



Case Study for

ATG Upgrade & Migration

from 10.1.2 to 11.2

Agenda

- 1 About Zenni Optical
- 2 Problems and Pain Points
- 3 Approach to upgrade
- 4 Data center Migration
- 5 Results of Upgrade & Migration
- 6 Summary
- 7 About WeProlance

About Zenni Optical

- Zenni Optical is a private online only prescription eyewear retailer and industry leader by online volume
- Their eCommerce website has been on ATG 10.1 and Endeca 3.1.2 since 2013, ATG & Endeca were integrated with custom code; shopping cart was highly customized as well to meet the business needs
- BCC was also customized and other custom applications were developed based on ATG to serve the backend merchandising requirements
- The owner also wanted to move data center at the same time

Pain points with ATG 10.1.2 version

- Oracle discontinued premier support for all ATG 10.x versions as of Dec 31st, 2015
- Multiple Business users editing content in Endeca XM at the same time is an issue
- Lack of partial indexing support in previous implementation impacted business operations
- PayPal was discontinuing support for TLS 1.0
- Rebranding initiative was lined up for year 2016 and version 10.1.2 OOTB rest framework had quite a few limitations just in case we want to go with Headless architecture

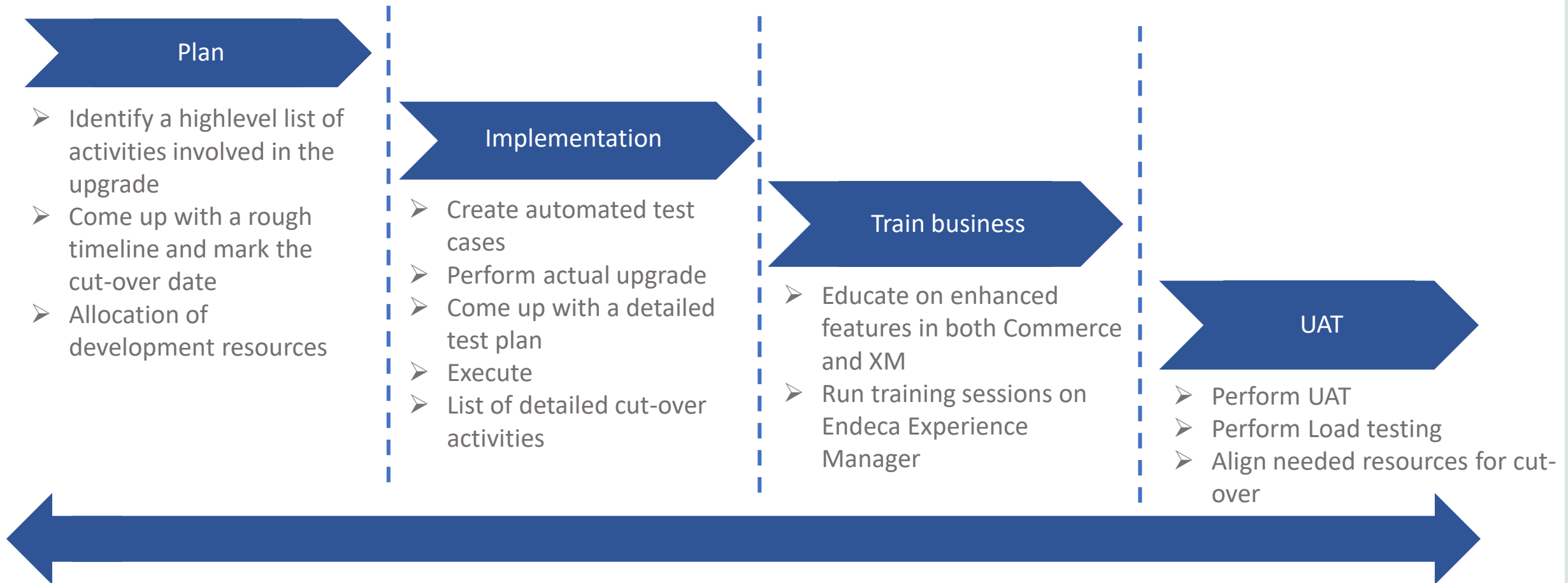
Challenges for IT team

- Small support/development team, how do we manage support and upgrade simultaneously?
- How to ensure minimum impact with ongoing business enhancement requests?
- How to ensure minimum disruption for the business and customers on the day of cut-over?
- How to provision infrastructure to deploy upgraded version in all environments(DEV, TEST and PROD)?
- Another business decision to migrate to a different data center in the mix added additional complexity

