

## Who we are

Advanced Cybernetics Group, Inc. (ACG), incorporated in 1992, develops software for high performance embedded Systems. We are based in Silicon Valley, with software development teams in Bangalore and Pune, India. We are an approved Department of Defense supplier.

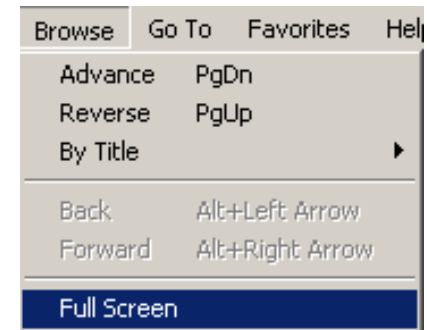
## Customers



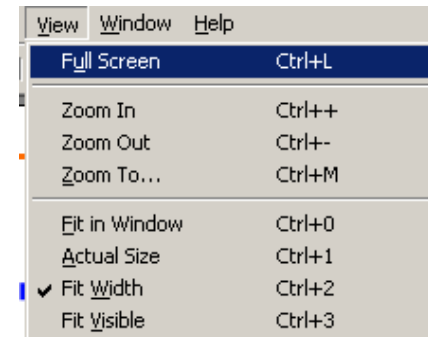
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1299 Parkmoor Ave, San Jose, CA 95126  
Email: [info@advancedcybernetics.com](mailto:info@advancedcybernetics.com)*

## Viewing Instructions

- In the browser, click on **Full Screen**.
- Mouse click to advance to next slide(s)



- In Adobe Acrobat, click on **Full Screen**.
- Mouse click to advance to next slide(s)



## THE PROBLEM

- Asian retail distribution chains service many small retail outlets.
- Large mobile field force is “disconnected” electronically from rest of organization
- Field level information flow is thus a bottleneck in an other wise efficient system

## THE MARKET SIZE

All Fast Moving Consumer Goods (FMCG) manufacturers operating in Asia:  
Pepsi, Coca Cola, Proctor and Gamble, General Electric...

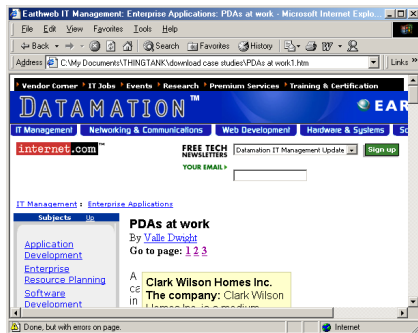
## THE CHALLENGE

- Inability to provide “always on” internet connectivity approaches applied abroad.
- Imported technology (e.g. Wireless Palms) not practical, cost effective or scaleable.

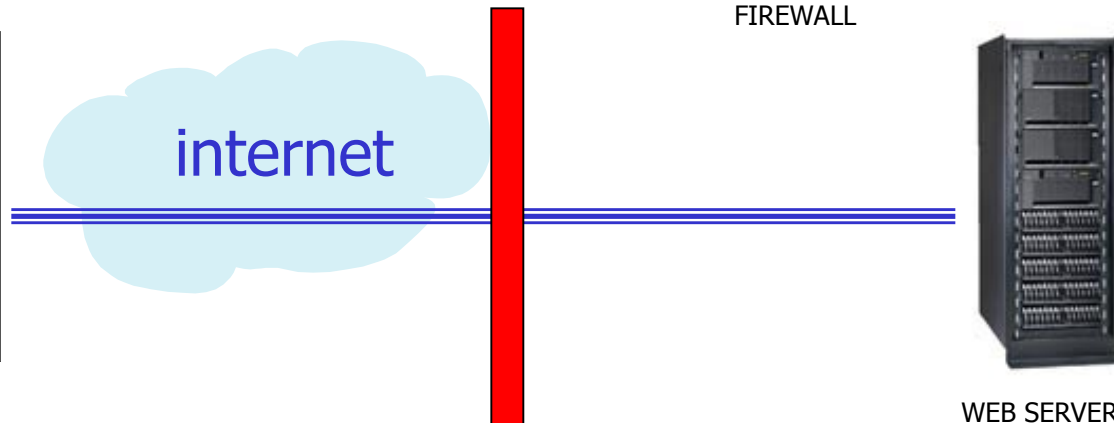
## THE APPROACH

- Develop a scaleable, secure platform designed around intermittent connectivity.
- Provide low cost internet devices supporting intermittent connectivity model.
- Simple adoption with no change to existing infrastructure.

