



Service Oriented Computing SIG – June, 2005

## Mission Critical Web Services - Land Titles and Conveyancing

LANDATA Case Study

Dept of Sustainability & Environment  
– Land Victoria

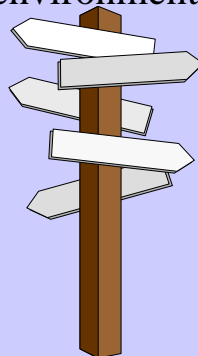
## DSE/LANDATA Case Study

- John McMahon (Shoreham Software)
  - ssho8008@bigpond.net.au
- Internet Architecture/Products:
  - Telstra, Kodak, DSE



## LANDATA Case Study

- Business, customers, suppliers, environment
- Products
- Case Study
  - Strategy
  - Specific Technology
  - Lessons Learned



## Business Domain

- LANDATA provides all external access to Property Titles, Dealings etc.
- Mission Critical: to LV and the entire Victorian Property Market....
  - Search tools – find properties/owners.
  - Order “Vendor Statement” or “Section 32” certificates for property conveyancing.
  - Land Survey info, Crown Land etc

## Customers

- 8 Resellers (B2B) - their customers:
  - Lawyers
  - Banks
  - Conveyancers
- Direct Account Customers (B2C)
  - Search Hall (10 th Floor Marland House)
- General Public (B2C)
  - Land Channel [www.land.vic.gov.au/TPC](http://www.land.vic.gov.au/TPC)



## Suppliers/Partners

- Land Victoria (aka Titles Office)
- Authorities
  - Councils
  - Water Authorities
- Transactions by:
  - Paper/Fax
  - E-mail
  - Synchronous/API
- LANDATA itself
  - Search products
  - EPA/Vic Roads



## Case Study

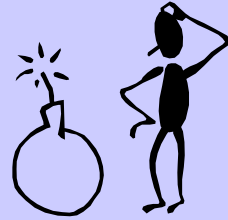
- Our experiences with Web Services and Service Oriented Architecture
- Conversion of B2B messaging API to Web Services:
  - Services used by resellers to resell land title data, document images, to conveyancing community – banks, lawyers, title searchers ...
  - Internal usage by DSE – LANDATA also.

## Working Definitions

- **Web Service** = computer application logic delivered as a service via Internet standards
- **Service Oriented Architecture** = a style of system architecture based on parts made up of services.
  - See ACSLearn:  
<http://www.acs.openlab.net.au/content.php?article.130>

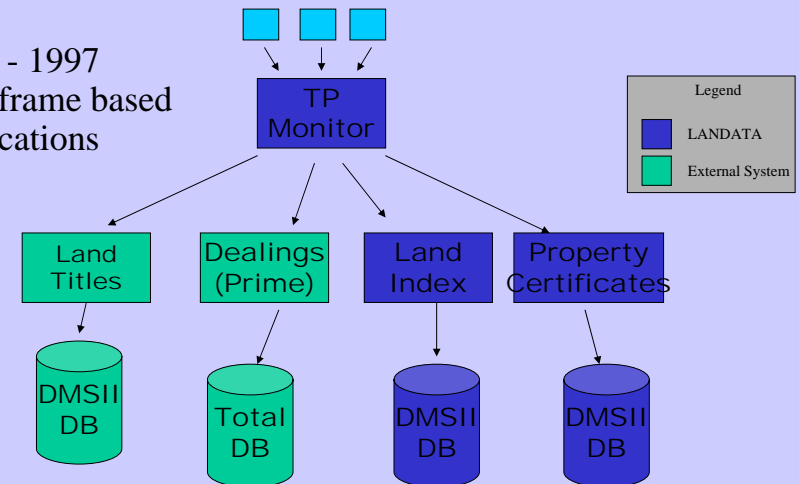
## Business Environment

- Government/Departmental Changes
- Government Policies
  - Electronic Service Delivery
  - Accessibility
- Competing projects



## LANDATA

1985 - 1997  
mainframe based  
applications



## Legacy System to Web

- IDC estimates:
  - 10,000 large IBM mainframes
  - 200 billion lines of legacy code
  - Integrate – don't reinvent ?
- Methods to Unlock
  - Screen scraping
  - Mid-tier integration (wrapping)
  - Interface redesign
  - Complete migration/rewrite

