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# Optimizing the Performance of Enterprise Applications

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**Shunra Virtual Enterprise**  
*The Leader in Network Emulation Solutions*

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# Optimizing the Performance of Enterprise Applications

IS YOUR APPLICATION **READY FOR THE NETWORK ?**

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# Agenda

- Application Performance: What Are Your Priorities?
- Business Trends Challenging Performance
- Case Study: Enterprise Oracle Application Performance
- Key Takeaways

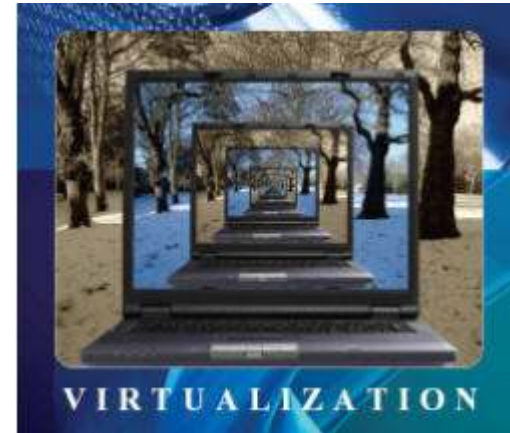
# State of the “Average” Enterprise

- Organizations average 6 business critical applications
- Deploying 4 new critical applications over next 2 years
- Only 42% of organizations satisfied with current performance of business critical applications
- Estimated impact of suboptimal application performance of corporate revenues =  9%

# What Are Your Priorities?

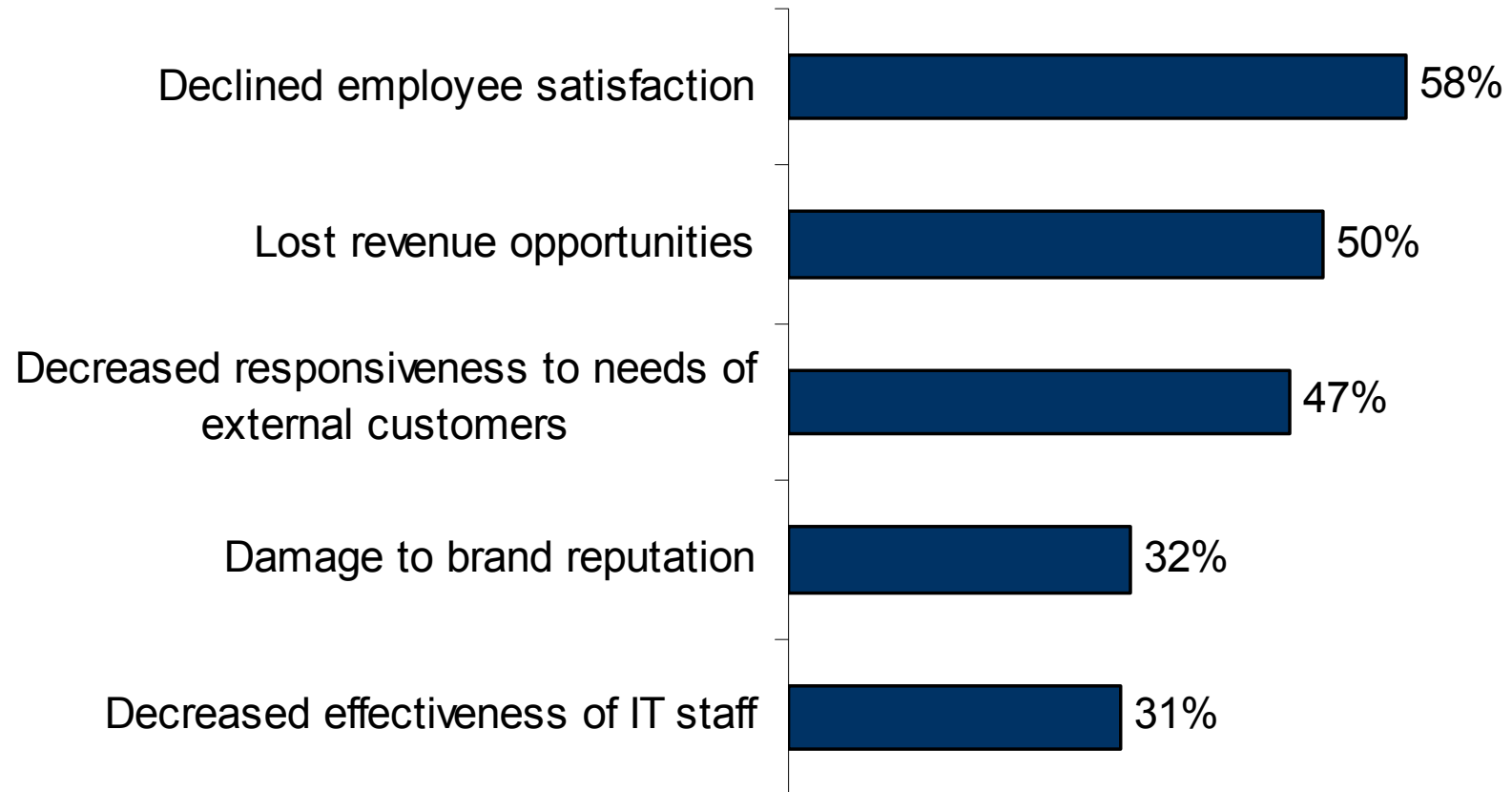
*Business Trends Challenging Application Performance*

- Virtualization
  - Data Center Relocation
  - Server Consolidation
  - Disaster Recovery
- IT Cost Reduction
  - VoIP
  - WAN Optimization/Acceleration
- Application Complexity
  - SOA Application Deployments



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# Why Should We Care about Performance?