## "ONLINE" CLIENT- SERVER



BROWSER CLIENT



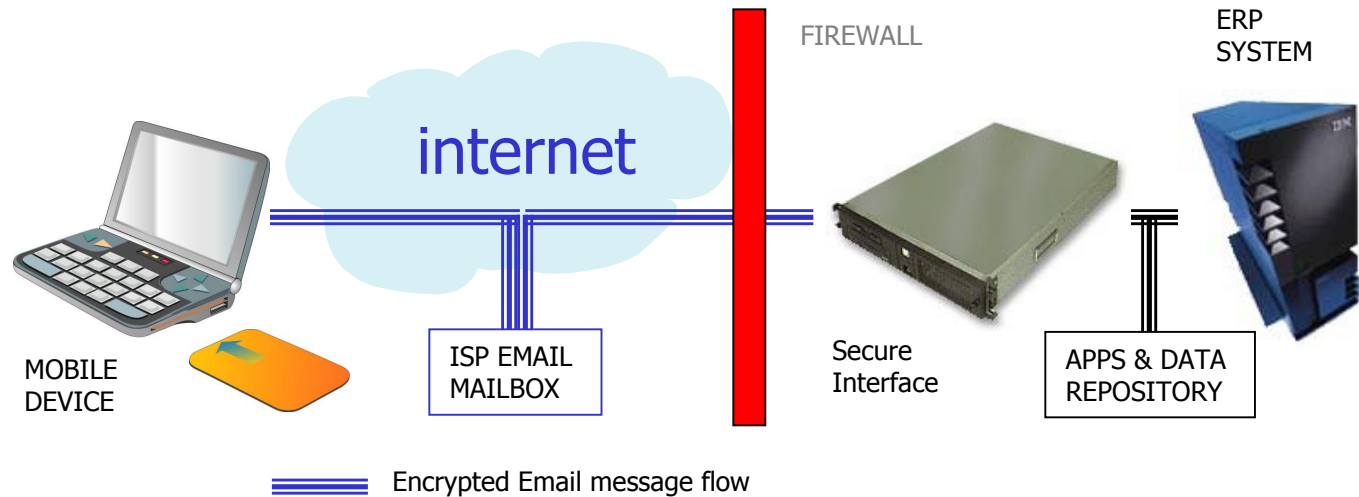
- SERVER CENTRIC AS OPPOSED TO CLIENT SIDE COMPUTING
- INTERFACE DRIVEN AT CLIENT SIDE, APPLICATIONS RUN AT SERVER SIDE

## ADVANTAGES OF CLIENT SERVER SOLUTIONS

- Lowest cost of ownership of a distributed, connected system
- All data flow to a central, secure data repository
- No application deployment at the client side needed

**ASSUMPTION: CLIENT SERVER SOLUTIONS REQUIRE ONLINE CONNECTIVITY**

## "INTERMITTENT" CLIENT-SERVER

PROVIDE NEEDS BASED SOLUTIONS

- 24-7 online connectivity is not needed in the field.
- Intermittent connectivity - typically once a day - is sufficient
- Email provides intermittent connectivity
- Build a solution around email to address client-server applications

**PARADIGM SHIFT: BUILD SOLUTIONS AROUND INTERMITTENT CONNECTIVITY.**

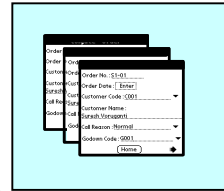
## FORMS RESIDENT IN APPLICATION REPOSITORY

Thin Client



"Server"

