
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV



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Learn how Carrier migrated their global Oracle landscape to AWS

Rick Carey

JD Edwards COE – Associate Director
Carrier Corporation

Jeremy Shearer

Sr. Partner Solutions Architect
AWS

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Session agenda

- Who are we
- Carrier corporation
- The selection process, why AWS?
- Project scope
- AWS Solution
- Ironing out the details
- Summary
- Your questions

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Who are we?



Rick Carey – Associate Director – Carrier JD Edwards ERP COE

- Worked with UTC/Carrier for 7+ years.
- Worked in Data Processing / Information Technology / Digital for 40+ years.
- Worked with JD Edwards for 33+ years.
- Worked across many industries, globally. Including:
  - International Trade.
  - Process and discreet manufacturing.
  - Airlines.
  - Commodity, FX and Precious Metal trading.
  - Retail and e-commerce sales.
  - Oracle Partners.
- Prince II Project Management trained.
- Scrum Master certified.

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- Rick.Carey@Carrier.com
- Rick@21stccs.com

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Who are we?



Jeremy Shearer – Sr. Partner Solutions Architect

- JD Edwards installation/upgrades/migrations since 1997
- Experience across iSeries, SQL Server, and Oracle (including Exadata)
- Joined the new Oracle Apps on AWS partner team in 2021

My focus is to work with AWS Partners to help them successfully migrate Oracle Applications to AWS

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- jeremyrs@amazon.com

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Who are we?

LTI AMS Relationship

Amit Bordekar
Saaranga Rai
Tushar Rangnekar
Ashraf Ali Shaik
Subin Viyyath
Gourang Sharma
Ashish Bhatavdekar
LTI Management and team (too numerous to mention)



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Global Projects



Oops!
Apologies!
This was another challenging global project!

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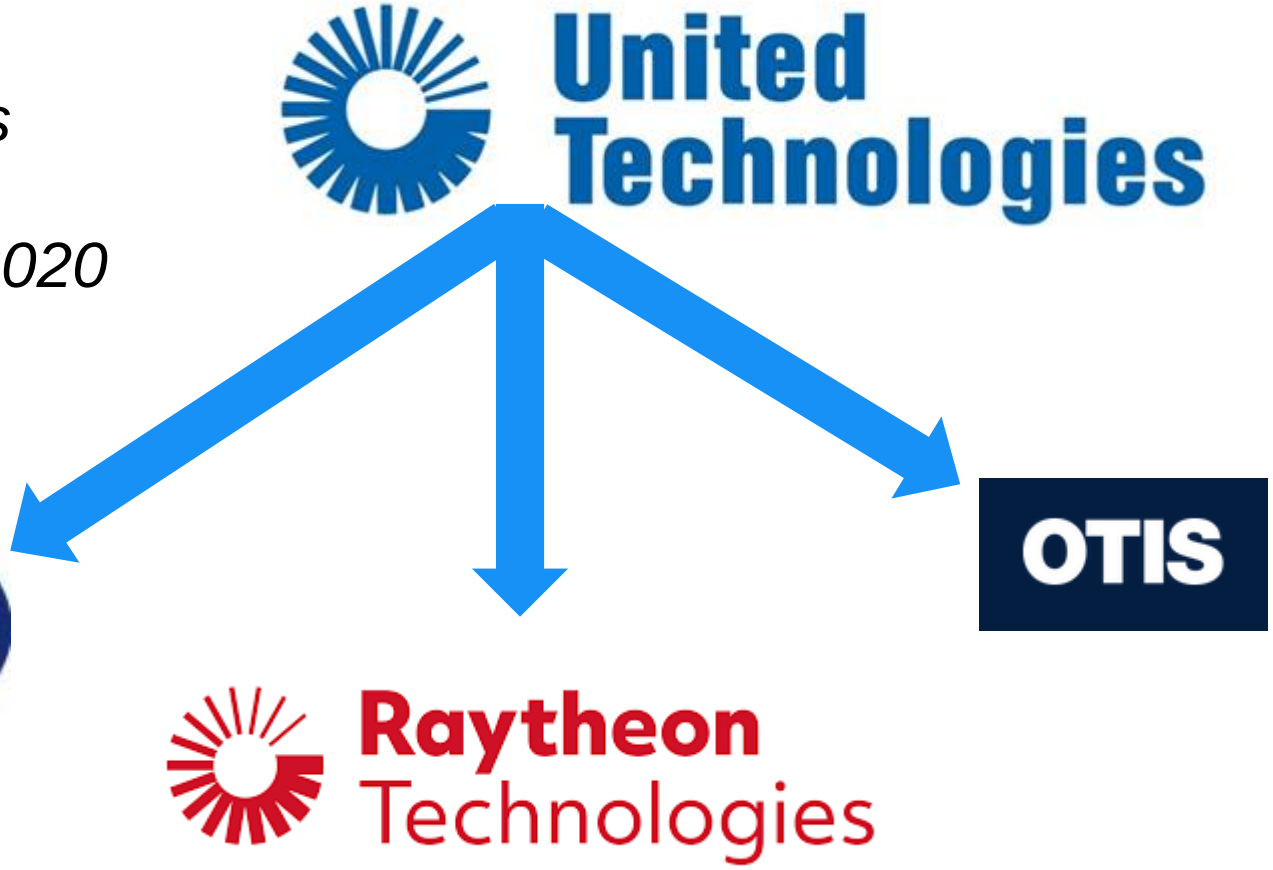
Carrier Corporation

