

Goin' Live: A 9iAS Implementation Case Study



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Overview - Client

- Corporation for National and Community Service (CNCS)
 - Americorps, VISTA, Learn and Serve, Senior Corps grants programs for non-profit organizations
 - Servers and many staff users in Washington DC, with state offices and service centers throughout the country
 - Potential external users (grantees and applicants) throughout the country

Overview - 9iAS Applications

- eGrants - Develop and deploy a new Oracle web forms application for use both on Internet and Intranet
- SPAN - Convert an existing client/server forms application to web forms for internal use
- Implement Web PL/SQL modules in conjunction with both efforts
- Discoverer for end-user queries

Overview - eGrants

- New application for grants application, review and approval, life-cycle management
- 300+ internal (staff) users
 - At headquarters, via LAN
 - In field offices via WAN or dial-up
- 1500 external users
 - Applicants, grantees, reviewers, site visitors
 - Peak load anticipated at 300 simultaneous users

Overview - SPAN

- System for tracking members of Americorps programs
- Client/server conversion to web forms
 - 125 internal users, via LAN and dial-up
 - Projected increase to 200 users
- Motivation
 - Centralized storage of forms/reports
 - Improved performance for dial-up users

Overview - Web PL/SQL

- One reporting module, part of eGrants
 - Reports functionality easier to implement via dynamic HTML
- Membership inquiries in SPAN

Overview - 9iAS Deployment

- Pilot program
- Intranet and test - installation and configuration
- Internet installation and configuration
- Testing - Trial by fire
- Deployment - Goin' Live

Pilot Program

- Install and configure 9iAS
 - Ability for client to test eGrants during development (development was off-site)
- Proof of concept for SPAN
- Performed on existing hardware
- For sizing production hardware: Oracle Forms Services Release 6i: Capacity Planing Guide. An Oracle White Paper, Nov. 2001.

Pilot Program

- 9iAS v1.0.2, Forms and Reports Server 6i release 2
- Platform:
 - Compaq Proliant 580, with 2.5 gigs of RAM and 3 700 MHz processors
 - Windows 2000
 - Intranet only

Pilot Program

- Training
 - Before, during, or after?
 - Actually, between the first and second installs
- Install 1 - few, if any, changes from the default
- Install 2 - start of required customization

Plan to throw (at least) one away.

Pilot Program - Customization

- Forms Listener Servlet configuration
 - Introduced in patch level 4
 - Can change configuration without bouncing server
 - Smaller footprint - no forms service required on Windows platform
 - Performance advantage
 - Servlets can be pre-loaded by setting zone.properties parameter `servlets.startup=lservlet<config>`
- No performance tuning or volume testing

Pilot Program - Customization

- Configuration changes

- Set location of icons, report destination and help files via httpd.conf
- Icons also referenced in registry.dat
- Use formsweb.cfg to set the configuration:

```
[BUILD]
serverURL=/servlet/1servletBUILD
pageTitle=CNCS eGrants Gateway
width=950
height=650
separateFrame=true
IE50=native
```

SPAN - Client/Server Conversion

- Convert Forms icons from .ico to .gif
 - IconCool from Newera software
 - Conversion only; no editing
- Reports need to be recoded
 - RUN_PRODUCT supported, but not recommended
 - HTML parameter form is ugly – need a form
- Forms Server 6i Reports Integration. An Oracle Technical White Paper, July 2000.

SPAN Conversion - Reports

- 1 Replacing RUN_PRODUCT directly with WEB.SHOW_DOCUMENT
 - At a minimum, need to check for Application_Property(USER_INTERFACE)
 - URL with which SHOW_DOCUMENT is invoked shows user name, password and connect string



