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# **Proactive Performance Management:** **Improving Service Delivery in an Oracle Environment**

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**Optimize Resources to meet Business Goals (Ptak, Noel & Associates)**

**BEZProphet Architecture**

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## About This Document

Today's Database Performance Management tools address the critical need to immediately detect and react to slowdowns with the goal of improving the performance of applications and databases. These tools are necessary to minimize the effect of current bad performance. However, these tools are designed to react to near-term concerns—not to forecast future performance to ensure consistent service delivery.

Many companies are turning to the IT Infrastructure Library (ITIL) to help align IT with the Business. A proactive approach to performance management can serve as a catalyst to jump start ITIL process development by focusing on the flash point between business and IT: data service delivery. Proactive Performance Management (PPM) provides a methodology to maintain the delicate balance between infrastructure focused supply and more service focused demand for system resources. PPM measures and supplies invaluable information for Operational Level Agreements (OLA), Capacity Management, modeled predictions of future performance, and a comparison of 'real' vs. 'expected' results.

PPM solutions, such as BEZProphet, complement existing Database Performance Management tools in two major ways. First they look at the service delivery by Line Of Business (LOB), not just measuring infrastructure components. Breaking down resource consumption, performance and throughput by LOB is significant, since service delivery is the primary flash point between Business and IT. PPM helps IT align service delivery with the business units.

Secondly, PPM adds the essential future element to allow proactive management. A firm understanding of what will happen in the future is required to optimize the use of existing infrastructure and support ever-changing performance requirements throughout the organization. Although predictive solutions have been successfully applied to this complex issue in the past, until recently, they have been regarded solely as a *"rich man's solution"*. Organizations that wanted to employ a predictive solution needed to have a dedicated staff of experts in order to reap any real benefits. Recent advances in technology, human engineering, and automation have opened this time-tested solution to a much broader audience by producing analytic profiling technology that fits into the daily routine of IT management at a reasonable cost.

PPM has the additional benefit of increasing IT productivity. Recent published studies indicate that almost half of an IT organization's budget can be spent doing "unplanned work", essentially reacting to changes or SLA breaches in the environment and wasting valuable budget dollars. By employing a PPM solution, these organizations can get ahead of the performance curve, stop reacting to unforeseen problems and begin proactively planning for growth and change.

This paper describes solutions for these important issues that can be used by virtually any organization – large and small.

## Executive Summary

Current business alignment trends have forced a Service Orientation on IT. Databases are the most important service elements within the applications. Existing Database Performance tools are good, but their focus is on components and reacting quickly to slowdowns and other service interruptions. What is needed is the ability to look at the service delivery by requestor and project future performance levels, evaluate alternatives and measure current vs. predicted results.

*“The number one challenge of IT Management is to deliver cost-effective, high-performing application service to the business.”*

**BEZProphet™** is an automated management solution for IT to deliver high performing, uninterrupted database services to the business. It does this *by measuring, managing and predicting resource consumption, performance and throughput by LOB.*

This empowers IT to **manage change, set realistic expectations, justify corrective actions** and ensure the delivery of **consistent, uninterrupted service** to the business at the lowest cost.

## Evolving Performance Requirements

The need for predictable application performance and the effects this has on business has evolved dramatically in the last 10 years. Businesses have become irrevocably intertwined with their critical applications. Similar to the way automotive and telephone technologies have irreversibly affected modern culture, computer technology has gone well-beyond accomplishing tasks faster; Information Technology has fundamentally changed the way we conduct business. There is an undeniable correlation between a business and the performance of its key applications. When applications are down or slow, costs and revenue are adversely affected immediately.

There is a great deal at stake, as organizations face pressures to: increase revenue; make efficient infrastructure and personnel investments; implement complex technologies and changing business paradigms; and address a new dimension that surfaced in the nineties—shareholder value. When public companies conduct business out in the open (e.g. on the Web), application performance can become painfully visible. A company can lose far more in valuation in a short period of time than it could lose in the relatively short duration their applications may be slow or unavailable. Now, the *cannot-be-denied* shareholders want to know what management is doing to ensure business continuity.

There is a constant, critical struggle to maintain a balance between maximizing utilization and minimizing costs. Without the proper tools to assess future application and infrastructure performance that is in a constant state of change and evolution, most companies are forced to over-provision to be safe. This has created a challenge for both company management and IT professionals; over-provisioning inflates costs, but under-provisioning risks revenue and growth.

Performance requirements evolve over time. Organizations need to get ahead of the curve and predict the impact of growth in applications and databases so they can effectively support business units and enterprise performance requirements.