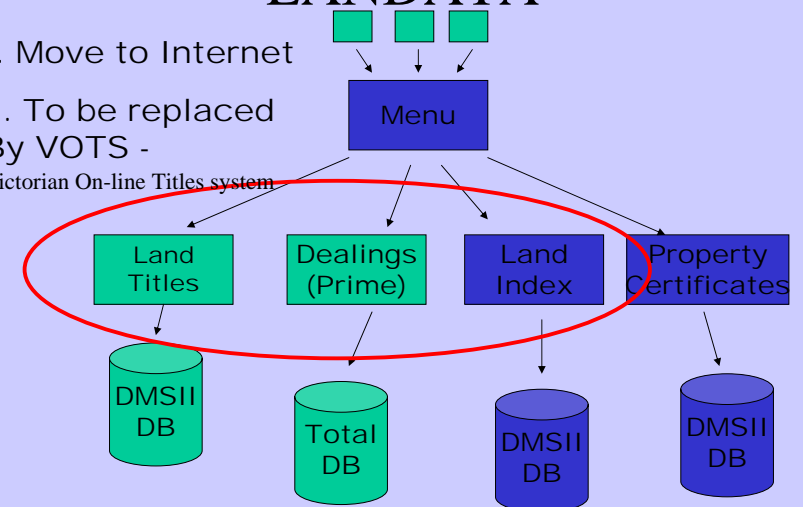


## LANDATA

1. Move to Internet

2. To be replaced  
By VOTS -

Victorian On-line Titles system



## New Technology Project - Objectives and Approach

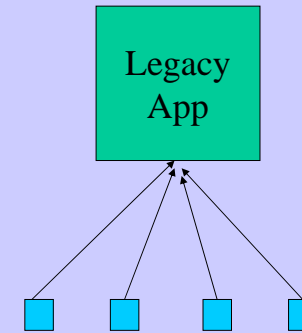
### Objectives:

- Facilitate system migrations
- Make incremental migrations
- Internet exploitation

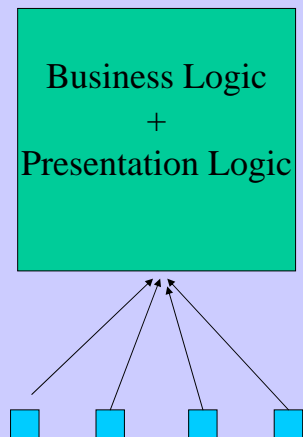
### Approach:

- Use service oriented architecture
- Use component based development

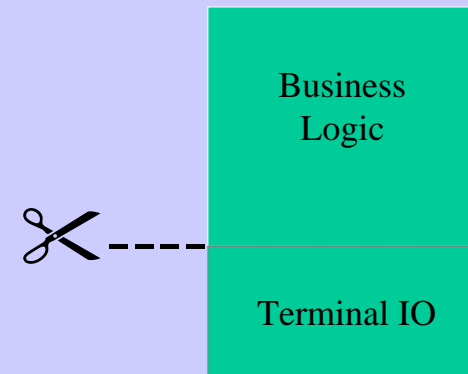
## How to make a Web Service...



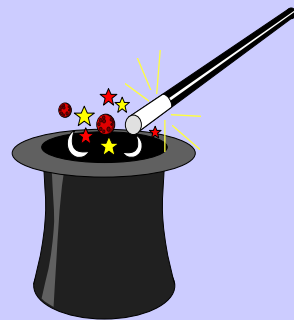
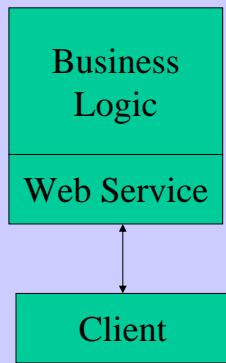
## Start...



