Insider's View of a Real-World Project

Performance Testing Composite Applications

presented by:

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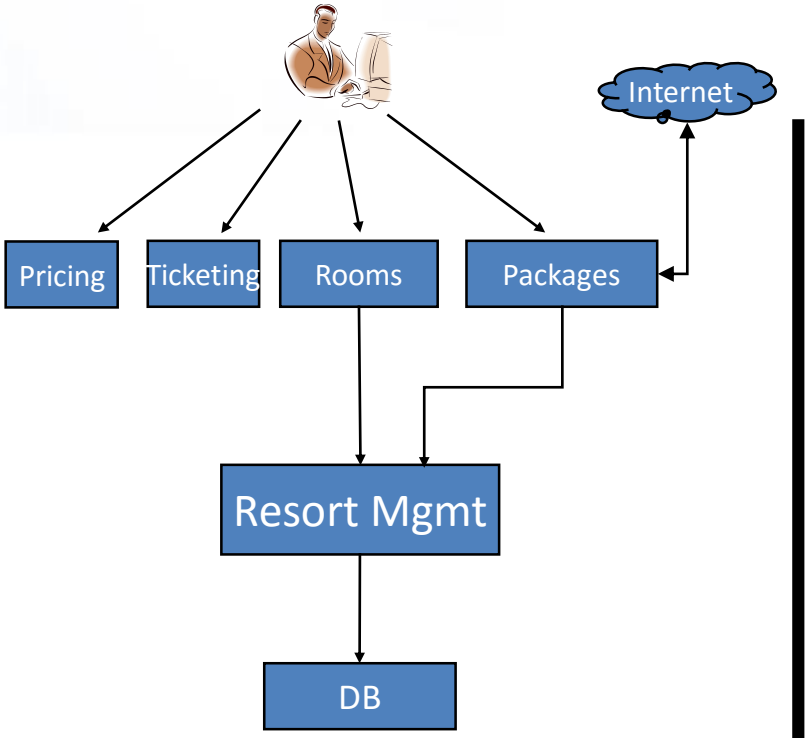
Agenda

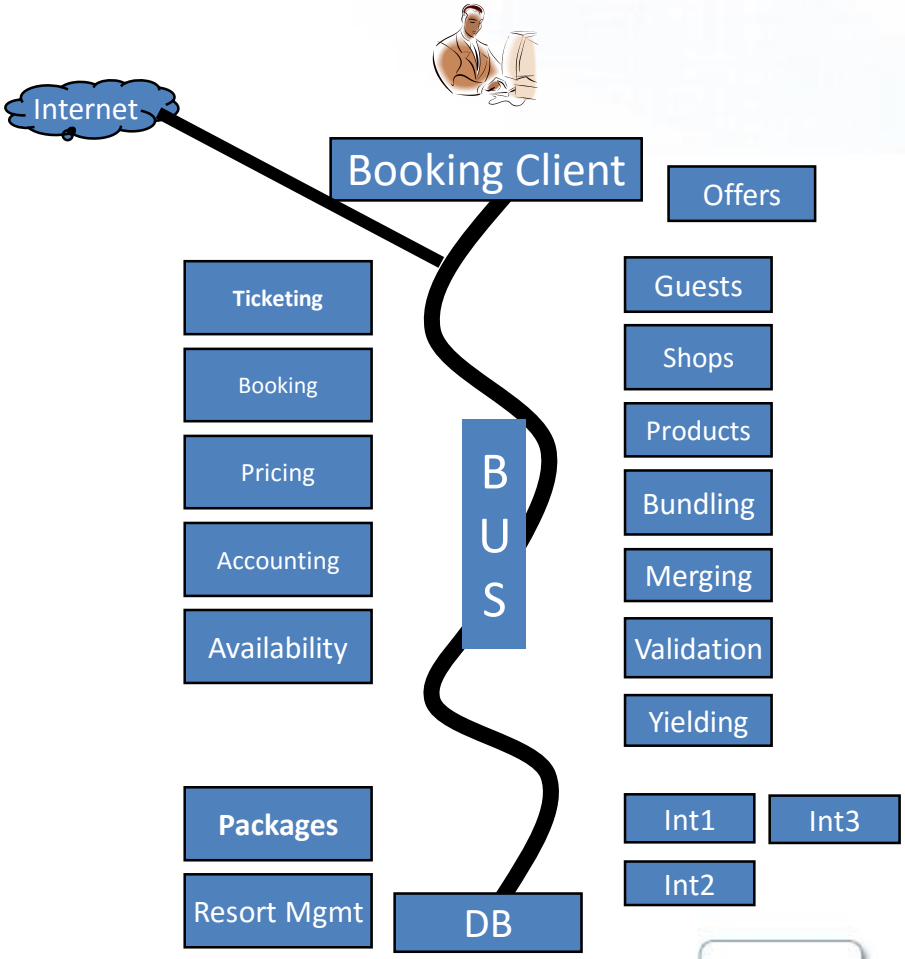
- Introduction
- System Background Information
- Goals, Challenges, Outcomes
- Questions

The move into a “Composite”