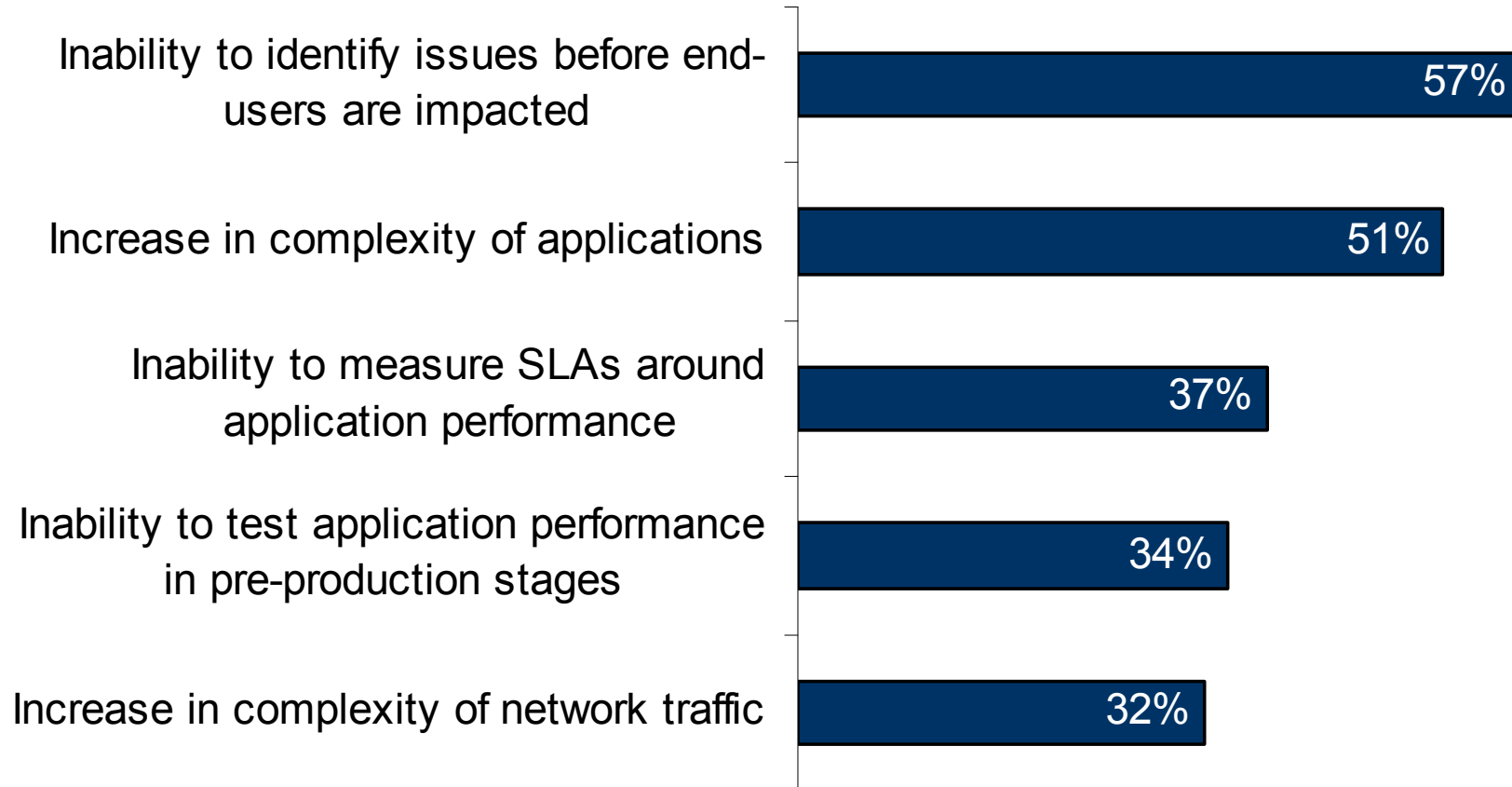


**Aberdeen Group** Application Performance Management Survey, August 2008  
A Harte-Hanks Company

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# What Are Your Priorities?

