



AutoPilot Transaction Tracking Introduction

**Richard Nikula
VP, Product
Development and
Support**



Introduction

Richard Nikula

- VP of Product Development and Support

Management software for “middleware”
since 1985

Involved in “MQ” since early 90’s

- Primarily at the technology layer
- Various certifications

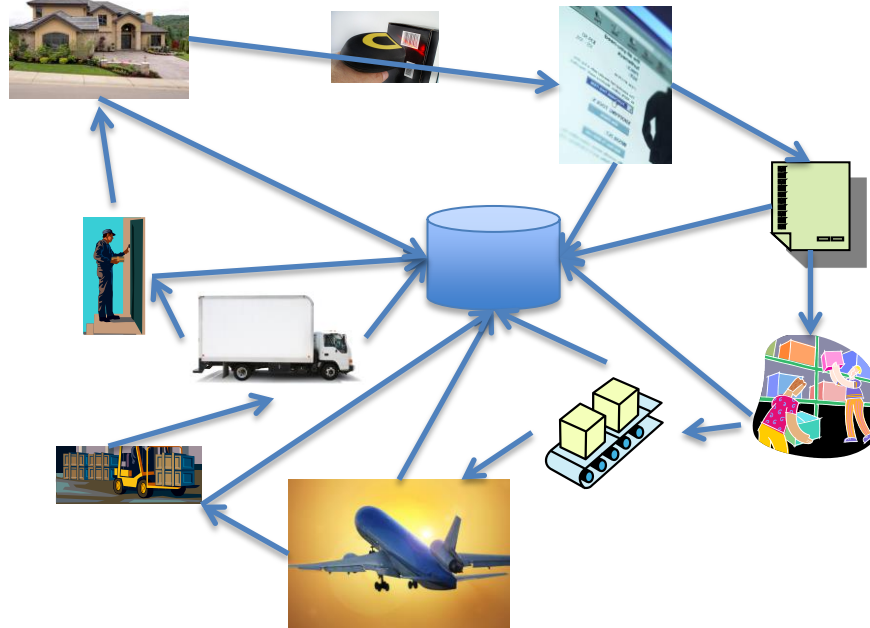
About Nastel Technologies

- Founded in 1994
- Middleware-centric Application Performance Management software supplier
- Core competency : Messaging Middleware, Java Application Servers, ESB's and other SOA technologies



Concepts of Transaction Tracing

Similar to Package Tracking



- A combination of disjoint technologies
- The results of mergers and acquisitions at various times
- Cost and timeliness are primary concerns
- No matter how fast you deliver, someone wants it quicker

Types of Questions You Might Have

End Customer

- Where is my package?
- Is my package progressing as planned?

Package Company Manager

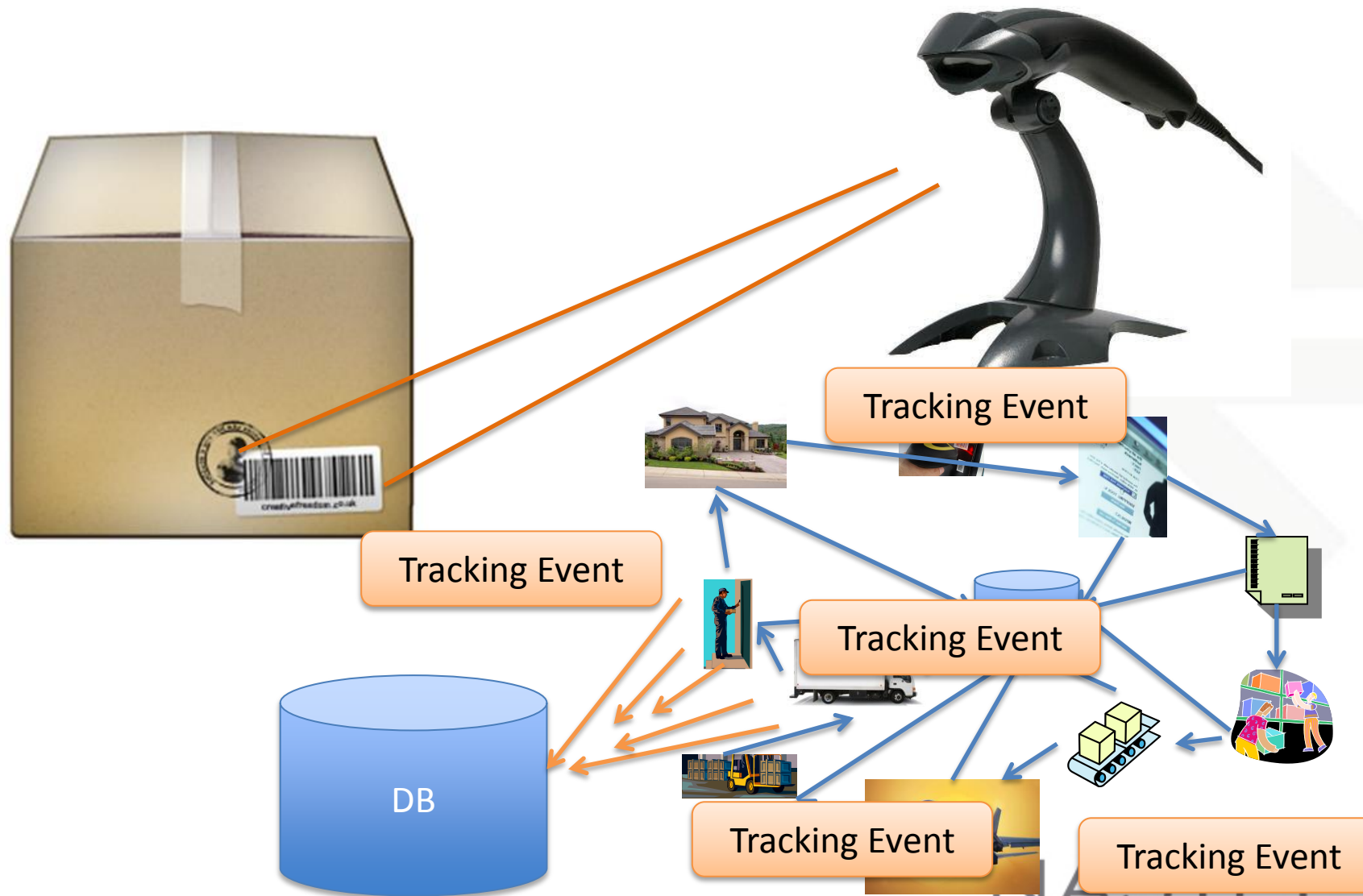
- Are packages being delivered on time?
- Where are the bottlenecks?
- Where do the most problems come from?
- What can I expect for tomorrow?

Technician

- Where can we make improvements?
- What happened to package “12345”?



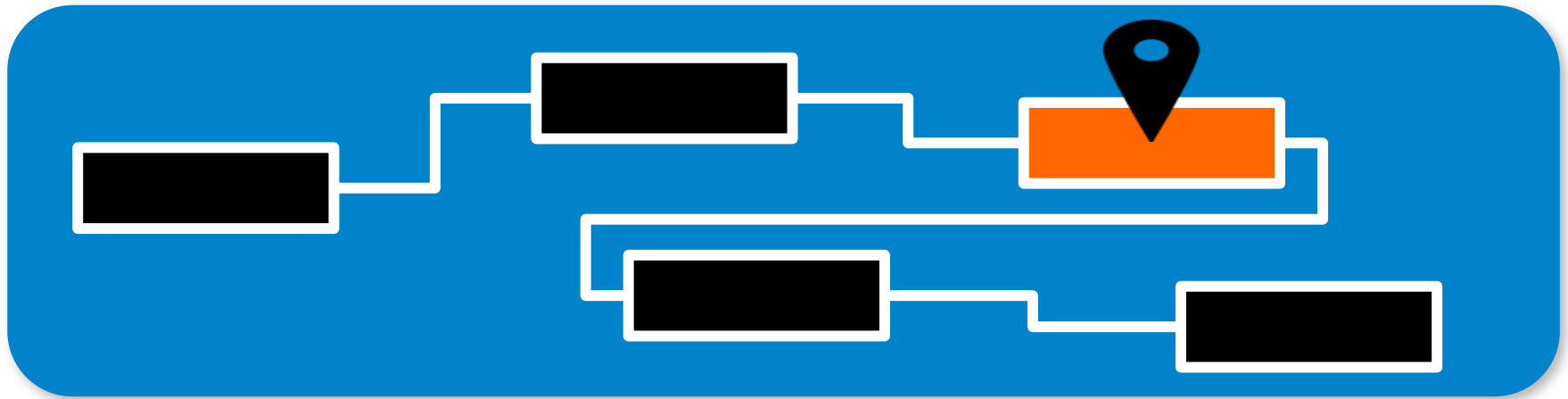
How do they Track packages?



The background is a solid blue color. Overlaid on this is a faint, light-blue abstract diagram. The diagram consists of several interconnected nodes, represented by oval shapes, connected by thin lines. One node is particularly large and prominent in the lower right. To the left of the main text, there is a faint, semi-transparent image of a magnifying glass, suggesting a focus or search function.

Transaction Tracking For MQ

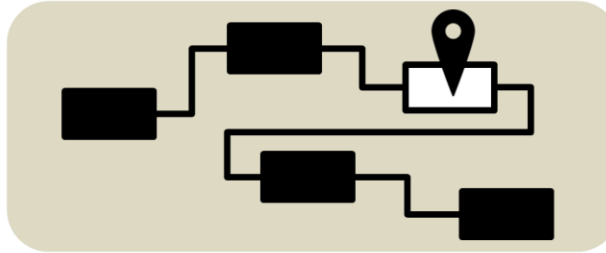
AutoPilot® M6 : Transaction Tracking



- Graphical view of transaction flows
- Details of each operation within a transaction flow
- Create Transaction Groups and SLA's in a few clicks
- Pinpoint SLA breaches
- Criteria-based search of transactions
- Real-time and historical analysis

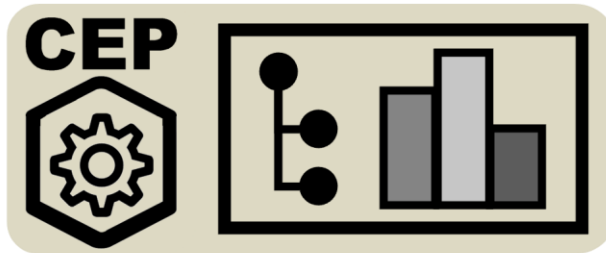
AutoPilot® M6 TransactionWorks : What is it?

