INDUSTRY: METALS, MINERALS & MINING

Lonmin Platinum

www.lonmin.com

"In my view, the most appealing aspect of this project was that we could use old existing technology and incorporate it with ArchestrA as a solution to our Remote View problem. With this technology, we gained a lot more control than expected over the remote viewing of SCADAs."

Johan Louw,
Automation Specialist,
Lonmin Platinum

IT in Manufacturing - Lonmin Shows the Way

by Wonderware Southern Africa

Goals

- Provide the office with real-time production and process information;
- Provide clearer insight into active processes.

Challenges

- Maintaining the independence of IT and production networks while providing the necessary information;
- Maintaining inter-disciplinary security;
- Providing the office area with plant information in real-time while conforming with all security policies and all at minimum cost.

Solutions and Products

- Wonderware InTouch HMI;
- Wonderware InTouch HMI for Terminal Services;
- Wonderware System Platform.

Results

- Real-time process information is available in the office to support informed decision-making;
- Independence of IT and production networks while providing a secure access from one to the other;
- Easy and secure end-user access to multiple applications;
- No interference with SCADA system operation possible;
- Greatly reduced software support, maintenance and deployment costs;
- High system speed and minimal network loading.

Marikana mine complex, South Africa - The bidirectional flow of information between business IT and manufacturing IT is critical to real-time decision-making at all levels but presents its own set of problems regarding security. The owners of these networks are naturally weary of providing access to information and functionality which could prove dangerous in the wrong hands.

Background

The original IT network had a flat topology with a DAS I/O server collecting data from the PLCs and communicating this to view stations for the shift boss, mine captain or engineer (figure 1). But, in order to conform with security policies, it was decided to separate the control network from the IT network which resulted in the topology shown in figure 2 where the production and control networks are two VLANS running on one control domain separate from the IT domain. The production and control networks are present in the control rooms, process plant and in the production areas but not in the office areas.

This arrangement, however, disconnected the shift boss, mine captain and engineer from the SCADA system and they lost the ability to view production information in real-time. To address the problem, a DMZ (Demilitarized Zone) was implemented. A DMZ is a network that serves as a buffer between a secure protected network (Control Network) and an '*insecure*' client network (IT Network). A DMZ usually contains servers which provide services to users from the client network, such as the web and, in this case, terminal services. These servers are open to limited access from the client network, but protected by a firewall. But this brought with it the issue of how to deal with security because office personnel could not be allowed unqualified access to the control systems.
One way around this was to deploy additional view stations on the control domain only by extending the network and its infrastructure (equipment, fibre links, PCs, etc.) but this would prove costly per view station and would also require time to implement.

The challenge therefore, was how to provide the office area with plant information in real-time while conforming with all security policies and at minimum cost.

Selecting The Solution

Three approaches were considered. The first was to use Wonderware System Platform read-only view stations but this would incur the additional network infrastructure costs just mentioned and require the ability to maintain multiple applications.
"The second option was to make use of the Wonderware Information Server (part of Wonderware System PLatform)*,"* says Johan Louw, automation specialist, Lonmin. *"Although Wonderware Information Server allows access from any network PC, this was a real-time SCADA reporting environment which this solution supports but which is better served by the third option which was the use of InTouch HMI for Terminal Services."*
InTouch HMI for Terminal Services, which supports Microsoft's Remote PC Connection, provided Lonmin with a list of features that met their specified requirements with a remarkable degree of accuracy and which included:

- **No Wonderware installation required** – this allowed Lonmin to be self-sufficient;
- **Quick Implementation** – *"Where some engineers expected me to me busy for an hour or more, I was finished in a matter of two to three minutes,"* says Louw;
- **Easy access and security control** – all access to the system is controlled from one server and this allows the full control of where SCADA access is available and also provides for the instantaneous granting or withdrawal of access rights to individuals. It was previously impossible to know who had access to which SCADA system or if this access was permitted;
- **Easy application maintenance** – all applications are maintained and updated at a central location without the need for deployment to a multitude of workstations. *"The traditional approach is to load*

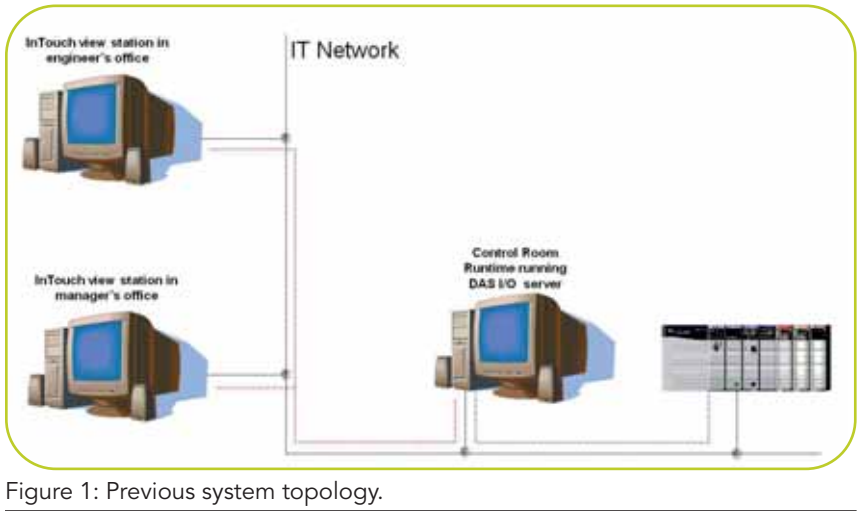

Figure 1: Previous system topology.

