



# The Role of Java™ Technology in IPTV

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# Agenda

Defining the IPTV Ecosystem boundaries

Hardware deployment in the Ecosystem

Java™ technology in the Ecosystem

Development Environments

Examples

Summary

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## Defining the IPTV Ecosystem boundaries

Hardware deployment in the Ecosystem

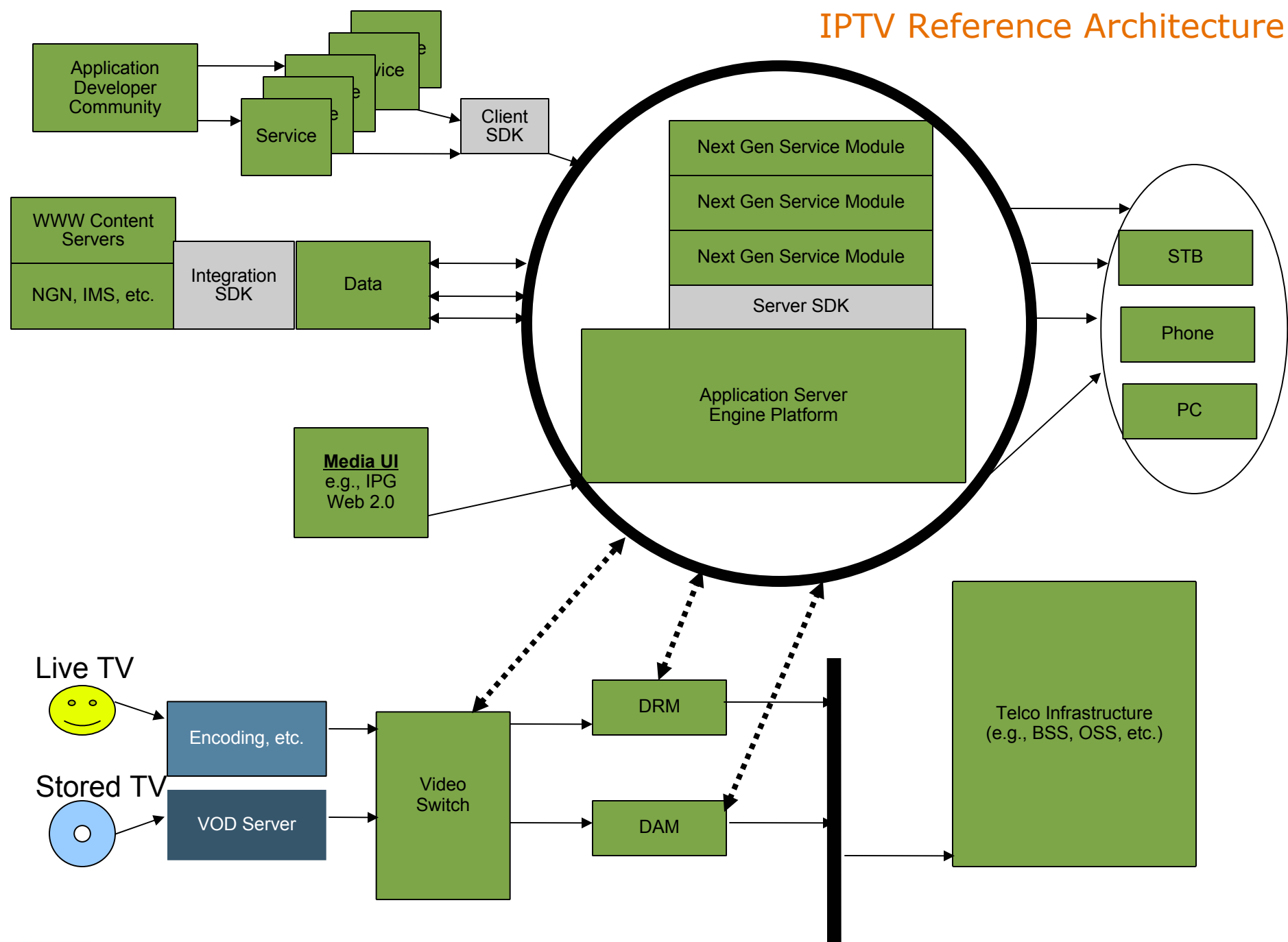
Java™ technology in the Ecosystem

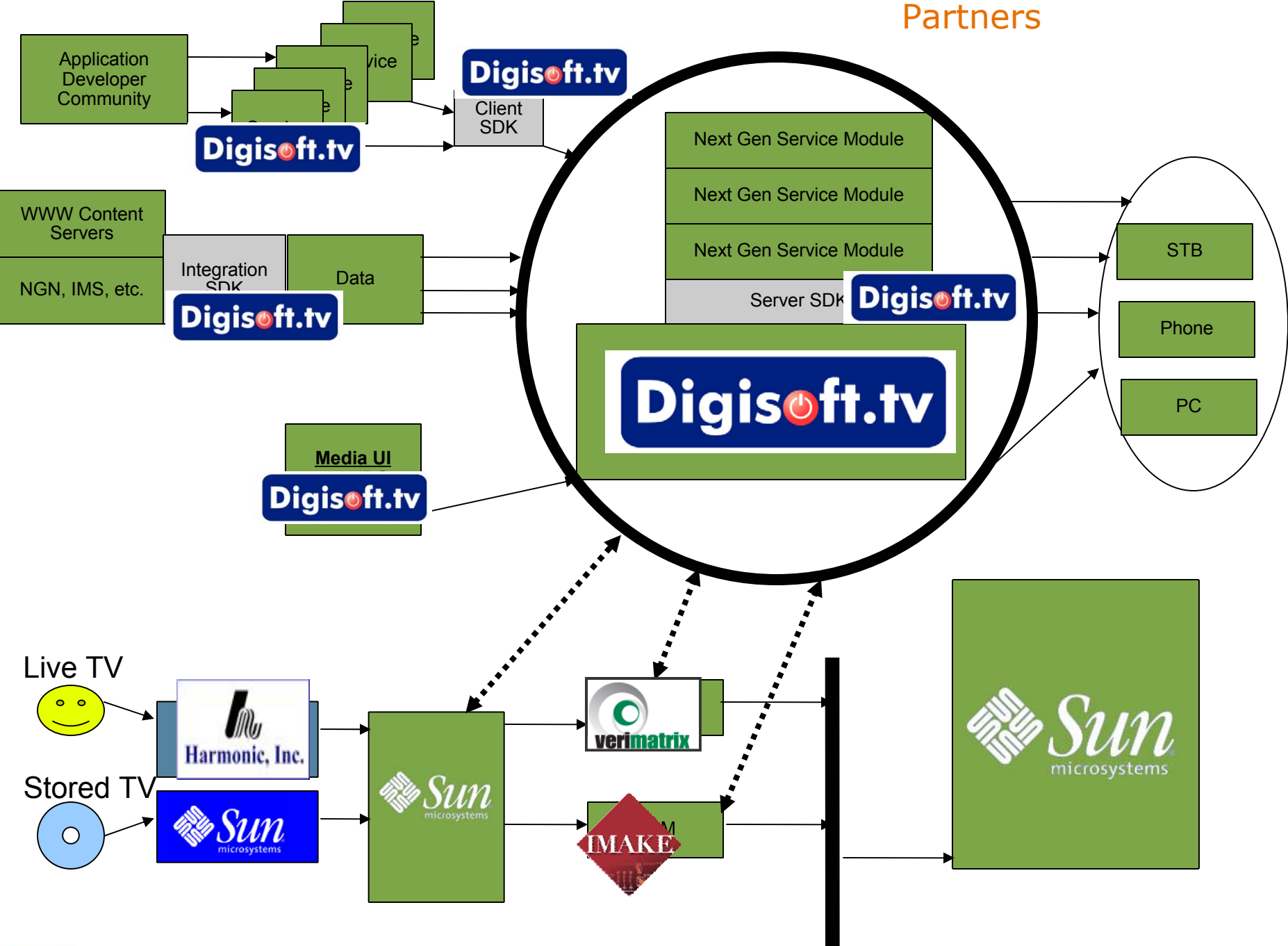
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# IPTV Reference Architecture





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**Hardware deployment in the Ecosystem**