Silo’d Application Structure

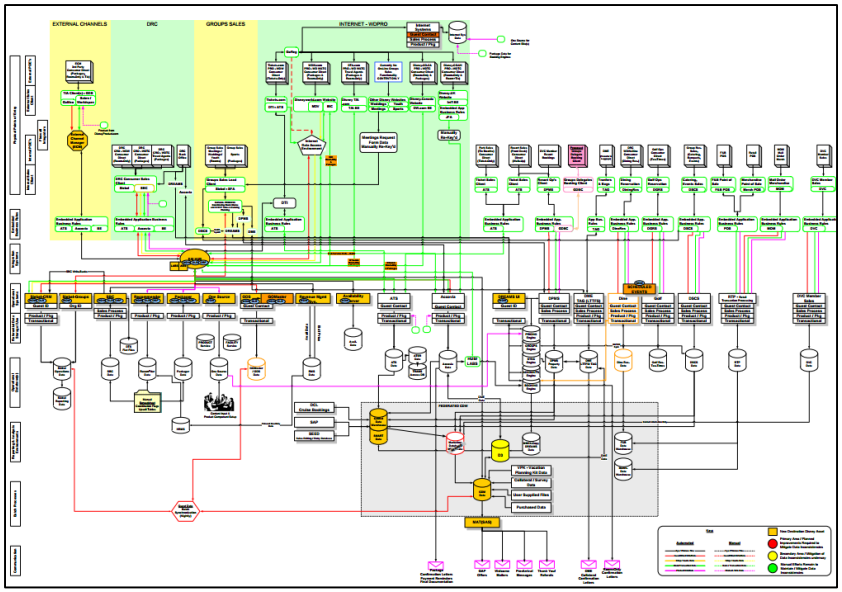


Integrated Composite Architecture

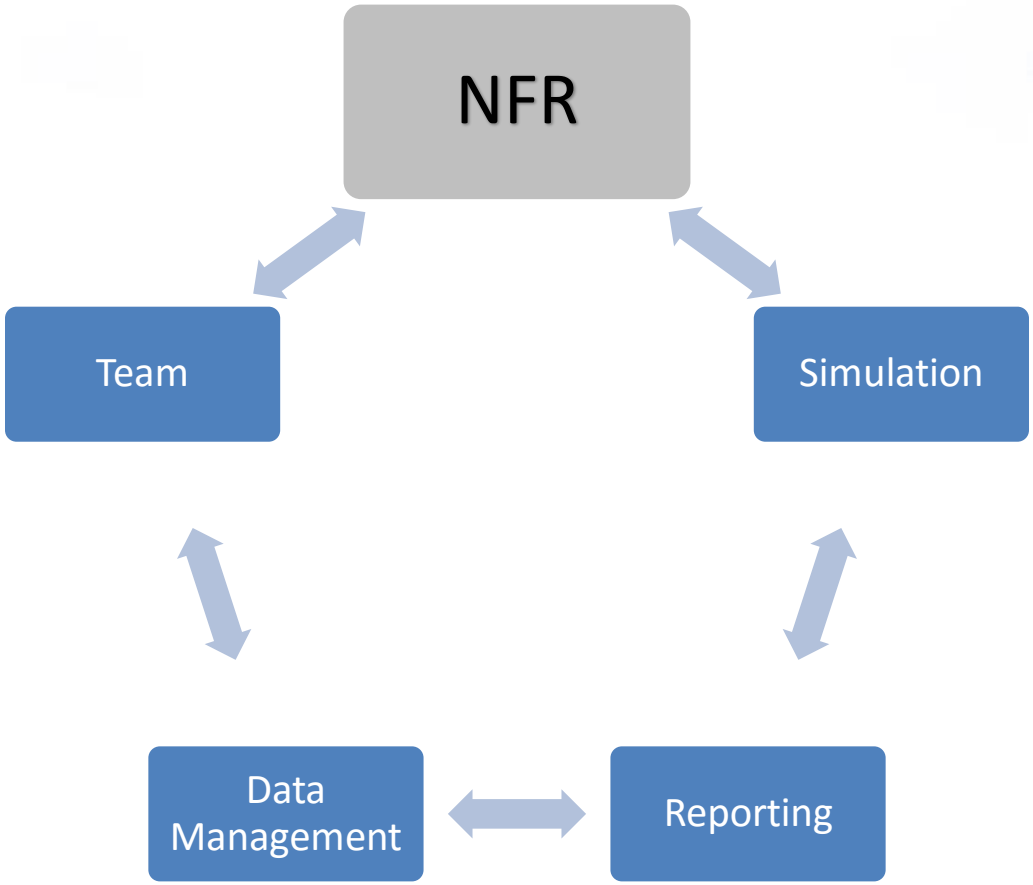


System Background Info

- Reservation and Fulfillment System
- External/Internal Users
- Complex Architecture
- Quarterly Releases
- Small Test Team



Composite: Effect on Testing



Non-Functional Requirements

Challenges

- Transaction naming conventions
- All response times tracked
- 15 user interfaces
- 5-10 scripts per application

Information overload!