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Carrier Corporation

Formerly part of United Technologies

Separated as stand-alone group in 2020



Carrier

Carrier Corporation

Formerly part of United Technologies

Fortune 500 Company

Founded in 1915

Three primary Divisions:

- HVAC
- Refrigeration
- Fire and Security



Carrier is the leading global provider of healthy, safe, sustainable and intelligent building and cold chain solutions, with a diverse and world-class workforce. With more than a century of expertise, we drive innovation while putting our customers first, helping protect our planet, and inspiring and empowering our people. Through our performance-driven culture, we are driving long-term shareowner value by growing sales and investing strategically to strengthen our position in the markets we serve.

$20.6B
2021 NET SALES

~58,000
EMPLOYEES

$11B+
GOODS COOLED
by Carrier on ocean daily

80+
BRANDS

100+
NEW PRODUCTS
for the 7th consecutive year

~90M
HOMES PROTECTED
by Kidde with

~400M
ALARMS INSTALLED

160+
COUNTRIES

~9,000
ACTIVE PATENTS
and pending patent applications worldwide

OUR INDUSTRY-LEADING BRANDS

































Carrier Corporation – COE Vision

Make it faster. Make it easier. Make it better. Make it matter.

Current state		Vision
Project management	→	**Product management**
Coordinators	→	**Doers**
Waterfall	→	**Design thinking and Agile**
12-18 month programs	→	**Incremental development**
Siloed	→	**Co-located**
Independent teams	→	**Team of teams**



Cloud First



Cybersecurity



Mobility



Stable ops





In-house

VS



Outsourced

Carrier

Carrier Corporation

Carrier Shares Digital Innovation and Transformation Story at Amazon Web Services (AWS) re:Invent Summit

Bobby George, Carrier's Senior Vice President and Chief Digital Officer, recently spoke at the annual **Amazon Web Services (AWS) re:Invent Summit** in Las Vegas on innovating our customers through IoT, enabling change and daring to disrupt with digital transformation technology. AWS re:Invent is a large, global learning conference organized by Amazon Web Services. This year marked the 10th anniversary of the event.

Introduced by Michael MacKenzie, General Manager of Industrial IoT and Edge at AWS, Bobby focused on how Carrier is closing the loop with AWS IoT.



Carrier's SVP and Chief Digital Officer, Bobby George, speaks at the annual Amazon Web Service (AWS) re:Invent Summit in Las Vegas.

