



Serialized Asset Management Tracking



SPAWAR Systems Center San Diego

Radio Frequency Identification (RFID) Solution

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SPAWAR

SSC San Diego is responsible for the development of technology to collect, transmit, process, display and manage information essential to successful military operations. The Center develops the capabilities that allow decision-makers of the Navy, and increasingly of the joint services, to carry out their operational missions and protect their forces



Supply Chain Management Division



Experience and expertise in providing the full suite of services and solutions

Strategy and Assessment

Adaptive Supply Chain Strategies - Adaptive Supply Chain Processes - RFID Assessments Scenario Planning, Modeling and Simulation

Visibility, Tracking, Tracing & Monitoring

End-to-end tracking, tracing & visibility, and event management & response - Supply Chain Monitoring - Asset Tracking & Management - People Tracking - Vehicle Tracking - Container Tracking & Identification - Railcar Tracking

Security

Product Security - Supply Chain Security - Facilities Access and Security

Safety

**Intrusion Detection
Road and Public Safety**

Communications

Wireless and Communications

Solutions design, development and integration

RFID/Sensors Solution Design and Implementation - RFID, Sensors, Wireless and Integration – Machine-to-Machine (M2M)



SAIC AIT/RFID Performance Impact



- Department of the Navy AIT Program Office
Five-year \$104M IDIQ contract
- Norfolk Ocean Terminal (Full implementation)
- Retrograde: Passive to Active Integration
- Active RFID Engine Container Tracking
- Asset Visibility in Manufacturing
- Asset Tracking
- Personnel Tracking
- Security
- Advance Traceability & Control Transportation System (ATAC)
(Ongoing)



“ATAC provided automated receipt information, collected via passive RFID, identified 355 shipments worth \$12.6M - where no proof of delivery information was previously recorded in the depot logistics system.”

*Mr. Alan Estevez
Assistant Deputy Under Secretary of Defense
Supply Chain Integration
United States Department of Defense*





AIT/Asset Management System Objectives



The core functions of **SSC SD C⁴I Systems Support Branch** are the receiving, screening, calibration, repair and issuance of Automatic Test Equipment (ATE).

The objectives of an AIT-enabled asset tracking system include:

- Improved ATE Status Accuracy
- Detecting and reporting all RFID-enabled ATE entering and exiting the Calibration Laboratory and Depot
- Physical inventory accuracy and readiness status of all ATE and ATS
- ATE accountability
- A system for the application of metal-mounted pRFID tags, in conjunction with ECN barcodes
- Life-cycle tracking of ATE
- ATE within Automatic Test Station Tracking. (Kitting/Aggregation)
- Expansion of Asset/Inventory Visibility through a Web-enabled Asset Management System (AMS) throughout SSC SD



Project Summary



SAIC was tasked to analyze, design and install an AIT system to track the movement of approximately 400 Automatic Test Equipment (ATE) items – for a Phase 1 implementation.

The design was to include all current data elements (ECN) utilized by SPAWAR to manage these assets and the required hardware and software components necessary to implement the system.

The mission was to track and control ATE over their lifecycle, support knowledge-enabled logistics and readiness, increase inventory accuracy, and reduce redundant requirements.

The installed system allows the universal implementation of a combined RFID and barcode solution. This system meets all DoD IUID and RFID standards requirements for data tagging and tracking.

Value

The value of the system will be driven by the need for reporting accuracy on the calibration, repair and location of ATE within the Calibration Lab, installed in Automatic Test Stations (ATS) and in the Repair Pool.

The implementation was primarily focused on Business Process enablement with RFID technologies incorporated into an existing barcode labeling process.





