



Formatv

en

10/21/10



# Agenda

- Open Source Introduction
  - History
  - Concepts
  - Benefits to RFID
- Open Source Resources
  - Sourceforge.net
- Open Source and RFID
  - Open Source RFID Community
  - Rifidi Introduction
  - Impact on Industry

# Introduction

- Who is Pramari?
  - Leading US Based RFID Software and Consulting Company
  - Member of EPCGlobal (Standards Group for RFID)
  - Partnered with leading Software Providers (IBM, Oracle)
  - Leading Hardware Partners (AWID, Alien, Identec)
  - Real Project Implementations (Gillette, Best Buy, UTC, Staples)
- About Prasith
  - RFID Veteran with over 7 years in RFID field
  - Architect of earliest EPC RFID implementations and middleware
  - Member of EPC Global Committees for software standards
  - Subject Matter Expert and Exam Reviewer for RFID Certification Exam

10/21/10

# Open Source - History

- Open Source History
  - 1984 – MIT Hacker Richard Stallman creates GNU project to provide free and open Unix tools such as gcc (unprecedented at that time).
  - 1991 – Student named Linus Torvalds attempt to put together a full operating system kernel called Linux. Uses much of GNU's work and takes on GPL license.
- Open Source Today
  - Linux is the fastest growing operating system in the world both in terms of features, performance and users
  - Enterprise tools such as Apache, JBoss (J2EE) and SugarCRM have proven that the Open Source model can build quality software comparable to and sometimes better than commercial software
  - Open Source is extremely agile and can change quickly to meet the needs of it's user community

10/21/10

The open source development process has been proven

44



# Open Source - Concepts

- Open Source (OSS) is community built software – It offers the ability for user's to directly interact with developers and also let's them become developers too.
- Open Source code has an inherent QA process. Developers take more care before releasing code and anyone is free to try to identify flaws in the code
- Open Source allows an unparalleled level of customization and also allows you the user to modify the code to your needs if the community can't
- Many different forms of licensing but all allow the ability to get free, open code and also modify it for internal use.

# Open Source - Licenses

- GPL and the FSF
- APL and the Apache Software Foundation
- EPL and the Eclipse Foundation
- Impact of Licensing on Software

# Open Source Resources

- Sourceforge ([www.sourceforge.net](http://www.sourceforge.net)) is one of the leading Open Source Communities
- Sourceforge is an Open Source Portal that hosts many of the top Open Source projects and over 110,000 projects in total
- User community of over 1,000,000 with advanced project management capabilities such as bug tracking, project ranking and code searching

# Open Source Business Models

- Open source business may not make money directly from its products
- Open Source companies do make predictable revenue
- In the 21st century web technology market, it is the open source company that has the greatest long-term strategic advantage
- The open source business model relies on shifting the commercial value away from the actual products and generating revenue from the 'Product Halo,'
  - Ancillary services like systems integration, support, tutorials and documentation.

# Open Source Business Models

- This focus on the product halo is rooted in the firm understanding that in the real-world, the value of software lies in the value-added services of the product halo and not in the product or any intellectual property that the product represents.
- In actuality, the value of software products approaches zero in the fast-paced, highly-customized, ever-changing world of information technology.
- Open source also cuts down on essential research and development costs while at the same time speeding up delivery of new products.
- The community members themselves provide free research and development by contributing new solutions, features, and ideas back to the community as a whole

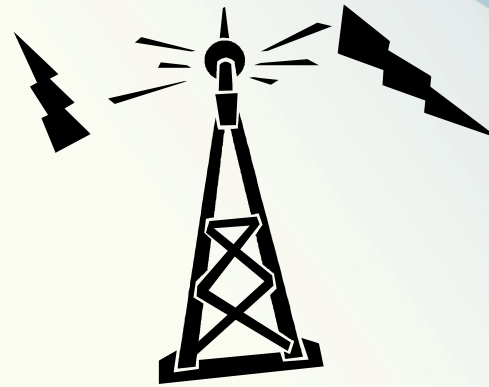
# Open Source Questions

- What is your interest in OSS?
- How can you make a difference in popular OSS projects?
- What kind of OSS projects can you start today?