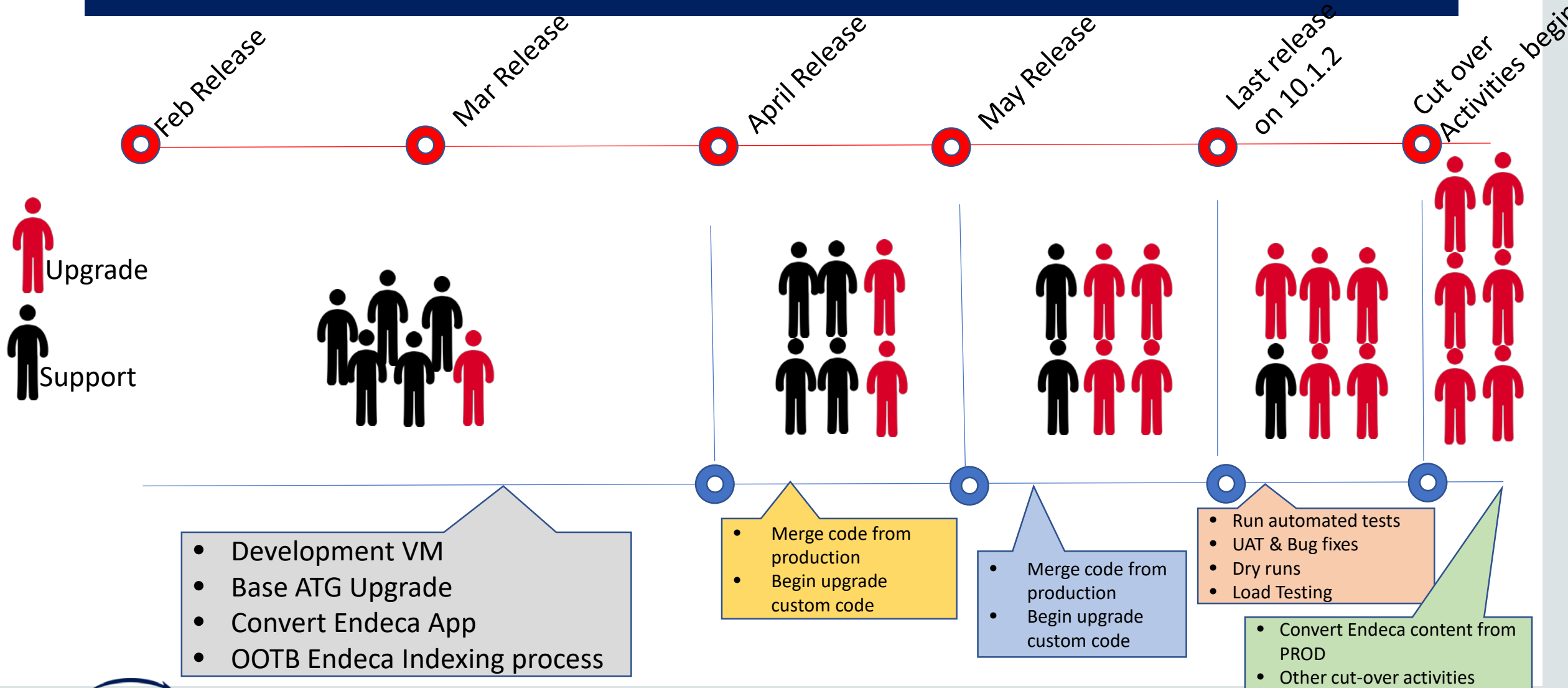
Key guiding principles

- Upgrade first base ATG and Endeca Application
- Split current development team into 2 tracks
- Create Automated test cases for regression testing
- Set to meet twice a month for first couple of months and then switch to weekly meeting.
- Prepare environments for deploying upgraded version as early as possible
- Train business team on changes in BCC and XM as early as possible.
- Do not implement new features as part of this upgrade

Upgrade process



Teams & Tasks



Migration Challenges

- Business couldn't wait to handle two projects separately and the cost will be significantly higher
- Two data centers were located in different states, managed by different hosting companies
- Had 3.5+ TB of user media files to be transferred over the public internet, or need ways to physically transfer secured storage device
- User media files were constantly added
- Oracle database files were over 750GB
- Maximum service window of 3 hours to minimize business impact