Driving digital transformation: Carrier selects AWS as preferred cloud provider

Seattle, WA, USA February 05, 2020

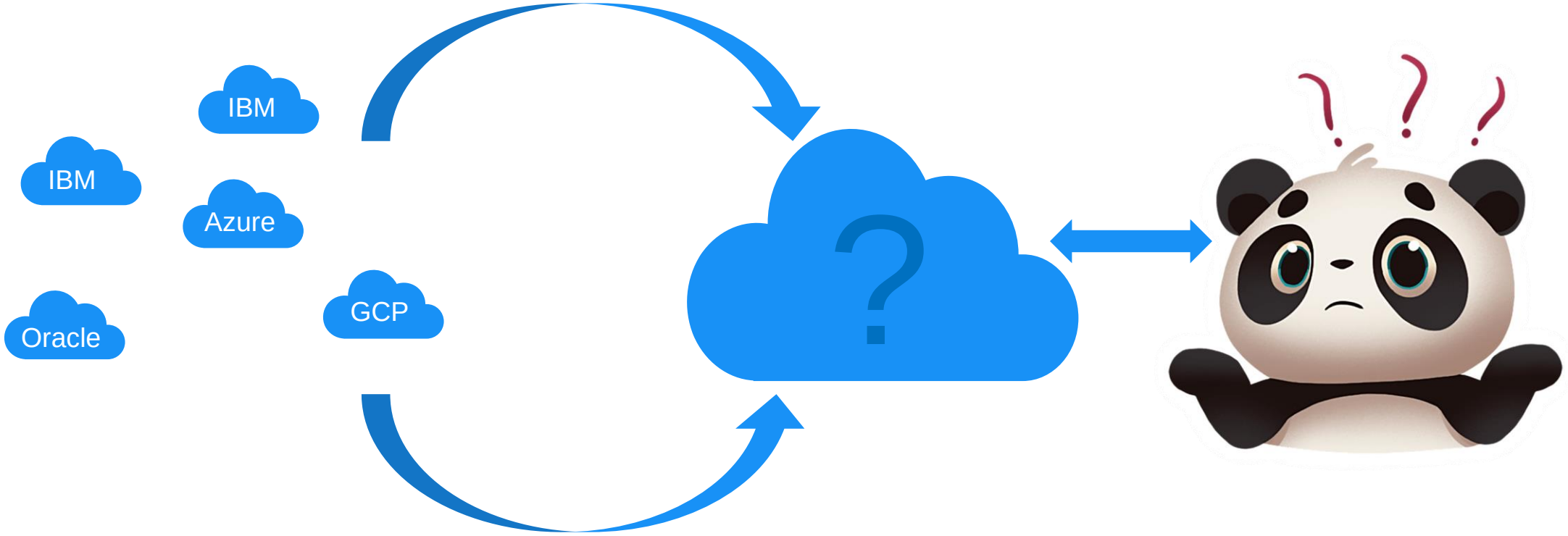


- 70% of 4,000 servers
- 996 Applications moved from legacy to AWS
- data warehouse, analytics and machine learning
- Reduced costs while enabling innovation

Why AWS?

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Selection process – Why AWS for JD Edwards?



- Numerous cloud providers
- For JD Edwards, potentially logical route is OCI due to ownership and experience
- Hybrid approach dismissed for several reasons, including cost and support model

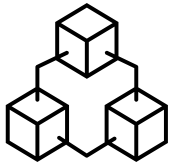
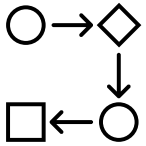
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Selection process – Why AWS for JD Edwards?

Selection Criteria:

- Cost
- Scalability
- Performance
- Disaster Recovery
- Data movement
- Strategic Road Map




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Selection process – I am convinced!











- Personal preference was to move to OCI
- AWS proactive and worked with us through an extensive assessment process
- Jeremy Shearer was integral to the process from beginning to end
- Flexible solutions and cost models
- Demonstrated that they were engaged, reactive, willing, and eager partners

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The project

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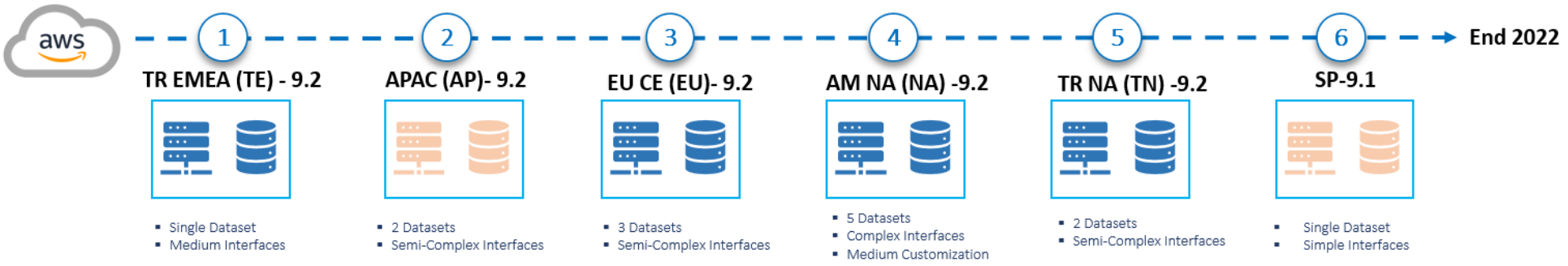
Project scope – Overview

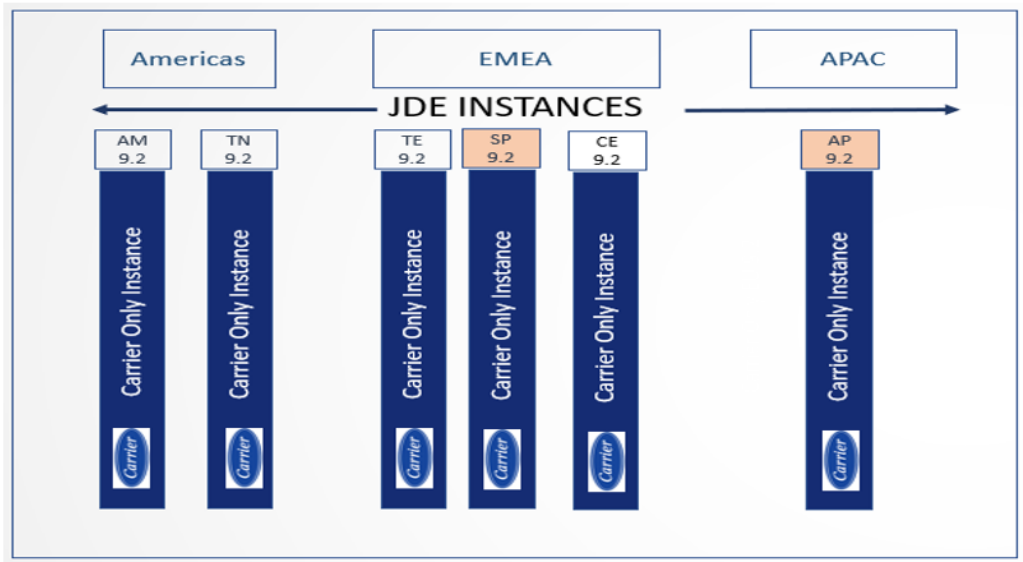
- Multimillion $ project
- 10 months implementation timeline
- Required upgrade/support from numerous integrated partner applications
  - ReportsNow
  - Bottomline
  - etc.
- Alignment with Carrier ERP COE strategic initiative for ERP solutions
- Elimination of technical debt
- Reduce run costs
- Deliver improved performance and flexibility
- Provide improved user experience

