

R12 Upgrade Best Practices & Tips to Reduce Downtime

Ramam Kallakuri
Managing Principal Consultant
Apps Associates

June 09, 2014



Ramam Kallakuri

- Managing Principal Consultant at Apps Associates Pvt. Ltd. Hyderabad
- 8 years of experience as an Oracle Apps/Business Intelligence/Fusion Middleware DBA
- Oracle certified professional

ORACLE®

Certified Professional

Oracle Database 10g
Administrator

ORACLE®

Certified Specialist

Oracle Exadata 11g Certified
Implementation Specialist



Performance. Growth. Excellence.

- Global provider of business and technology consulting services
- Founded in 2002 and achieved consistent growth
 - 650+ employees
 - Boston, New York, Chicago, Atlanta
 - Germany, Netherlands, India, UAE
- Recognized as one of the fastest growing private US companies by Inc. 500|5000 for four consecutive years
- Strategic Partnerships and Certifications
 - Oracle Platinum Partner
 - Oracle Specializations (EBS, BI, SOA, EM12c & Database)
 - AWS Advanced Consulting Partner
 - CMMI Level 3 Appraised
 - SSAE 16/SAS70 Type II





Agenda

- Why Upgrade
- 11i vs. R12 (Architecture Changes)
- E-Business Suite Roadmap
- Support Timelines
- Reduce Downtime – DB Considerations, App Considerations, Process Considerations
- Customer Case Study



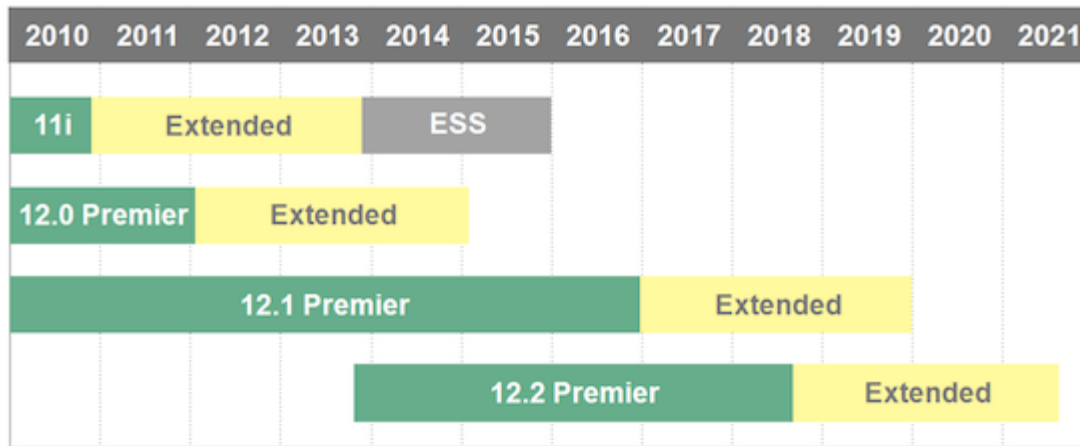
Why Upgrade

- To be on the supported version
- Enhance the existence environment with new features
- More scalability and better performance



