

Transworld Data Case Study

Enhanced 3270 User Interface

Today's enterprises are pursuing cloud-based computing within their IT infrastructures. If they are not moving systems and applications to the cloud, they are seeking greater abilities to integrate resources with their system management approaches so they can deliver even better reliability, availability and application performance. Part of the IT transformation around these goals involves resource integration and seamless visibility across all platforms and architectures in the data center, and part of it also involves cost savings and lower TCO (total cost of ownership). As more IT organizations move toward expanded implementations of private clouds with self-provisioning and on demand, pay-per-use computing models for their end users, IT is also beginning to be measured internally by the business through a series of SLAs (service level agreements) that track resource availability and reliability in an on demand environment; system and application performance; and IT time to respond and mean time to repair (MTTR) for instances of problem resolution. In all cases, the ante has been raised within the business for IT to deliver more.

The recent reengineering that occurred on the System z platform and that culminated with the introduction of the zEnterprise z196 and its companion z114 processor is aimed at this IT need set. zEnterprise users are the recipients of more processing power and richer feature sets than ever before, and for the first time they are also able to use the zEnterprise Unified Resource Manager, a firmware-level system manager that optimally integrates and manages System z, p and x resources in a single zEnterprise system management universe. zEnterprise's Unified Resource Manager teams with Tivoli system management solutions to provide end to end visibility of cross-platform applications for system and network administrators, database administrators and system programmers with a need to monitor, fine-tune and troubleshoot performance in a heterogeneous computing environment.

The Business Case for Agile Systems Management

As businesses transition to cloud computing concepts and to powerful platforms like the zEnterprise z196 and z114, the future IT environment will move beyond classic data centers and into ensembles of large numbers of like resources that are managed logically, as if they were one system. This environment will support the cloud, and will consist of autonomically managed pools of virtualized resources. To operate in this environment, system tooling must also keep pace at every level of infrastructure to ensure that those who are ultimately responsible for system performance in these far-reaching environments have the agility and the resources at their disposal that they will need to do the job that is expected of them.

For IT professionals charged with managing expanding CECs (central electronic complex) of systems and resources, there will be a need to move quickly through computing situations as these situations occur with enhanced visibility that gives an expanded view of everything that is happening within this expanded system of systems. To facilitate this level of vision, data feeding into a console separately from each subsystem must be consolidated into a single view so a system programmer or administrator has end to end visibility of transactions that cross subsystems and platforms. With this expanded vision, subject matter experts (SMEs) can begin to see consolidated *information*, and not just data that they must consolidate into information on their own.

How important to business is this transformation of subsystem data streams into a composite of information that can be immediately acted upon? Today's zEnterprise z196 system workloads move at a pace of 20,000 transactions/second. Maintaining the velocity of these transactions directly ties to corporate revenue streams—because when transactions slow or stop, market opportunity is lost. On the business side of the operation, there are only two ways to regain a lost market opportunity—by putting more people on computers that can hit the ENTER key for transactions, or by working staff overtime.

In this world of rapidly flowing transactions, system events can occur at split second speeds and then disappear just as quickly. They might appear to be a problem in z/OS, but turn out to be an issue on the network—or they might seem to be a problem in CICS that turns out to be an issue in DB2. While it is possible that portal-based technology can capture these event flows, point-and-click, GUI-oriented portals do not offer the realtime speed and response of 3270 displays for the subject matter experts who are ultimately called upon to fix serious system problems impacting the business. This is precisely why investment into enhancing the user interface (UI) of the 3270 monitor speeds time to value of the technology for the enterprise and also reduces TCO--because it is possible to investigate and resolve complex problems rapidly from a single point.

The OMEGAMON Portfolio

As enterprises move to “ensemble” IT infrastructures that exceed the boundaries of traditional data centers, tooling has to advance to meet the needs of companies so that they can continue to monitor, troubleshoot and resolve problems quickly. Speed to resolve times depend on the ability to see *information* that can summarize data flows from various systems, although present-day tools still present independent reporting from each subsystem. This leaves the system professional with the responsibility to turn data into information before he can resolve a technical issue. System professionals need a more expeditious means of monitoring and resolving problems. Portal-based user interfaces attempt to transform data into information with layered clicks and drilldowns into information gleaned from raw data steaming in from different subsystems-- but they are not nearly as efficient as command-line technology that is able to get to problem resolution faster. It makes sense for system professionals, who must operate at the command line level, have a “green screen portal” of their own that can stream in raw data from different subsystems into a composite informational view of everything going on in the sysplex. This is the level where system professionals resolve over 90 percent of system problems—and it is the level that the CIO and the enterprise expect these professionals to excel in.