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Project scope – Landscape

JDE Cloud – Future State for JDE Instances





SUMMARY

1. Carrier JDE landscape migration to AWS cloud. Specific cloud strategy will be applied for migrating each application
2. 6 Carrier JDE instances of IBM datacentre Southbury DC will be moved to AWS Cloud in current scope of project
3. Code current will be performed for each instances
4. Integration rewiring will be performed
5. Spain 9.1 will be upgraded to 9.2 in the process of cloud migration.
6. Chubb and Carrier entanglement of APAC will be resolved in the process of cloud migration

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Project scope – Some facts and figures

iseries IBM

On-Premise to Cloud Migration

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6 JDE Instance
16 Environments
50+ BU's

4 Test Phases per instance:
- Unit
- iCRP/SIT
- CRP
- UAT

3,000+
Total test scenarios and scripts tested and passed

500+
Interfaces / integrations migrated re-pointed

10+
JD Edwards Integrated Applications Migrated

20+ Dedicated ERP / LTI / AWS PM team

80+ Dedicated Carrier/AWS/LTI project team

2,000+
Business users seamlessly migrated

4 Data Migrations (Mocks) Completed per instance

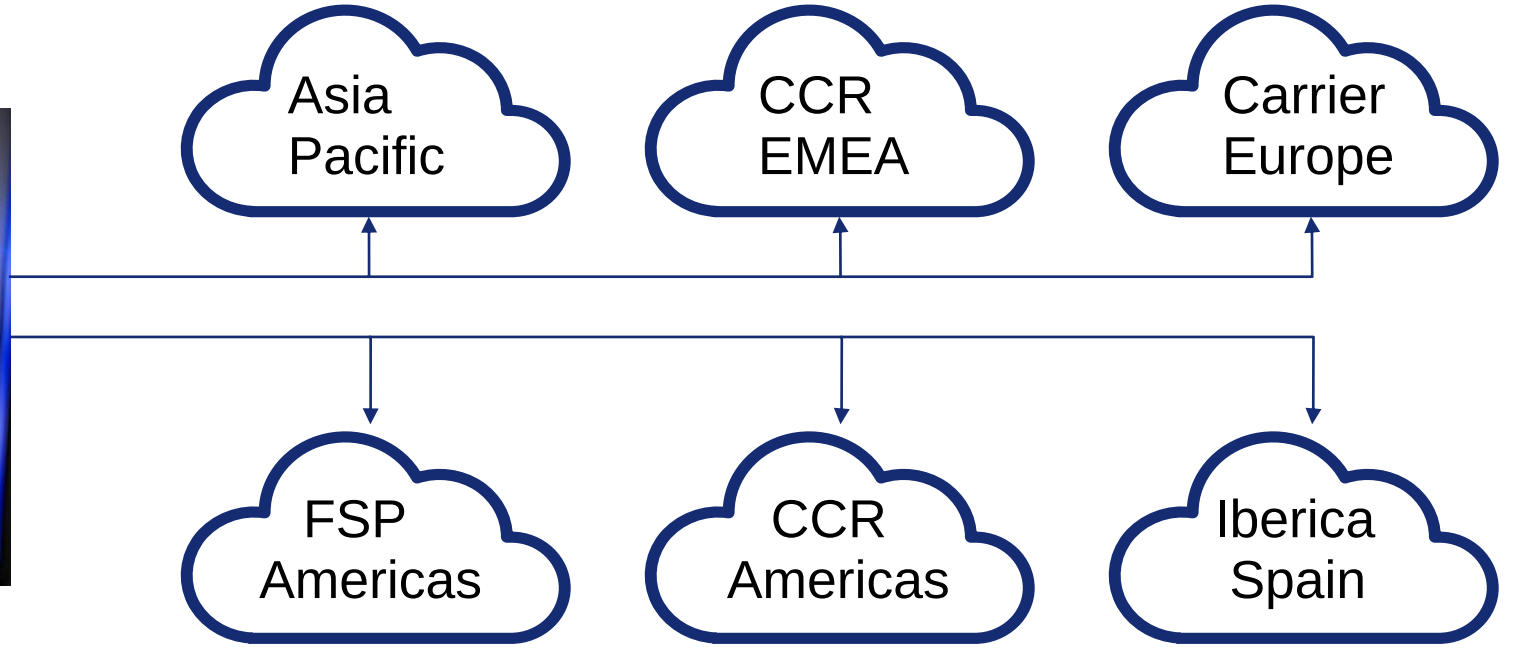
IBM DB2
Database

MS SQL EE
Database

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Project scope – Overview

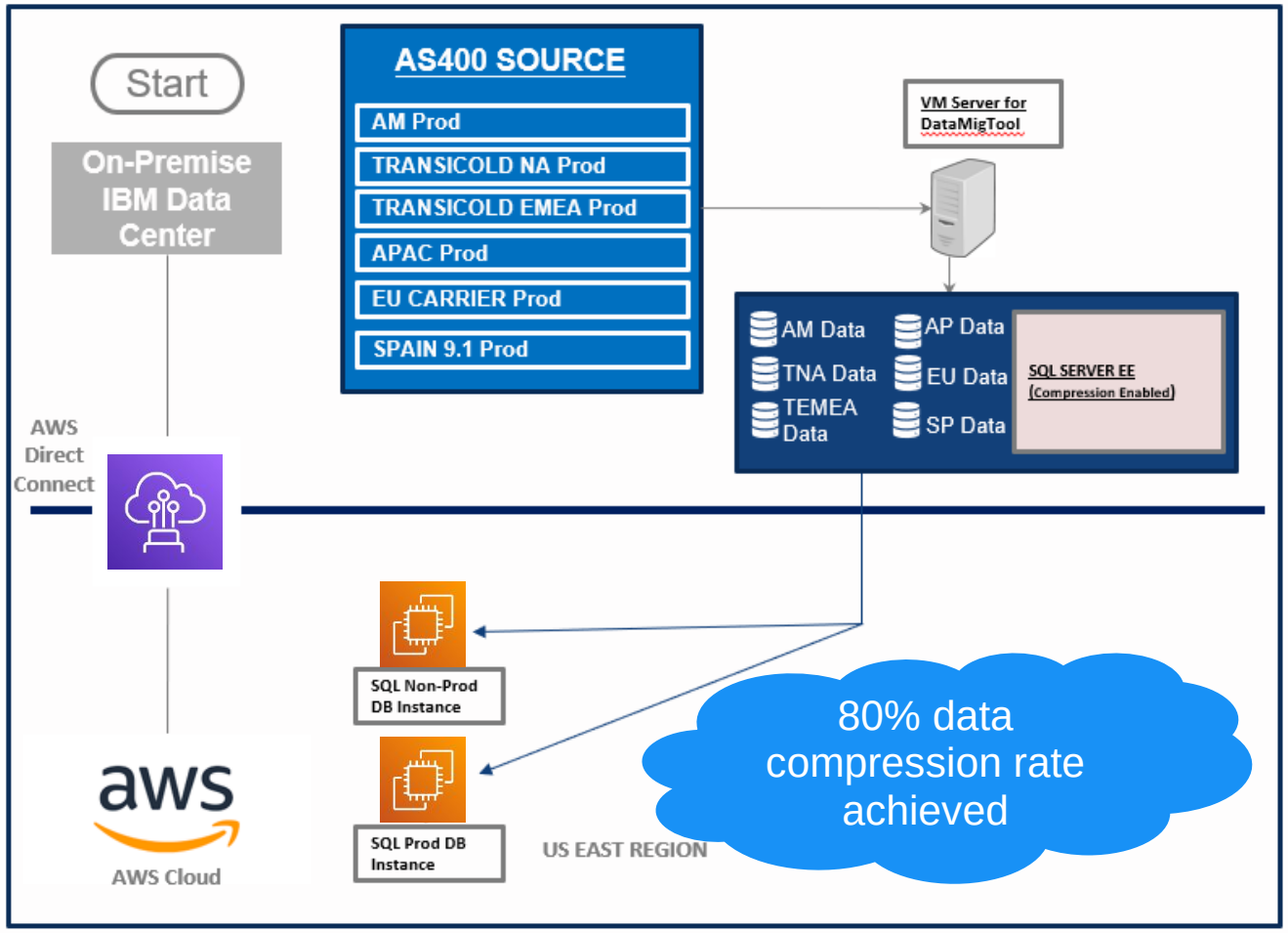




Migrated from shared on-premise IBM iSeries, running DB2 database to six individual instances on AWS running on Amazon EC2 servers and MS SQL Enterprise Edition database

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Project scope – Data migration



