

Oracle applications in a Split Configuration Environment using HP-UX

Rajesh Krishnaiah

Umesh Pathak

Sr. Technical Consultant
Hewlett Packard Company



Agenda

- Introduction
- What is IPF
- Why IPF
- Oracle on IPF
- Split Configuration
- Why Split Configuration
- Oracle E-Business Suite and Split Configuration
- Performance tips
- References
- Q & A

Before we start

- Will talk about
 - database migration option from PA to IPF
 - performance tuning tips
- We assume you already know about:
 - Oracle database/EBS installation & implementation procedures
 - Client server / multi tier architecture
 - Basic HP-UX kernel/Oracle configuration parameters

Itanium Product Family (IPF)

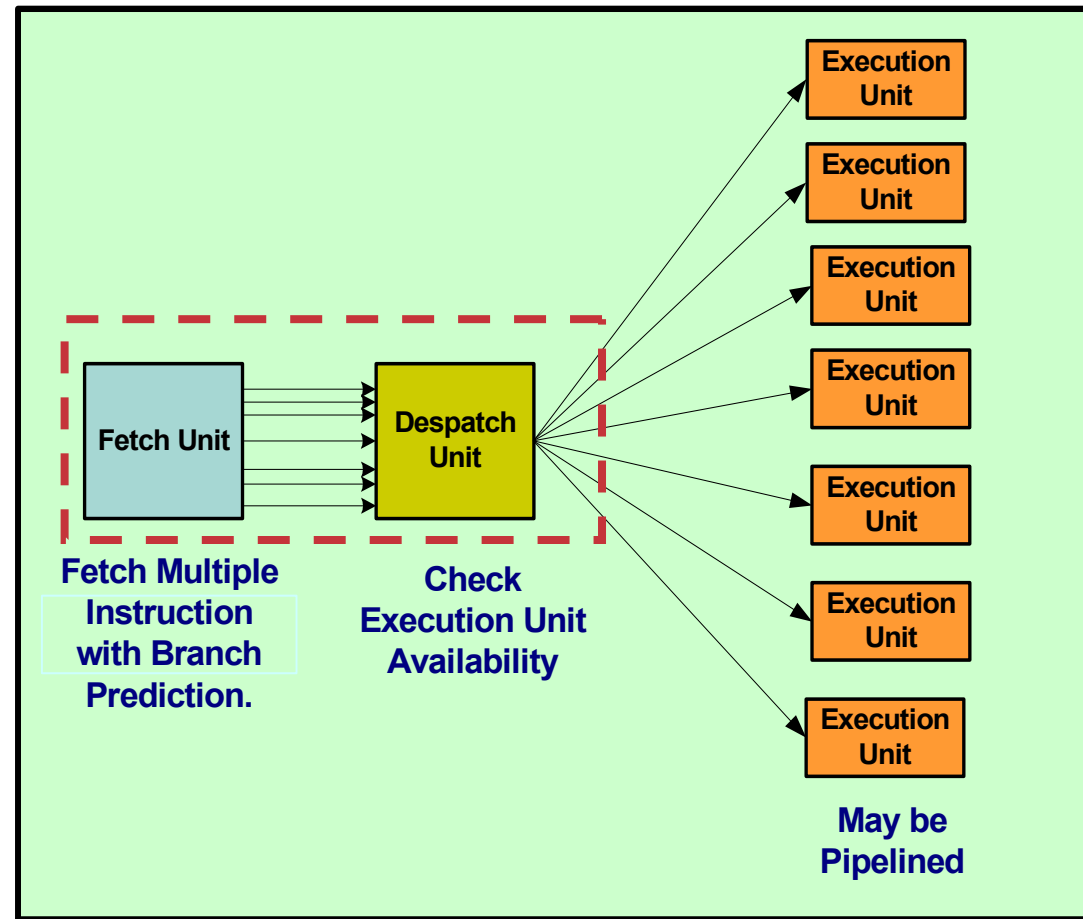
- Originally called “Intel Architecture – 64 bit” (IA-64)
- Co-developed by HP and Intel
- Next generation processor
- Based on Explicitly Parallel Instruction Computing (EPIC) architecture
- Features:
 - Predication
 - Speculation
 - Large register set
 - Multiple layers of cache

Itanium Product Family

- Features:
 - Advanced branch architecture
 - Register Stack
 - Avoid saving & restoring registers across function calls
 - Instructions Execute in Parallel
 - More Instructions are Executing
 - Deeper Pipeline
 - Architecture is explicitly parallel

Processor Architecture: EPIC

- Explicitly Parallel execution
- Dependency checker shifted to compiler
- Instructions are grouped and bundled
- More chip space for execution units



Why IPF ?

- Superior performance
 - Leading benchmark results
- Performance for all applications
- Next generation technology
- Support for a range of H/W platforms (2 to 64 CPU)
- Support for multiple Operating Systems
 - HP-UX, MS Windows, Linux
 - Multiple Operating Systems can concurrently run on different partitions on the same box
- Same version of HP-UX for both PA and IPF in future
- Enhanced manageability and scalability

