Windows 2000 Proof of Concept A Case Study

Agenda

- Proof of Concept What and Why
- Customer Goals
- HP Solutions
- Results

Proof of Conept What and Why
The What

- **In-house or @ HP prototype infrastructure tests**
- **A unique occasion to gain the required insight into the** *how-to's* **of specifying application infrastructures based upon Microsoft state-of-the art technologies**
- **An opportunity to leverage from HP's vast breadth of products, services, experience, and alliance with Microsoft**

Proof of Conept What and Why
The Why

- **Test application and underlying infrastructure (HW, SW, Middleware) in a controlled environment**
- **Determine and Analyze risk areas (e.g. scalability, reliability, performance bottlenecks, deployment complications, management solutions)**
- **Measure cost of these risks**
- **Develop integrated masters for deployment**
- **Excellent means to build teams (client, Microsoft, HP a partner staff)**
- **Obtain plug & play integrated solution during POC**

Proof of Conept What and Why
The Why

- **Scalability :**
  - ***identify and characterize components which govern scalability (HW,SW, Middleware and application design)***
  - ***Fully specify hardware requirements before volume purchasing and deployment***
- **Performance :**
  - ***obtain performance metrics and optimize through design changes on the fly***
  - ***Define "baseline" performance characteristics for deployment acceptance testing***
- **Reliability :**
  - ***provoke failures in multiple components at will and measure architecture resilience and recovery***
- **Management:**
  - ***Define key measurement hooks and explore their development and deployment simultaneous to application and infrastructure specification***
- **Integration**
  - ***Identify, develop, test and stage integration methodologies, components, parameters, & tools and proportionally test them***

Customer Goals

- Customer Industry
  - Mutual Life Insurance
- Challenge:
  - Provide a scalable IT infrastructure to improve health staff productivity

Customer Goals

Business Goals

- Increase customer service quality
  - High Availability
  - More functionality
  - Provide room for growth
- Cost-effective PC Infrastructure
  - Industry standard
  - Commodity clusters
- Make Development Productive
  - RAD tools
  - Business rules in Expert system

Customer Goals

Technical Goals

LCM Requirements	LCM Conclusions
150 on-line tasks per second on the central application server in the head office during office hours (approx 8am – 6pm)	Proven
8 million batch tasks without Expert System in a 6 hour window, also during office hours	Proven
4 million batch tasks with Expert System in a 6 hour window, also during office hours	Incomplete proof, further integration required. Pb's exposed thanks to POC2000 platform and V Large DB capacity of POC
Response time of 2 seconds or less for on-line users in 95% of the transactions	Lack of end-to-end instrumentation implementation despite MSO recommendations and suggestions

HP Solutions

What HP Delivered

- Architecture design collaboration with client and Microsoft
- Specification of “white-box” test methodologies
- Extensive POC staging
- Functional Tests & Lab management in Belgium
- Test Methodology and specific tools development eg virtual user for transaction generation & injection
- Staging of preliminary tests @ msc@hp Lyon through skilled cloning of DB and infrastructure to enable rapid test ramp-up @ Grenoble
- Access to beta/RC code and associated drivers etc from HP divisions on HP hardware (Netserver and storage)
- Leverage from previous POC experiences on Windows-DNA and BackOffice architectures (SQL, DTC, Clustering, COM+)
- FocusPM project management