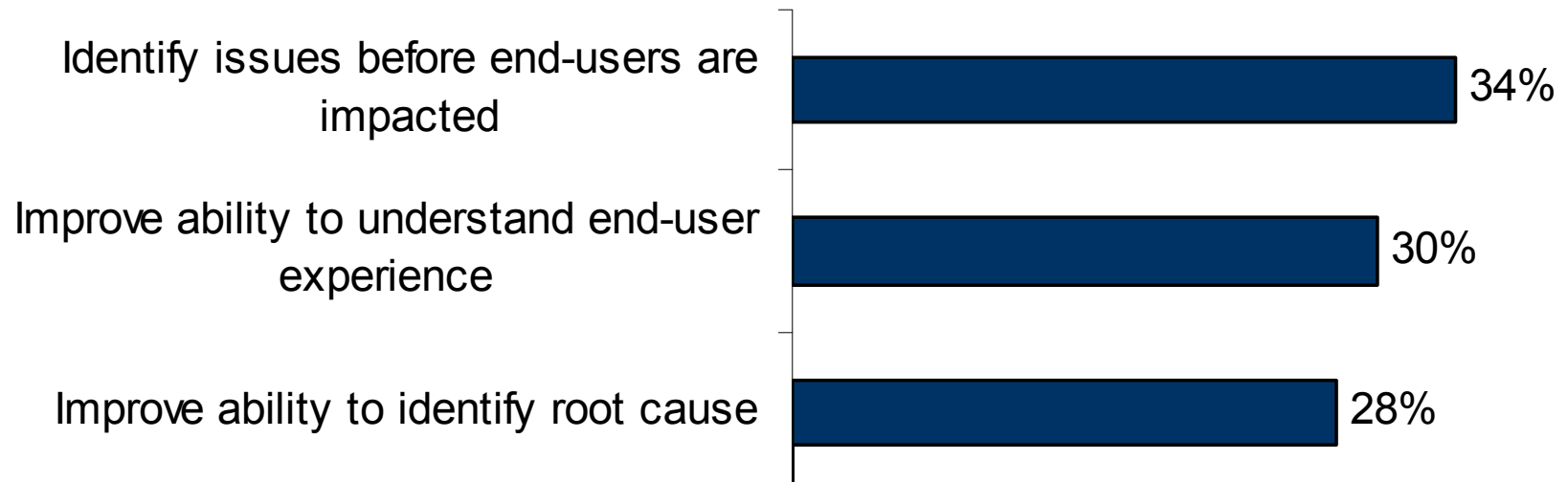
## *Top Application Performance Challenges*



**Aberdeen Group** Application Performance Management Survey, August 2008  
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# Top 3 Application Performance Management Needs



# Application Performance Improvement

## The Paradigm Shift - Innovative New Best Practice

*Pre-Deployment Application Testing  
Simulating Real-World Network Conditions in a  
Low Risk, Controllable Lab Environment*



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# Case Study: Enterprise Oracle Application

- Key Challenge



*U.S. Based Enterprise Expanding Deployment of Existing Application to European Location*

*Encountering Several Oracle Transactions Failing to Meet Application Performance Objectives*

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# Skyrocketing Transaction Response Times

Transaction	Baseline TRT [Sec]	Brussels TRT [sec]	App Turns	Total KB	KB per App Turn	Total Packets
OC_DATAENTRY_01_Launch	0.88	1.48	4	17.07	4.27	27
OC_DATAENTRY_02_Connect_to_DB	8.283	65	34	5694.02	167.47	6090
OC_DATAENTRY_03_Logon	1.062	2	11	12.06	1.1	19
OC_DATAENTRY_04_Expand_Data_Entry	0.385	1.17	7	4.51	0.64	10
OC_DATAENTRY_05_Select_Initial_Login_and_Entry	0.666	1.83	7	30.66	4.38	39
OC_DATAENTRY_06_Enter_Study	1.171	1.67	7	26.2	3.74	33
OC_DATAENTRY_07 Page 1	0.671	2.5	23	14.49	0.63	27
OC_DATAENTRY_08 Page 2	2.14	14.83	146	75.94	0.52	166
OC_DATAENTRY_09 Page 3	1.52	7.17	69	36.7	0.53	77
OC_DATAENTRY_10 Page 4	1.815	11.33	116	58.2	0.5	131
OC_DATAENTRY_11 Page 5	1.484	10.67	113	58.56	0.52	123
OC_DATAENTRY_12 Page 6	2.343	13.5	152	77.53	0.51	169