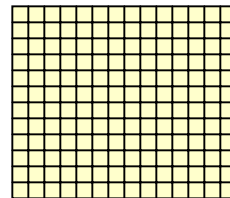
Forms



ISP Mailbox



Secure Interface

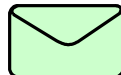


Field Data

Legend of Message types



Encrypted Form Sets



Encrypted Return Data



Encrypted Receipt Acknowledgement

## FORMS, ENCRYPTED, SENT TO DEVICE IN THE FIELD

Thin Client



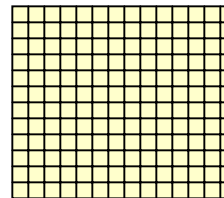
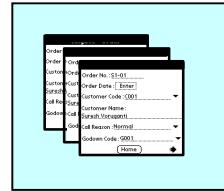
ISP Mailbox



Secure Interface

"Server"

Forms

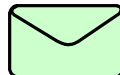


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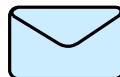
Legend of Message types



Encrypted Form Sets

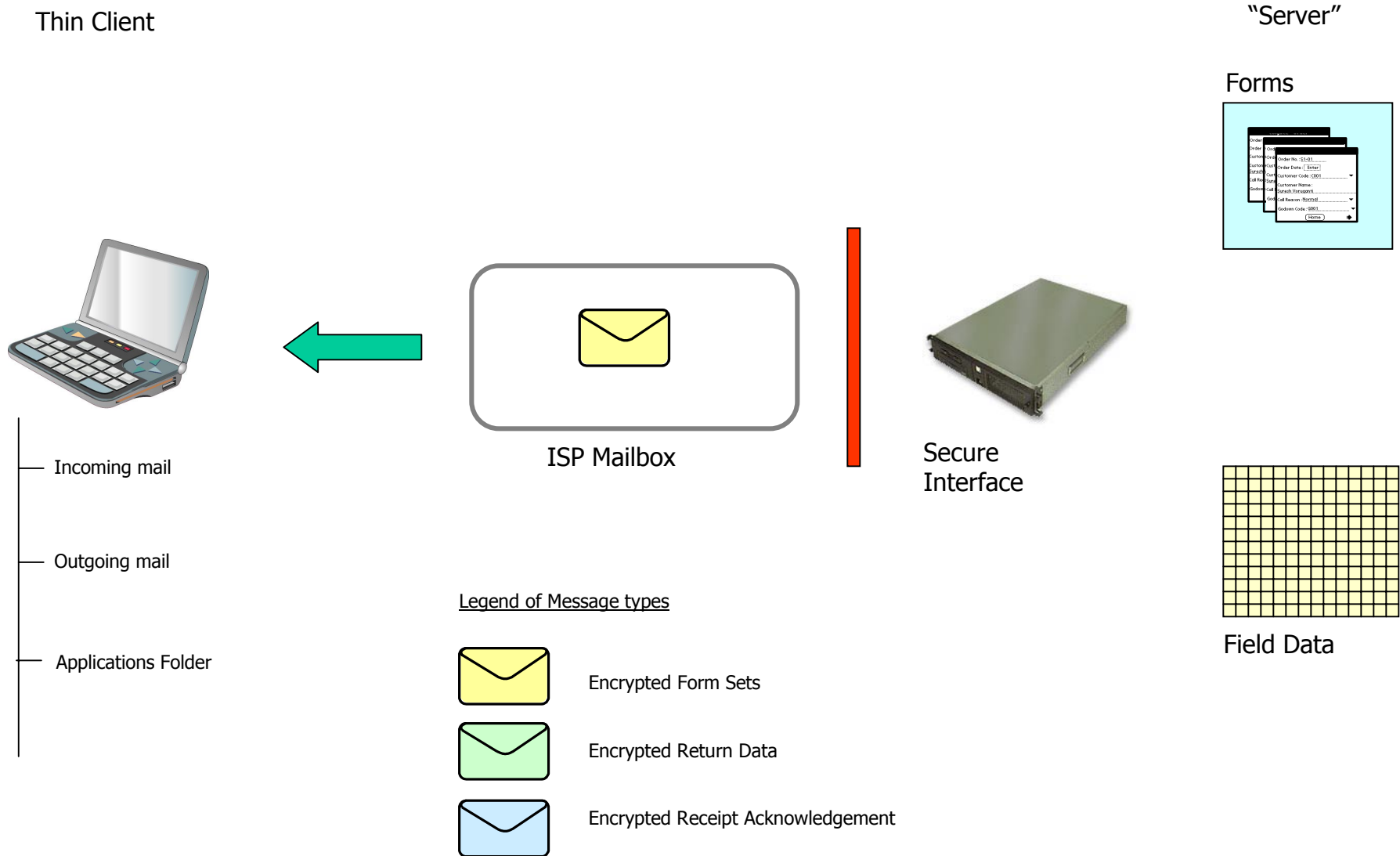


Encrypted Return Data



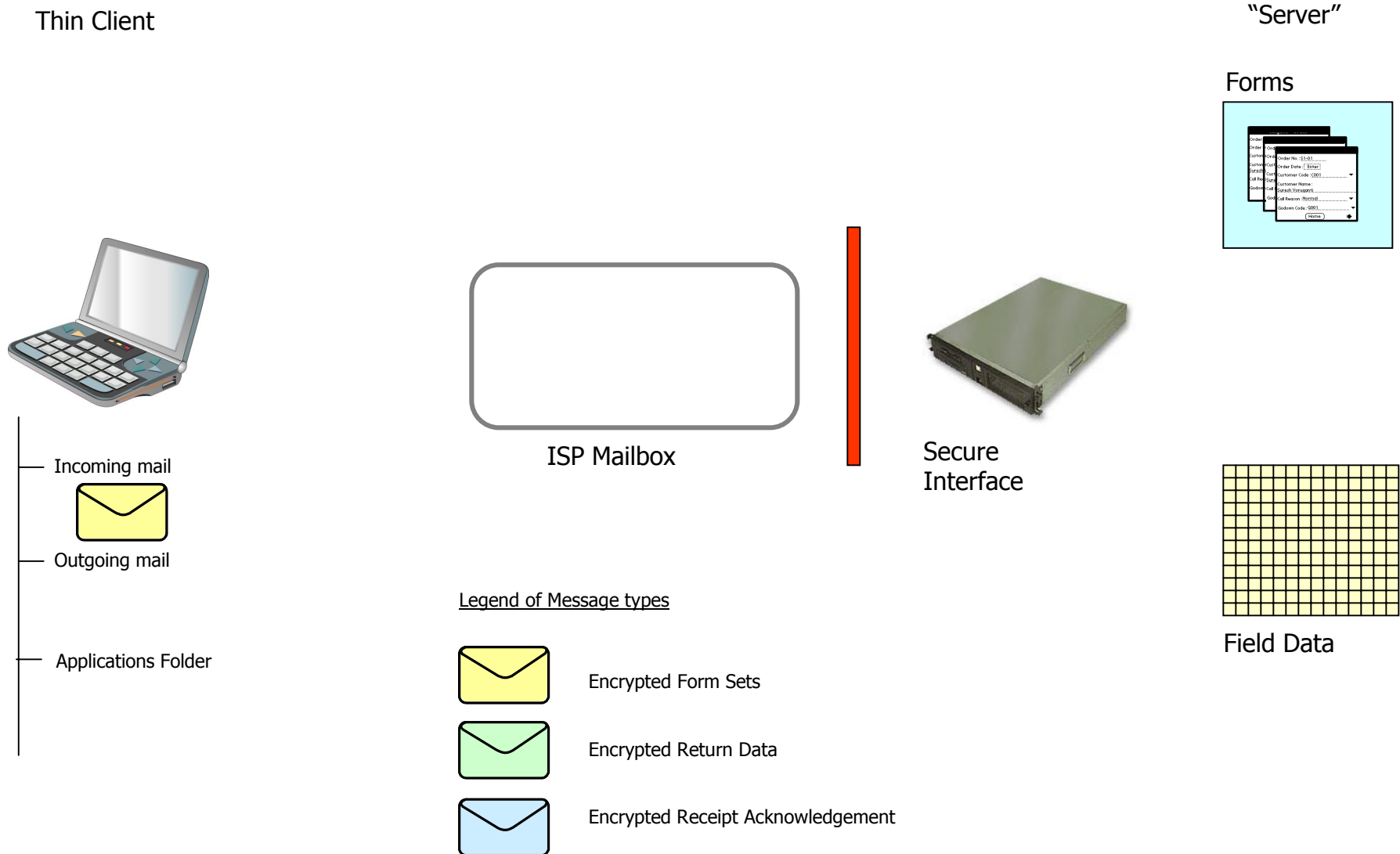
Encrypted Receipt Acknowledgement