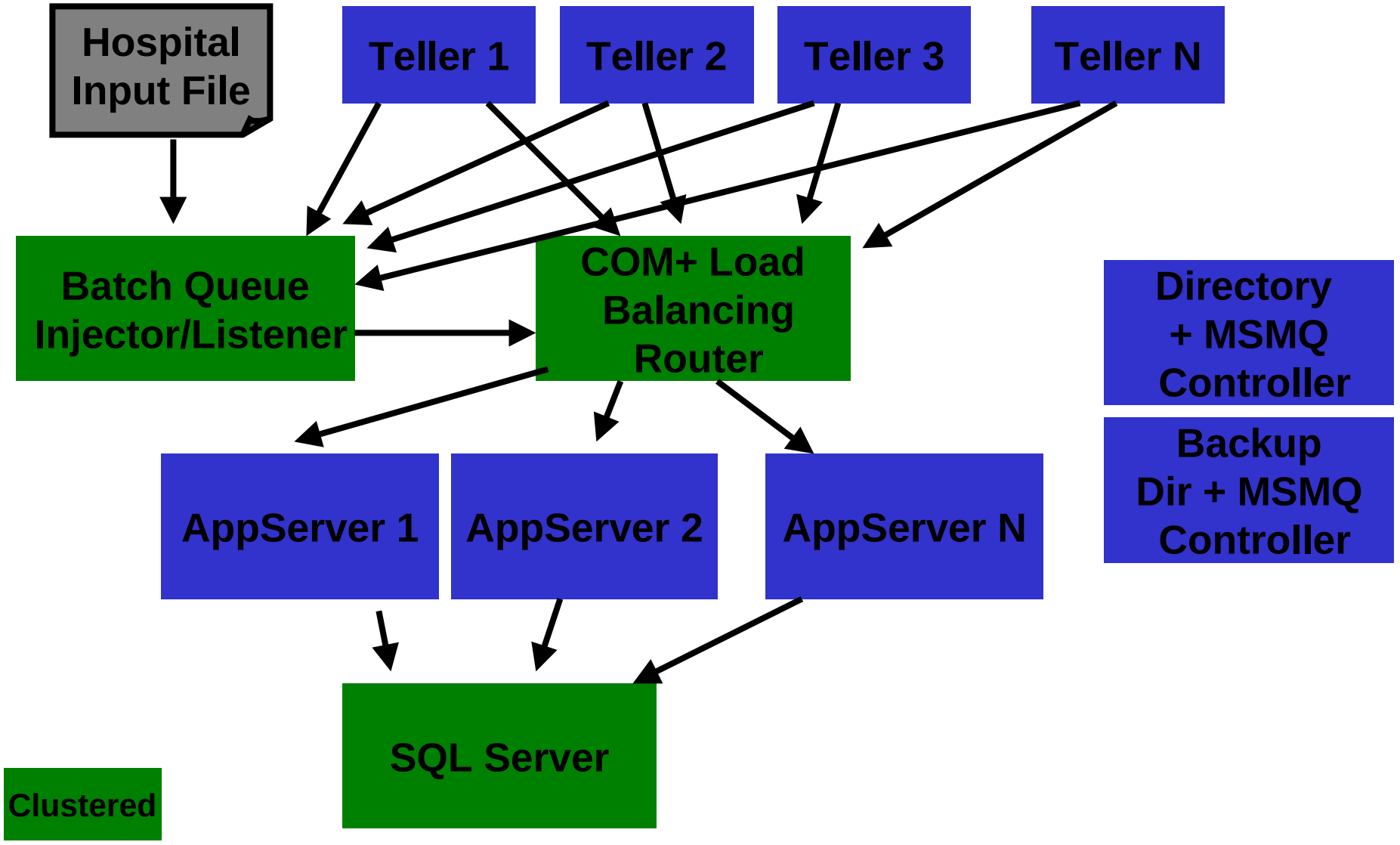
HP Solutions

What Microsoft Delivered

- Early (March/April 1999) information and access to proprietary data concerning Windows 2000 and COM+
- Windows-DNA infrastructure and application architecture design management
- Access to Redmond product teams for advise and product insight
- DB & schema design
- Windows-DNA & Windows 2000 specific training
- Functional test and performance tests and debug repairs