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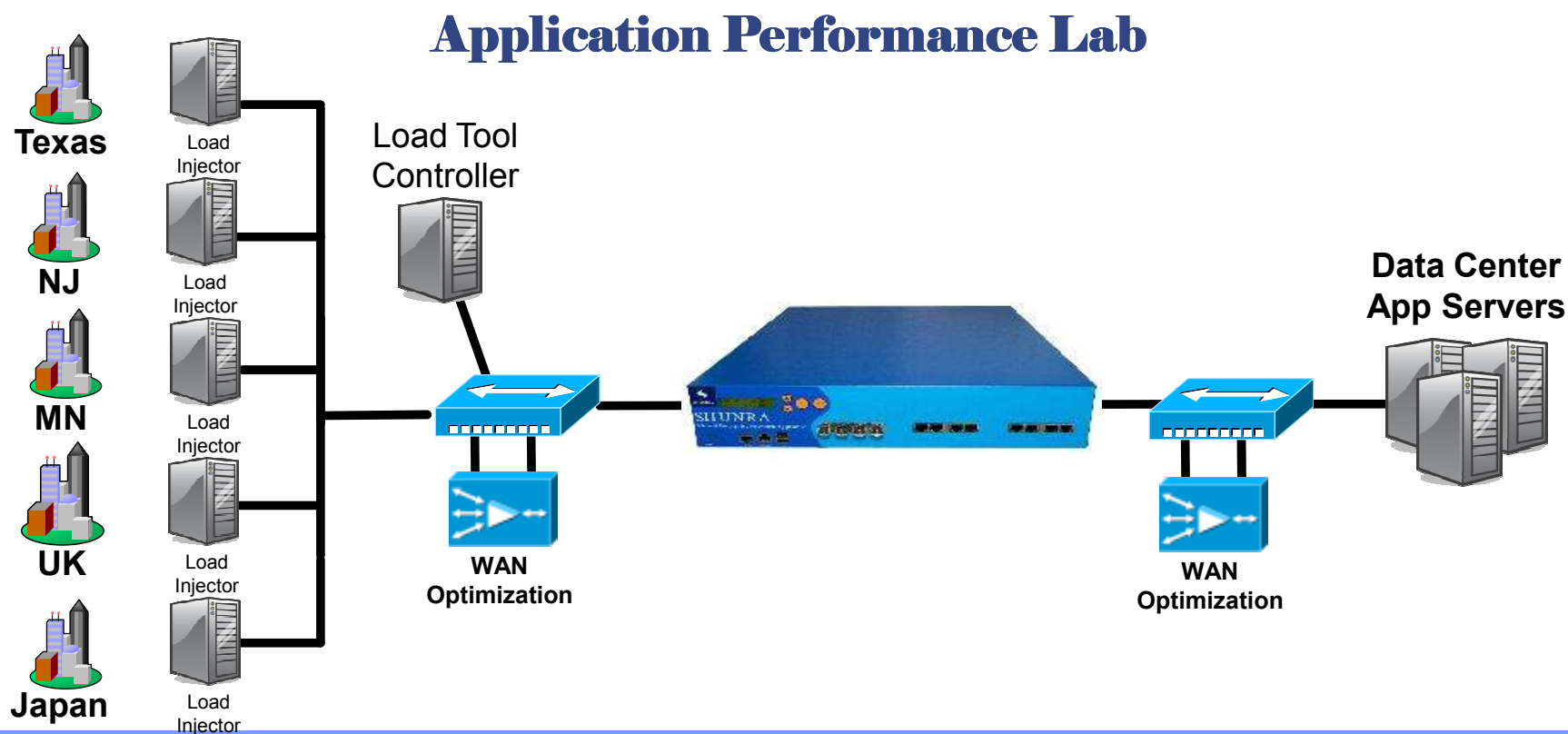
OC_DATAENTRY_24 Check Page 4	1.166	10	117	57.28	0.49	121
OC_DATAENTRY_25 Check Page 5	1.27	9.5	108	55.9	0.52	123
OC_DATAENTRY_26 Check Page 6	2.364	13.5	164	82.6	0.5	174
OC_DATAENTRY_27 Check Page 7	1.282	3.5	33	18.81	0.57	35
OC_DATAENTRY_28 Check Page 7_1	1.718	8.67	101	51.36	0.51	106
OC_DATAENTRY_29 Check Page 8	1.072	5.33	56	29.4	0.53	65
OC_DATAENTRY_30 Check Page 8_1	2.223	6.83	59	32.75	0.56	65
OC_DATAENTRY_31_Logout	1.656	2	5	2.99	0.6	11
OC_DISCMGMT_01_Launch	0.374	1.5	4	17.07	4.27	27
OC_DISCMGMT_02_Connect_to_DB	7.223	62.5	32	5687.37	177.73	6073

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# Pre-Deployment WAN-Aware Performance Testing

Step 1: Implement Application Performance Lab including Load Tool, App Servers, WAN Emulation Tool (and optional WAN Optimization).