## Step 1: Isolate business logic



# Voila! Web Service

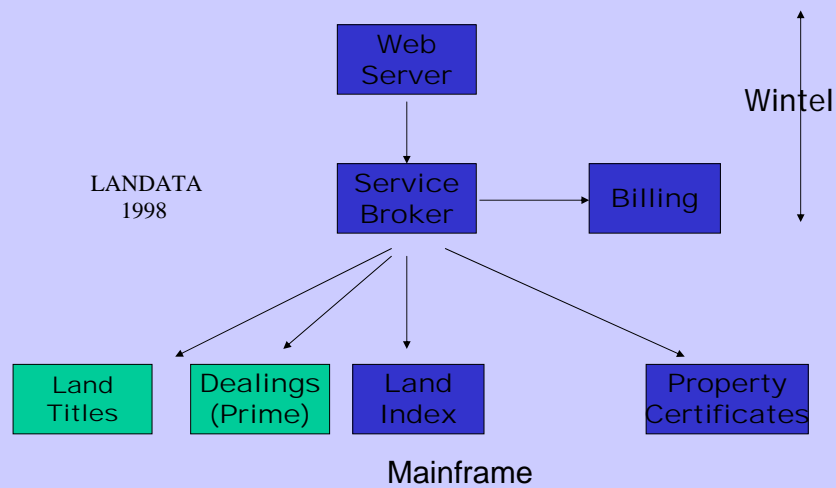


Web Service by refactoring

# Web Service Conversions

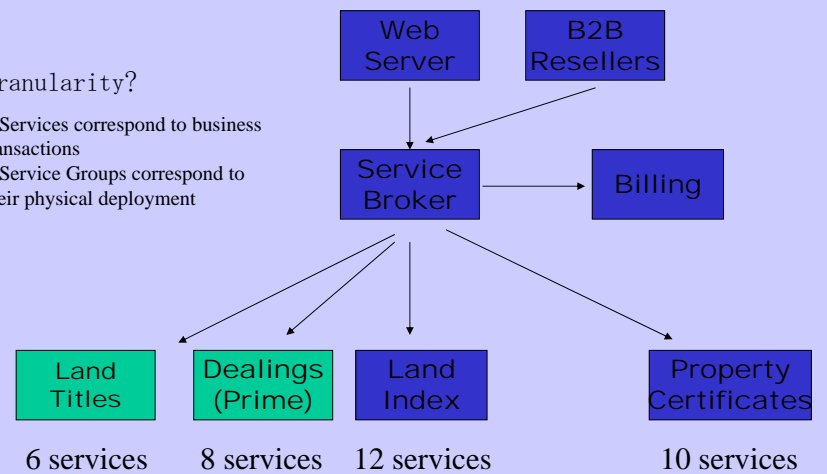
- Refactoring
  - Land Index
- Wrapping
  - Dealings
  - Titles
- Rewriting
  - Property Certificates
  - Billing

LANDATA  
1998



Granularity?

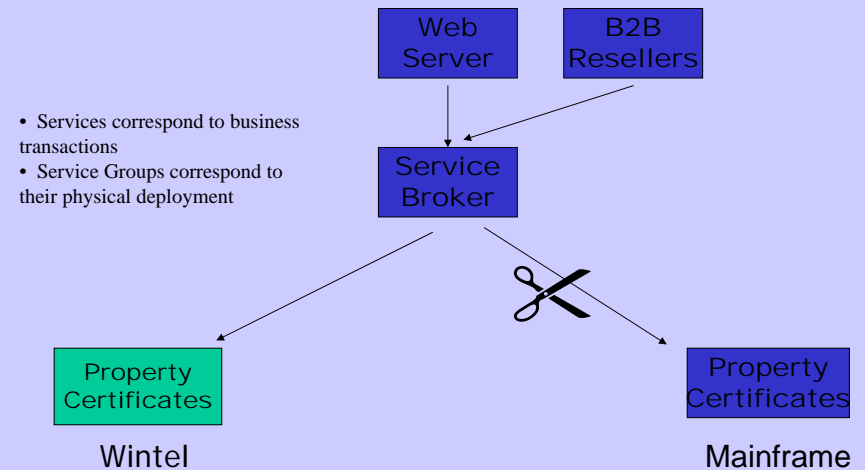
- Services correspond to business transactions
- Service Groups correspond to their physical deployment



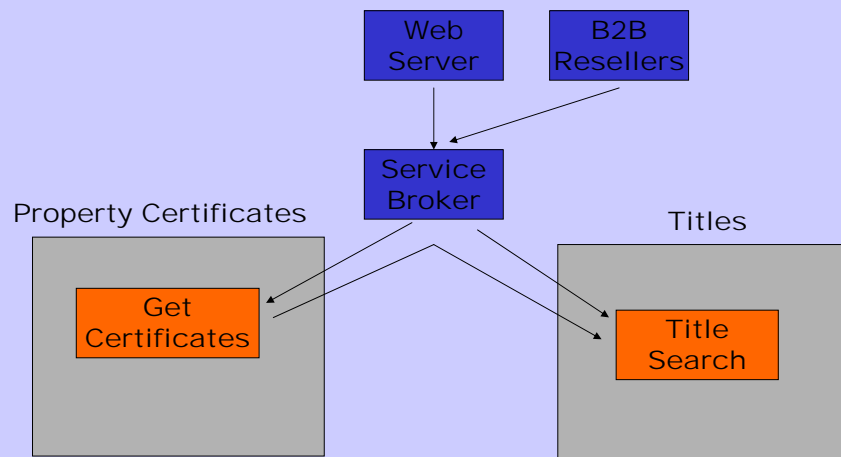
## “Service” Granularity

- We defined service at the level of the former mainframe transactions
  - Natural
  - Statutory fees etc
  - Customer expectation
- Aggregated individual services into Service Groups which were at the level of deployment.
  - Share parameters etc approx = the “system” level
- General Principles:
  - Should be business oriented (eg step of a business process)
  - Separate billing item.