## Service Oriented Management

Over-provisioning, the tax for not knowing, is a luxury overlooked in good times that becomes a lightning rod in bad times. There's nothing more motivating than a downturn in business and the accompanying focus on productivity to bring the question of business and IT alignment to the forefront. As businesses look at the amount of money they are spending on IT, they have questioned whether the goals of business and IT are aligned. It was easy for IT to get buried in the complexity and minutiae of

technology and the constant task of “caring and feeding” for legacy applications. IT effectiveness in support of business goals was sometimes overlooked by IT and usually under measured.

The result of this scrutiny is a new “Service Orientation”: looking at IT as a service provider to the business. The new metrics for business alignment and productivity are:

- Improved quality of service
- Lower IT costs
- Reduced business risk
- Improved agility.

In other words, IT is feeling the pressure to meet the demands of a growing business confidently and quickly with quality service at a reduced cost. Many companies are launching and executing ITIL based initiatives that are designed to develop necessary processes that promote better alignment of IT with the business.

### Components of Application Delivery

The service delivered by IT to business is primarily in the form of an application; not merely the application code and logic, but collectively all the infrastructure hardware and software involved in delivering the business function to the desktop of the user. The key to cost-effective delivery and value is measuring and managing the application service delivery.

*“Haphazard acquisition and application in response to the ‘catastrophe of the day’ means every problem has to be re-solved every time it occurs – a procedure wasteful of resources and frustrating in application.”*

*Richard Ptak - Ptak, Noel Associates*

Applications can be divided into functional components. There are three basic functions: Connectivity Service, Processing Service and Data Service. This is the proverbial three legged stool. Each function must work properly to deliver the application to the user. Each could adversely affect the user experience and the business. A malfunction or resource shortage in one area will constrict the delivery of the “whole” application. Each functional area by definition has a unique function and has a set of hardware, software and personnel focused on delivering the function.

Connectivity Service is probably the best understood and served by existing software tools.

The Processing Service component is starting to get a lot of attention with provisioning and configuration tools and Business Service Management solutions.

However, the Data Service component remains a black box. There have been great advances in measuring the database as a whole, tools to react performance problems and tools for tuning SQL, but there has been little available to measure and manage the delivery of data service. In order to better align itself with the business, IT needs to move to managed data services rather than relying solely on managing individual technologies.

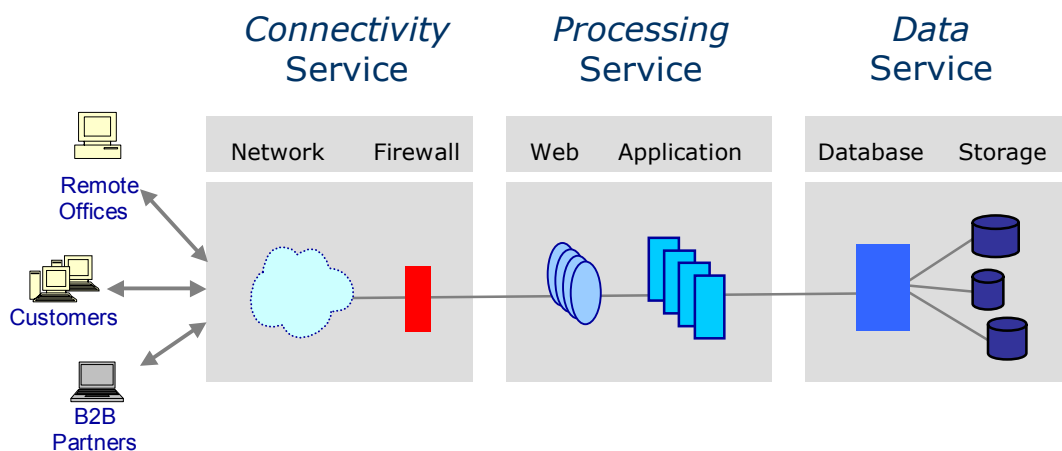
### GRID is on the way!?

Grid technologies (aka Real-time Infrastructure, Capacity on Demand, etc.) focus on dynamically balancing infrastructure components reacting to dynamic capacity needs of the applications. In many ways, these technologies automate the process of detecting capacity problems and shifting resources to react. The added benefit of the automated approach is that the resources can be configured correctly to eliminate common operational errors. However, the benefits of these technologies are not shared equally by components of the infrastructure. While adding servers to increase connectivity, or adding servers to boost processing power can be extremely effective, the nature of data does not lend itself as

easily to capacity on demand automation. The database is a convergent point in the infrastructure. The database management system embodies complex retrieval paths and locking mechanisms in response to data requests to keep data requests from stepping on each other and protecting the integrity of the database. Multiple database requests must be synchronized so dynamically adding servers doesn't necessarily speed up the queuing processes for CPUs, locks, I/O channels, cache or disks.