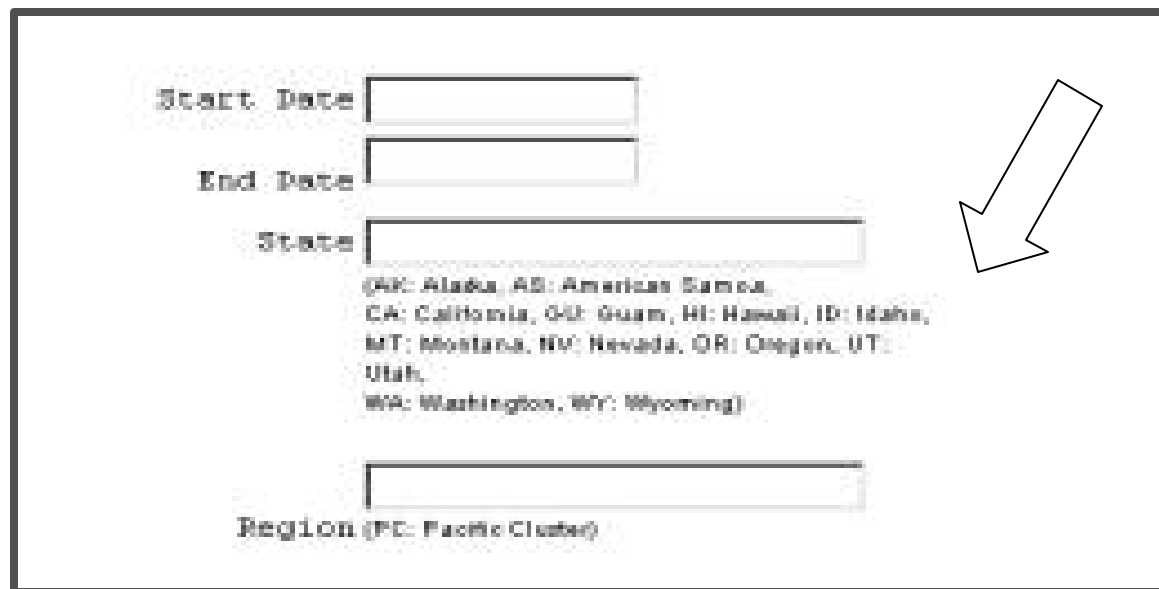
SPAN Conversion - Reports

1 WEB.SHOW_DOCUMENT

```
IF Get_Application_Property(USER_INTERFACE) != 'WEB'
THEN
    Run_Product(REPORTS, repname, SYNCHRONOUS,
                RUNTIME,,FILESYSTEM, plid, TO_CHAR(NULL));
ELSE
    un := Get_Application_Property(USERNAME);
    pwd := Get_Application_Property(PASSWORD);
    cs := Get_Application_Property(CONNECT_STRING);
    un := 'userid=' || un || '/' || pwd || '@' || cs;
    WEB.SHOW_DOCUMENT(... || un, 'SELF');
END IF;
```

Reports – HTML Parameter Form

- Ugly implementation of LOV/drop-down list



The screenshot shows a form with the following fields and text:

- Start Date:
- End Date:
- State:
(AK: Alaska, AS: American Samoa, CA: California, GU: Guam, HI: Hawaii, ID: Idaho, MT: Montana, NV: Nevada, OR: Oregon, UT: Utah, WA: Washington, WY: Wyoming)
- Region (PC: Pacific Cluster):

A large white arrow points to the State field, highlighting the list of states.

SPAN Conversion - Reports

- 2 WEB.SHOW_DOCUMENT: Represent user name and password with hex encryption
 - Not human readable on the URL
 - Hex-encoded URL stays in the browser's history, but prefix match uses regular character set
- Integrating Oracle9iAS Reports in Oracle9iAS Forms. An Oracle White Paper, Sept. 2001.

SPAN Conversion - Reports

- 3 Solution: Use RUN_REPORT_OBJECT followed by WEB.SHOW_DOCUMENT
 - Forms restriction on the reports server name in SET_REPORT_OBJECT_PROPERTY -- no numbers or underscores
 - Need Forms parameter forms
 - DESTYPE=pdf (Adobe Acrobat required)
 - DESFORMAT: Cache vs. file system

Reports Server

- Reports to “Cache” generate a hyperlink

Reports Server Queue Status

2. Past Jobs :

Job ID	Job Name	Job Status	Job Owner	Output Type	Output Name	Server Name
145	RPT_424	Finished	SYSTEM	PDF File	d:/cnsoutput/REPORT_OBJTES5009.pdf	Rep60_ORAAS2
144	rpgm9143.rep	Finished	SYSTEM	Cache		Rep60_ORAAS2

Production - Intranet Servers

- 9iAS v1.0.2, Forms and Reports Server 6i
 - Patch level 9; needed to support IE 6
- Platform:
 - 2 Compaq DL #360, each with 3 gigs of RAM, 2 1.2-GHz processors and 2 mirrored 72-gig drives
 - Windows 2000
 - Intranet use only

Production - Intranet Servers

- Load sharing – Round-robin DNS
 - Provides “semi” load balancing
 - Capacity and load of each server is not taken into account)
 - Multi-node setup (oraas1 and oraas2)
 - An ApJServGroup for each node, specifying
 - Number of jserv processes for each node
 - Weight for each node
 - Groups are automatically started

Production - Intranet Servers

- Web Server load balancing not implemented
 - “Documentation opaque”
 - Need to manually start and stop jserv engines
- Oracle 9i Application Server Forms Services.
An Oracle White Paper. Jan, 2002.
 - References howto.load-balancing.html

Production - Intranet Servers

- Initial experiments with SSL/https
 - Open SSL (freeware shipped with 9iAS) from the Open SSL project
 - Created internal certificates; Verisign not required
 - Discarded as overly paranoid for intranet (all machines behind the firewall)

