Wireless System Integration, Demonstration

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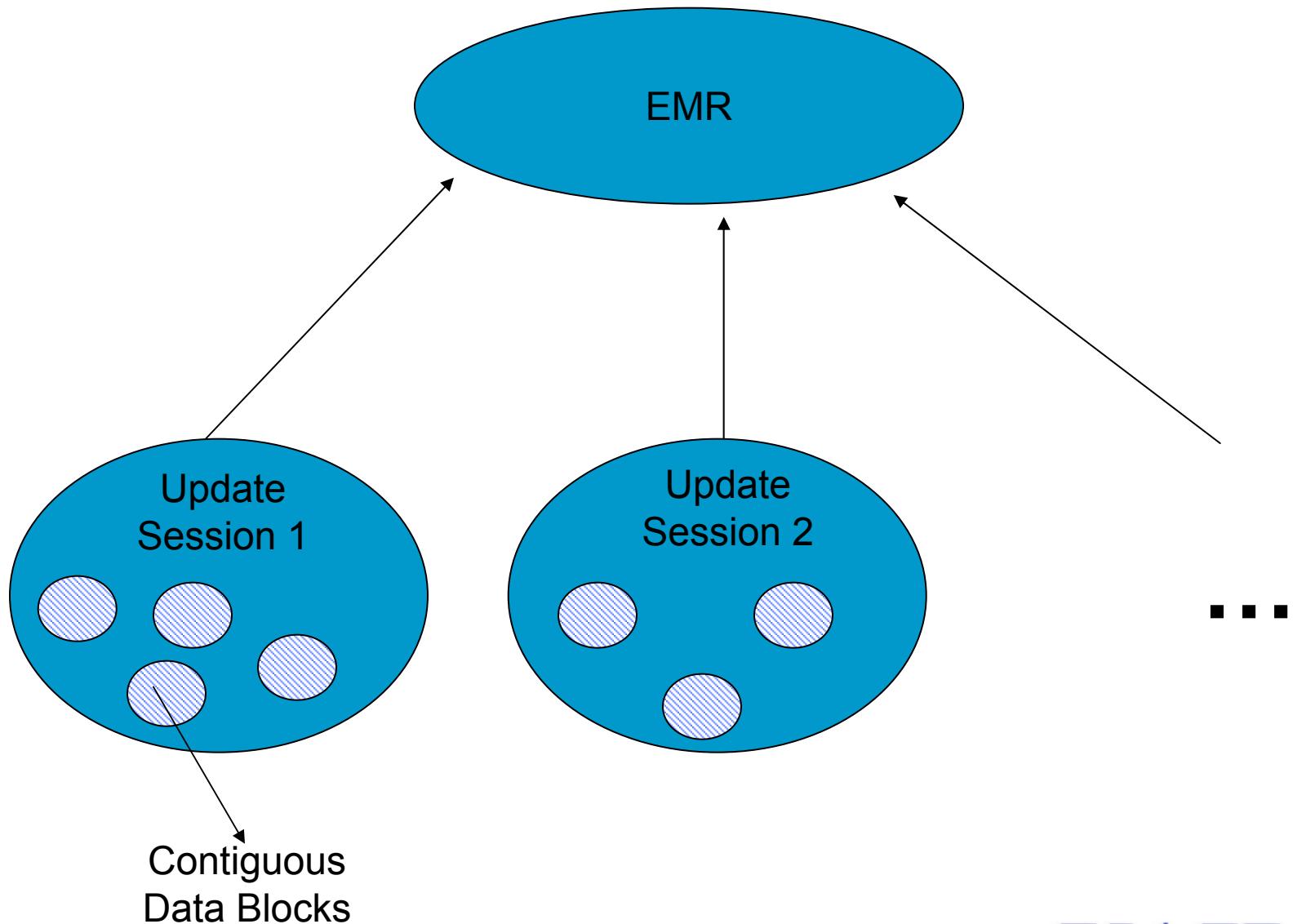
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EMB