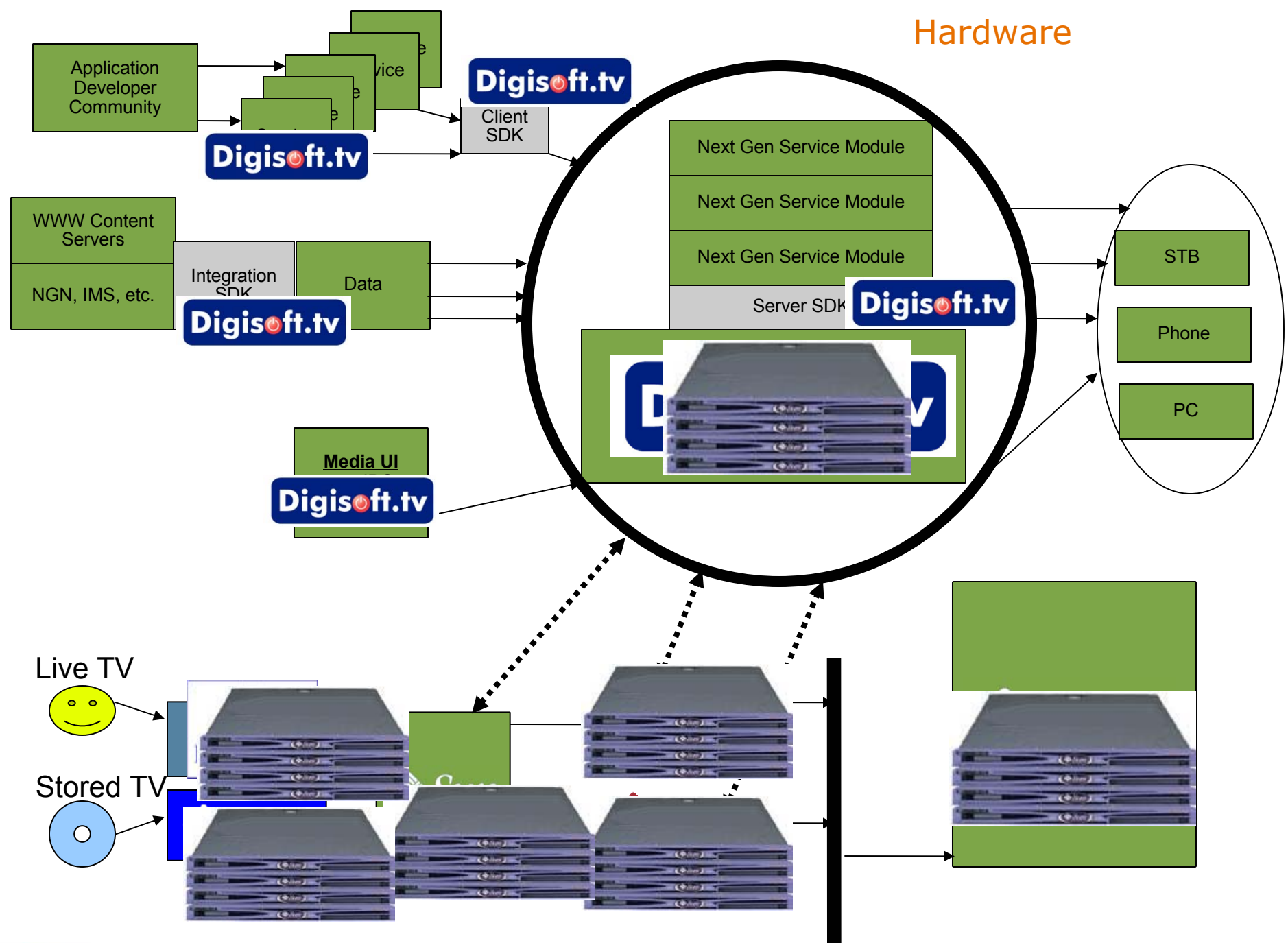
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# Hardware



# Sun™ Streaming System

Previously: “StreamSTAR”

- Personalized TV is the next killer application
  - Requires massive unicast streaming
- Sun Streaming System delivers 100,000 streams!
- 768 terabytes of video storage
  - Double Netflix’s entire catalog
- 2 terabyte video cache and 100,000 concurrent users
- most scalable streaming platform in the industry’s
- Open standards ensure investment protection and service innovation





