

Mining Giant Delivers Platinum-class Production



Anglo Platinum cuts cost of ownership and device response time with the Cisco Ethernet to the Factory solution.

EXECUTIVE SUMMARY	
Anglo Platinum—Process Plants	
<ul style="list-style-type: none"> • Mining/Metals • 65,000 Employees 	
CHALLENGE	
<ul style="list-style-type: none"> • Reduce downtime at widely dispersed facilities • Enable instantaneous and remote management of plant operations • Implement easy-to-upgrade solution that reduces costs and maximizes process efficiencies 	
SOLUTION	
<ul style="list-style-type: none"> • Cisco Borderless Networks connects network services to applications • Cisco Ethernet to the Factory (EttF) enables secure access to real-time operations data 	
RESULTS	
<ul style="list-style-type: none"> • Device response time reduced from seconds to milliseconds • Overall total cost of ownership cut to one-half industry average • Improved business decisions with real-time information on production systems 	

Challenge

The Anglo Platinum Group is the world’s largest producer of platinum-group metals. Its 65,000 employees throughout South Africa engage in the full range of mining operations including underground and open-cast mines, concentrators, smelters, and refineries. Besides its ongoing operations, Anglo Platinum has green field/brown field projects and joint ventures. To launch these projects successfully and outpace competitors, the company’s challenge was to deliver services more efficiently while enabling rapid adoption of technology at a reduced cost. Multiple opposing requirements surfaced including: remote maintenance of the control solutions to reduce turnaround times on after hours break downs and easy access to data to facilitate the analysis and management of the operation while maintaining the security of the control solutions. Finally, the network needed to help the company consistently enforce business policies such as safety regulations and documentation of compliance activities.

Over the past 10 years, the complexity of Anglo Platinum’s environment has grown exponentially. For example, the nature of its process control networks (PCN) had changed from small isolated networks consisting of 2-4 servers and maybe half a dozen clients to complex multi-layer networks with connections to the outside world consisting of 30+ servers and 10-20 clients.

This complexity was a challenge, according to Theo van Staden, Anglo Platinum’s head of infrastructure for the process environment (IT). He adds, “the current reality in our operational environment is that systems/process

engineers do an excellent job of keeping sites running but are under increasing pressure to ensure network availability, which is not their core function.”

Optimizing systems utilization, for example, depends on an uninterrupted product flow between the concentrators, smelters, and refineries. “Because the sites are in remote areas, they experienced high costs for critical services, support, and maintenance,” says van Staden. “There was no standard implementation, and the disparate technologies meant that each operation acted in isolation and was difficult to support and manage.”

To achieve its business objectives and exercise control over data traffic, Anglo Platinum needed to reduce these costs as well as virtually eliminate network downtime.

Solution

The company realized that its key challenge was bridging the gap between on-site process control systems and business-critical IT decision-making systems. It embarked on an intensive analysis followed by several initiatives including value-based management, of which asset optimization is one of the pillars.

Anglo Platinum developed a strategy to integrate the radically disparate worlds of the process control networks and the corporate data network into a secure platform for enterprise-wide dash-boarding and decision making at all levels of the operation. The strategy addressed key objectives including business continuity, security, total cost of ownership, skills availability, and reduced complexity. In addition, Anglo Platinum wanted to establish standards and a plan for scalability and future integration with process-oriented Supervisory Control and Data Acquisition (SCADA) solutions.

The first step had already been taken a few years ago when Anglo Platinum deployed a Cisco® Wide-Area Application System (WAAS) between the company's headquarters and several remote sites. Then, in 2007, Anglo Platinum adopted Cisco Borderless Network Architecture to design advanced network capabilities into its network infrastructure. This network architecture with three interconnected layers (everything over IP; virtualization; and service orientation) creates a customized, easily manageable bridge between network hardware and mission-critical enterprise applications.