OMEGAMON Product Overview

OMEGAMON product direction is premised on collaborative design and development with customer subject matter experts of an enhanced 3270 user interface that will improve informational content. Key product goals for OMEGAMON are:

- The ability to rapidly identify anomalous KPI (key performance indicator) behavior by bringing together multiple data streams from multiple subsystems into an integrated composite of information that simplifies trouble-shooting and leverages the navigational advantages of 3270 technology;
- The provision of multiple domain analysis capable of identifying complex interactions and subtle emerging problems across domains;
- Advance warnings of service impacts, deterioration or outage threats through the use of adaptive algorithms that leverage historical data;
- A focus on usefulness of results by continuously engaging customer SMEs in the test, evaluation and refinement of the OMEGAMON in pilot, early adopter and beta programs.

The first set of roadmap goals for the OMEGAMON 5.1 release include significant improvements in simplification and performance of OMEGAMON's quality of information and ease of use. Future roadmap goals call for the continued development of tool automation and currency, and further expansion of user interface convergence and integration to consolidate data streams from multiple, independent subsystems into a composite information display on a single 3270 monitor with an enhanced user interface. The intent is to surpass the capabilities of CUA (Common User Access), paving the way for the retirement of the CUA product. It is also anticipated that OMEGAMON's consolidated information displays will produce costs savings that will drive down TCO (total cost of ownership) for data centers.

New Features and Functions of OMEGAMON 5.1

Improved installation, maintenance and management of the OMEGAMON infrastructure—New Self-Describing Agents remove the need for system programmers to manually synchronize agents to servers as part of a Parmgen approach for system programmers to install, upgrade and configure the OMEGAMON 5.1 family.

Integration of CICSplex and z/OS plex information into a single, enhanced 3270 UI—Enables a consolidated 3270 view of CICS and z/OS events and activities across the sysplex, and provides a building block for additional subsystems (e.g., DB2, messaging, IMS, Storage and Mainframe Networks) that will be added in future OMEGAMON software releases.

Support for CICSplex Level Reporting—Data is collected and summarized by the agent and is present as a row (or rows) which represent the agent's view of the enterprise. Workloads spanning LPARS (logical partitions) are represented as a series of discrete rows on the enhanced 3270 UI display, with each row reporting the performance of the workload as measured by each individual agent. CICSplex reporting enables summarization of data at the CICSplex level in the Tivoli Enterprise Portal and the new 3270 enhanced interface.

Display of Key Performance Indicators—The CICSplex Overview and CICSplex Plex Service Class Analysis attribute groups display key metrics that identify the health of your collected CICS regions in your CICSplex environment (e.g., storage, files, maximum task percentage, CPU usage, transaction rate). They are used to populate the new CICSplex Summary workspaces and views.

Made-for-Enterprise information flows—Consolidated subsystem information on the 3270 enhanced user interface was defined and designed by subject matter experts at IBM customer sites to specifically meet the needs of sites charged with maintaining the health of their business systems.

Fewer “clicks” to resolve—By integrating all subsystem data flows into a composite information display on a single 3270 user interface, OMEGEMON eliminates having to use multiple 3270 monitors to drill down into individual subsystem data, and also the need for subject matter experts to make significant manual deductions before they can identify the source of a problem and solve it.

Reduced MIPS (Million Instructions per Second) Consumption—OMEGAMON’s Service Level Analysis (SLA) exploits specialty IBM System z Integrated Information Processors (zIIPs) when they are available. This reduces the charged MIPS consumption of the product, thereby reducing costs.

