Coronis Systems

Wavenis ULP long range wireless platforms, sensing, and M2M monitoring solutions

M2M Workshop
ETSI, Sophia Antipolis, June 04-05, 2008

Christophe Dugas
Director of Marketing & Communications
June 04-05, 2008
Company details

- **Coronis Systems**
  - Created in August 2000 in Montpellier, France
  - Coronis Inc. established in 2005 (Chicago, IL / USA)
  - Coronis office in 2006 (Shanghai / China)
  - Coronis Staff: 53 people
  - Wavenis ULP long range wireless platform, products and services

- **Deployment**
  - Over 1,500,000 Wavenis enabled units deployed worldwide
  - 500,000+ Wavenis enabled units on order
  - M2M networks of up to 100,000 end-points

- **June 2007, Coronis becomes an Elster Group company**
- **June 2008, creation of Wavenis Open Standard Alliance**
Investment in high level R&D projects

- **European Projects**
  - SWANS (MEDEA+) dual mode Wavenis/Bluetooth platform
  - µSWN (IST FP6) optimised Wireless Sensor Network (WSN) platform

- **French National Projects**
  - ARESA (ANR) routing algorithm optimisation (avec France Telecom R&D)
  - Wavelock (Eureka): battery-powered door locks with centralised wireless control
  - (Euripides) Wavenis + “fall detection” sensor (for the elderly) integrated in a wristwatch.

- **Coronis**
  - Internal R&D investment
Coronis has consistently focused on 2 primary goals

1. Create a world class wireless platform with ultra-low-power and long-range capabilities

2. Provide OEM products and solutions for system integrators, manufacturers, and value-added resellers
Device requirements

- Hard-to-reach ultra-low-power devices exhibit the same needs
  - Low quantities of data
  - Low radio traffic
  - Long battery life
  - Low cost
  - High radio link budget
  - Entry to the WAN
What we have learned from the market?

- **Market fragmentation**
  
The ULP market is extremely fragmented due to a myriad of diverse applications with discrepancies in requirements (latency, amount of data, range, autonomy)

- **Myriad of proprietary solutions**
  
  90% of the market is currently served by various proprietary solutions that address small & medium size business

- **Market loves industry standards**
**State-of-the art wireless solutions: spread spectrum**
- Bluetooth/WiBree (FHSS), ZigBee (DSSS), UWB (pulse)
- High reliability, strong resistance to interference, coexistence capability and low cost

**Mono-channel: conservative**
- KNX-RF, Z-wave, io-homecontrol, enOcean, ... & many others
- Easy to design and low cost
- Sensitive to interferers and poor coexistence capability
Wavenis at a glance

Traditional OSI 7-layer model:
- Application
- Presentation
- Session
- Transport
- Network
- Data Link
- Physical

Wavenis wireless protocol:
- Application
- Presentation
- Session
- Transport
- Network
  - SDP
  - Logical Link Control
  - Medium Access Control
- Physical

Application Programming Interface

Wavenis stack
Wavenis highlights

- **Long battery life** (up to 15 years on primary battery)
- **Long range** (200m indoor – 1km LOS)
- **Smart links** (2-way communications)
- **Reliable transmissions** (FHSS, FEC, data interleaving)
- **Connection to WANs** (Bluetooth extension capability)
- **Networking capabilities** (p2p, star, tree, mesh, repeater)
- **Low unit cost**
## Technology comparison table