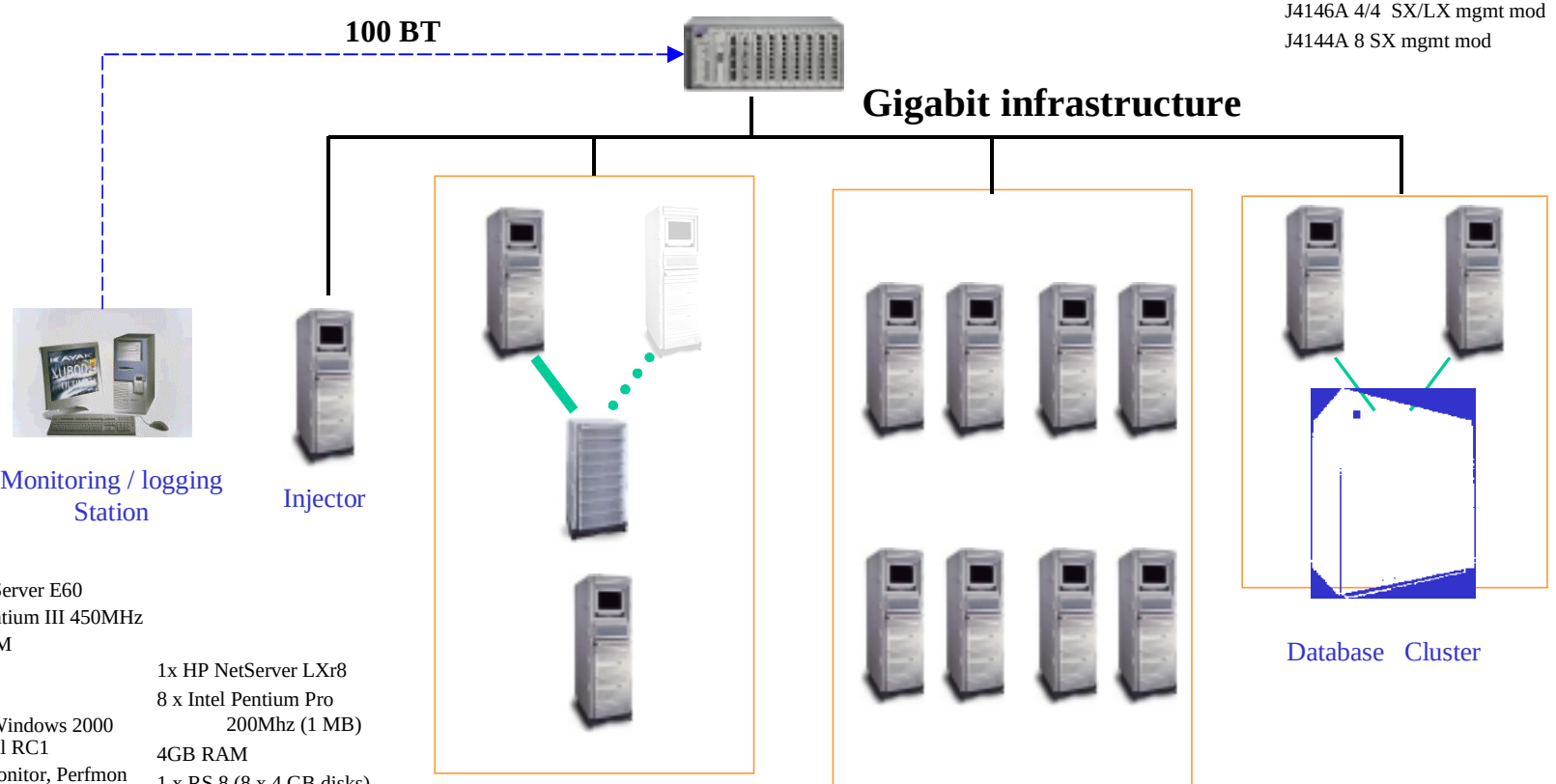
HP Solutions

Reducing Single Points Of Failure



HP Solutions

The Grenoble Performance test platform



1 Routing Switch:
J4139A Chassis
J4143A 8 ports Gbit/s SX non managed
J4146A 4/4 SX/LX mgmt mod
J4144A 8 SX mgmt mod

- 1x HP NetServer E60
- 1x Intel Pentium III 450MHz
- 64 MB RAM
- 9 GB disk
- 100 Base T
- Microsoft Windows 2000 Professional RC1
- Network monitor, Perfmon and other tools

1x HP NetServer LXr8
8 x Intel Pentium Pro 200Mhz (1 MB)
4GB RAM
1 x RS 8 (8 x 4 GB disks)
1 x SK-9843 (G Bit/s)
Microsoft Windows 2000 Advanced Server RC1
MSMQ Server installation
System32 COM+ M20 version