Customized Views—OMEGAMON for CICS on z/OS provides predefined workspaces that are designed for quick and easy monitoring, problem diagnosis and problem resolution. These workspaces can be further customized by you to suit your own requirements for display and navigation. The 3270 enhanced user interface presents up to fifteen panels per screen

Non-reliance on TSO/ISPF—The OMEGAMON 3270 enhanced user interface is built independently of TSO and ISPF. It will continue to operate, regardless of the availability status of TSO or ISPF. OMEGAMON 3270 is also not tied to any emulator. All that is required is that a site is using a 3270 emulator like PC Comm that supports the output of lines and rows to the 3270 display.

New Operating Console (OC) Commands for analysis of OMEGAMON CICSplex configuration—these include:

- OC STATUS,CICSplex
- OC DISPLAY,PLEX=cicsplex
- OC DISPLAY,PLEXRULES.

The Architecting of OMEGAMON: Collaborative Development with Customers

OMEGAMON for CICS on z/OS was designed and developed under customer guidance as part of a new agile development methodology. Collaboratively working with customer system programmers who are responsible for CICS performance, the OMEGAMON development team ensured that key performance indicators (KPIs) required for analysis were being used in the product, and that there was a new focus on real-life enterprise problem solving scenarios to help speed resolution of problems that system programmers routinely diagnose in their jobs.

High on customer subject matter expert lists was the ability to consolidate all subsystem information into a single 3270 enhanced user interface that would give them the capability of seeing enterprise-wide plex views. OMEGAMON developers worked with customer SMEs to identify KPIs at the plex, region and resource levels that should be captured in the UI. The end goal was to reorganize data so there would be fewer clicks to the root cause in problem cause discovery—and corresponding reductions in mean time to repair and staff time in the effort.

A second focal point in the collaborative development effort was to reduce the siloed views of data that had come to characterize OMEGAMON in the past. With data being siloed into separate 3270 applications for DB2, IMS, CICS and other zEnterprise subsystems, it was tedious and time-consuming for SMEs to perform analysis in each of these separate silos, and then manually integrate all of the findings into a composite problem resolution that takes into account all of the separate data from each of these subsystems' respective 3270-based reporting mechanisms. With its enhanced user interface, OMEGAMON 5.1 begins to deliver on the promise of pulling the threads of all zEnterprise subsystems together into a single 3270 display, beginning with a consolidation of CICS and z/OS data. The new OMEGAMON 3270 architecture eventually will include reporting on all zEnterprise subsystems in a single address space. It will allow an SME to see a CICS transaction from MQ, DB2, IMS or any other zEnterprise subsystem. The same SME will have the option of seeing both z/OS and distributed system message queues (e.g., Solaris, Systems p, etc.) from a 3270 perspective.

In its agile and collaborative development process for OMEGAMON, IBM engaged 17 CICS and 20 z/OS customers in an early adopter program, and 88 CICS and 11 z/OS customers in beta testing. The early adopter and beta test work occurred in enterprise production environments that are impossible to fully emulate in a software lab setting. These customers provided continuous participation and feedback during OMEGAMON 5.1 software development for z/OS and CICS. Early adaptor sites built out problem solving scenarios and worked through these test scenarios with IBM development by using 3270 enhanced user interface prototypes wireframes. They also reviewed demos of the software on a monthly basis, and worked together with IBM developers to define the critical KPIs that would be important for speed in problem resolution, and to determine the metrics that would need to be stitched together in order to produce information for the KPIs.

The result was an enhanced 3270 enhanced user interface that received strong reviews from its enterprise SME test group. The group noted that the way that data was now being organized on 3270 display eliminated many of the former pain points in the search for problem resolutions because data was organized in a way that made it more informational and inclusive. The views of this data could also be customized. In all cases, it was much faster to move through information. Whether the system being tracked was z/OS or CICS, the user was able to operate in an immediate context of problem resolution and follow the thread of his investigation.

Customer Use Cases

Systems professionals engaged in OID (Outside in Design) work have a number of critical objectives that they want to see improvement on in their system monitoring, performance tuning and problem resolution toolset. Among these are:

- The ability to identify the overall health of multiple plexes in a single view so resource bottlenecks that are impeding service level commitments can be quickly identified;
- Visibility of regions that are waiting on a lock state so the top blocker can be identified;
- The need to identify the top worst performing transactions in a plex so potential bottlenecks can be researched;
- Identification of the regions consuming the highest amount of CPU for purposes of identifying potential looping transactions;
- Being able to see if messaging traffic is being evenly spread across ports so response time commitments can be met; and
- Finding transactions that are queuing so the root cause can be found, thereby enabling response time to improve.

