T5 Logistics Manager
Performance
Prediction, Analysis and Repair

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Introduction Heathrow Terminal 5

http://www.heathrowairport.com/portal/site/default/menuitem.2f4d5e2800e51acc0fb42410c02865a0/

Logistics Manager in T5 architecture

Logistics Manager performance definition

Performance aspects:

- the load on a system
- the scalability
- the throughput

Logistics Manager performance definition

Throughput?

Questions defined:

1. Number of messages per hour
2. Maximum processing time per message
3. Jobs
4. Replication
5. Number of SQL statements per hour
6. Size of disk
7. Size internal memory

Logistics Manager performance definition

Prediction # messages per hour

Logistics Manager performance definition

Prediction # messages per hour

Total incoming messages / hr	414900

Flow related messages	Flow related			% of overall total
Message type	Messages /hr	Messages /s	%	
Register package	10500	2,92/s	3%	3%
Deregister package	10500	2,92/s	3%	3%
Tracking report & ID Change	286937	79,70/s	78%	69%
Package report	33982	9,44/s	9%	8%
Task Instruction	23982	6,66/s	7%	6%
	365900	101,64/s	100%	88%

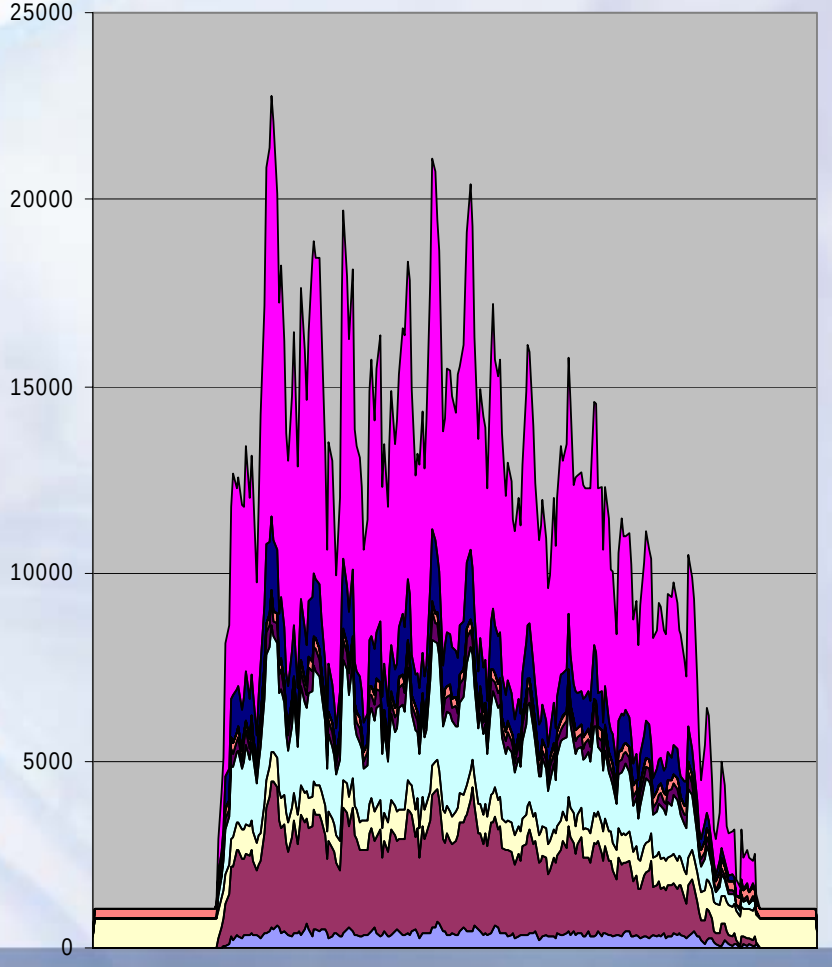
Non flow related messages	Non Flow related			% of overall total
Message type	Messages /hr	Messages /s	%	
Technical Segment Status	6000	1,67/s	12%	1%
Mode of operation	0	0,00/s	0%	0%
Availability report	0	0,00/s	0%	0%
Init sync	0	0,00/s	0%	0%
Lifesign request Areas -> LM	30000	8,33/s	61%	7%
Lifesign response SM -> LM	60	0,02/s	0%	0%
Reclaim	3940	1,09/s	8%	1%
Resend Manual Coding	0	0,00/s	0%	0%
Resend package reports from Bagstore	9000	2,50/s	18%	2%
	49000	13,61/s	100%	12%

Logistics Manager performance definition
Prediction # messages per hour

Simulation used to verify static calculated number of messages per hour.

