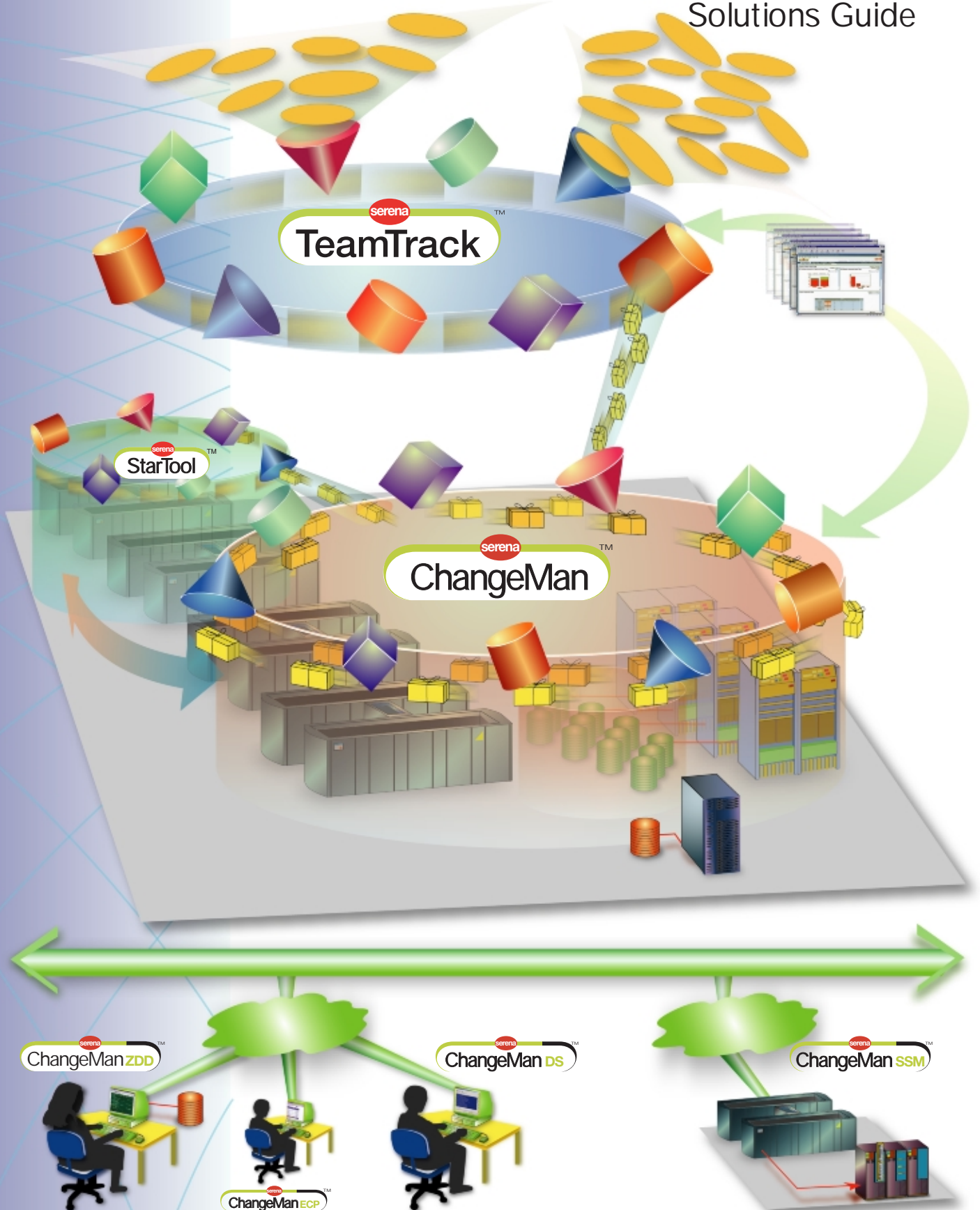


Serena Software

Enterprise Change Management

Solutions Guide



Process Automation Throughout the Application Life Cycle



Serena Software Enterprise Change Management

Solutions
Guide

Introduction

Business Benefits of ECM

Serena® TeamTrack®

Serena® ChangeMan®

Serena® StarTool®

ISV Partners

Professional and
Consulting Services

Glossary

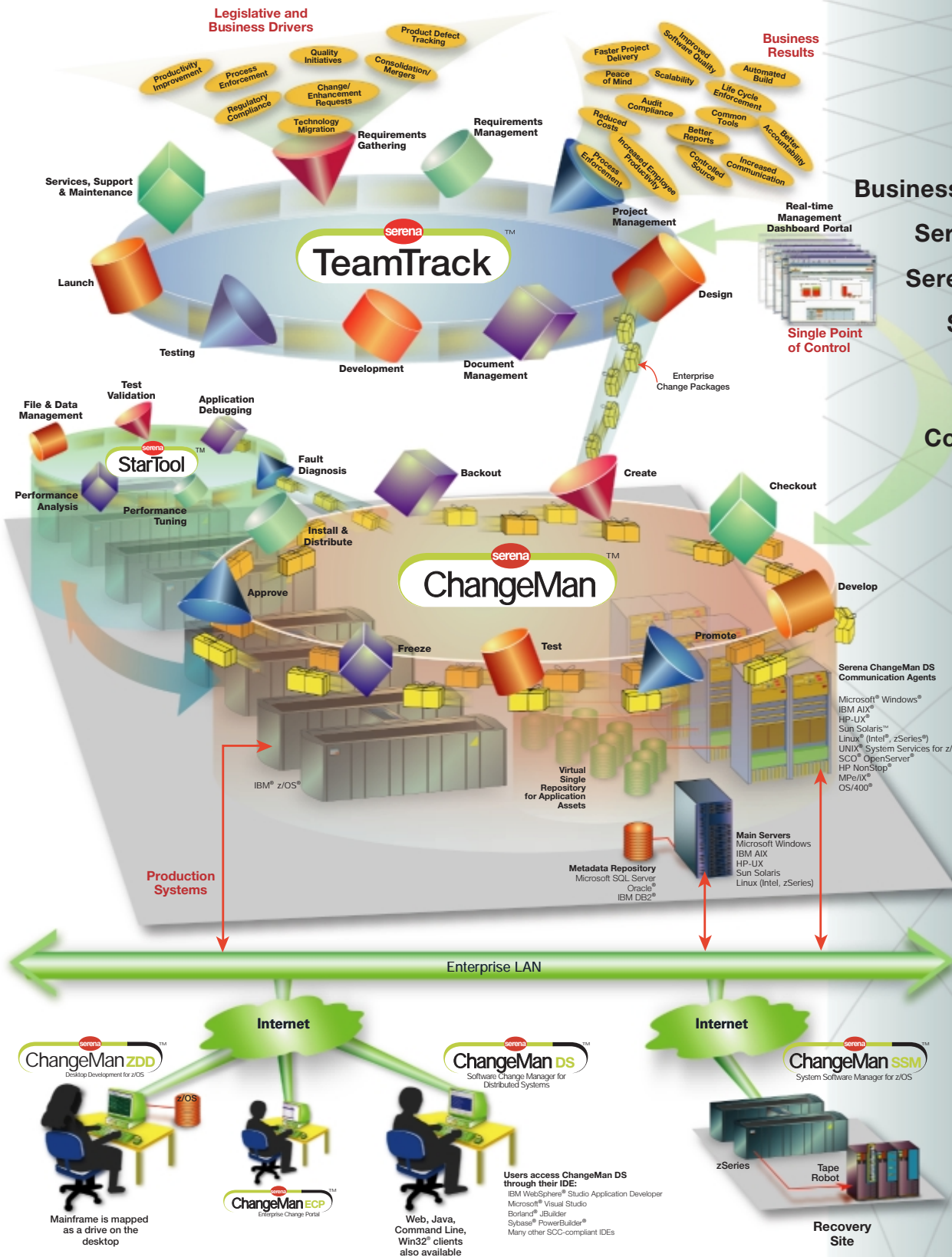


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Serena is Dedicated to Application Life Cycle Management

1

Enterprise Applications are More Critical Today Than Ever Before

Modern global enterprises are complex and dynamic entities. Many factors require enterprises to change constantly — new market trends, customer requirements, acquisition of new products and services, internal process improvements, availability of new technologies, and changing measures of effectiveness. The enterprise is constantly under pressure to adopt emerging IT technologies and new business processes to remain competitive. This holds true for virtually every business function: R&D, Marketing/Sales, Operations, and Finance and Administration. Applications are becoming more globally dispersed and increasingly integrated across multiple computing platforms. This increasing rate and complexity of business change causes an increasing rate and complexity of application change, which in turn mandates the need for improved application management practices.

Enterprise change is creating increasing business risks.

Since 1980 Serena Has Been Uniquely Focused on Application Management

Serena Software's mission is to deliver exceptional customer value through its innovative, high quality software and services that provide control over application change throughout the enterprise. Over the past two decades, Serena has extended this mission beyond both Software Change Management (SCM) and Enterprise Change Management (ECM) to Application Life Cycle Management with the Serena Application Framework for Enterprise (SAFE™) vision. The SAFE vision and Serena mission today is to provide an integrated and automated solutions set that consists of six major solutions categories:

- 1) People
- 2) Processes
- 3) Products
- 4) Partners
- 5) Services
- 6) Application Assets

SAFE Defines a Comprehensive Solution for Application Life Cycle Management

An enterprise can be logically divided into three major categories — people, tools and application assets (both software and hardware). Those logical components of the enterprise are interrelated in ways that are often complex.

- People play different functional and organizational roles, such as business managers, project managers, developers, testers, and so forth.
- Based on their roles, people use different application tools, such as IDEs (IBM WebSphere® Studio Application, Microsoft Visual Studio), ERPs (SAP® and PeopleSoft®), Help Desks (Peregrine Systems®) or Quality Assurance (Mercury Interactive®) to develop, change and support software application assets throughout their life cycle.
- People use these tools to manage a range of application assets, including software (databases and Web content) and hardware (mainframe, UNIX, and Windows servers).

Serena's focus is on the entire application life cycle through the SAFE vision.

Serena delivers complete application life cycle solutions that involve the interrelationship and synergy of the six major solution benefit areas, with each element contributing to the total solution set for the customer's business. Today, people are bound to application assets (such as the software code, the hardware platform, the OS, or the network) through their tools (such as an IDE). With SAFE, the enterprise can identify common elements across process islands and link these common processes with tools. SAFE will provide a single point of role-based access to enterprise information — whether it is processes, tools or assets. In this method, people are still making changes to application assets, but now all their activities are governed by the SAFE integrated, automated, and enforced change process framework.

Non-Integrated Tools Inevitably Cause Increased Application Downtime

One problem with today's application management environment is that people, tools, and application assets do not really work together. Various tools are not aware of the other's existence, people cannot share information and assets easily, and managers do not have a way of controlling and enforcing their operating procedures. This situation inevitably causes inefficient use of resources, wasted costs, and either unplanned application downtime through bugs that were not caught before application launch, or by excessive planned application downtime for global application launches.

Point-to-point tool integration solutions do exist on the marketplace today. However, these are very cumbersome to use and maintain and are not process-driven. Many times these solutions introduce yet another level of complexity to the picture instead of solving the real underlying business problems. In order to manage this broad range of related tools and processes¹, the SAFE solution specifies process-to-process integration across all enterprise application life cycle processes. Not only will SAFE reduce the expense of disparate non-integrated critical systems, but it will also allow Serena products to provide role-based views and give business managers exactly the information they need. Business managers can choose to eliminate unnecessary technical detail, with the opposite being true for technical managers. Examples of non-integrated point solutions are shown in Table 1.1.

Table 1.1 – Examples of non-integrated point solutions today

| Department | Process | Tools |
|-----------------------------|--|--|
| Software Program Management | Requirements Gathering and Analysis | Tracking and Project Management Tools |
| Software Engineering | Code Design and Development | Integrated Development Environments such as IBM's WebSphere Studio Application Developer (WSAD), Microsoft Visual Studio |
| Business Managers | Budgeting, Invoicing, etc. | ERPs such as SAP |
| IT Help Desk | Trouble Ticketing and Request Management | Help Desk System |
| Quality Assurance | Bug Tracking and Request Management | QA Tools such as Mercury Interactive® TestDirector® |

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¹ i.e., software (files, databases and Web content), hardware (mainframe, UNIX, and Windows servers) and configuration (network, security, etc.) assets

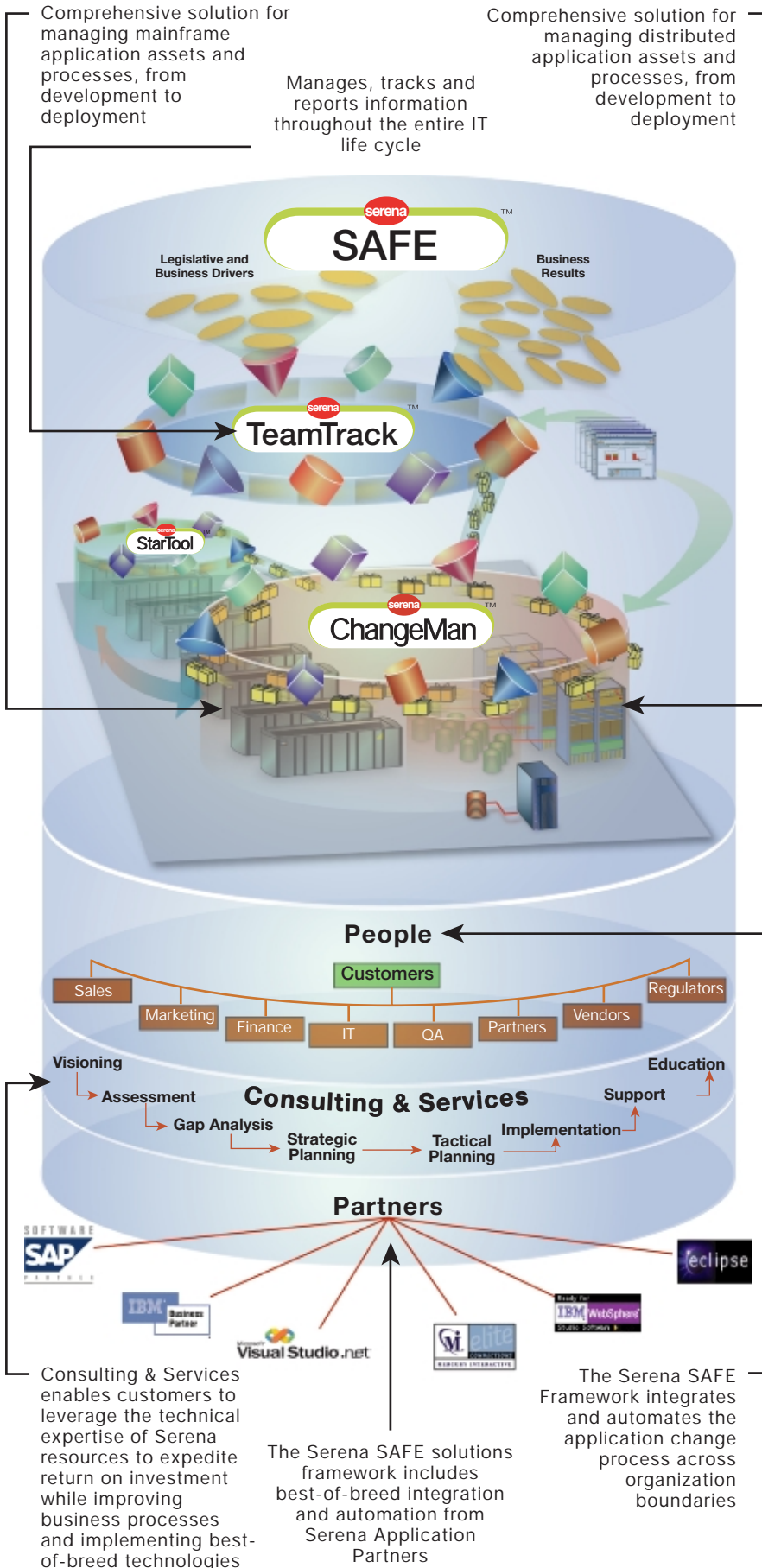
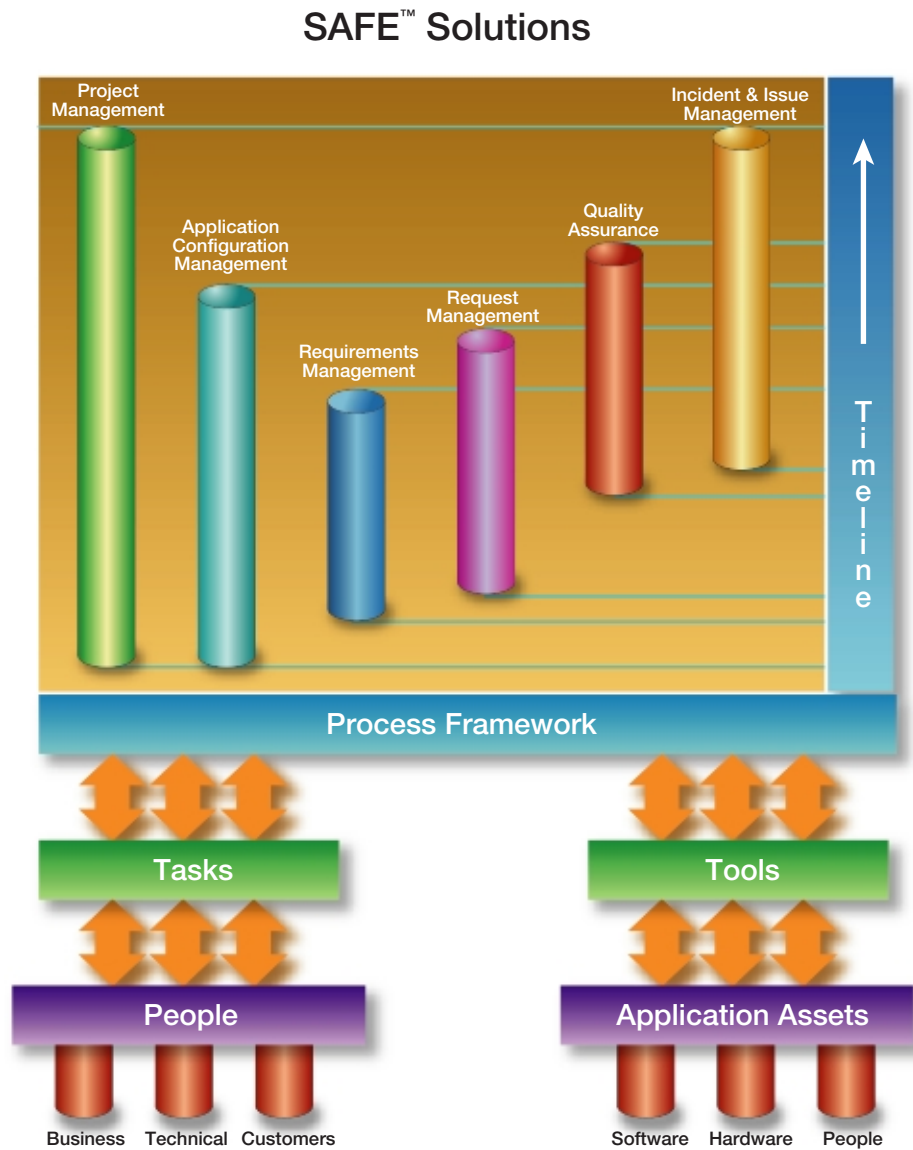


Figure 1.1 – SAFE is an elegant solutions framework of people, processes, products, partners, services and application assets that offers an unmatched breadth of native platform support.

By capitalizing on the Serena customer-oriented business focus, the SAFE solution provides a resolution to this complex enterprise management issue by defining, enforcing and integrating all application change management processes throughout the entire application life cycle. This is illustrated in Figure 1.2.

Figure 1.2 – The SAFE architecture integrates and automates people, process and application assets.



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SAFE is an Extendable, Collaborative Framework for Enterprise Change Management (ECM)

SAFE is an extendable, collaborative framework for Enterprise Change Management that will enable a single point of control over the enterprise-wide application life cycle business processes and provide role-based views of enterprise change, integrating people, tools and application assets. In November 2003, Serena released the first product to deliver on the SAFE vision: Serena TeamTrack Version 6, which tightly integrates with Serena ChangeMan throughout the entire application life cycle. Figure 1.3 illustrates the relationship between Serena TeamTrack and Serena ChangeMan products. These products are further described in detail in Chapters 3 and 4. Many more products and solutions are planned beyond this first and important step.

The SAFE solution provides a single point of control.

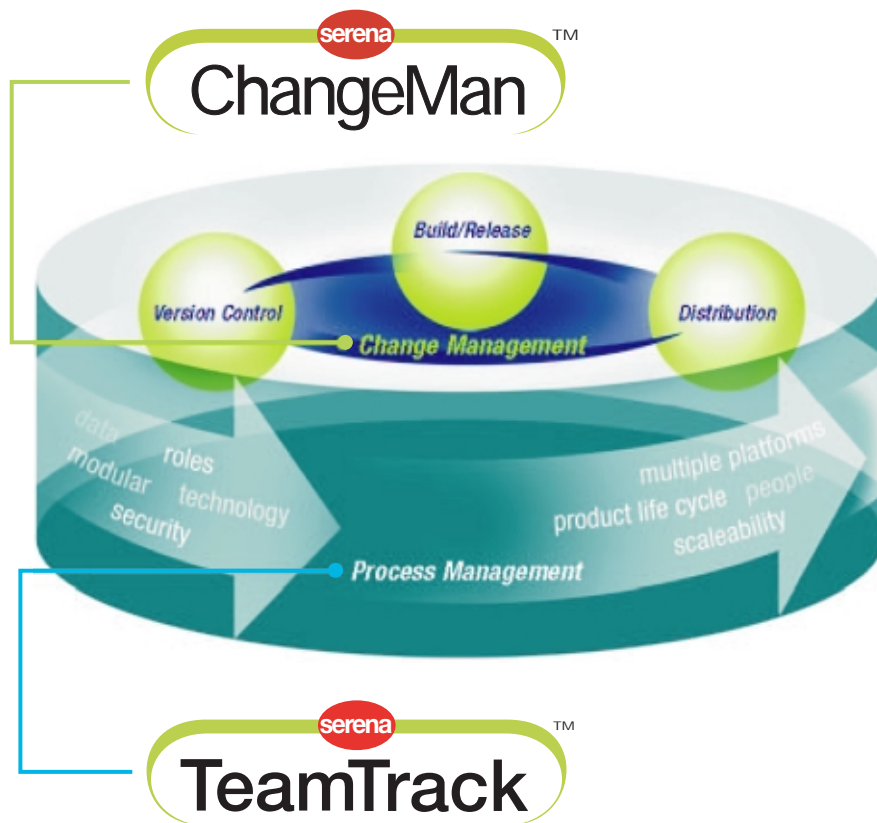


Figure 1.3 –
Serena ChangeMan and
Serena TeamTrack automate
and integrate all application
life cycle processes.

