PG-SME/OBS™

IMS PerformanceGuard for SME & Corporate

True end-to-end Performance Monitoring

From the End-User Perspective

"These Case Studies demonstrate the Incident Milestones and achieved Success Criteria taken from real life 'Business As Usual' Proof of Concepts over the course of three years."

Immediate ROI

From the outset of the installation of IMS PG-SME/OBS we look to provide immediate Return On Investment within the first three months of operation with particular emphasis on month one.

The solution will then continue to provide cost savings throughout the term of contract as demonstrated in the following examples of which one or two only are taken from each client.

Baselining & Root Cause

The implementation of PG-SME/OBS will enable a perfect baseline to work from and allow for full Visibility, Analysis and Optimisation of the Client's network, servers and application infrastructures, and most importantly the true End User Experience.

The purpose is to provide Root Cause Analysis and proactive management of all business applications, business transactions and End User response time measurement.

Proven Cost Savings & Prevented Expenditure

Below is a summary of the Customer Examples detailed on the following pages:

Customer Examples	Cost Savings
Utilities/Energy Company Baseline Remote Offices / Latency NOT Bandwidth	**£950,000** **Over Yrs 1-3**
Retail Manufacturing Company Application not Network	**£485,000 + £630,000/day** **Over Yrs 1-3 + Prevented daily Losses**
Insurance Industry Applications kill Server performance	**£432,000** **Over Yrs 1-2**
Finance Industry Backups, Applications and Morale affect Productivity	**£1,940,000** **Over Yrs 1-2**
Human Resource/Recruitment Server Performance and Routing issues prove costly	**£340,000** **Over Yr 1**

Recovering Productivity   Reducing Overheads   Increasing Profits

Utilities/Energy Customer – Baseline Remote Offices / Latency NOT Bandwidth

Optimise the End-User Experience & Productivity

WAN Utilisation Concerns

? WAN monitoring shows all remote links under utilised except for Marlow where the developers are carrying out large copy via the WAN. Users were swamping the link copying files of around 400Mb per user; this lasted several minutes on each occasion, adversely affecting all other users at that time.

✓ Protocol prioritisation and new business practices stopped this and **improved performance to all users of the link**. This prevented an overcharge from the ISP that directly **saved £500,000** over the 3yr contract.

Redundant WAN Activity

? Extraneous active directory sync activity between the Datacentre and remote DC's generating significant WAN traffic was identified. This was as much as 50% of the traffic on links to the smaller locations as it was the same across all sites.

✓ **This traffic was then virtually eliminated** by tuning the active directory settings. This action prevented an unnecessary project to deploy redundant links and **saved the business £150,000** in Yr1 of contract.

Reduce infrastructure costs while maintaining excellent levels of service

Excessive WAN Provisioning

? WAN monitoring Proof provided to stop BT increasing WAN bandwidth on the MPLS network; many links were in fact reduced (right-sized) without sacrificing any performance.

✓ This **saved £300,000** over the 3yr contract period and **saved valuable support costs and time** to the Customer's IT Support team.

Retail Manufacturing Customer —Application NOT Network

Proactively manage Application Service Levels

Barcode Reader Performance Issues

? The **LAN and WAN infrastructure was proven not to be the cause** of the many barcode reader performance problems which Psion-Teklogic had been claiming for months. They still wouldn't accept responsibility of the performance issues so IMS moved on to the next level detailed in the next bullet point.

✓ In the meantime expenditure on two consultancy projects were eliminated in firefighting the wrong issues **saving the business £85,000** in Yr1 .

Take control of an application in trouble

Psion Server Issues

? The **LAN** Server monitoring and analysis proved that instances of the Psion server service were abending; this was the cause of apparently random barcode reader disconnections which had previously been blamed on the network. Detailed information provided to Psion including accurate times of the abends (within seconds) and PIDs of the failing processes forced them to accept responsibility to resolve the problem.

This was subsequently *correlated with network captures* to link specific abends with the barcode readers affected. This issue took them some time to resolve but data gathered stopped the finger pointing and blaming the Customer's infrastructure which was all that had happened previously.

✓ **This saved valuable support costs and time estimated at over £90,000** in Yr1 to the Customer's IT Support team and **delivered necessary performance improvements to the business**.

Retail Manufacturing Customer —Application NOT Network—continued...

Make sure the most critical applications get priority support

Random Barcode Reader Performance Issues

? The server monitoring and analysis also proved that instances of the service were reaching 25% CPU for up to 60 minutes, This was shown to be a software problem as the user process was registering 100% CPU user time proving that it was running at maximum performance on a single hyper threaded instance on a dual processor server. This randomly caused extremely slow performance for apparently random barcode readers as each process supported up to 10 barcode devices. Once again this had previously been blamed on the network.

✓ IMS therefore **stopped the finger pointing** that had existed for over 6 months **saving valuable resource time costs measured at £110,000** over Yr1 of contract. Even with this information Psion were unable to identify the issue so IMS carried out more detailed troubleshooting of this problem, detailed in the next bullet point.