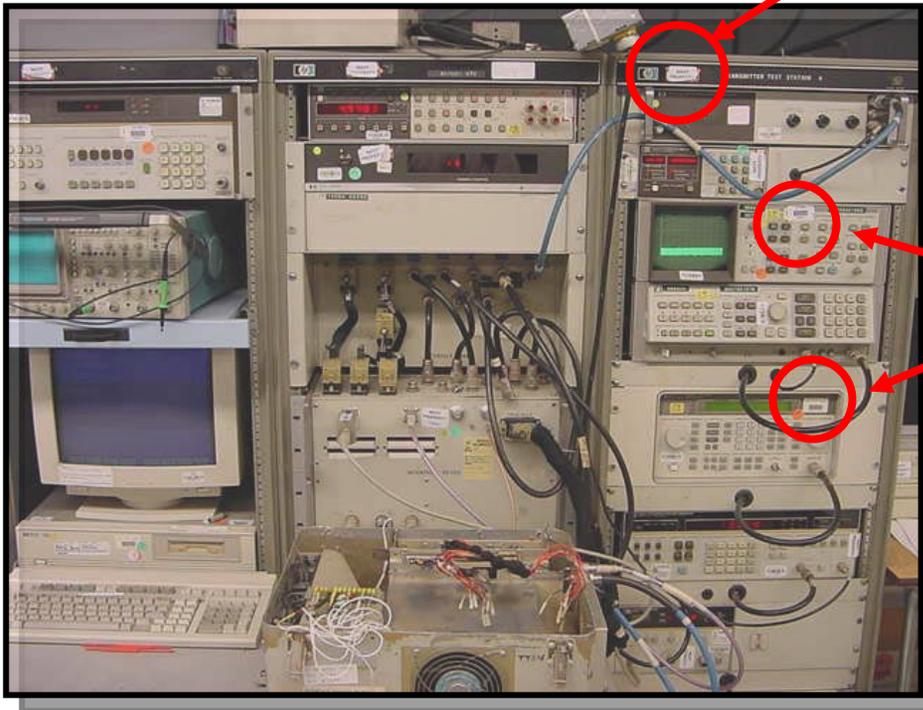
Legacy Tracking Process



Electronic Code Number:
Type – ATE, ATS
Model Number
Serial Number
Calibration Date

Automatic Testing Station ATS

Each ATS had been labeled with an ECN to allow for aggregation visibility.



Each ATE, within the ATS, must hold a current calibration for the entire ATS to be authorized for use.

Labor intensive to manually read each ECN for Physical Inventory operations.

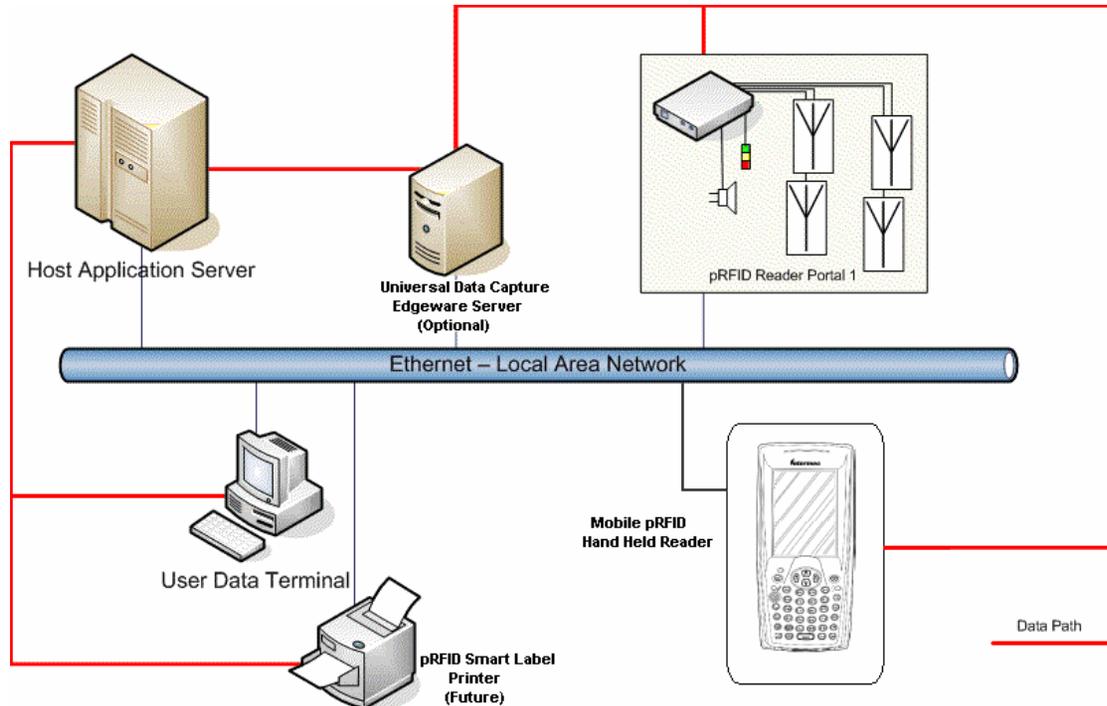


Architecture Requirements



- **All devices are to be connected to the LAN as IP addressable devices. This is a critical feature for the portals, allowing for future expansion and growth for new business processes.**
- **The exception to the direct connection are to be the Mobile Handheld Devices (HHD); where connection through an existing desktop computer/data terminal is simpler and the preferred method. The HHD cradles will be connected to the desktop for data synchronization to the AMS server.**
- **A Universal Data Capture (UDC) PC may be installed locally or the UDC software may be installed within the AMS server.
(This component manages all AIT devices that may be added in the future.)**
- **Each UDC PC will have a separate instance of the server.
(This provides the integration to a single point.)**

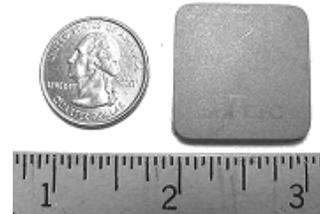
SSC SD pRFID System Architecture



This approach introduces flexibility in physical installation (can accommodate installation of additional readers) as well as flexibility in business processes (can restructure to support business changes). This also provides the necessary scalability to support an extended network without incurring repetitive integration costs.