## ENCRYPTED EMAIL RECEIVED BY THIN DEVICE





## EMAIL DECRYPTED AND PLACED IN INCOMING MAIL FOLDER



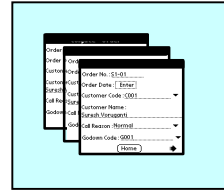
## INCOMING MAIL "READ", FORMS TRANSFERRED

Thin Client

"Server"



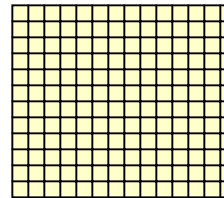
Forms



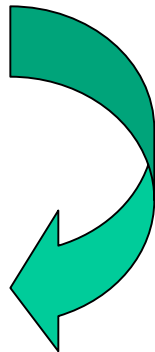
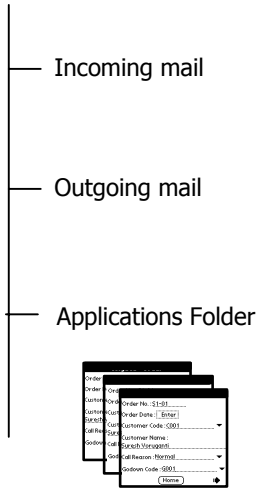
ISP Mailbox



Secure Interface



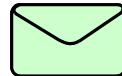
Field Data



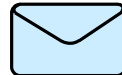
Legend of Message types



Encrypted Form Sets



Encrypted Return Data



Encrypted Receipt Acknowledgement

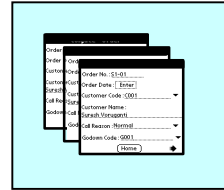
## USER FILLS FORM IN THE FIELD

Thin Client

"Server"



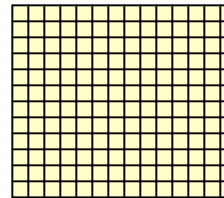
Forms



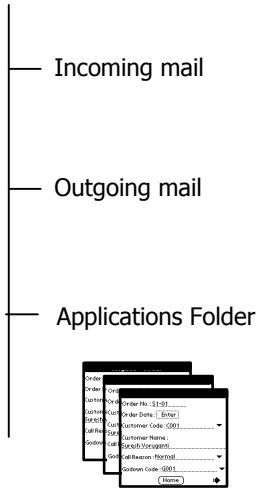