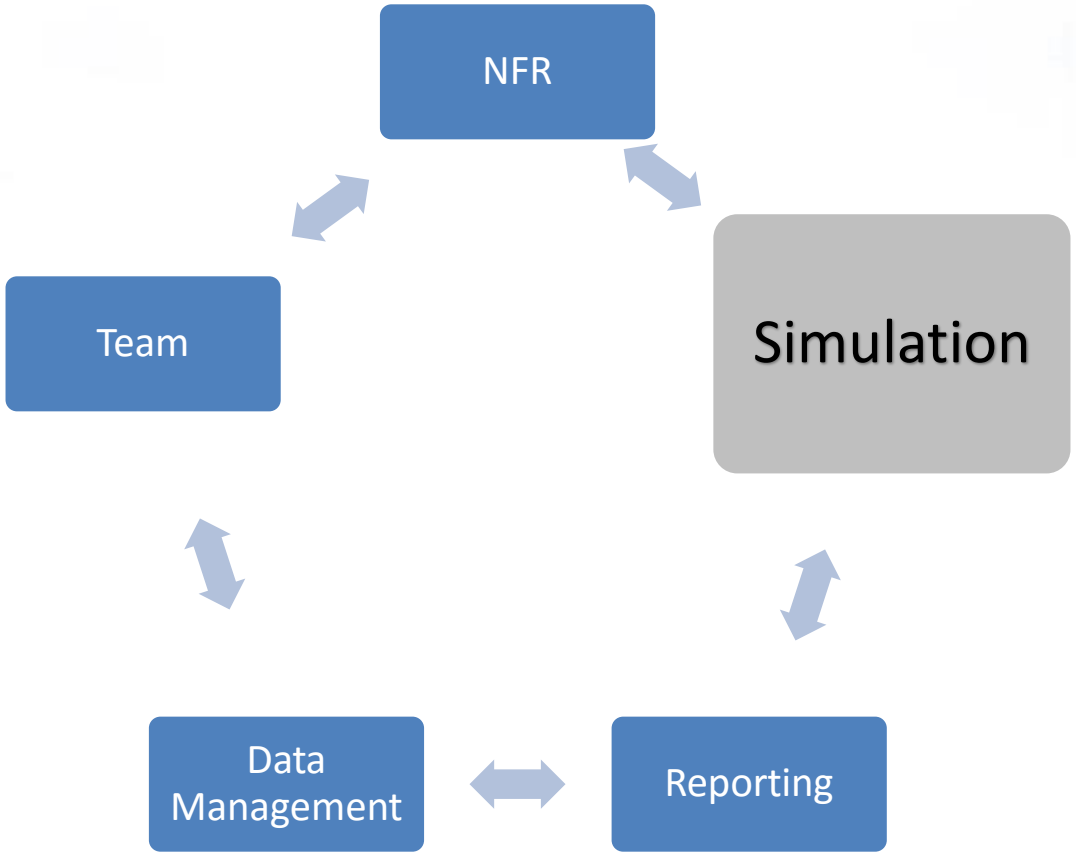
Non-Functional Requirements

- Goals
  - Improve Reporting
  - Team Focus
- Solution
  - Application Level Key Performance Indicators (KPIs)

NFR → KPI

- Application KPIs
  - *_KPI_ApplicationName_TransactionName*
- KPI Criteria
  - Business Impact
  - Production Volume
  - Known Issues

Composite: Effect on Testing



Application Simulation Model

Challenges

- Same goals every release
- “Success disasters”
- Production outages

Application Simulation Model

- Goals
  - Evolving tests
  - Reduce Production outages
- Solutions
  - Application Throughput
  - KPI Mapping

Model: Production Data

- Production logs
- Custom parsing tools
- Pivot Tables

Day	[19-Dec
Row Labels	Count of Operation
⊞5	1
⊞6	5
⊞7	397
⊞8	549
⊞9	910
⊞10	976
⊟11	1005
book	268
cancel	128
modify	85
retrieve	524
⊞12	820
⊞13	737
⊞14	806
⊞15	933
⊞16	796
⊞17	746
⊞18	631
⊞19	596
⊞20	657
⊞21	508
⊞22	148
⊞23	13
Grand Total	11234