AutoPilot® M6 TransactionWorks® **EXPLORER**



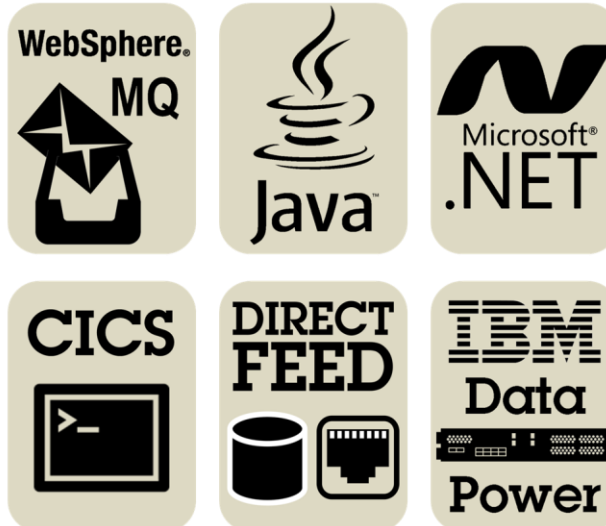
- Real-time transaction analysis
- Historical transaction audit trail

AutoPilot® M6 TransactionWorks® **ANALYZER**



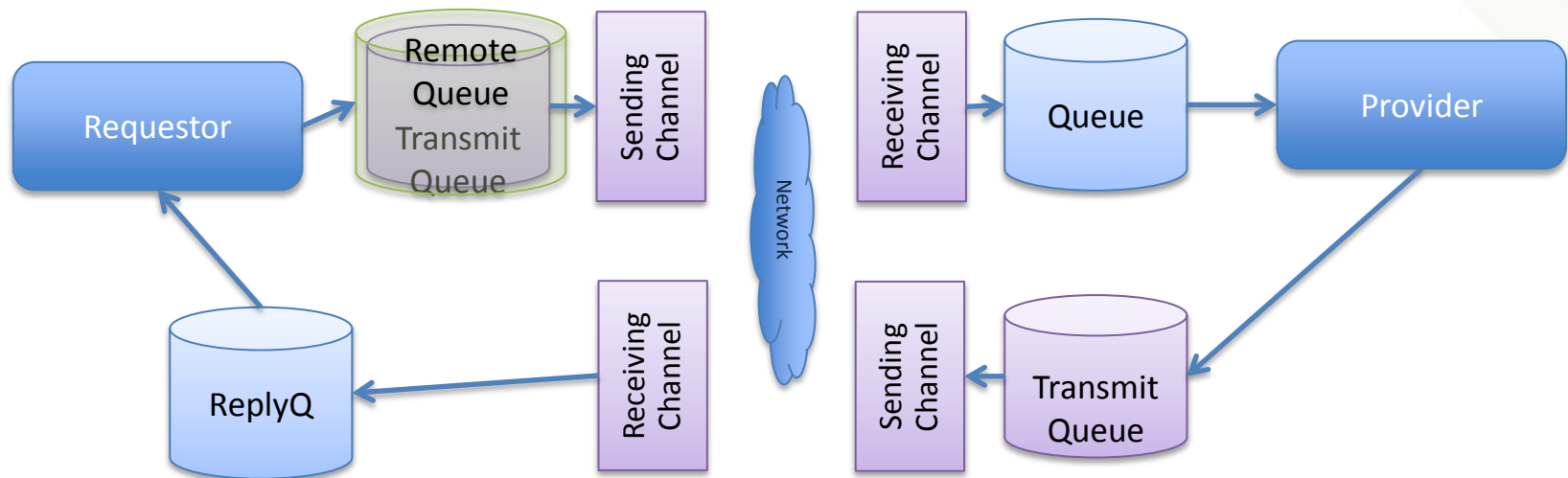
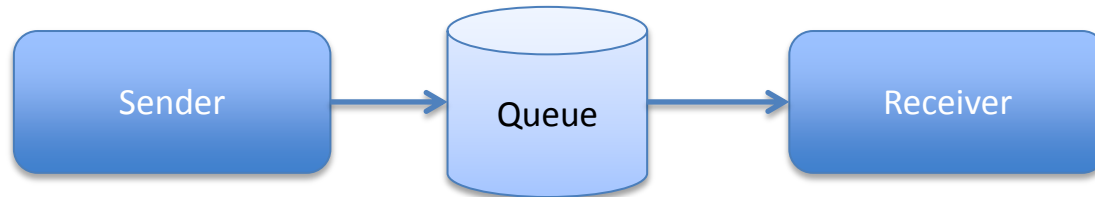
- Easy to define SLA's
- Transaction database
- CEP engine
- Automatic transaction "stitching"

AutoPilot® M6 TransactionWorks® **PROBES**



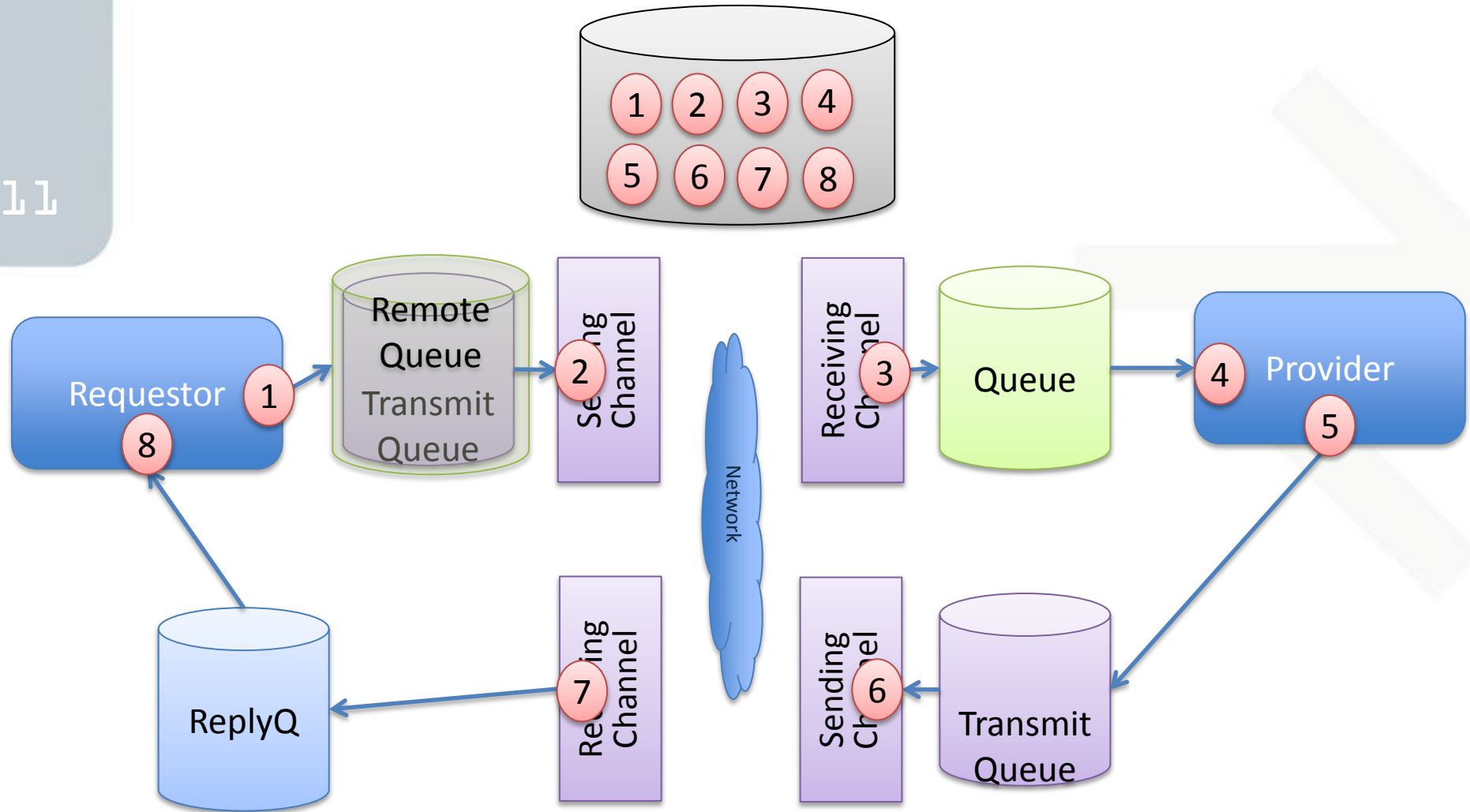
- Probes :Java, .NET, WMQ, CICS, DataPower, Direct Feed
- End-to-End
- Web to Legacy