Achieving the Business Benefits of Application Life Cycle Management

2

Market Drivers for Change and Configuration Management

According to IDC, the Software Change Management (SCM) market will grow to \$1.16 billion in worldwide revenue by 2007, due in part to the growing interest in process-centric change and configuration management solutions. IDC predicts that the basic drivers that have fueled the SCM market in the past will continue to do so in the future, as demand for improved software quality and development productivity continues unabated and IT organizations are forced to deal with the software complexity crisis.

IDC believes that successful SCM vendors will be those that can provide full life cycle support, robust yet flexible process/workflow support, and ease of use. According to Melissa Webster, Research Director for Application Life Cycle Management, "IDC demand-side research shows that the end users are looking for full-featured, highly functional products that are process-driven yet still easy to use."

IDC demand-side research shows that end users are looking for products that are process driven.

Summary of the Business Benefits of Enterprise Change Management (ECM)

In May of 2003, the Robert Frances Group (RFG) of Westport, Connecticut, conducted an independent study of companies using Serena ChangeMan products in the retail, financial services, managed services, food services and transportation services industries. These companies represented hundreds of developers and billions of dollars in annual sales. Figure 2.1 shows selected improvement percentages that the Serena clients experienced in six key areas.

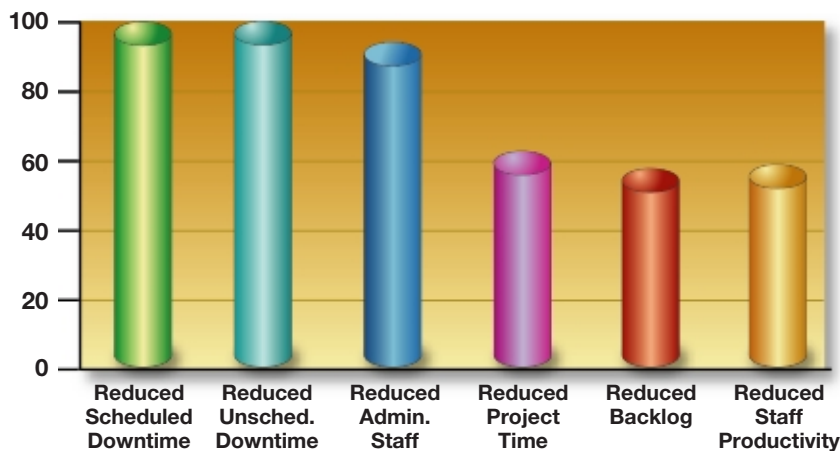


Figure 2.1 – The percentage of Serena ChangeMan clients reporting improvements in six key result areas

These results are proof positive that Serena's industry unique focus on Application Life Cycle Management has resulted in substantial payback to clients. Both scheduled and unscheduled downtime were taken into account and particularly large benefits were reported in savings from reduced unscheduled downtime. Since by some estimates, software accounts for 8 percent of all unplanned downtime for the enterprise², Enterprise Change Management (ECM) investment may be justified based solely on reduced unplanned downtime.

But there are many other ways to justify ECM. Respondents to the RFG survey reported benefits in three main areas: those affecting operations, those associated with developers, and others. These results are summarized in Table 2.1.

Table 2.1 – Summary of the tangible business benefits from using Serena ChangeMan solutions

| Operations | Development | Other |
|--|---|--|
| Decrease administrative staff need by up to 94 percent | Reduce time spent on audit and trace activities by 63 – 100 percent | Increase staff productivity by 15 – 50 percent |
| Decrease scheduled downtime by as much as 100 percent | Reduce project times by 30 – 60 percent | Increase new functionality into production applications by 15 – 80 percent |
| Decrease unscheduled downtime by 20 – 100 percent | Reduce number of staff needed to deliver a build by 43 - 93 percent | Reduce time-to-market for new applications by 50 percent |
| | Increase number of application packages delivered by 100 percent | Reduce backlog of software projects by 15 – 50 percent |

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Source: Robert Frances Group, 2003

“A major reason we purchased Serena ChangeMan was to stop outages caused by changes. Those outages were lasting several hours apiece. Speedy back-outs of failed code and automated changes mean no long outages anymore.”
— Team Leader, Retailer

Like many IT undertakings, some of the justification for the Serena solution involves tangible costs and benefits (hard savings) while some relies on intangible elements (soft savings). As we have seen from the Robert Frances Group study, justification is often complicated and multifaceted since there are many issues and many departments involved. Using Serena ECM solutions to better manage the application life cycle processes, customers can reduce planned and unplanned downtime, improve development process, decrease project times — and improve business results.

² Disaster Recovery Journal, Spring 2001.

The Disciplined Use of State-of-the Art Enterprise Change Management (ECM) Tools

With ECM, Serena identified the need for organizations to automate application change across disparate heterogeneous platforms in disperse worldwide geographies. The Serena ECM product family is the most thoroughly integrated multi-platform ECM solution available. The products work with any modeling method, development tool, and language. These solutions and the platforms they support are shown in Table 2.2 and described in detail in Chapters 3, 4 and 5.

Serena ChangeMan products are the only true process-centric solutions in the ECM market space.

| Serena ECM Product Families (options are indented) | OS Support | | |
|---|--------------|---------|------|
| | Open Systems | Windows | z/OS |
| Serena® TeamTrack® | ✓ | ✓ | |
| Serena® ChangeMan® Product Family – Automating Change | ✓ | ✓ | ✓ |
| Serena® ChangeMan® DS – Software Change Manager for Distributed Systems | ✓ | ✓ | |
| Serena® ChangeMan® ZMF – Software Change Manager for z/OS | | | |
| Serena ChangeMan DB2 Support Option | | | |
| Serena ChangeMan ERO – Enterprise Release Option | | | |
| Serena ChangeMan Merge and Reconcile Option | | | |
| Serena ChangeMan IMS Support Option | | | ✓ |
| Serena ChangeMan Load Balancing Option | | | |
| Serena ChangeMan Online Forms Manager Option | | | |
| Serena ChangeMan APS Option | | | |
| Serena® ChangeMan® ZDD – Windows-based Desktop Development for z/OS | | ✓ | |
| Serena® ChangeMan® SSM – System Software Manager for z/OS | | | ✓ |
| Serena® ChangeMan® ECP – Enterprise Change Portal | ✓ | ✓ | ✓ |
| Serena® StarTool® Product Family – Application Availability Products | | | |
| Serena® StarTool® FDM – File and Data Manager | | | |
| Serena StarTool FDM with DB2 Option | | | |
| Serena StarTool FDM with IMS Option | | | |
| Serena StarTool FDM with Compare Option | | | |
| Serena StarTool FDM with Conversion Option | | | |
| Serena® StarTool® APM – Application Performance Manager | | | ✓ |
| Serena® StarTool® DA – Dump Analysis Solutions | | | |
| Serena StarTool DA Batch – Batch Dump Analyzer | | | |
| Serena StarTool DA CICS – CICS Dump Analyzer | | | |
| Serena® StarTool® IOO – I/O Optimizer | | | |
| Serena® StarTool® RB VSAM – Record Backup for VSAM | | | |
| Serena® Comparex® – Intelligent Comparison Utility | | | |

Table 2.2 – Serena solutions and the operating systems they support

Serena TeamTrack: Application Life Cycle Manager

3

Change is the one constant in business. To remain competitive in today's rigorous business environment, companies must reduce costs dramatically, not just once, but year after year. This means continuously changing and improving the way business is done. Ensuring streamlined, effective and efficient processes is the key to the health of the enterprise and the job of Serena's process management solution — Serena® TeamTrack®. Serena TeamTrack helps organizations map, track and enforce their business processes by managing requests and issues enterprise-wide, as shown in Figure 3.1. Serena TeamTrack aligns business strategy with business requirements across the life cycle. Its very flexible design allows it to adapt to the way an organization works and to grow over time with the needs of the company.

Serena TeamTrack helps organizations map, automate and enforce their business processes.

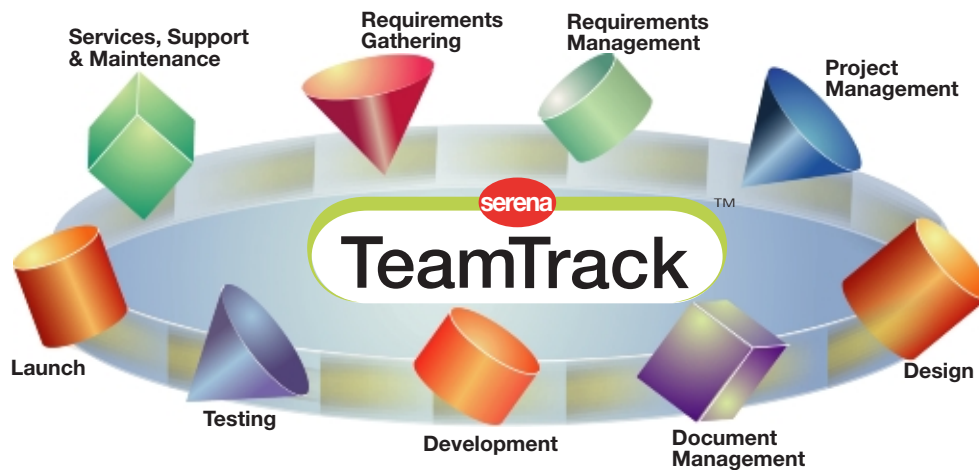


Figure 3.1 – Serena TeamTrack manages enterprise-wide requests and issues.

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The first product to deliver on the vision of Serena Application Framework for Enterprises (SAFE™) is Serena TeamTrack Version 6. Serena TeamTrack Version 6 ensures process enforcement throughout the application life cycle while allowing customers to make agile course corrections and reduce cumulative costs across the value chain. All of this provides business-process optimization, real-time visibility and bottom-line results. Because Serena TeamTrack is operational right out-of-the-box it can be up and running immediately, allowing a company to begin producing results quickly. In most cases, minimal to no training costs are required, and it has the lowest total cost of ownership of any fully configurable workflow management tool on the market today.

Serena TeamTrack is a powerful, flexible, configurable request management tool.

Serena TeamTrack is a Web-architected, secure and highly configurable enterprise change request and process management solution that empowers application development teams to improve communication and development processes across the enterprise. When used to control software development, Serena TeamTrack creates and enforces a clear process throughout the life cycle — from initial project request through post-delivery customer support activities. It prevents critical issues from falling through the cracks and provides simple but powerful tools for implementing Best Practice models. Serena TeamTrack is built

with an open architecture so it can easily integrate with existing version control and testing tools to improve workflow, communication and accountability across the organization.

Serena TeamTrack is the global leader because quality counts. The key features and benefits of TeamTrack are:

- Works on any platform
- Offers fast ROI
- Is quick and easy to deploy
- Has short time to benefit realization
- Works the way managers and developers work
- Reduces need for constant, time-consuming meetings
- Grows as an organization develops
- Makes use of previous investments
- Requires no development time

Serena TeamTrack can be integrated with many other best-of-breed products as a result of Serena services and partnering relationships between Serena and other top software vendors. Table 3.1 summarizes the integrations.

Table 3.1 – Serena TeamTrack integration: products, platforms and benefits

| Serena TeamTrack Integration Product /Platform | Integration Benefits |
|--|--|
| Serena® ChangeMan® DS | Automated and comprehensive SCM solution that streamlines development and improves communication across the enterprise. |
| SourceBridge | Leverages tool investments by creating an integration between Serena TeamTrack and any product that complies with Microsoft Source Code Control Interface (SCCI) standards. |
| VersionBridge for IBM (Rational) ClearCase | Adds application life cycle process management to the existing tool investments by integrating Serena TeamTrack with IBM (Rational) ClearCase®. |
| Integration with Merant PVCS | Adds Serena TeamTrack process management integration to PVCS Version Manager running in the Windows environment. Integration to PVCS Version Manager running in a non-Windows environment may require custom development. Please contact Serena. |
| VersionBridge for CVS | VersionBridge for CVS integrates Serena TeamTrack with CVS open-source version control system for issue and process management in CVS-based development environments. |
| VersionBridge for Perforce® SCM | Serena TeamTrack and Perforce SCM combine version control and automated SCM in a workflow-centric architecture with flexible configurability. |
| TestBridge for Mercury TestDirector | Ensures that test scripts are invoked automatically as components are moved to the testing phase, thereby preventing missed handoffs. |
| ProjectBridge for Microsoft Project | Links the processes required for development to a Microsoft Project timeline, ensuring that updates are made in both systems. |
| XMLBridge Software Development Kit | Allows complete, tight XML integrations with other applications already being used. |
| OpenAPI | The Serena TeamTrack API is an alternative means of manipulating data found in the Serena TeamTrack database. |
| Integration with Microsoft's Systems Management Server (SMS) | Allows IT departments to easily track assets and manage software and hardware details, thereby providing better troubleshooting capabilities. |
| Integration with Microsoft Outlook® | Allows users to submit items into Serena TeamTrack via e-mail using Microsoft Outlook forms, thereby creating better communication. |

Managing the Worldwide Change Process from a Single Point of Control through the Management Dashboard Portal

Serena TeamTrack Version 6 includes a new process management dashboard portal that enables users to view the progress of applications in real time throughout the development life cycle, as depicted in Figure 3.2. Most importantly, it gives users a view from a single source. Its role-based user interface enables users to view information based on their roles within the organization.

Enables users to view the status overview and detail information in real time

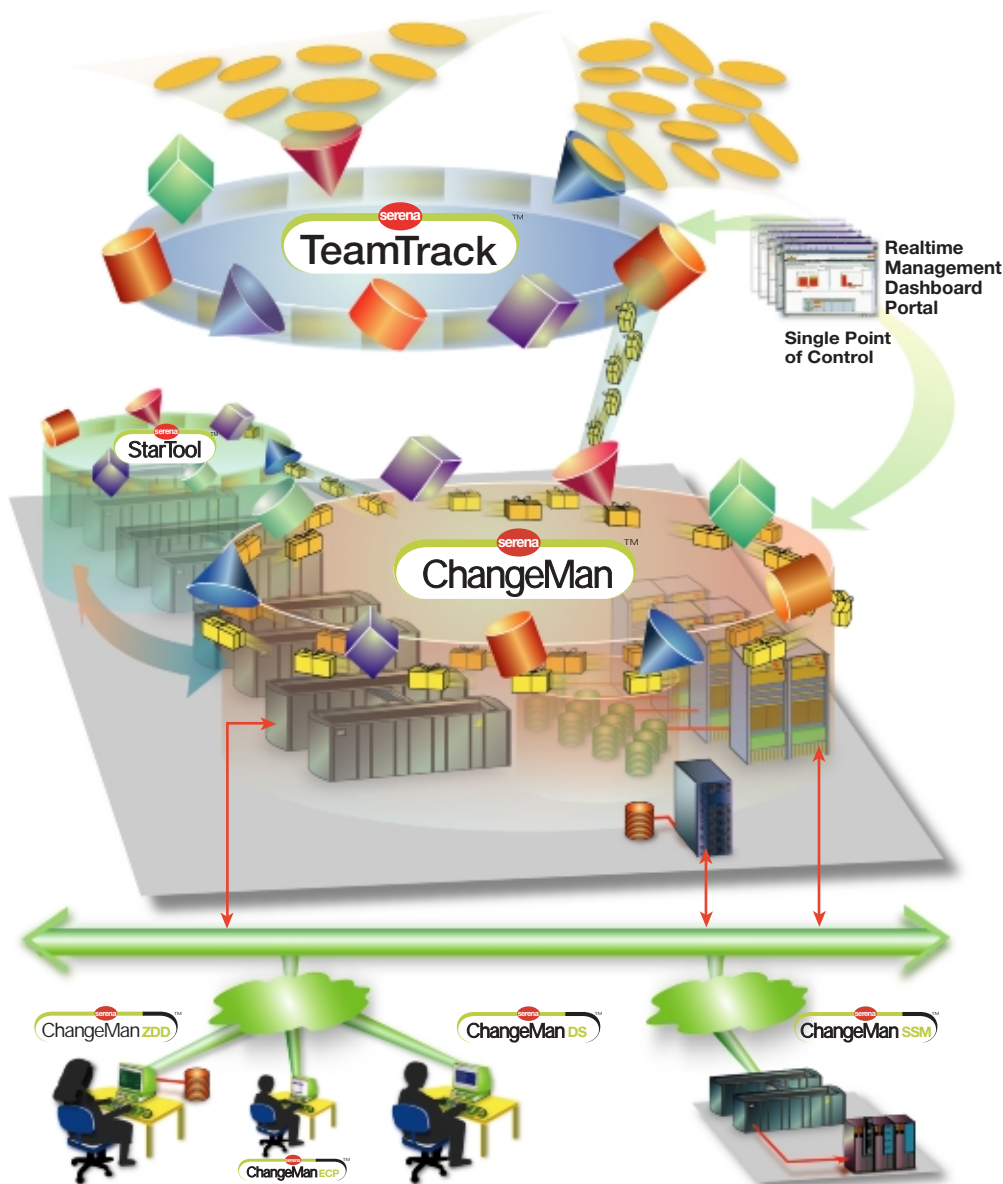


Figure 3.2 – Configurable home page for viewing role-based information

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The Management Dashboard Portal shown in Figure 3.3 allows its multiple reports to be arranged horizontally and vertically in a portal-like layout to provide at-a-glance views of a wide range of information. These reports can have thresholds that are set based on relative values of the information represented. The report's author can designate the values that are to be considered red alert thresholds. Viewers of the report can quickly

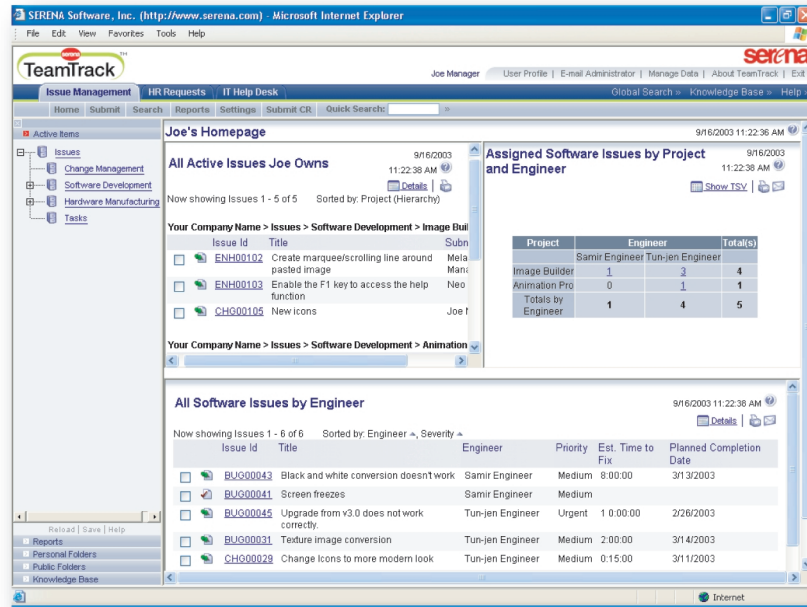
Red alert thresholds quickly alert report viewers to problem areas.

see not only the information and counts reported, but also the relative meanings of the counts, and will be alerted to the fact that certain values have crossed a threshold.

A powerful, drill-down capability allows more detailed views.

Distribution reports can also be set to drill down to show more detailed listing reports. If users want to see the specific items that make up the number displayed in a tabular report, they simply click on the number in the table to see the listing report of those items. New report types include scatter, true trend lines, and logarithmic scale for trend reports with widely varying values of data, such as when the data differs by orders of magnitude.

Figure 3.3 – The Serena TeamTrack Management Dashboard Portal



Serena TeamTrack Allows Companies to Rapidly Automate Business Processes

Effectively managing the people and information involved in business is one of the most challenging tasks in today's competitive environment. To help meet that need, Serena TeamTrack allows companies to rapidly automate their business processes, manage issues over time, and facilitate collaboration with all stakeholders across the enterprise and beyond. Its superior ability to manage, track and report on people, information and tasks throughout the entire life cycle makes it the tool of choice to help manage many areas of a company's business.

The same things that make Serena TeamTrack ideal for application life cycle management also make it ideal throughout the enterprise. All organizations have processes, both within departments and across departments. The question is whether they are explicit or implied. Making them explicit means reducing confusion, increasing communication and collaboration, creating accountability and visibility and thereby reducing intangible costs. Below are some key examples of how Serena customers have extended their use of Serena TeamTrack into other areas of their company.

The superior ability to manage, track and report on people, information and tasks throughout the entire life cycle is provided by Serena TeamTrack.

Human Resources

Time off requests, performance reviews, salary change requests and new hire/termination requests all require that specific people are involved — usually across departments. Approvals must be obtained and tracked. Software, equipment, security and phone card requests (among other things) must be made

in a timely manner in order to have the tools available for new hires, so they can be productive on their first day. Serena TeamTrack allows this information to be easily submitted and automatically routed to the proper people for approvals and action.

Order Processing

Since all companies rely on incoming revenue, ensuring that customer orders are processed quickly and correctly is critical to every organization. Mapping this process into Serena TeamTrack ensures that all orders get the right approvals and get processed without falling through the cracks. Through Serena TeamTrack, status on all orders can be viewed with the click of a button.

Return Merchandise Authorization Process

When supplying a product to market, there is always the chance that it might be returned — for a variety of reasons. The Return Merchandise Authorization process used to take 120 days at a plastics manufacturing plant. Now that it has been automated with Serena TeamTrack it takes less than 26 days. And it is only that long because of company policies. Additionally, visibility into the returns process has helped bring awareness to possible inefficiencies that can be corrected in the manufacturing process.

Managing Regulatory Issues (21CFRp11, HIPAA, Sarbanes-Oxley, and others)

Regulatory issues are a reality, and compliance is critical. Serena TeamTrack has helped many organizations map, enforce and report on these processes at a granular level to comply with regulatory issues and quality initiatives. By providing a graphical workflow depicting the processes, ensuring that these processes are followed and reporting on compliance to these processes, Serena TeamTrack makes it easy to pass the audit.