User Modelling

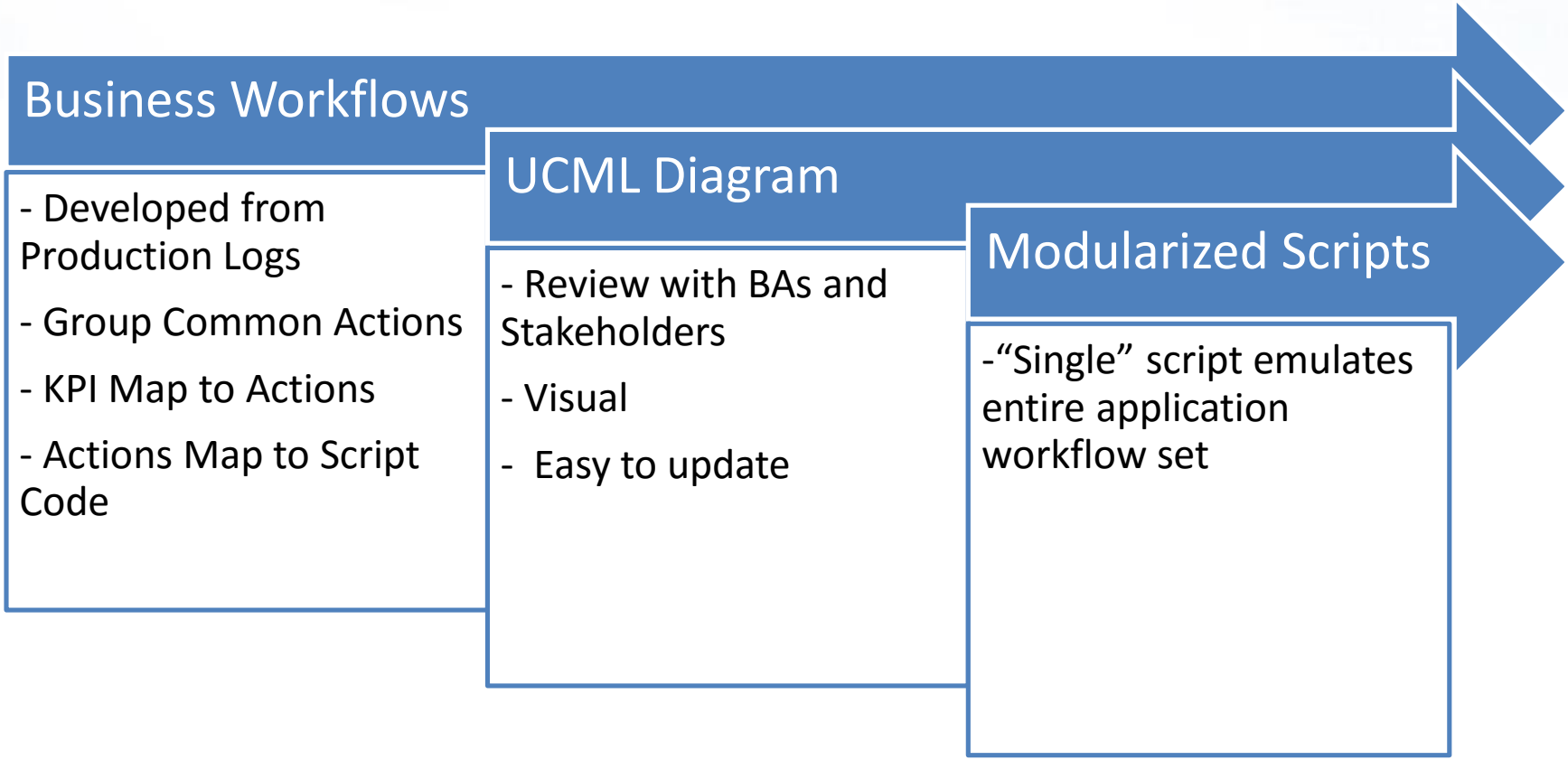
Challenges

- 1:1 Applications to Test Scenarios
- Script updates tedious
- Inflexible solution

User Modelling

- Goals
  - Reduce script maintenance
  - Improve communication
- Solutions
  - User Modelling
  - Script Modularization

User Modelling Overview



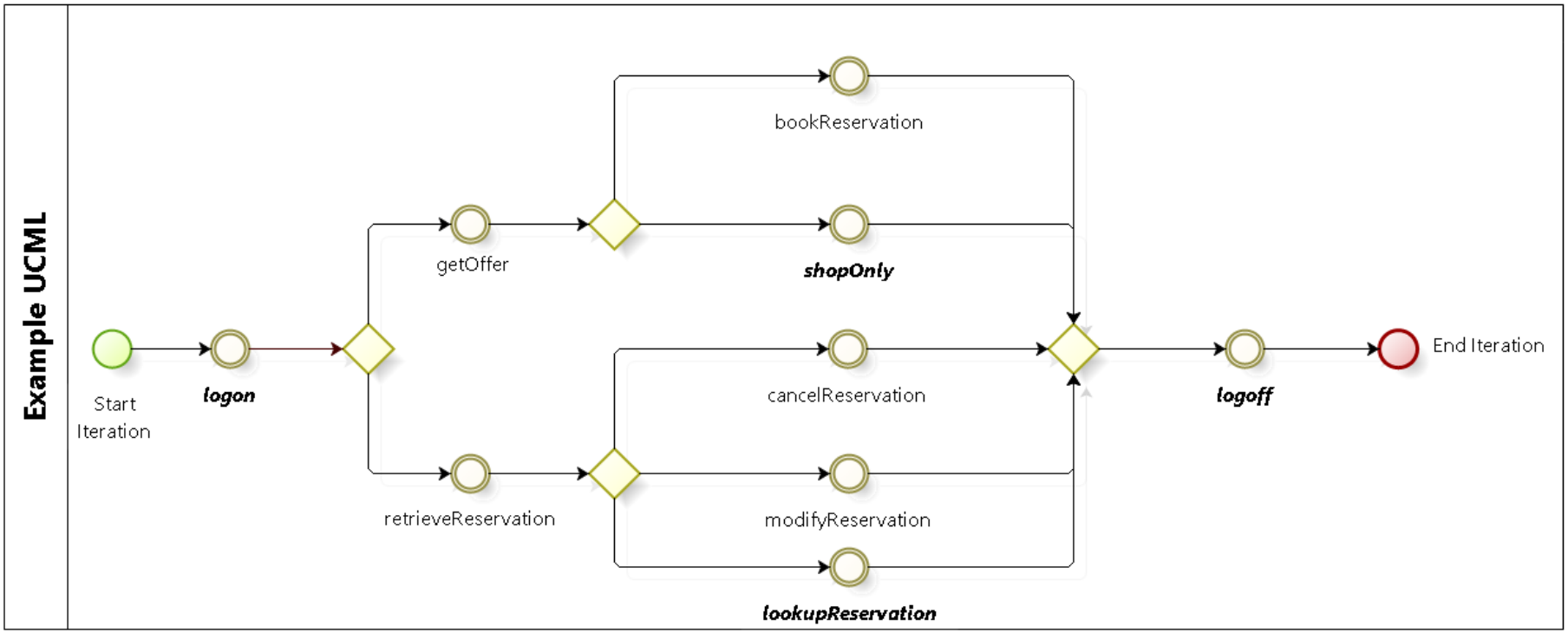
User Model Creation

- Gather Production data for busiest hour

Operation	Source	Throughput (per Hour)	UCML Percentage
retrieveReservation	(from logs)	524	
getOffer	(from logs)	2,545	
bookReservation	(from logs)	268	
cancelReservation	(from logs)	128	
modifyReservation	(from logs)	85	