Oracle on HP-UX - IPF

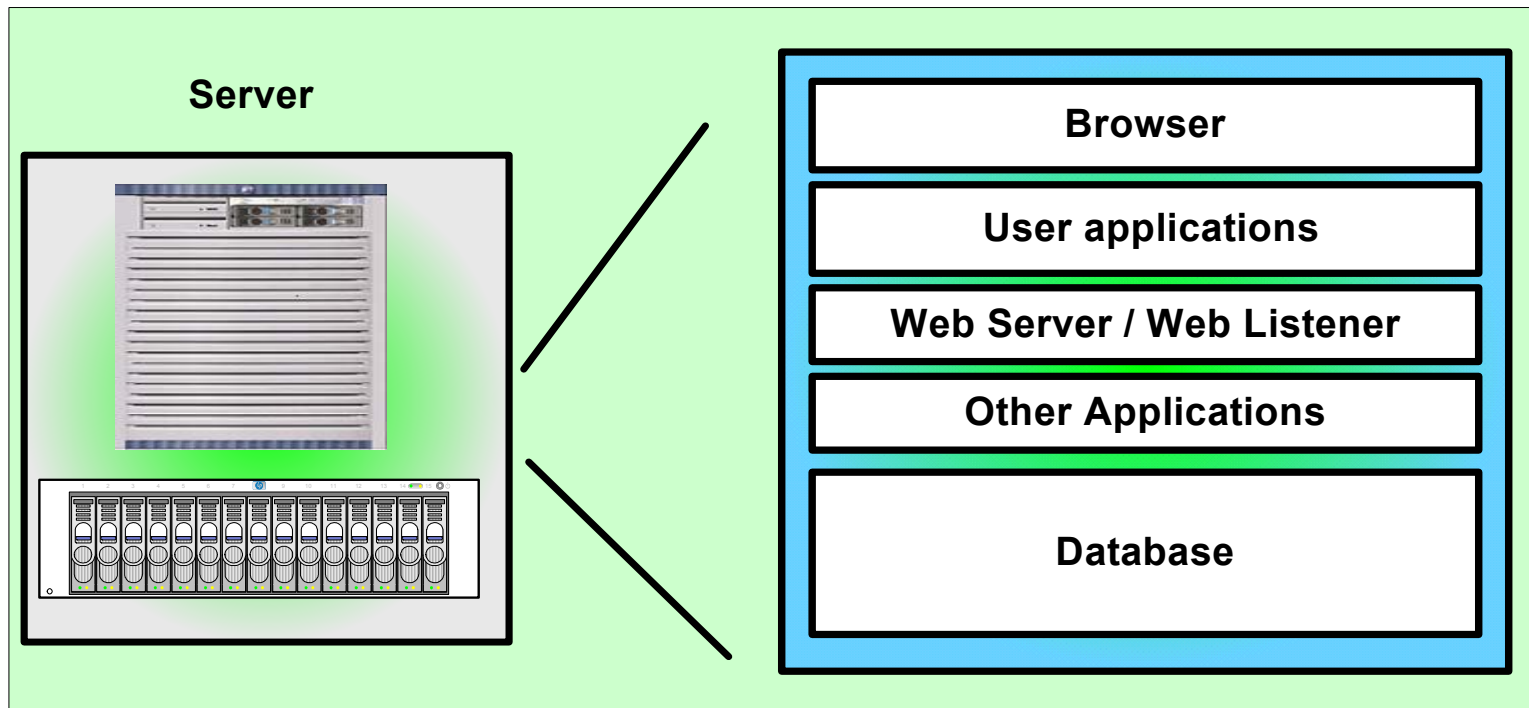
- Fully supported Oracle Database
 - Oracle 9i-R1 database developer release
 - Oracle 9i-R2 database production release with HMP
 - Downloadable from <http://otn.oracle.com>
- Superior performance on IPF
 - Benchmark results back this up
- Easy migration of Database (from PA to IPF)
 - Traditional export/import/upgrade
 - Just move/copy required data

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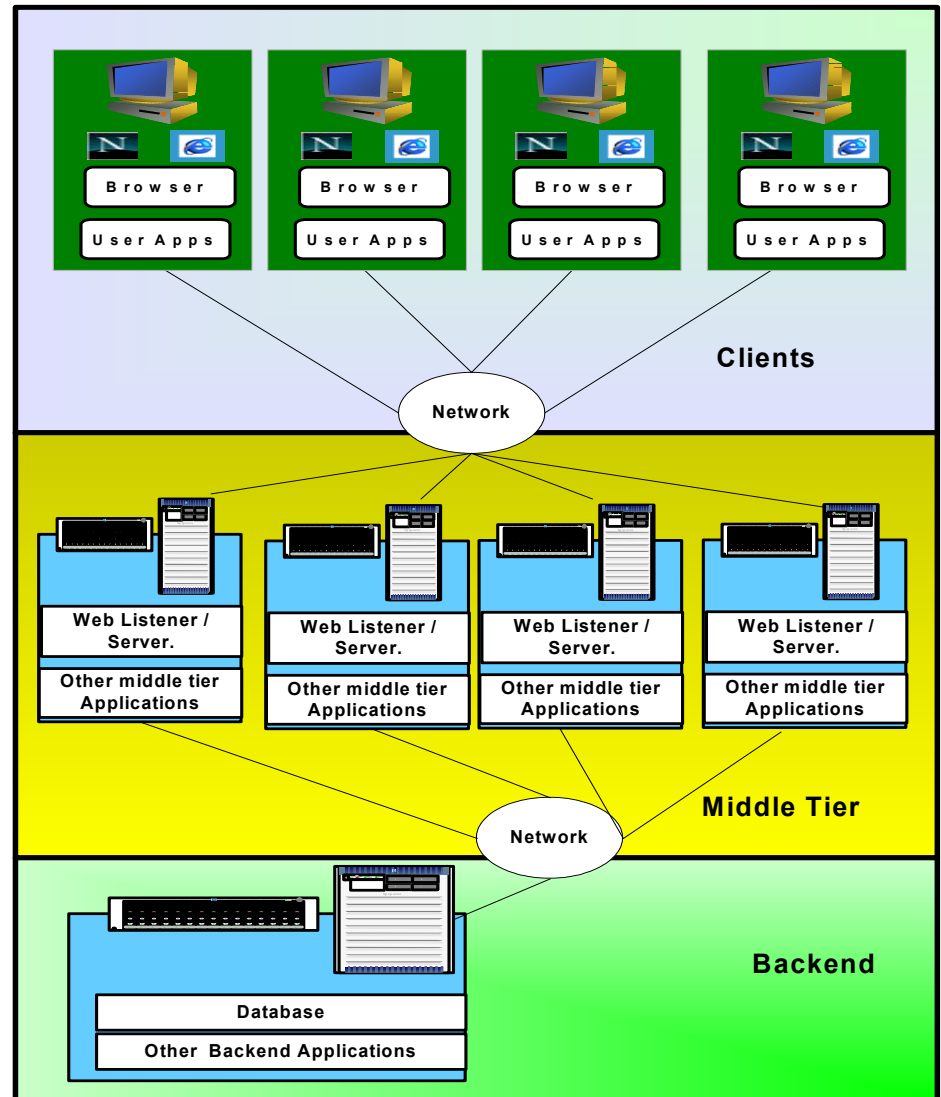
Typical single tier environment