ISSS MDBS 2006

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Demonstration
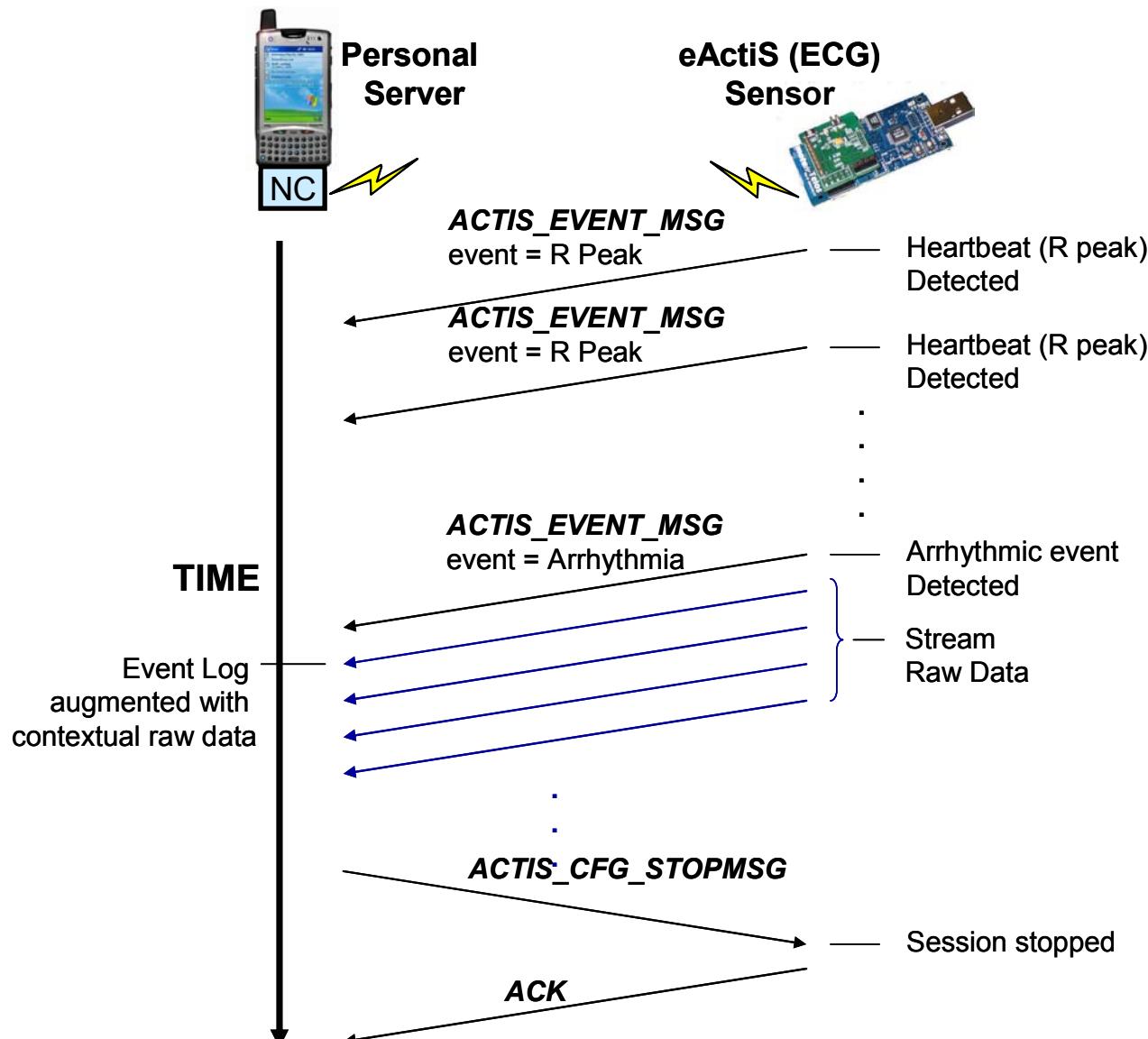
- System configuration
  - Position sensor (3 ACC axes – raw data)
    - Values Acc = 8000 + acc_comp*2000
  - Heart rate sensor
    - RR intervals in ticks (32 KHz – jiffy periods)
   - Heart rate – 60 * 32768 / RRint

System organization - Sessions

EMR

Update
Session 1

Update
Session 2

. . .

Contiguous
Data Blocks

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Typical Message Flow

Personal Server

eActiS (ECG) Sensor

NC

ACTIS_EVENT_MSG
event = R Peak
— Heartbeat (R peak) Detected

ACTIS_EVENT_MSG
event = R Peak
— Heartbeat (R peak) Detected

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ACTIS_EVENT_MSG
event = Arrhythmia
— Arrhythmic event Detected

TIME

Event Log augmented with contextual raw data

Stream Raw Data

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ACTIS_CFG_STOPMSG
— Session stopped