HP Solutions

The Grenoble Performance testplatform - details

Load Balancing Cluster and/or Domain Controller

- 2 x HP NetServer LH3 (Load balancing cluster)
  - 2x Intel Pentium III 550MHz (512 KB cache)
  - 256 MB RAM
  - 2 x 9 GB discs
  - 1 x SK-9844 dual link (G Bit/s)

- 1x HP NetServer Rack Storage/12 FC
  - 3 x 9 GB discs
- 1 x HP NetServer LH3 (Domain controller)
  - 2x Intel Pentium II 400MHz (512 KB cache)
  - 128 MB RAM
  - 2 x 9 GB discs
  - 1 x SK-9843 (G Bit/s)

- Microsoft Windows 2000 RC1 Advanced Server
- System32 deprotection + COM+ M20 version
- MSMQ Server installation
- MSMQ Primary Enterprise Controller installation

HP Solutions

The Grenoble Performance testplatform - details

Application Servers & Listeners (I)

- 4x HP NetServer LH4
  - 4 x Intel Pentium III Xeon 550MHz (2MB cache)
  - 4 x Intel Pentium III Xeon 500MHz (2MB cache)
  - 4 x Intel Pentium III Xeon 500MHz (1MB cache)
  - 4 x Intel Pentium III Xeon 400MHz (1MB cache)
  - 1GB RAM each server
  - 2 x 9GB discs each server
  - 1 x SK-9843 (G Bit/s) each server

- Microsoft Windows 2000 Advanced Server RC1
- MSMQ Server installation (LXr 8500)
- System32 protection + COM+ M20 version

HP Solutions

The Grenoble Performance testplatform - details

Application Servers & Listeners (II)

- 4x HP NetServer LPr
  - 2x Intel Pentium II 450MHz (512 KB cache)
  - 1 x 768 MB + 3 x 832 MB RAM
  - 2 x 9GB discs each server
  - 1 x SK-9843 (G Bit/s) each server

- Microsoft Windows 2000 Advanced Server RC1
- MSMQ Server installation
- System32 deprotection + COM+ M20 version