Asset Identification

~80% of all ATE surfaces are metal. A Gen 2, EPC, passive RFID tag (for metal mounting) was chosen. The SonTech ST06107.

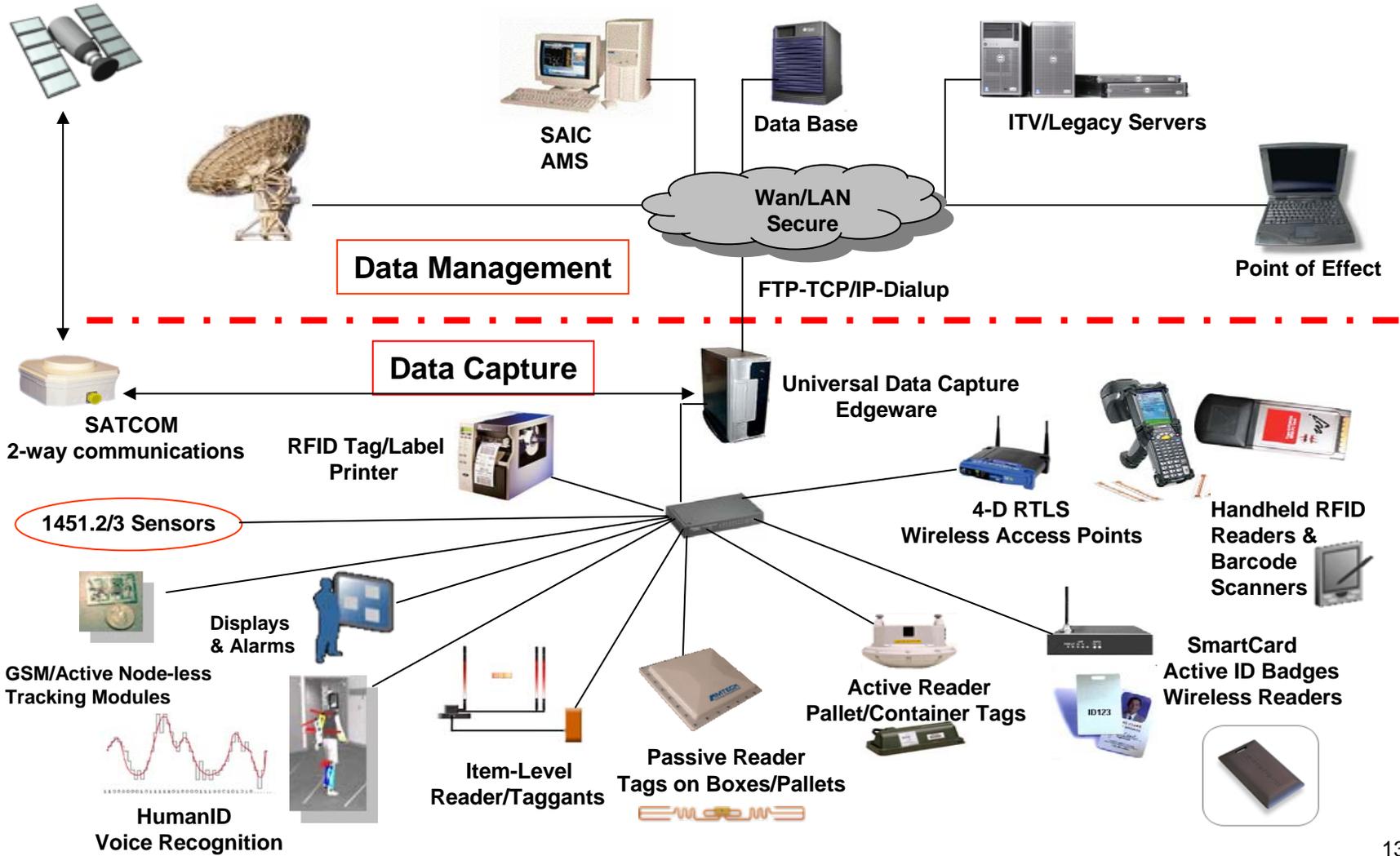


During Physical Inventory and tagging, the ECN was associated to the pRFID tag via the HHD application.

These two identifiers can provide the AMS User with all of the information required for asset status; such as Calibration Dates (yellow label).