Actual Execution

- Exercised the migration + upgrade more than 3 times to have more accurate estimates on time duration and minimize the risks
- Used the plan of 2 hours core maintenance window to give us one extra hour of contingency
- Started a week early and used multi-thread rsync to transfer multi Terabytes of user media files
- Used Oracle's rman to backup/restore database prior to the migration and only needed to transfer and catch up archive logs during the maintenance window
- Had very detailed plan: each small task has an owner and reviewer

Backend Start 2 Days Early

Steps	Pre-Req	Items	Category	Start PDT	Start Beijing	Est. Minutes	Owner	Reviewer	Notes
		Readiness Check	Communication	8/8/16 17:50	8/9/16 8:50	10	Henry Chen	Yaozhong Chen	
1.1		Confirm & force all BCC projects to complete	ATG - TZG	8/8/16 17:00	8/9/16 8:00	60	Jacky	Cui Jia	Jacky can start this even on 8/5
1.2		Disable DB log archiving	DB - TZG	8/8/16 17:50	8/9/16 8:50	N/A	TZG	Hailong	TZG ticket to create on 8/4
2		Stop Applications	TZG	8/8/16 17:50	8/9/16 8:50	15	Cui Jia	Yaozhong Chen	
2.1		Stop Preview/Staging	ATG - TZG	8/8/16 18:00	8/9/16 9:00	5	Cui Jia	Hailong	
2.2	1.1	Stop BCC	ATG - TZG	8/8/16 18:00	8/9/16 9:00	5	Cui Jia	Hailong	
2.3		Lock XM (Lock users so no edit to XM data)	Endeca - TZG	8/8/16 18:00	8/9/16 9:00	5	Cui Jia	Jacky	
3.1	2.1	Export PUB schema, ATG CA versionFileStore files and necessary tables in other schema	DB - TZG	8/8/16 18:30	8/9/16 9:30	5	Hailong	Cui Jia	For running ATG11 upgrade script later, Cui Jia has the export script
3.1	2.2	DB backup	DB - TZG	8/8/16 18:30	8/9/16 9:30	60	Hailong	Cui Jia	
3.2	3.1	Copy PUB export file to HKG	TZG -> HKG	8/8/16 19:30	8/9/16 10:30	60	Cui Jia	Hailong	
3.3	3.1	Copy DB bkup files	TZG -> IAD3	8/8/16 19:30	8/9/16 10:30	120	Cui Jia	Hailong	
3.4	3.3	Export CORE, Auto PD	DB - IAD3	8/8/16 18:30	8/9/16 9:30	30	Hailong	Cui Jia	The data should be from earlier testing, no live customer or order data, to be used for 3.10
3.5	3.4	Import PUB to UAT DB	DB - HKG	8/8/16 20:30	8/9/16 11:30	15	Cui Jia	Hailong	
3.6	3.5	Run upgrade scripts against PUB at HKG	DB - HKG	8/8/16 20:45	8/9/16 11:45	120	Cui Jia	Hailong	
3.7	3.6	Export PUB schema, ATG CA versionFileStore files and necessary tables in other schema	DB - HKG	8/8/16 22:45	8/9/16 13:45	30	Cui Jia	Hailong	
3.8	3.7	Copy upgraded PUB export file from HKG to IAD3	HKG -> IAD3	8/8/16 23:15	8/9/16 14:15	30	Cui Jia	Sham	
3.9	3.8	Import the above schema into RAC (no restore from rman backup)	DB - IAD3	8/8/16 23:45	8/9/16 14:45	30	Hailong	Cui Jia	Do NOT delete the backup file, we need to use it later (The PUB export was done on HKG DB)
3.10	3.9	Prepare CORE without user data	DB - IAD3	8/8/16 18:00	8/9/16 9:00	240	Cui Jia	Hailong	Make sure DMS tables are empty
4	5.4	Need sync XM configurations	HKG -> IAD3	8/8/16 18:00	8/9/16 9:00		Cui Jia	Nicky	Copy Endeca XM pages from HKG to IAD3
5.2		Start both dgraph processes	Endeca - IAD3	8/8/16 18:00	8/9/16 9:00	15	Cui Jia	Nicky	
5.3	5.2	Start Experience Manager	Endeca - IAD3	8/8/16 18:15	8/9/16 9:15	15	Cui Jia	Nicky	
5.4	5.3	Verify XM deploy & promote work	IAD3	8/8/16 18:30	8/9/16 9:30	30	Jacky	Nicky	
6.1	4	Re-config pages on XM	Endeca - IAD3	8/8/16 19:00	8/9/16 10:00	120	Jacky	Nicky	Bulk should have been done on HKG UAT, and copy over to IAD3
7.1		Start lock, all stores	ATG - IAD3	8/8/16 19:00	8/9/16 10:00	120	Cui Jia	Xie Dan	Verifying liveconfig layer
7.2	7.1	Start ful	ATG - IAD3	8/8/16 21:00	8/9/16 12:00	30	Cui Jia	Xie Dan	Need to make sure no customer emails are sent
7.3	7.1	Start BCC, verify deployment topology	ATG - IAD3	8/8/16 21:30	8/9/16 12:30	60	Cui Jia	Alvin	
8.1	7.3	BCC Full deployment	ATG - IAD3	8/8/16 22:30	8/9/16 13:30	120	Cui Jia	Alvin	
9.1	8.1	Test all scenarios (no Paypal or Amazon Pay?)	ATG - IAD3	8/9/16 0:30	8/9/16 15:30	120	Xiangkui	Jacky	New order probably error out when sending to ACP, only test one credit card order
Below to be executed on both days									
X		ATG Prep	ATG - TZG		1/0/00 15:00				
X.1		ACI Logs processed up to date	ATG - TZG		1/0/00 15:00		Zhou Peng	Sham	
X.2		DMS order messages check	ATG - TZG		1/0/00 15:00		Xie Dan	Sham	
X.3		DMS non-order message cleanup	ATG - TZG		1/0/00 15:00		Xie Dan	Sham	
Y		DB Prep	DB - both		1/0/00 15:00		Hailong	Cui Jia	
Y.1		DB logs copy	TZG -> IAD3		1/0/00 15:00		Hailong	Cui Jia	
Z		Verify Maintenance Readiness & Content			1/0/00 15:00				
Z.1		Verify emergency alert is set with correct content		8/7/16 18:00	8/8/16 9:00		Jacky	Vince & Jaye	The alert message needs to show correct down time of the website
Z.2		Verify maintenance page is ready with correct content		8/7/16 18:00	8/8/16 9:00		Tang Zhe	Vince & Jaye	The maintenance page needs to have ETA
Z.3		Verify maintenance page is set on all 3 areas		8/7/16 18:00	8/8/16 9:00		Cui Jia	Xiangkui	TZG webserver, IAD3 webserver, Akamai net storage; page contain server ID
Pending Issues & Questions									
		Is LB ready for dgraphs?							
		BI log clean up							

