



Case Study  
Intel® vPro™ Processor  
Technology  
Government  
Transportation Industry

# Training Its Sights on Advanced Rail Performance

## Jinan Railway Bureau Boosts Railway Management Efficiency and Security with Intel® vPro™ Processor Technology<sup>1</sup>

Jinan Railway Bureau, which oversees a major transport artery in eastern China that connects four of the country's most important export hubs, has seen its services improve by leaps and bounds recently.

It is not just the speed of its train services, but also the backend systems that enable the Bureau to schedule and keep track of its super-fast trains.

With the faster delivery of train services in response to China's sixth nation-wide train speed-up initiative, Jinan Railway Bureau saw the need to upgrade and expand its IT infrastructure to keep up with the heavier service loads that come with its speed boost.

Along with its new infrastructure, the Bureau also deployed a solution that could 'sense' the health of its network, 'predict' the operational status of its PC assets based on automatic collection of data, and then 'act' upon the information by utilizing remote management technology.

In doing so, Jinan Railway Bureau has paved the way as a pioneer in leveraging remote PC management technology for train services management in mainland China.

"In choosing Intel® vPro™ processor technology, we not only considered performance issues, but also investment protection issues. Intel vPro processor technology is a forward-looking architecture that will serve Jinan Railway Bureau well into the next decade."

Liu Teng  
Director  
Information Technology  
Institute of Jinan  
Railway Bureau

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### Challenge

- With the sixth speed up of China's railway system underway, Jinan Railway Bureau requires greater in-time data collected from railway lines to facilitate overall system management and train security.
- However, frontline rail workers possess very few or no PC skills, a bottleneck that can potentially cause delays in the Bureau's railway management.
- Additionally, casual PC mistakes on railway lines can cause issues that require the on-site presence of IT support staff, a time-consuming and labor-intensive process that impacts critical PC usage.

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### Solution

- In planning the new Permanent Way Management Information System (PWMIS) deployment for Jinan Railway Bureau, the IT department of China's Ministry of Railway (MOR) looked into adding manageability features at the PC hardware level to tackle manpower issues.
  - Hardware-based PC management capabilities provide Jinan Railway Bureau with the ability to better monitor and recover their PCs in daily operations, bypassing the hassle of on-site PC operations and regular maintenance.
  - In addition, Jinan Railway Bureau enjoys added flexibility in embedding hardware-based management features directly into their specially developed railway management software applications.
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# Intel® vPro™ processor technology does the legwork for Jinan Railway Bureau, reducing time-consuming on-site visits



## Spotlight: Jinan Railway Bureau

- Jinan Railway Bureau is one of 18 railway bureaus across the country.
- The Bureau's jurisdiction extends over 2,847km of railway tracks across the various major eastern provinces, namely Shandong, Jiangsu, Anhui and Henan, and consists of Beijing-Shanghai Railway, Beijing-Jiujiang Railway, Longhai railway, Jiaoji Railway etc.
- In all, Jinan Railway Bureau operates 14 main railway lines and other 21 branch lines, along with a total of 334 passenger stations.
- Jinan Railway also connects four of China's most important ports - Qingdao, Yantai, Rizhao and Lianyungang. These four ports are key export hubs, serving as important channels of eastern China's economic development.
- The Bureau employs a total of 142,707 service, support and administration staff.
- Held up as a role model by the MOR for efficiency through the use of technology, Jinan Railway ranked 17 out of 500 in a list of China's Largest Service Enterprises in 2002 and plays an important role in key MOR projects such as operations management, ticketing, carrier systems and finance systems, among others.
- With the sixth country level train speed up underway since April 2007, Jinan Railway Bureau's trains now service customers at an average of 200 km/h.

\*\*Source: Jinan Railway Bureau

## Assessing the Situation

The preparation work to cope with Jinan Railway Bureau trains' speed boost from 120km/h originally to 200km/h today did not come easy though.

According to the Director of Information Technology Institute of Jinan Railway Bureau Liu Teng, the backend IT support structure for trains drastically changes at speeds approaching 200km/h.

"At these speeds, the data services that are needed to drive the smooth operations of the railway infrastructure as a whole starts to spike upwards exponentially in terms of service load and your IT infrastructure needs to support that level of service demands with minimal downtime," says Liu.

An overall increase in the speed of its trains means that Jinan Railway Bureau would need to keep constant track of each individual train on each leg of its journey in order to maintain traffic order and ensure the security of the train as well as its passengers and cargo.

Initially faced with these logistics issues of train status and security, the Bureau sought to overcome the challenges by installing PCs at the frontline of its railway infrastructure, extending the reach of its PWMIS systems to capture the necessary data required.

However, in doing so, Jinan Railway Bureau faced another challenge - Its frontline rail workers possess very few or no PC skills, a bottleneck that can potentially cause delays in the Bureau's railway management.

In addition, even simple PC mistakes on railway lines can cascade into issues that could impact critical PC applications and require the on-site presence of IT support staff, a time-consuming and labor-intensive process that Jinan Railway Bureau simply could not afford.

"The odds are stacked too high on the event that even if just one PC requires immediate attention, no one on-site can fix it immediately and we would have to dispatch technical support personnel to rectify the situation while we wait out the downtime," says Liu, "The consequences of that happening is simply unacceptable to us, so we sought to find an alternative solution."

The answer was straightforward - Deploy PC systems running on Intel® vPro™ processor technology across its railway infrastructure for predictive management, remote operations as well as in-time support and response.