# Basic RFID Concept

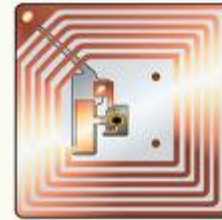
An interrogator unit, called a READER transmits a signal to a transponder, called a TAG.

The tag responds with a pre-programmed data transmission, which the reader receives and decodes.



# What makes it tick?

- Tags



# What makes it tick?

- Interrogators



# What makes it tick?

## Antennas

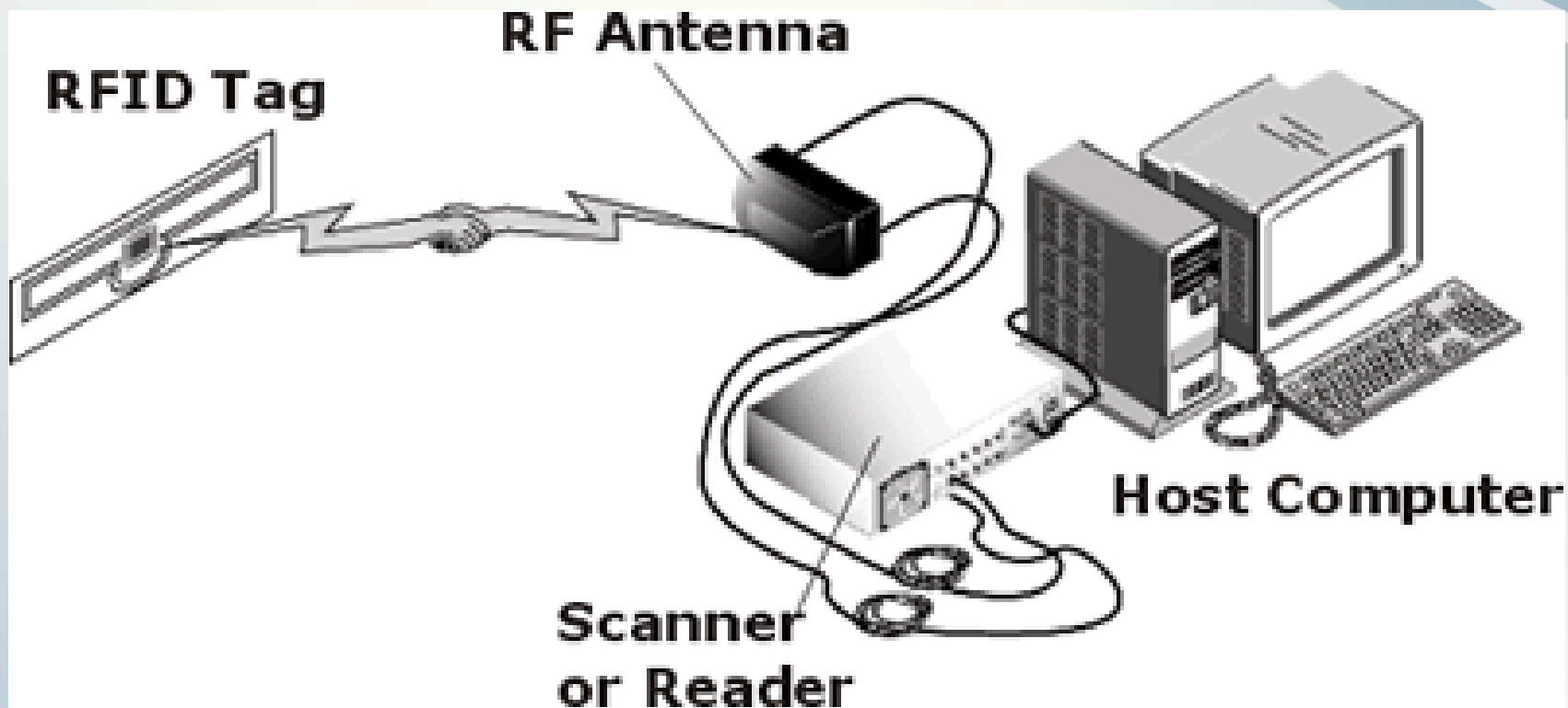


# What makes it tick?

- Systems Management Software



# RFID System Components



10/21/10

# OSS Benefits to RFID

- Most current and prospective RFID users agree that the following barriers make RFID a tough sell.
  - Limited access to hardware and software
  - No clear best practices or proven technology
  - Expensive software platforms for small/mid-size implementations
- RFID has a bad reputation of being very closed, expensive and having high barriers to entry
- Open Source can remove RFID's barriers to entry by making it easier and affordable
- Open Source fosters a learning community that can improve awareness and foster new development in RFID