ISP Mailbox



Secure Interface



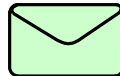
Field Data



Legend of Message types



Encrypted Form Sets



Encrypted Return Data



Encrypted Receipt Acknowledgement

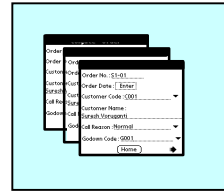
## RESPONSE ENCRYPTED, PLACED IN OUTGOING MAILBOX

Thin Client

"Server"



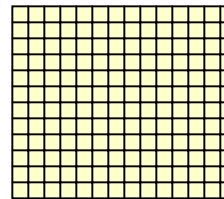
Forms



ISP Mailbox



Secure Interface



Field Data

Incoming mail

Outgoing mail



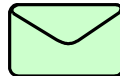
Applications Folder



Legend of Message types



Encrypted Form Sets



Encrypted Return Data



Encrypted Receipt Acknowledgement



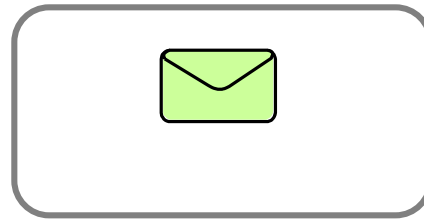
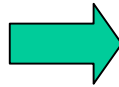
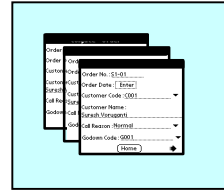
## OUTGOING EMAIL SENT, LOCAL COPY KEPT