AIT Network Components





Data Elements

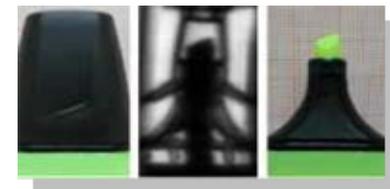
AIT Integrated Systems



- Asset ID
- Tag ID
- Asset Owner ID
- Untagged Asset Report
- Unknown Asset Alert
- Reader ID
- Site DataPoint
- Tag Data (ePC, DoD format)
- Timestamp
- GPS Data – Lat/Long/Elev
- Weighbridge Data (Delta Net)
- Item Counter Data
- Aggregation Data
- Video Frame Timestamp
- Proximity Associations
- Environmental Conditions
- Speed and Direction
- Manifest
- Alarms
- Vessel Number and position
- Flight Number and position
- Vehicle Number and position
- Last known 'read' location/time
- Next planned 'read' location/time
- Document Number
- Customs Seal authorization
- Tag conditions (Battery, etc.)
- Shelf life
- Stuffer ID
- Route and Links
- TCN, NSN
- Current Asset Location and Status



Optical Character Recognition



Terahertz Imaging



Fixed pRFID Portals



Passive RFID Portals installed at all key doorways.



SAIC Asset Management System



Development Path





SAIC AIT

Asset Management Systems



Asset Tags

- Metallic
- Reusable
- Asset



Readers & Antennas

- Fixed
- Stationary
- Mobile



Handhelds

- Manual/Item Scanning
- Exception Processing



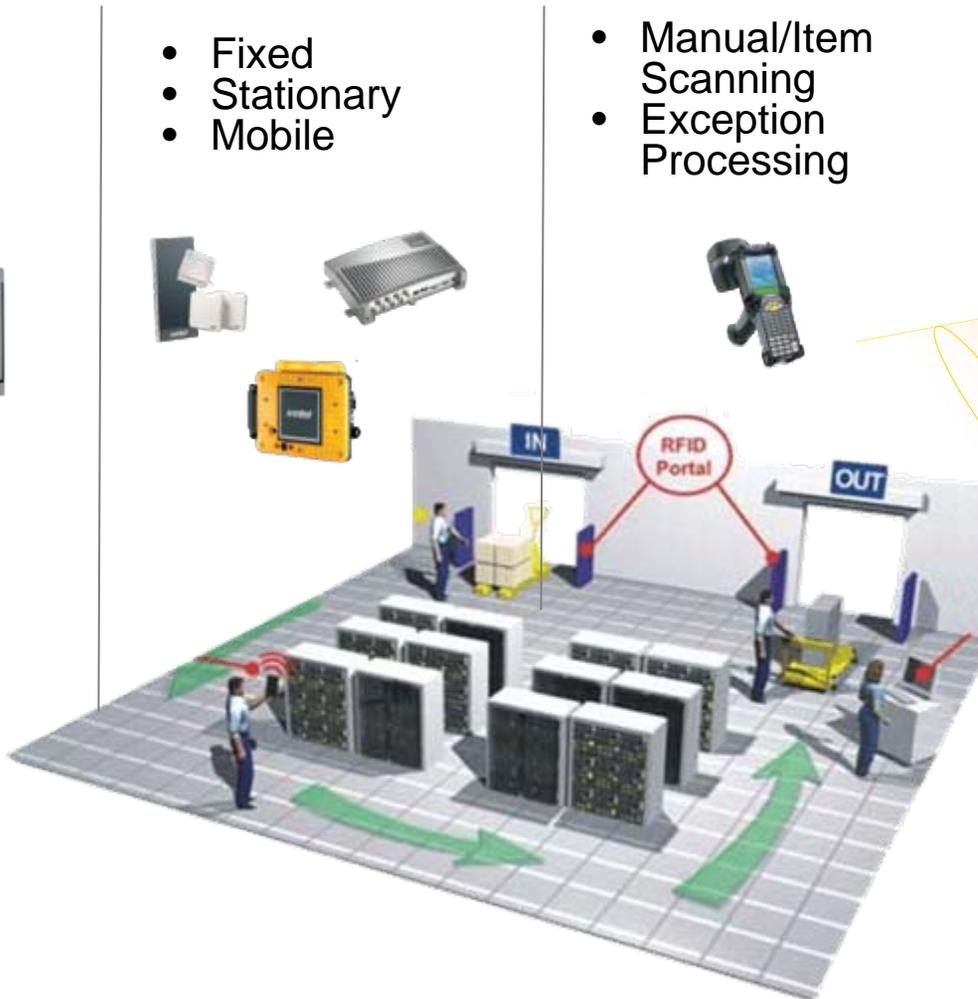
RF Management

- Access Points
- RF Mngmnt Switch



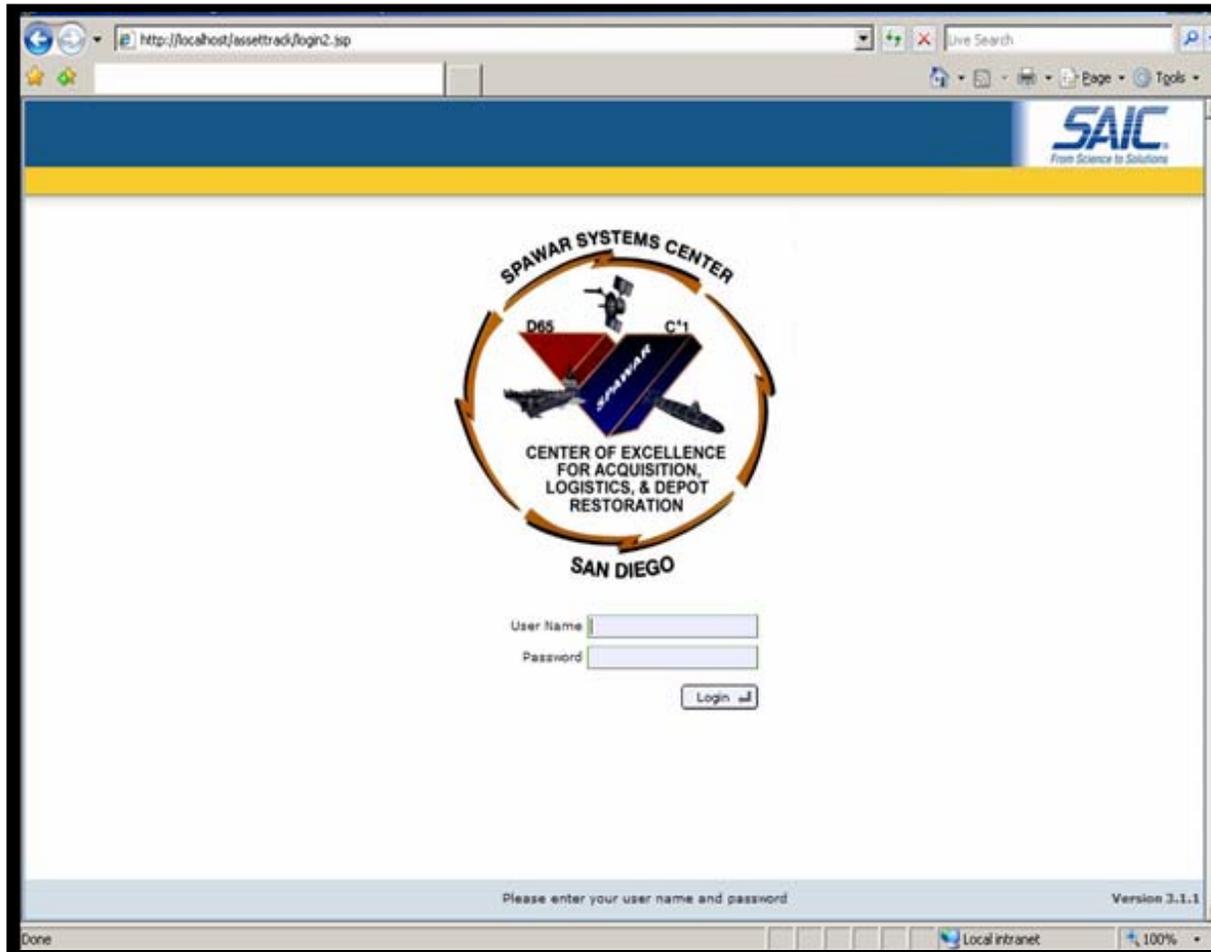
- Centralized Management
 - RF Management
 - Auto Config.

- Clustering
 - Correlation
- Opportunistic Locationing
 - Mobile AP Triangulation
- Security
 - Secure Tag Encryption