# Open Source RFID Projects

- Open Source (OSS) is growing rapidly to cover the major areas required for building effective RFID systems.
- OSS can allow users to start prototyping their applications and see the benefits in a short time
- OSS offers a very complementary and very effective 'step-up' approach to commercial vendors by allowing the easy build-up of knowledge and expertise with low cost
- Important Open Source RFID projects
  - Rifidi – A Business modeling and RFID development tool. Rifidi creates virtualized RFID environments for design, development and testing.
  - Rifidi Edge– Open Source RFID Edgeware, allows controlling of RFID Devices and gathering RFID related data in a facility

# What is Rifidi?

- Rifidi is a complete RFID Application Platform
  - Leading set of Prototype and Testing Tools
  - Open Source RFID Middleware Platform
  - ALE and Workflow development tools
  - Based on Eclipse and OSGI w/ Lightweight Emphasis
  - Open Source Ideals – Business Ready Purpose
- Rifidi is an open source RFID community
  - Numerous Contributors – UofA, PennState, IBM, FossTrak
  - Corporate and University Usage – PennState, IBM, HP
  - Over 25,000 downloads strong, Active Forums
  - Developer Contributions to LLRP-TK and other RFID toolkits

10/21/10



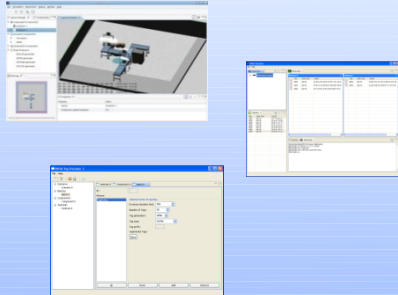
# What is Rifidi?

- Rifidi is a complete RFID Application Platform
  - Leading set of Prototype and Testing Tools
  - Open Source RFID Middleware Platform
  - ALE and Workflow development tools
  - Based on Eclipse and OSGI w/ Lightweight Emphasis
  - Open Source Ideals – Business Ready Purpose
- Rifidi is an open source RFID community
  - Numerous Contributors – UofA, PennState, IBM, FossTrak
  - Corporate and University Usage – PennState, IBM, HP
  - Over 25,000 downloads strong, Active Forums
  - Developer Contributions to LLRP-TK and other RFID toolkits