3- hour Maintenance Window

ID	Pre-Req1	Pre-Req2	Task	Category	Planned Start PDT	Planned Finish PDT	Planned Star Beijing	Planned End Beijing	Planned Duration	Owner	Reviewer	Notes
a			ATG Prep	ATG - TZG								
22.5.a			Stop all IAD3 stores, ful and locks	ATG - IAD3	8/10/16 20:00	8/10/16 21:00	8/11/16 11:00	8/11/16 12:00	60	Cui Jia	Raymond	
22.6.a			Stop BCC from IAD3	ATG - IAD3	8/10/16 20:00	8/10/16 21:00	8/11/16 11:00	8/11/16 12:00	60	Cui Jia	Raymond	
22.7.a			Stop LMS batch job	Danyang	8/10/16 20:00	8/10/16 21:00	8/11/16 11:00	8/11/16 12:00	60	Chong	Alvin	Stop the cron job to stop sending order updates to Fulfillment
21.1.a			Keep both Mdex/dgraph running	Endeca - IAD3								
22.2.a			ACI Logs processed up to date	ATG - TZG	8/10/16 21:00	8/10/16 22:00	8/11/16 12:00	8/11/16 13:00	60	Cui Jia	Zhou Peng	Assuming this was checked one day earlier
22.3.a			DMS order messages check	ATG - TZG	8/10/16 22:00	8/10/16 23:00	8/11/16 13:00	8/11/16 14:00	30	Cui Jia	Xie Dan	Assuming this was checked one day earlier
b			DMS non-order message cleanup	ATG - TZG	8/10/16 22:30	8/10/16 23:00	8/11/16 13:30	8/11/16 14:00	30	Cui Jia	Xie Dan	
22.11.b			DB Prep	DB - both								
22.12.b			DB logs copy	TZG -> IAD3	8/10/16 22:20	8/10/16 22:50	8/11/16 13:20	8/11/16 13:50	30	Cui Jia	Hailong	
22.13.b			Export schemas (PUB, CAT, STG, etc.)	DB - IAD3	8/10/16 21:00	8/10/16 21:30	8/11/16 12:00	8/11/16 12:30	30	Hailong	Cui Jia	Prepare for later import
22.14.b			Recreate the RAC from rman bkup	DB - IAD3	8/10/16 21:30	8/10/16 22:00	8/11/16 12:30	8/11/16 13:00	30	Hailong	Cui Jia	
			Log catch up	DB - IAD3	8/10/16 22:50	8/10/16 23:00	8/11/16 13:50	8/11/16 14:00	10	Hailong	Cui Jia	
c			Confirm Alert Message + Maintenance	Website	8/10/16 20:00	8/10/16 23:15	8/11/16 11:00	8/11/16 14:15	10	Jacky	Xiangkui	Make sure emergency alert is showing up
8.1			Confirm Maintenance is up at IAD3	Website-IAD3	8/10/16 20:00	8/10/16 20:15	8/11/16 11:00	8/11/16 11:15	15	Cui Jia	Xiangkui	Make sure IAD3 all web servers are up and showing maintenance page
8.2			Check & Confirm Alert Message	Website-TZG	8/10/16 23:00	8/10/16 23:15	8/11/16 14:00	8/11/16 14:15	15	Jacky	Xiangkui	Make sure emergency alert is showing up
d			Start monitoring web server logs									
23.30.d			www access & error log on 796790 & 796793	Web - IAD3	8/10/16 22:45		8/11/16 13:45			Tang Zhe		172.24.16.149/150
23.31.d			static access & error log on 796790 & 796793	Web - IAD3	8/10/16 22:45		8/11/16 13:45			Yun Wei		172.24.16.149/150
23.32.d			www & static/access & error on 796794	Web - IAD3	8/10/16 22:45		8/11/16 13:45			Zhanwen		172.24.16.151