- Everything on one system
- Probably easiest and cheapest to implement
- May not provide best performance, flexibility, manageability



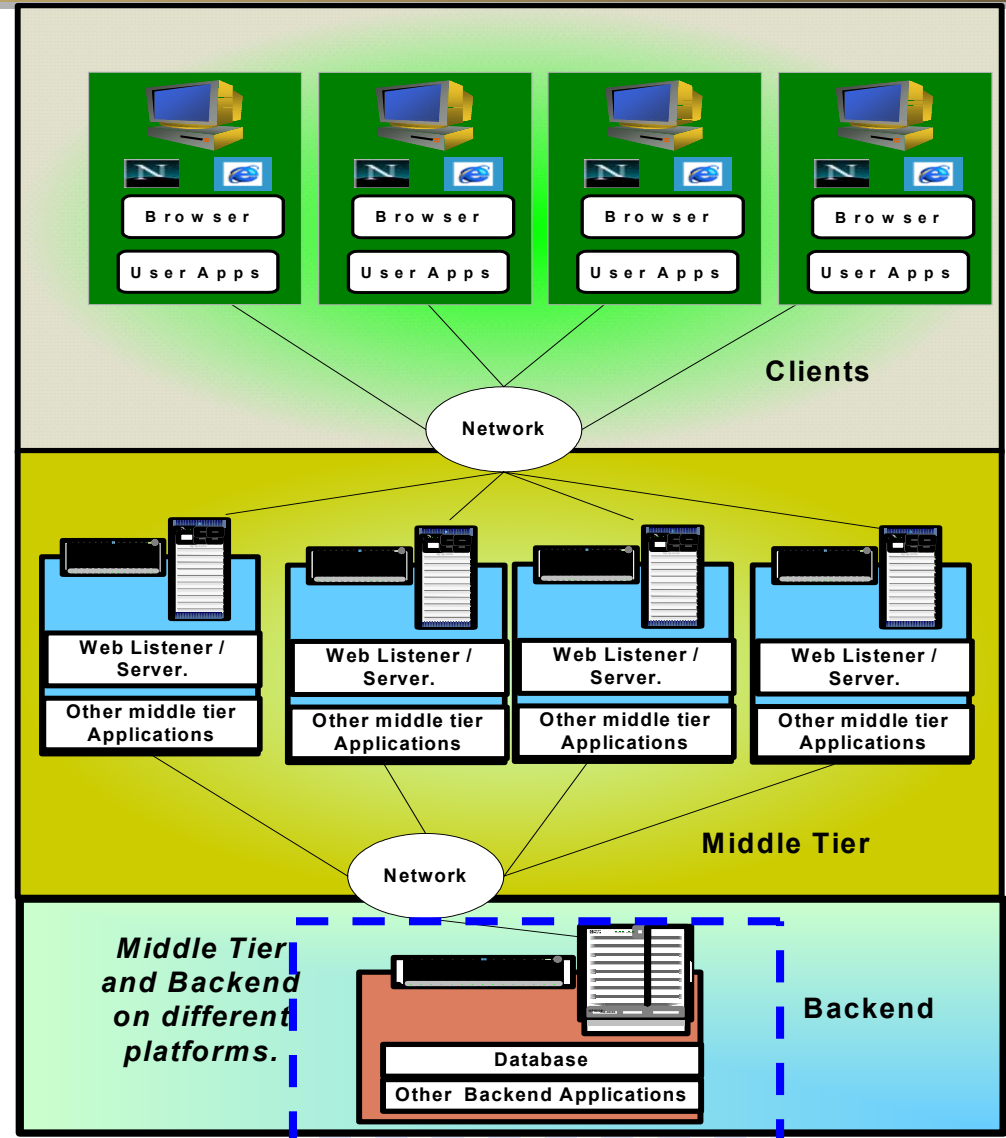
Typical multi tier environment

- Applications running on different tiers
- Complex to implement
- Better performance flexibility, manageability
- ...
- Good for high end complex applications



Typical split configuration

- Applications running on different tiers with different platforms
- Can use most appropriate platform(s) for each tier
- Complex to implement
- Enhanced performance, flexibility, manageability ...
- Good for high end applications