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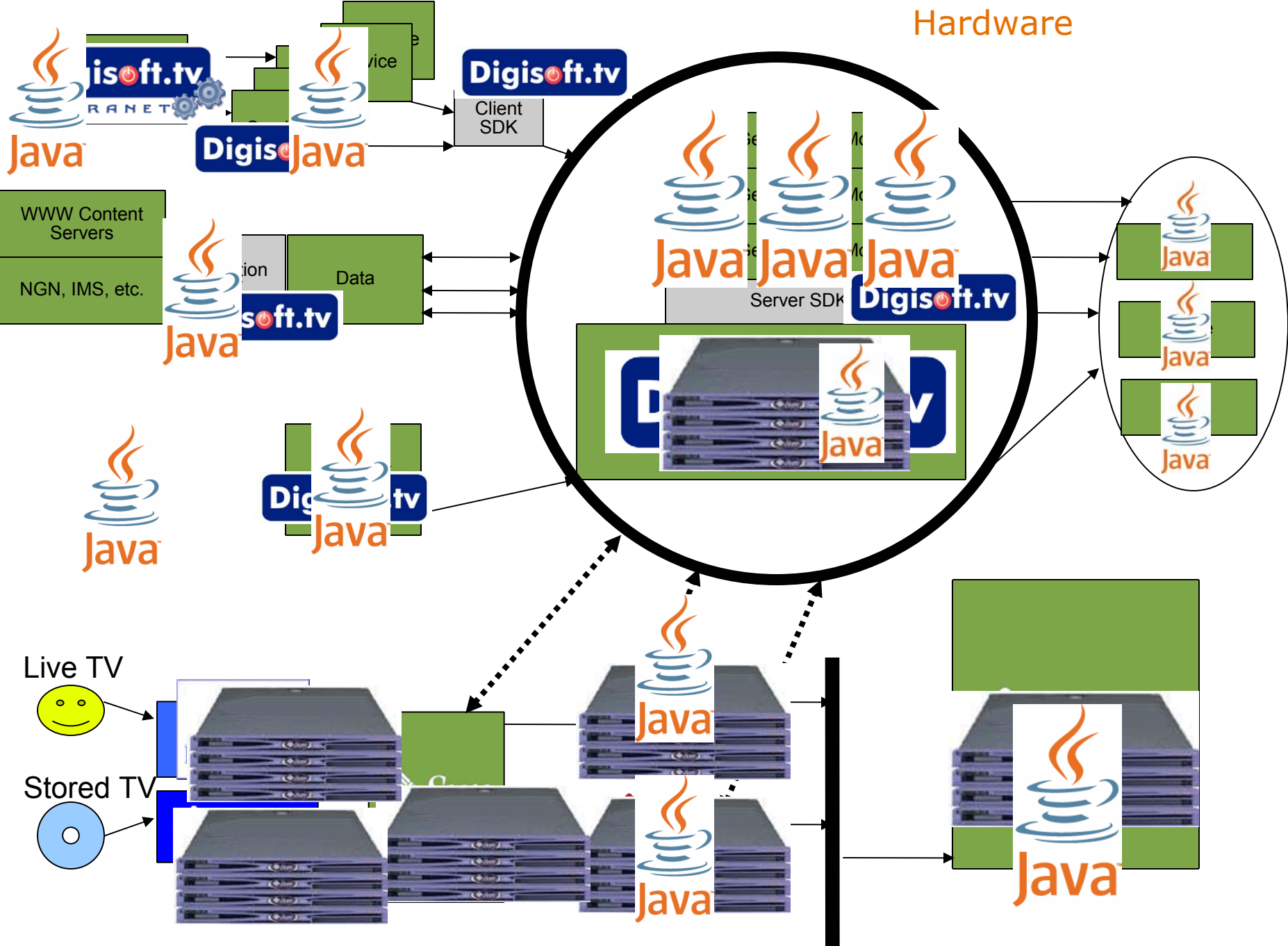
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# Java Platform Elements

Some sample areas

- Java platform in the Client
- Sun Java Enterprise System
- Java 2 Platform, Enterprise Edition (J2EE™ platform)
- JAIN™ technology/JSLEE

# Java Platform Elements

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# Java Platform in the Client

## “Client Middleware”

- MHP, OCAP, and GEM
- Proprietary Java technology-based Middlewares
- Java Platform, Micro Edition (Java ME platform) approach

# MHP, OCAP, and GEM

## Open Standards

- MHP and OCAP built on GEM
- GEM-IPTV subset of MHP 1.2

# MHP, GEM, and DVB-IPTV

**GEM-IPTV**

**MHP-IPTV**

**DVB-IPTV**

# MHP, GEM, and DVB-IPTV

## GEM-IPTV

Protocol independent

## MHP-IPTV

Mandatory  
DVB  
SD&S  
APIs

Optional  
Broadband  
Content  
Guide  
APIs

## DVB-IPTV

Uses MPEG-2 TS with various AV codecs  
Defines DVB version of RTSP protocol,  
also DVB Service Discovery & Selection protocols

Optional  
Broadband  
Content  
Guide



# GEM-IPTV in an Existing Network

## GEM-IPTV

**RTSP, IGMP, and UDP protocol mapping**

Protocol support for talking to  
Proprietary IPTV systems,  
e.g., MSTV, OMP, Minerva, etc.

# Hybrid: MHP + GEM-IPTV

## MHP

MHP support for broadcast networks  
Any version of MHP

## GEM-IPTV

RTSP, IGMP, and  
UDP protocol mapping

## DVB Broadcast Network Support

Satellite  
*or*  
Cable  
*or*  
Terrestrial

Protocol support for talking to  
Proprietary IPTV systems,  
e.g., MSTV, OMP, Minerva, etc.

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## DVB-IPTV

Uses MPEG-2 TS with various AV codecs  
Defines DVB version of RTSP protocol,  
also DVB Service Discovery & Selection protocols

# Hybrid: OCAP + GEM-IPTV

## OCAP

OCAP support for digital cable network  
Any version of OCAP

## GEM-IPTV

RTSP, IGMP, and  
UDP protocol mapping

## OCAP Cable Network support

Cable  
*only*

Protocol support for talking to  
Proprietary IPTV systems,  
e.g., MSTV, OMP, Minerva, etc.