A.0			Readiness Check	Communication	8/10/16 23:45	8/11/16 0:00	8/11/16 14:45	8/11/16 15:00	15	Yaozhong	Jacky	Make sure all of the above is done
A	A.0		Start Maintenance	Adjust here =>	8/11/16 0:05							
A.1.1	A		TZG 3 web servers switch to maintenance	Web - TZG	8/11/16 0:05	8/11/16 0:15	8/11/16 15:05	8/11/16 15:15	10	Cui Jia	Team	Team confirms maintenance page is up, need to identify all 3 servers
A.1.2	A.1.1		Stop all page serving JVMs - ATG	ATG - TZG	8/11/16 0:15	8/11/16 0:20	8/11/16 15:15	8/11/16 15:20	5	Xie Dan	Cui Jia	Reviewer confirms no JVM process running
A.1.3	A.1.1		Stop all page serving JVMs - AutoPD/FF	WLS - TZG	8/11/16 0:15	8/11/16 0:20	8/11/16 15:15	8/11/16 15:20	5	Zhou Peng	Cui Jia	Reviewer confirms no JVM process running
B.1.4	A.1.1		DNS change for origin-www and origin-static	DNS	8/11/16 0:15	8/11/16 0:25	8/11/16 15:15	8/11/16 15:25	10	Yaozhong	Zhanwen	add failover IP
A.1.5	A.1.2		Confirm data loaders catch up all ACI logs	ATG - TZG	8/11/16 0:20	8/11/16 0:35	8/11/16 15:20	8/11/16 15:35	15	Zhou Peng	Cui Jia	
A.1.6	A.1.2		Confirm DMS table no order messages	ATG - TZG	8/11/16 0:20	8/11/16 0:35	8/11/16 15:20	8/11/16 15:35	15	Cui Jia	Xie Dan	Delete AppD messages if extra msg is still there
A.1.7	A.1.5	A.1.6	Stop fulfillment	ATG - TZG	8/11/16 0:35	8/11/16 0:45	8/11/16 15:35	8/11/16 15:45	10	Cui Jia	Hailong	Try to stop fulfillment without kill first
C.1.8	A.1.7		Check connection & close BI database	DB - TZG	8/11/16 0:45	8/11/16 0:50	8/11/16 15:45	8/11/16 15:50	5	Hailong	Cui Jia	BI Database has no rman backup, migrated by DB dump
C.1.9	A.1.7		Check sessions & close RAC nodes	DB - TZG	8/11/16 0:50	8/11/16 0:55	8/11/16 15:50	8/11/16 15:55	5	Hailong	Cui Jia	
C.1.10	C.1.9		Backup, copy and restore DB logs for catchup	TZG -> IAD3	8/11/16 0:55	8/11/16 1:10	8/11/16 15:55	8/11/16 16:10	15	Cui Jia	Hailong	SCP should work, only logs since previous copy
C.2.11	22.14.b	C.1.10	Catchup DB logs	DB - IAD3	8/11/16 1:10	8/11/16 1:15	8/11/16 16:10	8/11/16 16:15	5	Hailong	Cui Jia	
C.2.12	C.1.8		Zip & Copy BI backup file	TZG -> IAD3	8/11/16 1:10	8/11/16 2:10	8/11/16 16:10	8/11/16 17:10	60	Cui Jia	Hailong	This is low priority, can be done later
C.2.13	C.2.11		Open RAC DB	DB - IAD3	8/11/16 1:15	8/11/16 1:20	8/11/16 16:15	8/11/16 16:20	5	Hailong	Cui Jia	
C.2.14	C.2.13	22.12.b	Import BCC/CA schemas (PUB, CAT, STG, etc.)	DB - IAD3	8/11/16 1:20	8/11/16 1:30	8/11/16 16:20	8/11/16 16:30	10	Hailong	Cui Jia	
D.2.15	C.2.13		Run upgrade SQL against CORE	DB - IAD3	8/11/16 1:30	8/11/16 1:35	8/11/16 16:30	8/11/16 16:35	5	Cui Jia	Hailong	
D.2.15.1	D.2.15		Run SQL against CORE to adjust server IDs	DB - IAD3	8/11/16 1:30	8/11/16 1:35	8/11/16 16:30	8/11/16 16:35	5	Cui Jia	Hailong	