User Model Diagram

- Create Partial UCML to fill in additional steps



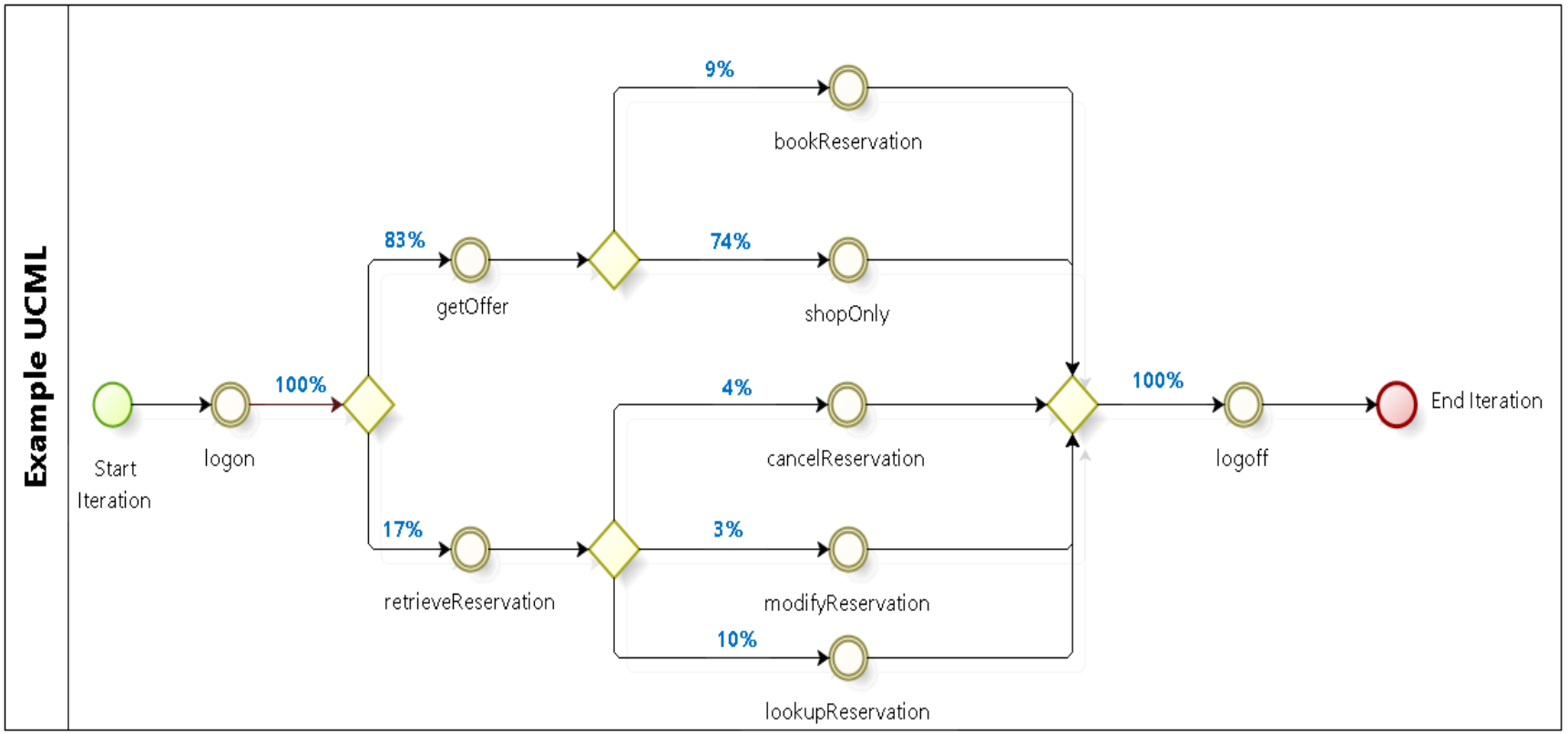
User Model Creation

- Fill in previous table with additional steps
- Calculate missing throughput and UCML %

Operation	Source	Throughput (per Hour)	UCML Percentage
login	= retrieveReservation + getOffer	3,069	100%
retrieveReservation	(from logs)	524	17%
getOffer	(from logs)	2,545	83%
bookReservation	(from logs)	268	9%
shopOnly	= getOffer - bookRes	2,277	74%
cancelReservation	(from logs)	128	4%
modifyReservation	(from logs)	85	3%
lookupReservation	= retrieveReservation - cancelRes - modifyRes	311	10%
logoff	= login	3,069	100%

