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Event Tracking API for J2ME

JSR #190

February 2006

Shai Gotlib, JSR #190 Spec Lead

INTEGRATED CUSTOMER MANAGEMENT

amdocs

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Who am I?

- Senior Expert at Amdocs Advanced Technologies group (Amdocs Chief Scientist office)
- Over 15 years of experience in software development and telecom / enterprise software business
- Currently in charge of Amdocs activities at JCP
  - Lead the Event Tracking API for JME specification (JSR 190)

Amdocs – a leading global vendor of telecom BSS and OSS systems in Billing, CRM, Order Mgmt and Mediation areas employing about 12,000 IT professionals and operating in over 50 countries with revenue of over $2 billion in 2005

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Agenda

- JCP Overview
- JSR 190:
  - The need, the opportunity, and the scope
  - High level events flow
  - The protocol between a Java ME Device and the collection system
    - IPDR Streaming Protocol
- Demo
- Q&A and Discussion

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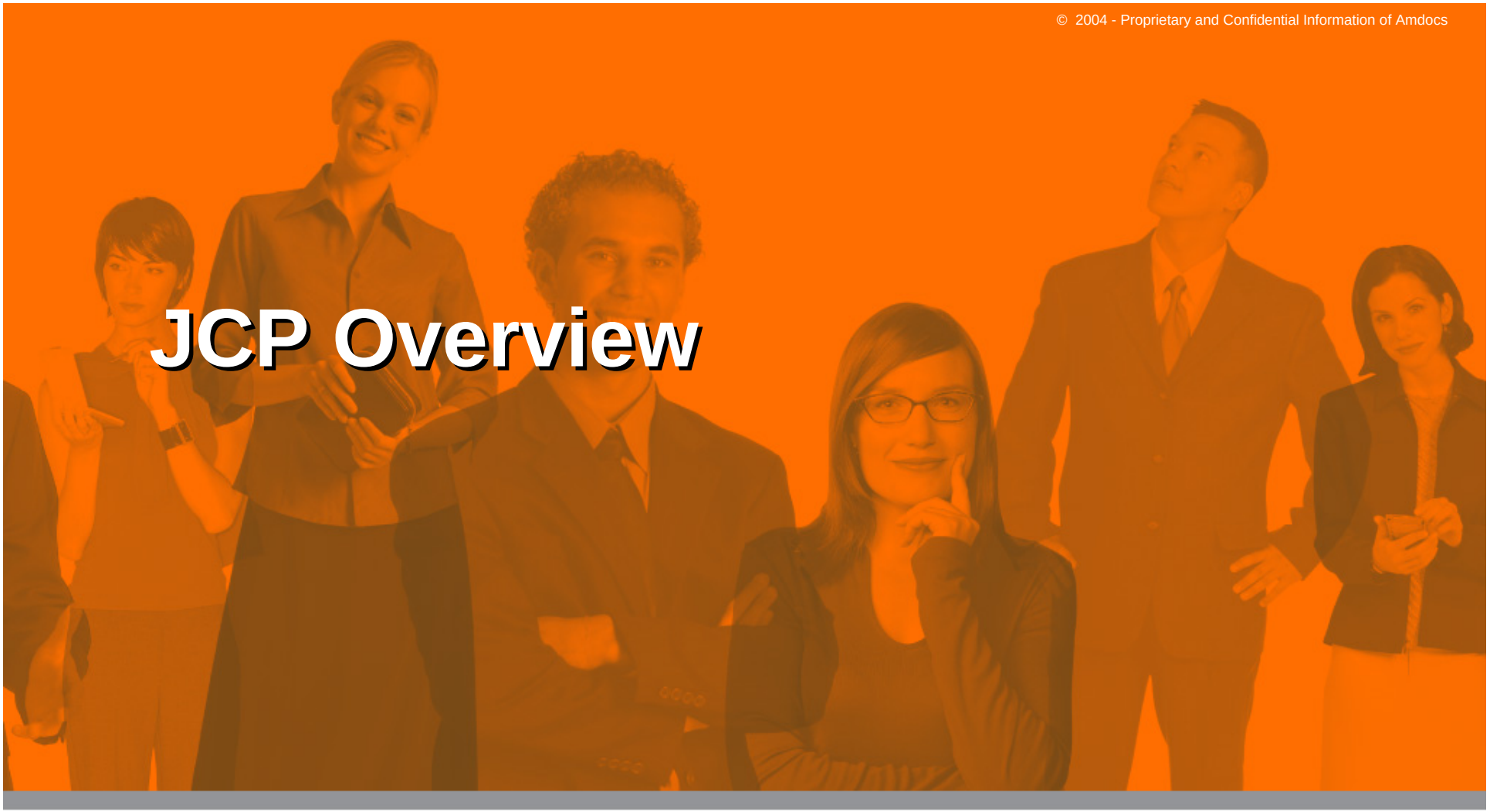

JCP Overview

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Java Community Process (JCP)

- The process established by Sun Microsystems for the creation of new, as well as the evolution of existing **Java Specification Requests (JSR)**
- JCP Goals:
  - Ensure Java to be standard and cross-platform compatibility
  - Continually grow the platform specification portfolio to meet the emerging technology needs of developers and organizations globally
- All JSRs are grouped into:
  - Platform JSRs: JEE (112), JSE (144), JME (79)
  - Technology JSRs: JAIN (22), XML (15), OSS (13)

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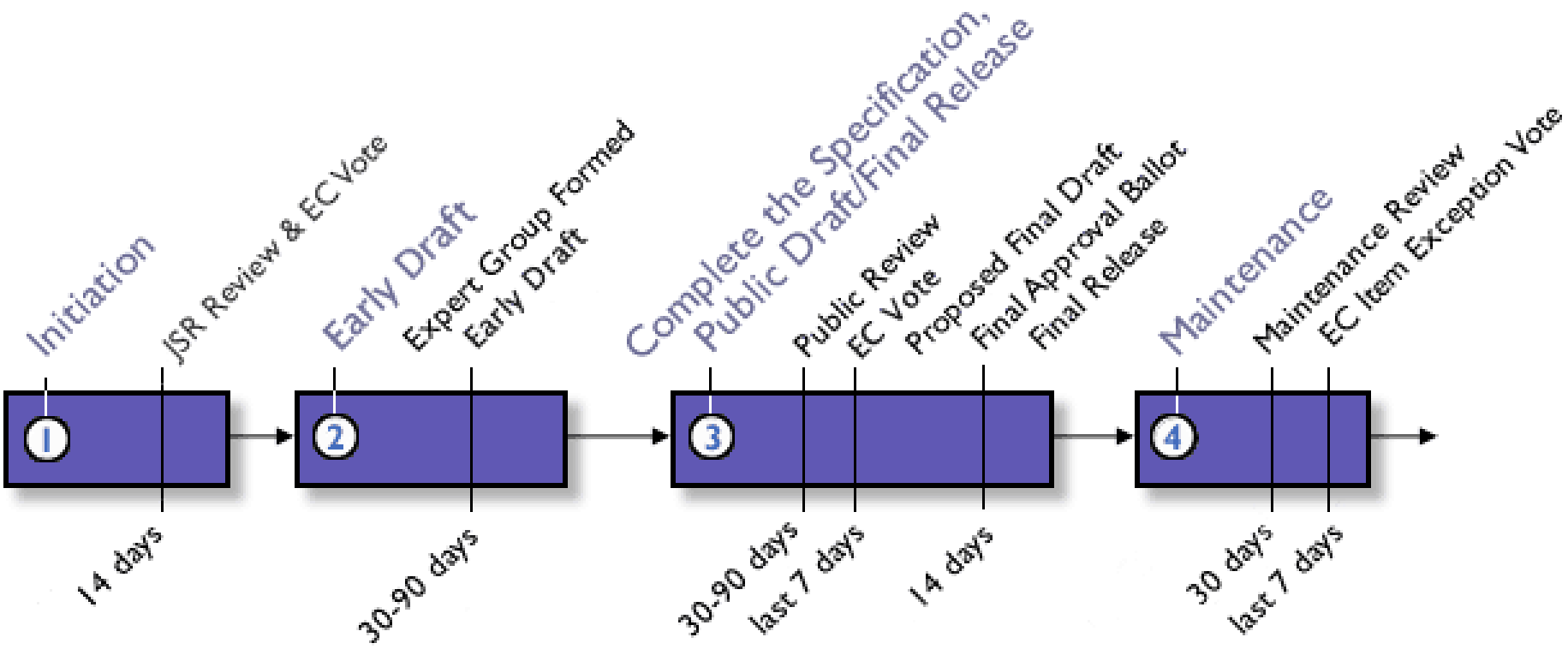
JSR Lifecycle in Brief



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What Does JSR Include?