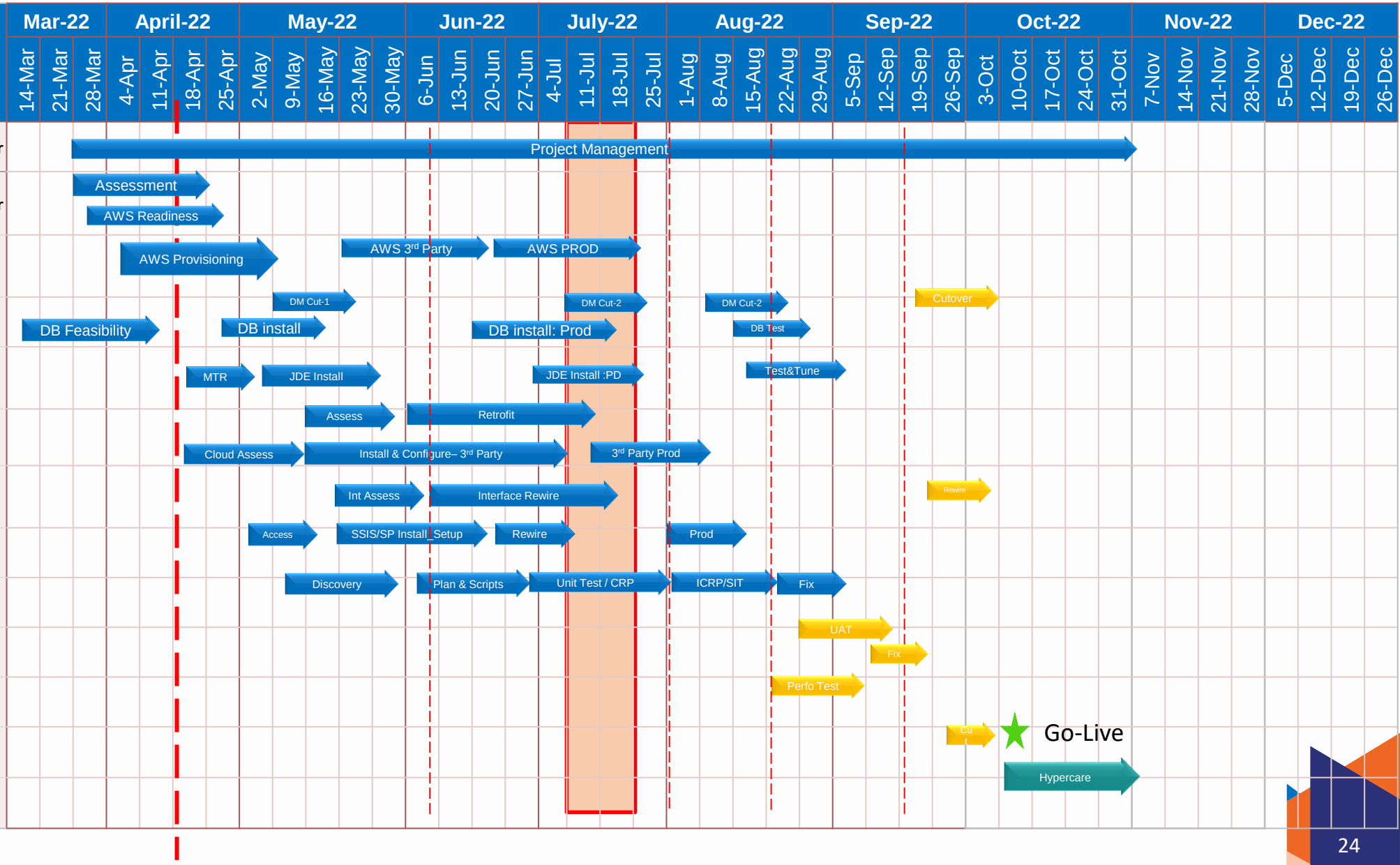
Application	iSeries		Windows		CPU		Storage	
	Prod	Non-Prod	Prod	Non-Prod	Prod	Non-Prod	Prod	Non-Prod
JD Edwards	2	1	39	26	218	84	79.0 Tb	38.2 Tb
Hubble			7	2	64	12	2.0 Tb	660 Gb
RF Smart			4	4	11	16	930 Gb	756 Gb
ReportsNow			8	0	32	0	1.6 Tb	0 Gb
DSI			4	2	14	6	960 Gb	560 Gb
Formscape			3	1	8	2	650 Gb	180 Gb
SQL DBs			3	0	24	0	6.2 Tb	0 Gb
Doubletake			1	1	4	4	180 Gb	180 Gb
Tidal			2	0	8	0	360 GB	0 Gb
Kewill			1	0	4	0	160 Gb	0 Gb
	2	1	72	36	387	124	92 Tb	40.5 Tb
	3		108		511		132.5 Tb	

132.5 Terabyte!!!

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Project scope – some facts and figures