Oracle® understands this and has developed Grid technology that allows for the unique parallelism requirements of the database management system to coordinate multiple servers. Grid is a partial answer to adding capacity quickly in situations when demand is not known. It does not remove the need to understand current and future data service levels.

## Application Services



**Figure 1. While Connectivity Service and Processing Service are relatively well understood, Data service remains a black box.**

## Measuring and Managing the Delivery of Data as a Service

The function of Data Services is to deliver data to the application and user requestors. The data service function is composed of many parts: Data Base Management Systems, databases (the data), storage "servers," storage devices and channels/networks/fabrics which connect the components. Each component has its own set of management software and many now have performance monitoring software available. These tools are necessary, but the same logic that applies to Application management applies to Data Service functions: *measuring the individual parts of the infrastructure does not constitute measurement effectiveness of service delivery*. There are few solutions that measure the data infrastructure in delivering data to the business.

To understand 'Data as a Service' you need to know:

- What is the service response time by LOB?
- How do LOB workloads affect others?
- What are the response times compared to service level objectives?
- What are the throughput patterns by LOB?
- Which lines of business are consuming the most resources?
- How much of the service time is spent in the DBMS?
- How much of the service time is spent doing I/O?
- How are response times trending?

- Where are the bottlenecks and what can I do about them?

These questions focus on the current state of data service delivery. To manage effectively, you need to consider the future ability to provide acceptable service. Companies and their IT infrastructure are rarely at equilibrium. The number of users grow, the number of applications grow, the volume of data grows, and new advanced hardware and software becomes available.

To manage effectively, you cannot react to every problem as it occurs. You need to effectively forecast future performance requirements to plan for uninterrupted service and contain emergency costs.

To manage 'Data as a Service' you need to know:

- How will the delivery of data change in the next 6, 12, 18 months?
- How long will performance of my critical lines of business be acceptable?
- Is my hardware configuration out of gas?
- When will we breach our performance goals?
- When will my throughput suffer?
- What if I change hardware?
- What if I consolidate servers?
- Is RAC/Grid appropriate for my application?
- What is the long-term impact of adding this index?
- Who/what is consuming the most resources?
- How will that new application perform/scale in production?
- Do I need more/faster CPUs? Disks?
- What will the merger do to my system performance?
- What if I add more users?

A Proactive Performance Management (PPM) solution should, at a minimum, provide analysis in order to:

- *Maximize ROI on Existing Infrastructure:* A PPM solution should allow organizations to maintain as close to 100 percent utilization of resources as possible. It should allow the enterprise to upgrade only when required, not on a fixed schedule.
- *Drive Down the Cost of Owning and Operating IT Assets:* The enterprise should identify server and application consolidation candidates and compare alternative architectures to optimize the ROI of IT infrastructure.
- *Understand How Changes Affect Operations:* It should allow IT to assess the impact of changes in hardware or software on the performance of existing applications. It should eliminate "guesstimates" by evaluating the impact of multiple variables to predict future requirements.
- *Manage Objectives to Meet Business Needs:* Provide consistent levels of service even as transactions increase and new applications are deployed. The enterprise should be able to understand the SLA requirements for each line-of-business (LOB) and ensure that acceptable performance levels are maintained over time.
- *Eliminate Firefighting:* Systems managers and Database Administrators (DBAs) should move from today's reactive approach and profile applications, compare alternatives, forecast the results and verify 'actual' versus 'forecasted' results to meet the SLAs of important LOB applications.
- *Set Realistic Budgets using Fact-Based Information:* The impact of hardware and software additions and upgrades should be forecast in advance so IT can justify infrastructure investments based on hard data.

- **Reduce the Risk of Upgrades:** Should eliminate surprises with each upgrade of the DBMS, since IT can first evaluate how the deployment of a new release or new feature will impact existing application and database performance.
- **Increase IT Agility:** Move quicker - Reduce time spent reacting, Answer can-we-do-this-questions quickly, move with certainty, stop experimenting with money, people and technology to provide ensure service.

## BEZ provides Managed Data Services Solutions

BEZ provides automated management solutions for IT to deliver high-performing, uninterrupted database services to the business. It does this *by measuring, managing and predicting resource consumption, performance and throughput by LOB.*

BEZ provides solutions to automate the management and analysis of data performance delivery to critical applications by LOB. For each LOB, BEZ solutions:

- Measure Current and Historical Data Service Times and Throughput
- Monitor Resource Utilization and Data Access Patterns
- Predict Service Delivery Problems
- Explore and Evaluate Alternative Resolutions
- Predict and Measure Results

This empowers IT to manage change, set realistic expectations, justify corrective actions and ensure the delivery of consistent, uninterrupted service to the business at the lowest cost.