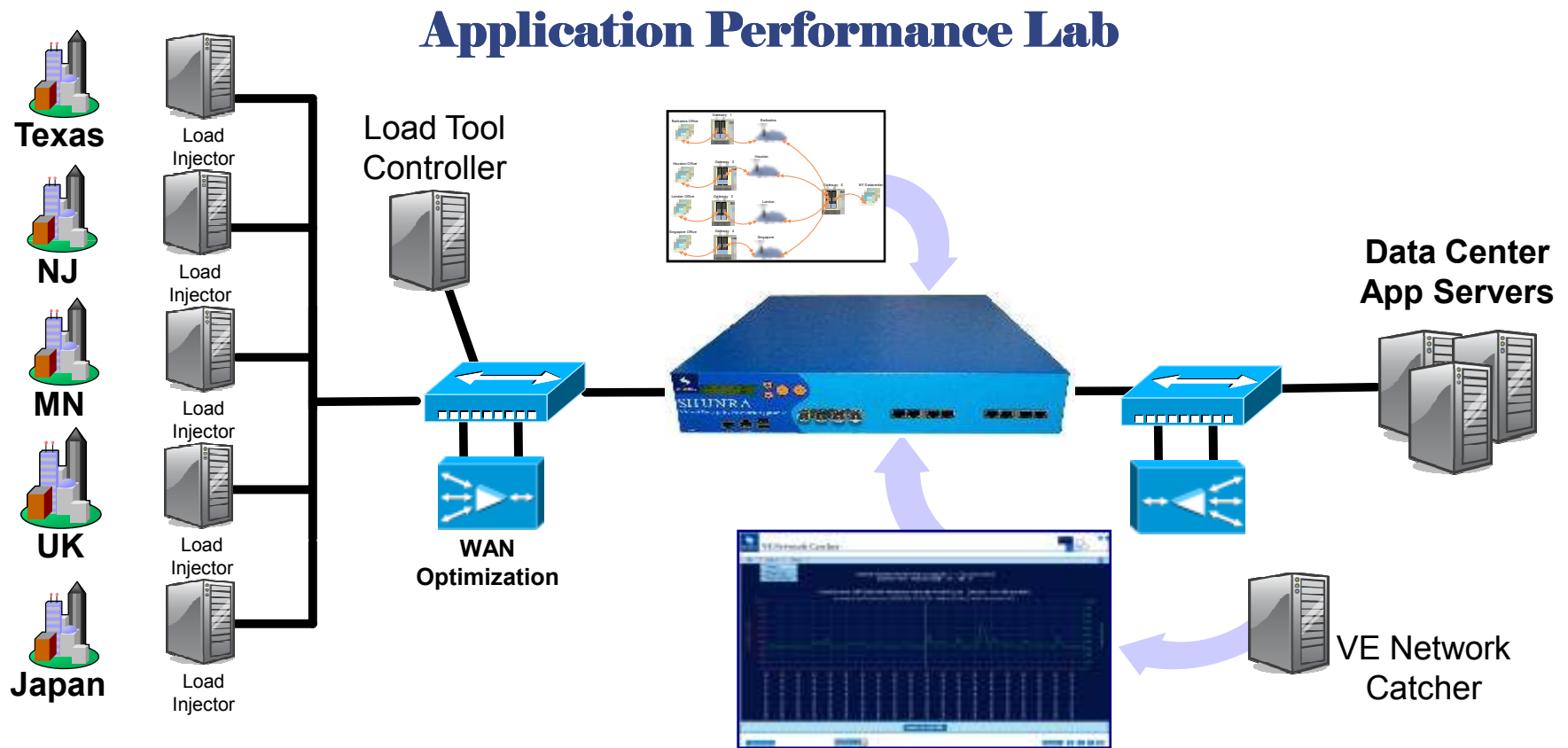
Step 2: Execute Business Process Scripts, Establish Performance Baseline.



# Pre-Deployment WAN-Aware Performance Testing

Step 3: Model the WAN & Import Production Network Behavior.

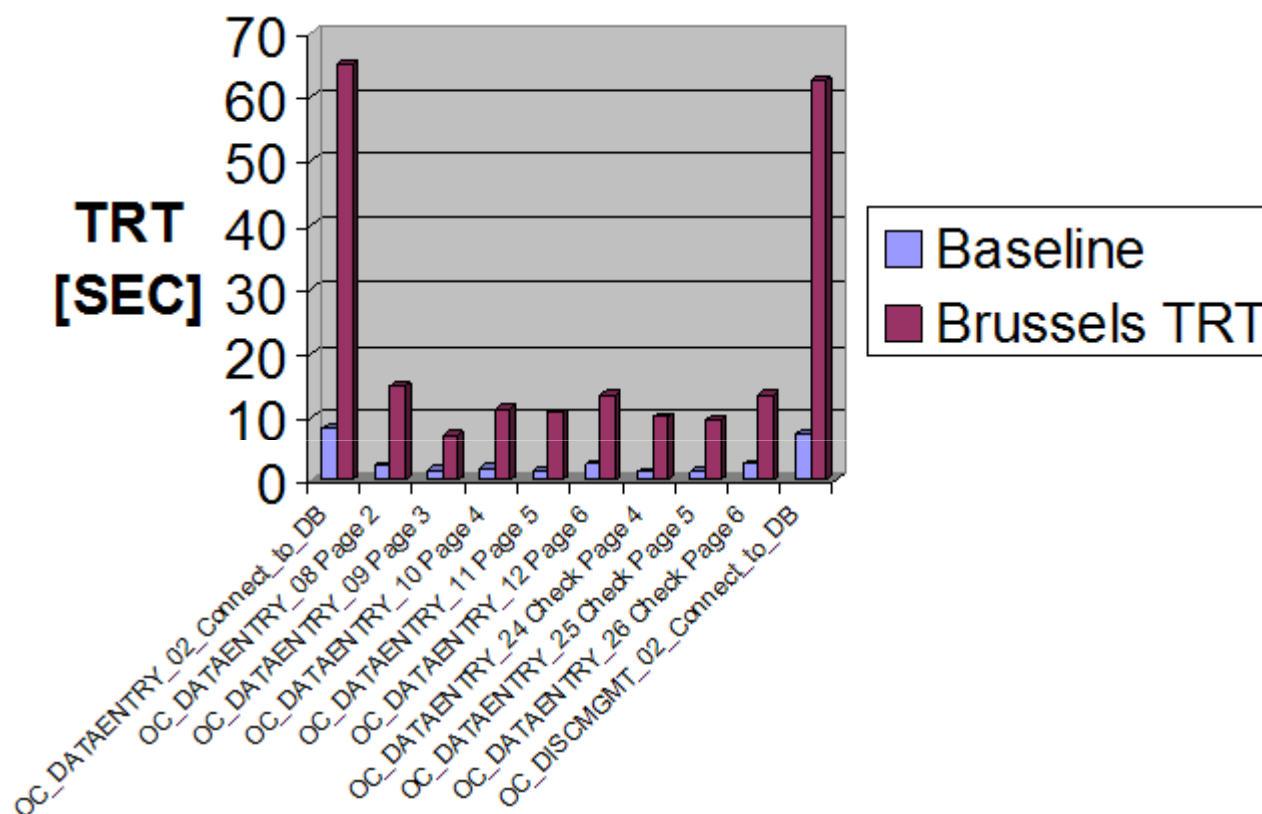
Step 4: Re-run Scripts, Measure Real-World Application Performance.