Agenda

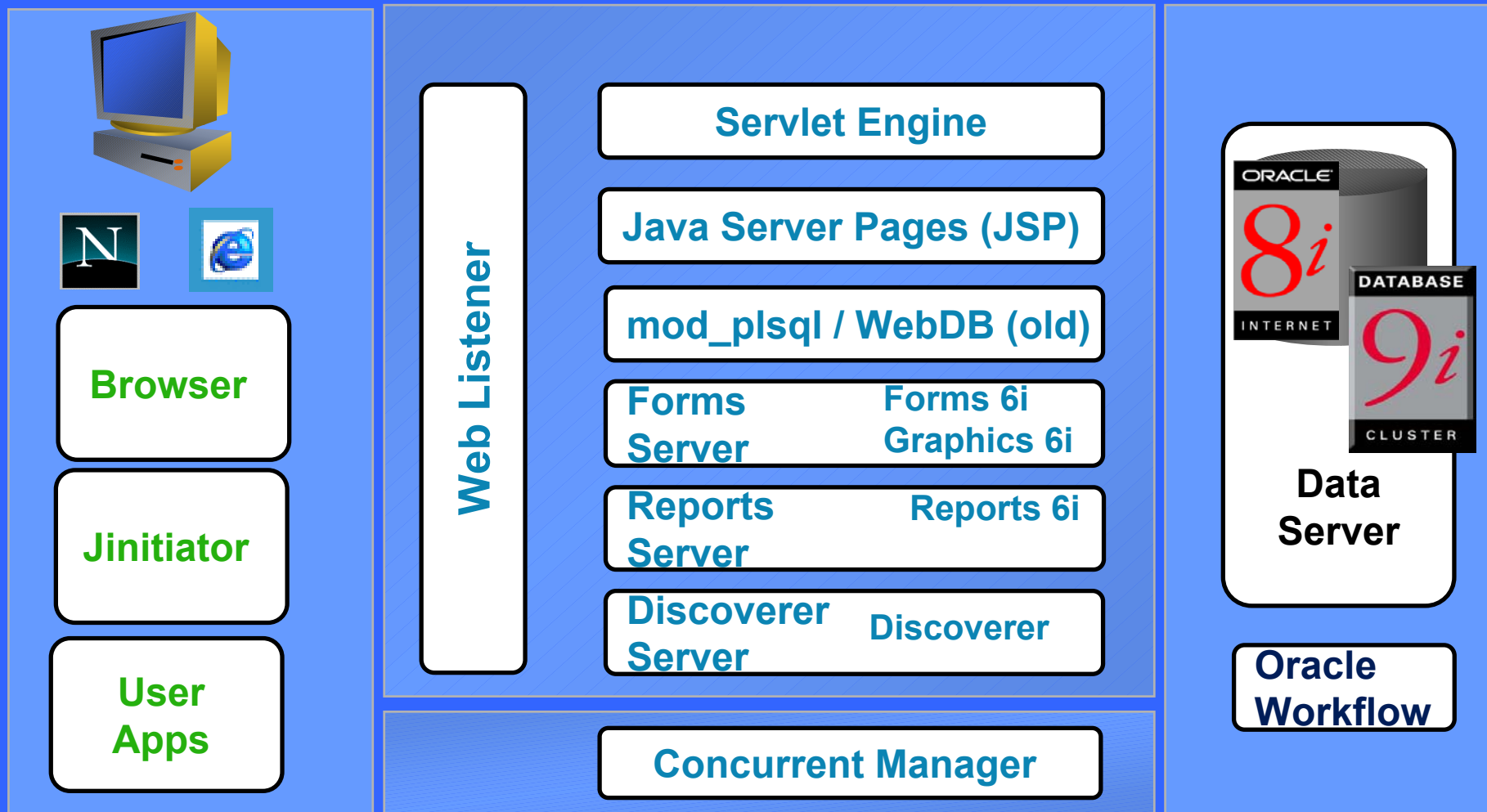
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Oracle E-Business Suite (EBS) Overview

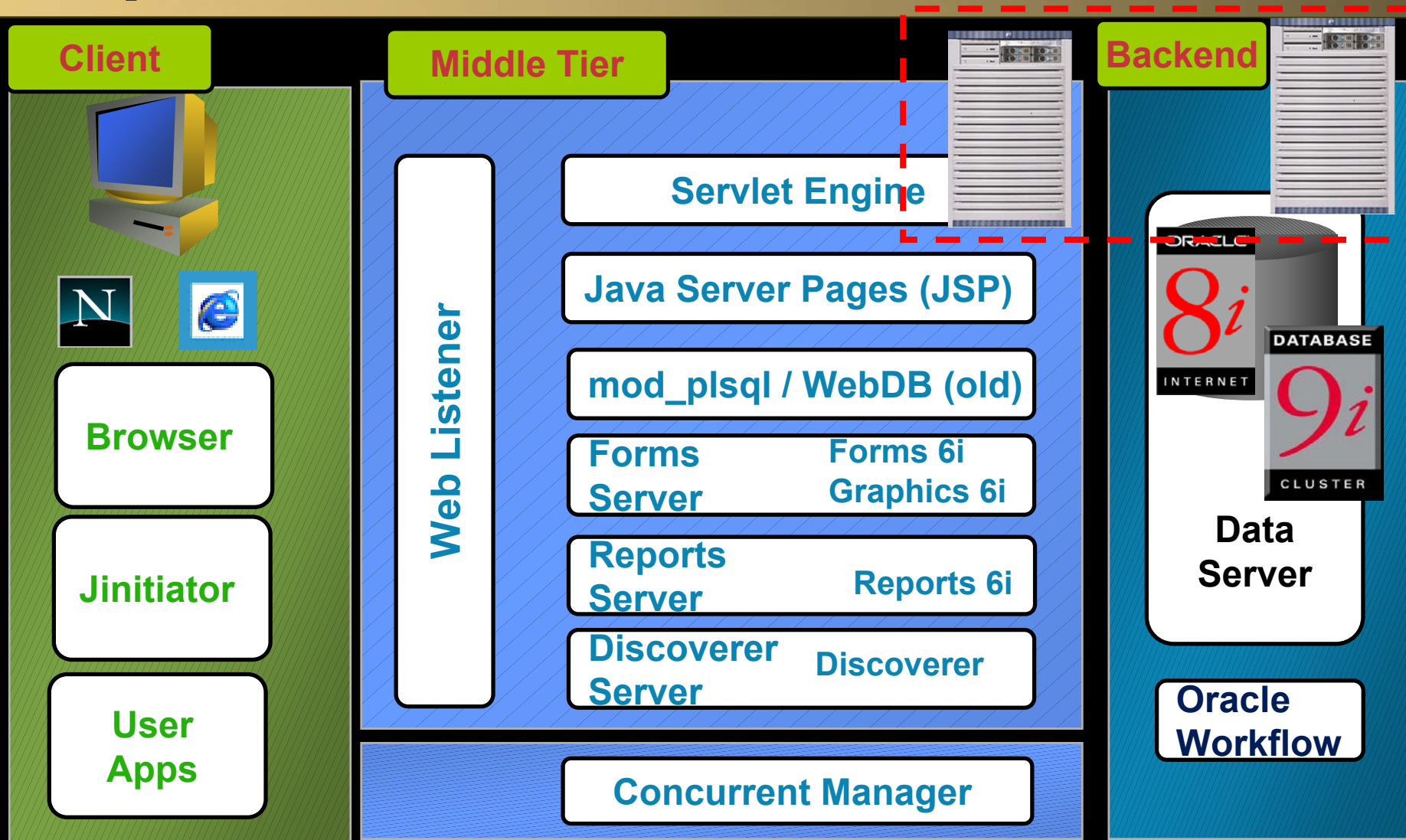


- Set of business applications
 - Enable you to manage CRM, HRM, ERP, ...
- Usually various components interact with single database
- Typically implemented in multi-tier environment