Thin Client



"Server"

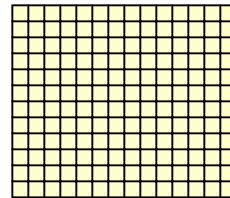
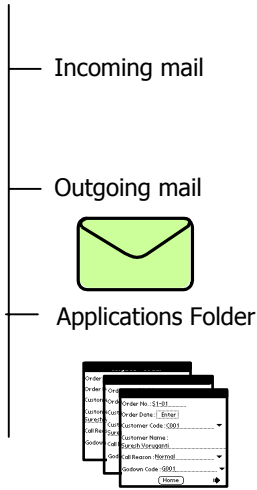
Forms



ISP Mailbox



Secure Interface

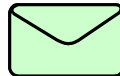


Field Data

Legend of Message types



Encrypted Form Sets



Encrypted Return Data



Encrypted Receipt Acknowledgement

## OUTPUT RECEIVED AND DECRYPTED

Thin Client

"Server"

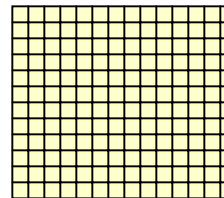
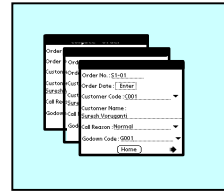


ISP Mailbox



Secure Interface

Forms

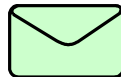


Field Data

Legend of Message types



Encrypted Form Sets



Encrypted Return Data



Encrypted Receipt Acknowledgement

## DATA REPOSITORY UPDATED

Thin Client



ISP Mailbox

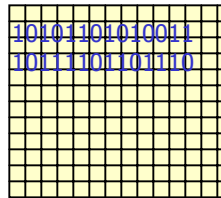
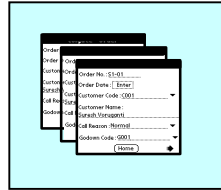


Secure Interface



"Server"

Forms

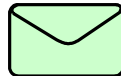


Field Data

### Legend of Message types



Encrypted Form Sets



Encrypted Return Data



Encrypted Receipt Acknowledgement

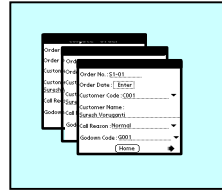
## ACKNOWLEDGEMENT RECEIPT SENT

Thin Client



"Server"

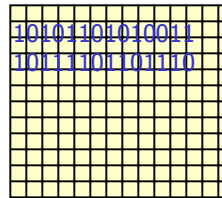
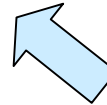
Forms



ISP Mailbox



Secure Interface

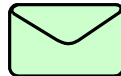


Field Data

### Legend of Message types



Encrypted Form Sets



Encrypted Return Data



Encrypted Receipt Acknowledgement



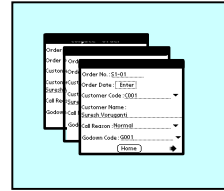
## OUTBOX COPY OF MAIL REMOVED

Thin Client



"Server"

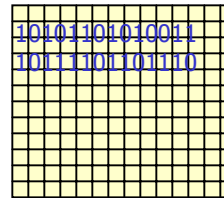
Forms



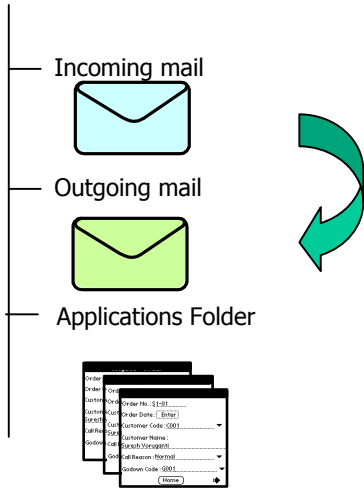
ISP Mailbox



Secure Interface



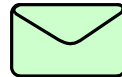
Field Data



Legend of Message types



Encrypted Form Sets



Encrypted Return Data



Encrypted Receipt Acknowledgement

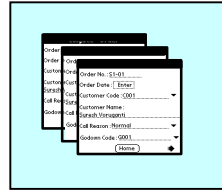
## TRANSACTION COMPLETE

Thin Client



"Server"