<table>
<thead>
<tr>
<th></th>
<th>Bluetooth WiBree</th>
<th>ZigBee</th>
<th>Z-wave</th>
<th>WiFi</th>
<th>Wavenis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency band</strong></td>
<td>2.4 GHz</td>
<td>2.4 GHz/5.2 GHz</td>
<td>868MHz/915MHz</td>
<td>2.4 GHz/5.2 GHz</td>
<td>433/868/915MHz/2.4GHz</td>
</tr>
<tr>
<td><strong>Data rate</strong></td>
<td>1 Mbps</td>
<td>250 kcps</td>
<td>few kbps</td>
<td>5.5/11MHz</td>
<td>4,8 / 19.2 typ / 100kbps</td>
</tr>
<tr>
<td><strong>PHY</strong></td>
<td>FHSS / GFSK</td>
<td>DSSS</td>
<td>Mono-channel / FSK</td>
<td>DSSS / OFDM</td>
<td>FHSS / GFSK</td>
</tr>
<tr>
<td><strong>Reliability</strong></td>
<td>+++</td>
<td>+++</td>
<td>-</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Low Power</strong></td>
<td>+</td>
<td>++</td>
<td>++</td>
<td>-</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Long Range</strong></td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Low Cost</strong></td>
<td>++</td>
<td>+++</td>
<td>+++</td>
<td>-</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Indoor Range</strong></td>
<td>- (10m)</td>
<td>- (20m)</td>
<td>+ (50m)</td>
<td>+ (50m)</td>
<td>+++ (up to 200m)</td>
</tr>
<tr>
<td><strong>Mesh network</strong></td>
<td>-</td>
<td>++</td>
<td>-</td>
<td>-</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Standard protocol</strong></td>
<td>+++</td>
<td>+++</td>
<td>-</td>
<td>+++</td>
<td>++ (designed with Bluetooth extension capabilities)</td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><strong>Deployment</strong></td>
<td>+++</td>
<td>-</td>
<td>+</td>
<td>+++</td>
<td>++</td>
</tr>
</tbody>
</table>
Standardization strategy

- Leverage deployment
- Provide Bluetooth extension capabilities
- Wavenis Open Standard Alliance
How does it work in the field?

Flexible operating modes
- PPP, broadcast, repeater
- Star, tree & mesh networks

ULP wireless network features
- Optimum wireless traffic
- Self-organizing
- Self-healing
- Easy network maintenance
Customers choose the platform that meets their development and commercial needs.
Wavenis-based metering products
Wavenis-based control products
Wavenis-based RFID devices
A global value chain for remote monitoring

FULL M2M CONNECTIVITY BETWEEN SENSORS AND REMOTE OFFICES

- **Wavenis network controller**
  - Wavenet Manager
  - Wavenet Monitor

- **GPRS & IP Gateways**
  - Wavebox, Wavegate

- **Sensors nodes**
  - Wavesense, Wavelog, Waveflow, Wavetherm, Wavetank
  - Wavetalk

3 GREAT COMPANIES.
1 GREAT SOLUTION.

- Wavenis network controller
  - Wavenet Manager
  - Wavenet Monitor

- GPRS & IP Gateways
  - Wavebox, Wavegate

- Sensors nodes
  - Wavesense, Wavelog, Waveflow, Wavetherm, Wavetank
  - Wavetalk
Case Studies

- **HA, Alarm & Security**
  Abloy, Technext, Intervox, DHS, Schneider Electric, ...

- **Industry & RFID**
  Mesh Systems, Pacscom Pedigree, T-Box, Nitrosoft, Netsize, Wavecom, Semaphore Intellot, Rizhone, GT&T, Webdyn, Schneider Electric, ...

- **Metering**
  SAUR, Veolia, CGE, Gas Natural, China Gas, HowDeep, Elster-AMCO, Sensus, EDMI, ...
Some of our customers

elster
Sontex
Sensus Metering Systems
MESH
& France Telecom
Schneider Electric
EDMI
HowDeep
AES Chemunex
THALES
GT&T
Compteurs Water S.A.
ZENNER
Nantes Métropole
Sagem
Ocea Soft
Delta Dore
SALTO
CIS
Mayalys
Pacscorm International
Tbox
Pedigree Technologies
Intervox
SAUR France
Contara
Veolia Eau
ABLOY
Honeywell
The #1 reason why Wavenis is being deployed: real-world performance

Over 1,500,000+ end points

500,000+ now on order
Following requests by customers, prospects, major R&D labs

To increase Wavenis exposure vs. competition

Accelerate Wavenis standardization process

Connections with complementary organizations (ETSI, IEEE, Bluetooth, KNX, others)

Creation: June, 2008
Thank You

Contact us at contact@coronis.com or visit www.coronis.com