Quality Initiatives (CMM, Six Sigma, ISO, ITIL, and others)

Quality assurance agents use Serena TeamTrack to ensure that the product meets the initial requirements and to track any possible bugs or issues. Because development and QA use the same Serena TeamTrack database, communication is streamlined and there is minimal risk of any issue falling through the cracks. Collaboration between development and QA is imperative for producing a quality product — Serena TeamTrack facilitates this.

Serena TeamTrack Enhances Enterprise-Wide Workflow Efficiency and Issue Management

As a central component of Serena's Enterprise Change Management (ECM) solution, the new Serena TeamTrack provides a simple, unique, role-based user interface. When combined with the rest of Serena's ECM products, the integrated solution enforces alignment of the software change approval process to the software change life cycle. Serena TeamTrack facilitates collaboration with all stakeholders across the enterprise and beyond. Employing common processes throughout the application life cycle promotes consistency and enterprise efficiency.

The paragraphs below describe how Serena TeamTrack is used by people with various different roles in the enterprise. They also illustrate the power of a role-based interface and demonstrate how Serena TeamTrack efficiently manages workflow across an entire company's processes and people.

“We earned ISO 9000 and CMM Level 2 Certification. It has improved our communication with other departments because we can document and report problems regardless of which computer we log into.”

— Serena Customer

“We use Serena TeamTrack in every department: product development, IT, sales, business development, finance and HR,” said Larkin Rider, director of process management at LookSmart Ltd., in San Francisco. “It is the easiest way to automate internal processes, support and report on operational metrics and goals, and maintain records for audit purposes. The external auditors love it. It has paid for itself many times over. As the director of process management, I can’t imagine working in a company without Serena TeamTrack to support my initiatives for operational efficiency.”

For improved productivity throughout the entire product life cycle, Serena TeamTrack optimizes workflow processes and includes all stakeholders.

Serena TeamTrack ensures that each individual participant knows what to do and when to do it.

“Increased productivity and efficiency directly improved our bottom line.”

— Serena Customer

- **Executive Management** uses Serena TeamTrack as a means to gain a snapshot picture of what is happening within the application life cycle in terms of some of the following questions: What is the high level summary? Are we going to hit release date? Are we going to be on budget?
- **Department Managers** use Serena TeamTrack to review the content and status of particular change requests, as well as to obtain summary-level information for planning purposes. They can also use Serena TeamTrack to help provide direction to IT such as input on and prioritization of change requests.
- **Project Managers** use Serena TeamTrack to manage the entire application life cycle. Uses include submitting initial requirements or change requests, collaborating with development on design, ensuring development and QA are on target, ensuring the readiness of the product, managing the product launch, ensuring proper support is ready, and then starting all over again. This is very complex and non-linear, and it often includes various external stakeholders throughout the process, including partners, vendors and others. Project managers use Serena TeamTrack to manage the project and ensure that each individual participant knows what to do and when to do it. Serena TeamTrack allows them to push tasks through the process with automatic notifications, creating accountability.
- **Development and Engineering Managers** use Serena TeamTrack to manage their change requests. Change requests and development tasks must be assigned and prioritized in order to manage the process and maintain maximum efficiency. Serena TeamTrack is often used as their primary source of work requests, to analyze the status of current change requests and work assignments and to assign tasks and direct workflow, depending upon the priority and complexity of change requests, as well as the availability of resources. It can answer questions such as: What defects need to be fixed? What's the next most important thing to work on?
- **Help Desk and/or Customer Support Agents** use Serena TeamTrack to manage all customer incidents. This includes knowing the company information, contact information, end-user hardware configuration and software configuration. Additionally, when a support agent believes a bug or defect has been reported, with a click of a button they can open an issue for QA to verify. The support agent can monitor the status of the issue and be automatically notified when the QA agent has done something to the ticket. This allows the support agent to provide the utmost customer service by monitoring the issue and notifying the customer when more information is available.
- The tight integration between Serena TeamTrack and Serena ChangeMan products provides **Change Planners** (members of the Change Board) with a tool for capturing and storing change request information for defining and enforcing change processes; for approving and prioritizing change requests; and for analyzing and reporting on the content and status of change requests at the individual and macro level.
- **Change Approvers** (project managers and/or members of the Change Board) use Serena TeamTrack as a primary source of information regarding the status and content of change requests.
- **Marketing Managers** use Serena TeamTrack to help launch a product that is developed for external sale by the company. Within Serena TeamTrack, the marketing team can find the new features and functionality to prepare the

appropriate sales literature, sales and analyst presentations and demand generation activities. Serena TeamTrack includes marketing in the application life cycle, ensuring that activities begin at the appropriate time with the right information.

Worldwide Process-Centric Change Management for the Enterprise

Serena TeamTrack provides management with full access to activity and resource status through comprehensive reports and charts. It delivers up-to-the-minute information on time-sensitive issues such as the number of outstanding critical bugs, time needed to fix them and projected release dates. It improves organizational efficiency by providing information on the issues, what each person is working on, whether priorities are being met and resources optimally deployed, and much more as shown in Figure 3.4. Serena TeamTrack maps, tracks and enforces business processes down to the task level. By using its effective process management capabilities, Serena TeamTrack provides the management control and the accountability needed to make adjustments and reduce cumulative costs across the value chain.

Serena TeamTrack maps, automates and enforces business processes down to the task level.

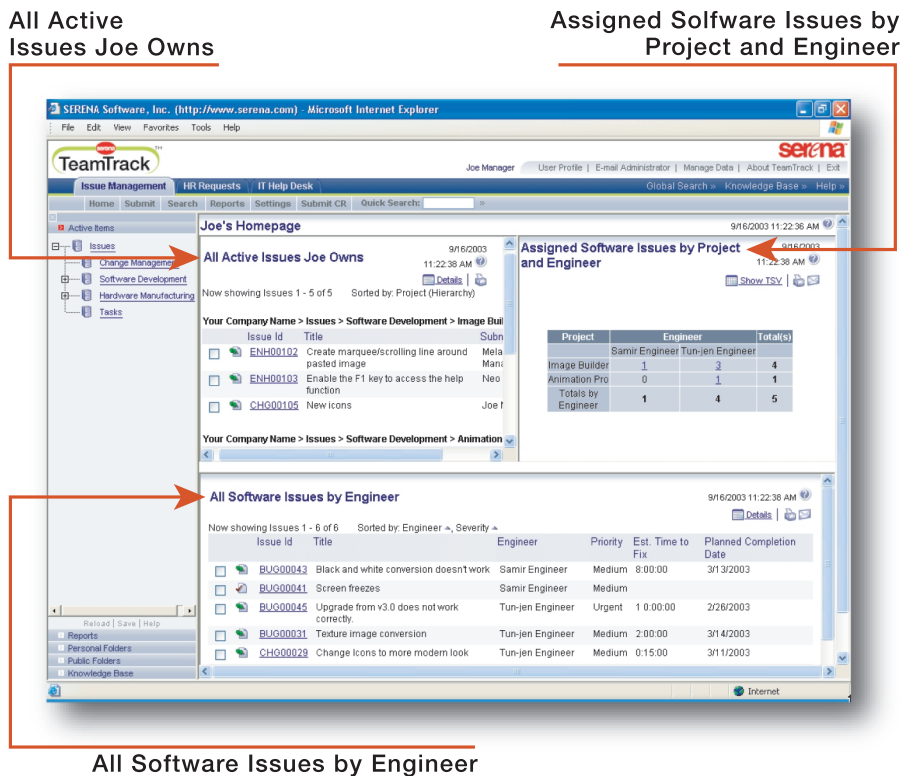


Figure 3.4 - Management Dashboard Portal for an enterprise-wide single point of control

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Serena TeamTrack's process management abilities accelerate application development and deployment, and reduce application downtime by assigning ownership, tracking accountability and enhancing communication across disparate systems. Ownership and accountability are embedded in every process and extended to all stakeholders, both within the enterprise and externally. With Serena TeamTrack, everyone on the team understands clearly what the issues are, who is responsible for each issue, and how to proceed. Serena TeamTrack manages issues from initial submission through completion, identifying all actions taken to address change requests, and ensuring no requests are lost. Each Serena TeamTrack solution contains pertinent fields, workflows, reports, tables, table relationships, scripts, triggers, templates, wizards and processes specific to a given industry.

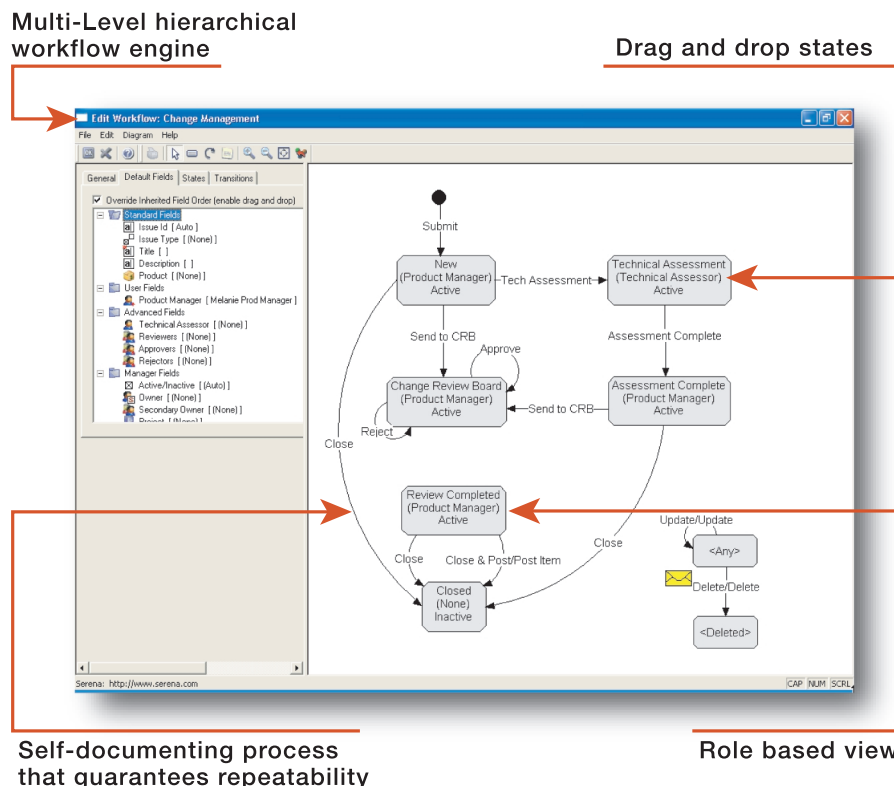
With Serena TeamTrack, everyone on the team understands clearly what the issues are, who is responsible for each issue, and how to proceed.

Overall business processes are linked with the processes of the individual departments or functional groups.

A Powerful Self-Documenting Graphical Workflow Editor

Serena TeamTrack solutions help personnel in all functional areas to build and deploy integrated business processes that extend to all stakeholders, including departmental users, customers, suppliers and business partners. Serena TeamTrack uses a robust, multi-level hierarchical workflow engine (Figure 3.5) to link the overall business processes with the processes of the individual departments or functional groups. It provides all users with a role-based view of their responsibilities, ensuring that all navigation and transactions are consistent with job function. It improves developer productivity by organizing information, prioritizing work assignments and allowing developers to use the tools they prefer.

Figure 3.5 - Self-Documenting Graphical Workflow Editor



Self-documenting process that guarantees repeatability

Role based view

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A powerful workflow engine makes it easy to extend Serena TeamTrack throughout the enterprise. The intuitive, Graphical Workflow Editor enables system administrators and process managers to perform real-time changes. They can configure privileges, add and delete users and groups, and perform all other administrative tasks without rebooting the server or logging users out of the system. Administrators can also define user groups that mirror the organization and assign access and privileges for users to virtually every point in the system, from projects down to individual field sections. The power of the Serena TeamTrack Graphical Workflow Editor is in its simplicity. It allows process managers to map every necessary step in the workflow of their projects without needing a database administrator or developer. Drag-and-drop functionality makes it easy to create a self-documenting process that guarantees repeatability. Managed administration licenses allow multiple users to administer specific areas of the Serena TeamTrack system so that no one can make changes outside their area of responsibility.

Serena ChangeMan: Software Change Management Solutions

4

Software Change Management (SCM) Solutions

Software Change Management (SCM) is the process for controlling and tracking changes to software assets. SCM enables a software development team to:

- Identify components, such as files and releases that will undergo change
- Establish a strict procedure for specifying, evaluating, and approving changes
- Report changes in a role-based view
- Audit changes that are made to ensure that quality has been maintained
- Support the implementation of the software to accommodate the changes that were requested

Serena's enterprise-class SCM solutions automate the entire application life cycle and streamline the application development process. This increases software reliability, improves application availability, and reduces time to market while containing costs.

Serena ChangeMan Enterprise Change Management (ECM) Products

The Serena® ChangeMan® products are an integrated multi-platform ECM solution, unmatched in terms of native platform support. The solution is process-driven and supports any modeling method, as well as many development tools and languages.

Whether for z/OS, UNIX, or Windows systems, the Serena ChangeMan solution makes code easier to find, modify, build, test and deploy, ensuring data integrity, so that only successfully tested programs reach production. The Serena ChangeMan products enforce adherence to a change process, thereby reducing human error, which is the number one cause of application outages. The solution establishes a flexible, process-driven infrastructure that simplifies change management as well as the actual development and deployment efforts that are essential for quality applications. Its defect tracking, robust release management, immediate back-out capabilities, online audit trails, impact analysis and version control offer a comprehensive ECM solution.

The Serena ChangeMan product family provides value across the IT organization, offering all the elements of robust software change management with advanced process flow capabilities. Developers, managers, and auditors, as well as quality assurance and operations staff use the Serena ChangeMan products. Serena ChangeMan provides safe, integrated access to software assets, regardless of the environment in which they reside. Unique among SCM solutions, Serena ChangeMan makes enterprise assets available for development and deployment across all major computing environments, spanning mainframe, UNIX, and Windows servers, as part of a centrally managed solution. Serena products are unique in their ability to support the most rigorous demands of every platform while integrating IDEs, process flow management and testing tools — every aspect of software development, from planning to deployment.

Serena integrated SCM solutions automate the application life cycle.

Serena ChangeMan products support z/OS, UNIX and Windows environments with process-centric Software Change Management.

Serena ChangeMan products are unmatched in terms of native platform support.

Table 4.1 – Products and key functions of the Serena ChangeMan product family

| Product (options are indented) | Key Functions / Benefits |
|---|---|
| Serena® ChangeMan® DS – Software Change Manager for Distributed Systems | Provides robust process-based SCM for the most widely used IDEs and distributed system operating environments |
| SAP Support Option | Enables coordinated deployment of SAP and non-SAP assets |
| Serena® ChangeMan® ZMF – Software Change Manager for z/OS | Provides reliable and streamlined implementation of software changes in a z/OS environment |
| Serena ChangeMan – DB2 Support Option | Extends Serena ChangeMan ZMF to include the full DB2 application development cycle, including DBRM management, application packages, application plans, and associated bind-control statements |
| Serena ChangeMan ERO – Enterprise Release Option | Provides enhanced release management capabilities in automation, productivity auditability and QA for release-centric development environments |
| Serena ChangeMan – Merge and Reconcile Option | Provides comprehensive merging of up to eight versions of source code into a single version, clearly identifying differences and conflicts |
| Serena ChangeMan – IMS Support Option | Allows Serena ChangeMan ZMF to manage the full IMS™ application development cycle, including migration and generation of DBDs, PSBs, ACBs, MFSs and related components at each phase of the software life cycle |
| Serena ChangeMan – Load Balancing Option | Leverages existing resources by allowing distribution of TSO users and batch processing on multiple MVS™ images while using a centralized Serena ChangeMan ZMF server |
| Serena ChangeMan – Online Forms Manager Option | Automates the tasks associated with creating, using and managing business forms, without requiring programming |
| Serena ChangeMan – APS Option | Extends the benefits of ChangeMan to software components generated by Micro Focus® APS |
| Serena® ChangeMan® ZDD – Desktop Development for z/OS | Provides a Microsoft Windows client for Serena ChangeMan ZMF that increases programmer productivity and ensures the integrity of mainframe software assets during desktop development |
| Serena® ChangeMan® SSM – System Software Manager for z/OS | Uses advanced fingerprinting technology to detect and track changes to datasets, PDS members or full DASD volumes, reducing planned and unplanned application downtime |
| Serena® ChangeMan® ECP – Enterprise Change Portal | Provides anywhere, anytime, single-point Web access to interdependent software changes across all of Serena’s SCM solutions on all supported hardware platforms |

Serena ChangeMan products are integrated with all leading IDEs.

The Serena ChangeMan product family is compliant with the dominant interface standards for source code control: Microsoft SCCI and Eclipse VCM. This means that the products work with the leading development environments (IDEs) and testing tools. Because the ChangeMan products are so thoroughly integrated into development environments, programmers on all platforms have the freedom to use any and all of the tools available for that platform. Platform and hardware-agnostic, Serena ChangeMan products protect and leverage investments already made in development platforms and security systems.

Serena ChangeMan tracks every change made to every application and component under its control. It makes complete audit trails and component histories available online. Auditors can determine the criteria by which they wish to examine or evaluate software assets, and Serena ChangeMan can generate reports in minutes. Serena ChangeMan absolutely guarantees source-to-load integrity, and can be an integral part of complying with regulatory requirements or internal and external audits. Combined with Serena® TeamTrack®, the Serena ECM solutions provide a single point of control to manage, track, and report on people, tasks and processes involved, from request to resolution. Some of the business and development advantages of Serena ChangeMan are summarized in Table 4.2.

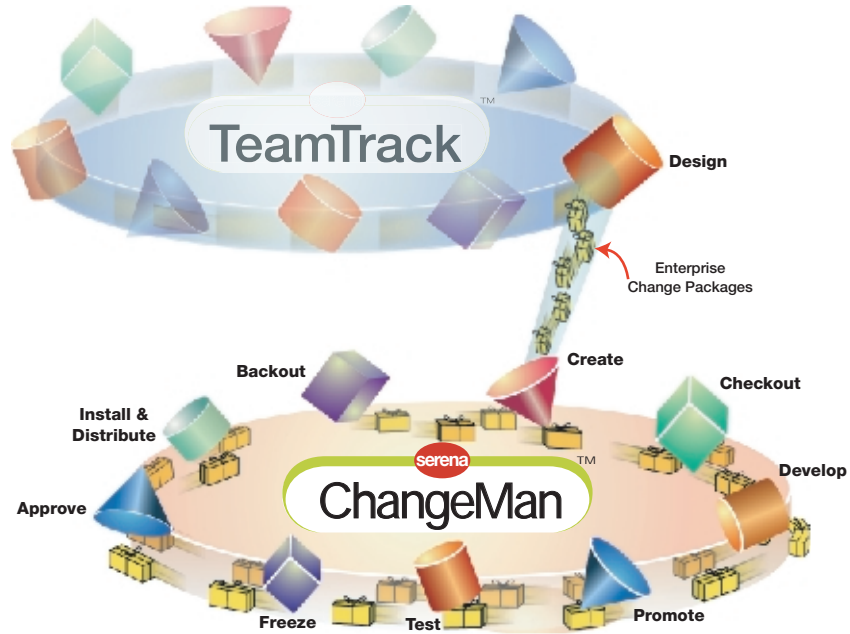
| | | |
|--------------------------------------|--------------------------|---|
| Development Advantages | Time Savings | Re-work reduction |
| | | Overlay protection |
| | | Concurrent development management |
| | | Distributed and multi-platform build and release management |
| | Productivity Improvement | Broad IDE and tool integration |
| | | Safe storage of changes |
| Access to all development components | | |
| Management Advantages | Convenience | Easy Web access |
| | | Enterprise views and reporting |
| | | Customizable Web access |
| | | Automated notification |
| | | Real-time multi-site support |
| | Consistency | Mainframe to Web |
| | | Deploys resources flexibly |
| | | Enforces best practices standards |
| | | Reduces training and cost |
| | | Manages life cycles within life cycles |
| | | Protects enterprise software assets |
| Defined, repeatable processes | | |

Table 4.2 – Management and development advantages of the Serena ChangeMan product family

Introduction to the Serena ChangeMan Process Flow

The Serena ChangeMan process flow starts with the design of a business process managed by Serena TeamTrack, and continues through the steps as shown in Figure 4.1.

Figure 4.1 – The Serena ChangeMan architecture automates the SCM process.



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Serena ChangeMan deals with Change Requests, which can be collected into packages called Change Packages. Change Packages group all the components of a software change together at the beginning of the change process. Components may include source files, executables, scripts, documentation and Java Beans — anything that is used to develop applications as shown in Figure 4.2A. When the selected packages are applied to the original projects, the result is a new release, as shown in Figure 4.2B.

Create a Change Package — A Change Package contains the elements to be edited and installed into production, and is identified by a unique package identifier. When a Change Package is created, the creator provides information that Serena ChangeMan needs to track and control the package.

Checkout components from source libraries — The checkout process allows developers and managers to copy components from source libraries to a ChangeMan staging area or to a personal development area where changes can be made.

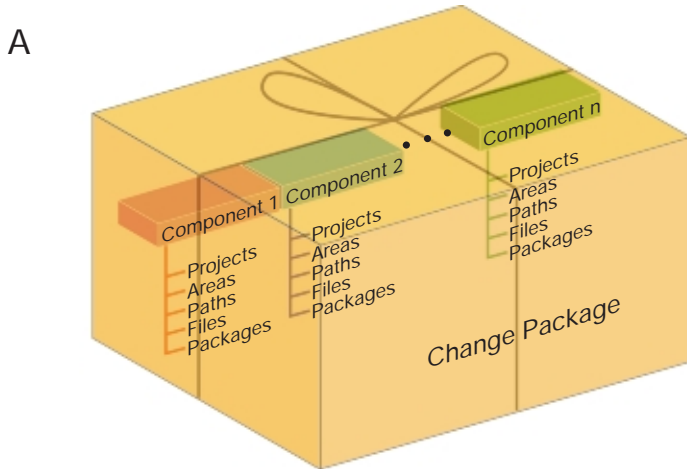
Edit changes — Developers may make changes to programs.

Audit process — The audit process validates the consistency of the components within a change package.