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# Analyze Application Performance Problem

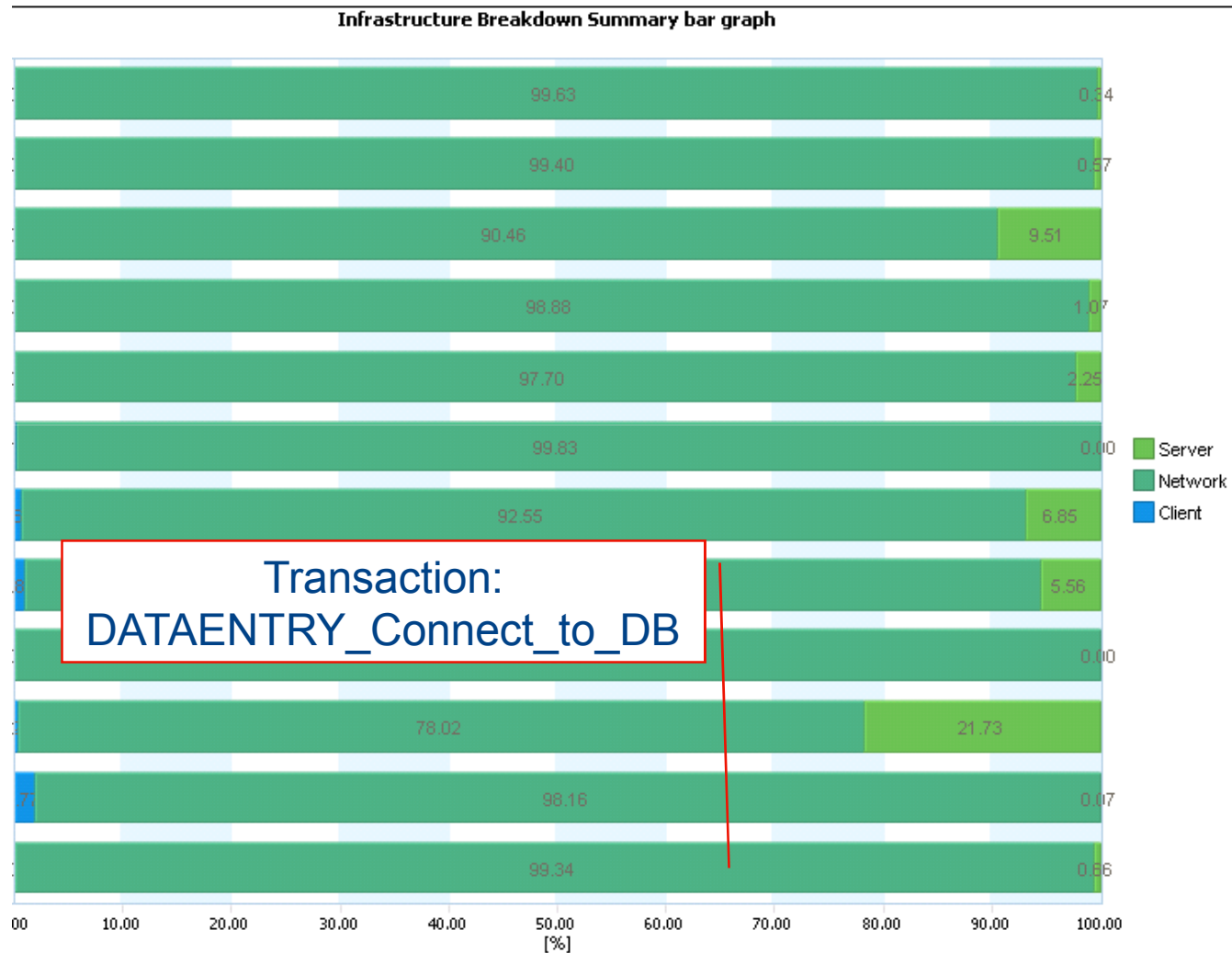
## Step 5: Analyze App Performance - by Location, Transaction, User Load



This report shows response time impact users will experience after deployed to Brussels = 8 to 10X increase in response time.