1. **JSR Specification**
2. **Reference Implementation (RI)** to prove feasibility
3. **Technological Compatibility Kit (TCK)** to enable testing and verifying a specific application's compliance to the JSR

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JSR 190

The Need, the Opportunity, and the Scope

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Event Tracking API for JavaME definition

- JSR 190 defines an optional code package that standardizes:
  - An application event tracking mechanism and the relevant interface on a micro edition device
  - A standard protocol to submit the event records to an event-tracking server

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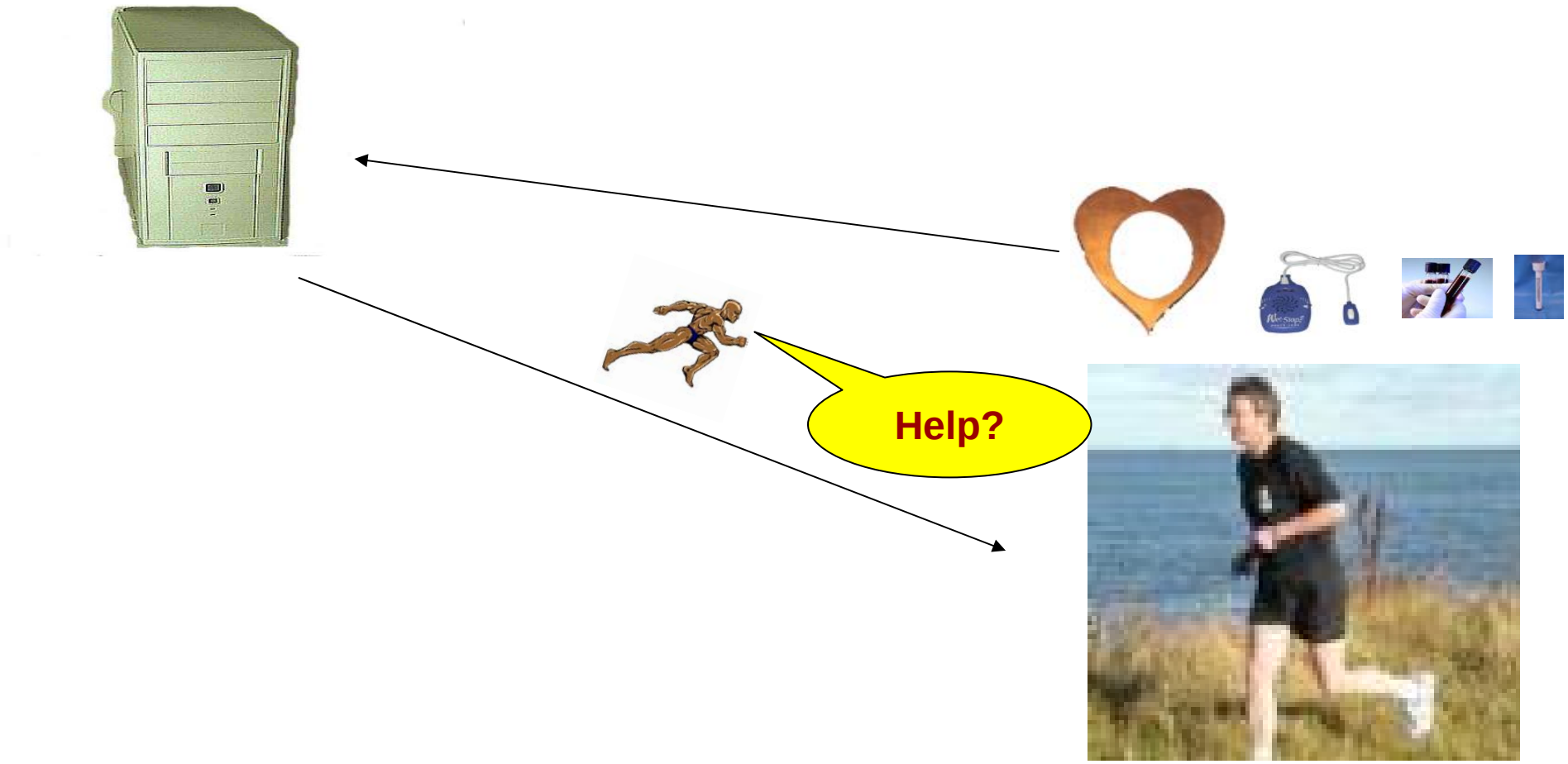
Track biometric parameters



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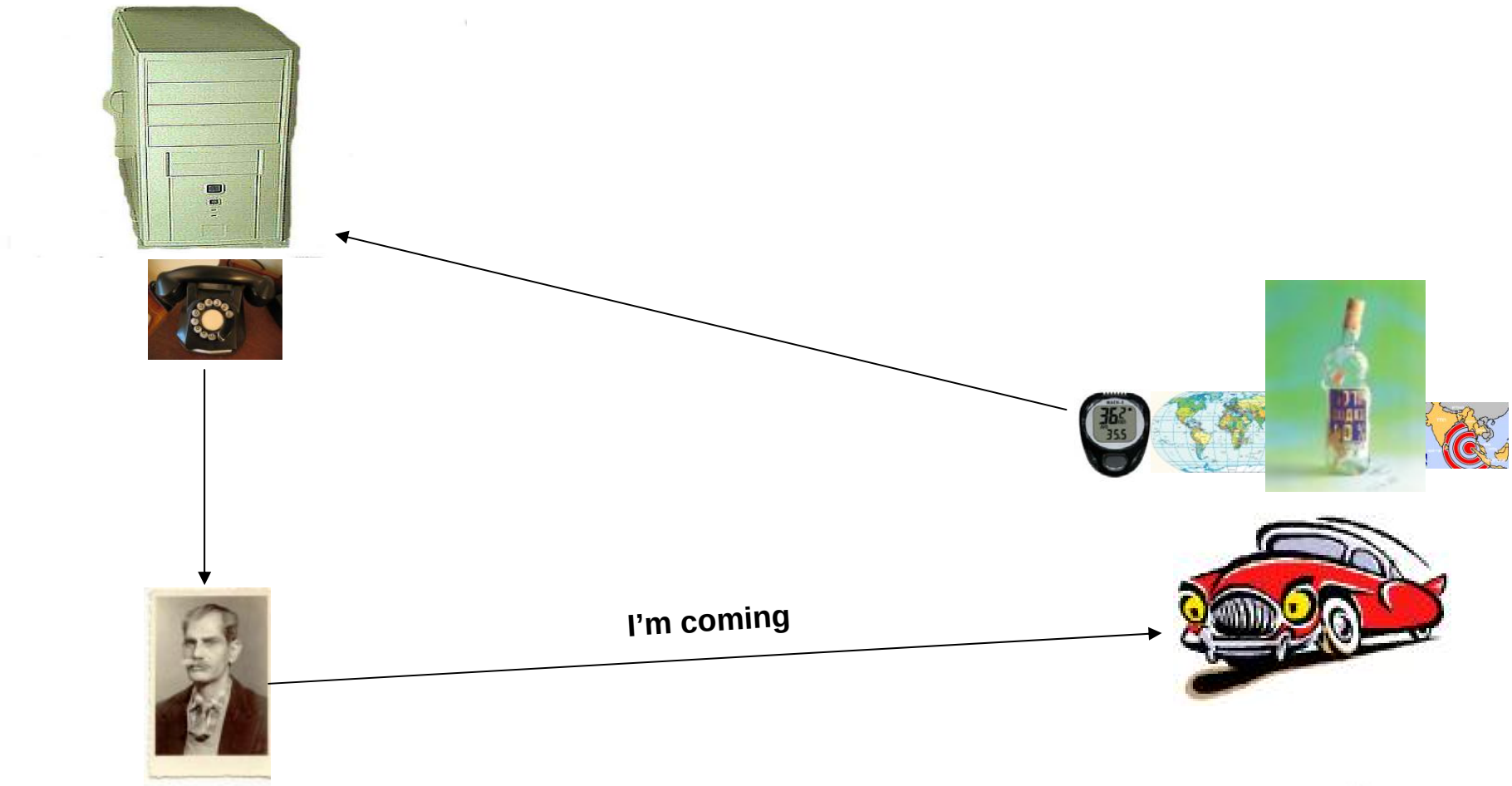
Track physical parameters