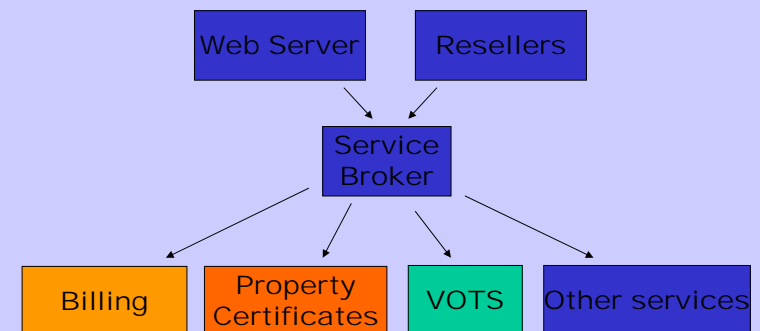
## Why Services ? - Migration



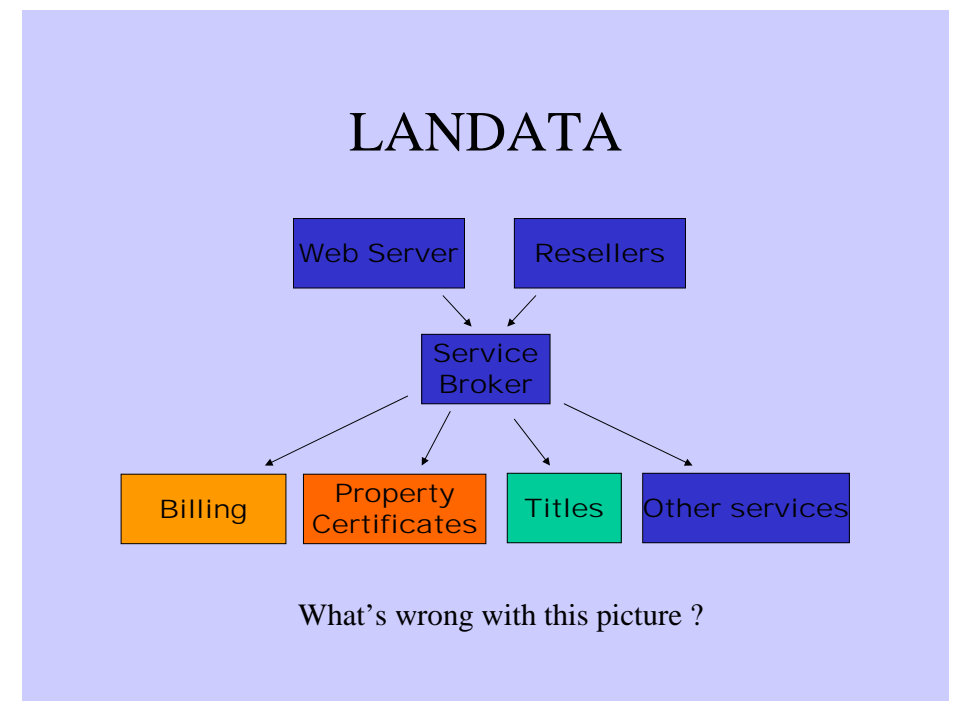
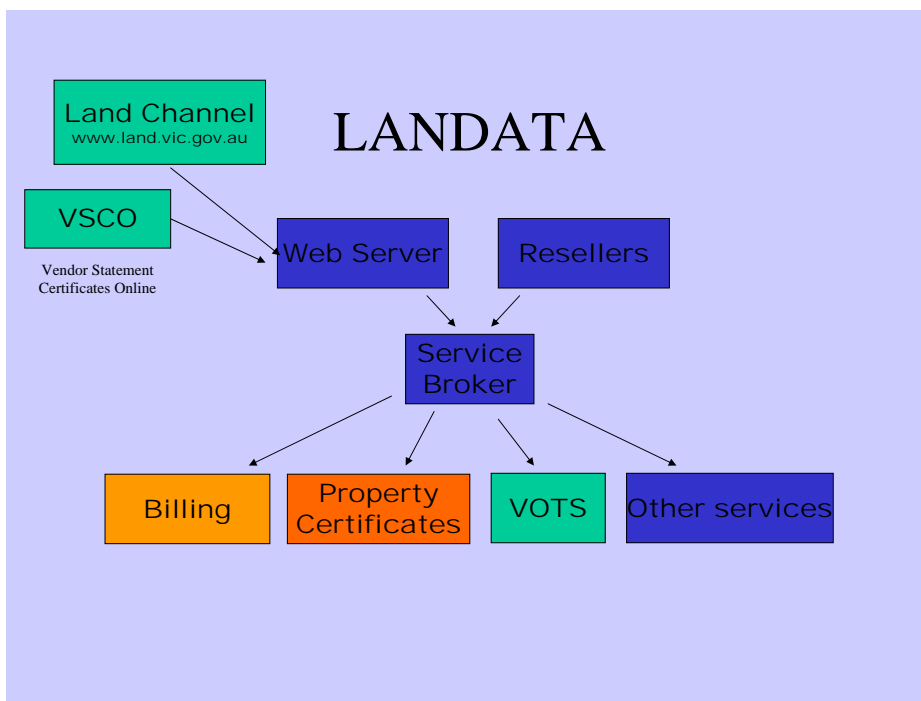
## Why Services ? - Aggregation



## LANDATA



Victorian On-line Titles system  
December, 2001



## Well...

- **Web Service** = computer application logic delivered as a service via Internet standards.
- **But...Current W3C definitions refer to XML as the means of data transfer.**
- 1998: LANDATA used HTTP internally and a proprietary message structure externally.
  - Flak from new resellers
  - Platform going forward ?
- Built with Microsoft DNA on Wintel platform

## Lessons #1 - SOA

- SOA is not = Web Services
  - SOA is a style of architecture and predates WS
  - WS a very good way to build SOA
- SOA is not an OO technology
  - We made services out of COBOL/Total running on 15 year old PRIME minis!