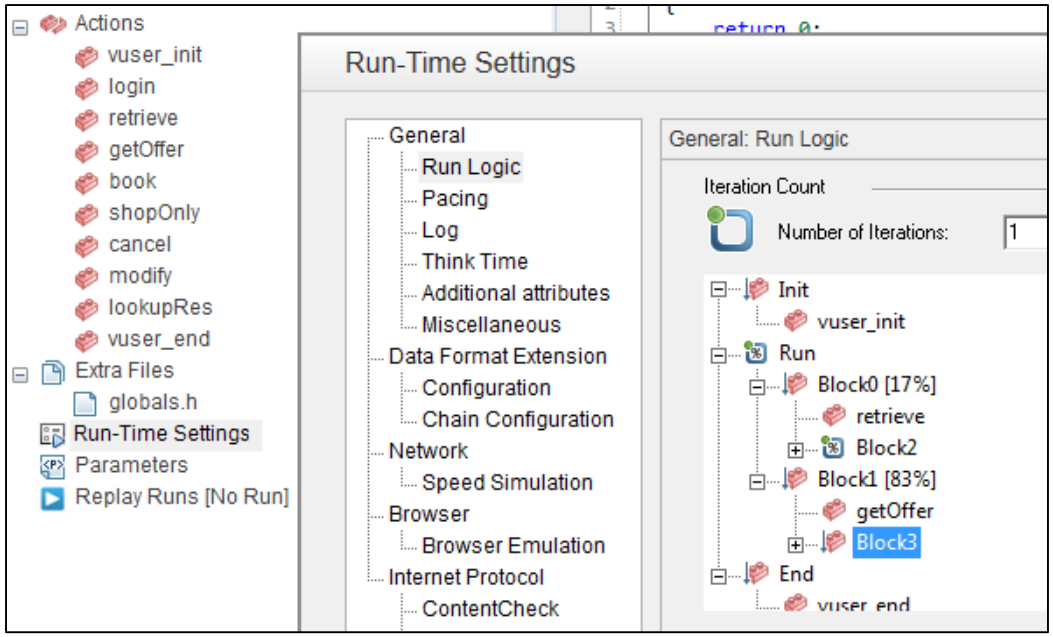
User Model Diagram

- Finished User Model

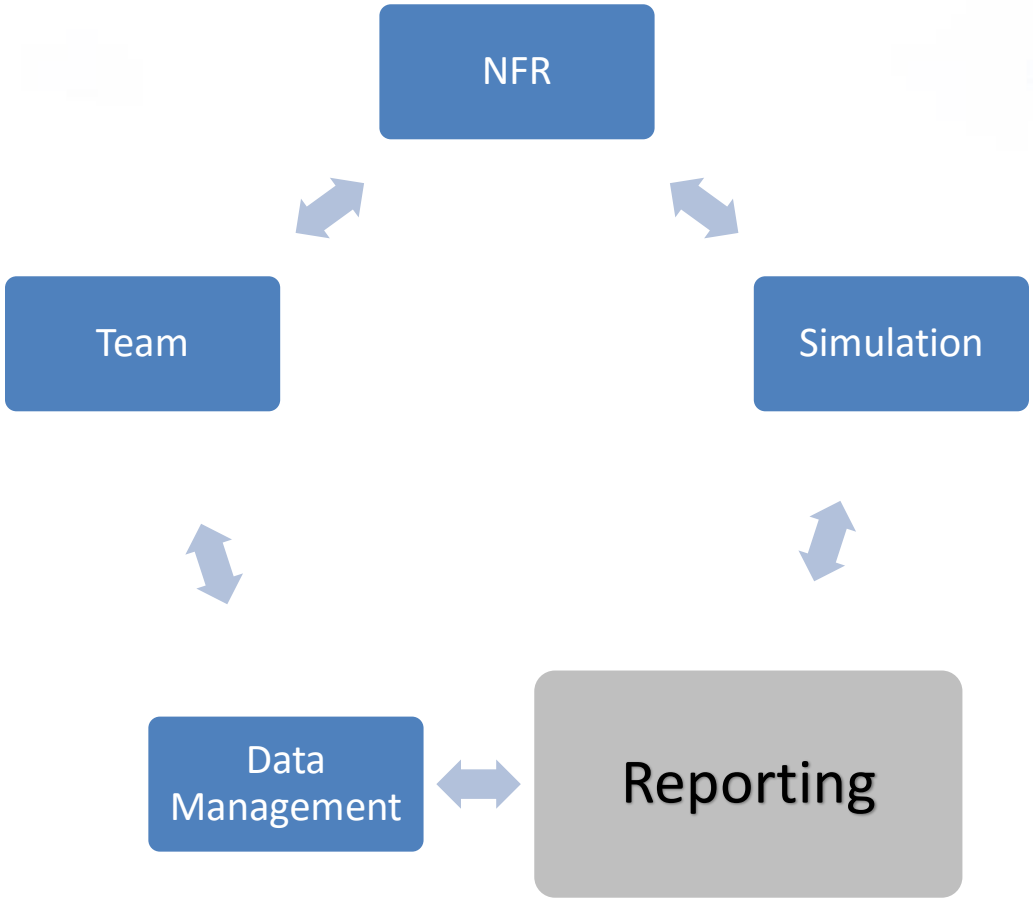


Modularized Scripts

- Action/Functions map to UCML
- Control via code OR tool feature



Composite: Effect on Testing



Reporting: KPI Comparison

Challenges

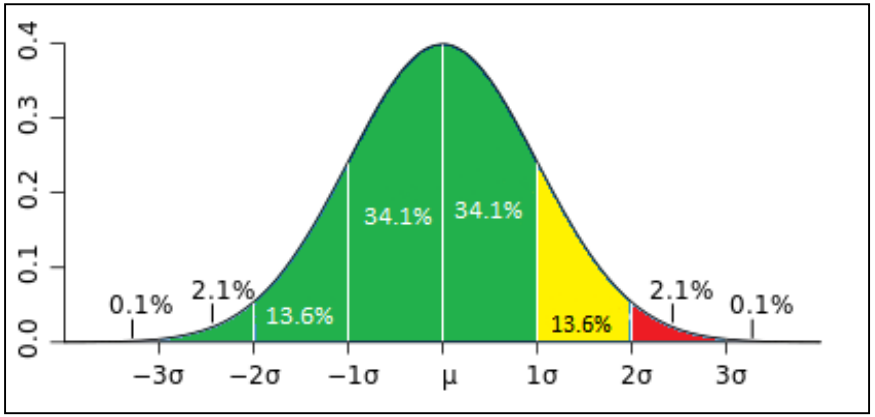
- Daily Tests
- Goals = Previous Release Avg. 3 “Green” + 10%
- Manual tracking via spreadsheet

Reporting: KPI Comparison

- Goals
  - Eliminate chasing *ghosts*
  - Improve performance of each Release
- Solutions
  - KPI Targets by Standard Deviation
  - Automated KPI Comparison

KPI by Standard Deviation

- Baseline = Best run from previous Release
- New Goals
  - Green <= Average Response Time + 1σ
  - Yellow <= Avg. Response Time + 2σ
  - Red >= Avg. Response Time + 2σ