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Track the game

Game Started

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Track the game

Level 1

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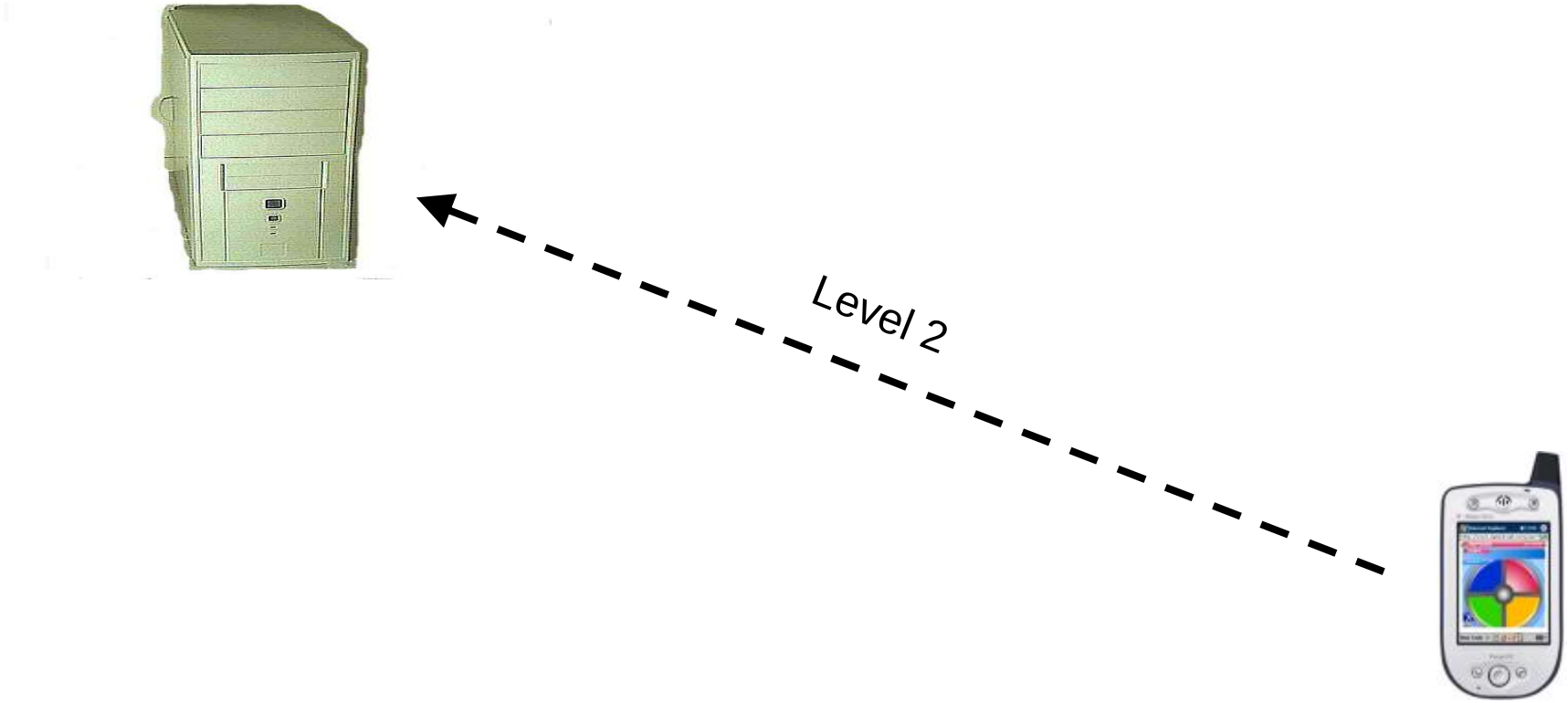
Track the game



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Monitoring and Tracking of JME Apps The Opportunity

- Monitoring and tracking application domains
  - Mobile game world
  - Monitoring and control systems for mobile
  - Collecting usage statistics and accounting information
- JME Technology for Mobility
  - Today over 635 Java-enabled handset models are available from 32 manufacturers (Sun, 6/05)
  - Number of Java-enabled handsets to reach 708 million by June 2005 (Ovum)
  - Java is the leading platform for mobile applications and services with 140+ carrier deployments worldwide (Sun, 6/05)

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Monitoring and Tracking of JME Apps The Need

- No standards exist
- Many proprietary solutions have been developed → the monitoring and tracking mechanisms market is very fragmented
- **JSR #190 comes to eliminate the fragmentation through standardized specification of:**
  - **The client API for events exposure**
  - **The protocol between a Java ME enabled device and the collection system**

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Event Tracking API for JME (JSR #190) The History

- **July 16, 2002:** the Event Tracking API for J2ME (JSR #190) is added to the JSR approval ballot
  - Initial scope and requirements defined
- **June 07, 2005:** the Spec Lead of the JSR moves from Tira Wireless to Amdocs Management Ltd.
  - Scope revisited and specification updated
- **February, 2006:** planned early draft review submission
  - Public draft review is expected to begin 3 months later (May)

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The Expert Group

- Amdocs Management Ltd.
- BenQ Corporation
- Chadha Sanjay
- Esmertec AG
- Gemplus Corporation
- Hewlett-Packard
- In-Fusio SA
- Leapstone Systems, Inc.
- Mobilitec, Inc.
- Nokia Corporation
- Openwave Systems Inc.
- Siemens AG
- Sony Ericsson Mobile Communications AB
- Sun Microsystems, Inc.
- TELUS Mobility
- Tira Wireless
- Vodafone Group PLC

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Monitoring and Tracking of JME Apps JSR 190 Scope

- The API for defining specific schema descriptions (*templates*) of the exposed event data records
  - **Out of Scope:** as a guideline, the JSR does not define specific templates for the event records
- The configuration of available *event-tracking servers*, their priorities, available sessions, etc.
- The API for sending data records according to the predefined template and configuration
- The protocol between a Java ME device and the JSR #190 complaint collection system
  - *IPDR Streaming Protocol* has been adopted

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Monitoring and Tracking of JME Apps JSR 190 Requirements

- Simple
- Configurable
- Extensible and flexible
- The API enable to influence the underlying protocol behavior
- Target platform: Connected Limited Device Configuration (CLDC)
- Small Footprint