Production - Intranet Servers

- Other security measures – Web PL/SQL
 - Limited access to DAD administration page
 - New DAD created to perform administration
 - Limit administration users via wdbsrv.app
 - Use database to authenticate
 - Limited database access for DAD account

Production - Intranet Servers

- Other security measures
 - Index.html pages created to replace defaults
 - Allow/deny directive used to limit access to directories/files, jserv status handler, etc

```
order deny, allow
deny from all
allow from 127.0.0.1 <appserver URL here>
```

Production - Intranet Servers

- Reports server tuning
 - Increase MAXENGINES from default of 1 (only 1 report will run at any one time)
 - Use MAXIDLE to timeout runtime engines that are not used; default is 30 minutes
 - Increase MAXCONNECT (default of 20 processes that can communicate with the reports server simultaneously is too low.) = # engines * # clients
 - Net8 Config appears to wipe out reports server settings in TNSNames.ora!!

Production - Intranet Servers

- Jinitiator issues - to use or not to use?
 - Pros
 - All browser versions supported
 - Limits browser configuration
 - Cons
 - Initial download 10 megs
 - Must be kept in sync with Forms version

Production - Intranet Servers

- Jinitiator issues - Decision
 - Use Jinitiator
 - Provide CD with software and instructions

Production - Intranet Servers

- Java Components
 - eSPAN: Jspell - Proof of concept for Pluggable Java Component (PJC)
 - eGrants: Momentum – Interface to accounting application running on external BEA application server

Production - Intranet Servers

- Jspell - PJC
 - Excellent documentation on integrating a PJC with forms available:
 - Technet.oracle.com/sample-code/products/forms
 - Extract jspellintegration.html from zip file
 - Change java configuration (jserv.properties, zone.properties)
 - Integrate calls to java classes in forms triggers

Production - Intranet Servers

- Momentum interface - architecture
 - PL/SQL-wrapped procedures in eGrants databases
 - Momentum servlet on eGrants application servers
 - Http communication to BEA server
 - Errors/results returned via a text string which is parsed and displayed

eMail - Intranet Servers

- Text email handled via UTL_SMTP calls in back-end code
- UTL_SMTP does not handle attachments
- Attempted solution:
 - Install MAPI mail client on application servers
 - Generate an Oracle Report: DESFORMAT=pdf, DESTYPE=mail

eMail - Attachments via Reports

- Problems

- Security

- Mail client must be installed and run on application server
 - Setting up user and service profile

- User interface

- Message subject line says: “Report from Oracle Reports”
 - Only one attachment per mail message
 - Cannot include message body in email

eMail – Attachments Eliminated

- Release 1: Solution
 - Remove mail clients from application servers
 - Give users an additional menu option to generate the attachment we were going to send
- Release 2: Java sendmail (if required)

Move the onus

Production - Internet Servers

- For eGrants use only
- Same hardware/software platforms as Intranet servers
- Application servers outside the firewall
- Security, security, security
 - Same provisions as intranet servers (index.html, DAD), plus more

Production - Internet Servers

- Security
 - Programmer access
 - No remote connection to application servers (locked server room)
 - Login at console only
 - No printer; restricted set of Windows software
 - Restricted set of eGrants application software installed

Internet Servers - Security

- SSL

- Apply for real Verisign certificates

- Generate private key request, send \$\$, get back public key server certificate and intermediate certificate
- Quick turnaround

- Redirect http to https

```
#Jserv.conf
<Location /servlet/>
    SSLRequireSSL
</Location>
```

Internet Servers - Security

- Oracle Advanced Security Option (previously Advanced Networking Option)
 - Not used!
 - Would provide encryption from database server to application server (outside the firewall, in DMZ)
 - Incompatible with Reports Server:
 - Wade through Release Notes (Note 111712.1)
 - Section 5.8: “The Reports Multi-tier Server does not currently support the Advanced Network Option.”

Internet Servers - Database Access

- Need a single port through firewall (can't allow listener to dynamically assign ports)
- Initially used Connection Manager
 - Did not need connection pooling
 - Only needed port redirection
- Replaced with `USE_SHARED_SOCKET` registry entry
 - Applied to database's `$ORACLE_HOME`

Internet Servers - Deployment

- All application software tested on Intranet; a subset deployed to the Internet servers
- Server setup was delayed, so not as much testing as desirable (“But all the software and hardware is the same!”)
- Additional problems:
 - Oracle/forms error not reported (no value in list) -- instead session is terminated!

Internet Servers - Deployment

- Expected behavior for first-time user (account created with expired password)



- Actual behavior (Bug # 2138962)
 - FRM-92100: Your connection to the Server was interrupted ...