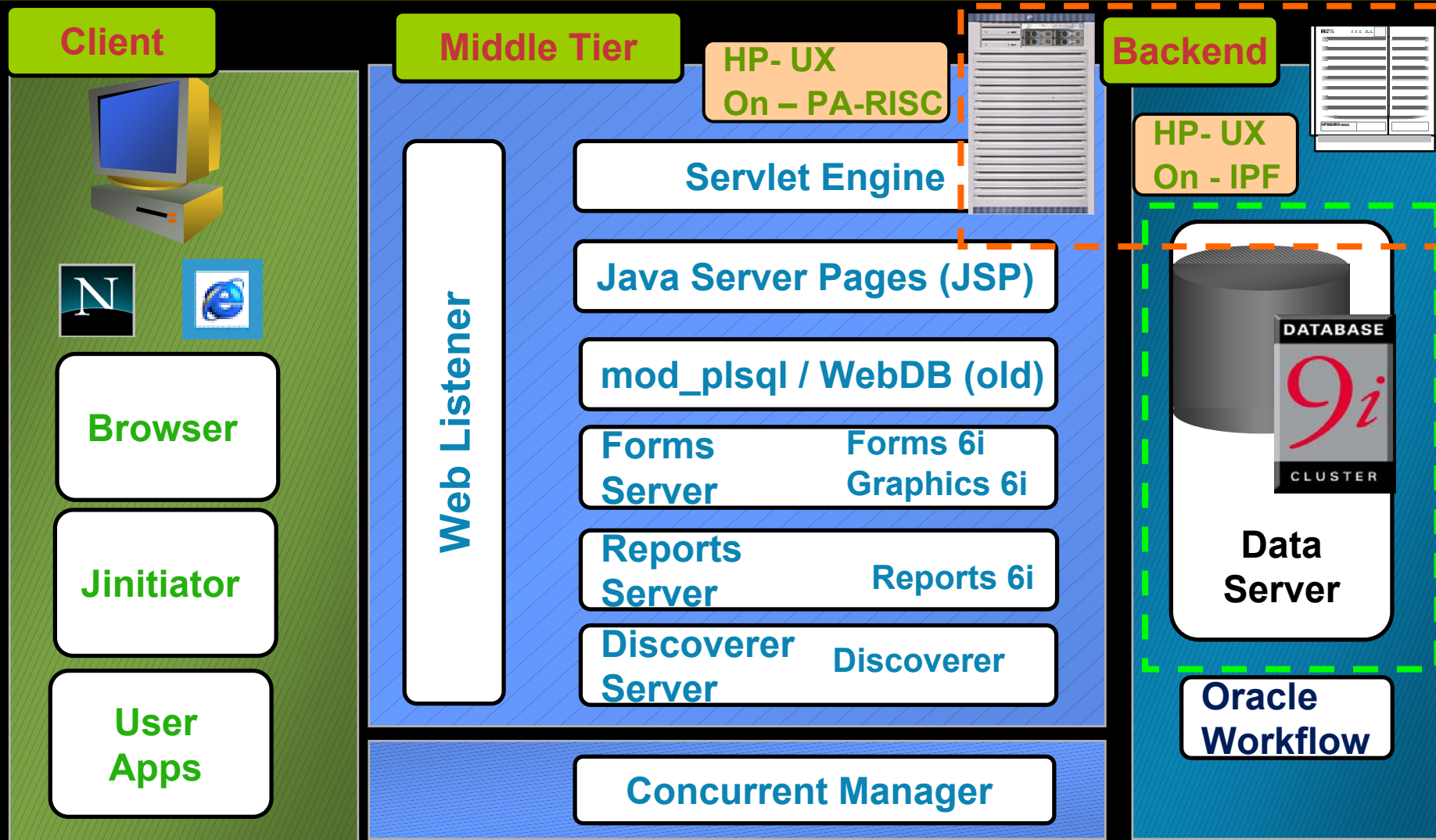
E-Business Suite Components



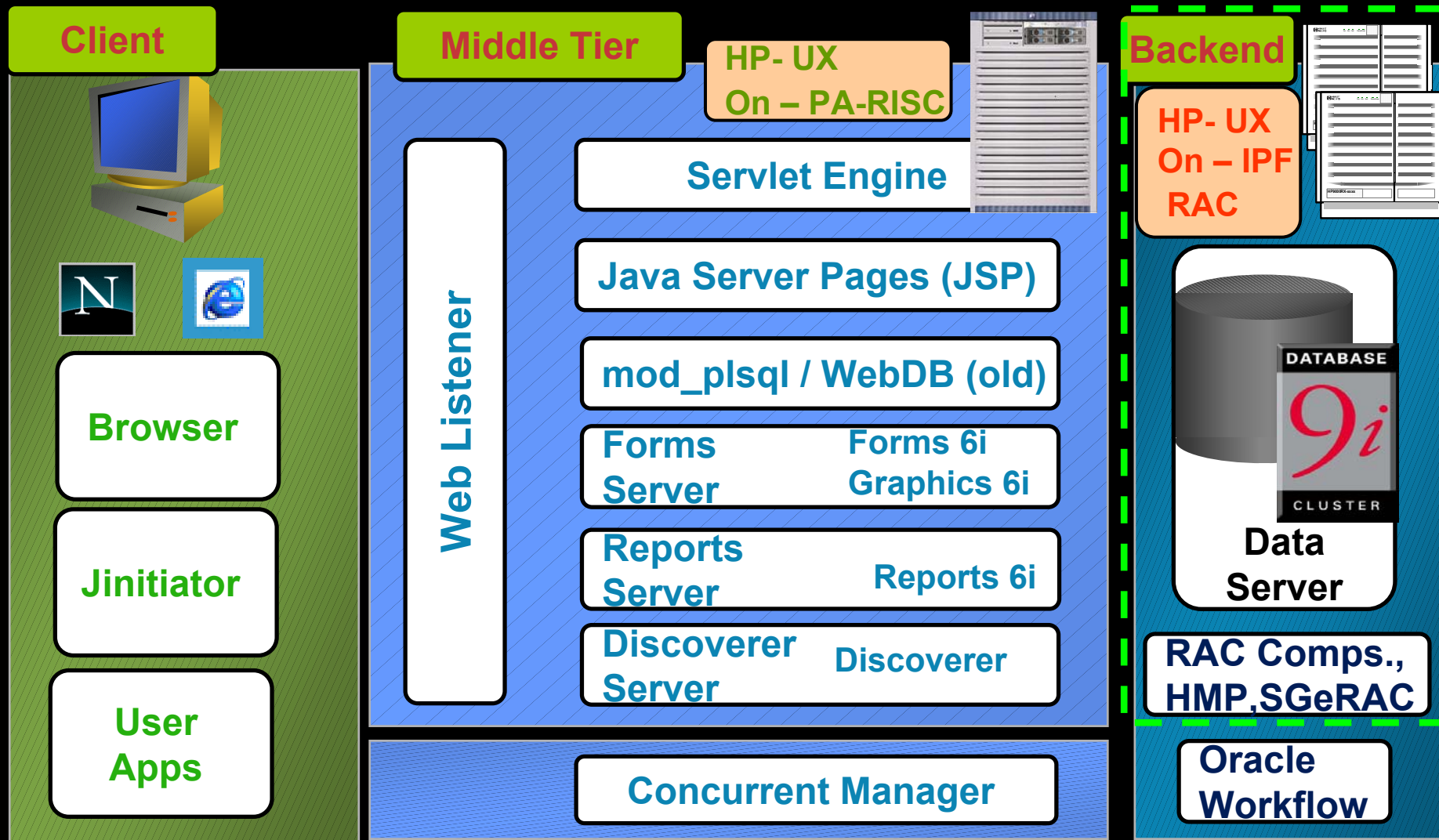
E-Business Suite Implementation



E-Business Suite in Split Config env. using IPF (Single Instance DB)



E-Business Suite in Split Config env. using IPF (RAC)



How to implement?

- Broadly two categories
 1. New Implementation
 2. Migration
 - Expansion
 - More power, capacity, flexibility

New implementation (Database tier)

- Setup
 - H/Ws (HP-UX Server(s)) for database
 - Network
 - Storage
 - Database Server(s) – IPF
 - Install HP-UX for IPF and required S/Ws
 - Configure Kernel
 - Install and configure RAC components (if needed)
- Install database S/W (Version 9i-R2)
- Configure database
 - Configuration files (.ora, listener etc.)
 - Data files, log files, table space etc.
- Create database

New implementation (Middle Tier/Client)

- Setup
 - H/Ws (HP-UX Server(s)) for apps
 - Network
 - Storage
 - Middle-tier Server(s) – PA-RISC
 - Install HP-UX for PA and required S/Ws
 - Configure Kernel
- EBS
 - Install
 - Configure EBS configuration files including tns etc.
- Client system
 - Install needed software
 - Configure appropriately
- Ready to fly

Migration

- Setup
 - H/Ws (HP-UX IPF server(s)) for database
 - Network
 - Setup Database Server(s) – IPF
 - Install HP-UX for IPF and required S/Ws
 - Configure Kernel
 - Install and configure RAC components (if needed)
- Install database S/W (Version 9i-R2)
- Configure configuration files (.ora, listener etc.)
- Migrate Database from existing HP-UX PA-RISC system to new HP-UX IPF system
- Remove old PA-RISC database server from the environment
- Move IP address / hostname to new IPF system or change tns configuration on middle tier appropriately