# Analyze Application Performance Problem

- Client-Network-Server Breakdown - network bound in this case



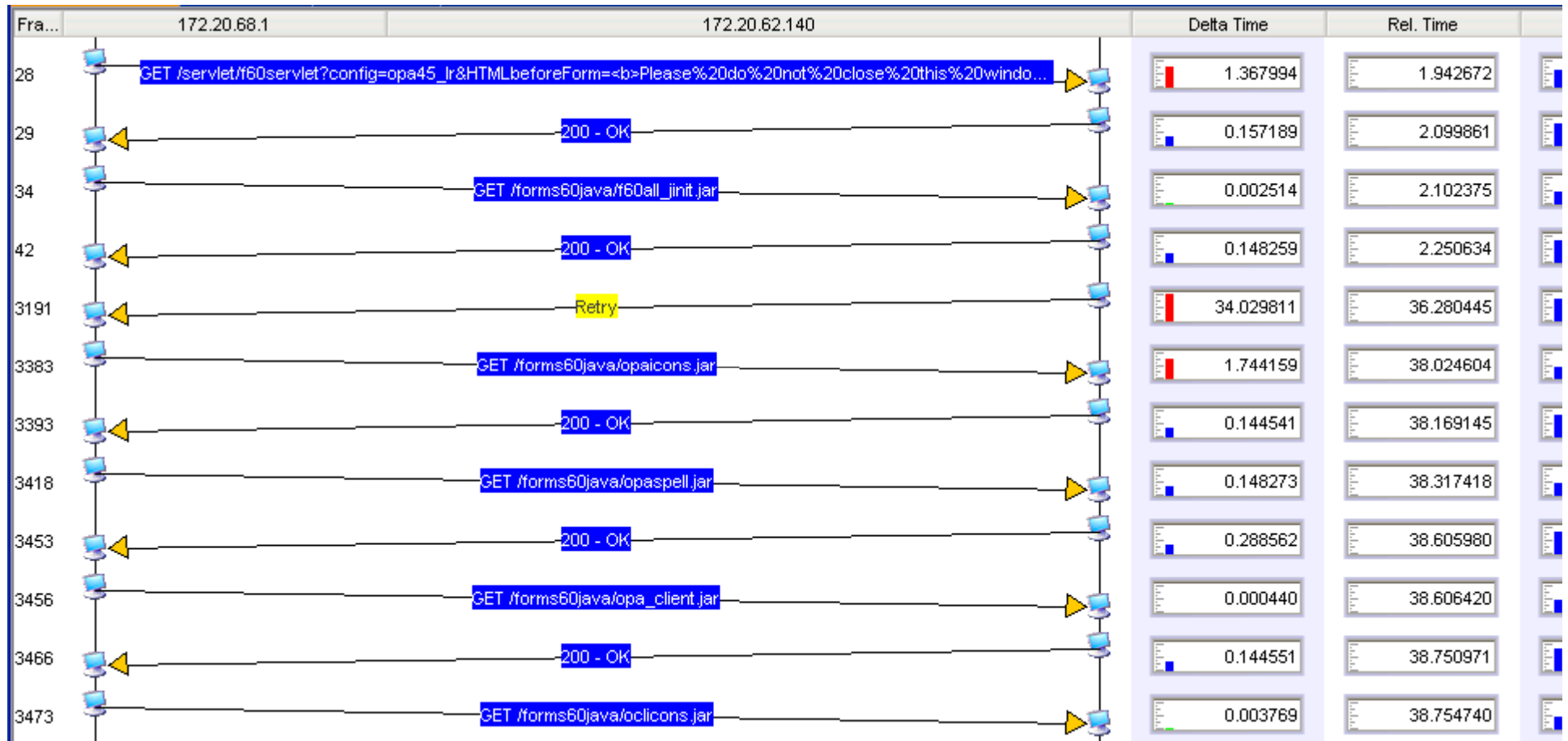
# Analyze Application Performance Problem

## Transaction: DATAENTRY Connect to DB

- Transaction Time: 65 seconds
- 2 key components take a long time to download - over 57 seconds for these 2:
  - f60all\_linit.jar, pharmaocgle.jar
- Fetching 2 JAR files generate hundreds of TCP turns
- 70 msec WAN latency to Brussels \* ~900 TCP turns = ~63 seconds of blocking time waiting for packets to turn across the network