“Typical” MQ Transactions Patterns



With Remote Queueing

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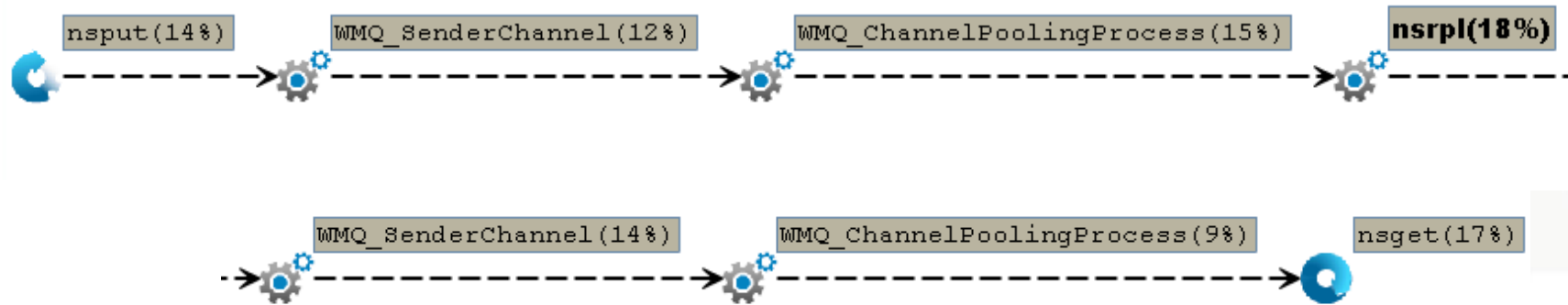
Message Intercept using MQ

Captures details about the message

- Header details (time sent, size, ...)
- Application details
- All or part of payload



Simple Message Flow



Time	Application	Operation Name	Resource	Elapsed Time (usec)	Message Id	Message Age (usec)	Resource Manager	Completion Code	Server	Ma
2013-09-22 22:15:24.001	nsput	MQPUT	TEST_RQ	29	1	0	DESKTOP99_QMGR	Succeeded	DESKTOP99	Mes
2013-09-22 22:15:24.003	nsput	MQCMIT	DESKTOP99_QMGR	0		0	DESKTOP99_QMGR	Succeeded	DESKTOP99	Mes
2013-09-22 22:15:35.424	WMQ_SenderChannel	MQGET	MB8QMGR	24	1	11424000	DESKTOP99_QMGR	Succeeded	DESKTOP99	Mes
2013-09-22 22:15:35.465	WMQ_ChannelPoolingProcess	MQPUT	TEST	30	1	0	MB8QMGR	Succeeded	DESKTOP99	Mes
2013-09-22 22:15:46.062	nsrpl	MQGET	TEST	45	1	22062000	MB8QMGR	Succeeded	DESKTOP99	Mes
2013-09-22 22:15:46.062	nsrpl	MQPUT	TEST_REPLY_RQ	24	2	0	MB8QMGR	Succeeded	DESKTOP99	Mes
2013-09-22 22:15:46.067	nsrpl	MQCMIT	MB8QMGR	0		0	MB8QMGR	Succeeded	DESKTOP99	Mes
2013-09-22 22:15:57.886	WMQ_SenderChannel	MQGET	DESKTOP99_QMGR	23	2	10826000	MB8QMGR	Succeeded	DESKTOP99	Mes
2013-09-22 22:15:57.886	WMQ_ChannelPoolingProcess	MQPUT	TEST_REPLY	33	2	0	DESKTOP99_QMGR	Succeeded	DESKTOP99	Mes
2013-09-22 22:16:02.070	nsget	MQGET	TEST_REPLY	36	2	16009000	DESKTOP99_QMGR	Succeeded	DESKTOP99	Mes
2013-09-22 22:16:02.072	nsget	MQCMIT	DESKTOP99_QMGR	0		0	DESKTOP99_QMGR	Succeeded	DESKTOP99	Mes

Sample display

Transaction Flow Diagram Transaction Timeline Transaction Trace(3) Transaction Milestones

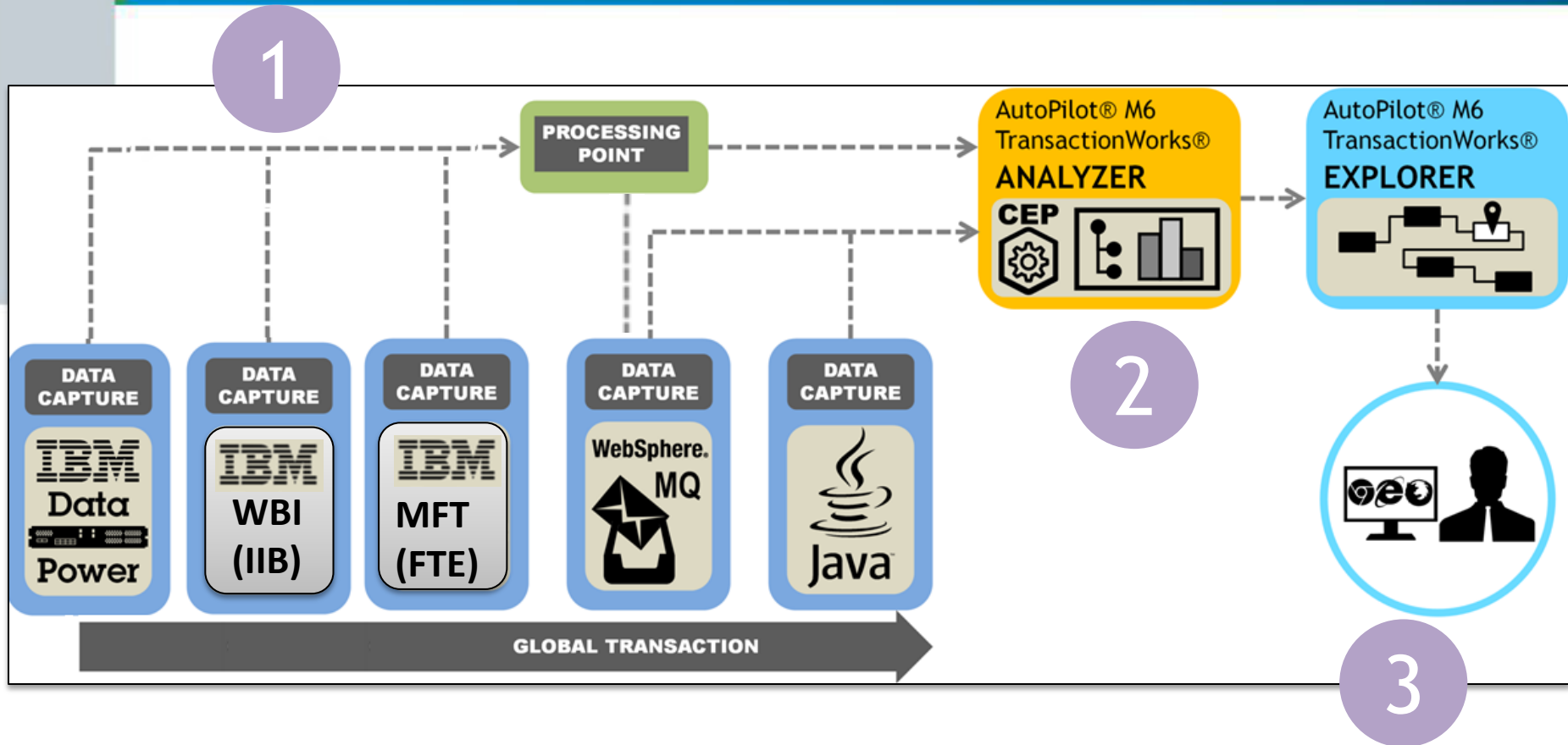
☐ Show Hierarchy

Time	Application	Operation Name	Resource	Resource Manager	Elapsed Time (usec)	Completion Code ▲	Reason Code
2015-06-01 10:52:15.000	amqspu	MQPUT	To.PayRoll.Primary	LocalQM1	69	Succeeded	0
2015-06-01 10:52:18.000	WMQ_ChannelPooling...	MQPUT	PayRoll.Primary	RemoteQM1	68	Succeeded	0
2015-06-01 10:52:24.000	amqsgetc	MQGET	PayRoll.Primary	RemoteQM1	39	Succeeded	0



Combined Flows

Other Transaction Monitoring



Example

MPGW Flows can be tracked by capturing the flow tracking events

Transaction Group > Summary > Trace Details

Show : From : 2014-04-21 1 : 40 : 00 PM To : 2014-04-21 1 : 50 : 00 PM Show

Trace

Start Date	Applications	Transaction Status	SLA Status	SLA Status Text	Workload (HH:MM:SS.mm)	Transaction Duration	Operations	Messages
2014-04-21 13:40:24	Demo_Gateway	Complete		Within SLA	0:00:00.000	0:00:05.454	2	

Transaction ID 14997

Transaction Flow Diagram Transaction Timeline Transaction Trace(2) Transaction Milestones

☐ Show Hierarchy

Time	Application	Operation Name	Resource	Elapsed Time (usec)	Server	Message Id	Completion Code
2014-04-21 13:40:24.392	Demo_Gateway	0:ProcessingPolicy_rule_0	ProcessingPolicy	0	IX52	1	Succeeded
2014-04-21 13:40:30.846	Demo_Gateway	2:ProcessingPolicy_rule_0	ProcessingPolicy	0	IX52	2	Succeeded

Failure Code

Transaction Group > Summary > Trace Details

Show: Select From: 2014-04-21 5 : 10 : 00 PM To: 2014-04-21 5 : 20 : 00 PM Show

Trace

Start Date	Applications	Transaction Status	SLA Status	SLA Status Text	Workload (HH:MM:SS.mm)	Transaction Duration	Operations	Messages	Transaction
2014-04-21 15:33:12	DataPowerEngi...	Failed ✖	2400.00%	Missed SLA ⚠	0:00:00.083	0:02:00.080	4	2	15059

Transaction ID 15059

Transaction Flow Diagram Transaction Timeline Transaction Trace(4) Transaction Milestones

☐ Show Hierarchy

Time	Application	Operation Name	Resource	Elapsed Time (usec)	Message Id	Completion Code	Reason Code	Message
2014-04-21 15:33:12.573	injector	MQPUT	FRONT.GET	49	1	Succeeded ☑	0	
2014-04-21 15:33:12.580	DataPowerEngine	MQGET	FRONT.GET	20257516	1	Succeeded ☑	0	
2014-04-21 15:33:12.584	injector	MQCMIT	MB8QMGR	0		Succeeded	0	
2014-04-21 15:35:12.584	DataPowerEngine	MQPUT	FRONT.GET.REPLY	69338	4	Failed ✖	2053	