ACK
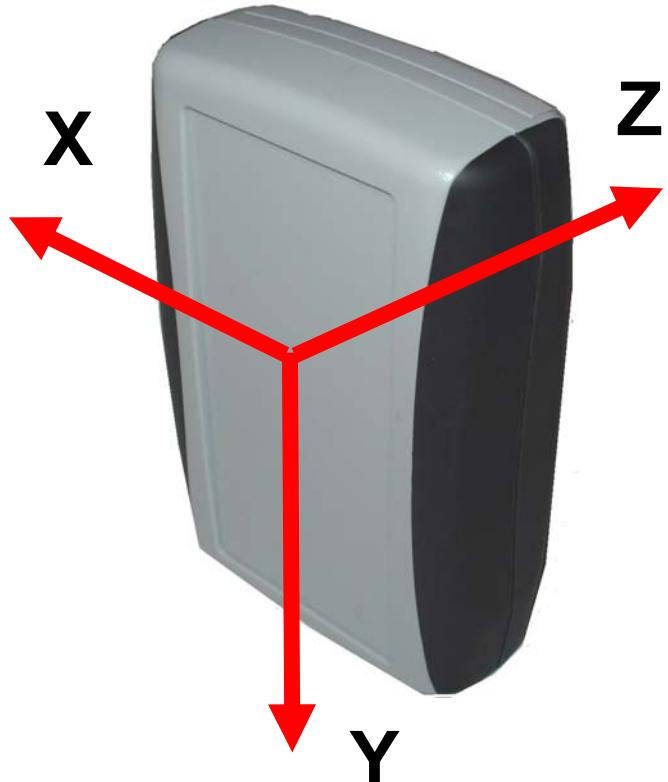
Session file format
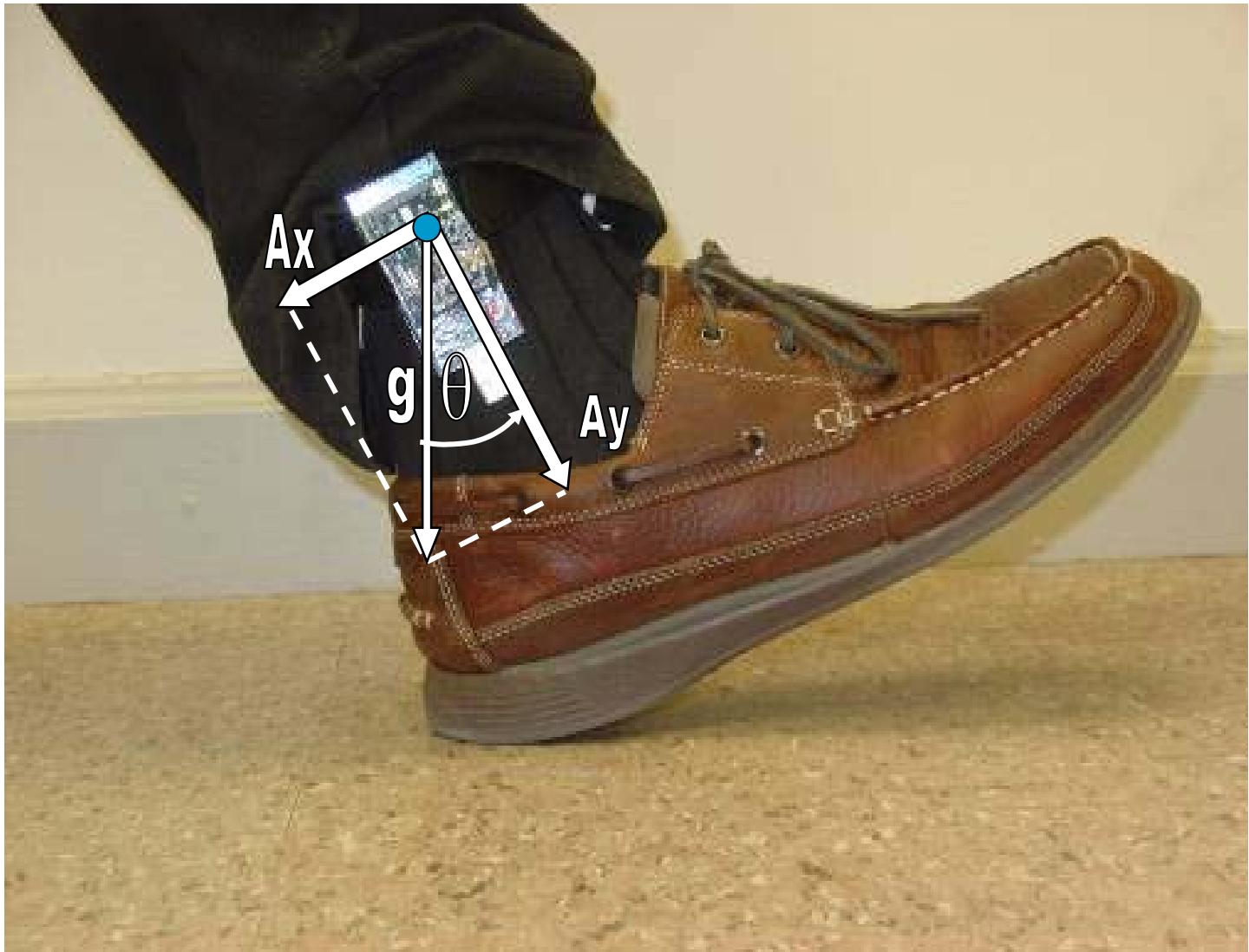
- Byte Field   Description
- 4   Timestamp   32-bit global jiffy time
- 2   numValues   Number of values used in data field
- 2   Not used   Reserved for future param.
- 2   LastSampNum
- 4   SessionSignalID Unique identifier formed from concatenation of session number with signal type
- 20   data   Signal dependent
  - for raw data this is 10 16-bit samples
  - AEE, the first 4 bytes are little endian AEE

- Total: 34 bytes/record

Accelerometer sensor

Acc = 8000 + acc_comp*2000

ActiS acceleration components

Demonstration

Test data

- Web page:
  - http://www.ece.uah.edu/~jovanov/whrms/data_proc.html

- Experimental data
- Example processing (.M)
- What information can you extract from the data set?
  - Change of position
  - Level of activity
  - Step recognition

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