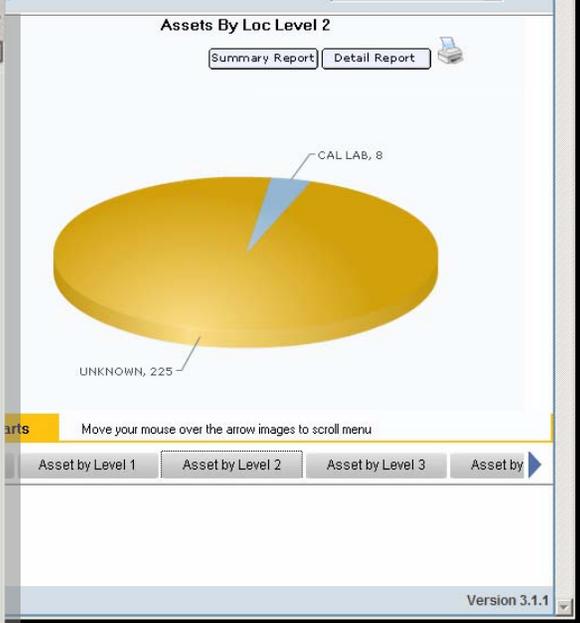
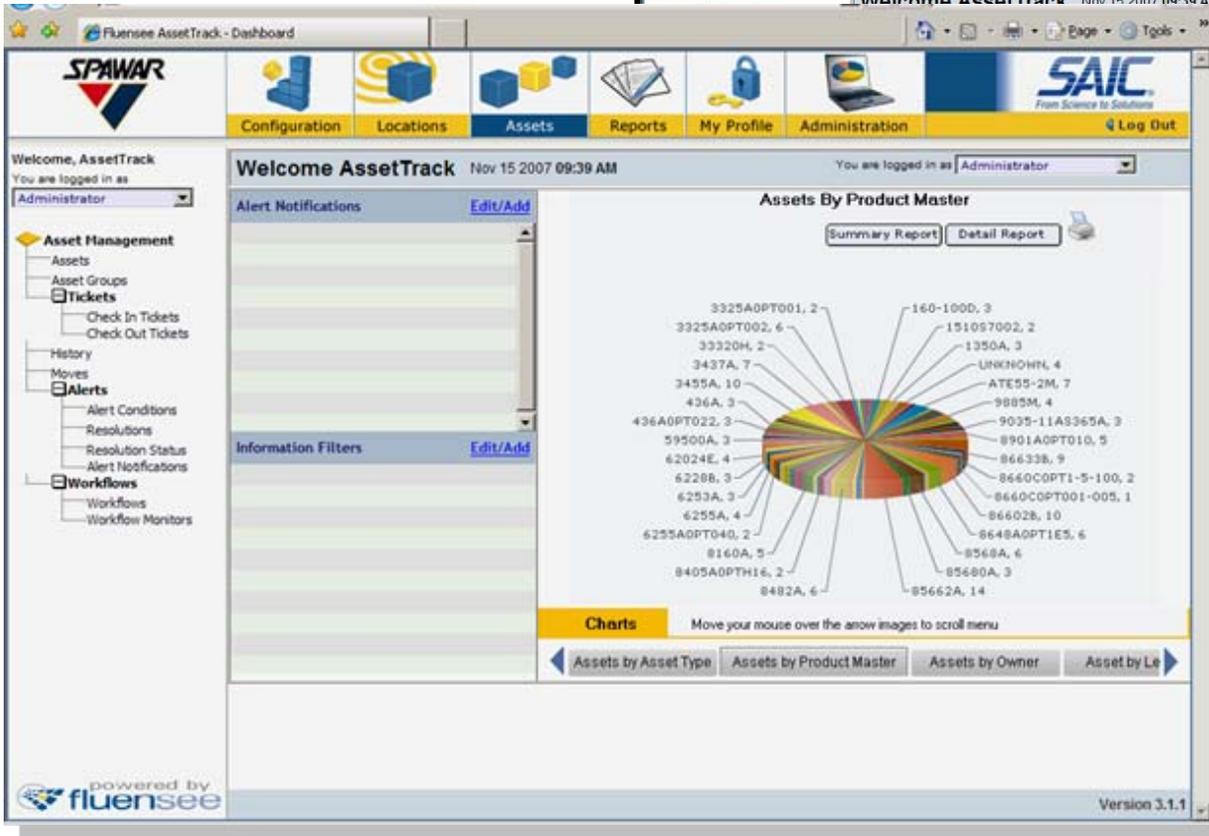
SAIC Asset Management System SSC SD



Web-enabled Login



ASSET REPORTS





Asset Details and Attributes



Fluensee AssetTrack - MetaData Filter

Configuration Locations Assets Reports My Profile Administration Log Out

Welcome, AssetTrack
You are logged in as Administrator

Administration
Labeling
Device Events
Device Console
System Events
Alerts
Alert Conditions
Alert Notifications