Queue Full

Ability to See the Combined Flow

Transaction Group > Summary > Trace Details

TEL[®]
Transaction Performance[®]

Show: From: 2014-04-21 5 : 10 : 00 PM To: 2014-04-21 5 : 20 : 00 PM

Trace

Start Date	Applications	Transaction Status	SLA Status	SLA Status Text	Workload (HH:MM:SS.mm)	Transaction Duration	Operations	Messages	Transaction ID	Transaction Groups
2014-04-21 17:11:34	DataPowerEngi...	Complete	300.00%	Missed SLA	0:00:15.610	0:00:15.603	15	8	15139	TradeApp

Transaction ID 15139

Transaction Flow Diagram Transaction Timeline Transaction Trace(15) Transaction Milestones

☐ Show Hierarchy

Time	Application	Operation Name	Resource	Resource Manager	Message Id	Completion Code	Correlator	User	Reason
2014-04-21 17:11:34.349	injector	MQPUT	FRONT.GET	MB8QMGR	1		Succeeded	TWD655556	rnikula
2014-04-21 17:11:34.355	DataPowerEngine	MQGET	FRONT.GET	MB8QMGR	1		Succeeded	TWD655556	MUSR_MQADMIN
2014-04-21 17:11:34.359	DataPowerEngine	MQPUT	DataPowerLogAsynch	MB8QMGR	3		Succeeded	TWD655556	MUSR_MQADMIN
2014-04-21 17:11:34.360	DataPowerEngine	MQPUT	BACK.REQUEST2						
2014-04-21 17:11:34.361	injector	MQCMIT	MB8QMGR						
2014-04-21 17:11:37.914	Demo_Gateway	0:ProcessingPolicy_rule_0	ProcessingPolicy						
2014-04-21 17:11:43.363	verifyapp	MQGET	BACK.REQUEST2						
2014-04-21 17:11:43.363	verifyapp	MQPUT	BACK.REPLY						
2014-04-21 17:11:43.367	DataPowerEngine	MQGET	BACK.REPLY						
2014-04-21 17:11:43.370	DataPowerEngine	MQPUT	DataPowerLogAsynch						
2014-04-21 17:11:43.373	DataPowerEngine	MQPUT	FRONT.GET.REPLY						
2014-04-21 17:11:43.373	verifyapp	MQCMIT	MB8QMGR						
2014-04-21 17:11:46.925	Demo_Gateway	2:ProcessingPolicy_rule_0	ProcessingPolicy						
2014-04-21 17:11:50.943	finalizer	MQGET	FRONT.GET.REPLY						
2014-04-21 17:11:50.953	finalizer	MQCMIT	MB8QMGR						

Message Content

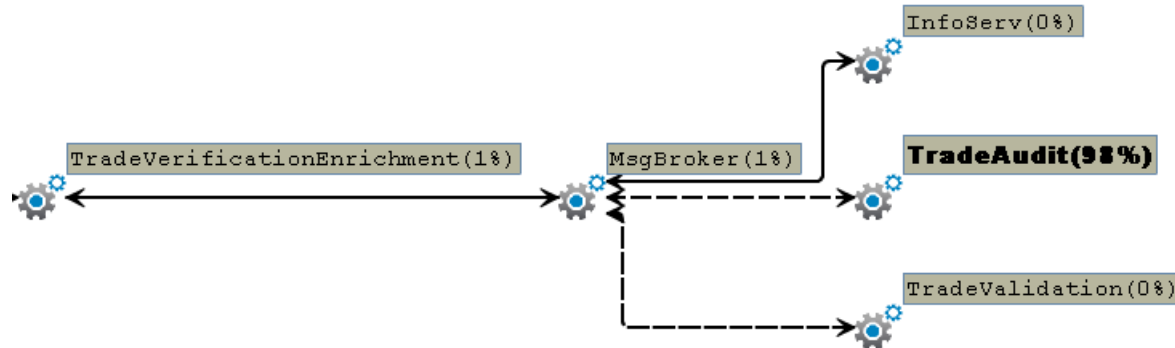
Display Type

Character Set

```
<?xml version='1.0' encoding='utf-8'?>
<ORDER_INFO>
  <CUSTOMER_DATA>
    <CUSTOMER_ORDER_NUMBER>TWD655556</CUSTOMER_ORDER_NUMBER>
    <CUSTOMER_NAME>SMITH</CUSTOMER_NAME>
  </CUSTOMER_DATA>
  <ORDER_DATA>
    <ORDER_ITEM>SKU0123</ORDER_ITEM>
    <ORDER_AMOUNT>3</ORDER_AMOUNT>
  </ORDER_DATA>
</ORDER_INFO>
```

Cross Application Tracking

20



Time	Operation Name	Resource	Elapsed Time (usec)	Message Id	Message Age (usec)	Completion Code	
2013-03-26 13:41:47.17	/trading/verification	/trading/verificati	7875		0	Succeeded	L
2013-03-26 13:41:47.19	com/acme/trading/verify.start	java	5749		0	Succeeded	L
2013-03-26 13:41:47.19	HTTP/GET/trading/verification	/trading/verificati	7665	2195	0	Succeeded	L
2013-03-26 13:41:47.19	Statement.executeQuery(String)	MySQL5.1:DBSer	1823	2196	0	Succeeded	L
2013-03-26 13:41:47.20	com/acme/trading/verify.request	java	1495		0	Succeeded	L
2013-03-26 13:41:47.20	QueueSender.send	queue://trading/	6565	2186	0	Succeeded	L
2013-03-26 13:41:47.20	MQPUT	TradeVerification.	10107	2186	0	Succeeded	L
2013-03-26 13:41:47.22	MQGET	TradeVerification.	10908	2186	834	Succeeded	B
2013-03-26 13:41:47.22	MQPUT	TradeValidation.I	9399	2187	0	Succeeded	B
2013-03-26 13:41:47.24	MQGET	TradeValidation.I	9507	2187	116	Succeeded	W
2013-03-26 13:41:47.24	MQPUT	TradeValidation.C	9803	2188	0	Succeeded	W
2013-03-26 13:42:23.22	MQGET	TradeValidation.C	35970000	2188	652	Succeeded	B
2013-03-26 13:42:23.22	MQPUT	TradeAudit.Input.	10511	2189	0	Succeeded	B

Types of Questions You Might Have

End Customer

- Where is my message?
- Is my transaction progressing as planned?

Middleware Manager

- Are transactions being delivered on time?
- Where are the bottlenecks?
- Where do the most problems come from?
- What can I expect for tomorrow?

Technician

- Where can we make improvements?
- What happened to transaction “12345”?



Execution Summary

Transaction Group > Summary

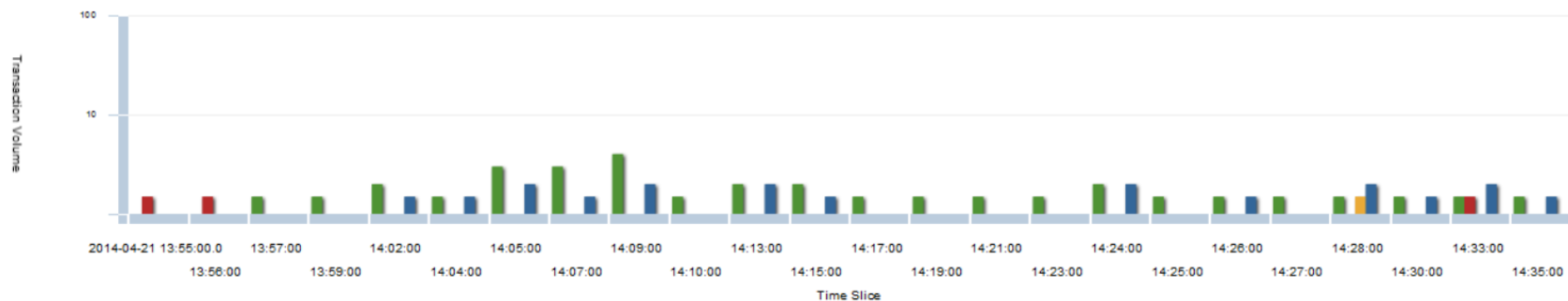
Welcome: opuser

Show: Last Hour From: 2014-04-21 1 : 39 : 17 PM To: 2014-04-21 2 : 39 : 17 PM Show

Filter >

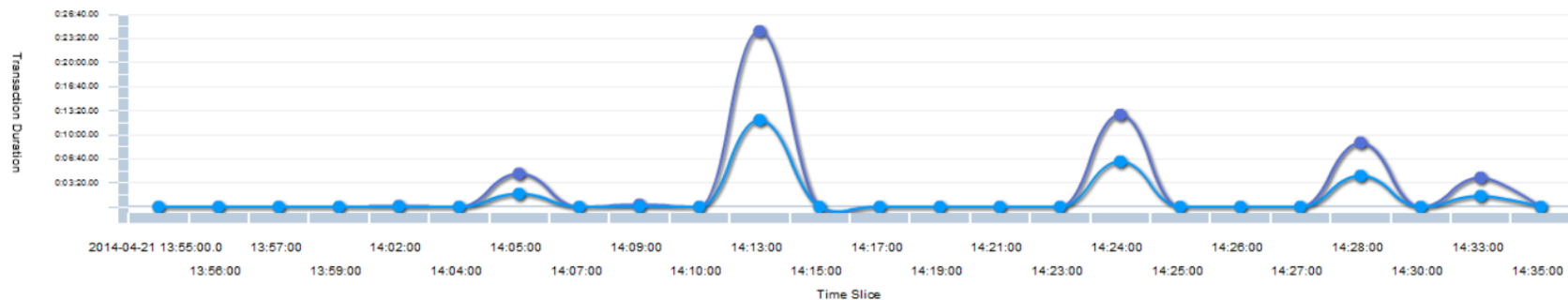
Total Transactions

Completed Failed In Progress Missed SLA Incomplete



Transaction Timing

☒ Maximum Activity Duration ☒ Average Activity Duration



Main Menu <<

Administration

- Admin Overview
- Create Viewlet
- Create Page
- Page List
- Filter List
- Settings List