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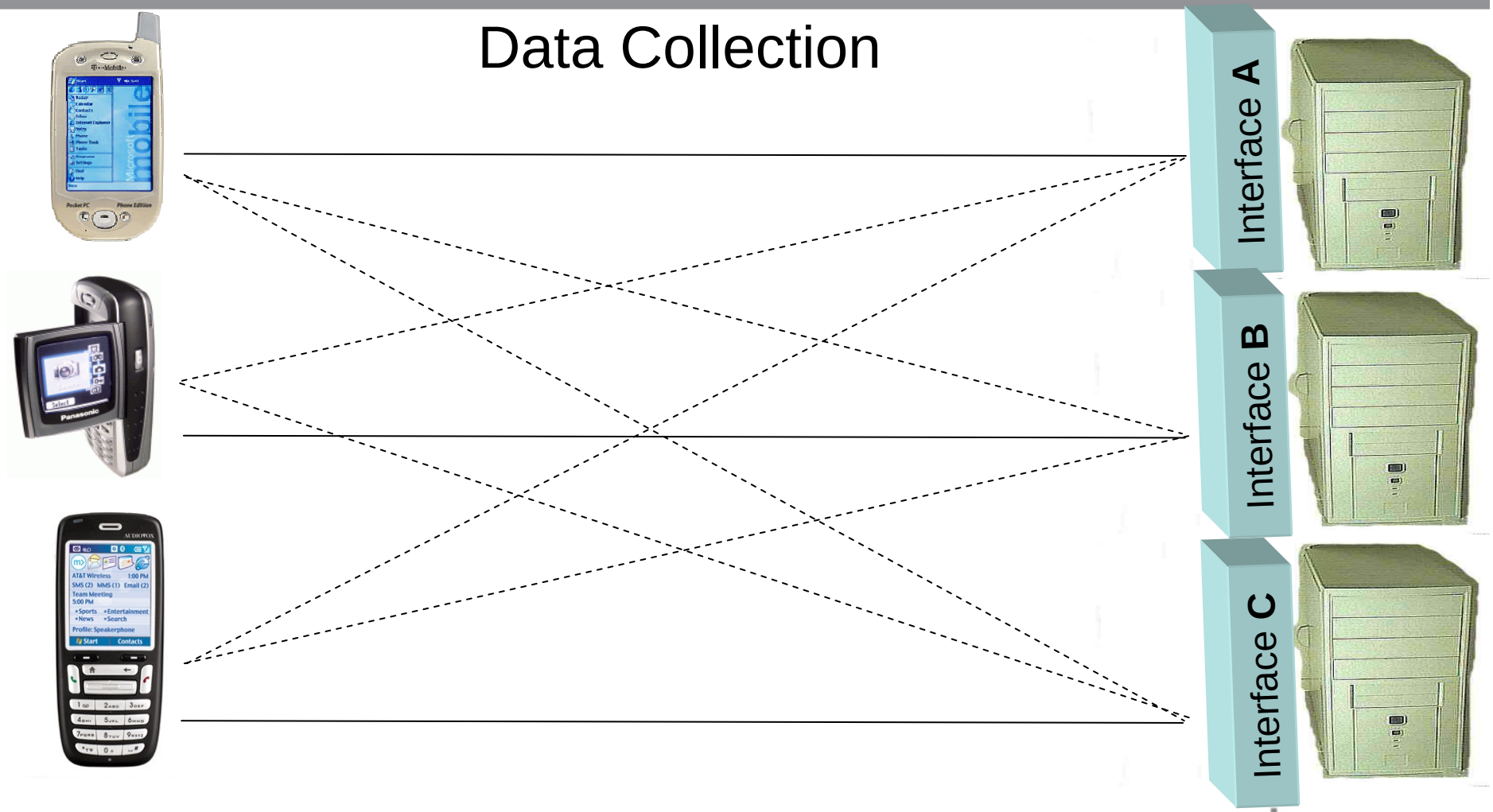
Monitoring and Tracking of JME Apps
The Current Situation

Data Collection



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Monitoring and Tracking of JME Apps With JSR #190 Implemented

JSR #190

Data Collection

IPDR
Streaming Protocol

JSR #190 compliant server

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JSR 190

High Level Events Flow

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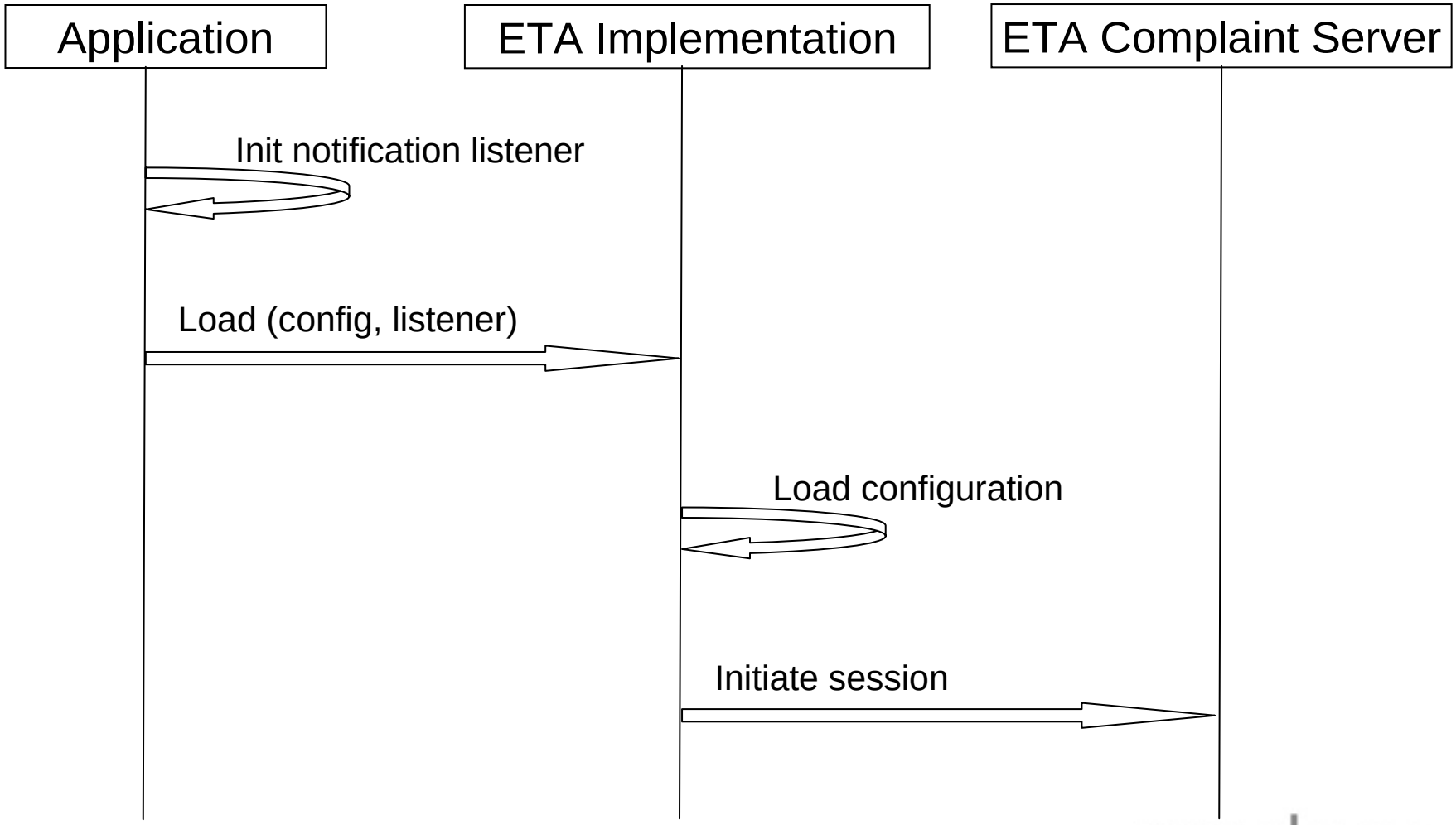
Events Flow
Event Tracking API (ETA) - Initial stage



