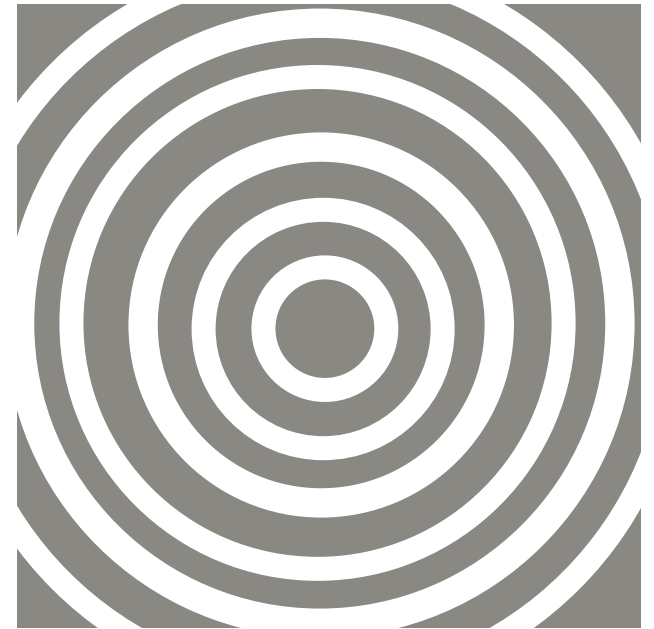




# Wireless Sensor Networks

**Can you Sense the Revolution?**





# Agenda



- **Crossbow Corporate Overview**
- **Wireless Sensor Network Market Overview**
- **Customer References**
- **Crossbow Product Portfolio**



# Corporate Overview



- **Global Leader in Sensory Systems**

- Founded 1995