List MetaData

Object Name: Object Type: Include Hidden
Field Name: Field Value: Only In Header

Search Upload

Object Name	Object Type	Field Name	Field Value	Hidden	In Header
ItemMaster	DEFAULT	Attribute1	Color	N	N
ItemMaster	DEFAULT	Attribute2	Department	N	N
ItemMaster	DEFAULT	Attribute4	Business Unit	N	N
ItemMaster	DEFAULT	Attribute3	Case	N	Y
ItemMaster	DEFAULT	Attribute6	Work Center	N	Y
ItemMaster	DEFAULT	Attribute7	Hostname	N	N
ItemMaster	DEFAULT	Attribute8	Container Dimensions	N	N
ItemMaster	DEFAULT	Attribute9	Container Dry Weight	N	N
ItemMaster	DEFAULT	Attribute10	Container Max Weight Capacity	N	N
ItemMaster	DEFAULT	Attribute11	Last Move Date	N	N
ItemMaster	DEFAULT	Attribute12	Last Validation Date	N	N
ItemMaster	DEFAULT	Attribute13	Attribute13	N	N
ItemMaster	DEFAULT	Product	Product	N	N
ItemMaster	DEFAULT	Asset Master	Asset Master	N	N
ItemMaster	DEFAULT	Item	Asset	N	N
ItemMaster	DEFAULT	Location	Location	N	Y
ItemMaster	DEFAULT	Item Owner	Owner	N	N
ItemMaster	DEFAULT	Assignee	Assignee	N	N
ItemMaster	DEFAULT	Project	Project	N	N
ItemMaster	DEFAULT	Is Fixed Asset	Is Fixed Asset	N	N
ItemMaster	DEFAULT	Item Category	Item Category	N	N
ProductMaster	DEFAULT	Attribute13	Mfg Country	N	N
LocationType	DEFAULT	Location	Location	N	N
LocationType	DEFAULT	Location Type Name	Location Type Name	N	N

My Profile Administration Log Out

Search

New Upload

Category	Description
Other	UNKNOWN
	3435A
	85680A
	85662A
	8160A
	8482A
	3437A
	8444AH49
	8444A0PT39H49
	8494H0PT001
	436A0PT022
	ATE55-2M
	ATE36-3M
	53132A0PT012030
	53132A0PT012
	6228B
	6253A
	81104A
	E4402B
	8160A0PT001
	6255A
	8663A0PTH02
	436A
	436A0PT003022



Asset Movement and History



The screenshot displays the Fluensee AssetTrack - Asset Details interface. The top navigation bar includes Configuration, Locations, Assets, Reports, My Profile, Administration, and Log Out. The main content area is divided into several sections:

- Asset Detail:** Shows Description TEST, Location CAL LAB, Product Master UNKNOWN, Status In Service, Type ATE, and Project.
- Event Description:** Lists location changes: Location changed from DEPOT to CAL LAB, Location changed from CAL LAB to DEPOT, and Location changed from UNKNOWN to CAL LAB.
- History Table:** A table with columns for Event Type, Event Description, Event Time, and Source. It lists several events including Identifier Change, Attribute Change, Location Change, and Asset Added.

Event Type	Event Description	Event Time	Source
Identifier Change Event	Assigned New RFID : 5341494300....	11-14-2007 10:46:45	admin
Attribute Change Event	Item Last Move Date changed fr....	11-14-2007 10:46:45	admin
Location Change Event	Location changed from DEPOT to....	10-11-2007 14:21:33	EnableRFID_Alien.0
Location Change Event	Location changed from CAL LAB	10-11-2007 14:10:10	EnableRFID_Alien.3
Location Change Event	Location changed from UNKNOWN	10-11-2007 13:30:47	EnableRFID_Alien.0
Identifier Change Event	Assigned New RFID with value 0....	10-11-2007 13:07:36	Handheld
Asset Added Event	Asset created	10-11-2007 13:05:21	admin

Total Results 7

powered by fluensee

Version 3.1.1



Mobile RFID Data Capture



Main Menu

- Transfer Files
- Audit Asset Location
- Tag Assets
- Decommission Tags
- Asset Search
- Asset Location Update
- Exit

Tag Association

Location

Tag

ECN

Serial Number





Reports



Fluensee AssetTrack - Handheld Upload Report

Configuration Locations Assets Reports My Profile Administration Log Out

Welcome, AssetTrack
You are logged in as Administrator

Handheld Upload Report

Handheld Upload Date: 11-14-2007

Upload ID	Type	Date	Status	Summary Message
16	assign	11-14-2007 10:45:04	Processed	1 records were processed 1 records had invalid data. 0 assets were created. 0 assets were successfully processed.
15	assign	11-14-2007 10:39:33	Processed	2 records were processed 0 records had invalid data. 0 assets were created. 2 assets were successfully processed.
14	assign	11-14-2007 10:20:11	Processed	1 records were processed 0 records had invalid data. 0 assets were created. 1 assets were successfully processed.
13	assign	11-14-2007 09:42:42	Processed	2 records were processed 2 records had invalid data. 0 assets were created. 0 assets were successfully processed.
12	assign	11-14-2007 09:33:51	Processed	2 records were processed 1 records had invalid data. 0 assets were created. 1 assets were successfully processed.
11	assign	11-14-2007 09:31:36	Processed	2 records were processed 2 records had invalid data. 0 assets were created. 0 assets were successfully processed.
10	assign	11-14-2007 09:17:32	Processed	1 records were processed 0 records had invalid data. 0 assets were created. 1 assets were successfully processed.
9	assign	11-14-2007 09:04:58	Processed	2 records were processed 2 records had invalid data. 0 assets were created. 0 assets were successfully processed.
8	assign	11-14-2007 08:54:58	Processed	3 records were processed 3 records had invalid data. 0 assets were created.