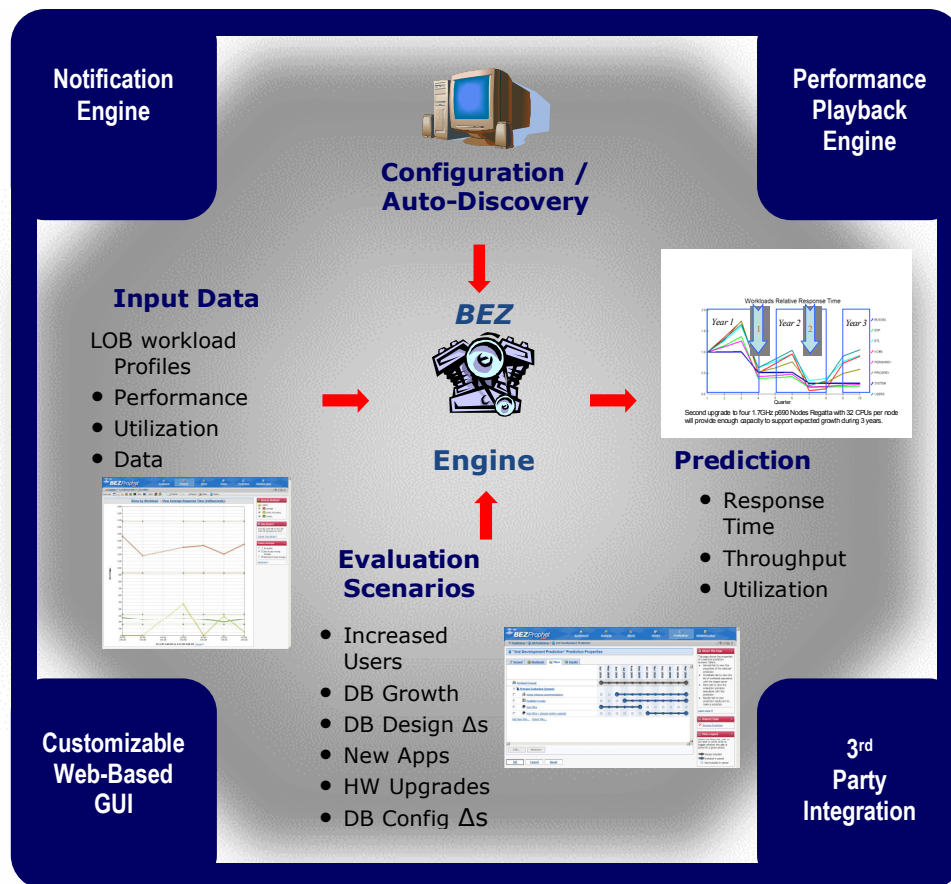


Figure 2. Architectural Overview of the BEZ Prediction Engine showing required input and Prediction Results.

## Jump Start ITIL Based Initiatives

ITIL is a widely used framework of best practice recommendations for IT service management. ITIL is about people and processes and not about specific tools. ITIL is not a set of standards nor is it rules and regulations. ITIL is more a set of pragmatic best practices for developing the right processes that help ensure a service oriented alignment of IT and the business. ITIL practitioners need to make decisions and drive process development.

A basic ITIL tenet states that “Service Level Management (SLM) is to maintain and improve on service quality through a constant cycle of agreeing, monitoring, reporting and improving the current levels of service. It is focused on the business and maintaining the alignment between the business and IT.”

BEZProphet provides valuable data and measurements that help support decision making and drive ITIL process development, including:

- Operational measurements for Operational Level Agreements (OLA) and Service Level Agreements (SLA)
- Capacity Measurements
- Predictive Analysis
- ‘Actual’ vs. ‘Real’ Comparisons of performance

