in virtual machines include: mySAP Business Suite, SAP Netweaver, SAP Business One, Lotus Domino, Microsoft Exchange, Oracle, SQL Server and MaxDB databases, BEA Weblogic

Hardware independence was one of the features that attracted T-Systems to VMware virtualization technology. “We needed to make sure we could virtualize environments on any hardware, and with any operating system, and this was extremely challenging,” recalls Wagner. “VMware offered the only solution that met those criteria.”

Agile management of resources was going to be a key part of the solution as well. “In order to ensure we could get top performance out of our hardware to keep costs down, we needed to be able to run our servers at high utilization rates,” says Smith. “But at the same time, to show our customers value, we couldn’t have more downtime than a typical hosting Service Level Agreement (SLA) would allow.”

This tension between high availability and high utilization required the kind of deft management that only VMware technology provides. Continues Smith, “In the past, if we saw a server getting near the top of our comfort zone for CPU utilization, we would have had to stop that application to move it to another server. From an SAP standpoint this is a huge problem, in that it means you kill all the buffers, so when you bring it back up again, response time is impeded. And this is largely the case with all enterprise apps.”

VMware VMotion provided the mixture of flexibility and availability that T-Systems needed. “With VMotion, I can move an instance of SAP from one server to another, and the end user won’t even see a blip,” says Smith. “This means that we can run our servers at higher efficiencies without increasing the risk of downtime, and provide more robust SLAs that compare well to traditional hosting—but at a 30-percent discount.”

Worldwide Results

To date, T-Systems has achieved a wide range of benefits with VMware infrastructure in place, including:

- **Server utilization.** “We now see consistent server utilization rates of 80 percent,” says Wagner. “One of the reasons we can confidently tell customers that they can save 30 percent on their hosting costs by moving to Dynamic Computing is that most customers are only running at 20-percent utilization right now. Virtualization lets us unlock that fallow capacity.”
- **High uptime.** “If a customer needs five nines of uptime,” says Smith, “then a classic customized hosting environment from T-Systems would be a better environment for them. But for the majority of customers, SLAs of 99 percent and 99.7 percent uptime work just fine. We can do that at low cost on our Dynamic Computing Platform thanks to the ability to migrate live virtual machines with VMotion.”
- **Hardware independence.** Systems integrators always try to avoid hardware dependency and lock-in. “We didn’t want to get locked in to one hardware provider or another,” says Smith. “And we didn’t want to have to run this on exceedingly high-end, high-cost specialty hardware. VMware’s ability to virtualize on any hardware was essential.”

- **New customer pipeline.** Customers who never could have afforded world-class enterprise applications under the old model have been eager to get take advantage of the efficiencies provided by the Dynamic Computing model. "We're seeing a lot of traction in the mid-market" says Smith.
- **Fiber pipe utilization.** Deutsche Telekom has a network of fiber lines spanning the globe. Thanks to the ease of moving virtual machines using VMotion, T-Systems is free to place data centers wherever they need to be, unconstrained by bandwidth issues. This allows Deutsche Telekom to further leverage their infrastructure investments.
- **Labor arbitrage.** Thanks to VMware's robust management tools, the labor to manage T-Systems' infrastructure can be located nearly anywhere, which helps on costs. Says Wagner, "A piece of hardware costs the same in Mexico or Switzerland. However, the cost of people to run that hardware can vary substantially. For example, our Frankfurt Dynamic Computing data center is managed by highly qualified teams operating out of Slovakia and Hungary."
- **Plug n play hardware upgrades.** "Thanks to the ability to use VMotion to move virtual machines off a server with no downtime, we have a lot of flexibility," says Smith. "For example, if there's a hot new server that we want to add to the resource pool, we can do that without taking down anyone's application."

Worldwide Expansion

As a result of the traction that T-Systems has seen with Dynamic Computing, with 40 customers up and running in the Frankfurt, Germany, data center, the company is already looking to expand worldwide. "We're opening a data center in Jacksonville, Florida, for customers who require that their data reside on U.S. soil, and one in Shanghai for customers who prefer their data stay inside China," says Wagner. "The nice thing about the strong management tools VMware provides is that we can pay attention to political concerns and other requirements and not have to worry about where we site data centers."

Dynamic Computing is looking to expand into other practice areas with other software vendors. "Like I said, we wanted this platform to work for any software on any hardware," says Wagner. "We just partnered with an ERP provider that has a very manufacturing-centric system to devise a new delivery model to penetrate the SMB market. They came to us to do that, and we solved that problem for them, and now are looking at their 1,100 current customers as a potential market for us. We're really looking forward to ramping this up and seeing how far we can take it."

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