Upgrading 11.5.8 Application and 9.2.0 Database in 24 Hours

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Introductions

Upgrading 11.5.8 Applications and 9.2.0 Database in 24 Hours

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Agenda

- JPL Environments
- Upgrade Constraints
- Upgrade Methods
- Details Upgrade Method
- Conclusion

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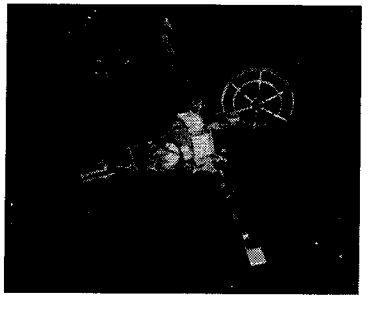

- **Federally Funded Research and Development Center**
  - Funded by National Aeronautics Space Administration
  - Operated by The California Institute of Technology (Caltech)
- **Located in Pasadena, California**
- **Robotic Space Exploration**
- **5,300 employees**
- **Annual Budget of $1.4 billion**

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Upgrade Timing

Normal Upgrade Duration

4 days (24x7)

Totally Unacceptable

Innovative Method using Private Regions

24 hours

Reduction of 75% downtime

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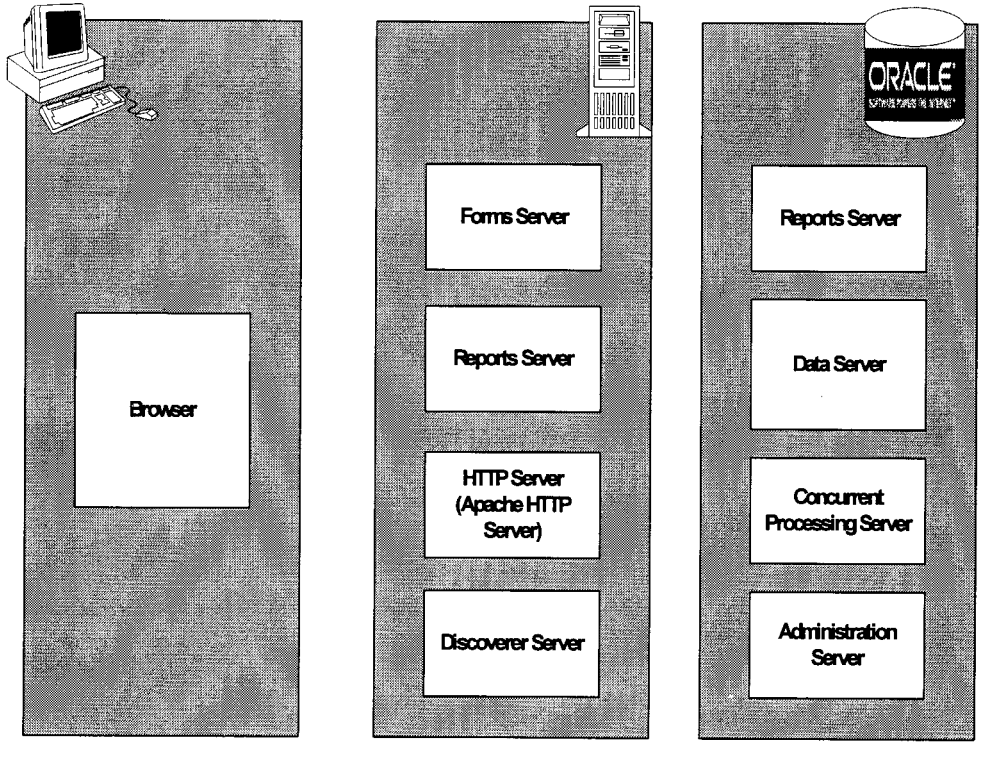
System Configuration

Hardware

- Sun E10K 16b 4gbx4cpu
- Solaris 8
- Veritas File System
- EMC Symmetrix 8830
- EMC SAN ED5000
- Storage TEK L700
- RMAN w/ NetBackup 4.5



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Pre-upgrade E-Business Suite Environment

Applications

- E-Business Suite 11.5.5
- Oracle Database 9.0.1
- 14 Oracle Modules
- 38 Custom Applications
- 10 Third Party Applications
- Hundreds of Re-Developed Custom Objects

Modules

- ✓ General Ledger
- ✓ Project Accounting
- ✓ Payables
- ✓ Cash Management
- ✓ Receivables
- ✓ Purchasing
- ✓ Order Management
- ✓ Inventory
- ✓ Assets
- ✓ Workflow
- ✓ Human Resources
- ✓ Payroll
- ✓ Oracle Advanced Benefits
- ✓ Internet Procurement

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IBS Team

- **Database Administrators**
- **System Administrators**
- **Data Security**
- **Management**
- **Sponsors**
- **Developers**
- **Functional Analysts**
- **Configuration Management**
- **Communication**
- **Change Management**

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Challenges

- Allowable downtime – Weekend
- Database Upgrade
- One-off patches
- Custom code migrations
- Bring current Tech Stack to 11.5.8
- 9.2.x RMAN upgrade

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Upgrade Methods

- Traditional follow the doc upgrade
- Off the wall upgrade method

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Traditional Upgrade

- Shutdown Production Database
- Follow 11.5.8 Maintenance Pack installation instruction
- Apply one off patches
- Follow 9.2.0.2 database upgrade instructions
- Migrate Custom Codes
- Validation All Modules

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New Upgrade Method

- Setup a private network with development servers & Window NT server with terminal server enabled.
- Clone production to development servers.
- Fresh install 11.5.8.
- Apply 11.5.8 Maintenance & one off patches.
- Install Oracle Database 9.2.0 Tech Stack.
- Apply all the database patch sets & patches.
- Copy the 11i volumes to PROD.
- Apply database drivers in PROD.
- Upgrade database in PROD.