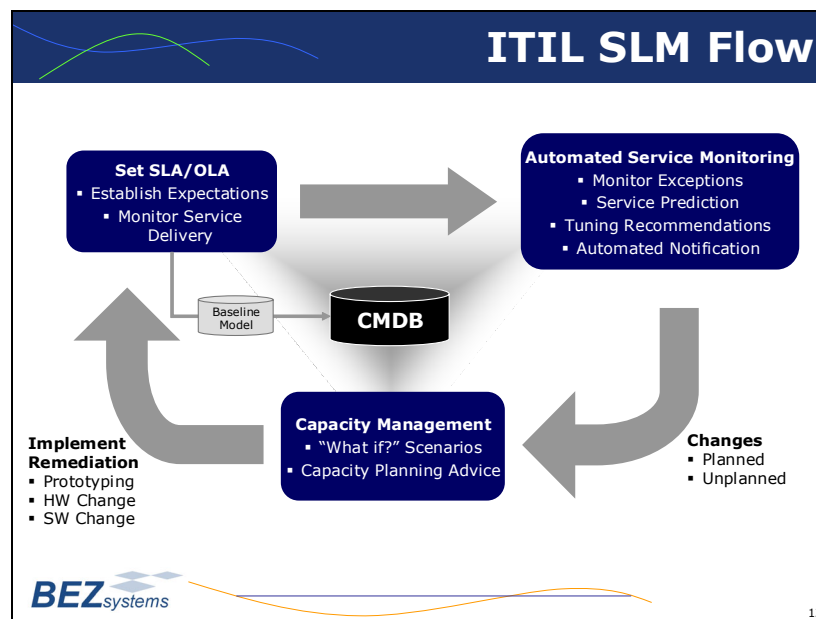


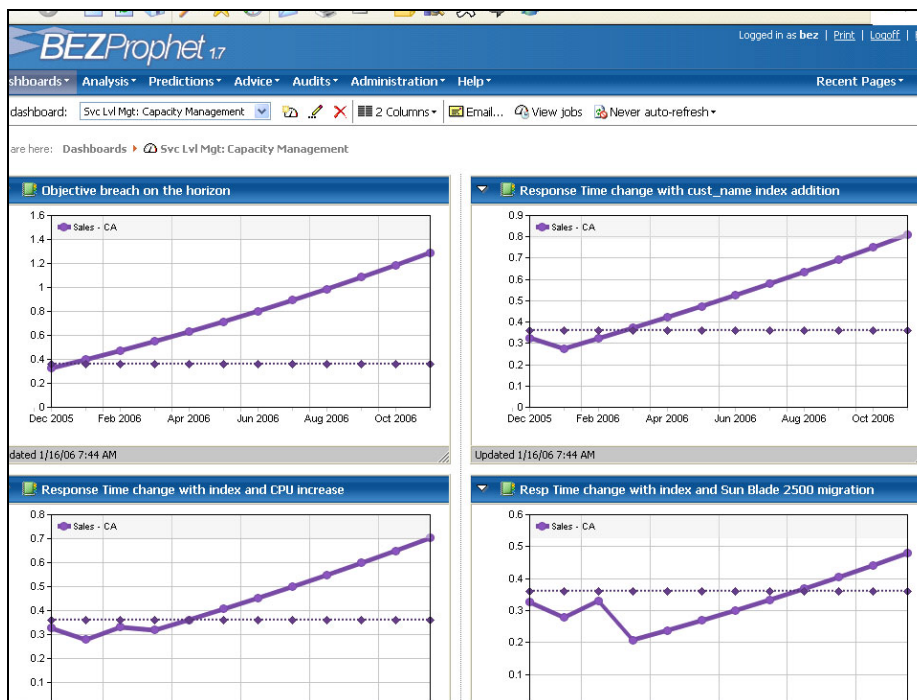
Figure 3. BEZProphet provides valuable data for ITIL Service Level Management

For example (Figure 4), BEZProphet can be configured with dashboards that provide details and insight into important measurements such as response time, throughput, and utilization while automatically comparing these values to their agreed upon objectives.



**Figure 4. BEZProphet Dashboards help with ITIL Service Level Management**

Another example (Figure 5) shows how BEZProphet can be used for Capacity Management by detecting a service level breach on the horizon and then comparing a series of remedial actions to avoid any potential shortfalls in service delivery.



**Figure 5. BEZProphet Dashboard showing Capacity Management Alternatives for upcoming service level breach**

## **Analytic Profiling: Striking a Balance between Cost, Benefit, and Effort**

Analytic Profiles have been successfully used for decades to determine the future performance and capacity needs of complex computer systems. Unfortunately, the earlier generation of these profiling tools suffered from at least three shortcomings that severely limited their wider use:

1. The amount of time and effort needed to build, calibrate, and conduct “*what if...?*” analysis of profiles often required an increase in head count and, as a result, were considered as a “*rich man’s solution*” that was beyond the reach of many organizations
2. Data collection requirements were frequently viewed as prohibitive in order to gather the level of detail required by these tools
3. Obtaining a detailed configuration diagram of the target system was difficult and often out of date by the time profiles were built and calibrated

Nevertheless, analytic profiles were widely used by the “*rich*” to address incipient performance and capacity issues with great success. Of the more common methods for performance and capacity management, analytic queuing network profiles strike the best balance between cost, risk, accuracy, and time.