Logistics Manager performance definition

Prediction # messages per hour



Logistics Manager performance definition

Prediction # messages per hour

Maximum # message per 5 minute interval = 22500

Per hour: 270000 incoming messages

Missing: HLC-> LM = 22000

Non flow related= 49000

Total messages = 270000+22000+49000 = 341000

Message processing time:

<8,69 - 10,55 ms>

Logistics Manager performance definition

Jobs

- Life signs
- Bags approaching
- Bags in area
- Segment status → performance critical
- Monitor in-time → performance critical
- Capacity influence
- Releasegroup
- Cleanup

Logistics Manager performance definition

SQL statements per hour

SQL statements calculation can be used to determine:

- Top ten rank of statements being executed
- Statements which take the most time to be executed

This can be used to focus on when performance tests results are worse.

Logistics Manager performance definition

Size of disk and internal memory

- Disk size per version = 60Gb
- Memory size per version = 16Gb

Logistics Manager performance definition

Throughput?

Questions defined:

- ✓ Number of messages per hour
- ✓ Maximum processing time per message
- ✓ Jobs
- ✓ Number of SQL statements per hour
- ✓ Size of disk
- ✓ Size internal memory

Logistics Manager performance analysis

Tests to be executed:

- Individual message types
- Multiple sessions
- Scenario
- Emulation
- Replication

Execution on multiple systems

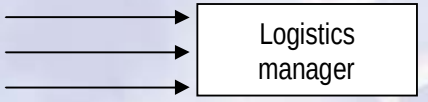
Logistics Manager performance analysis

Individual message types

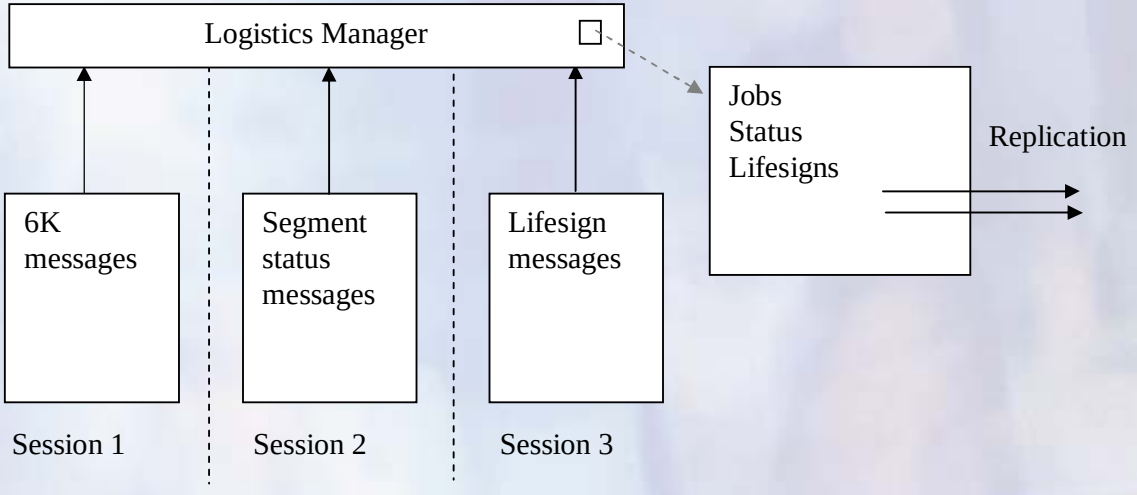
- RegisterPackage
- DeRegisterPackage
- TaskInstruction
- PackageReport
- TrackingReport
- IDChangeReport