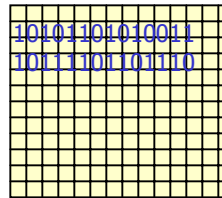
Forms



ISP Mailbox



Secure Interface



Field Data

Incoming mail

Outgoing mail

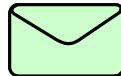
Applications Folder



Legend of Message types



Encrypted Form Sets



Encrypted Return Data



Encrypted Receipt Acknowledgement



Internet Connectivity  
Secure Transmissions

Application Support  
Application Management

Connectivity Ports

Integrated Modem  
Smart Card contains Encryption Keys  
Security layer built into Kernel of Operating System

Secure Application Deployment via Email  
Minimal, Server side controlled

Serial and Infra Red (IR)



Internet Connectivity	Accesses existing online connectivity at enterprise.
Exposed Interfaces	None. Not a web server. Email polling employed
Security	Hardware based fast encryption for bulk transmissions
Hardware	Standard Industrial Computer with Internet connectivity
Operating System	Linux
Configuration	Through Terminal. No external exposure
Data Interfaces	XML based inputs/outputs to enterprise databases

### Secure Key Administration

- Public Key Database
- Private Key Generation
- Smart Card Generation
- Administration Interface

### Web Folder Administration

- Account Subscriptions Database (rwx)
- Public and Private Folders
- Applications- Applets, Form Sets
- Transaction History (per Smart Card)



#### 1. Smart Card created

- Public/Private Keys created
- Access Privileges created
- Subscription list created