Most IT staff members and DBAs would undoubtedly welcome more time to devote to system performance and capacity planning but the demands of everyday problems (i.e. “unplanned work”) often get in the way of these important activities while wasting both time and as much as half of an IT organizations’ budget dollars. The latest generation of profiling technology directly addresses these limiting factors in order to greatly reduce the amount of time and effort to produce useful results. Many time-consuming administrative functions have been embedded in the technology making it far more practical to address the organizations future performance and capacity needs with existing staffing levels. Furthermore, by applying the profiling technology on a regular basis, existing staff can more effectively manage their time and focus on projects that will have the greatest impact on improving service to business users. These features include, among others, “As-is” predictions, Configuration Auto-Discovery, and open and flexible data collection facilities.

### **“As-is” Predictions**

As-is predictions are generated, and results are saved, automatically. This type of prediction uses historical data to calculate anticipated growth trends over the next 12 months, assuming that there will be no changes to the environment. The rate (e.g. daily, weekly, monthly) at which data is collected is set when you configure the profile. When results are generated, they are compared to specified performance goals and can be used to generate built-in performance advice to help extend those goals.

“As-is” predictions take a user-specified profile and the number of periods to forecast as primary inputs. Growth forecasts are automatically calculated based on historical data or standard growth plans by percentage per period can optionally be applied. As is predictions also take historical trends of user activity and disk growth and project those forward assuming no configuration changes.

Simply stated, “As-is” predictions, with minimal user intervention, provides a performance and capacity snapshot that let’s you clearly see what major problems are in the near future and provide built-in advice to help avoid or eliminate those problems.

“As-is” predictions help form the baseline performance and capacity thresholds that you are currently experiencing but it only tells part of the story. Once you clearly understand where you are – you need to

determine where you are going. With Planned Predictions, you can initiate a variety of possible scenarios based on data that you supply, including:

- *Configuration data* —product hierarchy relationships; hardware configurations; OS; DBMS configurations
- *Measurement data* (by LOB)—source period selection (representative time period to be used for profiling); resource utilization data (CPU, memory consumption); performance data (response time and throughput metrics)
- *Planning/LOB forecasting* information—prediction category selection; prediction plans (input on what is changing); prediction timeline horizon setting (number of periods and period size)
- *Performance goals/Service Level Objectives* (SLO); user preferences (for performance goal setting)

The powerful combination of “As-is” and “Planned” predictions provides a quick and almost effortless picture of today’s performance and capacity while allowing you to choose the level of detail and effort required to adequately address any predicted shortfalls in service and capacity.

### **Configuration Auto-Discovery**

Maintaining an up-to-date database of all IT assets — applications, systems, network switches and routers, databases, files, desktops, application servers, web servers, etc. — can be a time-consuming, expensive, and major challenge for any IT organization. Providing an up-to-date configuration is also one of the limiting “time-sinks” that hampers the effective use of profiling technology. BEZ addresses this issue directly with auto-discovery of significant portions of the managed system.

Once a server is identified as a monitoring candidate BEZ automatically discovers the details of:

- The Operating system
- Processor profile
- Speed and memory configuration
- Database instances on that server
- Logical volume and logical disk configuration
- As much of the physical storage subsystem as possible

For each database instance BEZ pulls out some of the critical parameters needed for analysis and “What if...?” predictions and interrogates the database catalog to figure out how many of the server’s logical volumes are mapped to database files. The physical storage subsystem is the toughest set of data to capture automatically since it usually requires access to a vendor specific API.

BEZ maintains an on-line Configuration Library that contains popular node, interconnect and storage subsystem configurations. Users can automatically connect to the library site from within the user interface and pull in standard configurations for more detailed analysis. This functionality is employed for assisting with manual configuration of the physical storage subsystem. For example, if a user has EMC storage arrays, he can easily access a whole series of EMC configurations built into the library. He can then choose the one that matches the target environment. There may be some slight modification of the data after that to update specific pieces of data (e.g. cache size, etc.) The configuration library is also used heavily for predictions. It allows users to choose different hardware (node, interconnect and storage) choices and can assist if manual configuration of the environment is needed.

Once again, the analyst’s time is considered to be of the utmost importance and a potentially tedious and inexact manual process can be almost eliminated by automating the discovery of the target configuration.

Built-in facilities also exist for making modifications (e.g. server additions, deletions, and mergers) in order to further refine profiles for more precise predictions and ongoing analysis but these use only a very small fraction of the time and effort that would be required to manually assemble a detailed configuration. The built-in configuration library stores specific configuration information and allows users to:

- Add a new node configuration
- Add a new node interconnect configuration
- Add a storage configuration
- Add a disk array configuration

Rather than having an analyst waste time determining the performance values for each vendors offering, they are stored in the configuration library. More specifically, the configuration library provides a list of available vendor brands of nodes, servers, storage subsystems, and inter-node communication system parameters. If the user selects a particular vendor and model number, the fields fill in automatically with parameters for the chosen brand. Users only need to select the vendor and model number – all relevant performance values are automatically entered into the model with no further required interaction.