Multiple sessions

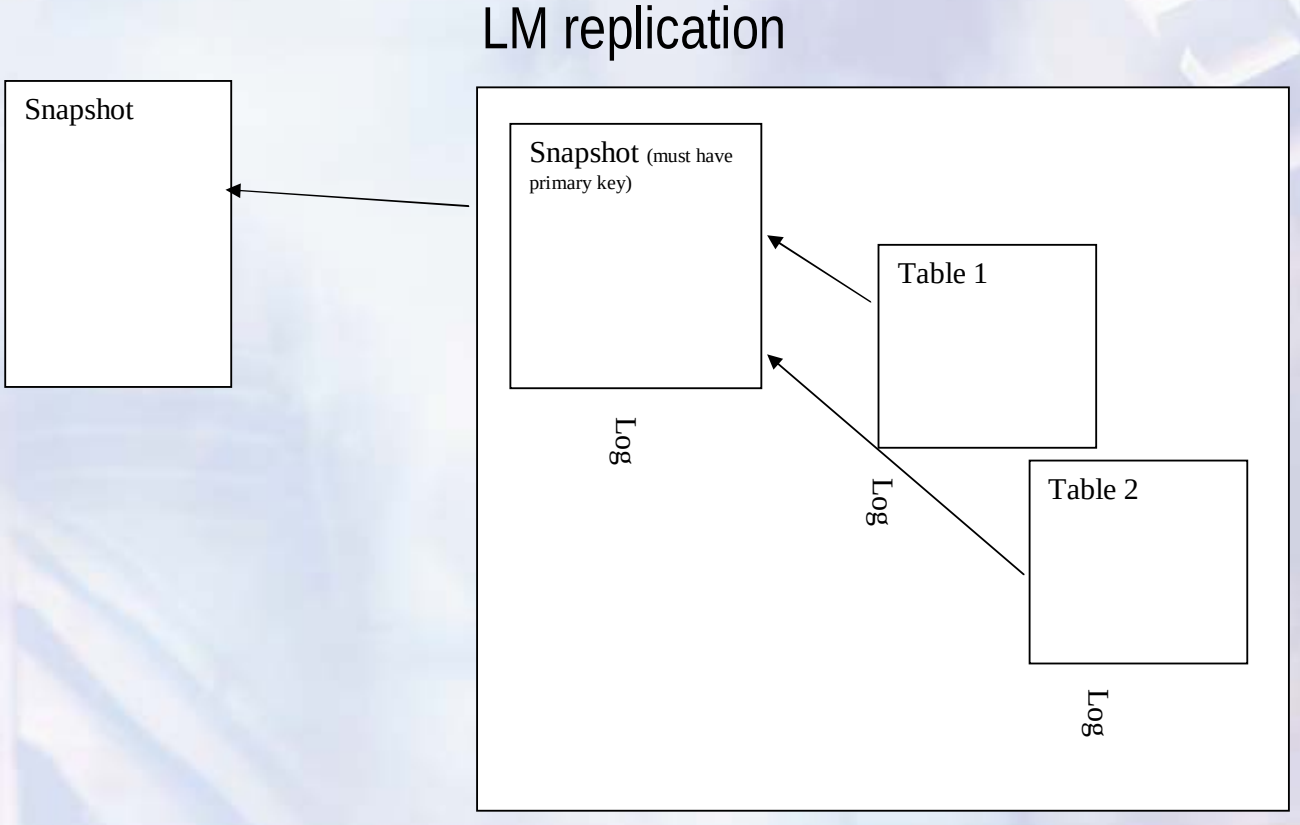
RegisterPackage only



Scenario



Logistics Manager performance analysis



Performance results

	Windows	AIX 1	AIX 2
MSG_TYPE	AVG	AVG	**AVG**
DeRegisterPackage	0,033	0,019	0,020
IDChangeReport	0,024	0,018	0,018
LifeSignRequest	0,024	0,018	0,015
PackageReport	0,038	0,024	0,025
RegisterPackage	0,684	0,622	0,696
SegmentStatusReport	0,106	0,018	0,017
TaskInstruction	0,414	0,407	0,449
TrackingReport	0,034	0,023	0,024
Overall	153 ms	140 ms	154 ms

Performance repair

- Data model changes
- SQL statements analysis using profiling and SQL trace
- Native compiling
- Conditional compiling