Severe Barcode Reader Performance Issues

? IMS were called in to investigate severe barcode reader performance problems. Forklift operators were reporting response times of 12-15 minutes when scanning a pallet: This was bringing production in the summer to a standstill as they could not unload lorries fast enough.

Deep analysis of the network traffic through the various tiers of the application found that 2 particular SAP calls were taking just over 6 minutes each. The calls were almost identical and only referenced 3 fields in the same table; one was carried out almost immediately the first one completed.

With the other SAP calls taking only a few seconds to complete, this was resulting in the response times the users were reporting. Analysis of the SQL backend traffic from the SAP servers then proved it was the SQL server that was responsible for the long delay.

With the detailed information and the relevant SQL call syntax it was short work for the DBA to identify that it was a custom view (z prefix) and looking at the 3 fields referenced there were no indexes configured on any of them. This meant that each request resulted in a sequential read of the entire table; a count query was run which took about 2 minutes to return a count of almost 4.5 million rows.

Possible actions were discussed and IMS suggested creating a SQL index on the appropriate field, it was agreed to try this resolution, as to resolve this through the formal SAP process would take at least a week to go from DEV to UAT to production.

The index was created at about 8pm, the following morning IMS gathered new captures of the same operators and we were pleased to say the response times were now under 3 seconds in total. It was then possible to see that one of the operators' successfully unloaded 11 pallets in less time than it had done to unload just 1 pallet the previous day, Bearing in mind it typically took between 60 and 90 seconds to drive around the warehouse.

✓ This allowed for a **significant saving in ongoing support costs** to the Customer's IT Support team and immediately **improved productivity to the business,** allowing very **significant cost savings in production and delivery.**

We have been informed by the Customer through statistics shown that loss of production, costs the business **£90,000 per hour**. In this issue a Forklift driver could only ship 4x pallets every hour instead of 40x pallets per hour, it was taking an entire day to load just one lorry. The cost to the business was approximately **7 hours of lost production per day** as the goods could not be shipped.

This went on for several weeks until IMS were called in to resolve the issue which we did in two days and reduced the time to as little as 1x minute per pallet, this speed had never been achieved before and we had increased out-put by 50% from the previous best productivity.

✓ This equates to a potential **saving to the Customer of £630,000 per day** on just this one piece of work alone. Plus the increased potential output **value of £450,000 per day** thereafter. These savings were supported over the 3Yr contract.

Retail Manufacturing Customer —Application NOT Network—continued...

SAP – SQL – Psion Server Issue

? Deep troubleshooting analysis of the SAP traffic from the Psion servers and the backend SQL traffic found that at the times when a process went rogue some invalid data was being returned to the SAP servers from the SQL servers. This was in turn passed to the Psion servers initiating the high CPU utilisation, at the end of the CPU activity a malformed request containing the previously returned invalid data was being sent to the SAP server, which then returned an invalid request message.

Psion and Axon then managed to identify that the original request was trying to access a temporary result table that had been destroyed but the SQL server returned the bad data. A patch was identified and this resolved the problem.

✓ This provided a **significant saving in ongoing support costs** to the Customer and immediately **improved productivity** to the business, providing **significant cost savings surveyed at £10,000 per month for 20 months** over Yrs1–2 of the contract

Insurance Industry Customer – Applications kill Server performance

Prevent business crises: Address problems before they impact the business

Siebel OM Server Issue

? The Siebel OM server monitoring showed that some Siebel processes were going rogue and sometimes running for days at 100% CPU user time on a multi-processor server. This was degrading the performance as the processes were not handling user requests. No errors were being logged by the systems. This information was raised in a call with Siebel and subsequently a patch for this behaviour was identified and installed to resolve the problem.

✓ This **reduced support costs** to the Customer and immediately **improved productivity** to the business, providing **significant cost savings estimated at £5,000 per month** over Yrs1–2 of the contract .

SAP Server Error Logging Issue

? The SAP servers were logging network errors against the Hyperion servers. This was identified as the Hyperion software was issuing a TCP Reset to end a connection rather than a clean TCP end session. These were not real network errors as such but more an example of poor coding practice. This had been an area of concern for the SAP operations team and had probably muddied the waters regarding resolving the real issues.

✓ This **saved valuable support costs and time estimated at £7,000 per month** to the Customer's IT Support team and delivered necessary **performance improvements to the business** over Yrs1-2 of the contract .

Finance Industry Customer – Backups, Applications & Morale affect Productivity

Quickly identify the root cause of performance problems

Backup Traffic High Volumes during working hours

? Various times throughout the day backups were taking place at Gb volumes in each occurrence. Reconfiguration of backups was arranged to take place on a separate VLAN so as not to impact the users. During backups, the normal utilisation rose from 10-20% up to 80-90%. This could have been using sever resources that the users needed to use.

✓ A 200% **improvement in user productivity** was gained providing significant **cost savings** to the business estimated to exceed **£15k per month** in Yr1 of the contract.