## Open and Flexible Agentless Data Collection

Data collectors gather measurement data regarding performance (e.g. response time, arrival rate) and resource utilization data, which form the basis for analysis and prediction. BEZ uses collected data to characterize response time and throughput for profiling and for comparison of actual performance to expected performance. Collected data is aggregated and stored hourly to support continuous review.

BEZ Supports two types of data collectors:

**Operating System** (OS) data collectors provide total utilization data at the server level. These collectors are generated automatically for each node on a selected server.

**Database Management System** (DBMS) data collectors provide instance-level data, which is collected from all nodes on which your database instance runs. Database collectors are generated by a built-in data collection wizard.

For maximum flexibility, the two major categories of data collectors are further broken down as follows:

### Operating System Collectors

- Device (I/O) Collector, which includes I/O statistics for different disks as seen by the node
- Node Collector, which includes I/O and CPU metrics for each monitored node
- Process Collector, which includes CPU utilization by different processes running on the node

### Database Management System Collectors

- Oracle Collectors – gather instance, requests, response time, and session data for Oracle instances
- VERITAS Collectors – gathers DBMS data and collects extra data for RAC environments for users of VERITAS i<sup>3</sup>

- Custom Collectors – gather metrics for all sessions and elapsed time for all SQL executions

A data collection wizard is included to minimize the time and effort required to collect data and to maximize the effectiveness of the collected data.

### What if You Had All the Answers?

In addition to greatly reducing the time and effort required to effectively measure and profile a system, the BEZ approach holds the answers to the following important questions that cannot be answered satisfactorily with traditional performance management technology today:

- *What if I could see ongoing performance metrics by specific Lines Of Business (LOB)?*
- *What if I had a way to understand the resources a planned new application is really going to take, how it will perform and how it will affect other applications after it is fully built, deployed and tuned?*
- *What if I could visualize the near-term and long-term impacts of adding a new application or changing a database design—before implementation?*
- *What if planning groups could be more proactive and had a methodical process that was easy to use, non-intrusive, continual, and repeatable?*
- *What if I could accurately understand the impact of upgrades or migrations before deployment?*
- *What if I had a framework to collect historical data and use statistical process control to determine which metrics indicate trends and which are merely temporary anomalies?*
- *What if I could see out 6-12 months and estimate performance to reduce the time and cost of testing, minimize performance risks, justify necessary upgrades and build confidence in delivering consistent and acceptable service in the future?*

BEZ advanced profiling technology satisfactorily addresses all of these “*what if...?*” questions. Direct answers to questions such as these help the enterprise:

- Reclaim lost budget dollars
- Reduce frustration
- Free up personnel time
- Steer clear of emergency budget demands for more hardware
- Avoid the need for heroic tuning efforts to just get through another peak period

There is a void in the ability for DBAs, capacity planners, management and business users to communicate on common ground. DBAs tend to make projections without assessing the impact to the hardware or the other non-database activity that may be running on their server. Capacity planners typically plan with little-or-no knowledge of the impacts to growth within the database itself. The database is treated as a black box for their planning purposes. The business community is repeatedly asked to finance IT expansion projects without seeing clear justification on why increased spending is required to sustain their business growth plans. BEZ merges the needs of all of these functional groups into one common solution by opening the lines of communication between organizations and allowing business-planning activities to factor in the impacts to the hardware, software and data access as a projection is made.