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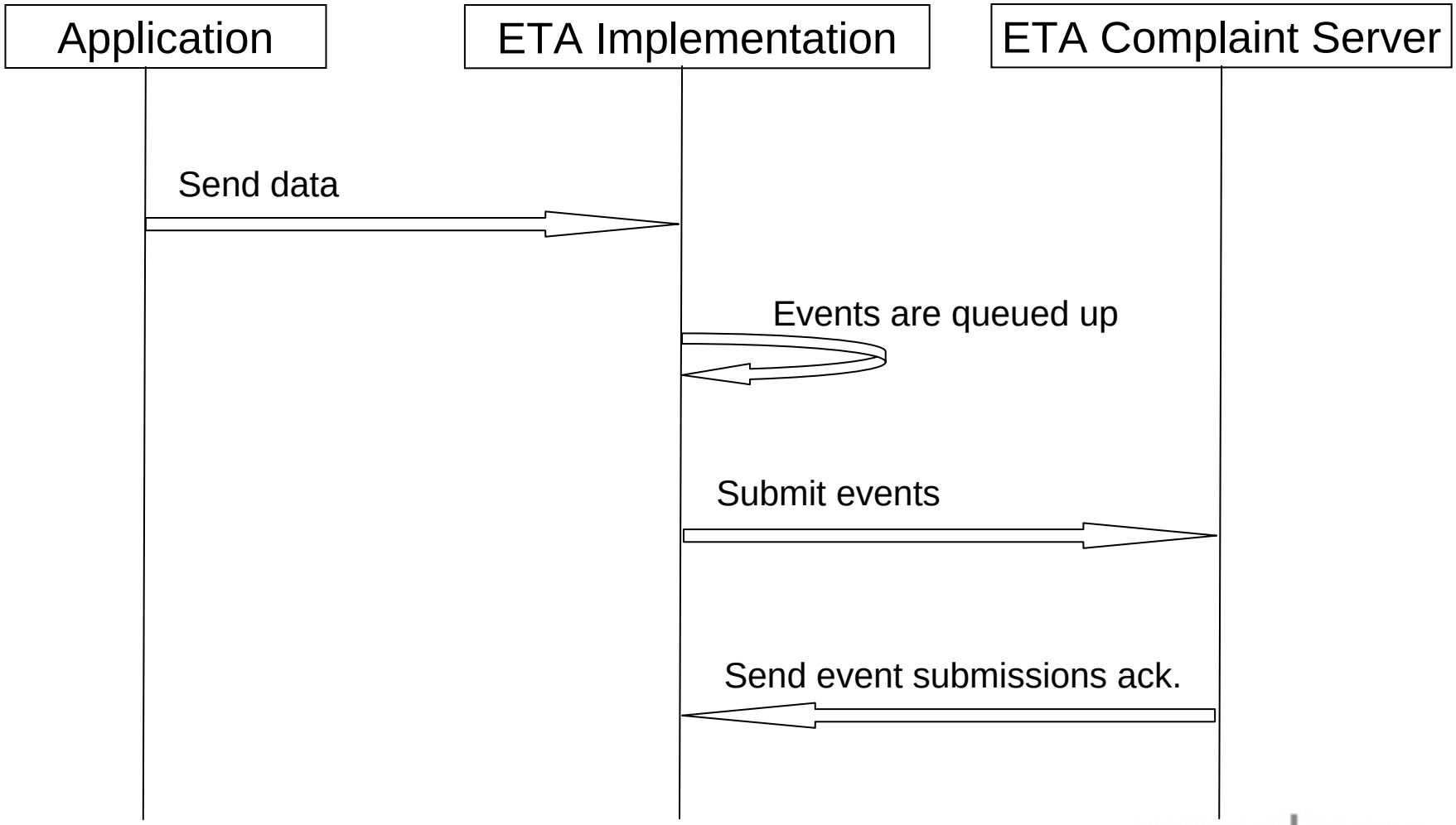
Events Flow
Data events process



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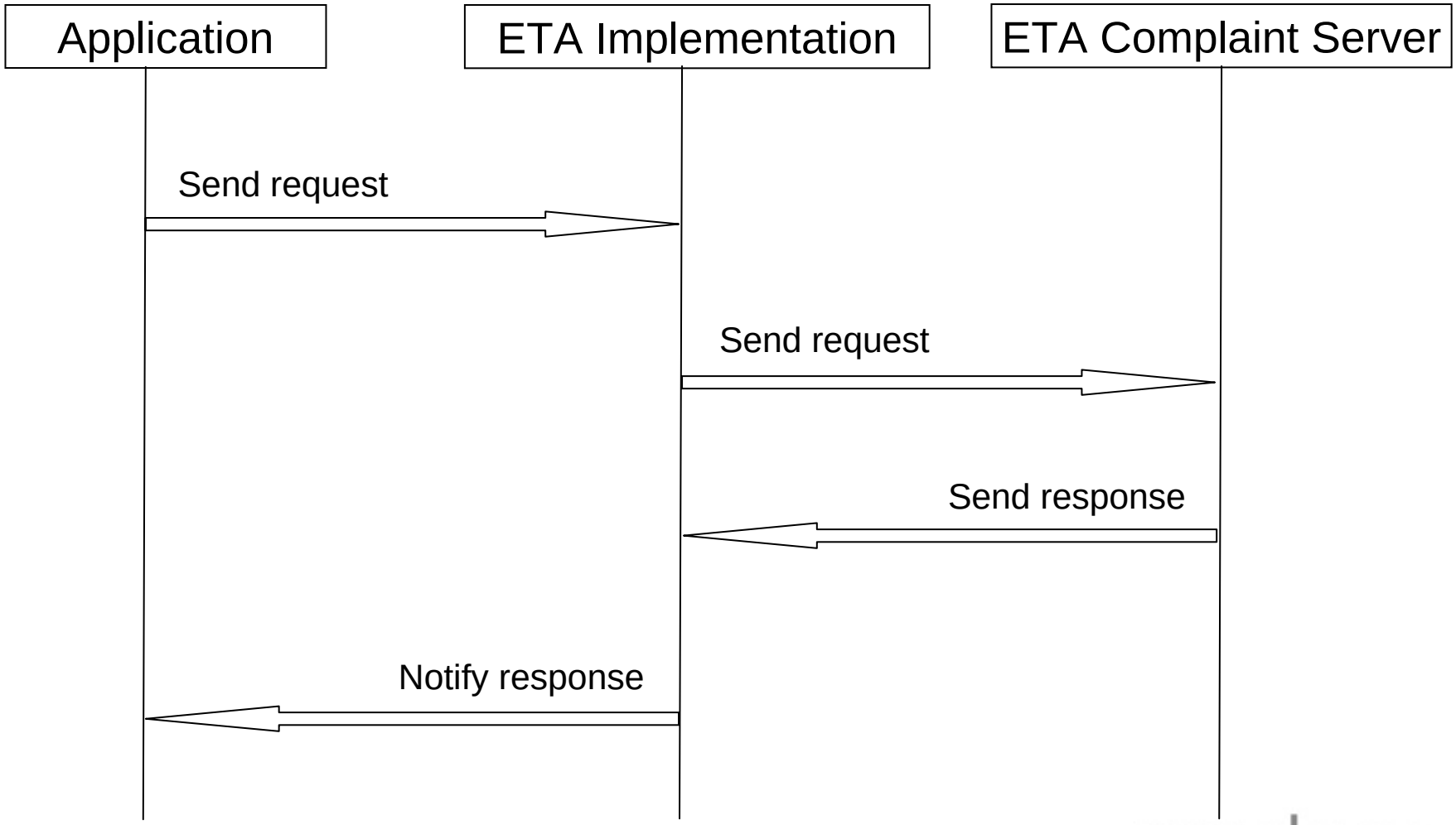
Events Flow
Request scenario (application point of view)