- MEMS-Based Inertial Systems
- Wireless Sensor Networking

- **110 Employees World Wide**

- **\$25M in Venture Capital**

- Cisco Systems, Intel Corporation
- Morgenthaler Ventures, Paladin Capital



San Jose Headquarters





# Inertial Markets



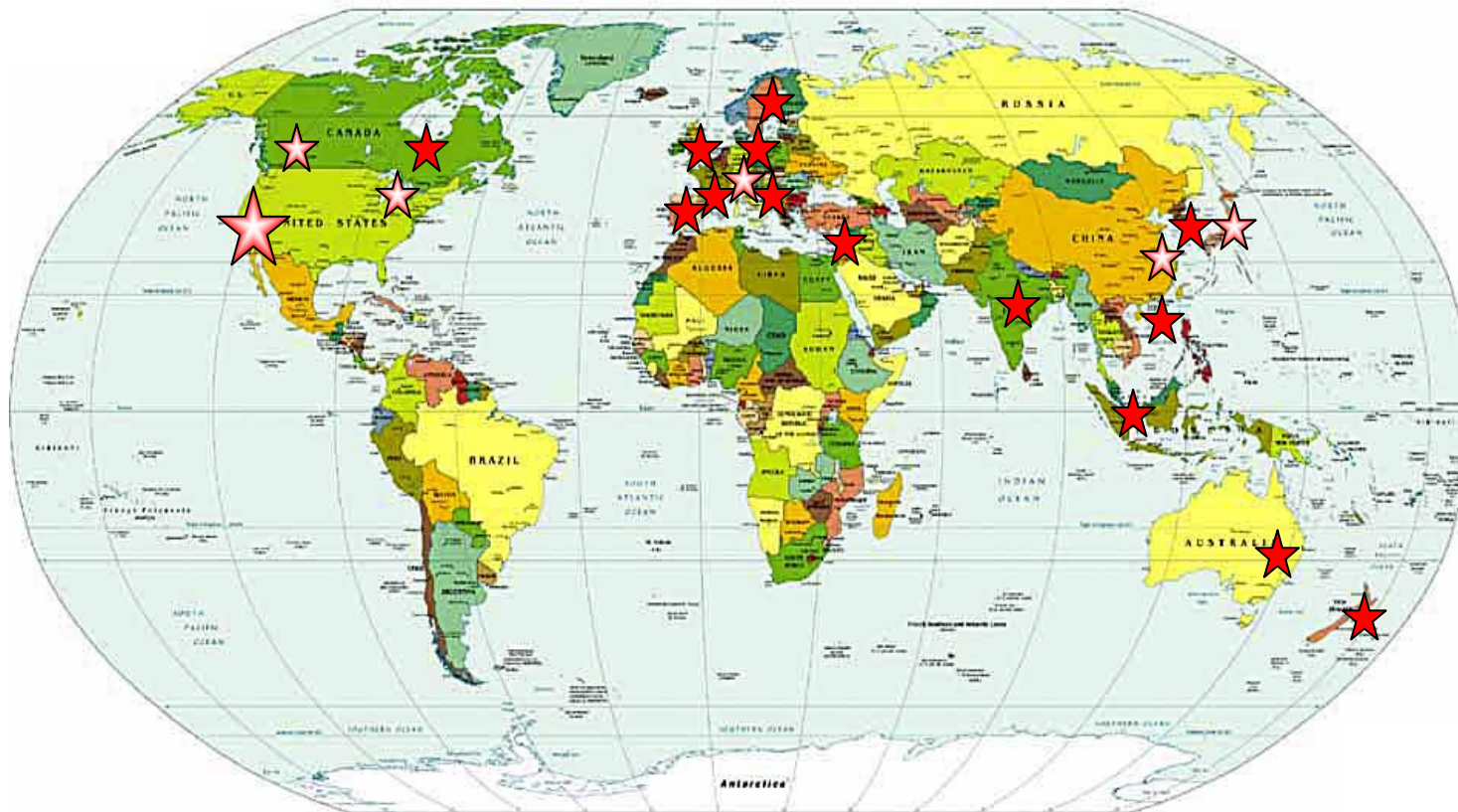
## ■ Sensor Systems for Avionics and Land Vehicles