Freeze process — The freeze process locks the package and makes the package available for the promotion and approval processes. A freeze can be propagated across Serena ChangeMan instances when managed by Serena TeamTrack, as shown in Figure 4.2C.

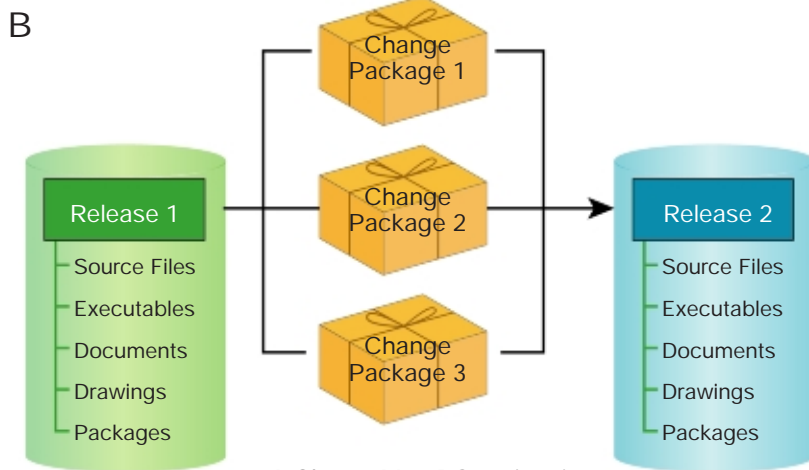
Promotion process (optional) — Promotion allows a package to be moved through various levels of testing. For example, promote from system testing to acceptance testing.

Installation — After Serena ChangeMan has gathered all of the approvals, the package is ready to be installed.

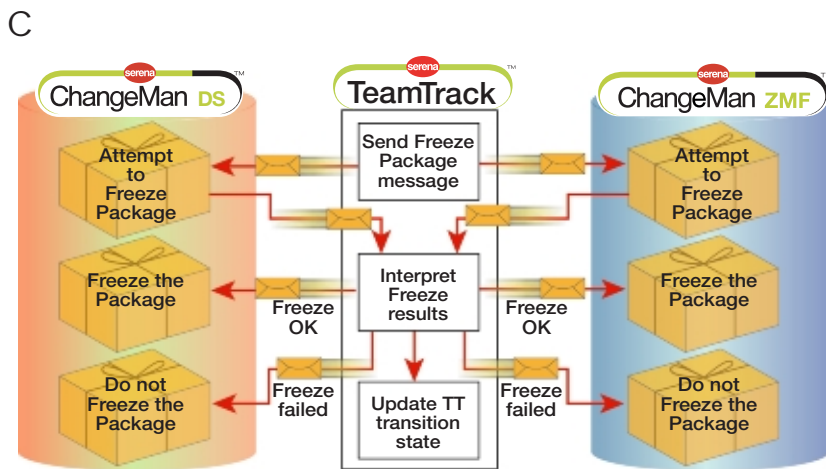


A Change Package can consist of any number of components.

Figure 4.2 – Change Packages drive the Serena ChangeMan process flow.



A ChangeMan DS project is modified by change requests which are collected into packages.



Freeze initiated from within TeamTrack. Freeze of ChangeMan DS and ChangeMan ZMF is coordinated by TeamTrack. TeamTrack state changes to freeze at the completion of successful freeze of associated ZMF and DS package(s)

Serena ChangeMan DS – Efficiently Supports Distributed Software Assets

Serena ChangeMan DS provides robust, process-based SCM — complete with versioning, roll backs, audit trail, cross-platform build and release management, and impact analysis — in distributed systems. It supports the most widely used operating systems, including UNIX, Windows, Linux, and integrates them through a sophisticated client-server and agent based architecture. Direct, seamless, feature-rich IDE integration allows developers to work in their IDE of choice (a plug-in is provided for native IDEs) with a minimum of additional training. A partial list of supported IDEs is shown in Table 4.3.

Table 4.3 – Popular IDEs

| | |
|---|-------------------------------|
| IBM Websphere® Studio Application Developer | Borland® JBuilder® |
| Microsoft Visual Studio .Net | Eclipse.Org Opensource |
| Microsoft Access | IBM VisualAge for Java |
| Microsoft Visual Basic® | Macromedia Cold Fusion® |
| Microsoft C++® | Macromedia® HomeSite® |
| Microsoft Visual Cafe | Sybase® PowerBuilder® |
| Microsoft Visual FoxPro® | Visual SlickEdit® |
| Microsoft Visual J++® | Many other SCC-compliant IDEs |

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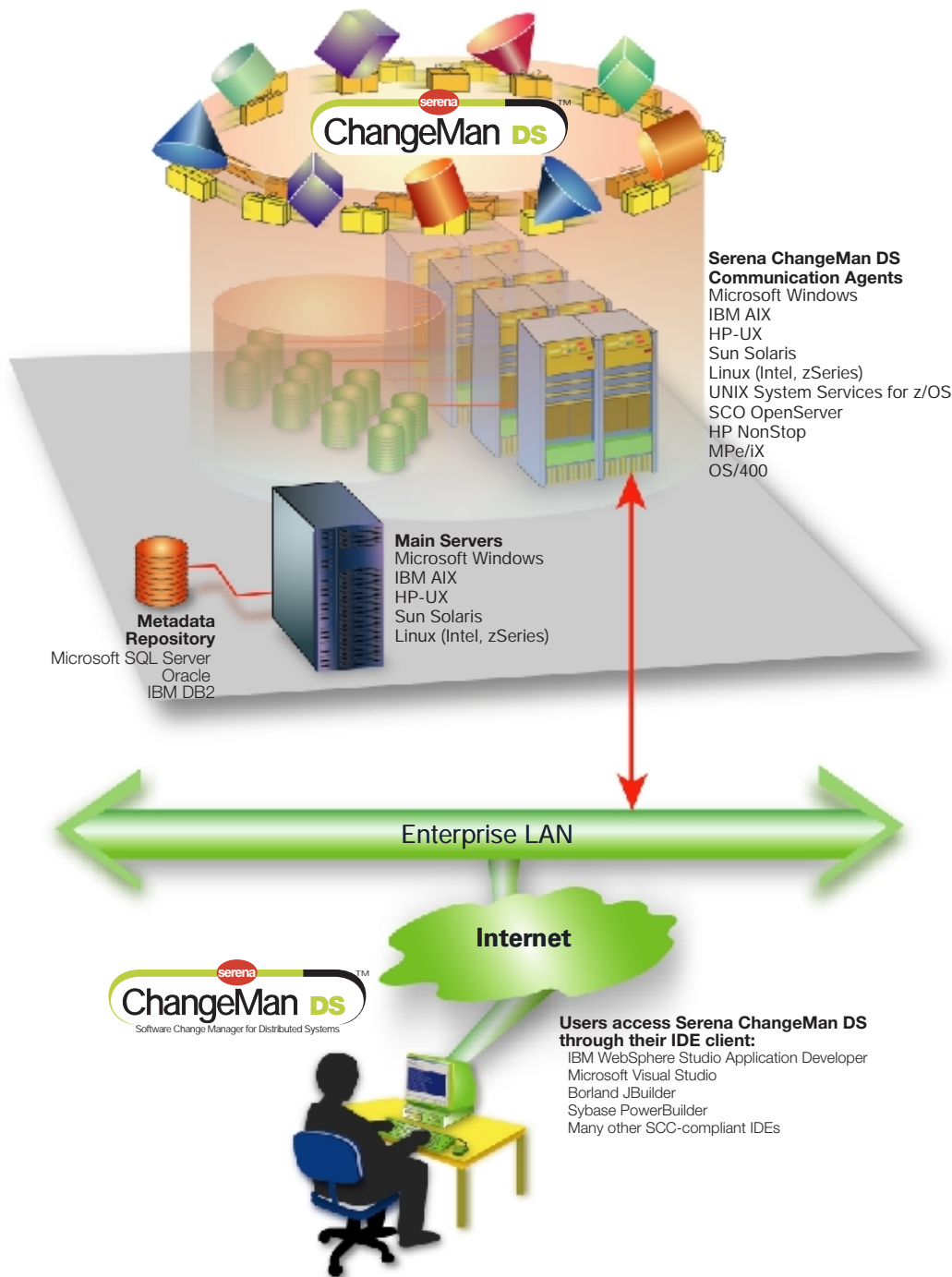
Serena ChangeMan DS offers a timesaving, cost-effective way to manage application assets across distributed systems, from development to deployment. An advanced architecture delivers cross-platform support and a central point of control across geographically dispersed workgroups. Sophisticated version management enables real-time, parallel development. A rich graphical interface facilitates project creation, check-out and check-in, source code changes, multiple version merging, impact analysis, rollbacks, approvals, promoting to QA, build and release management, software distribution and audit trails. It easily adapts to existing enterprise processes, yet allows developers to create and enforce desired development strategies. Intuitive configuration tables facilitate administration.

Sophisticated version management enables real-time, parallel development.

Serena ChangeMan DS is a proven solution for managing the complexity, time constraints and expense involved in building, deploying and maintaining distributed software applications. It features a multi-tier, TCP/IP-based architecture that ensures component control and application integrity and it facilitates communication among developers and teams, while preserving network bandwidth. As shown in Figure 4.3, the Serena ChangeMan DS architecture includes a central Main Server, a central Metadata Repository, distributed communication agents (which interface with various source repositories) and a choice of user-interface clients. No reconfiguration of processes, network architecture or file locations is required; all activity is managed through the central server.

Higher developer productivity results from the unique Serena ChangeMan DS architecture that keeps source code locally instead of in a centralized geographically removed database.

The industry-unique Serena ChangeMan DS architecture reflects the multi-platform nature of distributed systems, where the developers, source repositories, test and production environments may all be located on different servers in different places. Serena ChangeMan DS solves this problem most effectively by allowing components and people to reside locally, where it makes most sense — components are not forced to reside in a central, geographically removed database. There are many advantages of keeping the source code local on the machine of choice; most notably, this increases development availability since long-haul network downtime is not a factor and the availability of remote databases is not an issue. Both developers and management prefer this approach, since the code is kept in its native, non-proprietary format. So the two key advantages of the unique Serena ChangeMan DS architecture are: 1) there are no data conversions, and 2) development libraries are more available to developers since no gateways are needed. Access permission is the only thing that needs central access, and that checking is carried out quickly and efficiently.



**Figure 4.3 –
Serena ChangeMan DS offers
unmatched breadth of native
platform support.**

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Metadata resides on the server of choice (repository, database), where it is hosted by an ODBC-compliant database like DB2/UDB (IBM), SQLServer (Microsoft) or Oracle. The Metadata Repository contains information about application components and relationships, such as configurations, impact analysis, processes involved, permissions and detailed audit trail information. It facilitates comprehensive version control and version merging, with interactive branching and merging to simplify parallel development. The Main Server runs on a UNIX, Linux or Windows host machine and is responsible for centrally coordinating all SCM activities, including user authentication and transfer request authorizations.

***The Metadata Repository
contains information about
application components and
relationships.***

Serena ChangeMan DS eliminates the need for full copies of the product to be installed on every server where change management is required.

Serena ChangeMan DS eliminates the need for full copies of the product to be installed on every server where change management is required. Instead, Serena ChangeMan DS provides and communicates with small programs that run as agents (Communication Agents) on behalf of Serena ChangeMan DS to run background processes and handle requests from the Serena ChangeMan DS Main Server. Serena ChangeMan DS provides simplified, single point of access to program components that may be physically stored anywhere on the network. This not only reduces network traffic but also eliminates unnecessary code movement, which can be a potential source of errors.

Process Orientation

Processes consistently enforce the path along which files will move.

A key element of any successful software change management implementation is a well thought-out, clearly defined set of business processes to govern the software life cycle. These processes, which are defined by project management and implemented within the Serena ChangeMan DS environment, consistently enforce the path along which files will move as they progress from initial work to completion. They also impose user permissions for interacting with files at each point in their development. Defining these processes clearly in advance of a project assures a more collaborative work environment, prevents holes or bugs from entering the final product, minimizes rework and results in a higher quality application.

Serena ChangeMan DS includes an elegant graphical user interface (GUI) for organizing and viewing the process flow. Based on icons representing software assets, the interface allows project management to drag icons and draw arrows across the workspace to define the direction to which files may be transferred. File movements can be defined at a global level (for the entire product), application level (allowing variation from one group to another) or individual project level. ChangeMan DS implements the process flow as an actual set of rules governing code movement from a baseline repository, in a development work area, to a QA test area and eventually to an end-user production environment.

Serena ChangeMan ZMF – Software Change Management for z/OS

Serena ChangeMan ZMF, Software Change Manager for Mainframe Systems, protects corporate assets and lets developers get more done in less time. It is a comprehensive system that provides reliable and streamlined implementation of software changes in a z/OS environment. It manages and automates the process of migrating software changes from a development environment to any test environment and to the production environment. A comprehensive TSO/ISPF interface guides developers through various change management processes.

Serena ChangeMan ZMF controls every code change. It guarantees source-to-load integrity and ensures that only successfully tested programs make it into production. Serena ChangeMan ZMF reduces maintenance costs and regression errors by moving code through an automated life cycle with strict accountability and quality assurance at every step. It can integrate scheduling forms and approval processes online. It can support developer communication and perform regression analyses as part of the most thorough concurrent development available. With Serena ChangeMan ZMF, application code is easier to find, modify and deploy. Serena ChangeMan ZMF protects software assets and is an integral part of effective business continuity planning, extending mainframe applications, and establishing enterprise efficiency in multi-platform environments. Serena ChangeMan ZMF features an open architecture that facilitates integration throughout the data center and across platforms. It also accelerates implementation and reduces training costs.

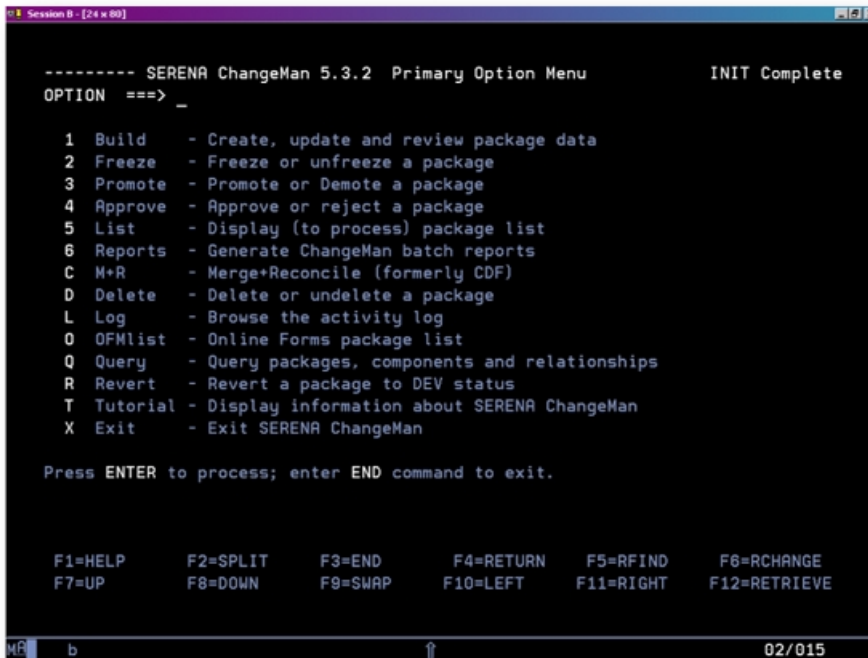


Figure 4.4 – The Serena ChangeMan ZMF primary menu option can be tailored using permissions-based UserIDs to provide a role-based view.

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In Serena ChangeMan ZMF, a Change Package is the vehicle in which all changes are moved from a development environment to a production environment. A change package may contain one or more components (source, copybook, load, JCL, control cards, compiling procedures, documentation, and other components), which are required to implement a software change.

Serena ChangeMan ZMF gives developers and managers a robust main ISPF menu (Figure 4.4) with many powerful SCM process options. The main functionality is summarized below.

- Impact analysis allows for the assessment of a change before it hits production
- Version control allows users to manage any number of component versions
- Library management is an integral part of the streamlined process
- Audit trails turn audits into a non-event
- Online approvals are fast and secure and can be done in parallel, serially or both
- Concurrent development eliminates overlays and facilitates developer communications
- Freeze control ensures that the changes tested are the ones put into production
- Automated backout allows reversion to earlier code in seconds
- Checkout ensures that developers are working with the right version every time
- Emergency protocols protect the integrity of the system while allowing quick fixes
- Online forms reduce paperwork and keep processes moving
- Managed processes automatically control and track all component translation processes
- Robust security features protect data in concert with existing security systems

Serena ChangeMan ZMF DB2 Support

The DB2 Option of Serena ChangeMan ZMF integrates Serena's ECM solution with the DB2 application development cycle, improving the integrity of the development, testing and production environments.

“Serena ChangeMan ZMF should be selected as an indispensable weapon in IT’s arsenal of survival and empowerment.”

— The Yankee Group

The DB2 Option automates the DB2 bind process to save considerable manual effort.

The DB2 Option automates the DB2 bind process to save considerable manual effort and create resource deployment flexibility for developers, database administrators (DBAs), and support staff. It automates the migration of DB2 load modules through test environments, and manages DBRMs, application packages, plans, and their associated bind control statements. It includes special management support for stored procedures, triggers, and user-defined functions, reducing the costs and challenges of establishing multiple physical testing environments by enabling the creation of multiple logical testing environments. It allows developers to see the real-time potential impact of change before it hits production. The DB2 Option provides a fully integrated, automated environment for managing changes to DB2 components and applications as part of an enterprise approach to managing change.

Serena ChangeMan ZMF IMS Support

With the IMS Interface, Serena ChangeMan encompasses the full IMS application development cycle, including the appropriate migration and generation of DBDs, PSBs, ACBs, MFSS and all of their related components at each phase of the software life cycle. As the Change Package migrates through testing and towards production, Serena ChangeMan invokes the appropriate generations including PSBGENS, DBDGENS, MFSGENS and applicable ACBGENS. Serena ChangeMan can also participate in the backout of changes from IMS production libraries. Library swap procedures can remain unchanged.

Benefits of the IMS Interface:

- Improves the reliability of IMS application generation procedures by automating key processes
- Provides productivity gains to database administrators by relieving them of their mundane generation procedure responsibilities
- Reduces time requirements for installing changes to IMS applications by automating key processes and minimizing coordination activities between development and database administration groups

Serena ChangeMan encompasses the full IMS application development cycle.

Serena ChangeMan ZDD – Desktop Development for z/OS

As a stand alone product, Serena ChangeMan ZDD provides a Windows Explorer user interface to z/OS datasets and PDS members, enabling them to be edited in-place from the desktop. Jobs can be submitted and their output viewed directly from Windows Explorer. Mainframe datasets and members can be transferred from the z/OS server to a Windows folder on the local computer with a simple drag and drop operation. Serena ChangeMan automatically performs data conversions when transferring data between Windows and the z/OS server. The ChangeMan ZDD client supports Windows (2000, XP, or NT 4.0), giving desktop programmers direct access to software assets residing on the mainframe without file transfers. No special execution environment or programming interface is required.

Existing Serena ChangeMan ZMF customers will additionally benefit by using ChangeMan ZDD to extend Windows Explorer to display component details as Windows Explorer columns, perform operations such as component promotion, demotion, builds and make XML-based requests such as creating, promoting, approving, and searching for packages managed by ChangeMan ZMF. With its industry-unique XML interface to Serena ChangeMan ZMF, popular desktop productivity tools such as MS-Project, Excel and Crystal Reports® can access ChangeMan ZMF change data using ODBC or native XML.

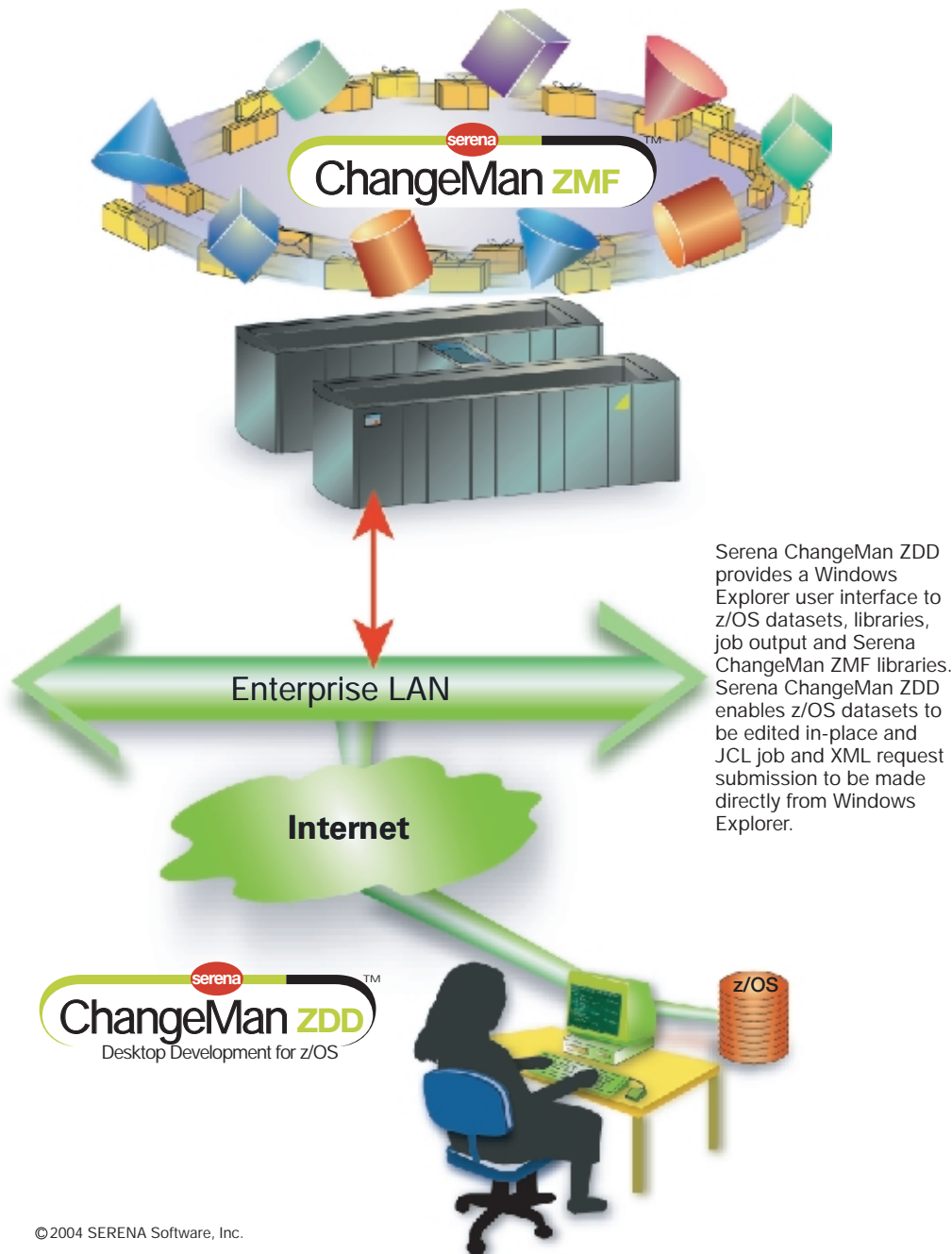


Figure 4.5 – The high level architecture of Serena ChangeMan ZDD

As shown in Figure 4.5, datasets, job output and Serena ChangeMan ZMF components are accessed as though they are local files on a PC or files on a Windows network, appearing as folders and files in Windows Explorer. Once the mainframe is mapped in Windows, it becomes as accessible as any other server, and desktop developers can use their preferred suite of tools, including any IDE, editor or even Microsoft Word, to access and edit mainframe files. The business benefits of Serena ChangeMan ZDD include its ability to:

- Leverage legendary reliability of a mainframe for data storage
- Lower training costs with intuitive user interface
- Provide secure, high integrity access of mainframe software assets
- Save costs by offloading mainframe CPU cycles
- Access to the mainframe dataset and job output without logging into TSO

A window between desktop and mainframe Serena ChangeMan ZDD allows the mainframe to look like any other Windows-based server, seamlessly integrating Serena ChangeMan ZMF assets into Desktop IDEs.