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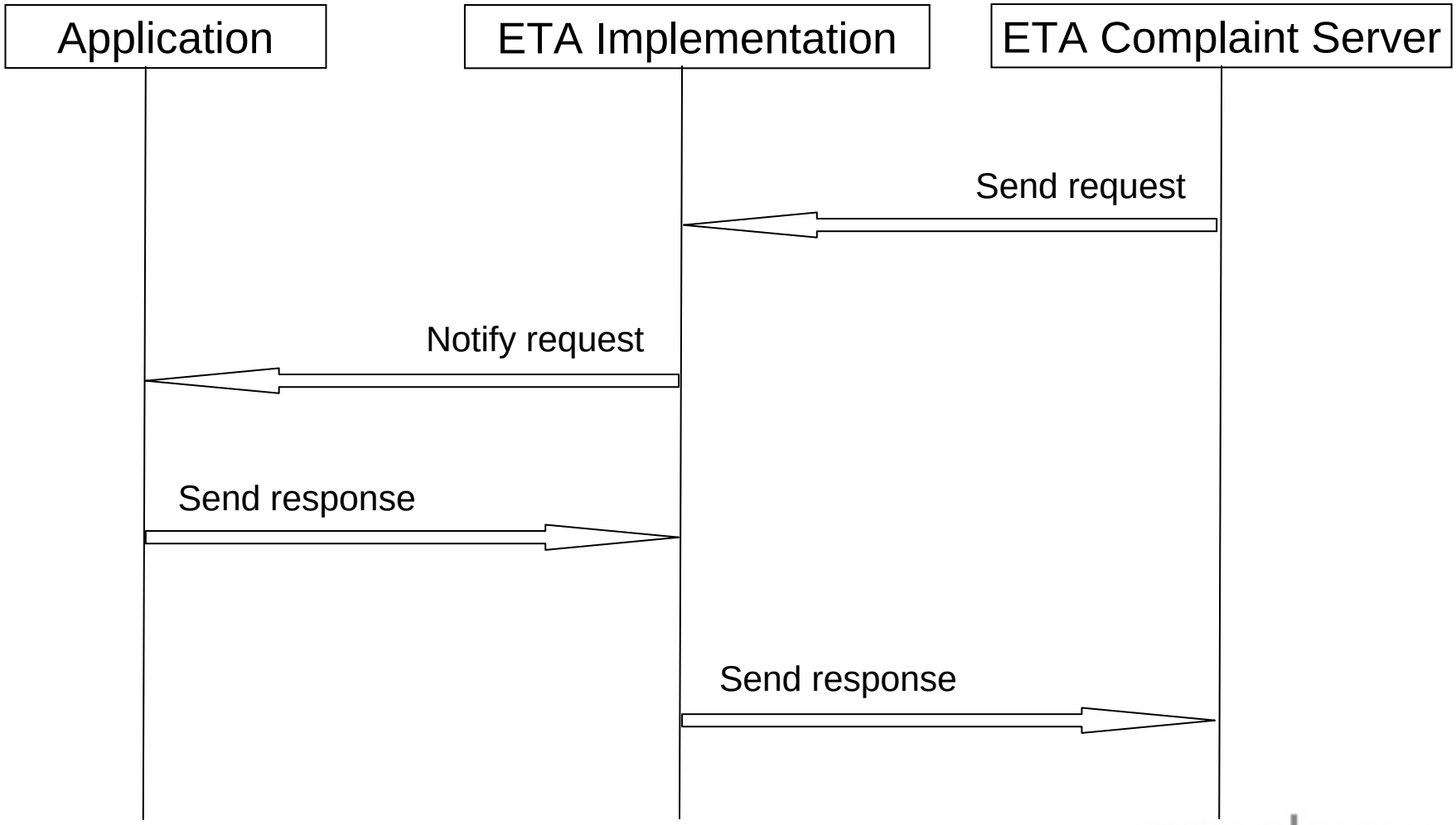
Events Flow
Response scenario (application point of view)



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Protocol Between a Java ME Device & the Collection System

IPDR Streaming Protocol

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Protocol Requirements

- **Reliable and Fault Tolerant:**
  - Billable/valuable data, regulatory requirements, negotiated SLA
- **Flexible:**
  - Avoid constraints on data models
  - Reduce the likelihood of “yet another protocol”
- **Scalable:**
  - Data rates between 100 and 30,000 records/sec per NE/SE
  - Operation across WAN
  - Support for 10s-1,000s of producers
- **Real-time:** introduce minimum latency – end-to-end processing
- **Efficient:** minimum impact on service element and network
- **Short Time to Market:** easy to implement (time and cost)

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IPDR Streaming Protocol (IPDR/SP)

- A reliable, flexible, real-time accounting protocol that:
  - Leverages IPDR foundation (e.g. service specification)
  - Uses XDR-based compact binary encoding and TCP/IP Transport
  - Evolved from IETF RFC 3423 (CRANE)
  - Applicable to a broad set of services and domains
  - Specifically designed to address requirements for usage data exchange

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IPDR/SP Industry Adoption

- American National Standard Institute (ANSI) adopted IPDR/SP as an American National Standard (ANS)
- CableLabs adopted IPDR/SP as a mandatory part of DOCSIS 2.0 and 3.0 implementation
- Approved by Alliance for Telecommunication Industry Solutions (ATIS) - Requirements and Architecture
- In process of submission at International Telecommunications Union (ITU) as part of the Next Generation Network (NGN) standardization

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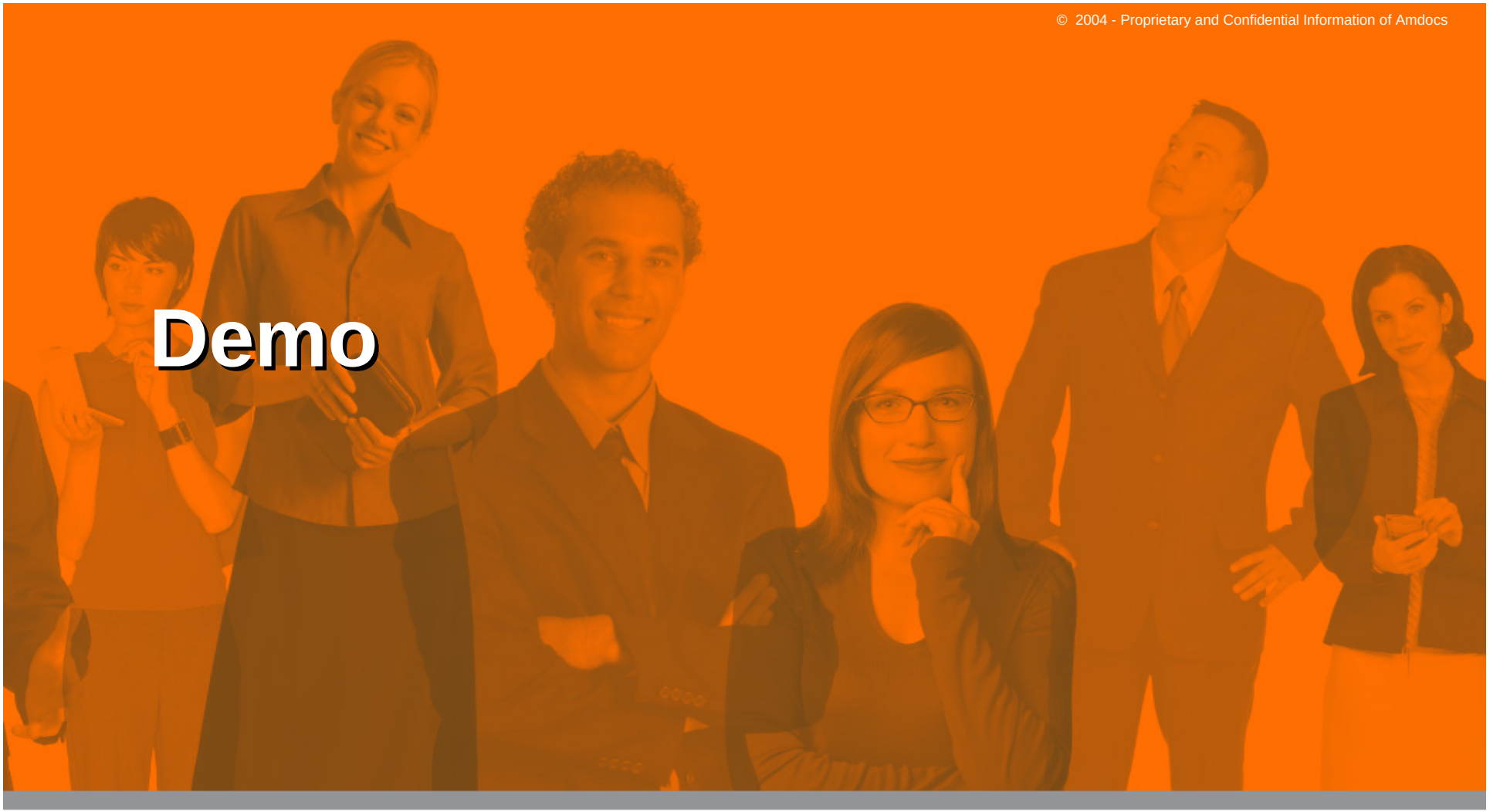