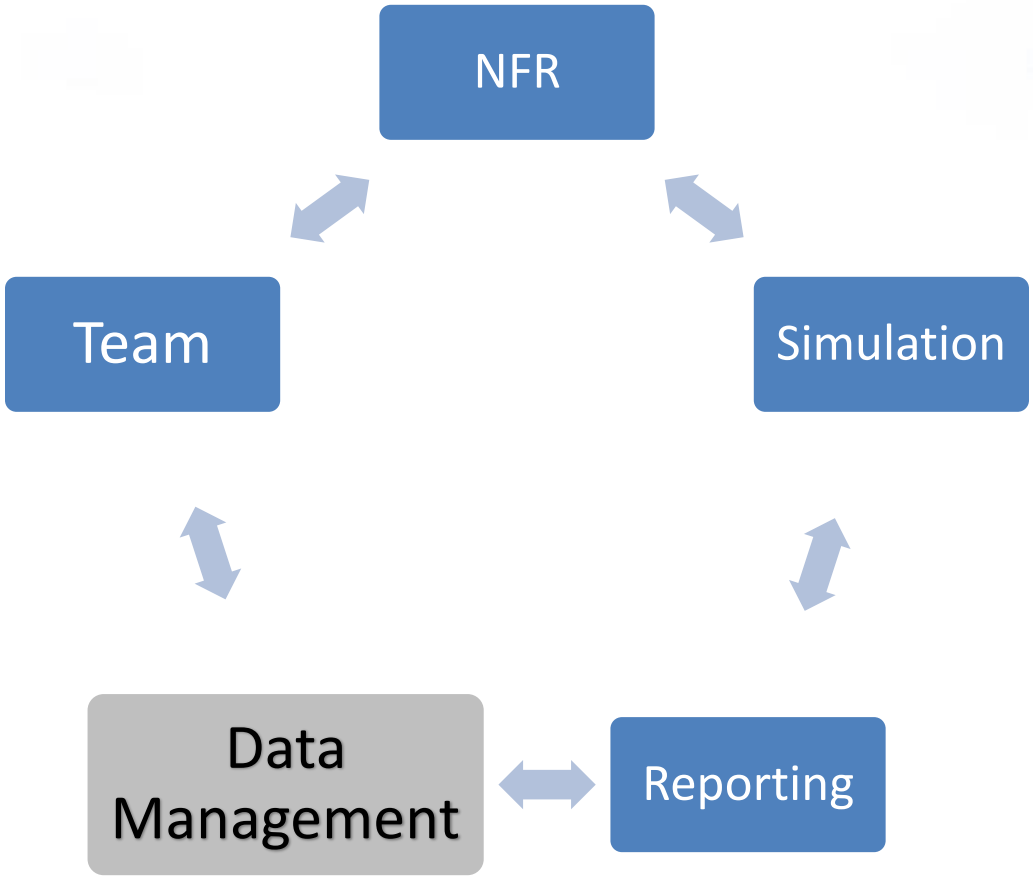


Automated KPI Sheet

- Excel macro mined results from tool with button click
- Dashboard for system health
- Faster Results
- Eliminate Human Factor

	A	B	D	E	F	G	H	I	M	N	O	P
1												
2	[redacted]			PM	AM	AM	AM	PM	PM	PM	AM	Delta
3		Transaction Name	Spring Goal - sec	16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep	
4	Target =	[redacted]	1.70	1.44	1.08	1.71	1.62	1.50	1.42	7.37	1.61	+0.09
5	Fall+10%	[redacted]	8.30	7.96	6.59	8.36	8.20	7.64	7.03	19.79	7.78	+0.52
6		[redacted]	3.30	3.00	2.40	3.13	2.88	3.05	2.87	20.87	2.83	+0.47
7		[redacted]	3.30	2.97	2.34	3.11	2.83	2.89	2.82	18.64	3.07	+0.23
8		[redacted]	1.00	0.81	0.64	0.85	0.78	0.83	0.85	8.23	0.83	+0.17
9		[redacted]	3.90	4.19	3.31	4.47	4.26	4.20	3.22	24.83	3.20	+0.70
10		[redacted]	1.50	1.31	1.03	1.33	1.21	1.26	1.34	8.18	1.42	+0.09
11		[redacted]	2.70	2.30	1.92	2.54	2.37	2.37	2.26	11.58	2.59	+0.11
12		[redacted]	4.10	3.74	3.00	3.76	3.54	3.76	3.63	18.44	3.56	+0.54
13												

Composite: Effect on Testing



Data Management

Challenges

- Varied mix of data storage
- Complex data requirements
- Little variability in existing data
- Production DB updates rare and costly