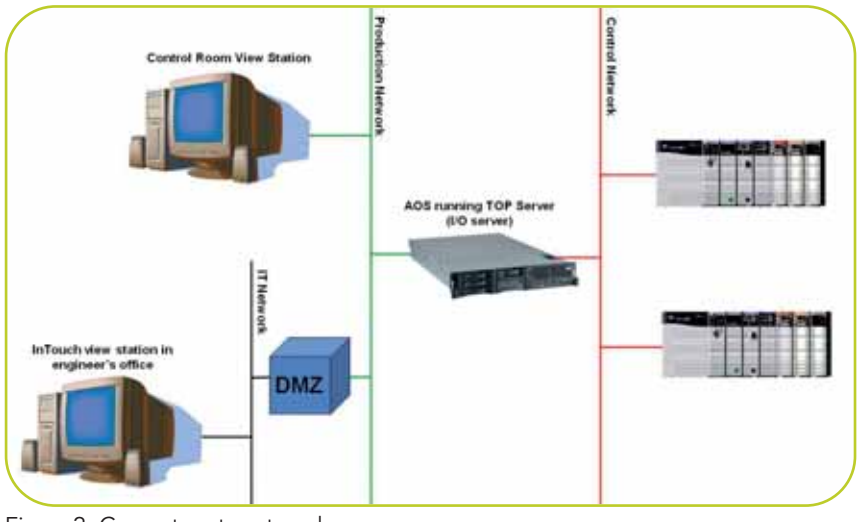

Figure2: Current system topology.

the operating system on each and every workstation which may all be in widely-separated locations, configure the networks including their security, load service patches and finally load the application software with service patches," says Louw. *"Needless to say, this can be very time-consuming and costly not to mention inconvenient. With the Terminal Server architecture, everything is done once only at a central location and end-users all have simultaneous access to multiple applications, all of which are up-to-date."*

- **Multiple applications hosted on one server** – all of Lonmin's multiple mine shafts, each with its own SCADA system and applications, can be hosted on a single server thereby providing convenient access to those who need it;
- **Client can view multiple applications at once** – terminals are not dedicated to any single application and can switch between applications at will.

"Finally, InTouch HMI for Terminal Services gave us the speed we were looking for while also minimising the load on the network," says Louw.

Implementation

The first step was to set up InTouch HMI for Terminal Services and to install the Terminal Server (read-only) edition of the InTouch HMI application. *"The read-only version prevents any user from changing / stopping or starting any equipment on the SCADA. We then deployed the System Platform and its view engine as well as all the applications,"* says Louw. *"The next step was to define user access and their sessions which involved specifying which applications each user can access. Thereafter, the only thing left to do was to set up remote access to the server – something which is really quick to do."*

Applications start automatically when selected but server access beyond the permitted range of applications is prohibited thereby preventing any wilful or inadvertent damage to the system. The application run time can also be specified so that if a shift boss or engineer forgets to sign off from the application, it will self-terminate in the specified time period. This feature also lessens the network and server loads.

The Wonderware System Platform's Integrated Development Environment shows which platform and view engine is in use as well as changes to any software releases. New software releases can then be deployed to all remote users instantly.

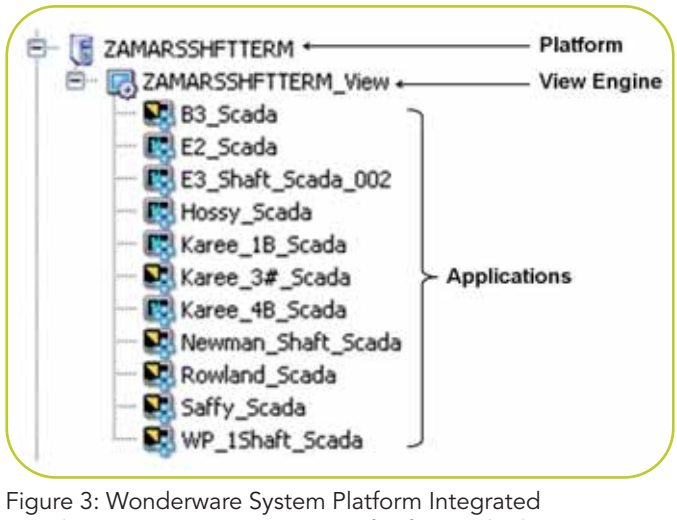

Figure 3: Wonderware System Platform Integrated Development Environment view of software deployment.

Conclusion

This is yet another example of Wonderware Systems Platform's underlying ArchestrA technology providing improved ROI on existing assets by incorporating them in such a way as to satisfy a current need. As the boundaries between the top floor and the shop floor blur in the interest of improved information delivery, addressing security issues between networks is becoming a common problem. This implementation is characterised by the way it addresses this safety issue while providing management with the real-time decision support needed for effective control – all in an environment which is flexible, easily expanded and simple to maintain.

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