Serena ChangeMan Enterprise Release Option (ERO)

Serena ChangeMan ZMF ERO is an optional module that provides enhanced release management capabilities. By creating a release focus, Serena ChangeMan ZMF ERO simplifies the process of supporting multiple release versions in motion simultaneously. It's a solution for release-centric development environments, providing automation, and increasing productivity, auditability and quality.

ERO provides customers with the ability to establish and automate a consistent release management process. Customers can create releases and manage those releases as they move from development testing, and finally into production. ERO understands the relationships between the components and packages that make up any given application release, and any other releases as defined in ERO Administration. ERO compares the relationships between production versions and all versions in motion. Audit checks the dependencies across releases, not packages. ERO identifies all dependencies on those components and makes sure developers are always working with the right component versions.

ERO provides customers with the ability to establish and automate a consistent release management process.

ERO makes it possible to establish and automate a consistent release management process, allowing the management of multiple releases along a consistent life cycle while providing robust protection and quality assurances.

Serena ChangeMan ECP – Enterprise Change Portal

Serena ChangeMan ECP provides the capability to manage multi-platform applications through a central Web portal. It goes beyond reporting and approvals, providing programmatic links for managing multi-platform applications. It enables coordinated life cycle management with single point of access to and control of development activity spanning mainframe and distributed platforms. The result is pinpoint-precise deployment of cross-platform applications. With Serena ChangeMan ECP, managers can view and approve software changes from virtually anywhere via a Web browser. Serena ChangeMan ECP also offers reporting tools to view package information gathered from across the enterprise. By performing searches across multiple Serena ChangeMan ZMF and Serena ChangeMan DS servers, change managers can view enterprise-wide information regarding change packages, installation dates and approvals.

Serena ChangeMan ECP enables coordinated life cycle management with a single point of access to and control of development activity spanning mainframe and distributed platforms.

Serena ChangeMan ECP incorporates the package-oriented approach, in which a package on a Serena ChangeMan ZMF server can be linked and coordinated with another package on a different Serena ChangeMan ZMF server, or with a package on a Serena ChangeMan DS server. In an effort to achieve consistent, multi-platform integration, Serena Software has taken the change package technology to the next level by introducing "Enterprise Change Packages." Enterprise Change Packages are software packages created on disparate platforms that are programmatically linked, managed centrally throughout their development, and simultaneously deployed into their native environment from a single point. Each Change Package is edited, tested and constructed with the tools best suited to its native platform. Cross-platform dependencies are highlighted at every step and linked packages can be accessed anywhere through a Web browser via Serena ChangeMan ECP. By linking cross-platform components, Enterprise Change Packages allow standardized application management and deployment. They represent the industry's most concrete, tightly integrated cross-platform ECM solution, ensuring consistency across platforms.

Serena is the undisputed leader in cross-platform capabilities.

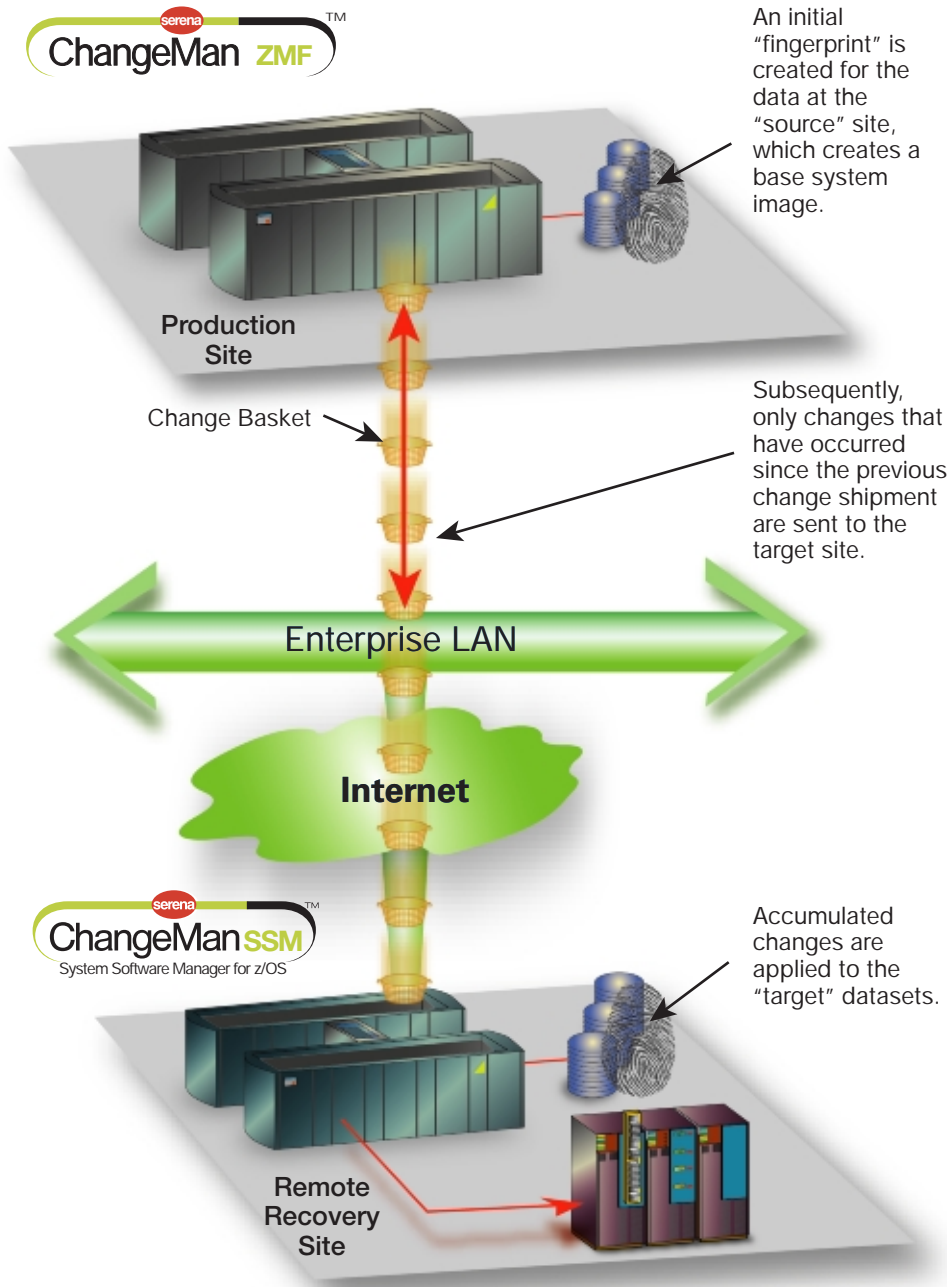


Figure 4.6 – Serena ChangeMan SSM fingerprinting greatly reduces disaster recovery time.

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Serena ChangeMan SSM – System Software Manager for z/OS

Serena ChangeMan SSM has the ability to detect changes to datasets, PDS members or full DASD volumes. Using a unique fingerprinting technology to determine if changes have been made, Serena ChangeMan SSM compares fingerprints rather than performing byte-for-byte comparisons or relying on system indicators of change. This unique approach enables Serena ChangeMan SSM to rapidly detect changes, even in very large environments. It can track every change to system code so that the site can know who made the change, what was changed, when the change was made, where the backup is, and, most importantly, how the change can be undone.

Serena ChangeMan SSM uses a unique 8-byte fingerprint for all records, libraries, members and so forth, to detect any changes.

The primary goal of Serena ChangeMan SSM is to increase application availability by speeding up recovery from site failure, reducing maintenance windows. Serena ChangeMan SSM provides an alternative to traditional disaster recovery technology, such as remote disk mirroring. A common application for Serena ChangeMan SSM is the synchronization of a production data center with a contingency or disaster recovery site. Traditional contingency plans call for making full volume backups of every DASD device in the data center to be sent off each day to the recovery site. This approach is neither practical nor cost effective. Many DASD volumes may be completely unchanged and even if there are sufficient CPU resources to perform the nightly backups, there may not be enough time each night to completely copy everything. With Serena ChangeMan SSM, a complete image backup of the production environment may need to be taken only once a month. A fingerprint dataset of the entire production system can be used to identify datasets or members that have changed during the day. Developers can perform the fingerprint process rapidly and concurrently with production processing. Only those files or members that have changed need to be exported to a Change Basket and sent offsite. Some users may even transmit changes over their network to the hot site periodically throughout the day to provide greater protection.

At the recovery site, Serena ChangeMan SSM may be used to import the changes quickly to contingency DASD each day. If the contingency plan calls for restoration of the production DASD in the event of a disaster, developers can set up the application of the changes from the Change Basket as part of the recovery process. The change basket contains all the control information along with datasets and members required to bring the two environments into synchrony.

As shown in Figure 4.6, the unique ability of Serena ChangeMan SSM to synchronize environments and automatically identify changes is perfect for ensuring that hot sites are immediately ready to go in the event of a massive production site failure. Additionally, the innovative technology contained within Serena ChangeMan SSM can synchronize environments faster than traditional methods, such as tape copies, and more cost-effectively than hardware-intensive procedures, such as data mirroring. It can dramatically reduce the cost of maintaining a disaster recovery site.

Serena ChangeMan M+R (Merge and Reconcile Option)

Serena ChangeMan M+R simplifies concurrent development by merging and reconciling multiple versions of software faster and more effectively. It allows multiple component versions to be in motion simultaneously, automatically merging up to eight versions and supporting concurrent development teams with online, color-coded reports and timesaving scheduling capabilities. It can prevent production regression and greatly reduces application implementation time.

Serena ChangeMan M+R is a tool for merging multiple component versions and libraries.

Serena ChangeMan M+R works with Serena ChangeMan ZMF to provide an integrated tool for merging multiple component versions and libraries. Their combined concurrent development management capabilities reduce costs, make it easy to reconcile current versions with ongoing changes, and speed the installation of new releases of third-party, customized applications. This integrated tool further reduces the complexity of project-based upgrades by generating a version impact analysis report displaying differences or similarities and the degree of complexity of their reconciliation.

Serena StarTool: Application Availability Solutions

5

Conducting profitable business in today's complex computing environments requires that data and applications residing on legacy systems be optimized to keep up with ever-changing conditions. As discussed in chapters 1 and 2, performance is a major factor in the availability equation since the faster a transaction or other computer function completes, the less chance there is for an application outage.

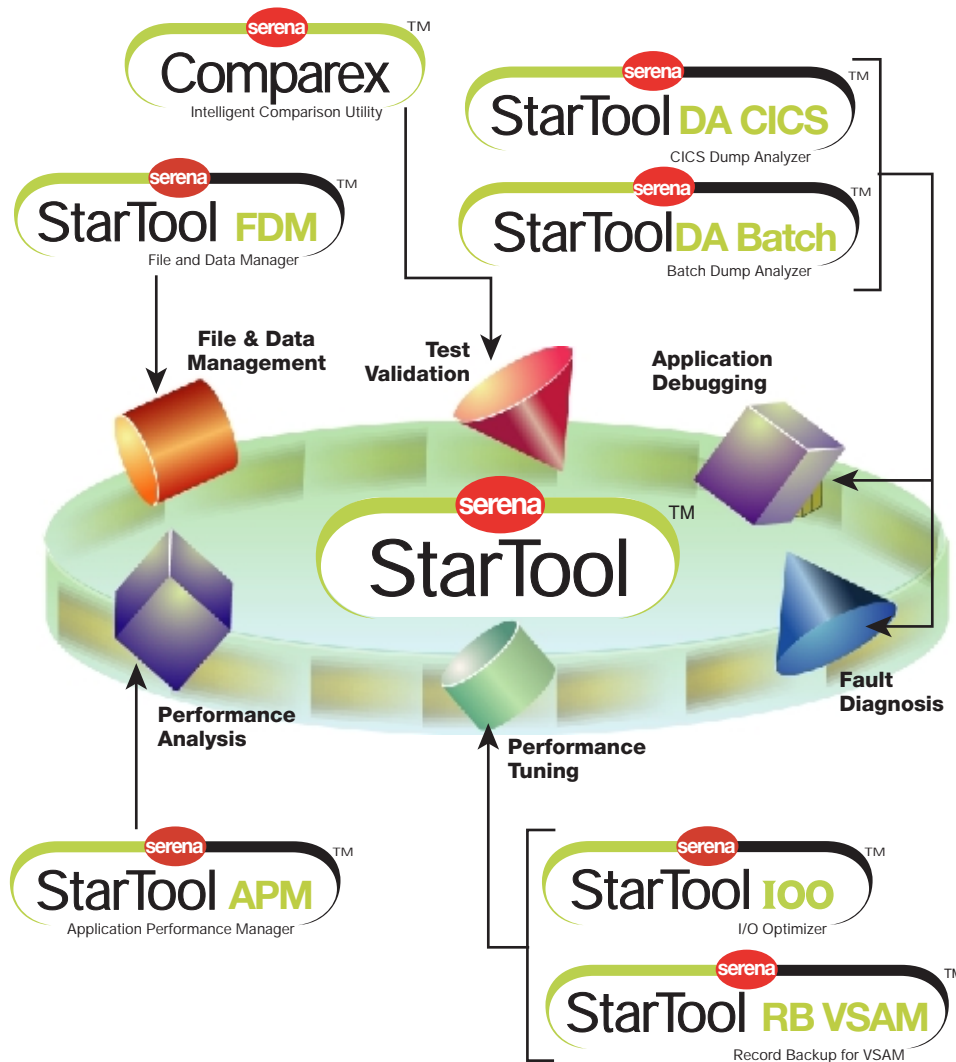


Figure 5.1 – The Serena StarTool family of products delivers a full set of programmer tools to enhance application availability.

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As part of the SAFE™ total solutions framework, the Serena® StarTool® family of products keeps mainframe developers moving quickly, accurately and efficiently. This powerful tool set enables enterprise application developers to create the highest available applications possible, using the most advanced and integrated set of tools in the industry. The integration of Serena® ChangeMan® and Serena StarTool speeds up the application

The Serena StarTool family of products decreases IT costs and increases enterprise profitability.

testing process, thereby accelerating the delivery of new mainframe applications or changes to existing applications, to meet business requirements. By pinpointing the source of application failures, Serena StarTool products increase the uptime of enterprise-wide applications. And by optimizing I/O performance they maximize the use of existing hardware, while enhancing end-user satisfaction. These results lead to decreased IT costs and increased efficiency.

The Serena StarTool Product Family Enhances Application Availability

The Serena StarTool family is part of Serena Software's overall solutions framework for Enterprise Change Management (ECM) delivery that speeds time-to-market and improves the quality and reliability of applications while reducing development costs. The Serena StarTool family of products offers a full set of programmer productivity tools that spans every phase of z/OS application testing, implementation and problem analysis. This provides a robust application availability solution, as shown in Figure 5.1 and Table 5.1.

Table 5.1 – Key features, functions and benefits of the Serena StarTool Product Family

| Product | Key Function | Key Benefit | Key Feature |
|----------------------------|--|--|--|
| Serena® StarTool® FDM | File and Data Management | Improves Developer Productivity | Enables quick development and editing of text and databases for a variety of MVS data types. Provides powerful data management capabilities, such as dataset space allocation and file recovery, to automate previously manual operations. |
| Serena® StarTool® DA Batch | Dump Management Capabilities for System and Batch Abends | Reduces Application Downtime | Full-featured dump management, with analysis and diagnostic capabilities for system and application abends. |
| Serena® StarTool® DA CICS | Dump Management Capabilities for System and Transaction Abends | Maximizes Online Application Availability | Quickly solves CICS® application transaction abends, with extensive point and shoot capabilities. |
| Serena® Comparex® | Any-to-Any Comparisons | Simplifies Debugging, Testing and Validation | Enables developers to find values that reside in separate locations across multiple files. |
| Serena® StarTool® APM | Application Performance Manager | Simplifies Application Tuning | Provides both real-time and historical performance statistics to pinpoint areas within an application that need to be tuned to deliver the desired response and turnaround time. |
| Serena® StarTool® IOO | I/O Optimizer | Maximizes I/O Throughput | Uses intelligent, industry-accepted rules of thumb to automatically tune I/O operations, thereby freeing performance analysts to focus on other issues. |
| Serena® StarTool® RB VSAM | Record Backup for VSAM | Reduces Backup Resources | Dramatically reduces the time and resources needed to back up VSAM data by detecting changes at the record level. |

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The Serena StarTool and ChangeMan Product Integration

Serena StarTool application availability products seamlessly integrate with the Serena ChangeMan change management products, as shown in Figure 5.2. By automatically invoking Serena ChangeMan functions, Serena StarTool can identify a list of application changes by date and owner, and can point to the exact source code that needs to be changed from the Serena ChangeMan-managed source code. Integration between the product lines minimizes the time, personnel and machine resources required for the testing, implementation and problem-analysis phases of the application life cycle. The integrated products expedite problem resolution by automatically identifying the lines of code that have changed in failing applications so that the application can be more easily restored to its previous working state.

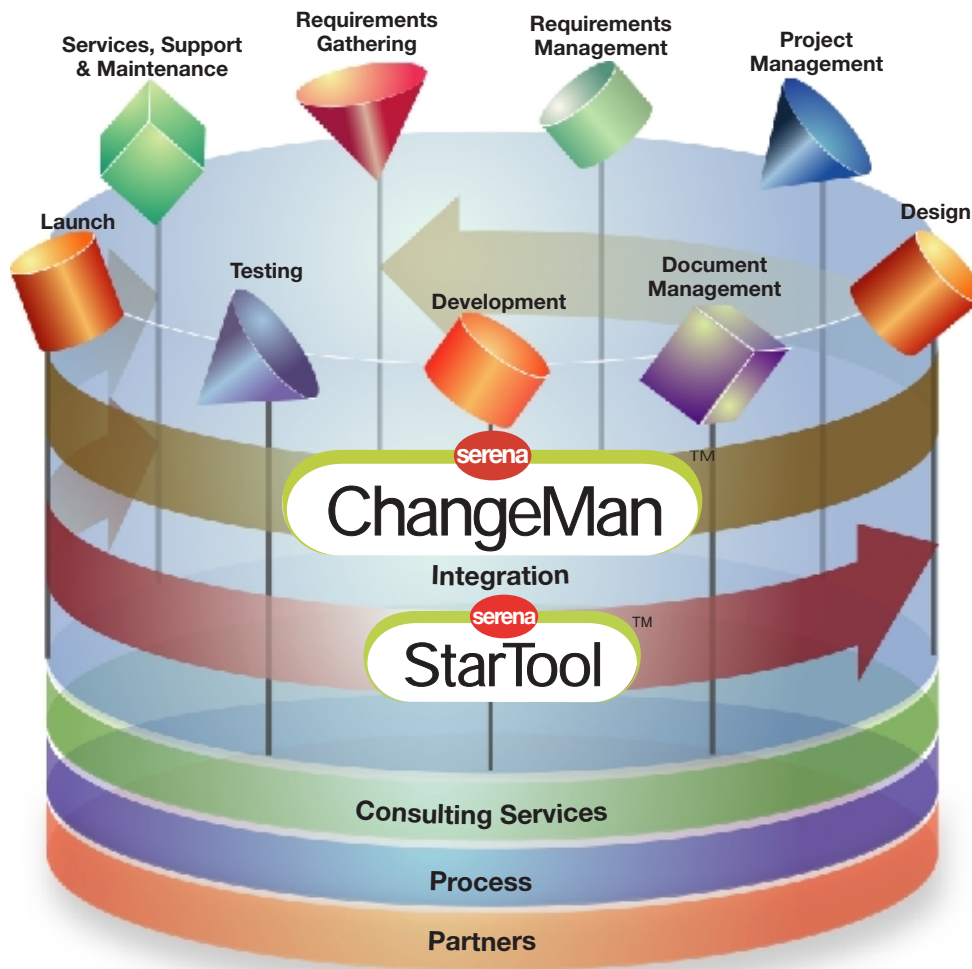


Figure 5.2 – Serena ChangeMan and Serena StarTool are integrated throughout the Application Life Cycle.

StarTool FDM – File and Data Manager

Serena StarTool FDM provides a comprehensive and easy-to-use tool set and environment for editing and managing all of the major file types used in the mainframe world: direct, VSAM, IMS, PDS, PDSE, DB2, sequential, IAM and extended sequential files. The tools and supported files are illustrated in Figure 5.3. With Serena StarTool FDM, complex data and file management tasks are simplified, and the need for multiple tools, batch utilities, and homegrown routines is eliminated for the entire data center. It allows comprehensive test data to be quickly created without writing and debugging one-time programs or using other time-consuming means. It can be used to fix problems in production data that have caused failures. Serena StarTool FDM can perform many everyday, time-consuming tasks, making it an invaluable tool for application developers.