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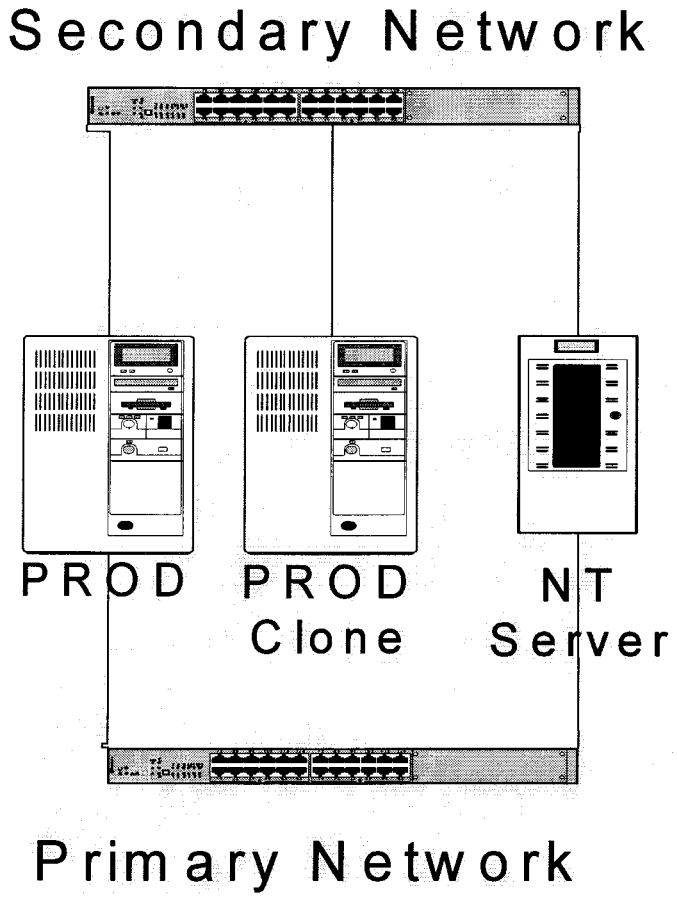
Setting Up The Environment



- Create 2 Servers in the private network (DB and Apps tiers)
- Create a PROD-Clone instance on the private domain.
- Set up an NT Server to bridge the 2 networks (public & private).
- Create 3 File Volumes in private domains.
- Perform upgrade on private domains through terminal server.

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Creating an 11i Instance

- Clone all 11i components (DB+Tech Stack) to the private domains.
- Fresh install 11.5.8 on new 1158 volume.
- Merge 11.5.5 and 11.5.8 to final-volume:
  - Get the current database Tech Stack: Copy 9i $ORACLE_HOME from 11.5.5 Source to final-volume
  - Get the existing 11.5.5 Application: Copy $APPL_TOP, $OA_HTML & $JAVA_TOP from 11.5.5 Source to final-volume
  - Get the new 11.5.8 Tech Stack: copy apps <sid>ora & <sid>comn (exclude $OA_HTML & $JAVA_TOP) from 11.5.8 source to final-volume
- Bring the database and begin the upgrade process.

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Update apps tech stack

- Upgrade/Configure Discoverer 4.1.46.
- Upgrade Developer 6i patch set 12
- Upgrade JDK 1.3.1
- Jinitiator 1.3.1.9
- Install Oracle 9.2.0 Tech Stack.
- Apply Oracle patch set 2 & one off patches to bring it to 9.2.0.2

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Apply 11.5.8 Maintenance Pack

- Using scripts to apply patches unattended
- Apply 11.5.8 Maintenance Pack Pre-requisite patches
- Apply 11.5.8 Maintenance Pack
- Post 11.5.8 Maintenance Pack Steps
- One off patches

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Instance validation

- Get functional users to validate the instance.
- Developers verify custom codes still work after the upgrade.
- Verify Third party software are not affected after the upgrade.
- Test out new 11.5.8 new functionalities.

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Prepare To Go Live

- Create new volumes on the production instance
- Copy all files from private regions to public regions excluding Oracle database files

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Go Live

- Split mirrors.
- Swap current Tech-Stack volumes with the final volumes from the Private regions (11.5.8).
- Bring up Oracle Database (11.5.5 & 9.0.1).
- Apply 11.5.8 d-drivers & all one-off d-drivers to upgrade database to 11.5.8.
- Shutdown instance again.
- Switch $ORACLE_HOME 9.0.1 to 9.2.0.2
- Upgrade Oracle Database to 9.2.0.2

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Propagate To Other Environment

- Using Oracle rapid cloning method.
- The method does not require to do the fresh install on the destination first.
- Run scripts on source.
- Copy all files to target server.
- Run scripts on target to complete the clone.

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Ground Rules

- Upgrade was 24 hours x 7 days
- Personnel performing tasks must be on-site 2 hours before estimated task start time
- Each team to have on site support and alternate during all shifts of the project regardless of the task
- All communications to quarterback.
- Have management contact of Oracle to get a point of contact for TAR escalation.

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Final Thoughts

- This method does take up some resources up front.
- Reduce the stress and mistakes.
- This method reduced 75% production downtime.
- You can do it too!

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