- First Silicon MEMS IMU/Gyro System
- First MEMS Gyro FAA certification





# Crossbow World-Wide



## ★ Crossbow

United States

Europe/Switzerland

Japan

China

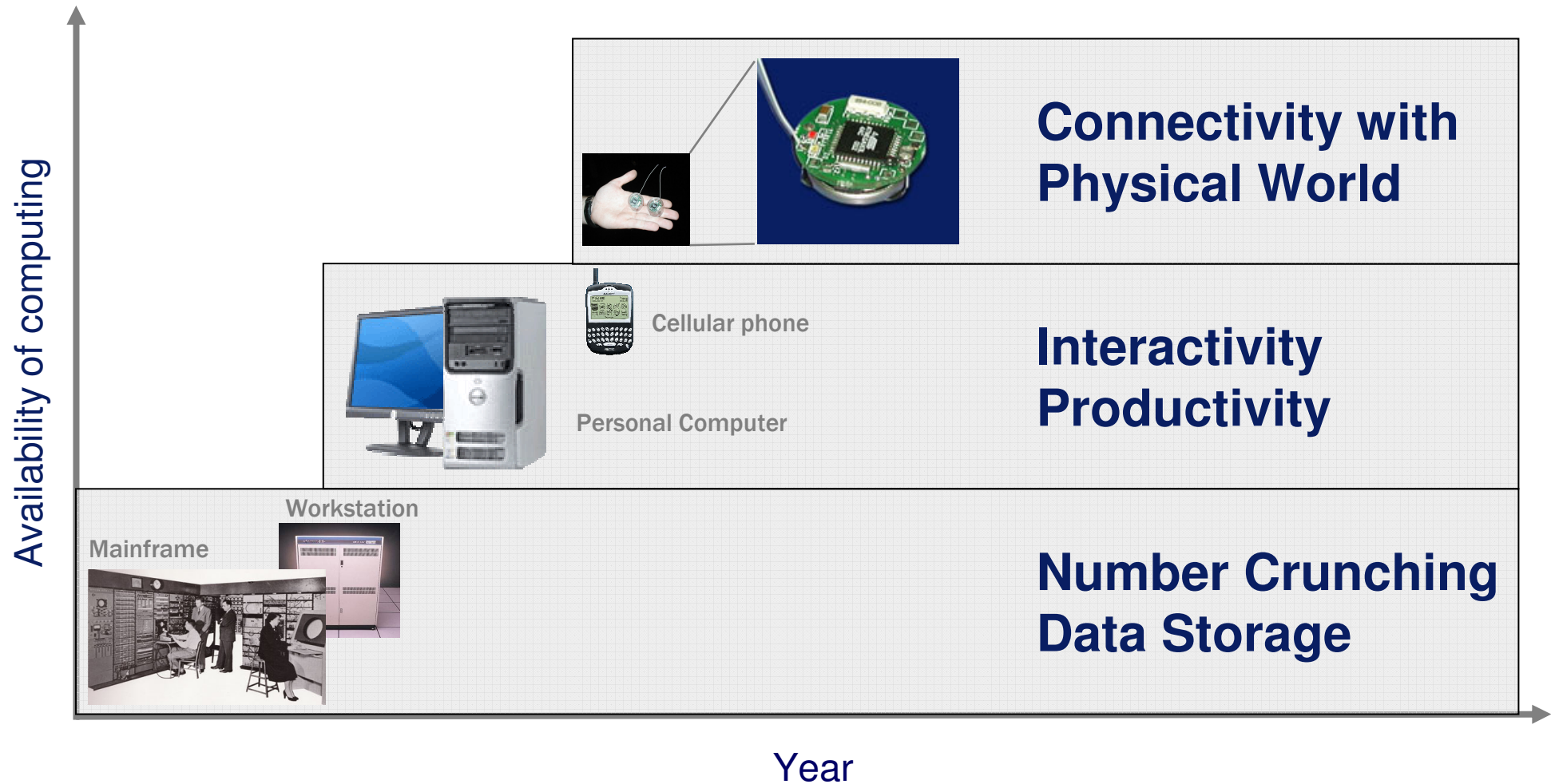
## ★ Distributors

Most European  
Countries

Key Asian Markets



# The Physical Internet





# Commercial Deployments



**Industrial  
Automation**



**Building  
Automation**



**Asset  
Tracking**



**Environmental  
Monitoring**



**Research,  
Education**

## ■ **Commercial Grade Technology**

- Reliability, Scalability, Security
- Flexibility and Ease-of-Use

## ■ **Standards**

- ZigBee Alliance, ISA SP100



# Customer Case Study – Life Fitness



## ■ Task

- Life Fitness VIVO product line
- Wireless Network for Fitness Equipment to Download and monitor of personalized workout
- Monitoring of equipment usage

## ■ Results

- Increased product differentiation
- Lower total-cost-of-ownership





# Customer Case Study – BP



## ■ What

- Vibration monitoring on oil tankers
- Manual sensor reading replaced with wireless sensor network

## ■ Results

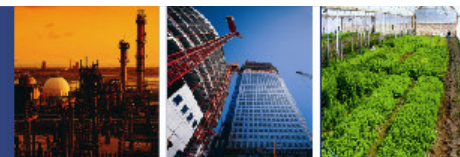
- Lower maintenance cost
- Proof of reliability of wireless sensor network in harshest environment
- Recognized with BP Helios Award