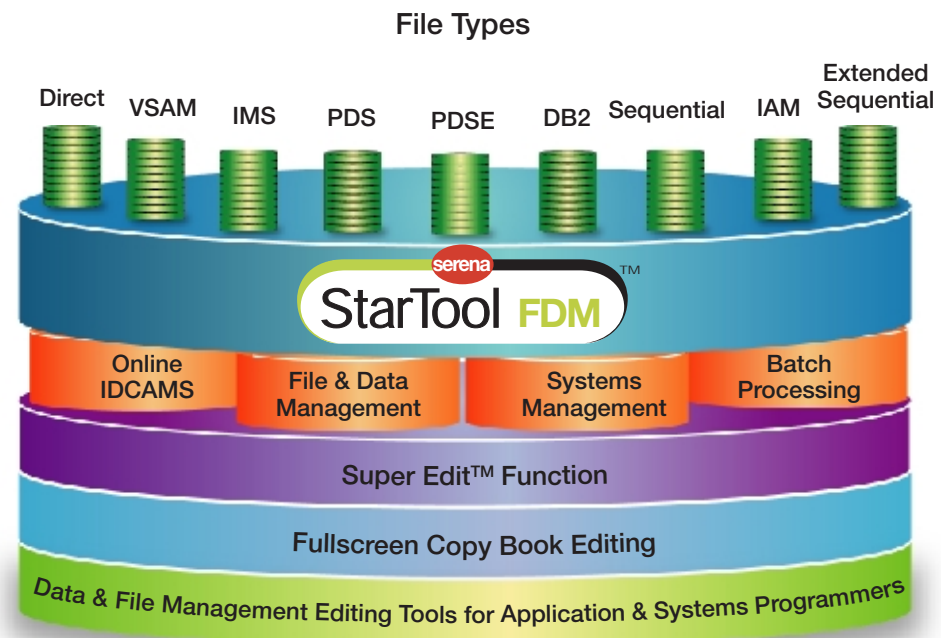
Serena StarTool FDM offers the most comprehensive range of file and data management functionality.

The unique functionality of Serena StarTool FDM enables complete file and data management with advanced editing capabilities. Users can modify data interactively on the screen or apply global updates from batch. Users can copy like files to unlike files and copy subsets of files based on user-defined selection criteria. A global search and replace feature allows searching for data across datasets and members and replacing it with other data. A restore feature allows the restoration of accidentally deleted members or previously edited members without reverting to backup tapes. Another area where StarTool FDM excels is in editing VSAM datasets. Records can quickly be added, deleted, updated and inserted in a VSAM dataset. Copybook Editing enables programmers to display and edit individual data records within the context of a COBOL or PL/I program's copybook record layout.

Serena StarTool FDM contains many unique, advanced editing capabilities.

Serena StarTool FDM offers one-step solutions to many of the most common problems that applications and systems programmers face when working with PDSs (libraries containing members). With Serena StarTool FDM, restoring a production environment after the integrity of files or physical attributes has been compromised no longer requires complex, error-prone processes or an IPL. It can expand PDS directory blocks and space allocations on the fly, restore deleted or previously edited PDS members, verify and fix physical and logical errors in members (i.e., altering DSCB) and rename ENQUEUED datasets.

Figure 5.3 – Serena StarTool FDM provides comprehensive, easy-to-use editing and management of direct, VSAM, IMS, PDS, PDSE, DB2, sequential, IAM and extended sequential files in z/OS.



Extensive load module management facilities allow users to perform complex tasks in a single step. Users can interrogate a single module or a selected subset of modules to assist in identifying properties, such as COBOL attributes and IDR DATA. The load module data can then be used to generate JCL to re-link a module, or disassemble modules for which the source code cannot be located. This data can also be used to generate SMP/E control statements or assign member aliases and alter load module attributes without re-linking modules. It can display all types of data associated with a load module, search for a load module by name, attributes or contents, and process selected modules with a wide variety of built-in tools. JCL used to compile and link programs is often missing and tracking down the missing JCL is a time-consuming and frustrating chore. Serena StarTool FDM simplifies this tedious task by providing tools to recreate link edit JCL and control cards. The time saved can be significant, especially when working on large projects. The MAP subcommand reveals the structure of any member or group of members giving a list CSECTS. This gives immediate insight into the makeup of load modules.

The solution offers one-step solutions to many of the most common problems that applications and systems programmers face when working with PDSs.

Serena StarTool FDM offers extensive load module management facilities.

Four Powerful Add-On Options to StarTool FDM

Available options include a DB2 Option, IMS Option, Compare Option and a Data Conversion Option.

Serena StarTool FDM with DB2 Option provides application programmers with a comprehensive set of tools for managing their DB2 data. By using the intuitive SQL builder, programmers can select exactly the data to be edited, or they can code their own SQL directly. Additional features include the ability to extract data into a subset table for ease of test data creation, panel driven dialogs for all the most popular SQL statements, an interactive SQL process and a full range of catalog reporting options.

Serena StarTool FDM with IMS Option allows developers to work with IMS data in the same manner as they manipulate QSAM, VSAM, DB2 and other types of data that exist in the data center. By using intuitive Serena StarTool FDM commands through an easy-to-use ISPF-like interface, IMS developers of every skill level can see immediate productivity improvement when working with IMS data. Serena StarTool FDM for IMS helps ease some uniquely difficult IMS problems, such as coding SSAs, formatting calls properly, using cumbersome utilities or writing one-time programs for each minor change and writing and relinking programs to an ever-changing and growing database.

Serena StarTool FDM with Compare Option offers robust data comparison so that programmers can effectively perform development tasks. With the Compare Option, datasets can be compared to ensure that the changes made were the required ones, down to the record level.

Serena StarTool FDM with Data Conversion Option creates test data in new formats, minimizing the need to write batch programs for each situation. It enables programmers to create test data easily and efficiently by automating the process of incrementing, decrementing or specifying default values for data fields. This saves a programmer's time while testing new or updated programs.

Even when some of the critical MVS subsystems such as TSO, VTAM or JES are not operational, functions from Serena StarTool can be accessed using the unique Started Task Facility in Serena StarTool FDM. This facility provides a method for accessing and altering datasets and their contents, without the availability of VTAM, TSO or JES. Using the MVS subsystem interface and its ability to communicate through the system console, line mode commands make it possible to make changes that can prevent the need for an IPL. This feature is designed for situations such as outages and system recovery.

Serena StarTool DA Batch automates the complex, error-prone process of diagnosing abends.

Serena StarTool DA Batch – Batch Dump Analyzer

StarTool DA Batch is used to analyze and resolve the cause of batch application and system failures – commonly referred to as abends. Serena StarTool DA Batch takes a dump as input and presents back to the user an easy-to-understand report illustrating the cause of failure, in most cases displaying the actual failing statement within the application's source code. With this information, the user is able to quickly resolve the cause of the program or system error. Serena StarTool DA Batch automates the complex, error-prone process of diagnosing abends and managing dumps, thereby delivering a proven solution to solving problems in the z/OS operating system and in applications that run in these environments. Serena StarTool DA Batch also provides a means to ensure the high level of application availability required by today's business conditions.

Serena StarTool DA Batch is a full-featured dump management, notification, distribution, analysis and diagnostic system for both system (SVC) and application (SYSUDUMP) abends. It offers easy-to-use analytical tools for diagnosing the cause of application and system outages. It expedites problem determination by displaying the failing instruction down to the source code level for both COBOL and assembler languages. And its seamless integration with Serena ChangeMan ZMF quickly and accurately identifies the latest application code changes, allowing quick problem resolution. Serena StarTool DA Batch has the key features needed by analysts and developers to efficiently solve abends in mission-critical applications.

Finally, Serena StarTool DA Batch also supports dump analysis for batch applications that interact with DB2 or IMS databases. For DB2, Serena StarTool DA Batch provides the contents of the last SQL call and other pertinent information, including formatted host variables, control blocks and data element values. For IMS, Serena StarTool DA Batch formats and displays the most pertinent information, including cost DL/I calls, PSB information, PCB information and much more.

Dump analysis for batch applications that interact with DB2 or IMS databases is supported.

Serena StarTool DA CICS – CICS Dump Analyzer

Serena StarTool DA CICS is a full-featured dump management system that provides detection, capture, notification, diagnostics and analysis of application abends involving CICS – both system and transaction abends. Its extensive point-and-shoot capabilities allow quick resolution of CICS application abends, increasing the uptime of critical business applications. All dumps normally requested by CICS are supported. Serena StarTool DA CICS detects any CICS abend condition, intercepts the abend and dump, supplements the dump management capabilities of IBM dump processors and captures information that would otherwise be unavailable, while suppressing duplicate dumps. It allows monitoring of the CICS abend history through summary and detailed management screens, making it easy to track trends and service levels of the online CICS applications.

Serena StarTool DA CICS is full-featured dump management system for CICS.

Serena StarTool DA CICS offers powerful functionality to solve CICS problems. It captures the active CICS screen at the time of the abend so that the analyst can associate the user activity with the abend. At this point, the analyst can dump the contents of the associated variables, registers and other memory and the abend can be isolated down to the failing instruction at the source code level. The analyst can then allow the program to continue executing through a facility called Soft Landing. This capability delivers the information needed to solve even the most complex CICS problems.

Serena StarTool DA CICS provides extensive support for all versions of COBOL and Assembler language. Powerful features included in Serena StarTool DA CICS speed up the debugging effort for applications written in these languages. With Serena StarTool DA CICS, users can immediately see the actual library level source that corresponds to

a set of instructions. This true level source may be an EXEC CICS statement, a simple COBOL verb or a Copy statement. This facility allows the programmer to quickly find the real source code statement needed to change and correct the problem.

Serena StarTool DA CICS also supports dump analysis for CICS applications that use DB2 databases. For DB2, the contents of the last SQL call and other pertinent information, including formatted host variables, control blocks, and formatted data element values, is provided. This information is invaluable in solving application abends for applications that use DB2 databases.

Serena Comparex – Automated Any-to-Any Comparisons

Serena Comparex is a powerful tool designed to quickly and accurately compare two files and print a report showing the records that are different and precisely which bytes differ between the records. It detects differences and similarities between files that have similar or different content, structure or record length, isolates the changes and generates detailed, easy-to-view Differences Reports. These reports can be used to ensure the accuracy and authenticity of application changes, file and/or database changes and to ensure synchronization between source code and load modules, identifying any out-of-synch conditions.

Its advanced functionality gives Comparex the ability to do selective comparisons. Comparex uses keywords, which allow compare operations to be restricted so that only specific portions of a file are compared, helping to minimize the scope of comparisons. More than 35 keywords are available, with two of the most important being MASK and FIELD. MASK is used to ignore portions of a record during a comparison and FIELD is used to select specific portions. Other examples of its advanced functionality are its understanding of date fields, which allows it to accurately compare dates in differing formats (such as MMDDYYYY to DDMMYYYY as well as many other combinations). Serena Comparex also has the ability to handle text comparisons using a line-by-line compare with a unique fade-in, fade-out feature to display both the preceding and following lines of text. Because it is engineered for speed and consumes little overhead, Comparex can be used whenever needed.

Serena Comparex is a key component of the Serena vision and solution for application availability in the z/OS environment. It is also fully integrated with Serena StarTool FDM, which means that StarTool FDM can invoke all of Serena Comparex. Serena Comparex has clearly demonstrated itself as the leader in comparison products, with an installed base of more than 1400 companies.

StarTool APM - Application Performance Manager

Serena StarTool APM measures, analyzes and helps to resolve z/OS application, subsystem and task performance issues. It provides both real-time and historical performance statistics to pinpoint areas within an application that need to be tuned in order to deliver the desired response and turnaround time. Real-Time Analysis allows a job to be monitored while it is executing and lets the results be viewed in real time, providing dynamic displays of job performance. Historical Analysis allows viewing of data collected during previous analysis sessions.

Serena StarTool APM is designed to be used both during the development cycle and after an application has been put into production. It analyzes and reports on CPU utilization, wait time (including the reason for waits) and I/O activity. It also can analyze batch and online COBOL, CICS, IMS and DB2 programs and jobs. Both high-level and detailed source code information is provided, as are metrics for z/OS address spaces.

Serena StarTool DA CICS provides support for all versions of COBOL and Assembler language.

Serena Comparex quickly and accurately compares two files and print a report showing the records that are different.

The leader in comparison products, Serena Comparex has an installed base of more than 1400 companies.

Serena StarTool APM pinpoints and resolves performance problems throughout the application life cycle.

Serena StarTool APM quickly shows developers which programs use CPU time and where within the programs the CPU time is being spent.

CPU utilization is reported for all load modules in an address space, each CSECT in each load module, and at the instruction or statement level (in either assembler or native compiler source code languages). The level of reporting lets an analyst quickly see which programs are using the most CPU time, and where within those programs it was spent. It also identifies file bottlenecks and lists the resources that caused the application/program to wait. Because it uses a low-impact sampling technology, it runs with very low processor overhead and is non-intrusive, which allows it to be used safely in both test and production environments.

StarTool IOO – I/O Optimizer

Serena StarTool IOO is an integrated optimization system that automatically and dynamically tunes the major components of z/OS I/O processing functions to achieve dramatic improvements both in batch and online throughput. It is the ultimate I/O throughput optimizer for z/OS. Using a proprietary analysis and intelligence gathering process during dataset OPEN processing and I/O requests to any VSAM or SAM (QSAM, BSAM and EXCP) dataset, Serena StarTool IOO builds an I/O environment for each dataset that maximizes processing efficiency. It automates I/O tuning, freeing performance analysts to focus on other issues, while ensuring maximum application efficiency and responsiveness throughout the life of mission-critical applications, thereby controlling costs, satisfying customers, and supporting growth. By better utilizing existing equipment, allowing it to deliver the required service levels, hardware upgrade costs can potentially be reduced or delayed through upgrade deferral.

Serena StarTool IOO automatically and dynamically tunes I/O processing functions z/OS to achieve dramatic improvements in both batch and online throughput.

One of the most significant factors affecting online and batch application performance, I/O processing, is the way in which an application performs activities such as writing to, or reading from, disk storage or sending a file to a printer or another application. Serena StarTool IOO automatically and dynamically modifies an application's I/O configuration to achieve the most efficient performance within the production environment. Once installed, and after applications are defined to it, Serena StarTool IOO is standalone and transparent to daily personnel activities. Using its database of information which comprises parameters and values, essentially rules that deliver the best I/O performance by type of device and by type of access, Serena StarTool IOO is able to automatically speed up I/O.

Serena StarTool IOO is the most comprehensive, cost-effective, fastest and easiest way to achieve total, automated system tuning.

Serena StarTool IOO is especially beneficial for VSAM processing. It offers a fully automated solution for I/O tuning of any VSAM file and greatly reduces analyst time devoted to VSAM tuning. For random access programs, Serena StarTool IOO automatically allows the use VSAM LSR as appropriate and builds the optimal number of buffers to achieve maximum performance. For sequential processing applications, Serena StarTool IOO allocates the correct number of NSR buffers for look-ahead processing. To improve performance, StarTool IOO monitors VSAM I/O activity after the file open and re-optimizes tuning parameters based on actual file modes used.

Serena StarTool RB VSAM – Record Backup for VSAM

Serena StarTool RB VSAM is an intelligent VSAM synchronization and business recovery tool for z/OS. It maximizes productivity for storage administrators and operations managers by making more effective use of the existing backup window. Serena StarTool RB VSAM reduces the daily backup load by identifying and backing up only the changed data. Consequently, Serena StarTool RB VSAM reduces the resources necessary to back up data, and eliminates the unnecessary and unproductive time currently being used by data centers performing full VSAM dataset backups.

Serena StarTool RB VSAM is a data replication and synchronization tool that enhances the data recovery process in the event of a system disaster or programmer error. It uses record-level change detection technology to identify and back up only the changed data

in VSAM files. The changed data can be easily transferred to a local/remote site for data replication and synchronization. Serena StarTool RB VSAM maximizes productivity, reduces the volume of data that is backed up daily, and reduces time and resources required to perform daily backups. It also dramatically reduces tape handling and transport and storage costs for backups of large VSAM datasets. It is designed as a business recovery and application re-run tool for very large VSAM files. It can easily be implemented in any MVS shop, regardless of the existing backup product in use. Serena StarTool RB VSAM works independently or in conjunction with full volume backup products such as IBM's DFDSS or Innovation Data Processing's FDR. Because it uses a proprietary access method that accesses full cylinders, it is faster than a standard IDCAMS REPRO or EXPORT backup when taking a full backup is necessary.

As shown in Figure 5.4, typical installations experience up to a 50 percent reduction in tapes used, and over 50 percent reduction in CPU usage and elapsed time when performing VSAM BACKUP/OFFLOAD using Serena StarTool RB VSAM.

Serena StarTool RB VSAM reduces the daily VSAM backup load by identifying and backing up only the changed data.

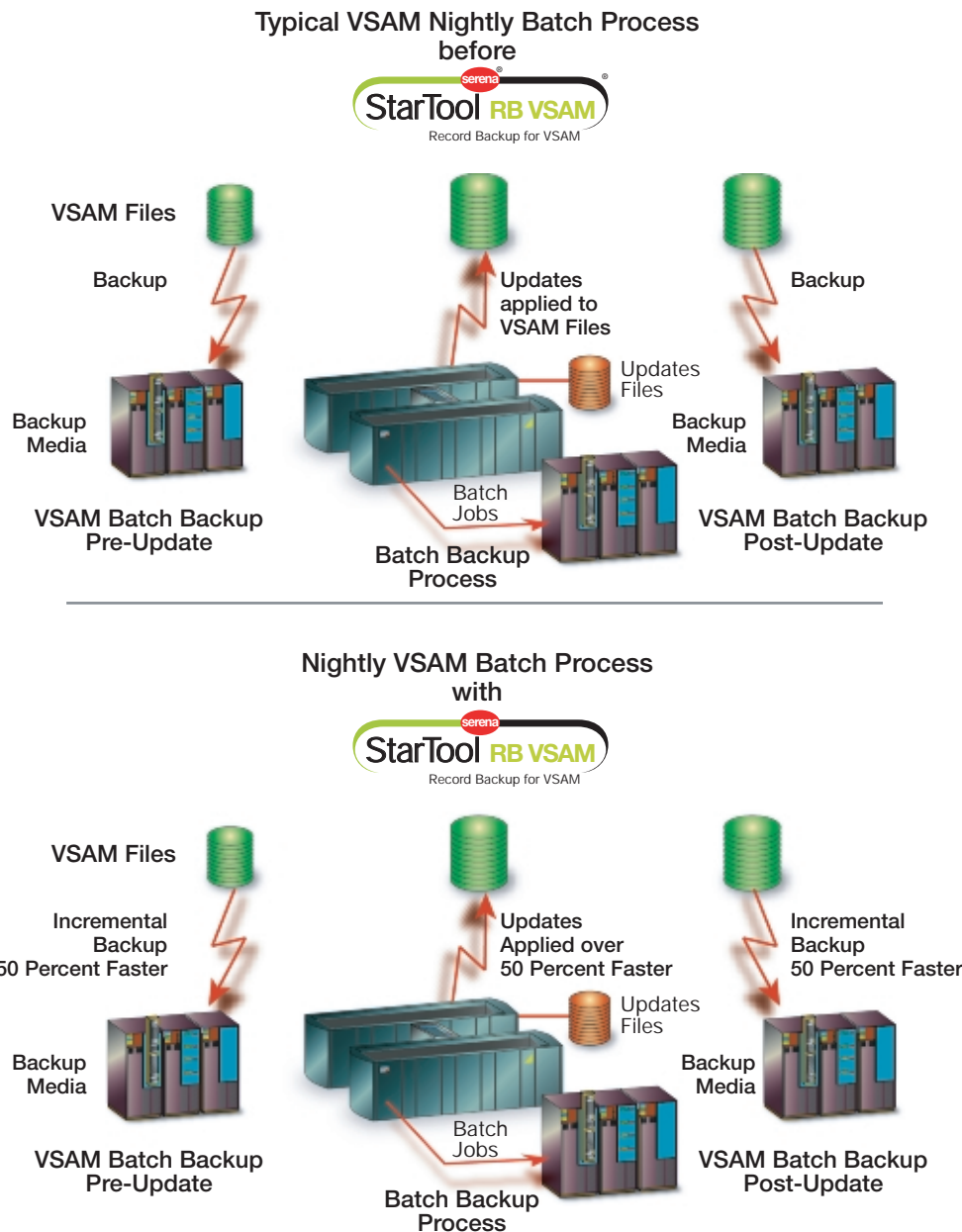


Figure 5.4 – Serena's innovative Record Backup for VSAM enables incremental backups and VSAM updates up to 50% faster.

In the event of a system disaster, Serena StarTool VSAM dramatically speeds up the data recovery process.

The size and structure of VSAM files makes it inconvenient and impractical to do full VSAM file backups on a regular basis. Serena StarTool RB VSAM addresses this issue with its innovative (and patent pending) fingerprinting technology that allows for record-level change detection. Using this technology, it identifies changes and packages all VSAM updates into a physical, sequential file. This file can hold the changed records for multiple VSAM files and is called a Change Basket. This method greatly simplifies the storage, transfer of changes and updating process at the target site(s). When files need to be restored, Serena StarTool RB VSAM simply applies the changes contained in the latest Change Basket to a full backup of the VSAM file, bringing the files up to the most current level. Since the number of daily updates is a small fraction of the total number of records this can dramatically reduce the amount of data to be transferred.