Demo

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Demo

- The code is based on **Maze game**
  - http://www.java2s.com/ExampleCode/J2ME/Game.htm
- A number of events to be reported were added to the original code:
  - Start Game
  - Restart Game
  - Change Level
  - Exit

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Demo code example
Loading the Exporter

At the constructor

- Initiate listener object
  - reportStateMachineListener =
    new ReportStateMachineListener(…);
- Initiate configuration
  - config = (new ExporterConfigJad()).init(this);
- Initiate Exporter and load it
  - exporter =
    new ExporterManager(…)
  - exporter.setConfiguration(config);
  - exporter.load();

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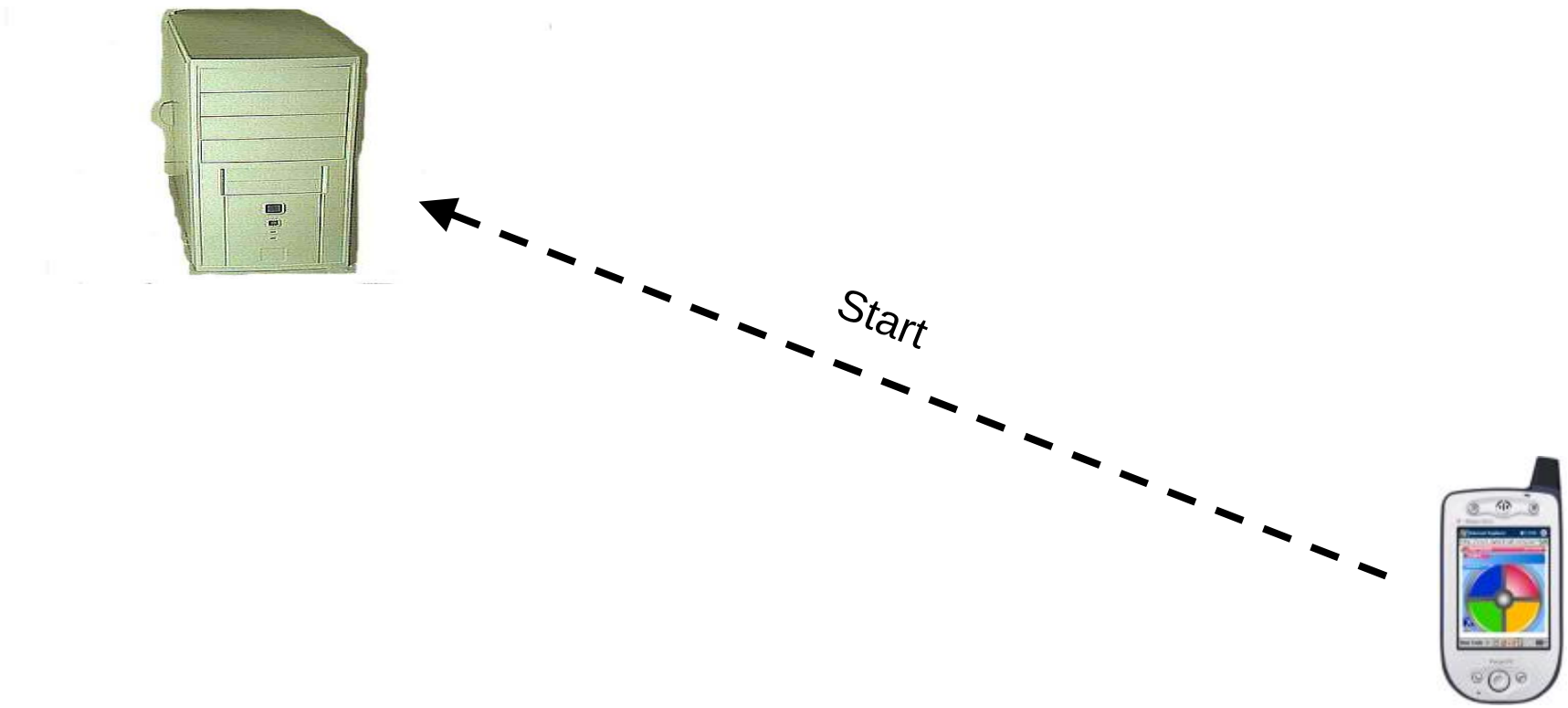
Track the game



> exporter.sendData(sessionId, templateId, startEvent);

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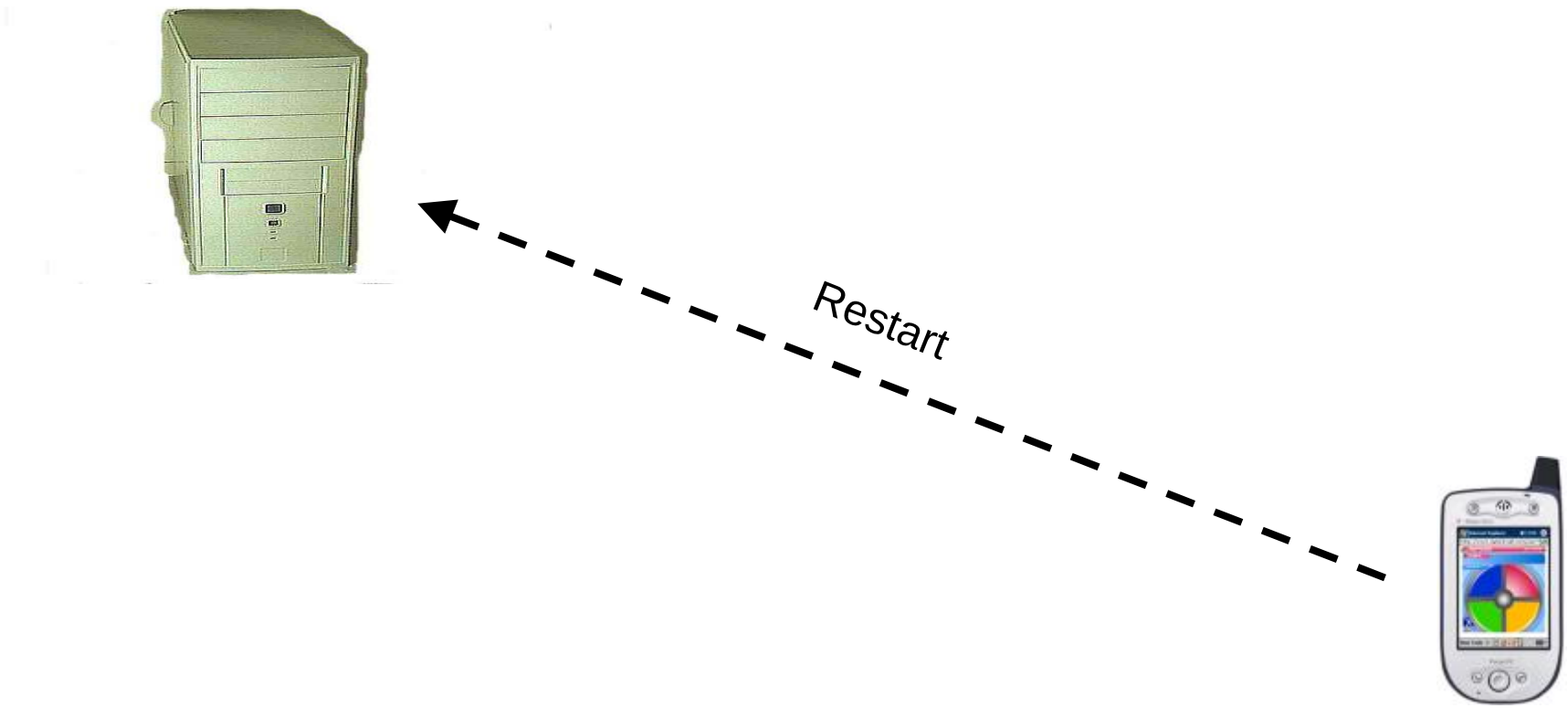
Track the game