EBS Support Timelines

E-Business Suite Support Timelines



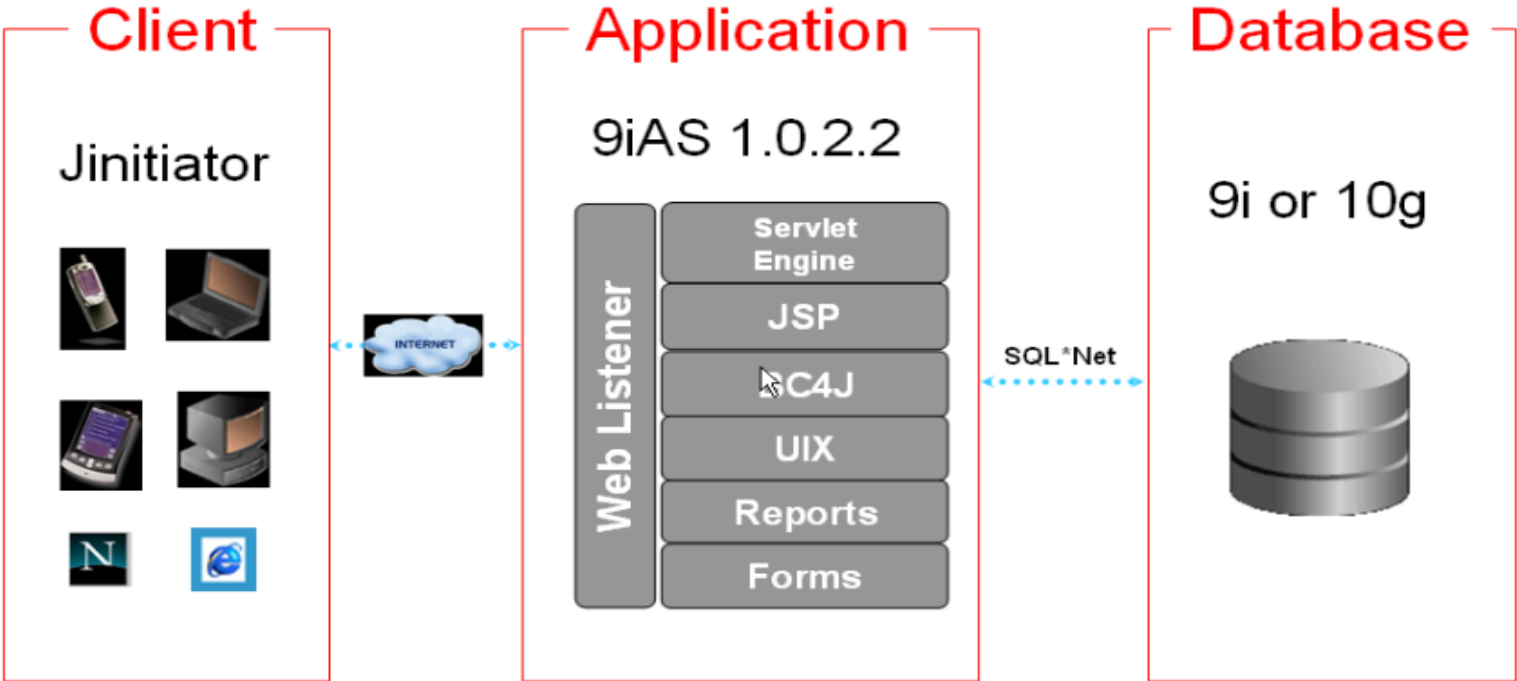
EBS 11.5.10.2 covered by an Exception to Sustaining Support to December 31, 2015

Longer EBS 12.1 Premier and Extended Support timelines

- Premier Support runs to December 31, 2016 (Originally was to end May 2014; 31 extra months added)
- Extended Support runs to December 31, 2019 (Originally was to end December 2018; one extra year added)