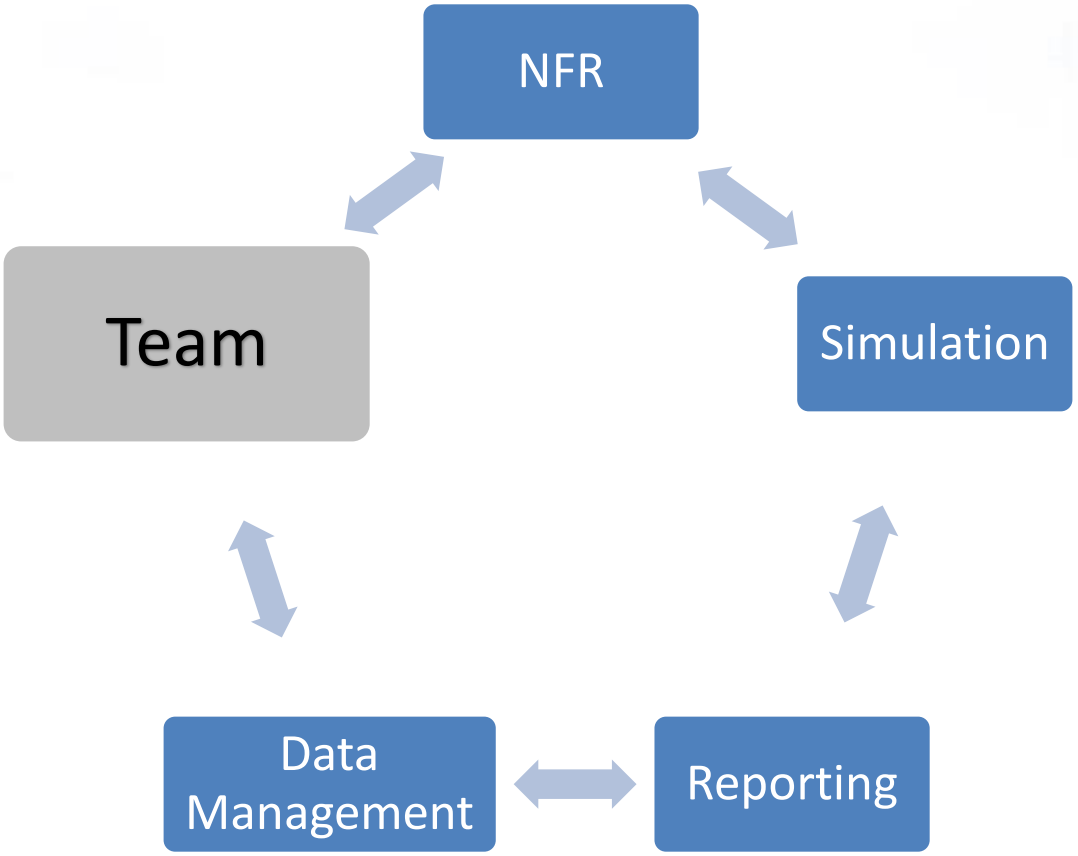
Data Management

- Goals
  - Consolidate to one data management solution
  - Repeatable data generation
- Solutions
  - Custom Data Warehouse created by team
  - Scheduled Data Generation

Data Management: VINO

- VINO = VTS Input ‘N’ Output
- Internally developed on top of existing tool
- Integrated with testing tools
- Stable, mature data storage system

Composite: Effect on Testing



Team

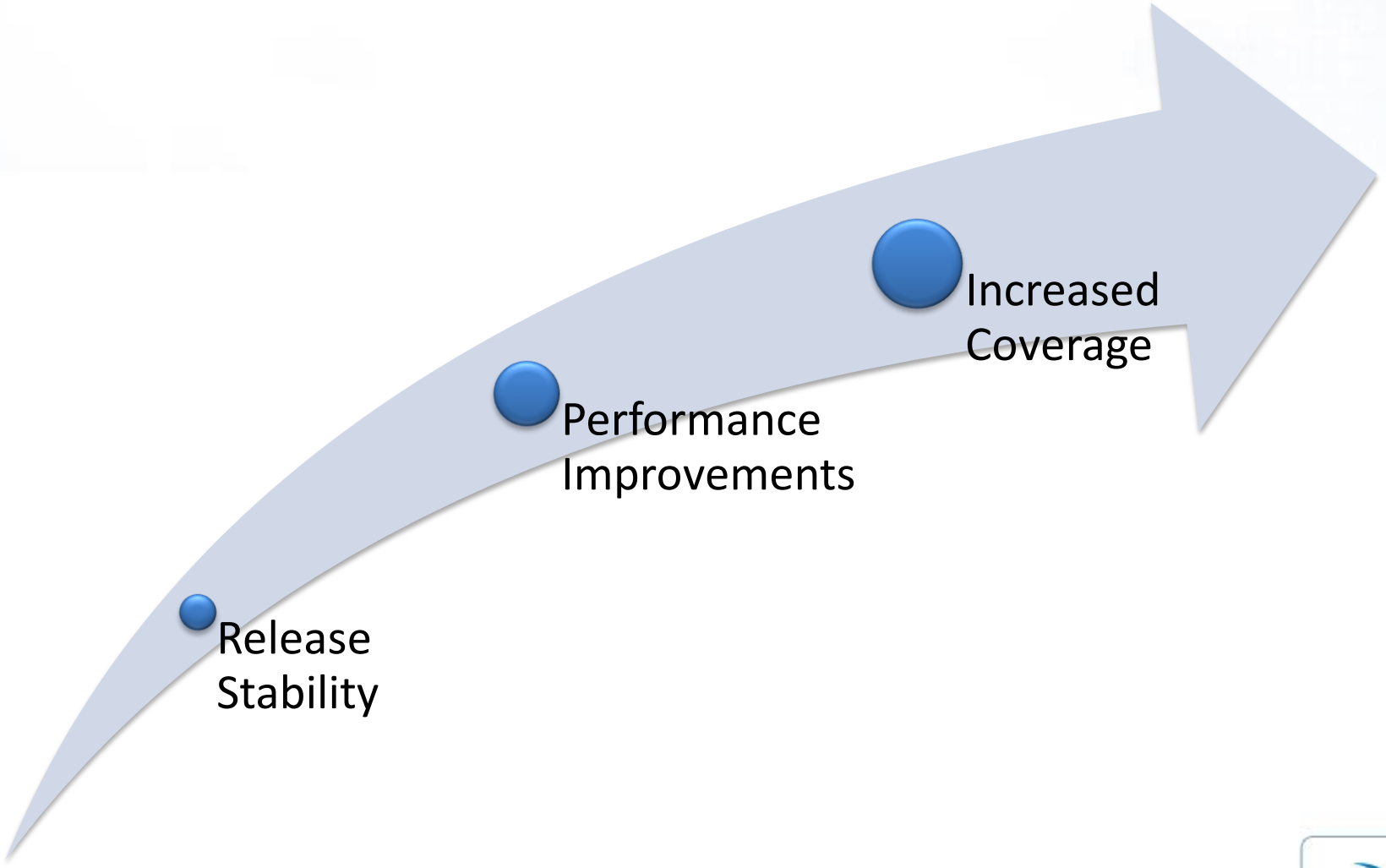
Challenges

- Small team
- Volatile schedule
- Performance test life cycle steps skipped

Team

- Goals
  - Support 3 builds per week
- Solutions
  - Mostly Rural Team
  - Continuous Testing

After-effects



Questions

Thank you!