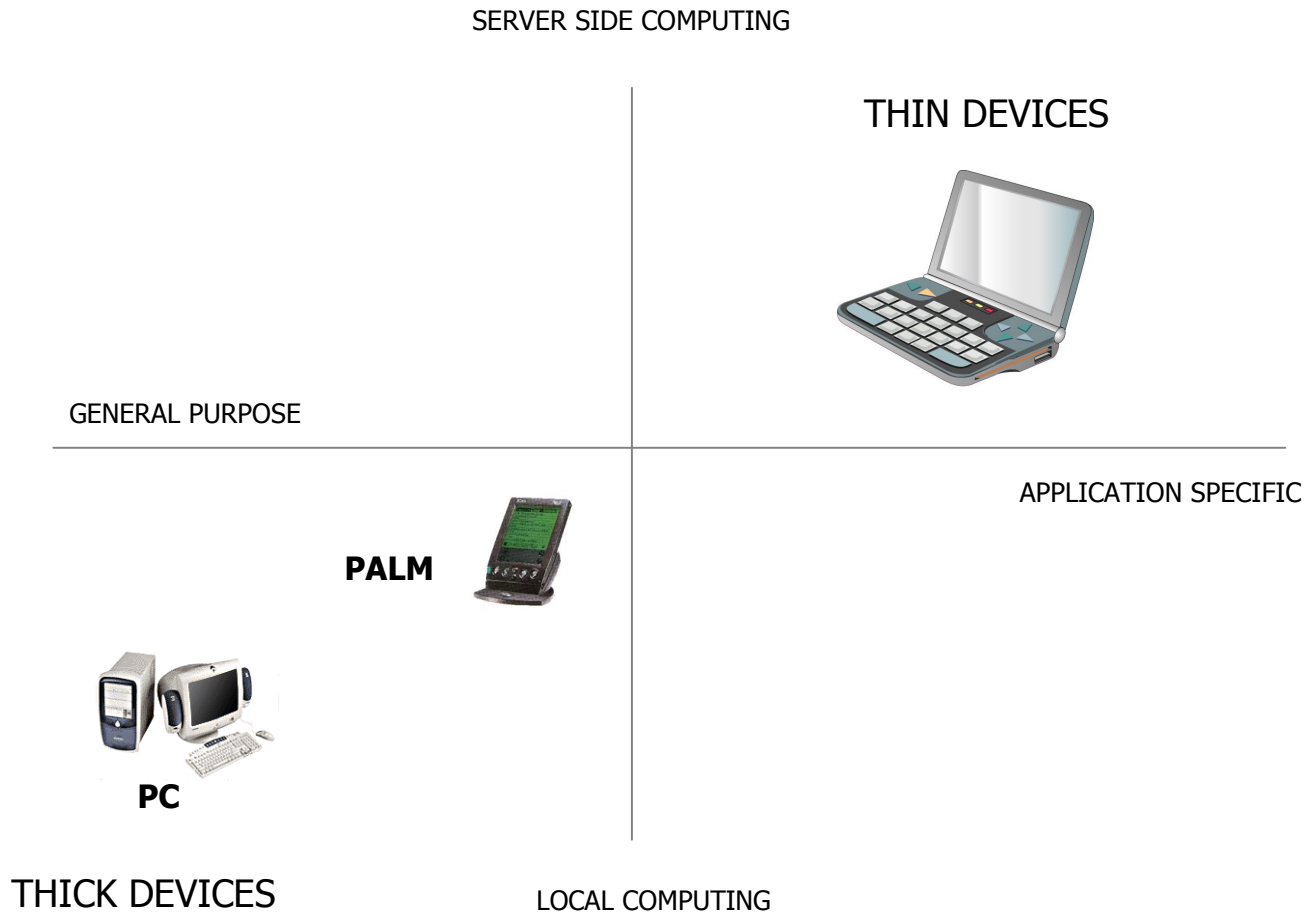
#### 2. Smart Card Inserted

- Card inserted in Device
- Device Logs on to Internet
- Card status made active

#### 3. Applications Installed

- Public Keys list loaded
- Applications downloaded
- Form templates installed

- Access to the secure interface is controlled by smart cards supplied by the enterprise.
- Multiple users of the same device, can have different access privileges to programs and data.

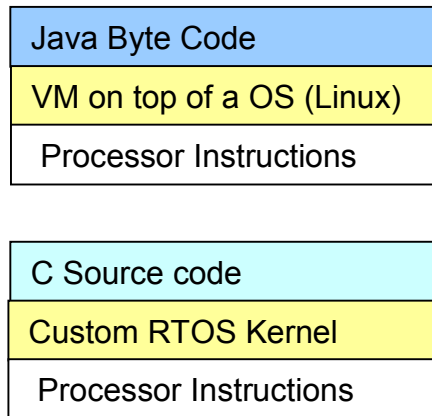


ACG focus: small footprint application specific internet enabled thin devices.

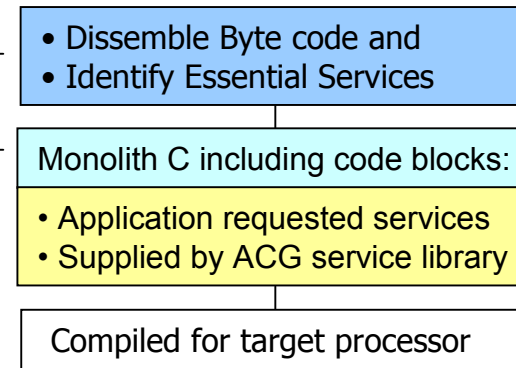
**Objective:**  
**Key Idea:**

Small foot print for low cost embedded system applications  
Remove overhead of OS/Virtual Machine from the equation

Typical Code Deployment Stack



Lean Code (Stack less) Deployment



**Soft "chip": OS-less compact code**

- Write Java or C code rapidly and test in simulation.
- Migrate swiftly to low footprint, low cost devices.
- No licensing costs for OS/JVM, lower cost for device hardware
- OS-free approach more secure – no OS to break into
- Lowered cost of development and deployment for ACG customers.

**For more on our thin footprint technology:**

[www.advancedcybernetics.com/technology.htm](http://www.advancedcybernetics.com/technology.htm)

**For more on wireless enabled small devices:**

[www.advancedcybernetics.com/products.htm](http://www.advancedcybernetics.com/products.htm)

Or write [info@advancedcybernetics.com](mailto:info@advancedcybernetics.com)