**theheliosawards**  
**partnership**  
**award winner**





# Customers



**Industrial  
Automation**



**Building  
Automation**



**Asset  
Tracking**



**Environmental  
Monitoring**



**Research,  
Education**

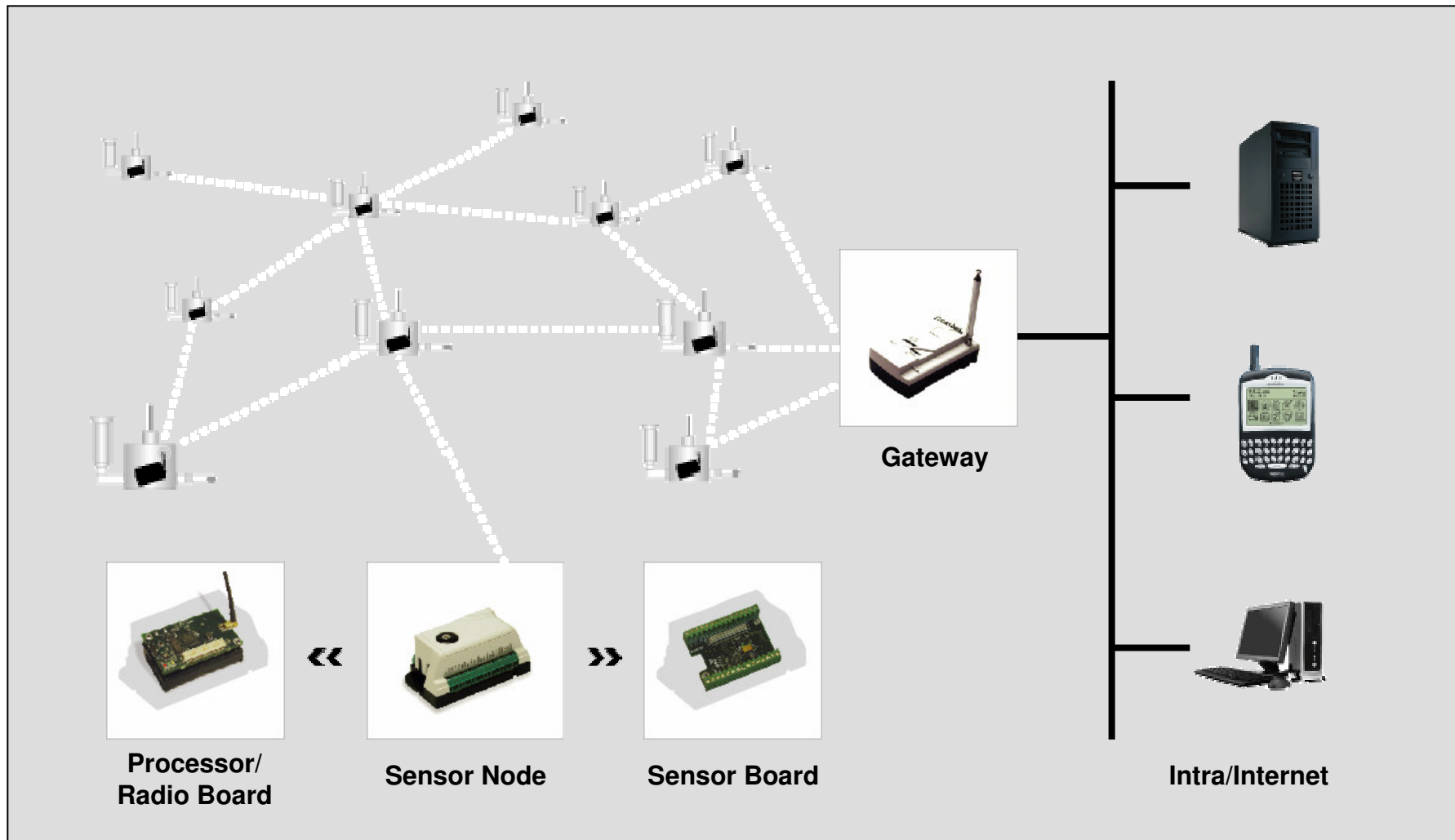
3M  
Advanced Aeration  
Albertsons  
Aginova  
Agilent  
Boston University  
BP

Eaton  
Honeywell  
IBM  
Life Fitness  
MIT  
Mitre  
Motorola  
NASA

Northrop Grumman  
Tyco Thermal  
Toro  
Stanford University  
UC Berkeley  
UCLA  
United Technologies  
Weyerhaeuser



# Wireless Sensor Network – Architecture





# The Crossbow Solution



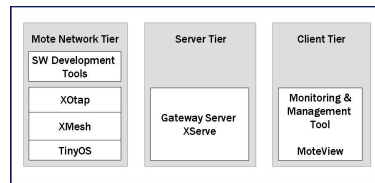
## Design Engineering Services, Support and Training