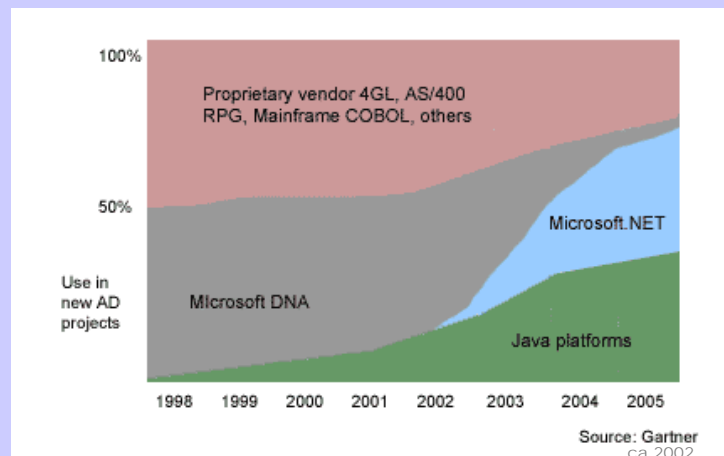
## SOA Benefits

- Greatly assisted migrations
  - Technically different platforms
  - Seamless migration process
    - Prime and Unisys Titles Systems to Sun/Oracle
    - LANDATA indexes to Sun/Oracle
    - LANDATA service point, billing and property certificates to Windows NT/SQL Server
- Low level **service granularity**
  - Gave excellent location flexibility
  - Relocations (almost) invisible to customers

## Business Case (May, 2002)

- Standards: LANDATA predated suitable standards
  - Opportunity to standardize
  - Create Platform for future – position, position!
  - Web Services like our Service Broker architecture
    - Very like Service Broker services
    - Good match, low risk, performance benefits
- DNA: Microsoft .net (February, 2002)
  - conversion inevitable sooner or later - within 3 years.
- Two enterprise platforms going forward
  - .net and Java/J2EE (next slide)
- Conversion to .net “natural” choice
  - Microsoft to Microsoft
  - Web Services support intrinsic

## Business Case - .net and Java



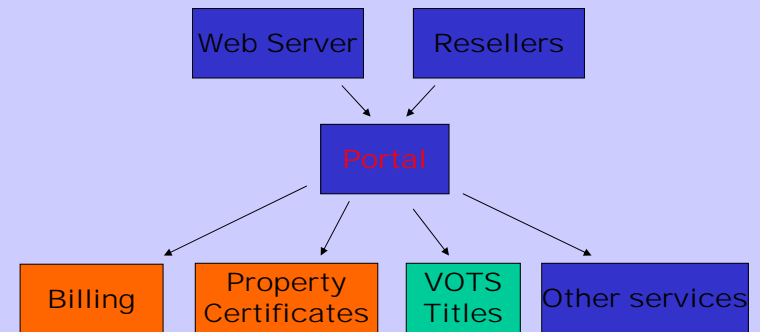
## Business Case (part 2)

- .net benefits:
  - Performance and scalability
  - Take Advantage of OO
  - Productivity (development and operational)
- Deliver on open standards easily
  - also translating to productivity
  - cross platform XML/SOAP/WSDL
  - no need to support client-side software
  - future inter-operability/collaboration - new systems.
- Lower risks in future support

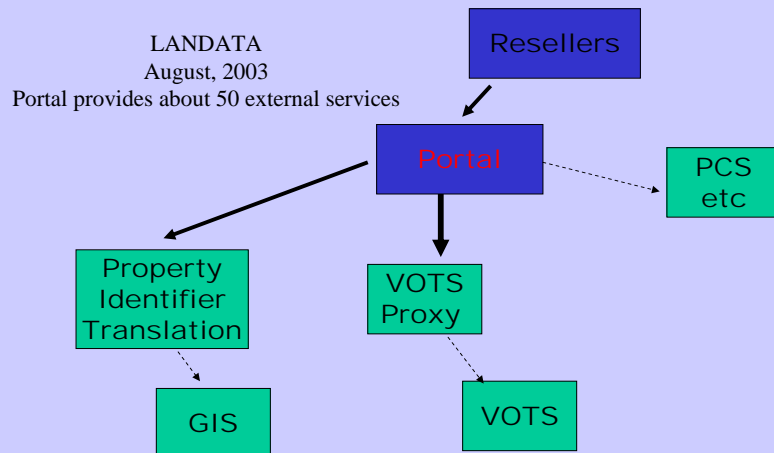
## .net vs J2EE

- WoG : IBM WebSphere J2EE
- **.net vs J2EE**
  - Cost/Performance
  - Support for Web Services
  - Developer Productivity and Availability
  - Small shop – conversion
  - Conversion costs
    - .net costs much lower
    - incremental migration