D.2.15.2	D.2.15		Run SQL for 16.8 release	DB - IAD3	8/11/16 1:35	8/11/16 1:40	8/11/16 16:35	8/11/16 16:40	5	Cui Jia	Hailong	
D.2.21	C.2.14		Start lock servers	ATG - IAD3	8/11/16 1:40	8/11/16 1:45	8/11/16 16:40	8/11/16 16:45	5	Cui Jia	Zhou Peng	ACP to new address, Bronto to live, Email server to send grid live
D.2.22	D.2.21		Start store1 on 796795-IAD3	ATG - IAD3	8/11/16 1:45	8/11/16 2:00	8/11/16 16:45	8/11/16 17:00	15	Cui Jia	Xie Dan	Start up and monitor logs
D.2.23	D.2.22		Verify store1 start up configuration	ATG - IAD3	8/11/16 1:55	8/11/16 2:05	8/11/16 16:55	8/11/16 17:05	10	Cui Jia	Xie Dan	ID-Gen seed, order & profile repository can read/write
D.2.24	D.2.21	D.2.22	Start store2/3/4 on 796795-IAD3	ATG - IAD3	8/11/16 2:00	8/11/16 2:05	8/11/16 17:00	8/11/16 17:05	5	Cui Jia	Xie Dan	Start up and monitor logs
D.2.25	D.2.21	D.2.22	Start store1/2/3/4 on 796798-IAD3	ATG - IAD3	8/11/16 2:00	8/11/16 2:05	8/11/16 17:00	8/11/16 17:05	5	Cui Jia	Raymond	Start up and monitor logs
D.2.26	D.2.21	D.2.22	Start store all (1/2/3/4) on 796799-IAD3	ATG - IAD3	8/11/16 2:00	8/11/16 2:05	8/11/16 17:00	8/11/16 17:05	5	Cui Jia	Alvin	Start up and monitor logs
D.2.27	D.2.21	D.2.22	Start store all (1/2/3/4) on 796800-IAD3	ATG - IAD3	8/11/16 2:00	8/11/16 2:05	8/11/16 17:00	8/11/16 17:05	5	Cui Jia	Zhou Peng	Start up and monitor logs
D.2.27			CMS & Baseline - may not be needed		8/11/16 2:05	8/11/16 2:15	8/11/16 17:05	8/11/16 17:15	10	Cui Jia	Nicky	
E.2.31	D.2.22	D.2.26	Modify web server to allow internal IP to test	Web - IAD3	8/11/16 2:05	8/11/16 2:10	8/11/16 17:05	8/11/16 17:10	5	Cui Jia	Xiangkui	Jacky needs instructions too
E.2.31.1	E.2.31		Test critical flow - existing user + My Account	Website - IAD3	8/11/16 2:10	8/11/16 2:30	8/11/16 17:10	8/11/16 17:30	20	Xiangkui	Henry Chen	Point local host to IAD VIP or web server
E.2.31.2	E.2.31		Existing User: gift card balance, store credit, coupon									
F.2.31.2	E.2.31		Test website critical flow - new user	Website - IAD3	8/11/16 2:10	8/11/16 2:30	8/11/16 17:10	8/11/16 17:30	20	Lu Ping	Henry Chen	Point local host to IAD VIP or web server
F.2.32	E.2.31		Migrate blog server & its MySQL DB & startup	TZG -> IAD3	8/11/16 2:10	8/11/16 2:30	8/11/16 17:10	8/11/16 17:30	20	Cui Jia	Zhanwen	Verify wordpress works and /blog works
			GO/NO GO									
			Modify web server to allow all traffic	Web - IAD3	8/11/16 2:30	8/11/16 2:35	8/11/16 17:30	8/11/16 17:35	5	Cui Jia	Zhanwen	Verify from public internet
<div> <div>Prep 2 Days</div> <div>Maintenance 3 Hours</div> <div>Resources</div> <div>Rollback Plan</div> <div>+</div> </div>												