10/21/10

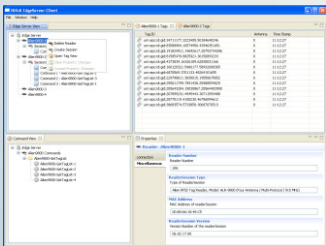


# Rifidi Product Suite

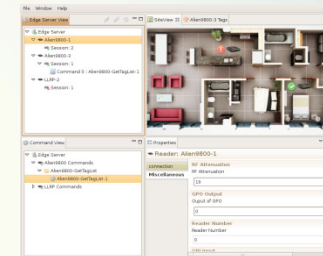


**Rifidi**  
**ToolKit**  
Rifidi Designer  
Rifidi Emulator  
Rifidi Tagstreamer

## Rifidi Workbench



## Rifidi EdgeServer



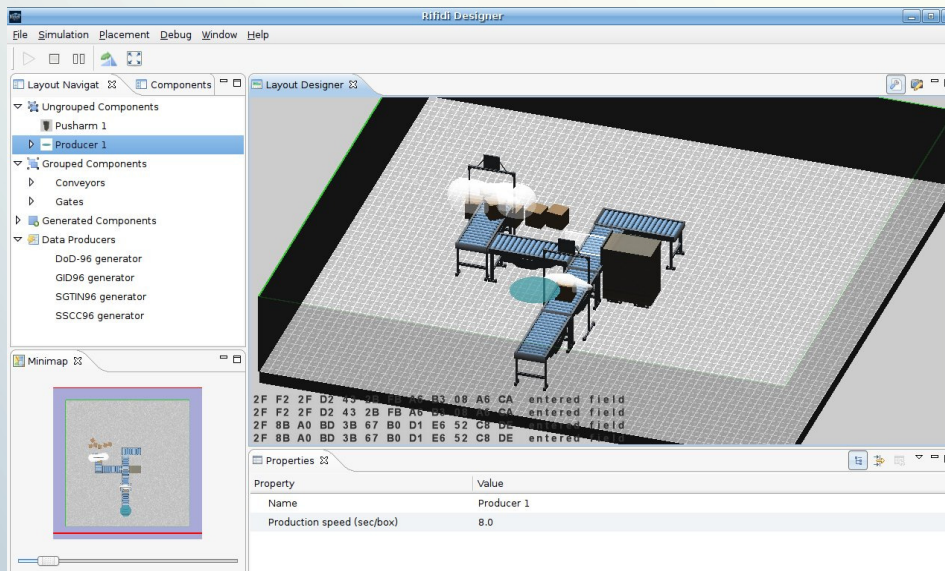
10/21/10



# Rifidi Toolkit

## “Software Defined RFID”

- The premier Prototyping Suite in RFID today
  - Designer – Create Visual Workflows to simulate RFID Processes
  - Emulator – Develop and Test with Software Defined Readers
  - Tag Streamer – Load Test and simulate large RFID data streams