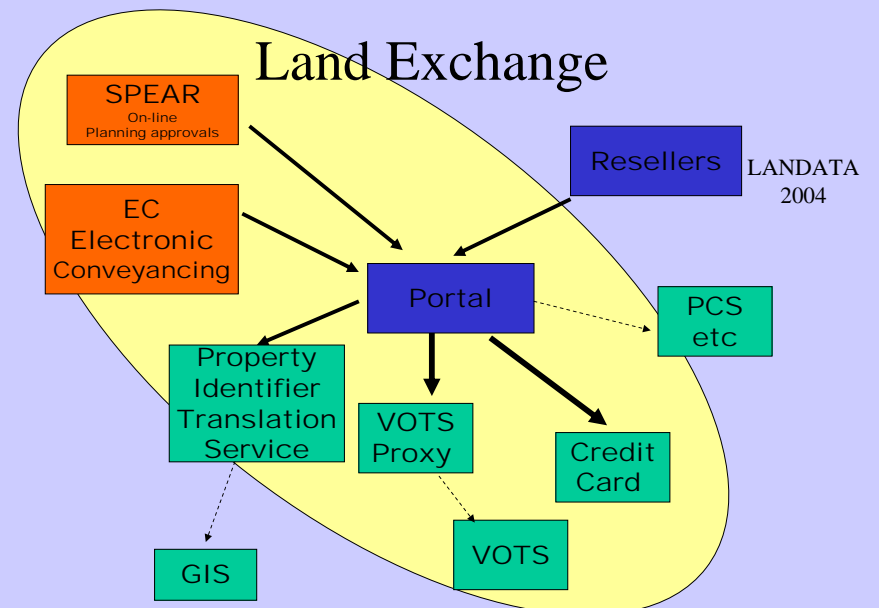
## Standard Web Services



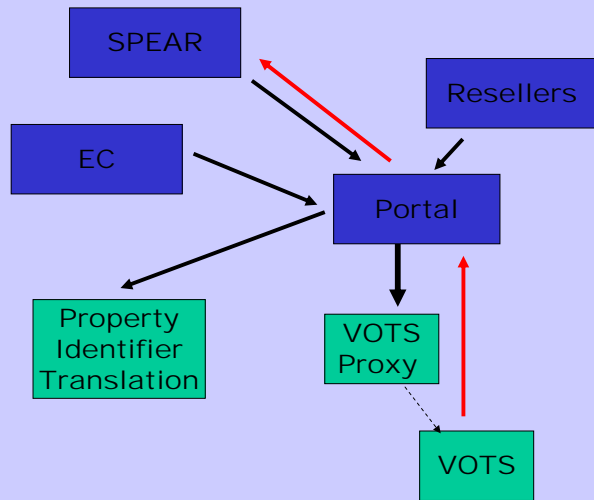
## Web Services



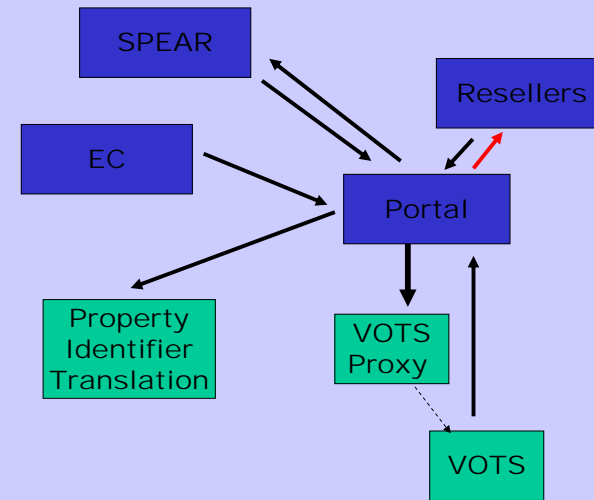
## Land Exchange



## SPEAR Alert Service

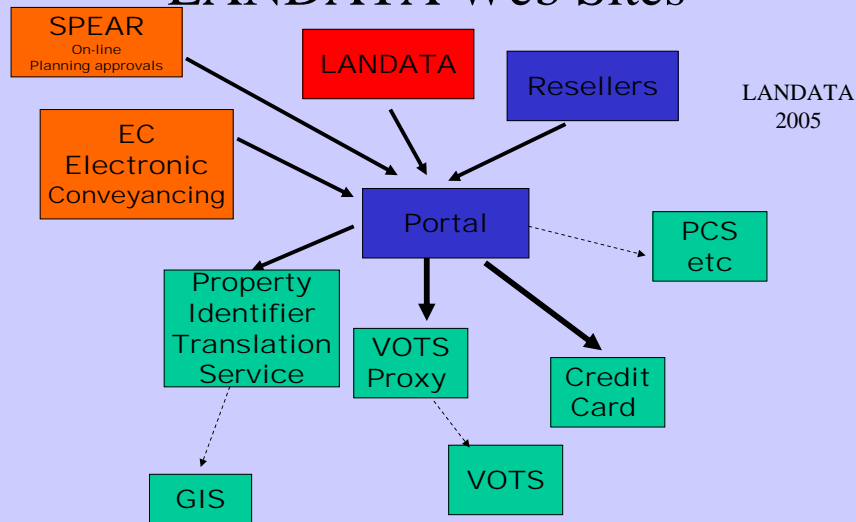


## Alert Service – New Product



Idea came from the business!