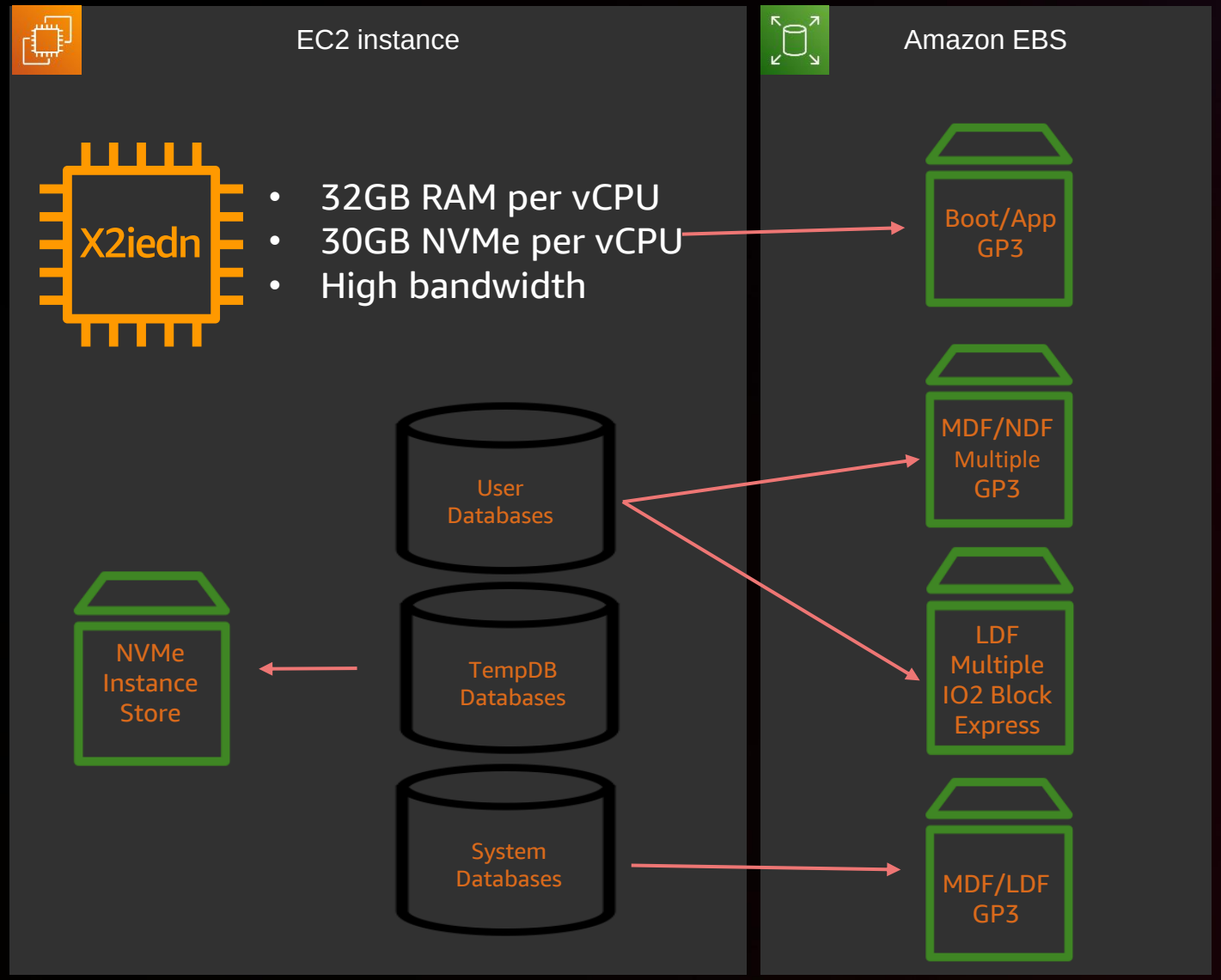
#	Activities/Weeks	Responsibility
1	Project Planning / Management	LTI & Carrier
2	Pre-Requisite Assessment & Finalization of target Cloud Arch	LTI & Carrier
3	AWS Initial Setups, Provisioning for all Instances / Support	LTI & Carrier
4	DB Installation / Migration / Support	LTI
5	Install JDE / Code Current (UN6)/ TRUPG 9.2.6 / 64 Bit Conv	LTI
6	JDE Retrofit / Dev Support during Project Phase	LTI
7	Integration Setup and Config (3rd Party) / Support	LTI, Carrier& 3rd Party
8	Sharepoint/SSIS	SSIS
9	CRP & iCRP - LTI/Carrier IT Testing	LTI & Carrier
10	UAT (Transicold EMEA)	Carrier
11	Performance Testing	LTI
12	Cut Over Preparation & Go Live	LTI & Carrier
13	HyperCare	LTI



Key aspects of the technical solution...

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SQL Server Optimized for JDE on EC2