# Proprietary Java Technology-Based Middlewares

## Legacy Client Middleware

- Some have/working towards standards
- Java and JavaScript™ technologies not to be confused!
- Open APIs rarely open
- Poor support for third-party application development companies, if any
- Too many Fat clients
- Better than non-Java technology solutions, but still very limited



**Guide**

RECORD +24 Hrs -24 Hrs

Channel	Time	Program
Channel 2	15:00	Childsplay - Chat show
Channel 3	15:30	Home and Away - Travel Show
Channel 4	16:00	Nationwide - Investigative Journalism
Channel 5	17:00	Live at 5 - Chat show
Channel 6	17:30	Seinfeld- Comedy
<b>Channel 7</b>	<b>18.00</b>	<b>Friends - Comedy</b>
Channel 8	18.30	Fraiser - Comedy
Channel 9	19.00	Life Lines - Documentary
Channel 10	20.00	Kill Bill - Movie
Channel 11	21.55	Will and Grace - Comedy
Channel 12	22.30	Into the West - Movie
Channel 13	24.00	Weather Forcast
Channel 14	01.15	Home and Away - Travel Show

15:10 - 12/22/05

# Java Technology Rapidly Growing on Devices



# Java Elements

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- Java platform in the Client
- **Sun Java Enterprise System**
- Java 2 Platform, Enterprise Edition (J2EE platform)
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# Sun Java Enterprise System (Java ES)

## Java ES 5.0

- Software
  - e.g., Sun Java System Application Server Enterprise Edition (more scalable than JBoss)
  - e.g., Identity Management Suite
- Support
- Professional Services
- Educational Services

# Java Elements

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# J2EE Platform

“Java Platform, Enterprise Edition (Java EE platform)”

- “Portable, Scalable, Robust and Secure”
- Java EE 5 platform vs. J2EE 1.4 platform

Table 1: Summary of Findings

Application Name	Item Measured	J2EE 1.4 Platform	Java EE 5 Platform	Improvement
AdventureBuilder	Number of classes	67	43	36% fewer classes
	Lines of code	3,284	2,777	15% fewer lines of code
RosterApp	Number of classes	17	7	59% fewer classes
	Lines of code	987	716	27% fewer lines of code
	Number of XML files	9	2	78% fewer XML files
	Lines of XML code	792	26	97% fewer lines of XML code



# Java Elements

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# JAIN Technology/JSLEE

Seek and you will find

- The JAIN technology initiative has defined a set of Java APIs that enable the rapid development of Java technology-based next-generation communications products and services for the Java platform
- JAIN Service Logic Execution Environment (JSLEE)

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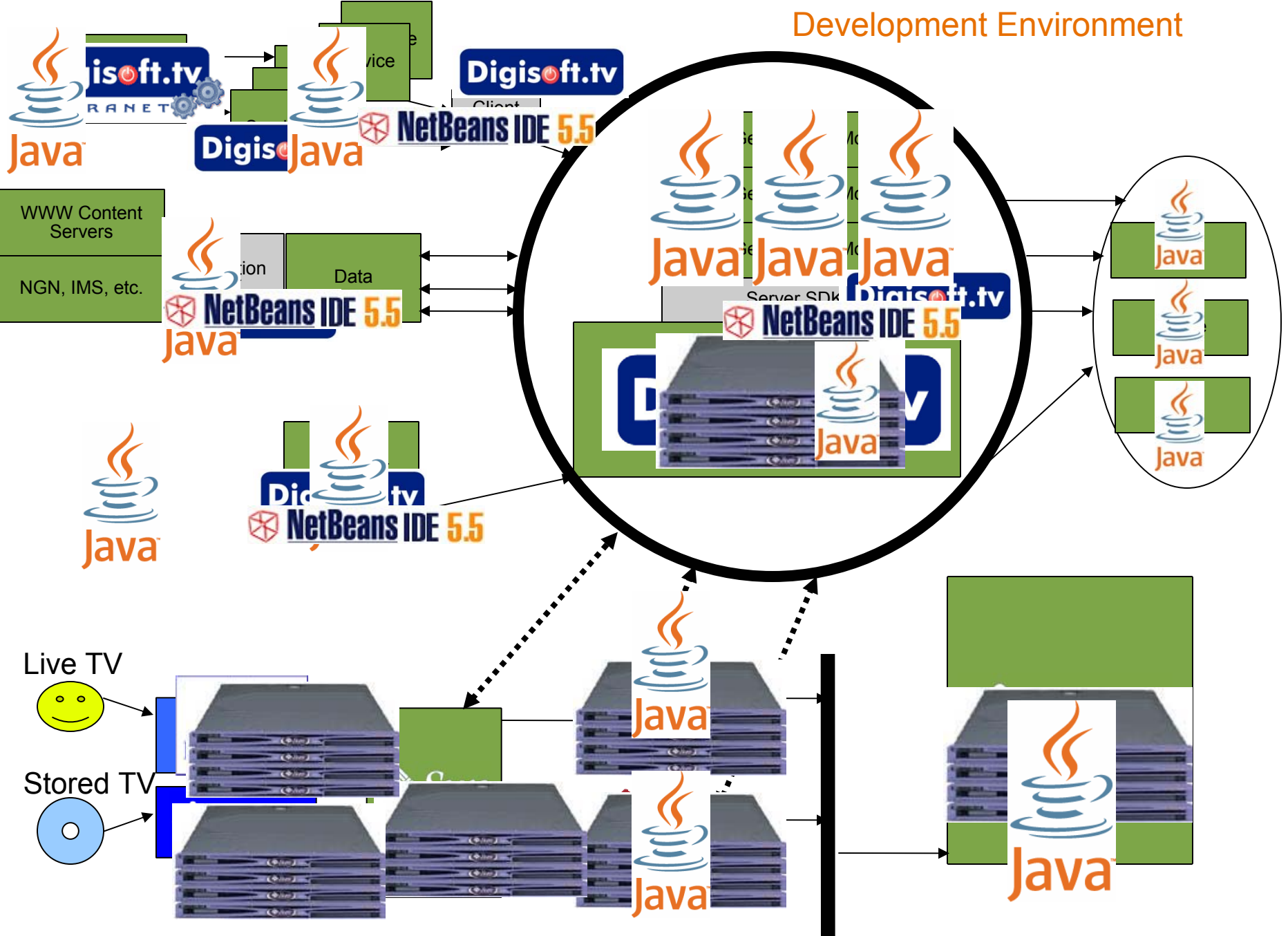
Java technology in the Ecosystem