ISV Partnering Solutions

6

Independent Software Vendor (ISV) partnering solutions provide a network of enterprise technology and solutions partners who complement the products and services provided by Serena Software, and add value for Serena customers. Serena partners include many of the top companies in the computer industry. The global program is designed to:

- Capitalize on the customer benefits that result from the synergy between Serena technologies and those of Serena's partners
- Empower Serena partners to provide customers with business value and best-of-breed enterprise solutions
- Drive customers' business continuity, workflow and process management, and success in managing their development and software assets throughout the application life cycle

| Software Vendor | Software |
|--|---|
| Auto-trol Technology Corporation | KONFIG® CM |
| Borland® | JBuilder®, Together® ControlCenter® |
| Catalyst Systems | Openmake® |
| Concurrent Versions System | CVS |
| Eclipse Open Source Consortium | Eclipse IDE |
| Flashline® | Flashline 4 (former name was CMEE) |
| Hewlett-Packard Company | HP NonStop®, MPE/iX®, HP-UX® |
| Information Engineering Technology (IET) | GuardIEn |
| Integrated Chipware™ | RTM i |
| International Business Machines (IBM®) | DB2®, CICS®, ClearCase®, IMS™, Lotus®, OS/400®, Rational Rose®, Ready for WebSphere Studio certified, Tivoli® Software Distribution, VisualAge® family of products, WebSphere® Studio Application Developer |
| Linux, SuSe, RedHat® | Linux® |
| Macromedia | ColdFusion®, HomeSite® |
| McCabe | TRUEchange |
| Merant | PVCS Version Manager |
| Mercury Interactive Corporation | TestDirector |
| Micro Focus® | APS |
| Microsoft® | Access, FrontPage®, IIS, InfoPath™, Office, Outlook®, Project, Sharepoint Portal Server™, SQL Server, Source Code Control Interface (SCCI), Visual Studio®.NET, Systems Management Server (SMS) Framework, Visual Basic®, Visual C++®, Visual FoxPro®, Visual J++®, Windows Server™ |
| Oracle® | Oracle 8i™, Oracle 9i™, Oracle 9i™AS |
| Perforce Software | Perforce SCM System |
| Relativity | Relativity Technologies Modernization Workbench™ |
| SAP® Solutions | SAP R/3® |
| SlickEdit® | Visual SlickEdit® |
| Sun Microsystems | SunONE Application Server, Java™, SunOne |
| Worksoft® | Certify® |

Table 6.1 – Serena products integrate, work with and/or support over 50 software platforms.

A Wide Variety of ISV Software Companies Work with Serena

Serena works with ISVs who offer software solutions that interoperate, complement and add value to Serena Enterprise Change Management (ECM) solutions. Their products often include mission-critical applications, such as integrated development environments, testing solutions, Web application servers, and ERP or CRM.

Validated ISV Partnering Solutions

Serena’s ISV partners include a cross section of industry-leading software organizations from whom Serena has received specific validation or certification. Through their innovations, these partners enhance and complement Serena efforts, to deliver best-of-breed solutions to mutual customers. Serena’s ISV partner certifications and validations are shown in Figure 6.1 below.

Figure 6.1 – Serena Partner Certifications and Validations



Serena is a Microsoft Visual Studio .NET Launch Partner, a Premier Member of the VSIP and a Microsoft Gold Certified Partner

Serena was one of the first SCM vendors to join VSIP (Visual Studio Integration Program). This program benefits Serena by providing access to Microsoft resources, Visual Studio .NET developers and opportunities to join Microsoft VSIP marketing programs and product guides. Serena was also selected to sit on the Partner Advisory Council (PAC).

Table 6.2 – Summary of Serena Enterprise Change Management (ECM) solutions and the Microsoft technologies they support

| Serena Products | Microsoft Products |
|------------------------|---|
| Serena® TeamTrack® | Windows Client, IE Client, SQL Server, Windows Server, Pocket PC, Access, Visual Studio.NET, Project, Exchange, MSSCCI, Office, IIS |
| Serena® ChangeMan® DS | Windows Client, IE Client, SQL Server, Windows Server, Visual Studio.NET, MSSCCI, Office, Windows Security |
| Serena® ChangeMan® ZDD | Windows Client, Windows Explorer interface to mainframe data, XML and ODBC client for ChangeMan ZMF |
| Serena® ChangeMan® ECP | IE Client, IIS, Exchange |

Serena ChangeMan products, when used with Visual Studio .NET, can improve application deployment processes across all enterprise applications, no matter what type of servers run them. Serena and Microsoft continue to work together to create a complete development environment, as shown in Table 6.2. Serena supports migration of legacy code to Windows NT® and other Windows environments, and has a cross-platform strategy to manage change across complex IT environments. Serena is Microsoft Gold Certified with Serena ChangeMan ZDD, which allows Microsoft Windows-based applications to easily access mainframe resident data.

TeamTrack supports and assists Visual Studio .NET developers in their efforts to build applications faster and more efficiently by providing them with a Web-architected, secure and highly configurable enterprise change request and process management solution. This solution empowers Visual Studio .NET application development teams to improve communication and development processes across the enterprise. Serena TeamTrack helps Microsoft developers to rapidly automate and enforce business processes, manage issues throughout the entire life cycle of their projects, and facilitate collaboration with all stakeholders across the enterprise and beyond.

Serena ChangeMan is SAP Certified

Serena ChangeMan was the first ECM solution to become SAP certified—directly integrating with SAP R/3 through Serena ChangeMan DS. Serena has developed a workflow specifically designed to manage SAP change requests and allow customers realize significant productivity gains in managing and improving the entire application development process. Serena is a partner of SAP, and is committed to providing continued support and high quality solutions for SAP environments.

Serena TeamTrack is CMII Certified

By achieving CMII Certification, companies address management of the products, facilities, and processes by managing the information about them, for example ensuring changes are what they are supposed to be in every case. This includes information that could impact safety, quality, schedule, cost, profit or the environment. CMII continues to represent the best industry practices allowing companies to maintain excellence in how they deliver services, helping them to provide tools with proper functionality, and providing oversight as needed to ensure that implementations are successful.

CMII Certification emphasis is on (1) change, (2) the reuse of standards and best practices, (3) the assurance that all requirements (all released information) remain clear, concise and valid, (4) communication and (5) the assurance that results conform to the requirements in each case.

Serena TeamTrack, which has been awarded CMII Certification, helps companies meet these requirements through an automated workflow change management solution that supports the change request life cycle from request submission through implementation.

Serena ChangeMan DS is Validated Ready for WebSphere Studio

Serena ChangeMan DS supports the WebSphere Studio Application Developer environment to accelerate leading-edge J2EE™ application projects. The tight integration between Websphere Studio Workbench and Serena ChangeMan DS provides significant benefits for Serena customers.

Serena is an Eclipse Open Source Consortium Board Member

Eclipse establishes an ecosystem of royalty-free technology — an open universal platform for tool integration. Tools built using Eclipse give developers language and platform freedom of choice in multi-vendor supported environments. Serena is deeply committed to supporting the latest Eclipse technology and working with other industry leaders to establish and promote open standards that benefit the development community. As an early adopter of the Eclipse Platform and a member of the Eclipse Board, Serena enables customers to easily integrate other Eclipse-based tools into their existing environments to accelerate next-generation development. Support for Eclipse is available in the latest versions of Serena’s distributed change management products.

IBM and Serena are Advanced Developer Business Partners

IBM technologies and Serena products leverage each other to create superior SCM and business or workflow management solutions, as shown in Table 6.3. The companies work together to continue to integrate new releases to satisfy the needs of common customers. These integrated efforts benefit our customers by accelerating application development across all platforms, delivering improved quality, and speeding application time-to-market.

Table 6.3 – Summary of solutions and the IBM technologies they support

| Serena Products | IBM Products |
|------------------------|--|
| Serena ChangeMan ZMF | z/OS, DB2, IMS, CICS |
| Serena ChangeMan DS | WSAD, Linux on zSeries, USS, OS/400 |
| Serena ChangeMan ECP | z/OS |
| Serena ChangeMan ZDD | z/OS |
| Serena® StarTool® FDM | z/OS, IMS, DB2, CICS, Linux 390, COBOL |
| Serena® StarTool® DA | z/OS, IMS, DB2, CICS, Linux 390, COBOL, PL/I |
| Serena® StarTool® IOO | z/OS, IMS, DB2, CICS, Linux 390, COBOL |
| Serena® StarTool® APM | z/OS, IMS, DB2, CICS, Linux 390, COBOL, PL/I |
| Serena® StarTool® VSAM | z/OS, CICS, VSAM |
| Serena® Comparex® | VMS, z/OS, CICS, COBOL, PL/I, VSAM |
| Serena TeamTrack | DB2/UDB |

Serena is a Two-Star Elite Partner with Mercury Interactive

Serena is a Two-Star, Elite Technology Alliance Partner with Mercury Interactive, the leader in the testing market. Serena integrates with TestDirector through two products — Serena TeamTrack and Serena ChangeMan DS. The Serena TeamTrack integration allows process synchronization, so managers concerned with the overall development process have a window into what's happening inside the more specific testing cycle. The Serena ChangeMan DS integration applies Serena's comprehensive SCM capabilities to TestDirector test scripts and projects (see Figure 6.3 below).

By integrating Serena TeamTrack with Mercury Interactive's business technology optimization software, Serena delivers an automated, highly integrated change and test management solution that allows customers to spend less time managing the application life cycle process and more time on maximizing business benefits. This capability gives customers a clear competitive advantage in the market.

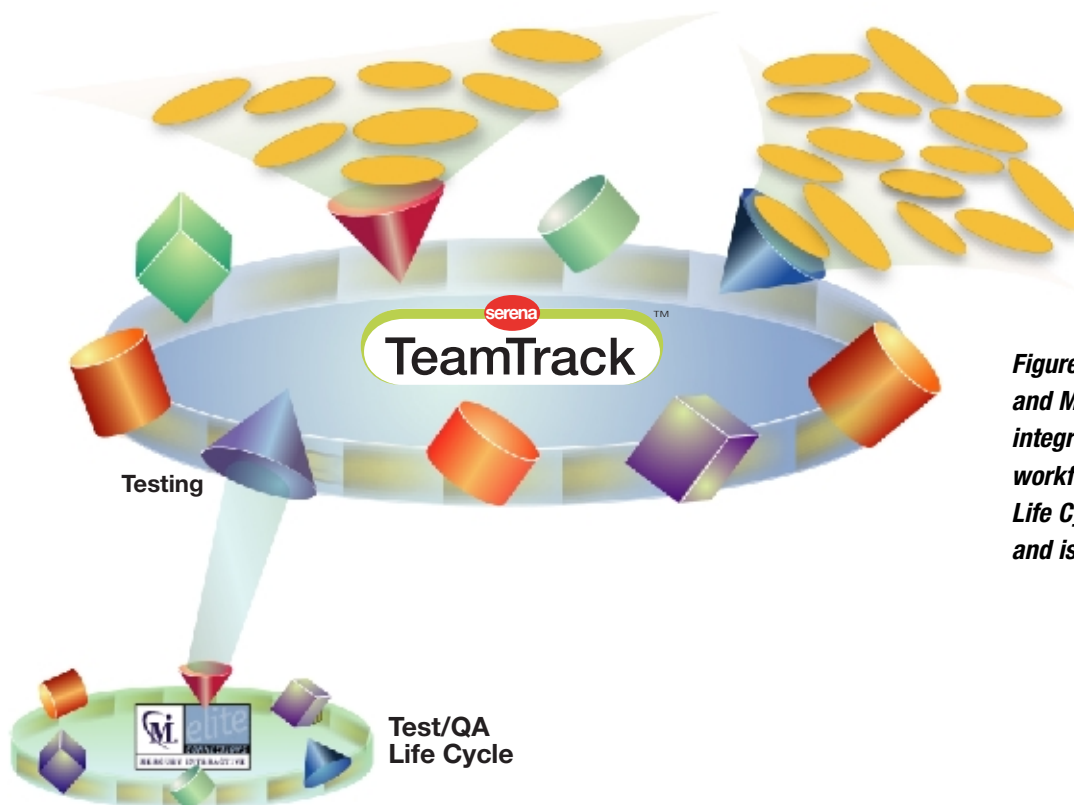


Figure 6.2 – Serena TeamTrack and Mercury TestDirector integration uses a pre-defined workflow to manage the Test Life Cycle, identify resources and issue QA assignments.

Consulting & Services Solutions

7

As part of a comprehensive product and process implementation strategy, Serena Consulting & Services offers a variety of services to provide today's enterprises with complete IT configuration management solutions. Serena uses proven techniques to ensure the success of an organization's change management initiatives. It offers customers solutions that extend well beyond the typical technology-specific issues and challenges. Serena's services are designed to provide a full suite of Enterprise Change Management (ECM) solutions, ranging from people to process and technology. The types of services provided include strategic and tactical planning, configuration needs assessment, requirements gathering/process definition, implementation and education. The services are available on a project basis or as an ongoing resource. The scope of work to be done can be tailored to suit an individual organization's needs, or consist of a suite of packaged offerings to address common recurring activities.

Serena Consulting & Services consultants provide a skilled and efficient means of executing a customer's work plan. Serena consultants have worked on implementations in some of the world's largest and most complex environments and can deliver results in a fraction of the time typically needed. They can also proactively identify potential issues and resolve them ahead of time.

Serena Consulting & Services brings today's IT organization the power and knowledge to plan and implement Serena product solutions. Serena ensures success by coupling careful planning with decades of experience in IT organizations throughout the world.

Serena uses proven techniques to ensure the success of an organization's projects.

Serena consultants have worked on implementations in some of the world's largest and most complex environments.

| Solution Offering | Description |
|----------------------------------|--|
| Strategic Planning | Organizational and program assessments conducted through face-to-face or confidential, Web-based interviews |
| Configuration Needs Assessment | Tactical planning that maps an organization's strategic plans to roll out the product and ensure that it conforms to the current desired processes |
| JumpStart Program | Serena® ChangeMan® ZMF, Serena® ChangeMan® DS and Serena® TeamTrack® implementation for a single selected application or process |
| Application Management Service | Change management implementation, administration and maintenance outsourcing to onsite, dedicated Serena resources |
| Education and Training Solutions | Fundamentals and advanced product-based education delivered regionally or hosted at customer sites |

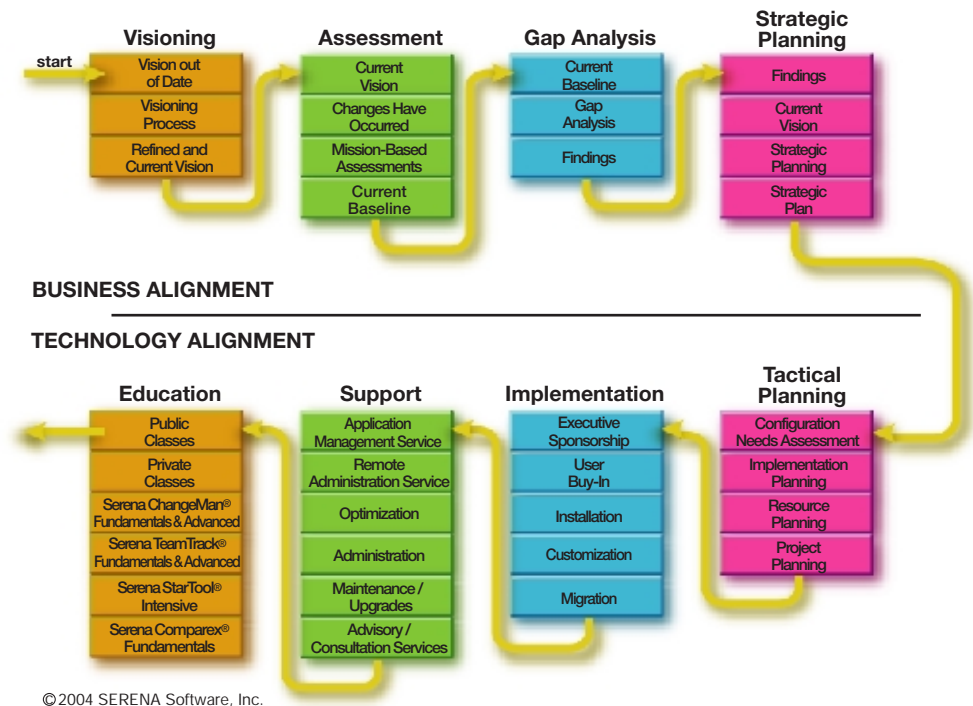
Table 7.1 – Summary of Serena Consulting & Services Capabilities

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Strategic Consulting Solutions

In order to achieve the maximum benefits from ECM, critical business goals must be aligned with the ECM technology in use. With proper planning and consultation, customers are poised to succeed and more quickly recognize a return on their investment. As shown in Figure 7.1, Serena has developed an eight-step process, which provides a clear line of sight that greatly facilitates aligning business goals and initiatives with the ECM technology.

Figure 7.1 – Serena’s eight-step process provides a clear line of sight to align critical business initiatives with ECM technology and process goals.



Enterprise Change Management (ECM) Business Review

The purpose of the ECM Business Review is to assess the effectiveness of the current change management program and determine areas needing improvement. Serena identifies critical success factors for the effective implementation of a new ECM tool or process, and ensures the implementation is achieved with minimal risk, minimal cost and maximum effectiveness.

Serena identifies critical success factors for the effective implementation of a new ECM tool or process and implements comprehensive reviews in key areas.

System Readiness and Utilization Review

This review encompasses three areas. In the first, Serena examines a site’s implementation readiness by reviewing preparatory activities and determining the resistance level to changes required for effective utilization. This process builds a basis for teamwork between the implementation task force and end users. The second review deals with implementation progress. Reactions of end users to implementation activities are analyzed and corrective actions are recommended as appropriate. This review strengthens teamwork, allows end users to participate in the implementation and validates the training program. Finally, in the system utilization review, the effectiveness of the system for end users is studied. The process develops a partnership between end users and the developers/implementers.

ECM Risk Assessment

Through an ECM Risk Assessment, Serena identifies and validates the strengths and weaknesses of a program and determines where the risk of not meeting expectations is greatest. This provides visible assurances that due diligence is applied to all key risk areas in the enterprise.

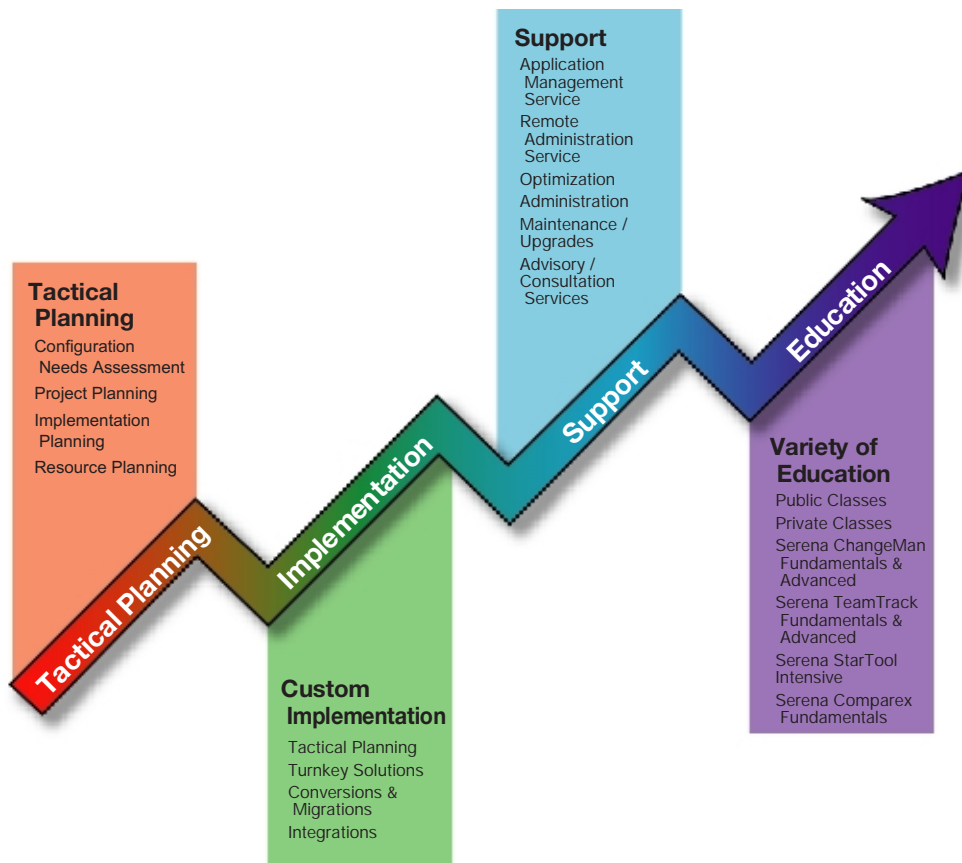


Figure 7.2 – The Serena Consulting & Services group offers a full range of services, from rapid JumpStarts to long-term business process outsourcing solutions.

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Configuration Needs Assessment

The purpose of the Configuration Needs Assessment is to review the current mainframe and distributed change management configuration, and to identify the requirements needed to improve or restructure the configuration. It's designed to provide a clear understanding of an organization's current change management process, compare that to best practices (optionally to the Capability Maturity Model – CMM or the Information Technology Infrastructure Library – ITIL), and chart a course to an ideal state. Specific recommendations are made on how to best install and configure the Serena products under consideration. A Configuration Needs Assessment will ensure the product rollout conforms to current or desired processes. If an organization is pursuing a formal set of process definitions, such as CMM or ITIL, a gap analysis will be performed to identify the areas that should be addressed to meet the needs of the next maturity level. At the end of the process, the client will receive the following documentation:

The Configuration Needs Assessment identifies the requirements needed to improve or restructure the configuration.

- Outline of current change management configuration to provide a comprehensive view and baseline to be used in applying ECM Best Practices
- Comparative (Gap) analysis of current configuration, processes, procedures and tools in place to meet ECM Best Practices
- Recommendations of modifications to current configuration to meet ECM Best Practices standards
- Outline of proposed change management configuration
- Implementation strategy and project plan for proposed change management configuration

The JumpStart Program addresses the question, “How can we get started quickly and in the right direction?”

Serena consultants are quick, efficient, highly trained specialists in Enterprise Change Management.

Serena training classes enable users to get up and running as quickly as possible.

JumpStart Program

A common question for many new Serena customers is, “How can we get started quickly and in the right direction?” Serena’s JumpStart program was designed specifically to address this need. JumpStarts help customers get started correctly by tackling a small application as a pilot project. This demonstrates the steps needed to be successful going forward. Customers get a quick win by implementing Serena ChangeMan ZMF, Serena ChangeMan DS, and/or Serena TeamTrack for a limited audience (application or process), and this also helps customers understand the requirements for a larger enterprise implementation.

JumpStarts vary in duration based upon the selected products scope, and deliverables being implemented. Serena ChangeMan ZMF and ChangeMan DS JumpStarts range from four to six weeks and Serena TeamTrack averages one to four weeks.

The Serena Pilot Jumpstart program provides organizations with:

- Accelerated implementation of applications
- Faster return on software investment costs
- Leveraged industry knowledge and product-specific expertise
- Full and immediate access to all Serena resources
- Realization of savings over the long haul with careful planning and faster, efficient software application implementation up front

Performing change management, configuration or administrative tasks involved with implementing software applications can be a daunting project for any organization. Most organizations can benefit from a turnkey implementation, in which Serena performs the bulk of the work effort to get applications up and running quickly and efficiently. With the JumpStart program, not only is the implementation accelerated, but an organization can also take advantage of the experience to continue the implementation of similar types of applications later on. Serena consultants are quick, efficient, highly trained specialists in ECM. Serena’s qualified professionals can prevent expensive shelf-ware situations and enable a full implementation of all functionality.