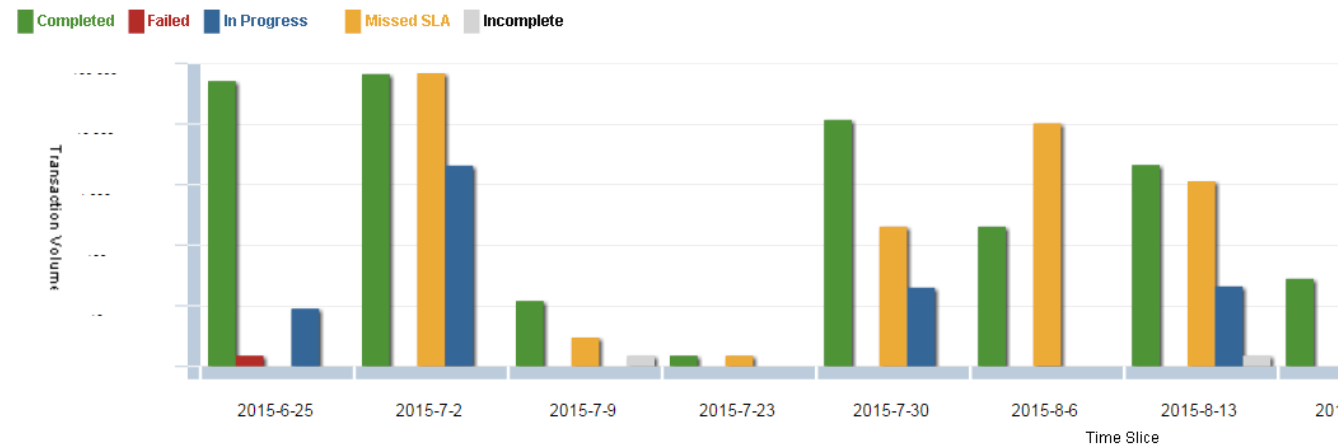
TWorks Admin

My Pages

- Find a Message
- Payment Details
- Payment Details Dashboard
- Payments last 2
- Profiler
- Summary**
- Top Charts
- Trace Details
- Transaction Analysis
- union

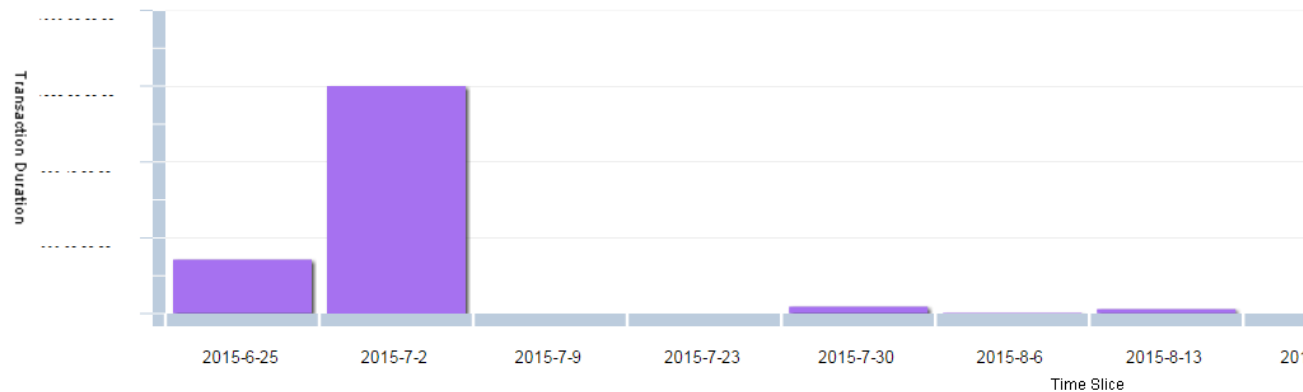
Show : Last 3 Mont... From : 2015-08-29 12 : 00 : 00 AM To : 2015-09-29 11 : 59 : 59 PM **Show**

Total Transactions



Transaction Duration

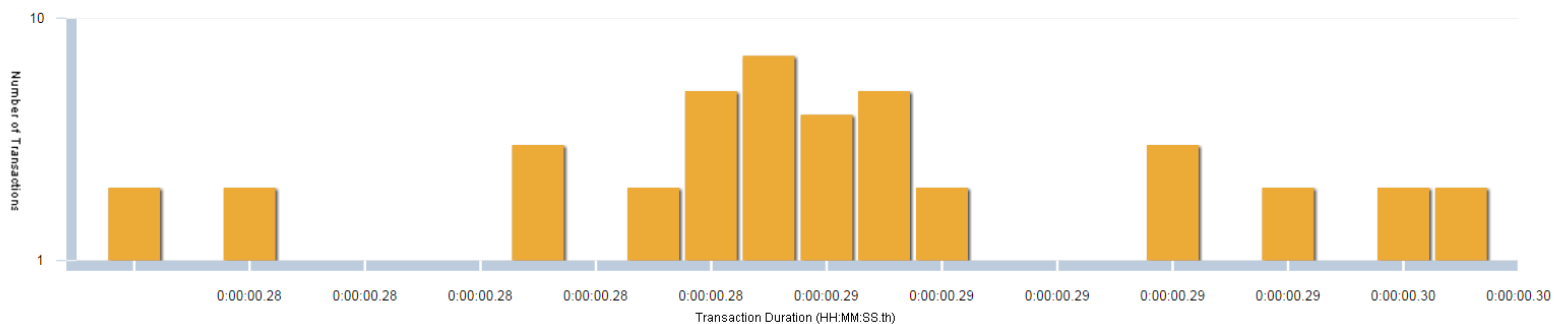
Total Transaction Duration



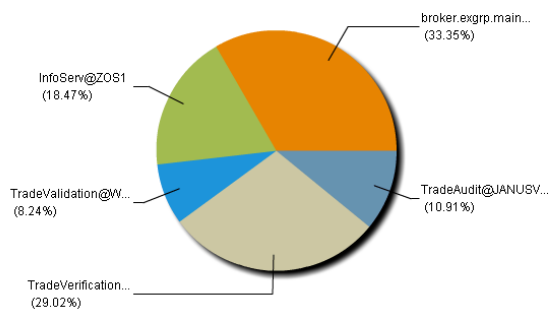
Show: Select From: 2015-08-20 12:00:00 AM To: 2015-08-27 12:00:00 AM Show