**"Intel® vPro™ processor technology consolidates our numerous and disparate information systems into one coherent, easily manageable data hub, enabling Jinan Railway Bureau to meet our information needs."**

Liu Teng  
Director  
Information Technology  
Institute of Jinan  
Railway Bureau



## Delivering the Solution

Through the deployment, 117 units of PCs running on Intel® vPro™ processor technology are installed at various train station as replacements while other new purchases are deployed at the Bureau's Railway Maintenance Group as well as near rail lines to monitor railway status for transportation safety.

Together, the Intel vPro processor technology-enabled PCs form the extended arm of Jinan Railway Bureau's PWMIS, allowing Jinan Railway Bureau to deploy distributed PC assets along its rail lines to monitor and keep track of its train traffic.

Intel vPro processor technology also delivers centralized PC management capabilities such as remote computer status tracking, remote power on/off, remote PC asset collection, remote IP address setup, network configuration, remote PC troubleshooting and system recovery capabilities to Jinan Railway Bureau, among others.

Leveraging on the integrated, hardware-based Intel® AMT manageability capabilities in Intel vPro processor technology, Jinan Railway Bureau is now able to address its manpower and maintenance issues.

For example, by collecting PC data remotely, technicians can analyze the information for fault

prediction, and pre-empt potential issues by administering, maintaining and even restoring its distributed PC assets regardless of OS or power state, bypassing the hassle of on-site PC operations and regular maintenance.

In addition, Jinan Railway Bureau enjoys added flexibility in embedding hardware-based management features directly into their specially developed railway management software applications.

This was accomplished with exhaustive support from Intel, who has been engaged with Jinan Railway Bureau engineers from the start in researching how best to integrate the Intel AMT functions of Intel vPro processor technology with the Bureau's new PWMIS applications.

In light of the advantages offered by Intel vPro processor technology, Jinan Railway Bureau could not be happier.

"Intel vPro processor technology not only benefits our PWMIS, but also all our other systems as well. We are now able to integrate all of our other systems into a coherent, remotely manageable IT infrastructure. This gives Jinan Railway Bureau unprecedented control over our hardware assets and subsequent maintenance workflow," says Liu.

**"With Intel® vPro™ processor technology, our frontline railway staff can now focus on their core competencies instead of worrying about PC issues."**

Liu Teng  
Director  
Information Technology  
Institute of Jinan Railway  
Bureau

### Key Technologies

- 117 Lenovo ThinkCenter M55P PCs running on Intel® vPro™ processor technology<sup>1</sup> form the frontline PWMIS deployment for Jinan Railway Bureau, delivering a steady stream of data for the Bureau's digital railway management systems.
- Intel vPro processor technology allows Jinan Railway Bureau to remotely inventory distributed IT assets.
- Incorporating Intel® Active Management Technology (Intel® AMT), Intel vPro processor technology further enables Jinan Railway Bureau to initiate remote startup, shut down and reboot regardless of power and operating system (OS) status.
- Intel vPro processor technology also allows Jinan Railway Bureau to remotely administer the network settings of its PCs' Intel AMT and OS features.
- In addition, Intel vPro processor technology delivers backup and restores capabilities to Jinan Railway Bureau, giving the Bureau peace of mind with its software and data applications.

### Integral Answers

- Intel technical consultants work hand-in-glove together with Jinan Railway Bureau engineers to support the Bureau's extensive Intel vPro processor technology deployment.
- In addition, Jinan was provided with an Intel AMT Reference Design Kit (RDK) to facilitate the rapid integration of Intel AMT into manageability applications.
- With such strong support from Intel, Jinan Railway Bureau was able to develop a remote system software maintenance system based on Intel AMT.
- Jinan Railway Bureau's software maintenance system realized the full potential of the remote management aspects in the Bureau's railway IT infrastructure from branches to stations and engineering sites.

"Furthermore, the manageability features of Intel vPro processor technology allow us to cut down on time-consuming and potentially costly site visits, reducing PC downtime and extending the reliability of our PWMIS," he adds.

With the successful deployment of Intel® vPro™ processor technology, Jinan Railway Bureau has scored an industry first in leveraging remote PC management technology for predictive train infrastructure management in mainland China.

Jinan Railway Bureau is also the first train authority in China to deploy PCs running on Intel vPro processor technology at the frontline of its rail infrastructure, benefiting from the data capture and management, access and analysis capabilities offered to keep its distributed PC assets up and running.

In doing so, Jinan Railway Bureau has once again demonstrated its forward-looking vision in technology deployment, a vision that will certainly serve the Bureau well as China's railway services roll confidently into the next decade.

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**Solution provided by:** *lenovo*

## Return on Investment

- With the successful deployment of Intel® vPro™ processor technology in Jinan Railway Bureau's PWMIS, the Bureau can now capture train data on time, ensuring the integrity of its management systems as well as the security of the trains under its jurisdiction.
- Intel vPro processor technology also allows Jinan Railway Bureau to realize lowered maintenance and manpower costs from the remote administration of its distributed IT assets.
- Additionally, Intel vPro processor technology-enabled remote PC administration allows Jinan Railway Bureau to smoothly manage PCs that host its critical PWMIS applications, ensuring minimum downtime that may cause potentially dangerous obstructions to its train services.
- Jinan Railway Bureau's development of proprietary management software based on data provided by an Intel RDK further saves unnecessary third-party software vendor costs, lowering the Bureau's total cost of ownership.

\*\*Source: Jinan Railway Bureau



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1 PCs with Intel® vPro™ technology include Intel® Active Management Technology (Intel® AMT). Intel AMT requires the computer to have an Intel AMT-enabled chipset, network hardware and software, connection with a power source, and a network connection.

\*Other names and brands may be the property of their respective owners.

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