Internet Servers - Deployment

- Fix - Emergency upgrade to Patch Level 10
- New problem (Bug # 2173804)
 - Passing parameters from forms to reports
 - Fixed AFTER we had gone live, via library change

Internet Servers - Deployment

- Reports Parameter Fix:

```
IF Get_Application_Property (USER_INTERFACE) = 'WEB'  
THEN  
  IF instr (v_value, ' ') > 0 THEN  
    IF substr(v_value,1,1) <> '' THEN  
      v_value := '' || v_value || '';  
    END IF;  
  END IF;  
END IF;  
  
add_parameter (pl_id, v_parameter, TEXT_PARAMETER,  
v_value);
```

Functional and Load Tests

- Limit on connects - TEST database limitations
 - Insufficient database block buffers, open cursors, max connections
 - Too many objects were being pinned
 - Insufficient memory (server maxed out)
- Need to test in same exact environment as will go live (Duh!)

Functional and Load Tests

- SSL performance problems (?)
 - Probably not – but due to insufficient number of jserv processes for the number of users
 - Problem is not in the CPU, so doing encryption in NIC hardware wouldn't help
 - Problem is bandwidth - encrypted data can't be compressed further

Functional and Load Tests


- Configuration – tuning continued
 - Apache, Jserv, zone.properties
 - Why some configuration changes didn't work
 - NT: threads per child
 - UNIX: MaxClients
 - RTFM: “On Windows platforms, Apache does not fork ...”
- Performance: Oracle HTTP Server powered by Apache Performance Guide (A86676-01)

Goin' Live

- 50 staff users trained by mid-May
- 1000 external users trained mid-June
- System turned on (link put on corporation web site) two weeks later

Experience is something you don't have until after you need it.

Goin' Live

Address  http://nationalservice.org



Corporation for National and Community Service



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[President Introduces New "Students in Service to America" Guidebook](#)

[Senior Corps and AmeriCorps Launch New Recruitment Campaign. View "Americans Give Back" PSAs](#)

[President Urges Swift Passage of Citizen Service Act. See Details of Legislation](#)

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Goin' Live



*Corporation for National
and Community Service*

eGrants

What is eGrants?

eGrants is an integrated, secure, web-based system that will be rolled out over the next year. With eGrants you can manage applications for federal assistance from application to close out. eGrants allows you to apply for a grant or project online as well as manage all other aspects of any current grants you have. Currently available for Senior Corps September and October renewals and Martin Luther King Day Grant applications.

How do I use eGrants?

You must obtain a userID and password in order to use eGrants. If your organization has never applied for Corporation funding or has had a grant for years, first-time eGrants visitor must first create an account in order to access the system. Once you set up your account, be sure to retain your userID and password, because you will be required to sign in every time you enter the eGrants system.

eGrants

Apply for funding or manage your eGrant using this new system.

New User

Whether you already have a Corporation grant or have never applied for funding, if this is your first time using the eGrants system, you must first **create an account**.

Sign In

If you already have an account with eGrants, Sign in to manage your current grant or apply for new funding

Forget your password?

Goin' Live – Connection Problems

- FRM-92102 and 92101
 - “a failure has occurred on the client/server”
 - Increase session.timeout parameter (in zone.properties) from 30 minutes to 1 hour
 - Do not use a database session timeout
 - Update the help desk's FAQ

Goin' Live – Connection Problems

- FRM-92101 reported after only 56 users!
 - Application server, when started from command line, uses IO Desktop Heap, default size=3072
 - When started as a Service, uses Non-IO Desktop Heap, default size=512
 - Fix: HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\session Manager\SubSystems: xxxx, yyyy, zzzz
- Bug #2178219 (NT only)

Goin' Live – Orphan Processes

- The infamous: ifweb60.exe
 - Processes on the application servers with no database sessions
 - Not consuming CPU, but are consuming memory
 - Caused by users losing Internet connection?
 - Contribution of running in separate windows?
 - Time out and go away on the intranet, but not on the internet
 - Go away when server is restarted.

Goin' Live – Browser Problems

- Browser problems
 - IE 4.0: not supported, and must be upgraded
 - Macs:
 - OSX not supported; OS9 has bug (fixed in patch 12)
 - OS 10 works with the latest upgrade and SSL patch
 - IE 5.x and 6.x: configurations must allow session cookies and applets
- Ongoing, as new users sign up
- Importance of help desk!

Goin' Live – User Problems

- Orphan users – can't connect
 - Browser configuration issues still puzzling
 - Users don't have write privileges to the registry, and cannot create keys for JInitiator
 - HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\JInitiator\<version>

Conclusion

- A more-or-less satisfied user base – both staff and external users
- Problems:
 - Deciphering documentation
 - Patch levels of the software stack
 - Hardware and software interactions

Life is a learning experience.

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