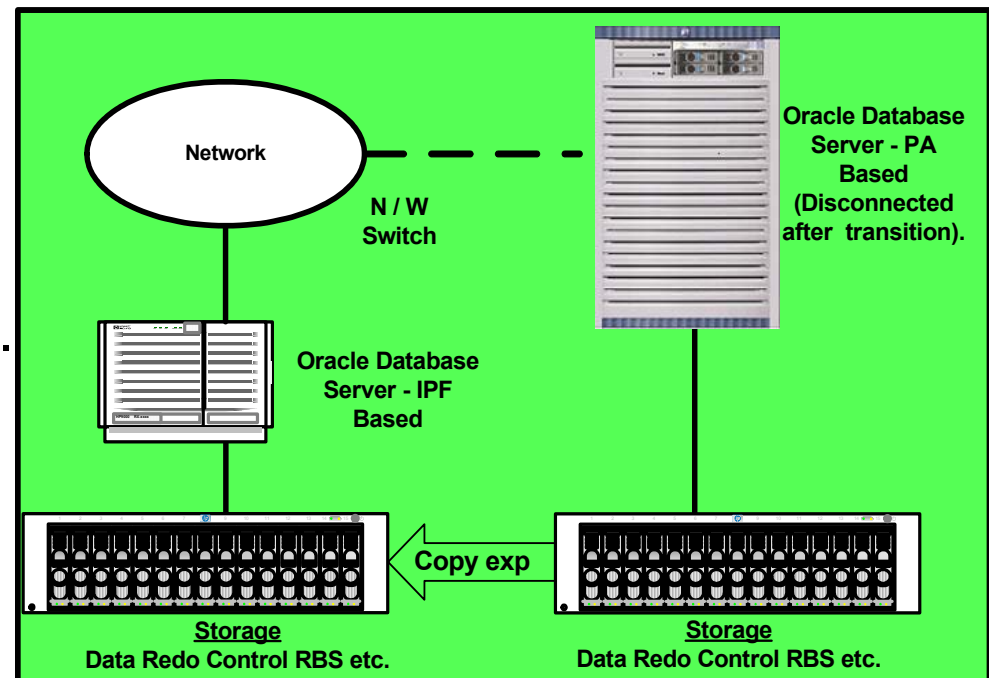
Migration

- Database migration
 - Traditional Export/Import/Upgrade
 - Copy all Oracle data (data, log, RBS, Undo, control etc.)
 - Move storage (Suggested)

- Starting out:
 - Install Oracle database (9.2) S/W on IPF system
 - Shutdown and backup database on PA-RISC system
 - Upgrade PA database to version 9.2 (if needed)

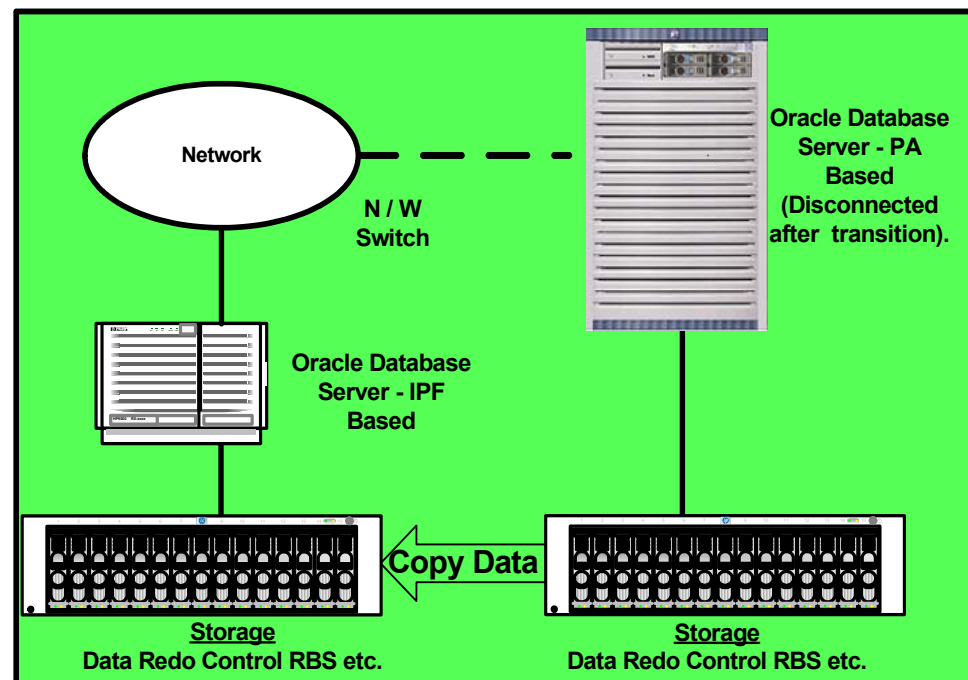
Database migration (Export/Import)

- Export the database on PA system
- Create required file systems/raw partitions on IPF system
- Copy export files from PA system to IPF system
- Import the database to IPF system
- Configure database, listener etc.
- Remove old server from the environment
- Bring IPF server into the environment
- **Need extra Storage**
- **Time consuming**



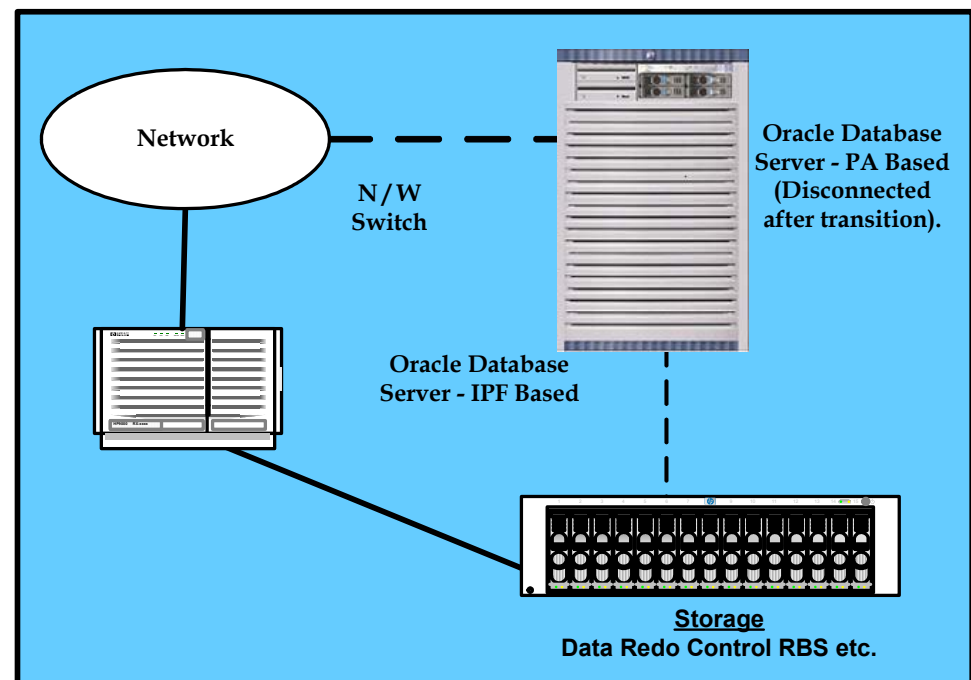
Database migration (Copy database)