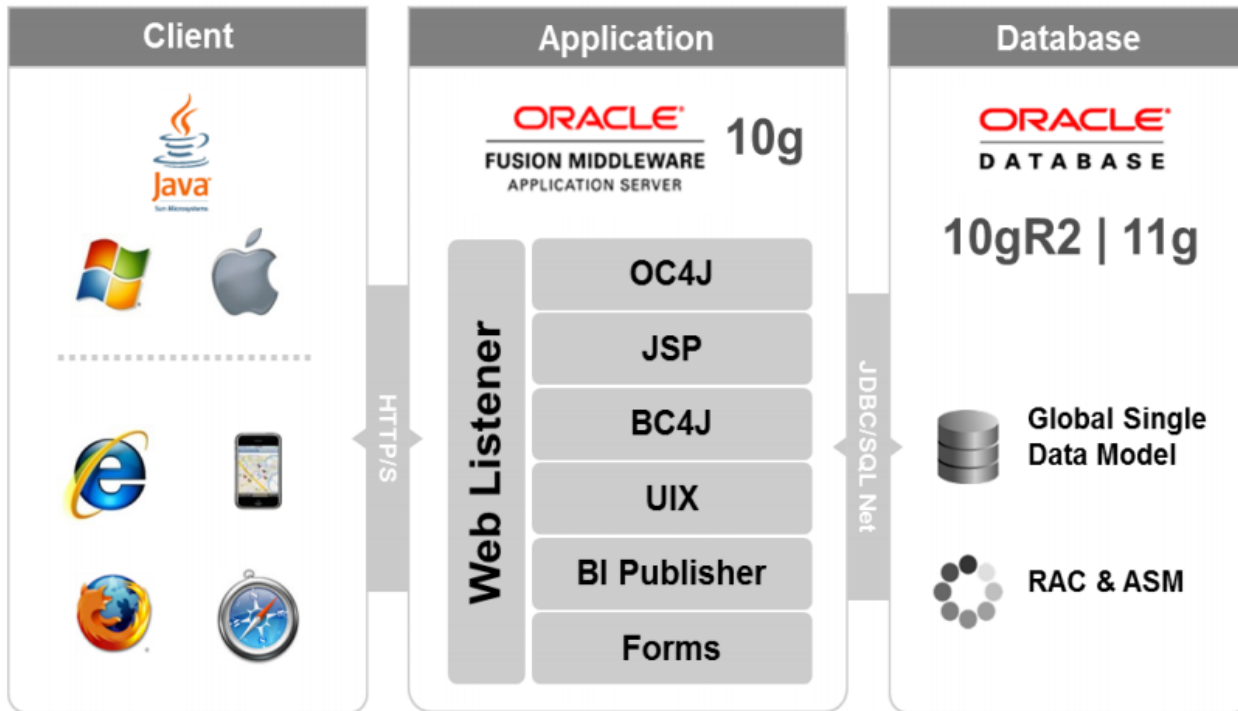


11i Architecture





R12 Architecture





R12 Technology Stack

Technology Component	Version included in 11.5.10.2	Version included in 12.1.3	Version Certified
Middle Tier (Forms/Reports)	6.0.8.25	10.1.2.3	10.1.2.3
Middle Tier Oracle Home/Java	1.0.2.2/1.4.2	10.1.3.4/1.6.0	10.1.3.5/1.7
Database	9.2.0.6	11.1.0.7	10gr2 - 10.2.0.5 11gr2 - 11.2.0.4



R12.1 Key Facts

	11i10CU2	R12.0.4 RI	R12.1 RI	12.1.3 RUP
#of Product Schemas	209	195 (25 removed,11 added)	201 (25 removed,17 added)	No changes
#file calls in DB portion of the U driver	104242	144940	156622	23408
PROD db size	31 GB	45 GB	50 GB	NA
File system size	26 GB	28 GB	28 GB	
#files shipped in RI	268359	357778	385755	NA
#of Changed + New files in DB portion of the U driver	NA	~95488 (Vs 11.5.10.2)	~104057 (Vs 11.5.10.2) ~31843 (Vs 12.0.4)	~23474 (Vs 12.1.1)



Upgrade Path





Upgrade Prerequisites

- Database must be on 10gR2 or higher
- EBS must be on 11.5.9 or higher
- 11i.AD.I.6
- ATG PF H Rollup 6 or higher



Reduce Upgrade Downtime

DB Considerations

- Have bigger redo logs
- Database in no archive log mode
- Disabling Auditing
- Disable flashback
- Disable TDE
- Enable Degree of Parallelism (DOP)
- Tune init.ora parameters
 - SGA_MAX_SIZE
 - PGA_AGGREGATE_SIZE
 - db_file_multiblock_read_count



Reduce Upgrade Downtime

DB Considerations

- Disable custom triggers and business events
- Tablespace sizing
- Allocate parallel channels for RMAN backups
- Recycle bin = off



Reduce Upgrade Downtime

Application Considerations

- Use TUMS (“The Upgrade Manual Script”) to avoid tasks not relevant to the system
- Upgrade by request
- Batch size
- AD workers
- Increase ADJREOPTS, ADJRIOPTS parameters (Ref: 557926.1)
 - Avoid errors “occurred during initialization of VM, could not reserve enough space for object heap errors”
- Distributed AD



Reduce Upgrade Downtime

Application Considerations

- Merge NLS patches
- Apply Help and NLS patches online
- Apply HR Global driver online
- Merge and apply product specific patches (post upgrade)
 - 62 patches merged as 10 patches
 - 20 hours patching time reduced to 8 hours

Product	No.	Patch Location	Driver File
Project Suite	17	/r12/staging/R12Upgrade/Product_Specific_Patches/Project_Suite/dest	u_merged.driv
Cash Management	1	/r12/staging/R12Upgrade/Product_Specific_Patches/Cash_Management/13024047	u13024047.driv
E-Business Tax	1	/r12/staging/R12Upgrade/Product_Specific_Patches/E-Business_Tax/10072294	u 10072294.driv
Fixed Assets	4	/r12/staging/R12Upgrade/Product_Specific_Patches/Fixed_Assets/dest	u_merged.driv
General Ledger	2	/r12/staging/R12Upgrade/Product_Specific_Patches/General_Ledger/dest	u_merged.driv
Payments	9	/r12/staging/R12Upgrade/Product_Specific_Patches/Payments/dest	u_merged.driv
Receivables	2	/r12/staging/R12Upgrade/Product_Specific_Patches/Receivables/dest	u_merged.driv
Payables	5	/r12/staging/R12Upgrade/Product_Specific_Patches/Payables/dest	u_merged.driv
Sub Ledger Accounting	8	/r12/staging/R12Upgrade/Product_Specific_Patches/Sub_Ledger_Accounting/dest	u_merged.driv
Human Resource	12	/r12/staging/R12Upgrade/Product_Specific_Patches/Human_Resource/dest	u_merged.driv