HP Solutions

The Grenoble Performance testplatform - details

Database Cluster

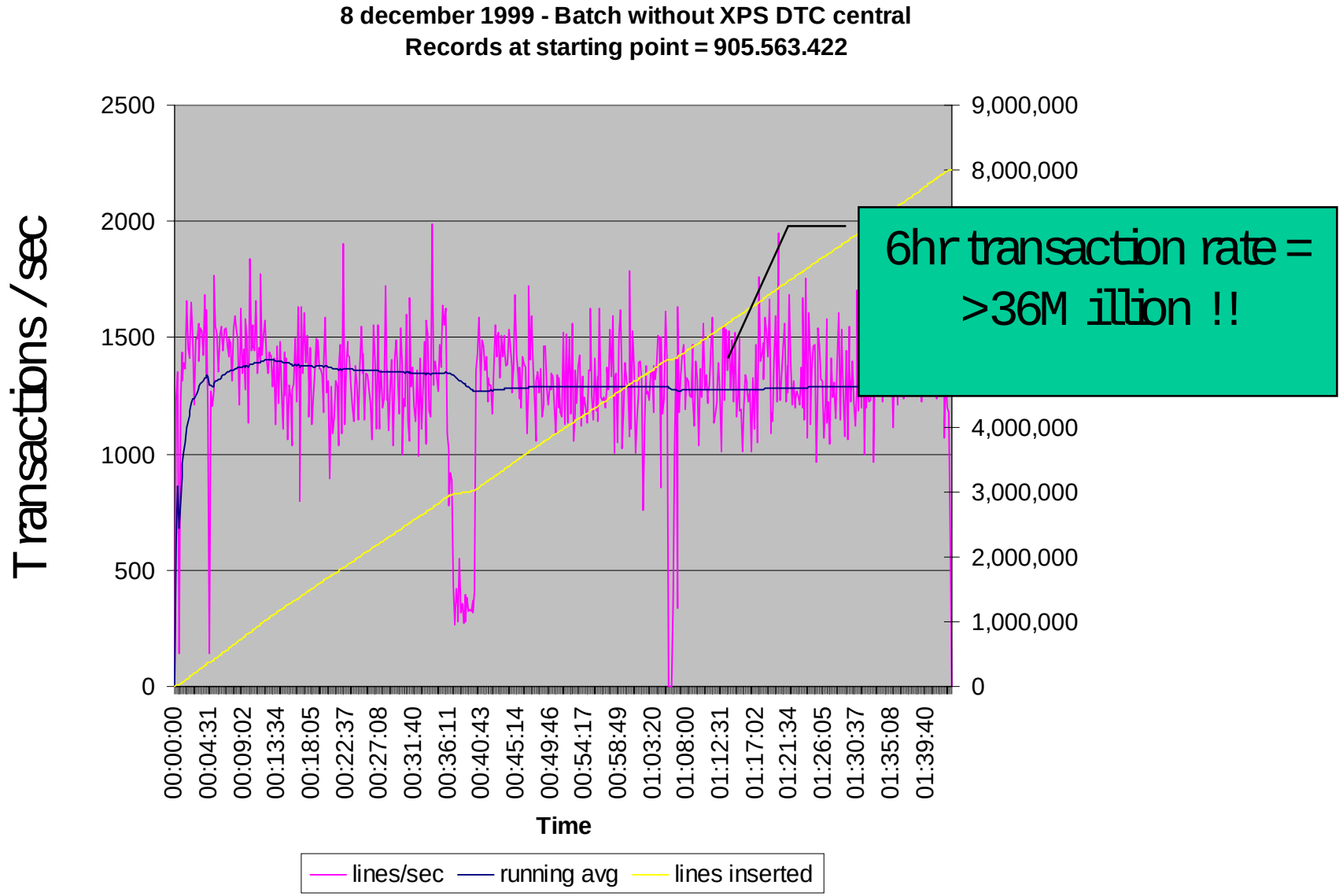
- 2x HP NetServer LXr8000
  - 4x Intel Pentium III Xeon 550MHz (2MB cache)
  - 3 GB RAM
  - 1 x SK-9844 dual link (G Bit/s)
  - 1 D8602A Tachlite FC card
  - 2 x 18 GB discs
- FC HUB:
- Mass Storage: HP XP256
- Microsoft Windows 2000 Advanced Server RC1

HP Solutions
The Grenoble Performance testplatform - details

XP256 Configuration

HP PRODUCT NO.	DESCRIPTION	QTY
A5700A	XP 256 Disk Array	1
A5701A	XP 256 Disk Control Frame	1
A5709A	50Hz disk array frame w/2 disk canister	1
A5723R1	36.9 GB Array group - 4 drives per group	7
A5733S	36.9 GB Spare Drive	2
A5721R1	15 GB Array group - 4 drives per group	2
A5731S	15 GB Spare Drive	1
A5705A	4 port Fiber Channel Pair	2
A5702A	8 port SCSI adapter Pair	1
A5740A	Additional CHIP Power Supply (Addl Pwr Sply)	1
A5710A	1GB cache memory (1GB cache memory)	15
A5711A	Additional Cache Platform Board (Addl Cache PL B	1
A5712A	128 MB Shared Memory Module (128MB Shared M	2
B7905A	Continuous Access XP (Continu Access XP)	1
B7908A	Cache Mgr XP	1
B7909A	Perf. Mgr XP	1
B7911A	Remote Control XP (Remote Cont XP)	1
B7912A	Lun Configuration Mgr. XP	1
B7915A	RAID Mgr. XP	1

Results


8 december 1999 - Batch without XPS DTC central
Records at starting point = 905.563.422
Transactions / sec
2500
2000
1500
1000
500
0
9,000,000
8,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
00:00:00
00:04:31
00:09:02
00:13:34
00:18:05
00:22:37
00:27:08
00:31:40
00:36:11
00:40:43
00:45:14
00:49:46
00:54:17
00:58:49
01:03:20
01:08:00
01:12:31
01:17:02
01:21:34
01:26:05
01:30:37
01:35:08
01:39:40
Time
lines/sec
running avg
lines inserted
6hr transaction rate =
>36Million !!