LLRP Toolkit

Project Overview
1-21-2009

LLRP Toolkit (LTK)

www.llrp.org

LRP-Toolkit

- **What is it?**
  - **Open source software**
    - Programming libraries for building LLRP enabled devices
    - Apache 2.0 license
    - http://www.sourceforge.net/projects/llrp-toolkit
  - **Integrated LLRP documentation**
    - With permission from EPCglobal
  - **Community web site**
    - http://www.llrp.org

Goals

- **Goals**
  - Accelerate the development of LLRP enabled devices
  - LLRP interfaces for common programming languages
  - Common method to describe LLRP extensions
  - Human readable description of LLRP packets
  - Integrated documentation

- **Out Of Scope**
  - An implementation of LLRP client or reader
  - Define new features or packet for LLRP
  - Provide RFID based applications

http://www.llrp.org

Timeline

LLRP Toolkit (LTK)

- **2007 April – LLRP Ratified**

- **2007 May – Community meets to discuss LLRP libraries**

- **2007 June – Project Kickoff**

- **2007 August – Alpha release for LTK-Perl and LTK-C**

- **2007 September – Online packet decoder tools use LTK**

- **2007 October – LTK Java development begins**

- **2008 January – LTK C#.NET beta begins**

- **2008 March – Impinj ships production LTKC/LTK**

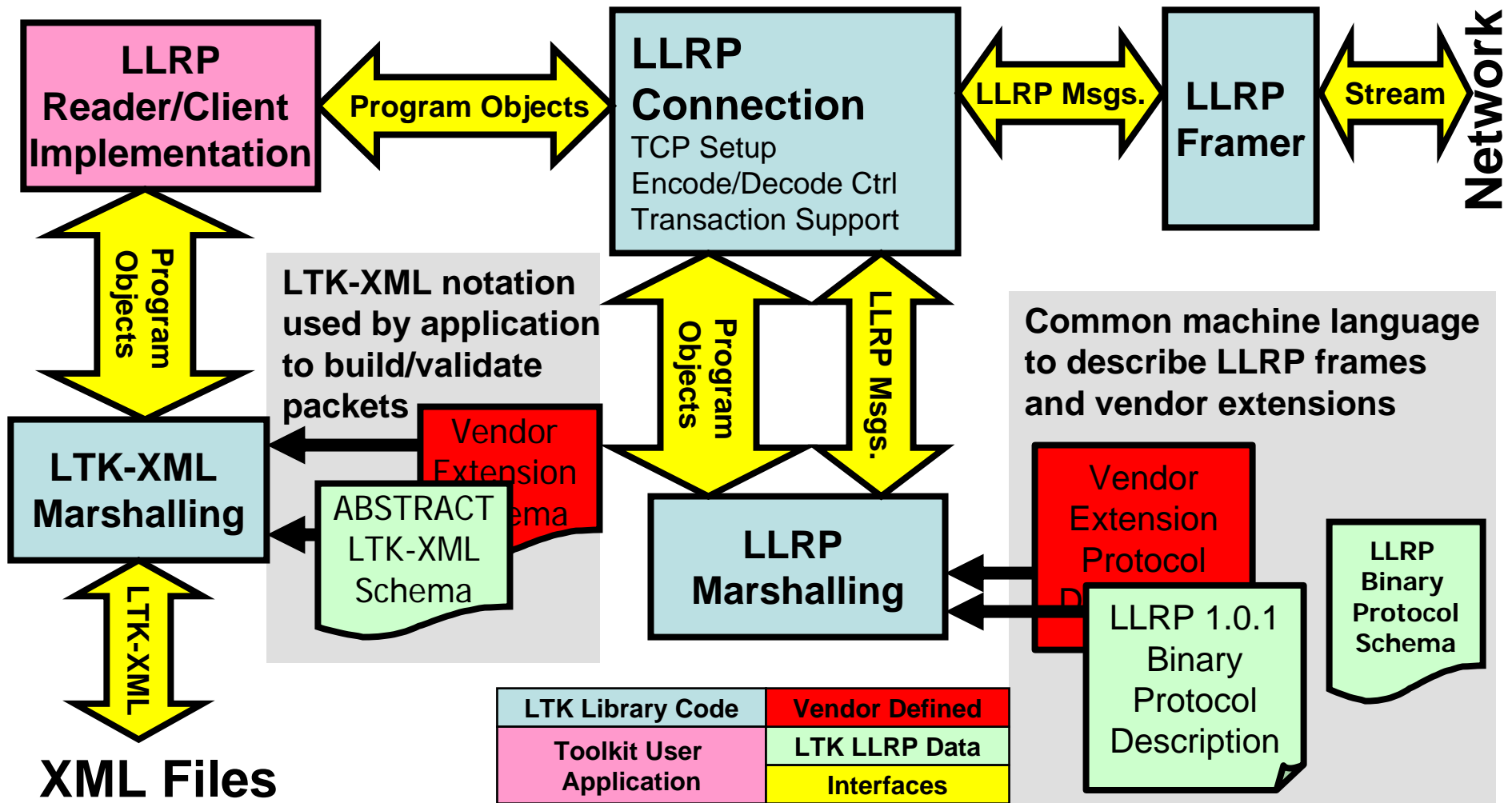- **2008 December – Production release 1.0.0.5**

Status

- **Production Libraries available:**
    - C, C++, Java, C#.NET, and Perl
- **Parsing and serialization of all LLRP frames**
- **Converts LLRP packets to LTK-XML**
    - Share among implementations
    - Debug or troubleshoot
- **Complete Vendor extension model**
    - Easily adapt extension into any language
- **Preliminary packet test framework**

Technology/Architecture

LLRP Reader/Client Implementation

Program Objects

LLRP Connection
TCP Setup
Encode/Decode Ctrl
Transaction Support

LLRP Msgs.

LLRP Framer

Stream

Network

Program Objects

LTK-XML notation used by application to build/validate packets

Program Objects

LLRP Msgs.

Common machine language to describe LLRP frames and vendor extensions

Vendor Extension Schema

LTK-XML Marshalling

ABSTRACT LTK-XML Schema

LTK-XML

LLRP Marshalling

Vendor Extension Protocol

LLRP 1.0.1 Binary Protocol Description

LLRP Binary Protocol Schema

XML Files

LTK Library Code	Vendor Defined
Toolkit User Application	LTK LLRP Data
	Interfaces

Future

- **Packet test framework**
- **LLRP 1.2**
- **More user documentation**
- **LTK-XML for C and C++**