Reduce Upgrade Downtime

Process Considerations

- Automate the upgrade process as much as possible
 - Use Shell scripts, `adalldefaults.txt`, identify the steps we can do ahead of cutover time
- Time every activity and deal with bottlenecks
 - A baseline for upgrade execution time, analyse `adtimrpt.sql` output
- Maintain Issues & Resolution document for quick reference
- Maintain cookbook
 - Cookbook includes end to end activities along with various phases which are sequentially listed down



Reduce Upgrade Downtime

Process Considerations

- Maintain Checklist
 - Crosscheck the checklist before start any major tasks (like 12.1.1 or 12.1.3 upgrade etc.) This checklist should have SGA, PGA, job_queue_processes, parallel_max_servers, heap size etc.



Customer Case Study



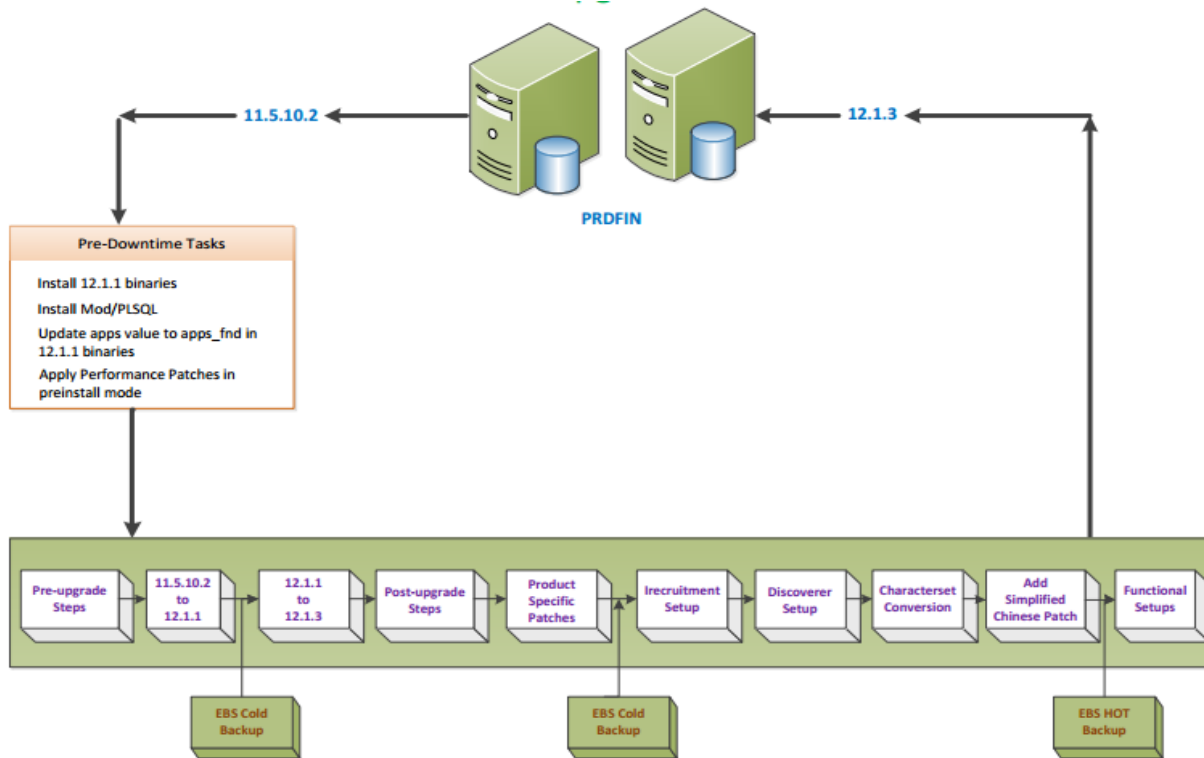
Customer Environment

	Source Environment	Target Environment
DB Version	11.2.0.3	11.2.0.3
Application Version	11.5.10.2	12.1.3
DB Size	800 GB	800 GB
NLS Languages	English	English, Simplified Chinese
Nodes	4	4
Operating System	Sun Solaris SPARC 64bit	Sun Solaris SPARC 64bit
DB Character set	WE8IS08859P1	AL32UTF8

Customer Complexities Custom Apps Schema



Process Flow





Lessons Learned

- Run at least one mock upgrade in the production hardware before the actual upgrade (if we have new hardware for R12 production)
- Degree of parallelism
 - Helped for bigger patches
- Performance patches
 - Cross check with Oracle support before implementing them
- *adalldefaults.txt (when Autoconfig run)*
 - Have this file in the common location and let all the patches pick the file from the common location