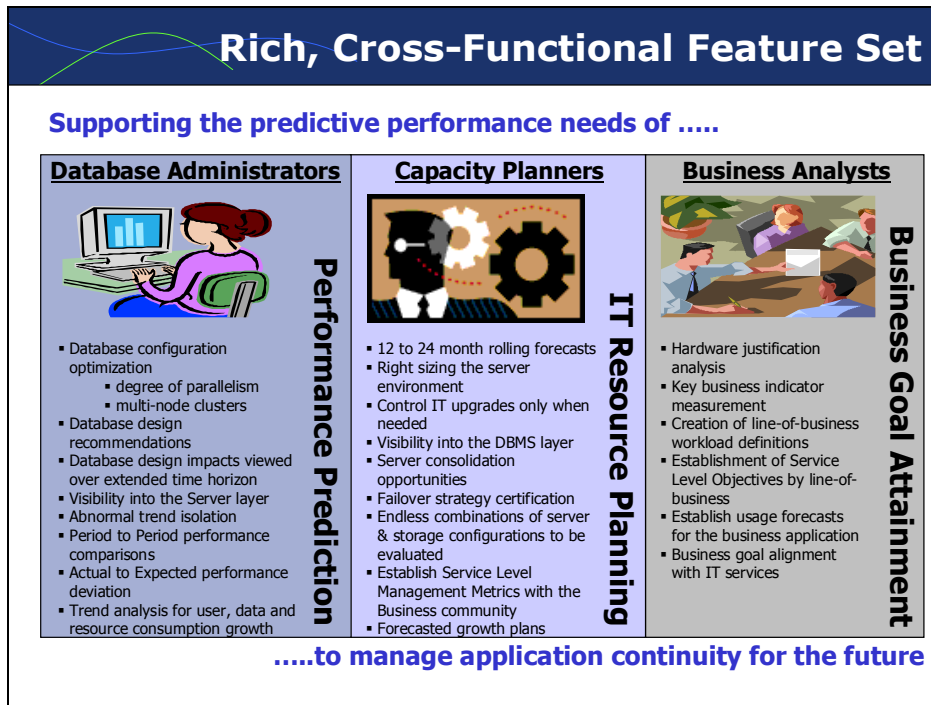
Stakeholders	Goals	Risks	
<b>Business Management</b>	<ul style="list-style-type: none"> <li>▪ Productivity</li> <li>▪ IT Support of Business</li> </ul>	<ul style="list-style-type: none"> <li>▪ Business Performance</li> <li>▪ Spiraling Costs</li> </ul>	<p><i>Organizations are no longer willing to make speculative investments in information systems without a clear understanding of the costs and measurement of the benefits.</i></p> <p>— Butler Group</p>
<b>IT Management</b>	<ul style="list-style-type: none"> <li>▪ Service Levels</li> <li>▪ Cost Control</li> <li>▪ Personnel Retention</li> <li>▪ Manage Complexity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Budget Approvals</li> <li>▪ Lack of Innovation</li> </ul>	<p><i>The average company with a data warehouse routinely over-configures their system by 50%</i></p> <p>— Gartner Group</p>
<b>Technical Operations/DBA</b>	<ul style="list-style-type: none"> <li>▪ Increase Capacity</li> <li>▪ New Applications</li> <li>▪ Infrastructure Changes</li> <li>▪ New Software Releases</li> </ul>	<ul style="list-style-type: none"> <li>▪ Guessing Wrong...</li> <li>▪ Fighting Fires</li> <li>▪ Over-Provisioning</li> <li>▪ “Viral” Effect of <u>Unreported</u> Problems</li> </ul>	<p><i>DBAs spend 30% of their time unnecessarily chasing performance problems.</i></p> <p>— Giga Information Group</p>

**Figure 6. PPM directly addresses the goals and risks of all major stakeholders.**

### PPM Provides Answers

The BEZ PPM solution provides answers to complex problems that allow you to:

- *Anticipate performance problems and fix them before they create a crisis by identifying who or what is consuming the most resources within key applications.*
- *Explore and evaluate alternative solutions to future performance and capacity needs through powerful yet easy to use “What if...?” predictions to assess the impact on response time and throughput for major LOBs.*
- *Predict and Measure Results on an ongoing basis by employing powerful “As is” predictions that use historical growth trends or user-specified anticipated trends.*
- *Jump start ITIL based initiatives to help with process development and to provide ongoing measurements for OLAs, SLAs, Capacity Management, predictive analysis, and a comparison of ‘real’ vs. ‘expected’ performance.*



**Figure 7. BEZ merges the needs of all 'stakeholders' into one solution.**

BEZ merges the needs of all 'stakeholders' into one solution, allowing business-planning activities to factor in the impact of application performance, budget constraints and business growth plans as projections are made.

### Summary and Conclusion

Database Performance Management needs have evolved to meet business demands for better service. Now that there are reliable solutions that react quickly to database slowdowns effecting business critical applications, its time to move up the maturity ladder by complementing these with a more proactive solution which promotes business alignment and ensures consistent service delivery.

BEZProphet is an automated management solution for IT to deliver high performing, uninterrupted database services to the business. It does this *by measuring, managing and predicting resource consumption, performance and throughput by LOB.*

BEZProphet empowers IT to **manage change, set realistic expectations, justify corrective actions** and ensure the delivery of **consistent, uninterrupted service** to the business at the lowest cost.

## About BEZ Systems

Since 1993, BEZ Systems has been offering innovative Proactive Performance Management (PPM) solutions that provide a line-of-business view of application resource utilization for today and tomorrow. These solutions allow enterprises to accurately profile application performance, compare 'change and growth' alternatives, and forecast future requirements. Future performance predictions are an invaluable component of verifying that business objectives and performance goals can be met, thereby minimizing any shortfalls in service. With over 100 person years of experience, BEZ also offers "best-practice" professional services to help companies quickly implement PPM solutions for immediate results.

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