10/21/10



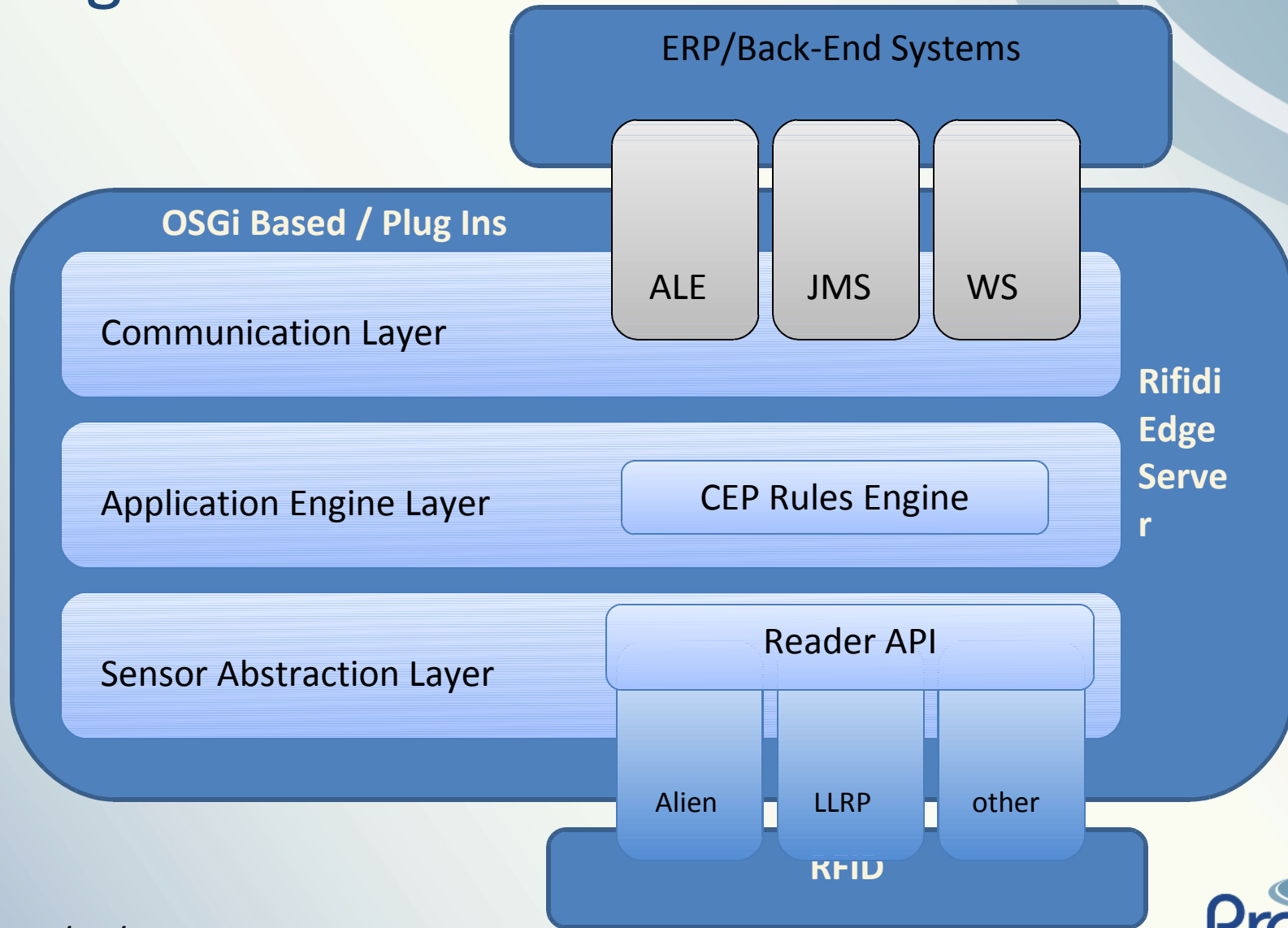
# Rifidi Edge Server

- Cutting edge RFID Middleware Platform
  - Lightweight, High Performance Platform based on OSGI and Java
  - Built with module update and hot deploy features
  - RFID customization of high performance CEP/ESP Engine (Esper)
  - Standards compliant ALE Engine built on top of Esper and FossTrak TDT
  - Combine ALE and CEP modules to create dynamic RFID applications
- Supported by Development & Monitoring Tools (Future)
  - Close integration to our Prototyping Suite
  - Eclipse Based tools to develop RFID Workflows
  - Eclipse and Web Based Monitoring tools for Production Operations
  - Sophisticated Notifications and Alerts definition toolkit

10/21/10



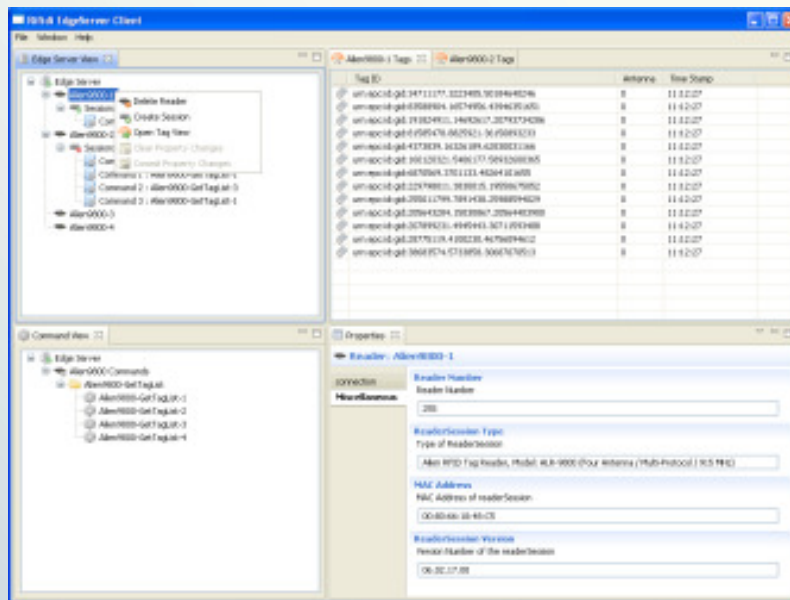
# Edge Architecture



10/21/10

# Rifidi Workbench

- Development Platform for ALE and RFID
  - Eclipse Based UI Centric Development
  - Graphical Support for Building ALE
  - Build Sensor Plug-ins and customize RFID data collection
  - Workflow tools for custom RFID application
  - Future support for other ALE Engines



