

## **Business Case for Utilizing Rajant BreadCrumb® Technology in Mining**

*Maximizing Utilization of High Capital Value Equipment Delivers  
Production, OpEx, Safety and Environmental Benefits*

Rajant Corporation, November 2007

*“With an eye on their profit margins and the continued threat that the price of commodities like gold, copper and iron may fall, it's a fair bet that the big mining companies will be keeping the pressure on manufacturers to constantly eke more efficiency out of their machines.”*

- Special Report 2007, Mining-Technology

# **Business Case for Utilizing Rajant BreadCrumb® Technology in Mining**

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## **Executive Overview**

Rajant Corporation enables significant improvements in mine-wide operational processes and ownership savings by providing an advanced, high speed communication networking structure that results in:

- Increased ownership savings and operational efficiencies
- Real-time communications
- Real-time monitoring and control
- Easy to deploy, expandable and adaptable
- Enhanced safety response and accident aversion
- Minimal fixed infrastructure
- Single-switch operation and minimal IT support

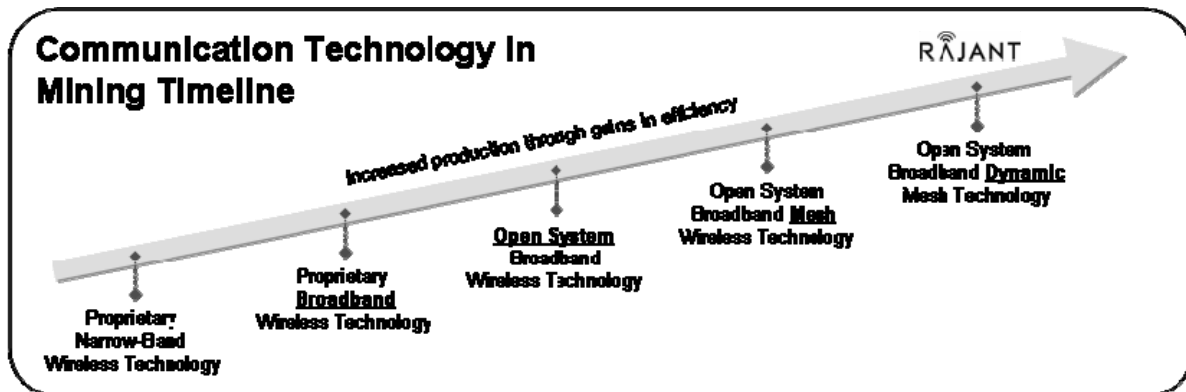
Rajant Corporation, based in Malvern, Pennsylvania, has developed proprietary software and wireless meshing technology that is currently being utilized around the world in numerous mission critical military and first response applications. Rajant's technology is now recognized within the mining industry as a viable networking tool that creates situational awareness and communication, reaching previously unmet efficiency quotas.

## **Technology Overview**

Rajant's InstaMesh® is the intelligence that manages hundreds of connections from Rajant devices (known as BreadCrumb® units) to other stationary or moving devices. Traditionally, mesh networks have difficulty adapting to physical changes in a wireless network creating excessive lag times up to thirty minutes. By the time the network stabilizes, a node could have been moved or line of site could have been blocked and the stabilization process starts again resulting in additional lost time and data. InstaMesh® technology is always one step ahead of any changes in the network with rootless meshing that adapts in real-time. Miners, wireless phones, wireless cameras, haul trucks, shovels, loaders and other equipment move around in normal operation without lag in communications. The network immediately adjusts to moving devices and changing elements in normal mining operations. The system is an easily configured one button operation, self-healing and extendable without the need of an on-site IT specialist.

Rajant's technology provides portable wireless mesh networks that utilize open standard 802.11 protocols to provide the necessary communication backbone for real-time decision making. Using open standard Wi-Fi (IEEE 802.11) enables commercial off-the-shelf devices such as laptops, PDAs, handheld computers, video cameras, sensors, VoIP-enabled phones and other devices to connect to the Rajant mesh network. According to Gartner-Dataquest, there are currently over 500 million Wi-Fi devices in the market today and by the end of 2007 68% of all new portable and mobile devices will

be Wi-Fi enabled. Open systems standards keep the cost of technology low, and give the mine operator many choices in equipment providers.



Quantifiable benefits from Real Time Data are expected when more operational data has been evaluated, with potential for a 1-5% increase each in:

### 1. Productivity Gains

- Dispatch of vehicles through improved equipment utilization
- Haul road route maintenance and metrics
- Ore Control and load metrics
- Asset management
- Truck payload monitoring
- Productivity monitoring
- Position monitoring, grade control and machine guidance
- Stockpile guidance and control

### 2. Equipment/Maintenance Savings

- Fuel level
- Tire health and extended life
- Engine health
- Maintenance records

### 3. Safety Enhancements

- Proximity Detection and Collision Avoidance
- Video camera surveillance
- RFID tagging – miner, equipment location/tracking
- Emergency Response Communications
- Miner tracking
- Operator video surveillance

### 4. Cost Benefit Analysis/ROI – Rajant estimates that a mine's average investment in the wireless network would pay for itself in under a year

due to combined increases in production, savings in equipment costs and increases in safety.

Typical example for medium sized mine:

*Original Rajant Investment of \$500,000*

- Faster decision making for dispatching increases shift loads to \$20,000 per month; equates to savings of \$240,000 per year
- Extended tire life savings of 4 tires per year at \$60,000 each equates to \$240,000 per year
- Savings in 1 major engine rebuilds at \$80,000 per year
- Reduced cost of traditional fixed wireless infrastructure \$150,000

*Total Savings of \$710,000 – payback within 9 months.*

5. **Trusted Source with Kennecott** - Rajant Corporation, recently announced that its BreadCrumb® wireless mesh system had been selected by the Kennecott Utah Copper Corporation (KUCC) wholly owned subsidiary of Rio Tinto as its primary communications platform for operations within the Bingham Canyon Copper Mine, the world's largest open-pit copper mine. The Rajant BreadCrumb® system will enable KUCC to gain additional operational efficiencies by tracking, monitoring and managing its copper mining operations.

### **Summary**

Rajant's BreadCrumb® network is a ruggedized, reliable, high-speed enabler to application specific systems on a common communications backbone. The instantaneous deployment of BreadCrumb units allows mines to immediately maximize their capabilities of *achieving gains of up to 10% in productivity.* Rajant's InstaMesh® features require minimal fixed infrastructure, thus reducing overall cost of ownership.