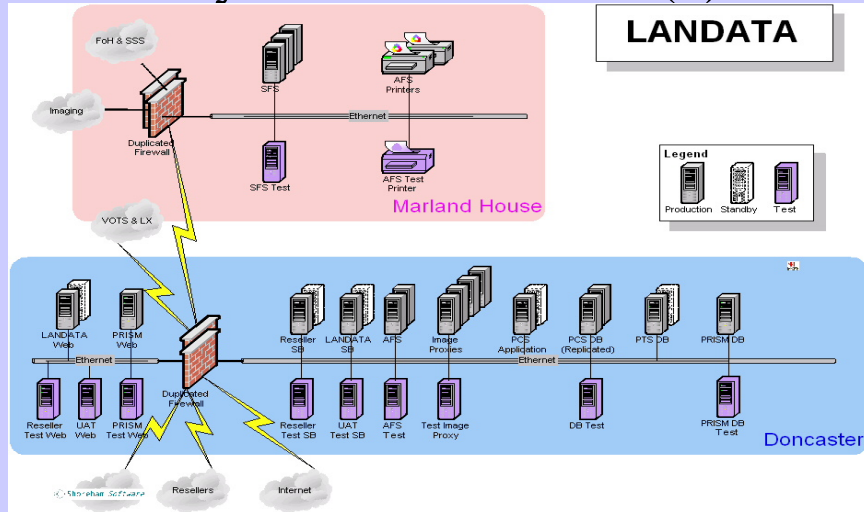
## LANDATA Web Sites



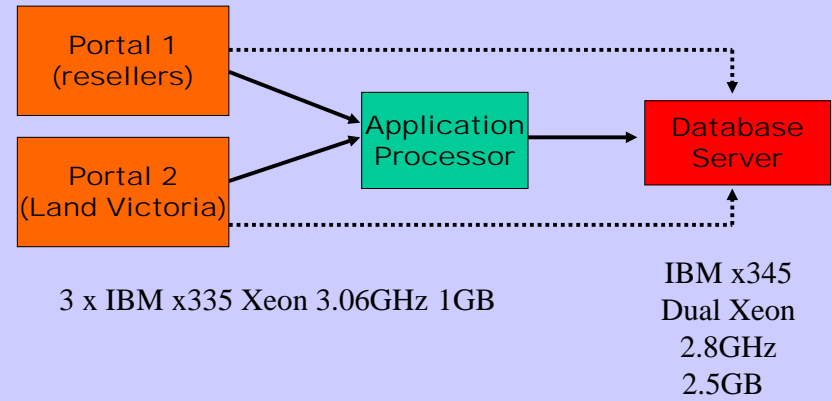
## Volumes

- Currently 100,000 web service calls per day.
- Growing to 160,000 when fulfilment converted.

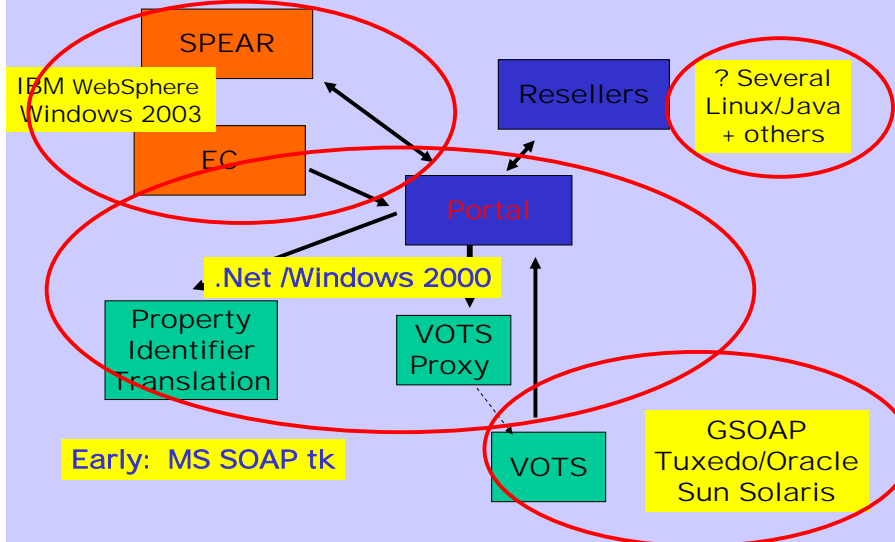
# Physical Architecture (1)