- Create required file systems/raw partitions on IPF system
- Copy old database from PA system to IPF system (can use tar, cpio, rcp etc.)
- Setup & configure database , listener etc. on IPF system
- Remove old server from the environment
- Bring IPF server into the environment
- **No performance impact**
- **Need extra storage and more time**



Database migration (Move database - suggested)

- Move storage from PA system to IPF system
- Import required Volume group(s) (file systems/raw partitions) from PA system to IPF system
- Setup & configure database listener etc. on IPF system
- Remove old server from the environment
- Bring IPF server into the environment
- **No extra storage / Very quick**
- **No performance impact**



Database migration

Other options

- In case don't want to first upgrade database (8.1.7) to 9.2 on PA-RISC
 - Shutdown and backup database (8.1.7) on PA-RISC system
 - Move storage or copy database (data, log, redo control etc) from PA system to IPF system
 - Follow the the steps to upgrade 8.1.7 to 9.2
 - Configure database, listener etc. on IPF system
- For detailed database migration options and steps please refer –
 - Oracle 9.2 release notes and *Oracle 9i Database Migration Release 2 (9.2)*
 - Migration white paper

Why split configuration

- IPF gives better performance
- No need to upgrade everything at the same time
 - Can expand gradually
 - Measure, assess and grow
- You can utilize your existing H/W
 - Example: Existing PA database server can be utilized in the middle tier
- Any tier can have mix of PA and IPF in future

What has been done ?

- HP and Oracle worked together to ensure migration works smoothly:
 - http://otn.oracle.com/tech/hp/PA-RISC_to_Itanium_wp.pdf
- We have used the migration methods (Move/Copy the storage) internally for various benchmarks
- We have used same technique (migration/split config.) for our OASB benchmark
 - http://www.oracle.com/apps_benchmark/html/index.html?0325A_Report1.html
- HP and Oracle have worked together and certified “Split Configuration” architecture
- Easy upgrade from PA-RISC to IPF
- Compatibility between PA-RISC and IPF
 - Source Code
 - Binary - through dynamic code translation technology (Aries)

What has been done?

- Inbox upgrade
- Broad portfolio of ISV applications supported
- Support for various development tools

Key init ora parameters

9.2.0.2

- `cursor_space_for_time`
 - It's possible to significantly decrease Oracle's shadow memory footprint by setting this parameter to FALSE without paying a significant penalty in CPU utilization
- `hpux_sched_noage`
 - Sets the priority of the Oracle processes to a fixed value
 - Avoids priority inversion penalty
 - For example, Oracle processes that are holding a latch will not be preempted, meaning fewer latch waits and sleeps

Key init ora parameters

9.2.0.2

■ java_pool_size

- Allocates space in the SGA for services parsing requirements of Java commands
- Set it to 0 for certain applications, where Oracle RDBMS is not required to process any Java statements
 - When this parameter is set to zero, Oracle allocates only a very small amount of memory for the Java pool
 - NOTE: You should not set this parameter to zero if you are using any of the Java based modules

Key init ora parameters

9.2.0.2

- session_cached_cursors
 - Lets you specify the number of session cursors per Oracle shadow process
 - Repeated parse calls of the same SQL statement cause the session cursor for that statement to be moved into the session cursor cache
 - Because each cursor requires some SGA space, keeping this value low reduces the overall memory requirements

Key init ora parameters

9.2.0.2

- **shared_pool_size**
 - The part of the SGA that contains the data dictionary cache and library cache among many other things. This could be the largest part of the SGA.
- **shared_pool_reserved_size**
 - Reserves a portion of the shared SQL pool for large SQL statements.
 - typically set to 10% of the shared_pool_size.

Performance tuning

■ timed_statistics

- Specifies whether to collect statistics related to time
- Setting this to FALSE lets Oracle avoid the overhead of additional system calls
- If not set value of all time related statistics are set to zero
- Now Oracle uses light weight system call on HP-UX

■ Shared library permissions

- Shared libraries does not need to have write permission
- Write permission on shared lib could impact performance

Performance tuning

- Data page size of oracle binary can be adjusted to balance CPU and memory utilization
 - Larger data page size
 - more memory
 - less CPU
 - To check the data page setting
 - `$ /usr/bin/chatr $ORACLE_HOME/bin/oracle.`
 - To set the data page size (e.g. 1M)
 - `$ /usr/bin/chatr +pd 1M $ORACLE_HOME/bin/oracle`
 - [NOTE: +pd <size> is the requested virtual memory data page size .]

Performance tuning (Key kernel parameters)

- **shmmax**
 - Should be big enough to hold complete SGA
- **maxdsiz**
 - Per process memory limit
 - Applicable for 32 bit applications
 - More than 1 GB may not be of any use
- **maxssiz**
 - Should be adjusted appropriately (roughly 128 MB)
 - This and maxdsiz should be adjusted together

Performance tuning (Key kernel parameters)

- maxdsiz_64bit
 - Per process memory limit for 64 bit application
 - Need to set big enough
 - Typically 2 to 4 GB is fine.
- maxssiz_64bit
 - Per process stack size for 64 bit application
 - Typically 1 GB is fine

References

- Migration white paper and other topics
 - <http://otn.oracle.com/tech/hp/content.html>
- HP-Oracle alliance site (other white papers etc.)
 - <http://oracle.hp.com>
- Information about IPF and development tools
 - <http://www.hp.com/go/itanium>
 - <http://h21007.www2.hp.com/dspp>
- Intel - Itanium
 - http://www.intel.com/products/server/processors/server/itanium2/index.htm?iid=ipp_srvr_proc+high1_080702&

References

- Oracle 9i
 - <http://otn.oracle.com/software/products/oracle9i/content.html>
- EBS
 - <http://www.oracle.com/applications/index.html>
- EBS Benchmark (Split Configuration)
 - http://www.oracle.com/apps_benchmark/html/index.html?0318A_Report1.html

Thanks.

Rajesh Krishnaiah

(rajesh.krishnaiah@hp.com)

Umesh Pathak

(umesh.pathak@hp.com)