**Development Environments**

Examples

Summary

# Development Environment



Projects

- manila
  - sthlib
    - New
    - Build Project
    - Clean Project
    - Generate Javadoc for Project
    - Clean and Build Project
    - Set Main Project
    - Open Required Projects
    - Close Project
    - Rename Project
    - Move Project
    - Copy Project
    - Delete Project Delete
    - Find... Ctrl-F
    - Tools
    - Properties

DButton.java x MessagingAPI.java x

```
/**
 * $Header: /digiSoft/xlets/stblib/src/com/digisoft/xlets/api/MessagingAPI.java 19 28/02/06 10:51 Dchapman
 *
 * Copyright DigiSoft.tv Ltd. All Rights Reserved.
 *
 * This software is the proprietary information of DigiSoft.tv Ltd.
 * Use is subject to license terms.
 */

package com.digisoft.xlets.api;

import java.io.IOException;
import com.digisoft.xlets.util.Connection;

/**
 * Wraps messaging specific XML.
 *
 * @author ccoughlan jstack
 * @version 1.0
 */
public class MessagingAPI
{
    private Connection myConnection;
    private final static String INBOX = "inbox";

    public final static String EMAIL = "Email";
    public final static String SMS = "SMS";
    public final static String MMS = "MMS";
    public final static String MEMO = "Memo";
}
```

9:4 INS

Search Results

Output

Usages



**NetBeans Software** (First time here ?)

Search

 **IDE**
 **Mobility Pack**
 **Enterprise Pack**
 **Profiler**
 **C/C++ Pack**
 **Platform**

**NetBeans 5.0**



Download now!

**News**



**The NetBeans' Birthday Celebration**  
October 26th is NetBeans' eighth birthday! We are celebrating for the whole month of October and YOU get the presents! Join us for stories about the history of NetBeans, quizzes, and prizes, including an Apple iPod! Join the party!

[Read more](#) →



**Featured Partner: DigiSoft.tv**

The NetBeans IDE is the core development tool in DigiSoft's "IPTVBOX", an Interactive TV development laboratory specifically aimed at IPTV and multi platform support for interactive services and applications.

[Read more](#) →

**Latest Downloads**

- [NetBeans IDE 5.0](#)
  - [Mobility Pack 5.0](#)
  - [Profiler 5.0](#)
  - [NetBeans IDE 5.5 RC1](#)
- [\\* View all](#)



**Why NetBeans? (Part 1)** Have your own NetBeans day at home in your armchair! Invite your friends, make some popcorn, and look at Roman's new Flash demo where

he answers the question "Why NetBeans?" The first of two parts demonstrates the GUI Builder, Ant, Profiler, and the Platform. [Read more](#) →



**The Road to 5.5: Release Candidate One** The first release candidate for the NetBeans IDE 5.5 is now available. NetBeans 5.5 supports the Java EE 5 platform,

and the Java Persistence, EJB 3 and JAX-WS 2.0 specifications. Also available are updated versions of the Profiler and Mobility Pack. [Read more](#) →



**Calendar**

- [NetBeans worldTour](#)
- [NL-JUG J-Fall 2006](#)
- [NetBeans User Group Munich](#)
- [OOPSLA 2006](#)