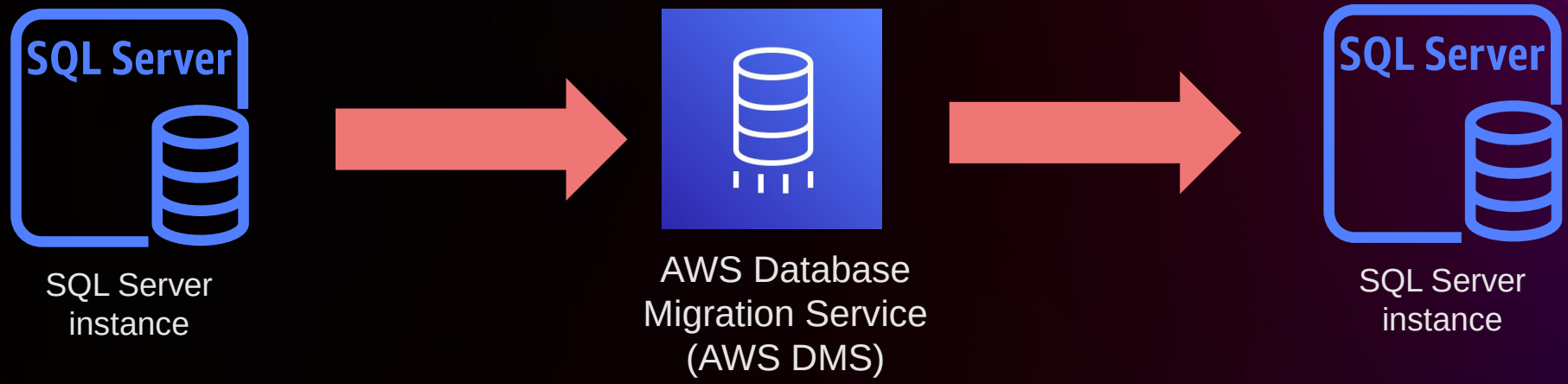
JD Edwards E1 databases need lots of IO but relatively little compute power

- *Lots of memory*
- *High-performance storage for TempDB*
- *Low latency for LDF*
- *Moderate IOPS/throughput for MDF/NDF files*
- *Use SQL Server page compression*

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AWS Database Migration Service (AWS DMS)

Use SQL Server tools to limit impact of third-party programs or offload these workloads to a reporting replication; AWS DMS for reporting replicas

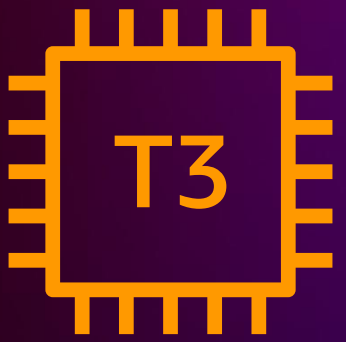


Protect your JD Edwards database from third-party systems

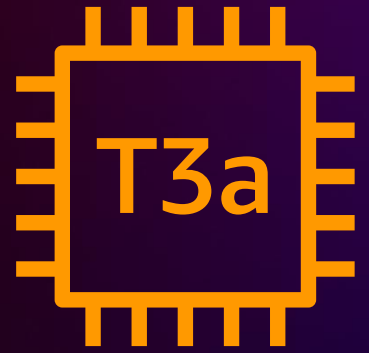
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JD Edwards Application Tier on EC2

JD Edwards UBEs are very busty and often constrained by single thread performance. Optimize with burstable Intel instances. If needed, leverage high-frequency instances (not needed at Carrier)



JD Edwards Weblogic server scales with limits around garbage collection/memory management; optimize with burstable AMD instances



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Key technical challenges during testing

All below are resolved:

- JDE MRP performance challenges
- AWS DMS interactions with SQL Server AlwaysOn
- SQL Server character set (case sensitivity) issues bar coding solution
- JD Edwards Julian data format and attribute definitions differences between DB2/400 and SQL Server

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The REALITY and challenges

- Not 100% plain sailing, however, good planning and good team ensured no disasters.
- Effective and frequent communication plan is absolutely essential.
- Cross functional team involvement important.
- Numerous parallel digital/business projects reliant on JD Edwards continued unabated.
- Culture, language and localisation can not be ignored.
- Organizational Change Management vital across so many functions, regions, cultures.
- Lessons learned from previous AWS migrations avoided potential pitfalls.
- Approval processes not always ‘real time’ in diverse global organisations. Plan ahead.
- Executive support is crucial in addressing risks and obtaining resolution.
- Data attribute challenges from DB2 to MS SQL EE.
- HUNDREDS of interfaces/data exchanges, both internal and external re-pointed and tested.
  (including those created years ago and consigned to tribal knowledge and history)

Carrier

Lessons learned

2021 CIAT Culoz migration from 8.12 on premise to 9.2 on AWS cloud.

- Original infrastructure design possibly not optimal.
- Performance not matching expectations.
- Costs exceeding budget.

First time Carrier moved an on-premise JD Edwards instance to AWS cloud.

- Potentially over-reached in infrastructure design.
- Potentially too many ‘Architects’ involved without adequate AWS knowledge.

Jeremy and AWS team completed a detailed analysis on the JD Edwards and SAP infrastructure.

- ‘Right sized’ the design and services.
- Reduce costs.

LAST BUT NOT LEAST:

- Select experienced partners (application, infrastructure, AMS) to improve chances of success. Engage with these partners early and often. Ensure they are vested in the partnership!

Carrier

Summary

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Special thanks



Jeremy Shearer

Megan Rye

Chris Marsh

Bhuvan Wadhwa

All the other folks that deserve a mention ☺

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Questions?

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Thank you!

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