Filter

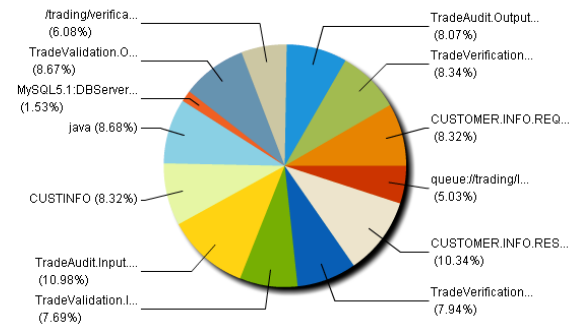
Transaction Histogram



Application Statistics



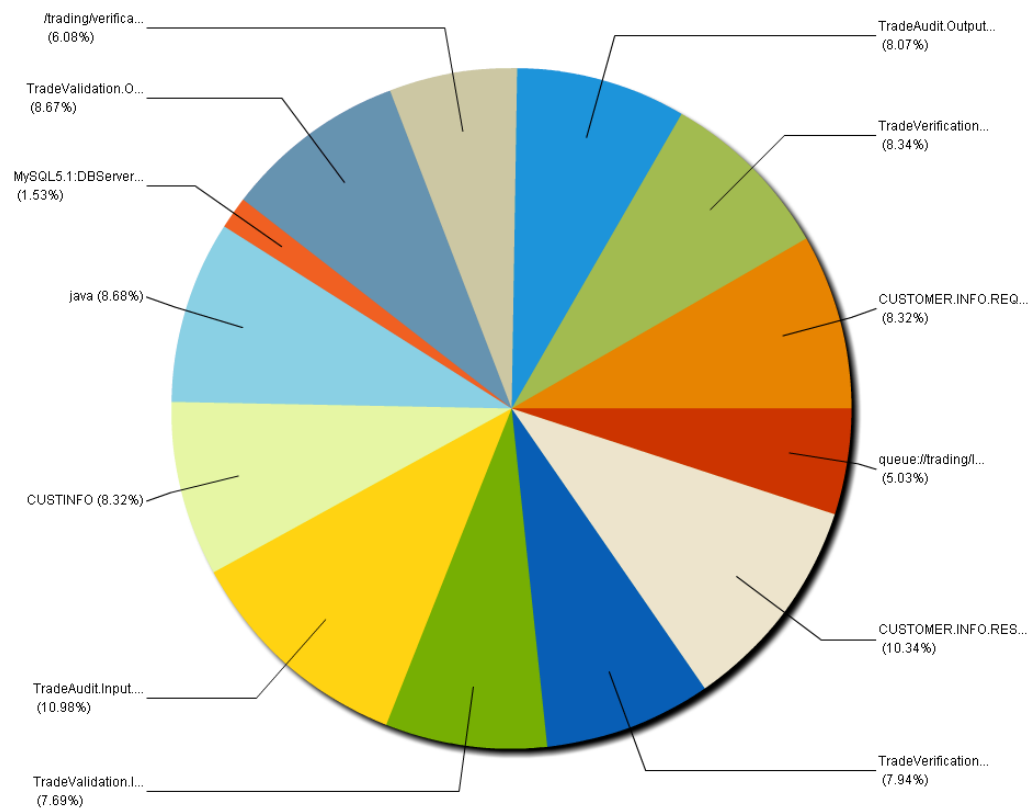
Resource Statistics



Show : From : 2015-08-20 12 : 00 : 00 AM To : 2015-08-27 12 : 00 : 00 AM Show

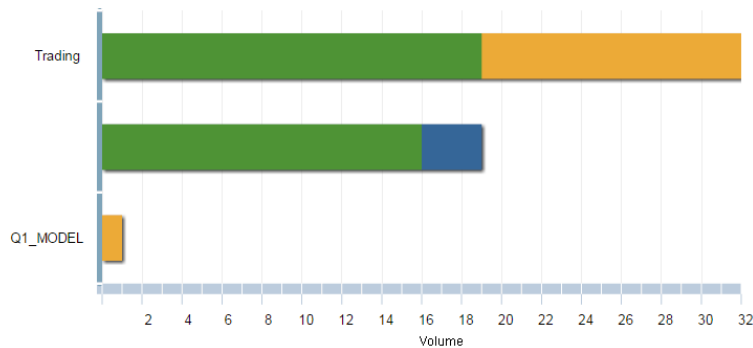
Filter

Resource Statistics

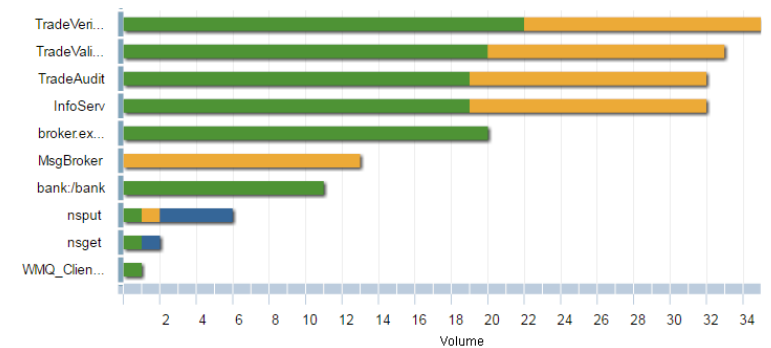


Show : From : 2015-09-24  12 : 00 : 00 AM  To : 2015-10-01  12 : 00 : 00 AM  Show  

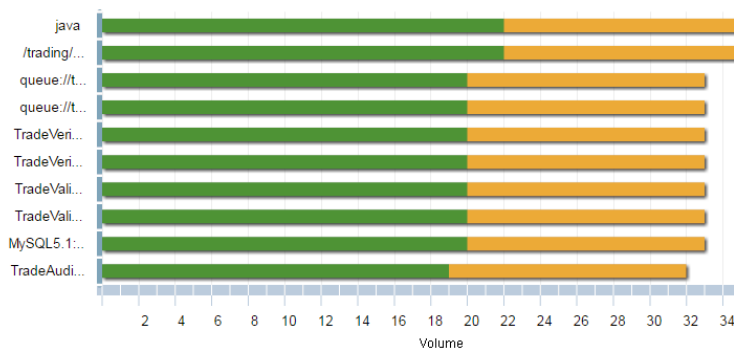
Transaction Group Usage



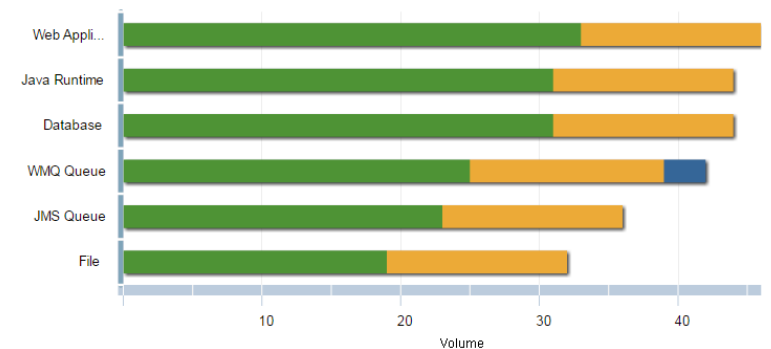
Application Usage



Resource Usage



Resource Type Usage



Show : From : 2015-09-29 9 : 46 : 56 AM To : 2015-09-29 9 : 54 : 56 AM

Profiler

API Type Name	API Function	Resource	Total Count	Total Warnings	Total Failed	% Usage	Avg Operation Time (HH:MM:SS.mmm)	Max Operation Time (HH:MM:SS.mmm)	Min Operation Time (HH:MM:SS.mmm)	Avg Msg/s (HH:MM:SS.mmm)
▼ MQGET			258	0	0	98.85%	0:00:01.831	0:00:34.650	0:00:00.008	0:00:
		TradeAudit.Output.Queue	32	0	0	0.06%	0:00:00.010	0:00:00.012	0:00:00.008	0:00:
		CUSTOMER.INFO.RESPONSE	32	0	0	0.06%	0:00:00.010	0:00:00.012	0:00:00.008	0:00:
		TradeAudit.Input.Queue	32	0	0	9.81%	0:00:01.465	0:00:03.848	0:00:00.024	0:00:
		TradeVerification.Input.Queue	32	0	0	0.06%	0:00:00.010	0:00:00.012	0:00:00.008	0:00:
		CUSTOMER.INFO.REQUEST	32	0	0	0.08%	0:00:00.013	0:00:00.015	0:00:00.010	0:00:
		TradeValidation.Output.Queue	32	0	0	88.62%	0:00:13.237	0:00:34.650	0:00:00.008	0:00:
		TradeValidation.Input.Queue	33	0	0	0.06%	0:00:00.010	0:00:00.012	0:00:00.008	0:00:
		TradeVerification.Output.Queue	33	0	0	0.06%	0:00:00.010	0:00:00.011	0:00:00.008	0:00:
▼ Send			291	0	0	0.60%	0:00:00.010	0:00:00.015	0:00:00.005	0:00:
▼ QueueSender.send			33	0	0	0.04%	0:00:00.008	0:00:00.008	0:00:00.005	0:00:
		queue://trading/InputQueue	33	0	0	0.04%	0:00:00.008	0:00:00.008	0:00:00.005	0:00:
▼ MQPUT			258	0	0	0.55%	0:00:00.010	0:00:00.015	0:00:00.008	0:00:
		TradeValidation.Input.Queue	32	0	0	0.06%	0:00:00.010	0:00:00.012	0:00:00.008	0:00:
		CUSTOMER.INFO.RESPONSE	32	0	0	0.08%	0:00:00.013	0:00:00.015	0:00:00.010	0:00:
		TradeAudit.Input.Queue	32	0	0	0.06%	0:00:00.010	0:00:00.011	0:00:00.008	0:00:
		TradeAudit.Output.Queue	32	0	0	0.06%	0:00:00.010	0:00:00.012	0:00:00.008	0:00:
		CUSTOMER.INFO.REQUEST	32	0	0	0.06%	0:00:00.010	0:00:00.012	0:00:00.008	0:00:
		TradeVerification.Output.Queue	32	0	0	0.06%	0:00:00.010	0:00:00.012	0:00:00.008	0:00:

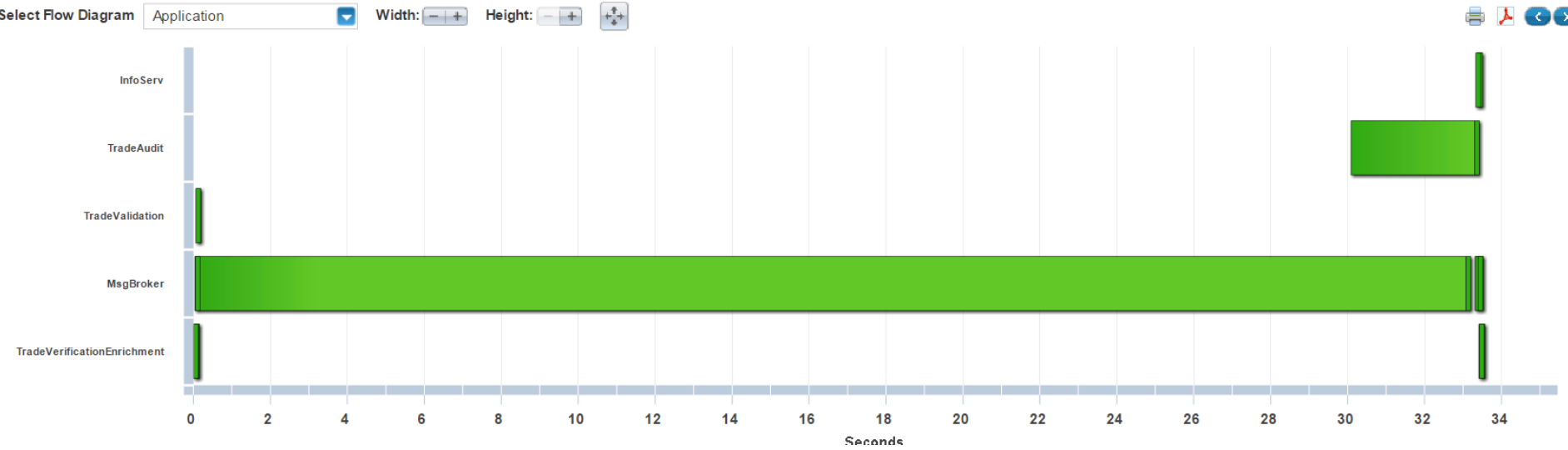
Show : From : 2015-09-29 9 : 50 : 00 AM To : 2015-09-29 10 : 00 : 00 AM