- Reports
 - Asset Management
 - Asset Status
 - By Asset Type
 - By Product
 - By Assignee
 - By Owner
 - By Location
 - Asset Movement
 - By Asset Type
 - By Day
 - By Location
 - Asset History
 - Business Unit
 - Inventory
 - Ticket Management
 - Individual Charge Balance
 - Location Validation
 - Handheld Data Transfer



Device Management



Fluessee AssetTrack - Device Console

Welcome, AssetTrack
You are logged in as Administrator

Administration

- Labeling
- Device Events
- Device Console
- System Events
- Alerts
 - Alert Conditions
 - Alert Notifications

Device Console

Last Updated: 11-15-2007 9:43:57 AM

Status	Device	Model	Type	Description	Last Updated	Event/Error Log
	Alien	ARL-9800	EPC-Passive	ARL-9800 reader	11-15-2007 9:31:32 AM	Alien Log

powered by fluessee

Fluessee AssetTrack - Device Events

Welcome, AssetTrack
You are logged in as Administrator

Administration

- Labeling
- Device Events
- Device Console
- System Events
- Alerts
 - Alert Conditions
 - Alert Notifications

Device Events

Level:

Event Date From: To:

Device:

Message:

To:

Search

Device	Message	Level	Event Time
Alien	Able to Ping Reader	Info	11-15-2007 09:31:32
Alien	Able to Ping Reader	Info	11-15-2007 06:55:43
Alien	Unable to Ping Reader	Error	11-15-2007 06:49:54
Alien	Able to Ping Reader	Info	11-15-2007 06:40:37
Alien	Unable to Ping Reader	Error	11-15-2007 06:22:18
Alien	Able to Ping Reader	Info	11-15-2007 06:21:36
Alien	Unable to Ping Reader	Error	11-14-2007 14:29:45
Alien	Able to Ping Reader	Info	11-14-2007 14:10:52
Alien	Unable to Ping Reader	Error	11-14-2007 14:09:50
Alien	Able to Ping Reader	Info	11-14-2007 14:01:04
Alien	Unable to Ping Reader	Error	11-14-2007 13:51:49
Alien	Able to Ping Reader	Info	11-14-2007 12:46:49
Alien	Unable to Ping Reader	Error	11-14-2007 12:21:48
Alien	Able to Ping Reader	Info	11-14-2007 12:15:02
Alien	Unable to Ping Reader	Error	11-14-2007 12:13:50
Alien	Able to Ping Reader	Info	11-14-2007 12:01:32
Alien	Unable to Ping Reader	Error	11-14-2007 12:01:01
Alien	Able to Ping Reader	Info	11-14-2007 11:55:47
Alien	Unable to Ping Reader	Error	11-14-2007 11:55:15
Alien	Able to Ping Reader	Info	11-14-2007 11:46:29
Alien	Unable to Ping Reader	Error	11-14-2007 11:45:16
Alien	Able to Ping Reader	Info	11-14-2007 11:28:25





Search and Inventory



Audit Assets

Location

Location 0
Total
Audit Total 0

Barcode

Start

Exceptions

Done

Search

Search By

Serial Number

Serial Number

ECN

Total 0 Read 0
Assets Total

Total Found 0

RF Scan Start

Assign Found Done

100

Decommission Tag

Tag ID:

RF Scan Read Total: 0

Delete

Save

Done





System Benefits



- **Asset Configuration and Workflow Planning**
- **Critical Asset Visibility**
- **System Monitoring and Alerting**
- **Significant Reduction in Labor**
- **Web-based Asset Visibility**
- **Activity Planning**
- **Monitoring of Asset Status Changes**
- **Proactive Alerting**
- **Full lifecycle management**
- **Asset History**
- **Faster Repair Cycles**



Business Metrics



The SSD CD Serialized Asset Tracking System will more than support high read rates of tags and other technical measures. The Metrics will measure the overall performance of the business process, which are essential to understanding the benefits of enablement (ROI). Throughout the life of the system, metrics will provide:

Inventory Accuracy
Inventory Adjustments
System Uptime
ATS Uptime
Repair Cycle Times
ATS Population and Status
MTBF
User Frequency

In addition to the RFID enablement, the business processes changes are also intended to support:

- A common “core” process for the Cal Lab and future AIT enhancements.
- Future business process improvements
- Total Asset Visibility of all future AIT-enabled assets within the entire SCC SD facility.



AIT Points of Contact



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“Where’s my stuff?!”