### Crossbow Hardware Platform



HW Unit Sales  
IP Licensing

### MoteWorks Software Platform



SW Licensing

### Product Designs



IP Licensing

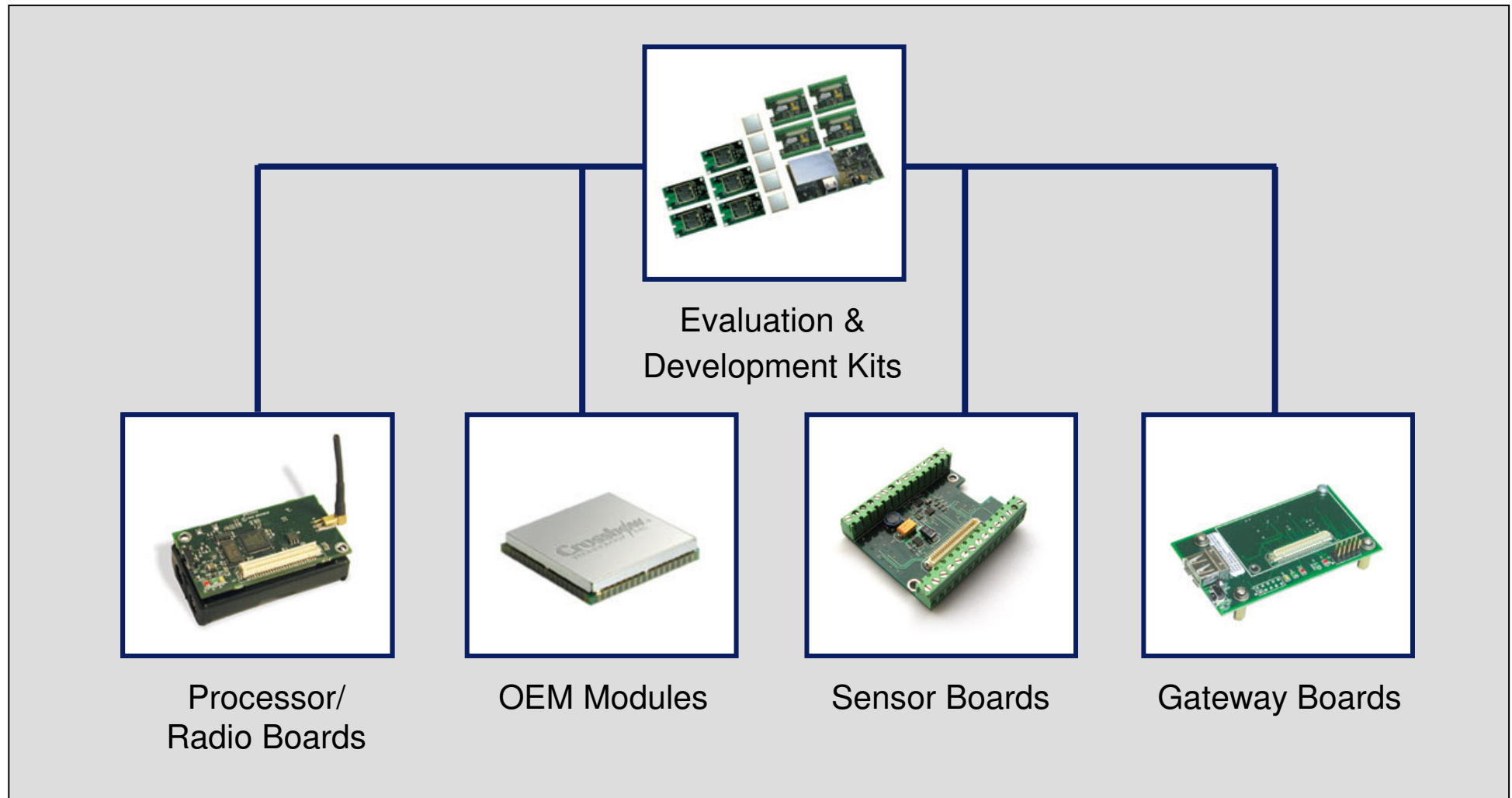
### Volume Manufacturing



Unit Sales



# Crossbow WSN Hardware Platform





# Hardware Platform – Benefits

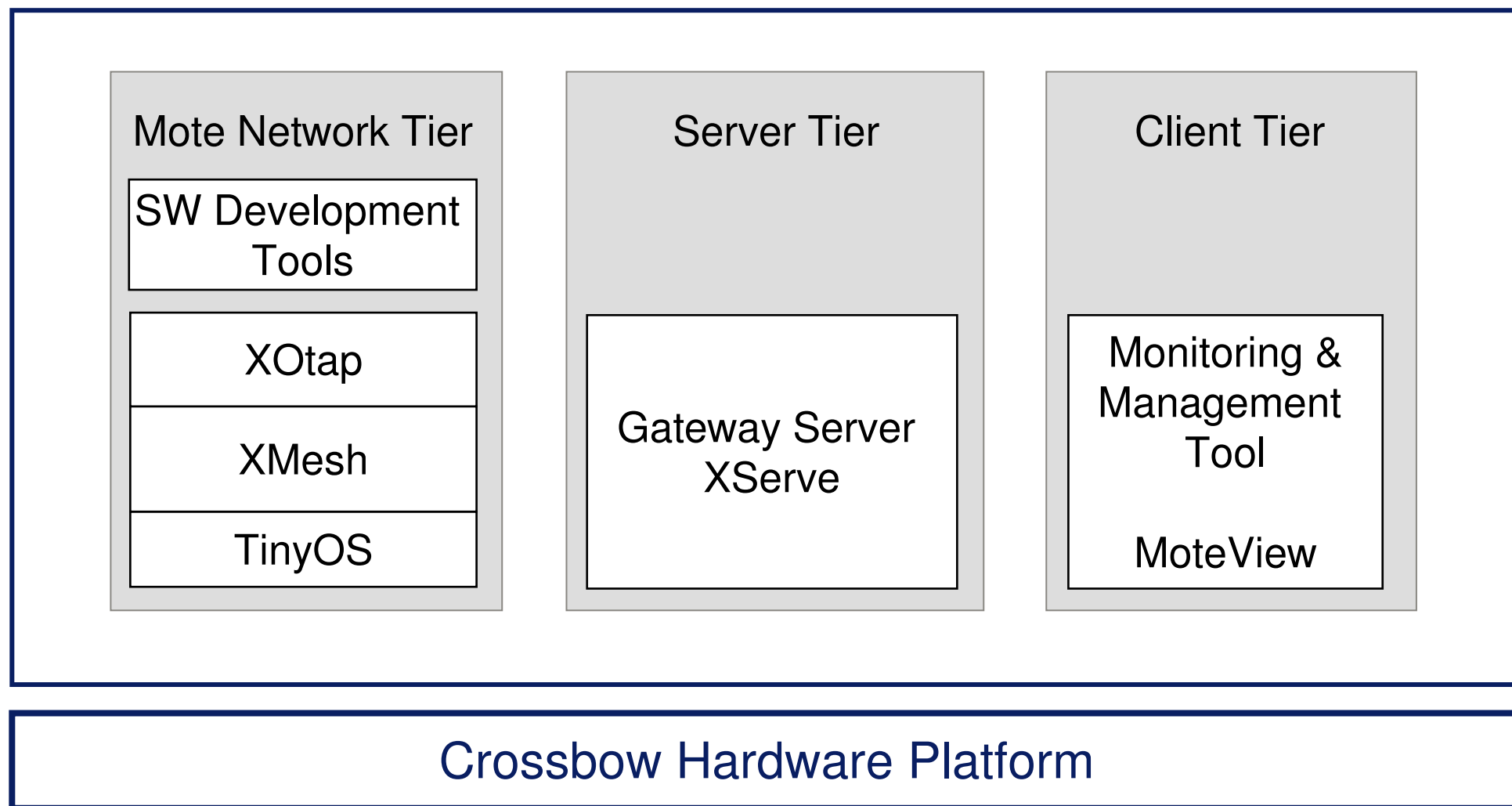


- **Out-of-Box WSN**
  - Preprogrammed Processor/Radio Boards
- **Modular Architecture**
  - Processor/Radio Boards, Sensor Boards, Gateways
- **Fast Hardware Design**
  - OEM Modules and Development Kits
- **Cost Effective Deployment OEM Modules**
  - OEM Modules optimized for low power, low data rate, reliable wireless networks





# MoteWorks Software Platform





# MoteWorks – Benefits



- **Complete Platform for Wireless Sensor Networks**
  - Proven, reliable, low-power
- **Flexibility**
  - Choice of optimal network topology and power scheme
- **Open Programming Platform**
  - Both programmer and non-programmer interfaces
- **Standards**
  - Crossbow leads ZigBee WSN profile group, Member of SP100
- **Cost effective network deployment**
  - Provisioning and management with over-the-air-programming



# Crossbow Product Designs



Security



Environmental  
Monitoring



Industrial  
Monitoring

MoteWorks Software Platform

Crossbow Hardware Platform



# Crossbow Product Designs – Benefits



- **Very Fast Time-to-Market**
  - Complete product design
- **Efficient Customization**
  - MoteWorks and/or Crossbow Design Engineering Services
- **End-to-End Solution**





# Crossbow Services



## ■ Design & Development

- Customer Specific Designs
- Board level hardware development
- Software firmware and application development



## ■ Training

## ■ Volume Manufacturing

- Option for customer specific designs through low cost off shore manufacturing





# Why Crossbow?



- 1. Market leading, proven wireless sensor network technology**
- 2. End-to-end, enabling product offering including hardware, software, services and manufacturing**
- 3. Unique combination of sensor, wireless communication and application expertise**





# Wireless Sensor Network Market Forecast