**Other Headlines**



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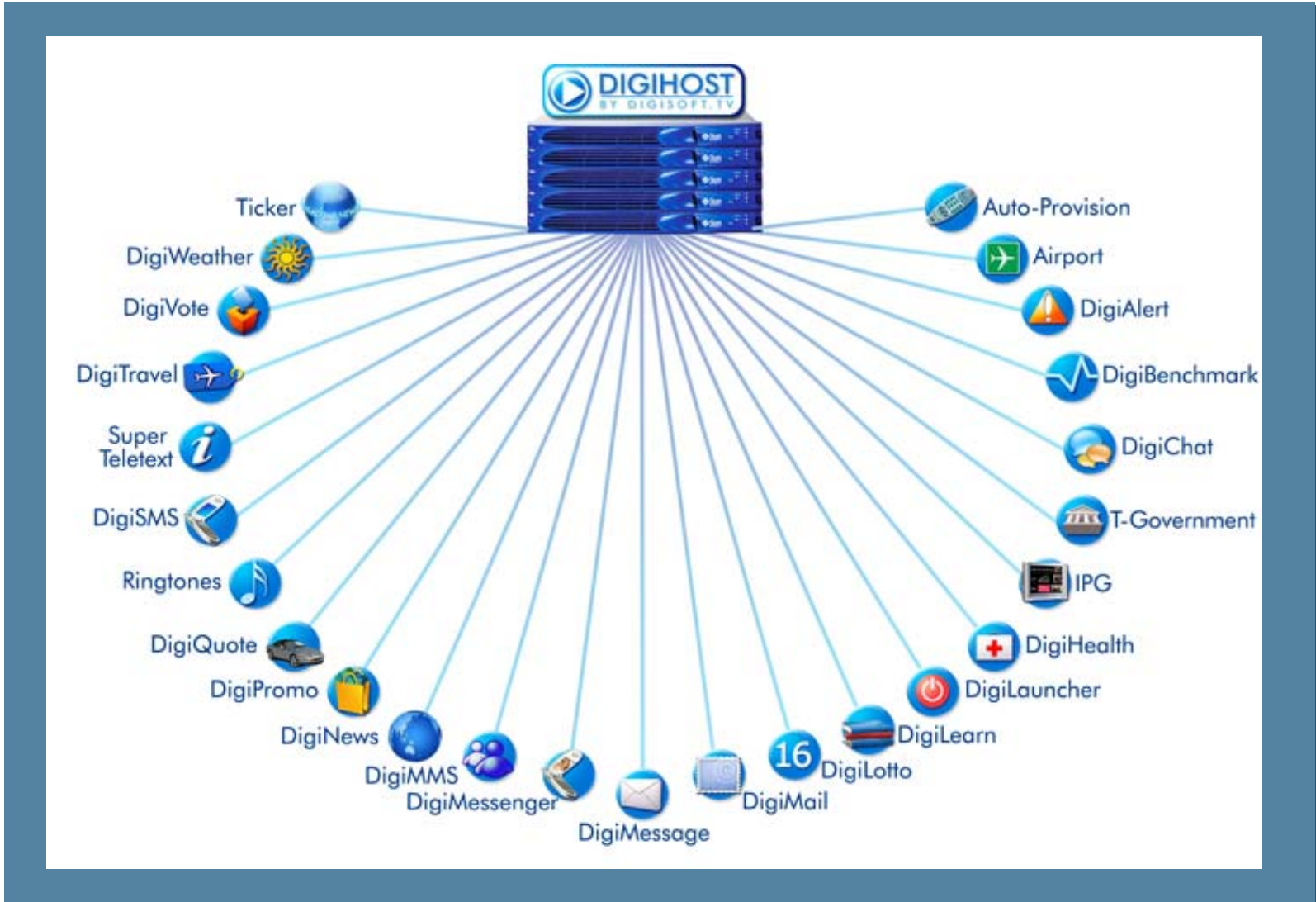
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**Examples**