The critical technology deployment, however, was to link enterprise IT networks with production process control networks. Process networks typically utilize multiple protocols at different network levels (device, control, information). Furthermore, the various automation vendors that are used deploy different controls and communications protocols. Anglo Platinum also opted for the Cisco Ethernet-to-the-Factory (EttF) solution, because it provides an end-to-end infrastructure that includes support for industry standards and ruggedized hardware for harsh environments. EttF is part of the suite of Cisco Smart+Connected Manufacturing solutions designed to help manufacturing companies successfully connect plant and business systems. EttF also provides real-time visibility into production systems and offers predictable performance and system resiliency. In fact, the decision to adopt EttF centered on a number of reasons, including:

- Increased complexity in the plants and increased data logging with a requirement that this data is made available to the engineers and other systems. The need for remote access, for example, is key to a metallurgist getting his/her job done.
- The networks went from isolated networks to being connected to the IT network at the same time as the threats to networks in general were increasing from viruses and hackers. This has led to the creation of DMZ style networks; which has added complexity to the control solutions.
- Control systems have been changing from running specialized versions of UNIX and VAX to more general purpose operating systems like MS Windows which has in turn increased the vulnerability of the

systems.

- The sheer amount of instrumentation on the plants has radically increased.
- Lack of skills had forced AP to utilize external companies to remotely support certain systems and centralize other skills; the advanced process control group is an example of the latter. One final objective of the company was to build an in-house competency for support and maintenance.

EttF helps alleviate these issues today by ensuring that the control network and the overall operation infrastructure of Anglo Platinum's plants function efficiently and seamlessly.

“Anglo Platinum’s cost of ownership fell to one-half the industry average after the Cisco EttF deployment. Now, we can ensure the availability of systems and support from a central location and have comprehensive visibility and reporting.”

—Theo van Staden, head of infrastructure (IT), Anglo Platinum

“By implementing a sensor-to-boardroom operating paradigm, Cisco EttF provides the enterprise-wide, on-site visibility that is the critical element to improving business performance and decision-making both at factory floor layer and the boardroom,” says Paul Wheeler, Cisco regional sales manager for manufacturing, mining, and distribution industries.

Anglo Platinum chose Business Connexion (BCX), a Cisco business partner, and Advanced Technology Services (ATS) to advise on this strategy. An in-house Anglo Platinum team effectively managed the deployment from the design, physical layout, and project management to ensure minimal downtime in the plants.

Results

The transition from an environment that was virtually impossible to support to an environment that is supported by a small team centrally has been dramatic. “Anglo Platinum’s cost of ownership fell to one-half the industry average after the Cisco EttF deployment. Now we can ensure the availability of systems and support from a central location and have comprehensive visibility and reporting,” says van Staden. “It also meant that we could align business SCADA systems to conform to best-practice recommendations and implement services such as antivirus,” he adds. “We were also able to roll out a common domain (AD), remote access through a reliable solution which is secure and safe.”

The Cisco solution has enabled stakeholders to have a “secured and authorized” top-down view on production from any location, reducing turnaround times on decision making and helping ensure availability and continuity of all critical systems in Anglo Platinum Process plants.

“Most importantly,” says van Staden, “We are now in a position to deliver support to all operations from a central location, this puts management in a situation to make educated decisions and ensure availability which will ultimately benefit production.”

According to van Staden, so far Cisco EttF has been installed in all process plants in Anglo Platinum. Some of the benefits for the company include:

- more standardized, scalable solution that can be expanded at lower cost,
- flexible infrastructure that improves responsiveness and faster decision-making,
- ability to maintain quality and production uptime with better visibility, and
- mitigated security risks such as unauthorized access, unauthorized actions by authorized individuals, and

interception of data.

PRODUCT LIST

Switches

- Cisco Catalyst® 3750 Series Switches
- Cisco Catalyst 2960 Series Switches
- Security and VPN

Firewall

- Cisco ASA 5510 Adaptive Security Appliances

“If we don't have systems availability, we don't make platinum,” says van Staden. Cisco Ethernet to the Factory and Borderless Networks have helped the company to not only attain that fundamental operational goal but outpace its competitors as well.

For More Information

To learn more about Cisco Smart+Connected Manufacturing solutions, please visit www.cisco.com/go/manufacturing



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