Results achieved

- More than 50% reduced backend processing time using G1 GC with JDK 1.8, along with the new hardware (3 years newer)
- Bring back Oracle Commerce platform under Oracle Premier support
- Performed load testing with 25k concurrent users
- Individual team members did not depend on each other to manage their changes in Endeca XM
- Upgrading JDK version as part of upgrade was good enough to support TLS 2.0, No impact with PCI counsel mandatory upgrade
- No work arounds or custom code needed to support partial indexing.

Results achieved contd.

- Additional features available for business in version 11.2 :
 - Fast deployments as CMS is moved to DB proc
 - Time based pricing to support flash sales
 - Multi-site integration in Endeca with introduction of sites in XM
 - Access to OOTB integration with Oracle Coherence
 - Leverage OOTB management and indexing features for non-commerce content like: help docs, faq etc.
 - Better password hashing algorithm
 - OOTB mature framework support to build REST services

Results achieved contd.

- Platform enabled for future plans:
 - Unified reporting in OBIEE
 - Leverage OOTB Partial indexing framework to trigger partial indexing when an item either runs out of inventory or an out of stock item available again
 - Upgrade to just released version 11.3 much more smoother and shorter time frame
 - More options to implement a headless micro service based architecture.

Summary

- Build a business case for upgrade
- Build a list of guiding principles
- Understand Product enhancements
- Identify overlapping custom features that are now part of new version
- Evaluate which feature to retain by taking into considerations following factors:
 - How does your feature match against OOTB product feature?
 - Is it easy to replace with product feature ?

Summary contd.

- Identify risks and have a plan to mitigate against them. If there is no option, then have a fallback plan, at least you will be most likely moving directionally forward.
- Ensure you have proper regression testing plan, automated testing is very very helpful.
- Have a key resource who has done similar upgrade for all the versions your application has to go through
- Have enough time to perform load testing
- Train your business team well before going live with all the changes so that they will have enough familiarity
- 1 or 2 folks should do majority of the initial migration, then ramp up the team to address additional tasks arising out of custom code or any replacement with OOTB feature

About WeProlance

- Consortium of Oracle Commerce technologists
- Common goal of delivering high quality, high performance , yet cost effective solutions
- Providing guidance in planning, designing and architecting highly scalable ecommerce solution leveraging Oracle Commerce and Endeca
- We are Thinkers, Doers and Problem solvers
- Being an Active/Engaging Partner with the customer in achieving business goals