Trace

Start Date	Applications	Transaction Status	SLA Status	SLA Status Text	Workload (HH:MM:SS.mm)	Transaction Duration	Operations	Messages	Trans
2015-09-29 09:53:07	InfoServ,TradeA...	Complete ✓	25.00%	Within SLA	0:00:00.125	0:00:00.278	27	12	96532
2015-09-29 09:53:09	InfoServ,TradeA...	Complete ✓	0.00%	Within SLA	0:00:00.129	0:00:00.286	27	12	96532
2015-09-29 09:53:09	InfoServ,TradeA...	Complete ✓	0.00%	Within SLA	0:00:00.125	0:00:00.288	27	12	96533
2015-09-29 09:53:10	InfoServ,MsgBr...	Complete ✓	825.00%	Missed SLA	0:00:00.126	0:00:33.456	27	12	96532
2015-09-29 09:53:10	InfoServ,TradeA...	Complete ✓	25.00%	Within SLA	0:00:00.123	0:00:00.283	27	12	96531
2015-09-29 09:53:10	InfoServ,TradeA...	Complete ✓	0.00%	Within SLA	0:00:00.129	0:00:00.289	27	12	96533
2015-09-29 09:53:11	InfoServ,MsgBr...	Complete ✓	875.00%	Missed SLA	0:00:00.122	0:00:34.437	27	12	96533
2015-09-29 09:53:11	InfoServ,MsgBr...	Complete ✓	825.00%	Missed SLA	0:00:00.126	0:00:33.230	27	12	96534
2015-09-29 09:53:11	InfoServ,MsgBr...	Complete ✓	825.00%	Missed SLA	0:00:00.127	0:00:33.722	27	12	96536

Transaction ID 965326

Transaction Flow Diagram Transaction Timeline Transaction Trace Transaction Milestones



Transaction ID 965326

Transaction Flow Diagram Transaction Timeline Transaction Trace Transaction Milestones

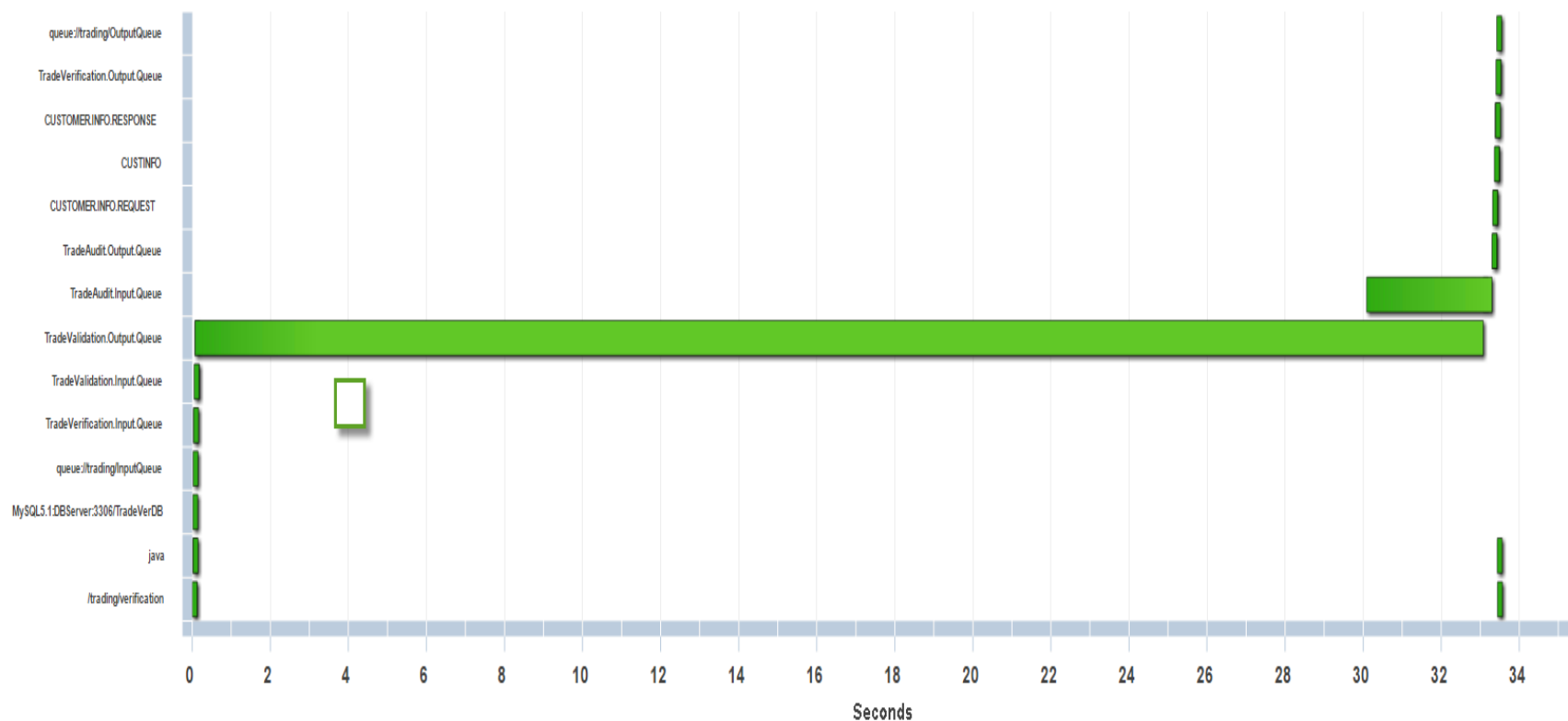
Select Flow Diagram

Resource



Width:

Height:



Transaction ID 922988

Transaction Flow Diagram

Transaction Timeline

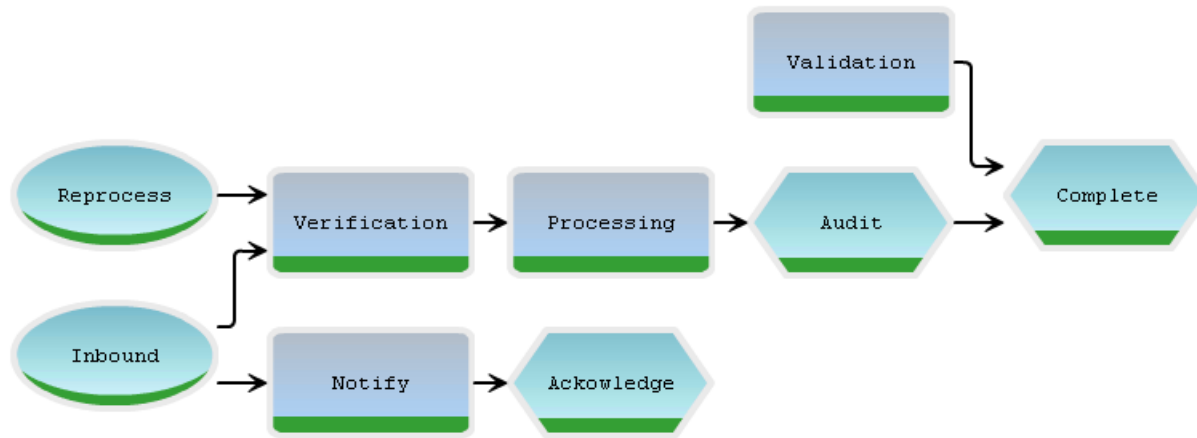
Transaction Trace(32)

Transaction Milestones(16)

☐ Show Hierarchy

Sever...	Time	Operation Name	Elapsed Time (usec)	Message Id	Message Age (usec)	Completion Code
	2015-08-04 20:23:36.045	MQPUT	87	1	0	Succeeded
	2015-08-04 20:23:36.092	MQGET	69	1	52000	Succeeded
	2015-08-04 20:23:36.154	MQPUT	88	3	0	Succeeded
	2015-08-04 20:23:36.201	MQGET	98	3	51000	Succeeded
	2015-08-04 20:23:36.263	MQPUT	256	5	0	Succeeded
	2015-08-04 20:23:36.310	MQGET	83	5	50000	Succeeded
	2015-08-04 20:23:36.419	MQPUT	111	7	0	Succeeded
	2015-08-04 20:23:36.466	MQGET	69	7	56000	Succeeded
	2015-08-04 20:23:36.546	MQPUT	84	9	0	Succeeded
	2015-08-04 20:23:36.593	MQGET	55	9	52000	Succeeded
	2015-08-04 20:23:36.670	MQPUT	114	11	0	Succeeded
	2015-08-04 20:23:36.717	MQGET	117	11	47000	Succeeded

Other Usage



Transaction Group: SLA Status: Filter:

Interval Count: Aggregation Interval: Transaction Status:

Refresh Interval:

Select

Application

Default

In Progress Payments

Missed SLA

Processed

Transaction ID

Verbose

Transaction Group:

Milestone:

Milestone:

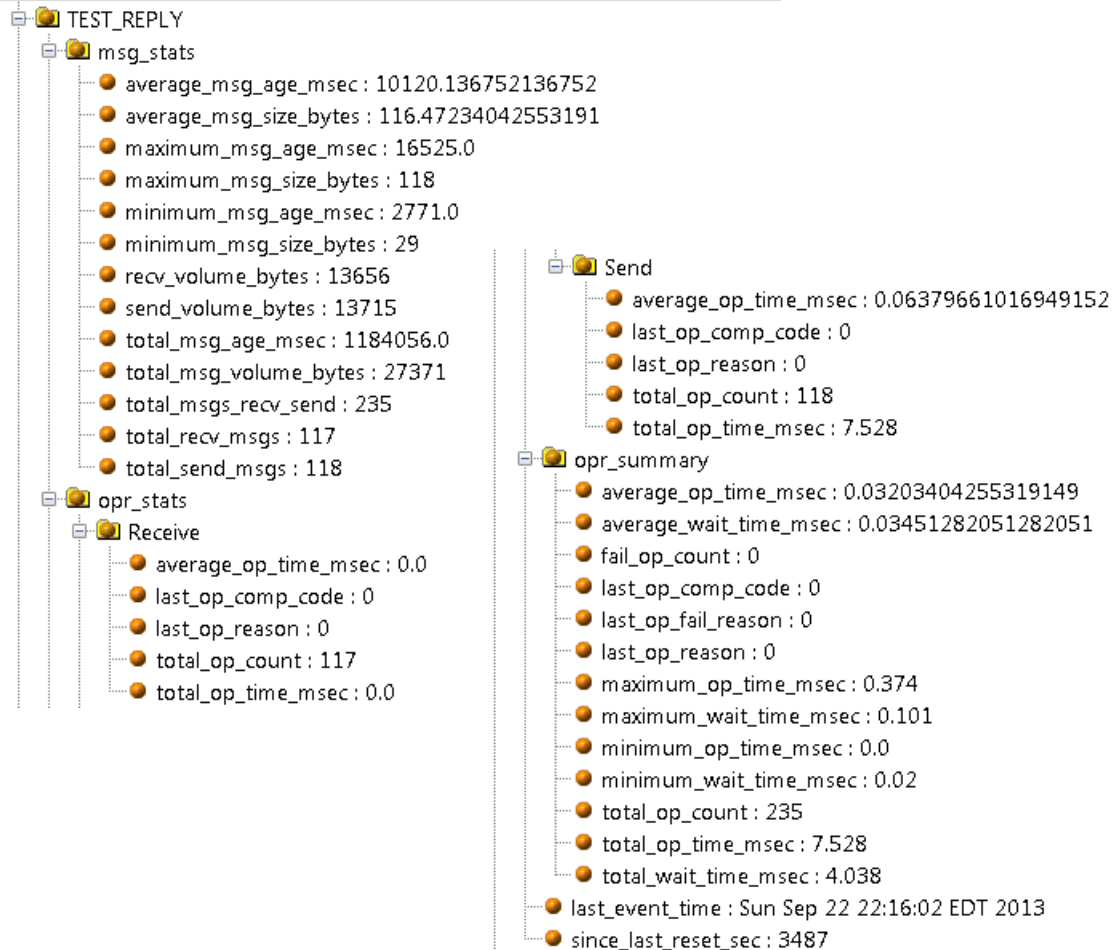
08-04

Transaction Group:

Search Message Tag:

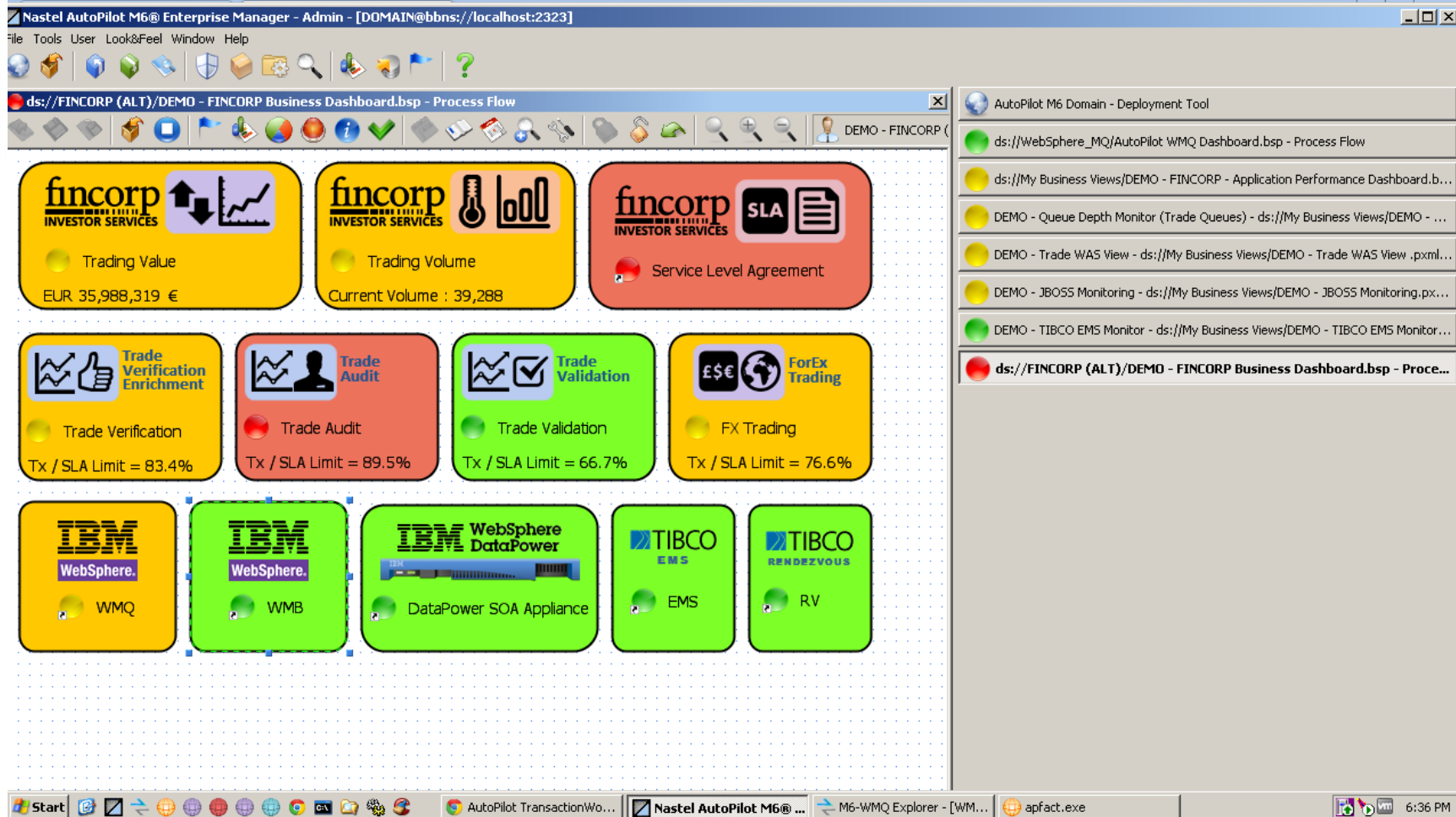
Transaction Group: <input type="text" value="All Transactions"/>			SLAStatus: <input type="text" value="ALL"/>			Filter: <input type="text" value="Verbose"/>		
Application: <input type="text" value="ALL"/>			Completion Code: <input type="text"/>			Transaction Status: <input type="text" value="ALL"/>		
Search Message Tag: <input type="text"/>			Messages: <input type="text"/>			Search Exception: <input type="text"/>		
Reason code: <input type="text"/>			Resource: <input type="text"/>			Operations: <input type="text"/>		
Resource Manager Type: <input type="text" value="ALL"/>			Resource Type: <input type="text" value="ALL"/>			Resource Manager: <input type="text" value="ALL"/>		
Transaction Id: <input type="text"/>			Units of Work: <input type="text"/>			Server: <input type="text" value="ALL"/>		
Transaction duration: <input type="text" value="Select"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/>			User: <input type="text" value="ALL"/>					
Milestone: <input type="text" value="Select"/> <input type="text" value="Select"/> <input type="text" value="0"/> <input type="text" value="0"/> : <input type="text" value="0"/> : <input type="text" value="0"/> . <input type="text" value="0"/>								
Interval Count: <input type="text" value="200"/>			Aggregation Interval: <input type="text" value="10080"/>			Refresh Interval: <input type="text" value="5"/>		
<input type="button" value="Show"/> <input type="button" value="OK"/> <input type="button" value="Cancel"/>								

Increased Statistics Available



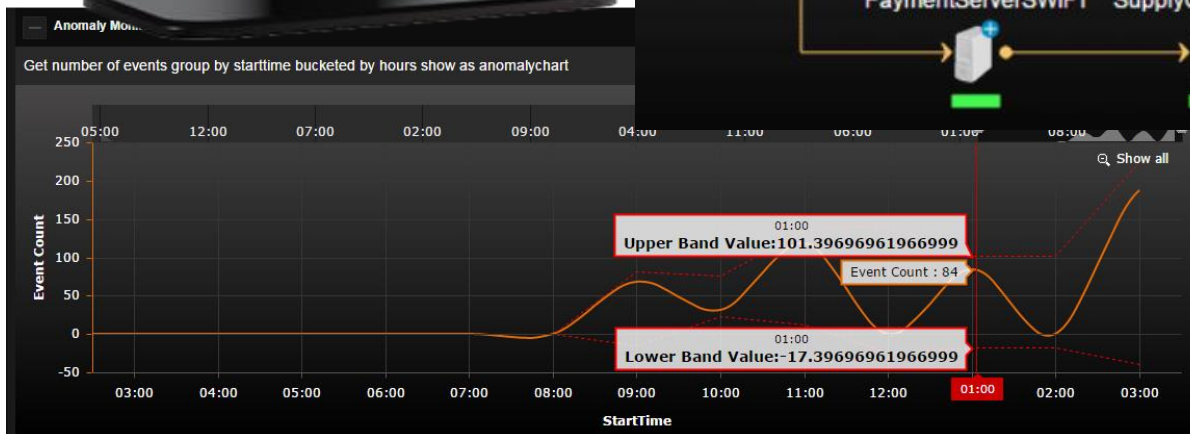
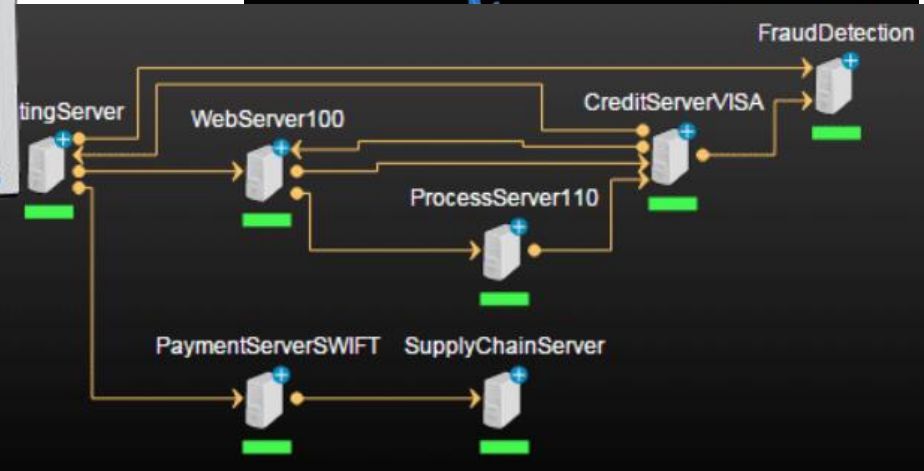


Business View based on Transaction Analytics



Insight into Trends – AutoPilot Insight

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Questions



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