10/21/10



# Putting it all Together

- Start Prototyping with Rifidi Toolkit
  - Try scenarios and put together quick demo's
  - Keep the scenarios for virtual testing later
- Develop RFID applications with Rifidi Edge Server
  - Create custom java applications using our Sensor Abstraction Layer
  - Create custom applications using our customized rules engine
  - Leverage platform for communication and integration
- Use Rifidi Workbench to ease development and Monitoring
  - Use Workbench to create standard ALE applications
  - Visually set up readers and data collection methods

10/21/10



# Sensor Abstraction Layer

The screenshot displays a software application window with a menu bar (File, Window, Help) and a toolbar. The main interface is divided into four panes:

- Edge Server View:** A tree view showing the hierarchy of edge servers. Under 'Edge Server', there are three main nodes: 'Alien9800\_1', 'Alien9800\_2', and 'LLRP\_1'. Each node has a 'Session: 1' sub-node, which contains a 'Command 0' (e.g., 'Alien9800\_GetTagList\_1' or 'LLRP\_GetTagList\_3').
- Command View:** A tree view showing command categories. Under 'Edge Server', there are 'Alien9800 Commands' and 'LLRP Commands'. 'Alien9800 Commands' includes 'Alien9800-GetTagList' with a sub-item 'Alien9800\_GetTagList\_1'. 'LLRP Commands' includes 'LLRP-CreateROSpec', 'LLRP-DeleteROSpec', and 'LLRP-GetTagList', each with a sub-item (e.g., 'LLRP\_CreateROSpec\_1', 'LLRP\_DeleteROSpec\_2', 'LLRP\_GetTagList\_3').
- SiteView:** A 3D architectural rendering of a room interior, including a red sofa, a desk, and a chair. A red exclamation mark icon is visible in the scene.
- Properties:** A configuration panel for a 'Reader: Alien9800\_1'. It has tabs for 'connection', 'General', 'GPIO', and 'Miscellaneous'. The 'connection' tab is active, showing fields for 'IP Address' (127.0.0.1), 'Port' (20000), and 'Username' (alien).

10/21/10

# ALE Development View

The screenshot displays the ALE Development View software interface. At the top, there is a menu bar with 'File', 'Window', and 'Help'. Below the menu bar, the main window is titled 'ALE - Sensor'. The interface is divided into several panes:

- ECSpec View:** A tree view showing the hierarchy: ALE Server > ECSpec: ECSpec > Logical Readers > Alien9800\_1, Alien9800\_2, and Subscribers (127.0.0.1:10000). The 'Subscribers' folder is selected and highlighted in orange.
- Logical Reader View:** A list of logical readers: Alien9800\_1, Alien9800\_2, Dock\_Door (with sub-items Alien9800\_1 and Alien9800\_2), and LLRP\_1.
- ECSpec:** A configuration panel for the selected ECSpec. It includes:
  - Reporting:** 'Set the properties for the reports.' Name: 'NewReport', Report Set: 'CURRENT'. Options: 'Report if Empty' (unchecked), 'Report only on Change' (unchecked).
  - Output Options:** 'Set the properties for the reports.' Options: 'Include Tags' (unchecked), 'Include EPC' (checked), 'Include Raw Hex' (unchecked), 'Include Raw Decimal (deprecated)' (unchecked), 'Include Tag Count' (unchecked).
  - Filters:** 'Set the filtering criteria. Enter one pattern per line.' An 'Exclude Patterns' text area is present.

At the bottom of the ECSpec panel, there is a status bar that says 'Edit Reports(72)'.

# Licensing and Support

- Rifidi Toolkit
  - Currently LGPL licensed - soon to be EPL for more flexibility
  - Currently available for download
- Rifidi Edge Server
  - GPL Licensed for standard version
  - Can be dual licensed for OEM's
  - Started Closed Beta program on June 15th, 2009
  - Full Version available in October with Support and Consulting
- Rifidi Workbench
  - Currently LGPL – will be EPL on release
  - Started Closed Beta Program on June 15th, 2009
  - Full Version available in October 2009 with Support and Consulting

10/21/10