Recovering Productivity   Reducing Overheads   Increasing Profits

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Finance Industry Customer – Backups, Applications & Morale affect Productivity —continued...

Ensure successful deployment of a new application

SQL Application

? There were known issues with this business SQL application within the Customer. One task 'Po Resurrection' took over 30 mins to complete, generating over 42,000 database calls, creating over 56Mb of traffic. This was not expected to work effectively over the WAN and the application vendor was required to patch / re-write the code.

✓ Potential **cost savings** in lost production were estimated at **£1.4Million over 6 months** based on similar recent application failure in Yr1 of the contract .

Improve communication between IT and business users

Remote office Network Performance Problems

? A network monitoring exercise to investigate users complaining of slow response quickly found the cause to be a very large graphic file >3Mb in the news frame of the home page. This was causing the home page to generate over 5Mb of WAN traffic for every user the first time they logged in. As a result the WAN link was operating at maximum capacity at times in the morning resulting in the poor performance. This issue was affecting all sites to a greater or lesser extent however it certainly affected a high number of users over a considerable amount of time. The fix was simply to re-save the jpeg in a web friendly format rather than the high resolution photo quality. There were a number of other graphics that were also oversized for the quality required on the web page. Adjusting these correctly brought the home page down from over 5Mb to under 300kb.

✓ This improvement in End-User performance at the remote office significantly **improved user morale** particularly in the morning, **saved valuable support costs by not wasting continued time investigating, time** to the business, **improved productivity and protected the customer facing corporate brand** .

Human Resource/Recruitment Customer – Server Performance and Routing issues prove costly

Quickly identify costly Server Performance issues

Random Server Crashing

? IMS PG-SME was required to identify why some servers were crashing after 2-3 days for no apparent reason, this included key SAP servers. Investigations identified the problem was a *memory leak* in the HP Insight Manager service that was consuming 16kb every 2 minutes. With this information the server team identified that an HP patch had failed to update a DLL on some of the servers, this resultant mismatch of service and DLL versions caused the memory leak. Once identified this was easy to resolve. In the course of this issue IMS PG-SME had alerted on one SAP server that had been down and found it had been restarted by one of the IT team the previous evening, (they had kindly filled in the shutdown reason box and used their admin login), however they had failed to check if the server successfully restarted. The procedure has now been updated to take this into account.

✓ **This saved valuable support costs** and time to the IT Support team and delivered necessary performance improvements to the business **saving productivity costs of £5,000 per day over a 2 week period** until re-build.

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Human Resource/Recruitment Customer – Server Performance and Routing issues prove costly —continued...

Visualise and manage business network performance

Key Server disconnections

? IMS PG-SME investigated overnight network disconnections between key servers in the data centre that were causing batch jobs to fail. Analysis of the network monitoring showed high volumes of traffic at the times of the problems, this should not have been an issue with the network configuration in the data centre, but it was coincidental.

Monitoring the servers involved, proved that packets were being dropped which were causing the disconnects. IMS suggested checking if backup schedules had changed or the batch schedules themselves as there were no reported network configuration changes at the time. Some jobs were rescheduled and this partially eased the problem but did not resolve it. Even under the traffic levels being seen the network should not have been dropping packets. IMS PG-SME was further deployed to monitor other network devices and servers, this gave a strange result that one blade chassis switch was routing a significant amount of traffic that should have been handled by the Cisco 6513's.

When the HP engineer was on site it was found that this switch had been replaced about 14 days earlier and it had a later version of firmware with enhanced STP functionality. This new functionality was disabled and the network routing was back to normal, however this was not the root cause of the packet loss. The mapping had also shown that where blade enclosures were plugged into the Cisco's, some of the ports were dropping high number of packets. Ethernet networks running TCP/IP are very resilient to dropped packets and the degradation of a small number of dropped packets is practically insignificant on a LAN. However, when it gets too high it causes disconnects not just retransmissions. A call was logged with BT with the detailed ports identified for investigation. This was escalated to Cisco who then examined the configuration and reported that the gigabit cards installed were of the over subscribed type designed for wiring closet distribution switches not server farms. Each 8 ports only shared 1 Gbps of bandwidth to the backplane. Correlating this information revealed that in one case with a number of the servers that had experienced the disconnects there were 27 blade servers sharing 1gbps to the Cisco backplane.

✓ Work to redistribute these servers and examine ways to resolve these network issues were advised and carried out to a successful conclusion. This discovery and ongoing process has delivered and will continue to deliver necessary **performance improvements** to the business and valuable support costs with **savings of £270,000** on advised switch replacement, in Yr 1 of the contract.

"Proactive performance monitoring from the End-User perspective is the ultimate judge of whether or not IT is delivering the best possible service"

For further information please either...

- visit pg-sme.inmansys.co.uk for Small to Medium Enterprise Business'
- visit pg-obs.inmansys.co.uk for Corporate Business'
- contact IMS at ims-pg@inmansys.co.uk or (0)1277 841848

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