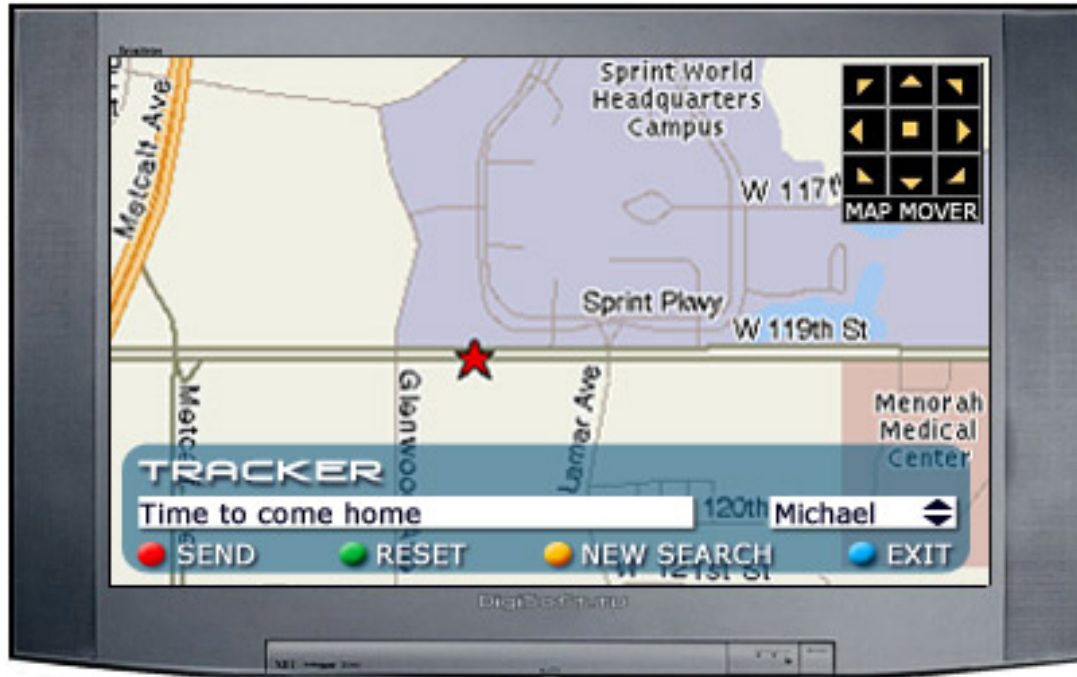
Summary



April 5, 2007

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e.g., Integrate to an LBS, SMS, and Mapping Server and develop a simple client to see where your child's phone is...



How much would a parent pay for this???

Would it influence their quad-play selection?

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INTERACTIVE EXERCISE-NUMERACY

QUESTION 2 of 10

What time is shown on the clock?

- 1 - 1 o'clock
- 2 - 5 o'clock
- 3 - 4 o'clock
- 4 - 2 o'clock

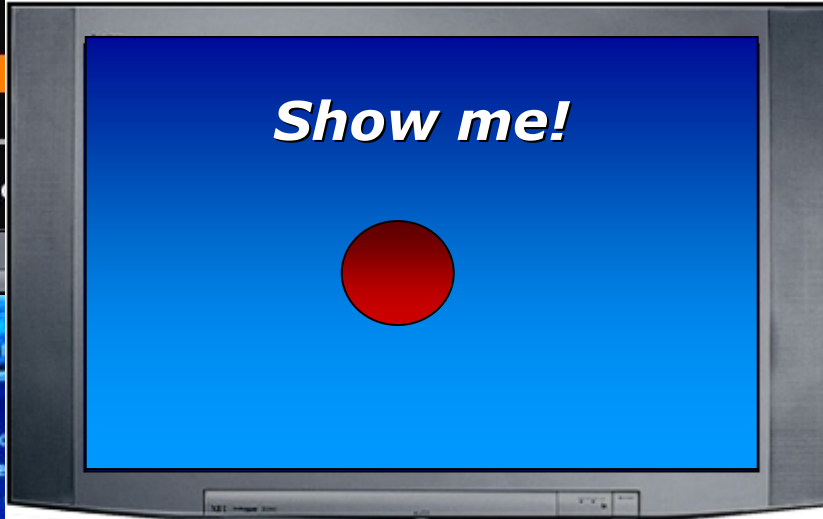


CHECK ANSWER    BACK



10

	Received	Status
4	13.05.04 - 16:30	Unread
4	10.05.04 - 18:47	Read
tv	05.05.04 - 09:42	Read



**DigiWeather**

- 1. Northwest
- 2. Midwest
- 3. Northeast
- 4. Southwest
- 5. Southcentral
- 6. Southeast
- 7. Alaska
- 8. Hawaii

Temperature scale: -50 to 120 F / -50 to 50 C

MENU    BACK    NEXT    EXIT

Fate "prendere fiato" al creative: vi aiuterà a fare utili in futuro. In amore, per dichiararvi: invitate a cena la persona amata. Se per lei la scintilla non è ancora scoccata, oggi sarà la volta buona.

OROSCOPO PERSONALE    USCIRE

National Lottery

When press Select

22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42

3    13    20

MENU    QUICK PICK    NEXT    EXIT

banking 365 interactive

24 hour banking at your finger tip

Please select a number from

- Account Information
- Transfer Funds
- Bill Payment
- Information
- Contact Us

MENU    BACK    NEXT    EXIT

Rugby di 6 nazioni

Chi vincerà il rugby di 6 nazioni?

- 1. Irlanda
- 2. Inghilterra
- 3. Italia

Selezioni prego il numero di vostra scelta

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2007 JavaOne<sup>SM</sup> Confere

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## Why use Java technology in IPTV?

- Flexible to developers, partners, and customers
- Portable—cross-platform
- Scalable
- Large range of Java technology solutions available
- Even larger support infrastructure



# Q&A

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