# DATAENTRY\_Connect\_to\_DB

*First JAR file took 35 seconds to download*



# Improve Application Performance

## Step 6: Implement Corrective Action to Improve Application Performance

- Server Infrastructure Improvement Options
  - Server Scaling, Load Balancing, etc.
- Application Code Improvements Options
- Network Infrastructure Improvement Options
  - WAN Optimization, Increasing Bandwidth, QoS

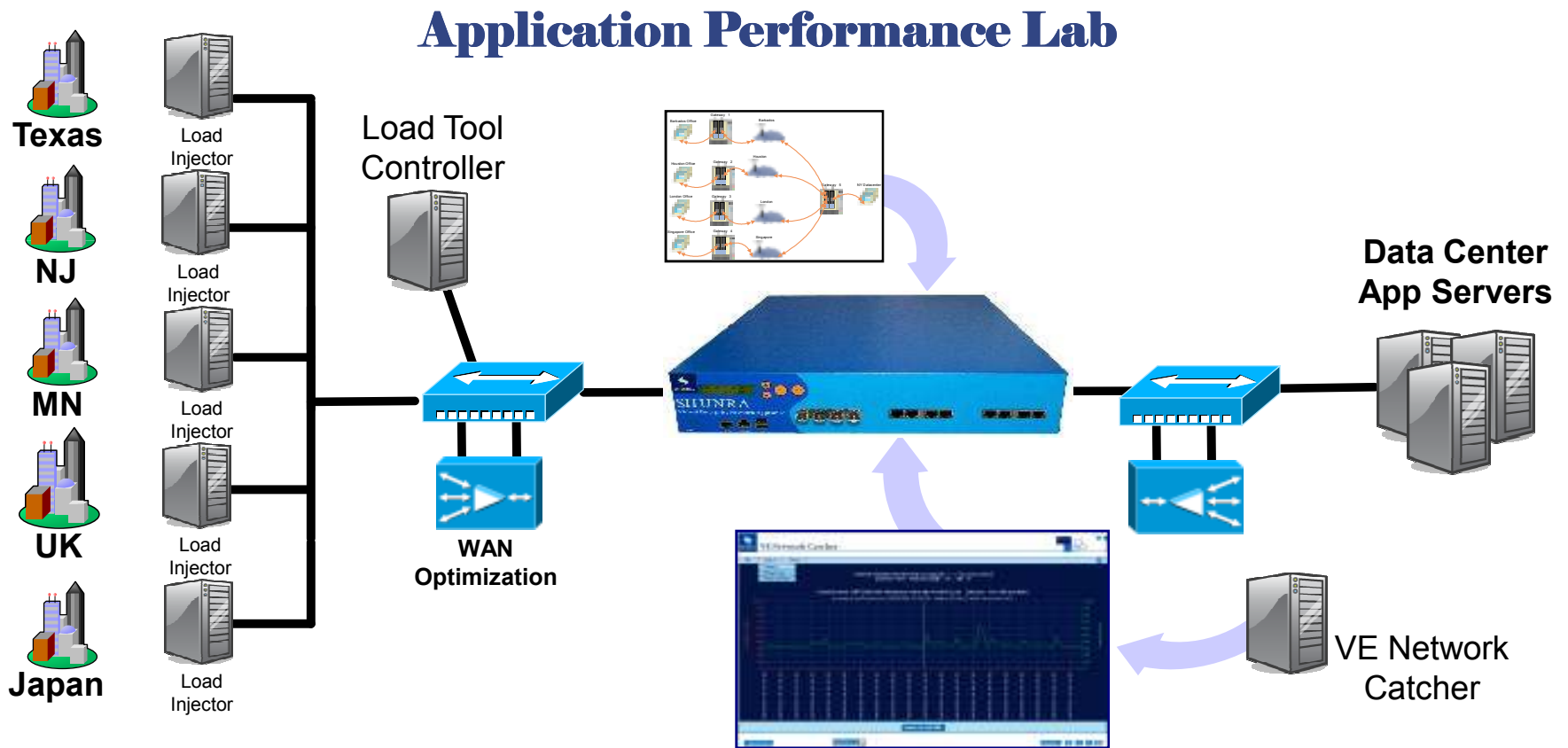
# Recommendations in this Example

Transaction: DATAENTRY\_Connect\_to\_DB

- See if the size of the 2 jar files can be reduced
- Increase TCP window size on the server to 1 MB (even 512 Kbps should show a big improvement)
- Some of the issues could be improved with the use of a WAN Accelerator
  - Run the test with a WAN Accelerator in the lab; expectation of at least 20-30% response time reduction

# Pre-Deployment WAN-Aware Performance Testing

## Step 7: Validate Improvements in Application Performance Lab



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# Key Takeaways

- Develop capabilities for predicting and analyzing application response times prior to deployment
- Develop capabilities for measuring and analyzing application response times for each transaction
- Develop capabilities for measuring the quality of the end-user experience

Implement a Pre-Deployment Network-Aware Performance Testing Best Practice to get control of application performance on your network

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