# Physical Architecture(2)

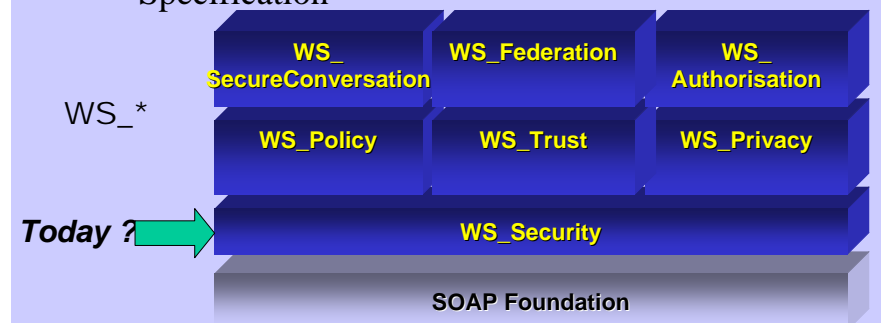


# Cross Platform



# Web Services – Security

- Joint IBM / Microsoft Web services Security Specification



## LANDATA - Security

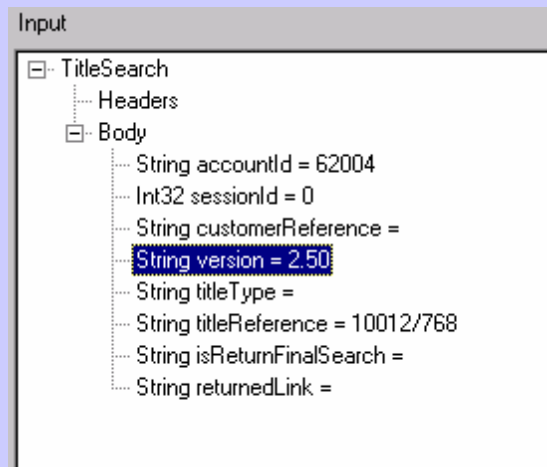
- Requirements
  - Here and now
  - Cross platform/variety of toolkits
- **SSL**
  - <https://portal1.landata.vic.gov.au>
  - Mixture of :
    - self generated certs - Test
    - Commercial CAs (eg Verisign) - Production
- Standard X.509
- Reality – still difficult:
  - cross platform
  - certificate extensions
  - CRL processing (argggghh!)
  - Performance hit: 25% CPU overhead for 128 bit SSL

## Versioning – End Points

- Requirements
  - External customers, unpredictable schedules
  - Multiple versions concurrently (3, new 1 every 2 months)
  - Once interface changes, need to version
  - We deliver XML documents – schemas need to be versioned too.
- **Our Web Service End-point:**  
[https://portal1.landata.vic.gov.au/portal/3.10/webservices/...](https://portal1.landata.vic.gov.au/portal/3.10/webservices/)
- Versioning built in
- Publication difficult cross-platform

## Versioning #2 – XML Schema

- XML schema version taken as an input parameter



## Reflection

- Migrations are complete
  - Should we revert to monolithic systems?
  - Should we use platform specific protocols?
- **NO!**
  - Configuration Management IS much harder.
  - However: simplicity, power, modularity, responsiveness to business much better.

## LANDATA – Next Steps

- Order Fulfilment
  - Web Services not sufficient to describe a business process.
  - Usually, business transaction comprised of multiple web services (from both sides).
- Issues:
  - managing the sequence of calls
  - managing integrity around “sub-atomic” parts of a business transaction.

## Web Service Transactions

Web Services over the Internet have additional complications:

- Transactions can be long-running.
- Reliability and scalability concerns:
  - Multiple, disconnected parties → must have asynchronous capabilities.
- Must be able to process exceptions to maintain transactional integrity.

## Orchestration/Choreography

- **Orchestration :**
  - how web services are assembled and controlled to deliver a business process
    - from the perspective of one of the parties
    - ie both parties would have their own orchestrations.
    - similar to the “workflow” of old.
- **Choreography :**
  - defines the sequence of messages which flow among the parties.

## Orchestration/Choreography

- Emerging/competing standards (!)
  - ebXML (UN/CEFACT)
  - BPEL – Microsoft/IBM etc
  - WSCI (pron Whisky) – Sun et al.

## Ahead of the game ?

- Attracted to BPEL but too early to jump.
  - BPEL4WS and/or WSCI probably OK
  - Standards too young and disputed
  - Work flow style engines to support standards not developed or supported well enough for mission critical usage.
- How do you provide for transaction integrity today ?
  - Compensating services / transactions.

## Current Projects

- Custodian Web Services (being deployed)
  - standard service for Section 32 order/delivery
  - Local government/water authorities
- ALERTS product (Aug/Sept)
  - subscription to alerts
  - publication of alerts (by WS call and/or e-mail)
- Revised Section 32 ordering process
  - Unified ordering process for Land Channel, VSCO, Self Service and brokers.

## Summary of Benefits

- Web services approach:
  - Proven in **Mission Critical, Medium volume** case
  - Proven **Cross/Platform** reality
  - **New business value**
    - Integrated services were built out of lower level services
    - New products (Business understands Services Architecture better)
  - Much more effective **Enterprise Integration**
    - Services re-used by emerging systems
    - Reused Legacy Systems – **extended the ROI**
- Success using a technology in its infancy
- Worrying signs:
  - Standards diaspora WS\_\*, BPEL, WSCI
  - Simpler technologies like REST taking off

## Are Web Services Hype ?