> exporter.sendData(sessionId, templateId, restartEvent);

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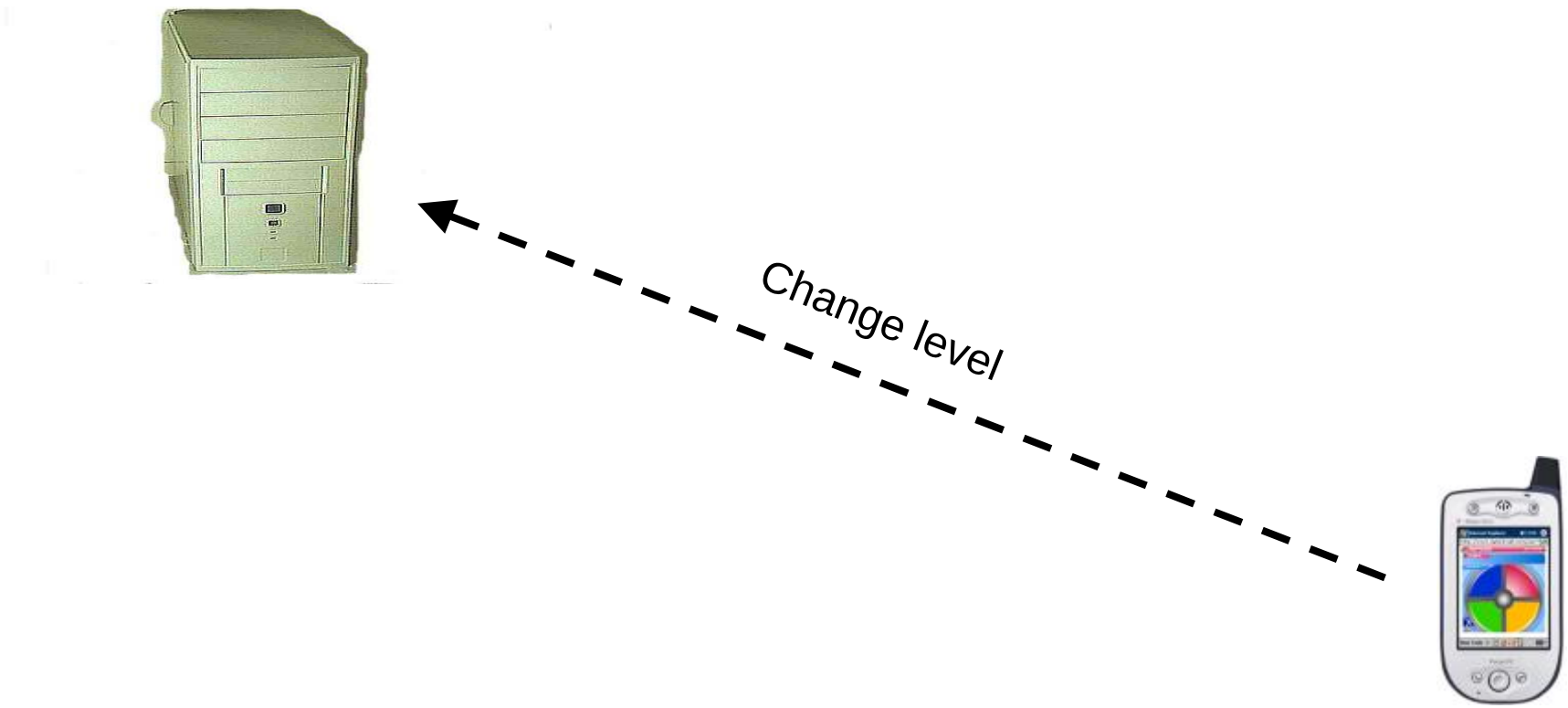
Track the game



> exporter.sendData(sessionId, templateId, changLevelEvent);

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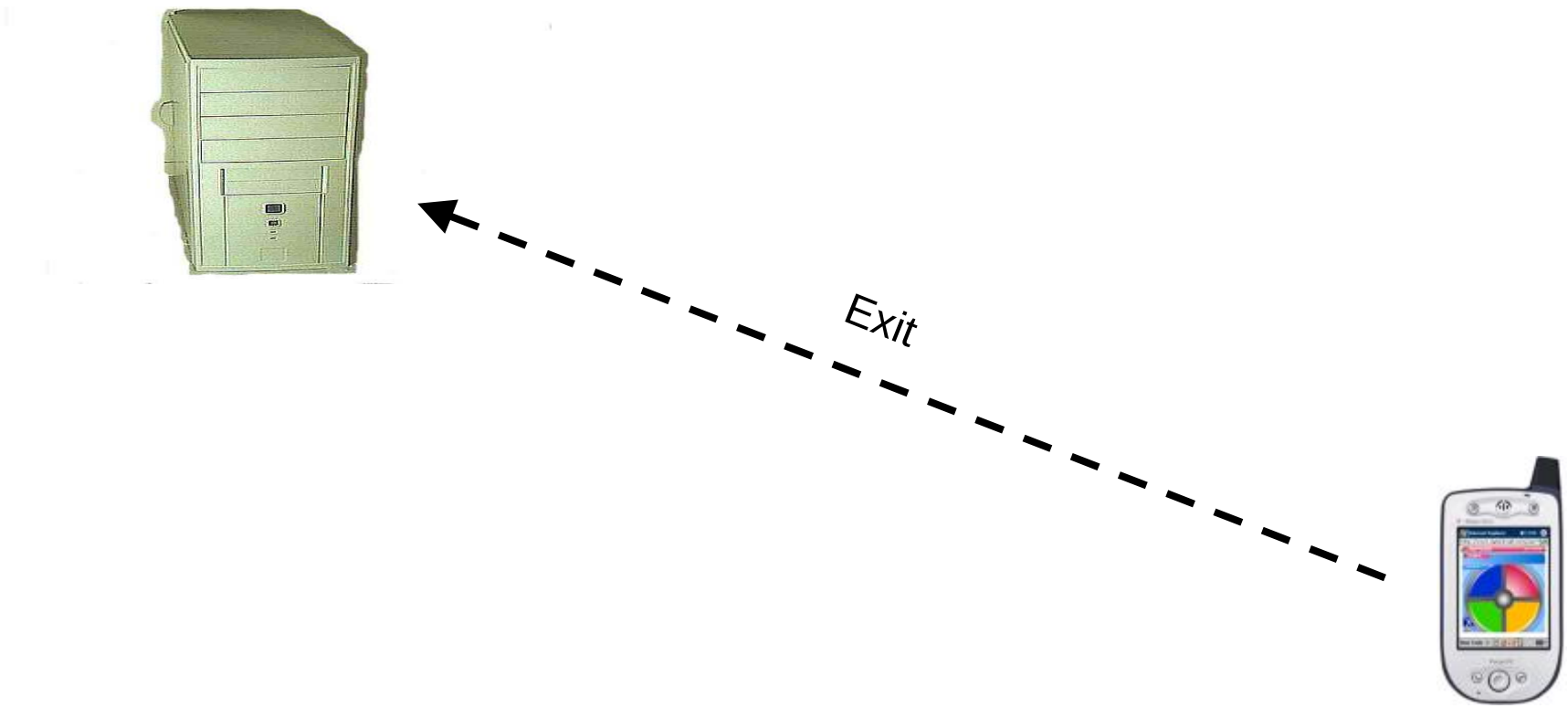
Track the game



> exporter.sendData(sessionId, templateId, exitEvent);

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Summary

- The need for Monitor and Tracking events is constantly increasing
- JSR 190 can eliminate the current fragmentation of the event tracking APIs and protocols
- We believe it is closely related and can be leveraged by the existing OMA activities in the Gaming Services Client/Server Interface Specification and other areas

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Thank You!

JSR 190