Play with SGA, PGA, batch size, adworks to find the optimized value

	E2E	1st Round	2nd Round	3rd Round	4th Round	5th Round
Patch Workers	64	64	76	76	76	76
SGA Size	10 GB	12 GB	15GB	12 GB	12GB	12GB
PGA Size	2 GB	2 GB	2 GB	4 GB	5GB	6GB
ADJREOPTS	3 GB	4 GB	4 GB	2 GB	2 GB	2 GB
ADJRIOPTS	3 GB	4 GB	4 GB	2 GB	2 GB	2 GB
Java Heap Size	3 GB	4 GB	4 GB	2 GB	2 GB	2 GB
No of JVM Core	1 each	1 each	1 each	1 each	1 each	1 each
batch size	1000	1000	1000	5000	10000	20000
SLA Data	1 Year	6 Months	6 Months	6 Months	6 Months	6 Months
Servers Configuration						
Physical Memory	64 GB	64 GB	64 GB	64 GB	96 GB	96 GB
Swap Memory	32 GB	32 GB	32 GB	32 GB	32 GB	32 GB
No of CPUs	32	32	32	32	48	48
Total 12.1.1 Upgrade Time (in hours)	46	35	34	31	25	22
12.1.1 Upgrade Patch start time		02-Apr-13 11:15 EST	Apr 09 2013 13:44:05	Apr 11 2013 19:22:16	Apr 15 2013 14:48:36	Wed Apr 17 2013 14:42:51
12.1.1 Upgrade Patch end time		03-Apr-13 23:35 EST	Apr 10 2013 22:27:00	Apr 13 2013 02:25:13	Apr 16 2013 20:52:58	Thu Apr 18 2013 14:52:55
Redo Log Size	250M	250M	250M	250M	250M	1GB
Redo Log Multiplexing	Yes	Yes	Yes	Yes	Yes	Yes
Top Jobs	Duration	Duration	Duration	Duration	Duration	Duration
glrflseg.sql	07:55:14	07:54:02	07:39:18	07:29:50	07:17:35	07:18:26
cstpostimportaad.sql	04:03:28	05:59:25	09:47:13	Skipped this job	Skipped this job	03:08:47
adsstats.sql	03:22:27	02:27:34	02:33:25	02:29:25	2:14:54	02:25:58
apostimportaad.sql	01:20:49	02:11:11	01:55:41	01:38:50	00:53:38	00:53:42
gmfpostimportaad.sql	01:09:21	01:44:53	01:49:04	01:40:32	01:02:12	00:49:11
papostimportaad.sql	01:16:30	01:35:58	03:28:46	01:22:07	00:42:31	00:42:45
arpostimportaad.sql	00:49:21	01:30:45	02:44:40	00:59:14	00:28:58	00:29:49
adobjcmp.sql	01:16:46	01:05:39	01:11:05	01:03:48	00:54:34	00:51:31
pnupgsia.sql	01:41:13	00:12:49	00:13:17	00:15:51	00:14:54	00:21:12
ar120gir.sql	01:29:09	00:29:25	00:28:47	00:15:19	00:20:32	00:20:25



Upgrade to EBS 12.1.3 vs 12.2.2/3

- You should choose EBS 12.1.3
 - Prefer to target a release on which Oracle has thousands of live customers
 - Would like to stay on 12.1 for 3-5 years before upgrading to 12.2 (Premier Support till mid 2018)
 - Are you upgrading from a release prior to 11.5.10.2
- You should choose EBS 12.2.x
 - You need the high availability provided by Online Patching
 - You want the functional enhancements that are in 12.2
 - You prefer to invest in a single project to upgrade directly to 12.2
 - You want to have hundreds of New Features comes with 12.2, Weblogic Server, Streamlined Installation





Connect with Us

Web: www.appsassociates.com

Email: ramam.kallakuri@appsassociates.com

YouTube: www.youtube.com/user/AppsAssociates

LinkedIn: www.us.linkedin.com/company/Apps-Associates

Twitter: [@AppsAssociates](https://twitter.com/AppsAssociates)

Facebook: www.facebook.com/AppsAssociatesGlobal

Google+: www.plus.google.com/+AppsAssociatesGlobal/





Thank You!



ADVANCED CONSULTING PARTNER

North America

- ▶ Boston (Headquarters)
- ▶ New York
- ▶ Atlanta
- ▶ Chicago

Asia

- ▶ India
Global Development Center

Europe

- ▶ Germany
- ▶ Netherlands

Middle East

- ▶ Oman
- ▶ Dubai

www.appsassociates.com