In one customer use example, a SME used OMEGAMON XE to monitor the overall health of CICSplex subsystems that were running in the enterprise. The goal was to quickly identify hot spots that required further investigation. With the enhanced 3270 UI, the SME was able to rapidly respond to incoming help desk calls such as a user that said his session was hung, and that the only information he could provide was his user id. In a case like this, the SME usually needs to figure out, based on minimal information, how to free the user's session. This often involves using many systems cycles to do sorts, filtering etc. Now, the SME has the option of using a new find command in OMEGAMON 5.1 that was part of the customer directed development requests. By using this command, the SME can insert the user id in the command and the response shows everything the user is connected. This greatly simplifies the task. The SME then cancels the correct session hanging the user and they are back in business. The value of the agile development and working with customers is that the day to day tasks or common problems can be prioritized and using customer feedback and reviews, built into the products that development knows are needed and will be used.

A European automobile manufacturer preferred the navigational abilities of 3270 over GUI (graphical user interface) technology for deep-rooted technical problem solving. Its experience with OMEGAMON 5.1 3270 enhanced UI screen navigation was that time to problem resolution was accelerated with the ability to consolidate data from different subsystems into an informational display on a single 3270 screen. "Not having to log on to separate subsystems and LPARs (logical partitions) saves time. We believe that the 3270 system interface is the most trusted technology to perform system monitoring and problem resolution," said the SME.

Nissay Bank was deploying a new system platform and wanted to reduce operating costs and overhead. Nissay made the decision to replace its current monitoring system with OMEGAMON, which uses sub-capacity charging based on CPU resource usage, one of the features of Systems z. The move enabled Nissay to keep costs down while enhancing performance.

OMEGAMON Strategic Direction

In concert with customer SMEs, the OMEGAMON product suite will continue to be developed with the end goal of consolidating all 3270 monitor user interfaces into an enhanced 3270 UI that will be able to provide plex-capable workspaces as well as integrated views of other OMEGAMON monitors. This will allow a system programmer, for example, to view both CICS and z/OS performance KPIs in a single workspace.

Initial CICSplex workspaces available in the enhanced OMEGAMON 5.1 User Interface are CICSplex Service Level Analysis and CICSplex Transaction Analysis. Future workspace additions will include:

- Transaction Definitions
- Task History (ONDV)
- Program Definitions
- File Analysis
- Storage Analysis
- Temporary Storage Analysis
- Degradation Analysis (DXAN)
- DB2 Summary
- Connections Summary
- Enqueue Analysis
- Resource Limiting (RLIM) Controls
- Application Trace Facility (ATF) Control
- Web Services

Current product deliverables targets include a 3270 enhanced user interface monitor in 2012, with CICS and z/OS being the first two monitors available in the single enhanced UI 3270 display—followed by the additions of DB2, messaging and IMS.

Summary Remarks

The future of IT will extend today's classic data centers into virtual IT infrastructures that will reach beyond the boundaries of the enterprise, running applications that cross multiple platforms, systems and networks. SLAs for data centers will become increasingly stringent, given the fact that even the slightest application slowdown could result in millions of dollars lost for an enterprise. Portal-based system management tools will play their role in managing these extended architectures, but with transactions moving at speeds at 20,000 transactions/second and upward—and with system events occurring and then disappearing in fractions of a second—sites will continue to call upon their subject matter experts to resolve critical production problems quickly, before these problems can ever impact the enterprise. Operating in this sub-second world, SMEs will require the strength of a 3270-based portal that consolidates individual subsystem data streams into a composite view of plex-wide information. The 3270 enhanced user interface also preserves the fleetness of 3270 navigation, an absolute necessity if technical problems are going to be resolved quickly—and with a minimum of clicks. The OMEGAMON enhanced user interface for 3270 meets this need, which will continue to grow in an age of expanding

data centers and heterogeneous applications that will operate in both the cloud and traditional enterprise contexts.