Application Management Service

The Application Management Service provides customers with the opportunity to outsource the day-to-day management and administration of their Serena ChangeMan systems. The minimum duration for this service is one year, and it provides for a minimum of one dedicated, on-site Serena ChangeMan expert consultant to perform routine and advanced change management functions, including installation, customizations and application migrations, as well as maintenance and upgrades.

Education and Training Solutions

Serena’s education program helps companies build the professional knowledge and skills needed for the implementation, customization and administration of Serena products. Courses are designed to maximize the use of each product and enable users to get up and running as quickly as possible. Public courses are available at selected Serena locations. The classes are small, hands-on and designed for various skill levels — new users, experienced users or product administrators. An extensive schedule of classes is available and listed on www.serena.com.

In addition to the courses given at Serena’s educational facilities, courses can also be given at the user’s location. Training held at a user’s site can be customized to meet very

specific needs. Onsite courses minimize disruption, and they are a cost-effective way to receive highly personalized education in the context of a company's unique environment. All of Serena's courses can be customized and presented onsite. In addition to the public courses, a company can request training on any Serena product or service.

Serena is also proud to offer a variety of Internet-based learning courses that provide customers with access to detailed product knowledge from the convenience of the Web.

Serena's courses can be customized and presented onsite.

Glossary of Terms

| | |
|---------------------------|--|
| Access Method | A set of system software routines that call the operating system to get data stored on disk or tape drives. Examples include VSAM, ISAM, and QSAM. |
| API | Application Programming Interface or API is a set of software routines calls that allow software developers to interface to (or call) a specific program. It often provides that ability for different software products to integrate with one another. |
| Application Server | An application server is a computer in an Internet environment that performs the data processing necessary to deliver information as well as process information for Web clients. |
| Approval Process | An approval process is a process in which members of a designated approval group must approve a change package before it can move to the next state. |
| Area | In Serena ChangeMan DS, an area is a logical name for a physical location in which the software components, organized by applications, packages and projects, reside. Specific development or QA areas can be associated with a package to control the work and test locations used during the change cycle. Areas can be specified at the application level. This sets the bounds for the areas that can be associated with packages in a particular application. In Serena ChangeMan ZMF (ERO), an area is a repository of software components for each step of a release. |
| Assembler | An assembler is a programming language that is one step away from machine language and is coded by systems programmers and some application programmers. |
| Assignments | Assignments are units of work that are assigned to a user to complete. Assignments are usually associated with change requests. |
| Authorization list | An authorization list is a list of users who are authorized to perform a given action. |
| Backup | The practice of copying files, data or systems stored on disk or tape to another disk or tape is referred to as file backup or backup. This is done for protection in case the active file gets damaged. Backup is considered local copy as opposed to remote copy. |
| Baseline | A library that stores the most current version of the software. |
| Batch | Batch refers to computer systems and application software programs that are run offline (usually at night) for the purpose of reporting, database reconciliation, etc. See also online systems. |
| Batch window | The period of time (usually at night) when the enterprise systems and databases are not online to users is known as the batch window. |
| Bind | During compiling, the compiler assigns symbolic addresses to some variables and instructions. When the program is bound, or linked, the binder replaces the symbolic addresses with real machine addresses. |
| Borland JBuilder | Borland JBuilder is an Integrated Development Environment or IDE. See also IDE. |
| Bug | A bug is an error or defect in software or hardware that causes a program to malfunction. |
| Bug Fix | A bug fix is actual corrected software. |
| Change Basket | Used in Serena ChangeMan SSM, a Change Basket is a single dataset that contains the changes between two environments (e.g. Test/Prod, SYSRES/ALTRES, or LPAR/LPAR), or the changes in an environment between two different points in time. This is a physical sequential file holding the data and information required to synchronize two environments, either locally or remotely. It is similar in concept to a Change Package in Serena ChangeMan. See also Change Package. |

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| ChangeMan | The Serena ChangeMan family of Enterprise Change Management (ECM) products is a best-of-breed ECM solution that can manage parallel changes to software code and content running on different platforms, from mainframes to distributed systems to the Web. Because enterprise applications have no boundaries within the computing infrastructure, Serena ChangeMan products enable management to view, correlate and approve all relevant changes from anywhere, using a Web browser. |
| ChangeMan DS | Serena ChangeMan DS, a software change manager for distributed systems, provides robust SCM — complete with versioning, rollbacks, audit trail, cross-platform build and release management, and impact analysis — for distributed systems such as UNIX, Windows, Linux, MPE/iX and OS/400, and integrates them with an elegant architecture. The graphical interface simplifies the creation of process flows. It allows distributed development teams to work in their preferred IDEs and development tools. Changes are managed and deployed with very low impact on network resources. |
| ChangeMan ECP | Serena ChangeMan ECP is an enterprise change portal that links directly with Serena ChangeMan DS and Serena ChangeMan ZMF to offer a central management point for software development with a customizable Web interface. Serena ChangeMan ECP provides common reporting, approvals and promotions across platforms, enabling Serena's unique Enterprise Change Packages to be executed across the enterprise. With Enterprise Change Packages, links between application components on multiple platforms can be established early in the development cycle, and enforced throughout. They can prevent premature movement into production of mainframe components that affect distributed applications, and vice versa. In addition, they can help ensure that only when all aspects of a multi-platform application are ready are they deployed to production. |
| ChangeMan SSM | Serena ChangeMan SSM automates the process of keeping hot site mainframe systems in sync with primary systems by eliminating full tape backups. |
| ChangeMan ZDD | Serena ChangeMan ZDD provides a Windows Explorer interface to z/OS files and jobs and an XML interface to Serena ChangeMan ZMF. |
| ChangeMan ZMF | Serena ChangeMan ZMF, a software change manager for z/OS, provides robust SCM and sets the standard for process flexibility and concurrent development practices in mainframe environments. It features a standard-based architecture, guarantees source-to-load integrity, and facilitates complete and immediate backout to protect application uptime. |
| Change Package | Unique to Serena since first inventing SCM in 1980, Change Packages group all the components of a software change together at the beginning of the change process. Components may include PROCs, Documentation, Java Beans or JCL — anything that is used to develop applications. Change Packages make it easier to move code through a process with integrity, handle emergency changes and predict and improve the quality of software applications. They allow developers to work in their platform of choice while the application is later deployed on the appropriate platform. See also Change Basket. |
| Check In | To check in a file is to move a new version of a file or project to a production area and store the changes in an archive if set up to do so. |
| Check Out | To check out a file is to copy a file from the production area to a target area (usually a development area). |
| CICS | A popular IBM teleprocessing monitor and online transaction processor. CICS stands for Customer Information Control System. CICS code is placed into application programs to allow online processing and is coded by Application Programmers. |
| Client | A client is a computer system or process that requests a service of another computer system or process (a server), and accepts that server's responses. A client is part of a client-server software architecture. In Serena ChangeMan DS, client code refers to the code that provides the user interface to Serena ChangeMan DS from anywhere in the enterprise including the Internet. Serena ChangeMan DS clients include Windows, Web browsers, Java and command line 9 for use in scripts, and most popular IDEs. See also IDEs. |

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|-----------------------------------|---|
| Client/Server Architecture | This refers to a network architecture in which each computer or process on the network is either a client or a server. Servers are powerful computers or processes dedicated to managing disk drives (file servers), printers (print servers), or network traffic (network servers). Clients are PCs or workstations on which users run applications. Clients rely on servers for resources, such as files, devices and even processing power. |
| CMM | The Capability Maturity Model or CMM is being developed and managed by the Software Engineering Institute (SEI) a federally funded research and development center sponsored by the U.S. Department of Defense. Serena ChangeMan products directly support many of the specific requirements defined in the SEI CMM Level 2 and automate key portions of development activity to ensure repeatable software quality. See also SEI and ChangeMan. |
| CMII | The Configuration Management II Model or CMII, provides an advanced version of Configuration Management that enables an organization to manage their products, facilities and processes by managing their requirements, including changes, and assuring conformance in each case. Both a Serena Professional Services Representative and Serena TeamTrack are CMII certified. |
| CMMI | CMMI stands for SEI's Capability Maturity Model Integrated. See also SEI. |
| COBOL | COBOL or COmmon Business Oriented Language is a high-level business programming language that has been the primary business application language on mainframes and is coded by application programmers. |
| Communication Agent | The Communication Agent is a process (as an example, UNIX Daemon or Windows Server service) running on each machine; it creates child processes for direct builds, makes, managing files, interfacing to the server and other SCM activities. The results of each operation are sent back to the server. Serena ChangeMan DS employs communication agents that maintain source repositories of change elements and then communicate with the Serena ChangeMan DS Main Server to update the metadata repository. |
| Comparex | Comparex is Serena Software's comprehensive solution for any-to-any mainframe file comparisons — functions needed for software quality assurance, efficient application testing and crucial application availability. Uniquely, Serena Comparex quickly and accurately compares the contents of any two libraries, directories, files or databases. Serena Comparex detects differences and similarities between files that have similar or different content, structure or record length, isolates changes and generates detailed, easy-to-view differences reports. |
| Compile | Compile is the process used to transform a program written in a high-level programming language from source code into executable object code. |
| Component | In Serena ChangeMan ZMF, a component is a single member of a change package. Usually, it is a member of a library that has been brought into Serena ChangeMan ZMF for the purpose of being modified. More specifically, it is a partitioned dataset member that contains a piece of a computer system. In Serena ChangeMan DS, a component is any project, area, path or file that is under Serena ChangeMan DS control. |
| DASD | Direct Access Storage Device is a term used to describe mainframe disk storage. |
| DB2 | IBM DB2 or DataBase 2 is a relational database management system. DB2 uses the SQL language interface. This class covers SQL and SQL coded within a COBOL program and is for application programmers. |
| Development Area | A development area is an area used by programmers to modify existing software or create new software. |
| Distributors | Distributors are marketing and fulfillment firms that have the exclusive right to market, promote, sub-license, and distribute Serena software directly to the end user. These partners typically provide sales, presales and the first level support. These partners represent SERENA Software, Inc., in parts of the world where we have no direct sales force. |

| | |
|---|---|
| Downtime | Downtime is a planned or unplanned interruption in system availability. Planned downtime is usually for scheduled system maintenance, and unplanned downtime usually includes business interruptions or disasters. |
| Eclipse | IBM's Eclipse open source software platform is designed to allow developers to integrate tools using a common interface. Serena is an IBM Business Partner and supports the Eclipse standard. Eclipse can be used to create Integrated Development Environments (IDEs) that can build diverse applications, such as C++ programs, Web sites, embedded Java programs and Enterprise JavaBeans. |
| ECM | Enterprise Change Management or ECM is a term coined by Serena Software to expand the concept of Software Change Management (SCM). ECM addresses all management and operational aspects of streamlining the entire application environment through managing changes to multi-platform, multi-location application software components from a single point and not just the software code as with SCM. |
| End User Area | An end user area is an area containing the complete and final software. |
| Enterprise Change Package | This term refers to Change Packages that involve heterogeneous (mainframe and non-mainframe) hosts as managed by Serena ChangeMan ECP. See also Change Package and Change Basket. |
| ERO-Option | Serena ChangeMan ZMF manages releases through the Enterprise Release Option or ERO-Option, where users can concurrently manage all Change Packages belonging to multiple time-dependent releases through the life cycle. |
| ERP | Enterprise Resource Planning, or ERP, can be used to describe any software system designed to support and automate the business processes of medium and large businesses. This may include manufacturing, distribution, personnel, project management, payroll and financials. |
| Fingerprint | Using a proprietary algorithm, Serena's ChangeMan SSM can reduce a data record, file, directory or DASD volume to a 6–10 byte fingerprint that uniquely represents the data contents. Comparison of such fingerprints allows SSM to rapidly determine if changes have taken place in the fingerprinted environment. |
| Framework | In object-oriented systems, a framework is a set of objects that share a common structure and represent a design for solutions to related problems. |
| Freeze | Freeze means to lock a piece of software against further change and to record the state of a project and its build information (including versions of the files that went into the release) when it is ready for distribution. |
| FTP | FTP is an abbreviation of File Transfer Protocol, the protocol used on the Internet for sending files. |
| GUI | GUI is an acronym that refers to a Graphical User Interface, which is the software that controls the screen presented to a user in a computer application. |
| HTTP | Based on TCP/IP, HTTP is the Internet protocol used by the World Wide Web to fetch hypertext objects from remote hosts. It is the abbreviation for Hypertext Transfer Protocol. |
| IBM VisualAge for Java | IBM VisualAge for Java is an Integrated Development Environment or IDE. See also IDE. |
| IBM WebSphere Studio Application Developer | IBM WebSphere Studio Application Developer is an Integrated Development Environment or IDE. See also IDE. |
| IDC | IDC is a respected technology analyst firm located in Framingham, Massachusetts. |

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| IDE | Integrated Development Environments or IDEs are collections of programming tool sets and processes that are fully integrated. Examples of IDEs supported by Serena ChangeMan DS are: IBM WebSphere Studio Application Developer and Microsoft Visual Studio .NET. In addition to IDEs, today's enterprises also use ERP software (SAP and PeopleSoft), Help Desk (Peregrine) and/or Quality Assurance (Mercury Interactive), in order to manage a range of applications, such as software (files, databases and Web content), hardware (mainframe, UNIX and Windows) and configuration (network, security, etc.) assets. |
| Impact Analysis | A process by which interdependencies between program components are identified. The target may be any element, such as a variable, data item, function call or include file. |
| IMS | IMS or Information Management System is database software from IBM that is based on the hierarchical data management model. |
| Incident | An incident refers to an issue, problem, bug, modification or enhancement to the development process. |
| Internet | Internet refers to a global network connecting millions of computers. More than 100 countries are linked into exchanges of data, news and opinions. |
| Intranet | An intranet is a network (based on TCP/IP protocols like the Internet) belonging to an organization (usually a corporation) that is accessible only by the organization's members, employees or others with authorization. An intranet's Web sites look and act just like any other Web sites, but the firewall surrounding an intranet fends off unauthorized access. Like the Internet itself, intranets are used to share information. Secure intranets are now the fastest-growing segment of the Internet because they are much less expensive to build and manage than private networks based on proprietary protocols. |
| ISAM | The Indexed Sequential Access Method, or ISAM, is an IBM access method. See also Access Method. |
| ITIL | ITIL is an acronym for IT Infrastructure Library, which was published originally by the UK government (OGC) to provide a disciplined framework for the delivery and support of IT services. |
| JCL | JCL stands for Job Control Language, which is used to run IBM mainframe batch jobs. JCL tells the system the program to run and the files used by that program. Typically, applications programmers and systems programmers create JCL. Operations and production control workers run the JCL and fix JCL errors. Sometimes end users run job JCL and need to know how to fix the errors or make changes to the JCL. |
| LAN | Local area networks or LANs are networks of computers that are geographically close together; this usually means within the same building. Most LANs are confined to a single building or group of buildings. However, one LAN can be connected to other LANs over any distance via telephone lines and radio waves. A system of LANs connected in this way is called a wide-area network (WAN). |
| Legacy Systems | Legacy systems are computer systems and applications based on architectures that are proprietary and not easily transferable to other types of computer systems. Examples include HP 3000/MCP/iX, MS DOS, Data General and Digital VAX/VMS. Legacy systems can also refer to application systems that have been in use for an extended period of time. |
| Life Cycle | The automation of a business process, in whole or part, during which documents, information or tasks are passed from one to another for action, according to a set of procedural rules. |
| Link | Link is the process by which two packages are associated. |
| Linux | Linux is a freely distributed open source operating system that runs on a number of hardware platforms. |

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| Linux on zSeries | Linux on zSeries will support the new zSeries 64-bit architecture in real and virtual mode on zSeries servers. |
| LPAR | Logical partition or LPAR represents a logically segregated portion of the computing capacity of an IBM mainframe computer. |
| Macro | A macro is a software routine that performs one or more tasks. Macros are used to save programming time. |
| Macromedia ColdFusion Studio | Macromedia ColdFusion Studio is an Integrated Development Environment or IDE. See also IDE. |
| Macromedia HomeSite | Macromedia HomeSite is an Integrated Development Environment or IDE. See also IDE. |
| Main Server | A main server is a host machine that is responsible for coordinating SCM activities, including user authentication and transfer request authorizations. The main server does not store files; they are stored in their native format and in the original directories. |
| Mercury Interactive | Mercury Interactive is a certified Serena partner and developer of quality assurance and software testing products, such as Mercury TestDirector. |
| Mercury TestDirector | Mercury TestDirector is a software-testing product that has been integrated with Serena TeamTrack. The Serena TeamTrack and Mercury TestDirector integration uses a pre-defined workflow to manage the Test Life Cycle, identify resources and issue QA assignments. See also Mercury Interactive. |
| Merge | Merge is the activity of intelligently combining multiple change sets that are separated into a single release or integration milestone. |
| Metadata | Metadata is data about, or descriptive of, other data. Such data can include configuration information, table formats, configurations, impact analysis and audit trail information. Several Serena products maintain metadata repositories. |
| Metrics | Metrics of a subject area comprises objective data, such as line of code counts, change set information, identifying areas of a piece of software that were modified and the developer who made the modifications. |
| Microsoft Access | Microsoft Access is a relational database management system. |
| Microsoft Studio .NET | Microsoft Studio .NET is an Integrated Development Environment or IDE. See also IDE. |
| Microsoft Visual Basic | Microsoft Visual Basic is an Integrated Development Environment or IDE. See also IDE. |
| Microsoft Visual C++ | Microsoft Visual C++ is an Integrated Development Environment or IDE. See also IDE. |
| Microsoft Visual Café | Microsoft Visual Café is an Integrated Development Environment or IDE. See also IDE. |
| Microsoft Visual Studio .NET | Microsoft Visual Studio .NET is an Integrated Development Environment or IDE. See also IDE. |
| Microsoft Visual FoxPro | Microsoft Visual FoxPro is an Integrated Development Environment or IDE. See also IDE. |
| Microsoft Visual J++ | Microsoft Visual J++ is an Integrated Development Environment or IDE. See also IDE. |
| MPE/iX | MPE/iX is the operating system for the HP3000 minicomputer. |
| MVS | Multiple Virtual Storage (MVS) is an IBM mainframe operating system which evolved through OS/390 to z/OS today. |
| Object code | Object code is executable machine code generated by a source code language processor, such as an assembler or compiler. |

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| Online Systems | An online system is an interactive computer system supporting users over a network of computer terminals. |
| Open Systems | Open systems is a general term for computer systems and applications whose characteristics comply with de facto standards made available throughout the industry, and therefore can be connected to other systems that comply with the same standards. This term usually refers to UNIX- and Windows-based systems. |
| Operating System | An operating system is the collection of all software programs that allows application programs, databases and access methods to run on a computer. The operating system (OS) performs basic tasks, such as recognizing input from a keyboard, sending output to the display screen, keeping track of files and directories on the disk, and controlling peripheral devices, such as disk drives and printers or a mouse. The OS schedules the various programs that the computer executes. The OS is also responsible for security, ensuring that unauthorized users do not access the system. |
| Parallel Development | This term refers to development activities that occur simultaneously for either multiple change sets or releases and are physically separate from each other. Parallel development efforts are usually merged into an integration environment. |
| Partner | Serena uses the term partner for any company Serena has signed a contract with that allows both companies to interact with each other by sharing any or all of the following with the intent to enhance their own and/or each others businesses: software, customers and prospects or company resources. |
| Permission | A permission is a rule associated with an object that regulates which users can have access to the object and what actions they can perform in relation to that object. It is an authorization to perform a specific task or action. For example, you may be granted permission to read a file, but not be granted permission to modify the file. A permission, or set of permissions, may be assigned to an individual user, or to a designated group of users. |
| Portal | A portal is a Web site that offers access to a broad array of resources or applications. An early example is AOL. |
| Process Flow | Process flow is governed by a set of rules in Serena ChangeMan DS that control the transfer of components from area to area. This enforces defined routes that files must follow during the development life cycle. |
| Production Area | A production area contains baseline components and prior versions. Production in Serena ChangeMan DS is equivalent to baseline in Serena ChangeMan ZMF systems. See also Baseline. |
| Project | A project is a logical grouping of software components that are tracked and manipulated during the SCM promotion, build and release process. |
| Promote | Promote is the movement of any managed object from one area to another. Promote in Serena ChangeMan DS and Serena ChangeMan ZMF means moving to testing, and to move between testing environments. |
| QA Area | A QA area is an area used by quality assurance personnel for controlled testing. See also Area. |
| QSAM | QSAM is an IBM access method. See also Access Methods. |
| Query | A query is a request for information from the database. Typically, queries are saved and reused, although there are ad hoc queries, which are used once, then discarded. |
| Release | A release is a version or revision of a product. |
| Repository | A repository is a storage space where multiple databases or files are located for distribution over a network, or a storage space where a user can access locally without having to travel across the network. |

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| Request | A request is a change that was asked for by a user for a particular product or release. |
| Resellers | Resellers are marketing and fulfillment firms that have been granted the right to market, promote, sub-license and distribute Serena software directly or indirectly via Serena to the end user. |
| RFG | With a focus on the business of IT, the Robert Frances Group or RFG is an IT analyst firm that helps IT executives align their IT efforts with corporate business strategies. |
| ROI | Return on Investment |
| Role-Based Views | Part of the Serena vision for SAFE, a role-based view is the presentation of change and related information to give business managers and other specific types of users access to only the information they need. See also SAFE. |
| Rollback | A rollback is the process of replacing the version in the live environment with a previous, frozen release. |
| SAFE | Serena Application Framework for Enterprises or SAFE is an extendable, collaborative framework and vision for Enterprise Change Management within which all future Serena products will be built. SAFE will solve today's problem of many tool sets that do not work together. For example, today's enterprise uses various tools — such as IDEs (IBM's WebSphere Studio Application Developer and Microsoft Visual Studio .NET), ERPs (SAP and PeopleSoft), Help Desk (Peregrine) or Quality Assurance (Mercury Interactive) — in order to manage a range of applications, such as software (files, databases and Web content), hardware (mainframe, UNIX and Windows) and configuration (network, security, etc.) assets. The SAFE framework specifies process-to-process integration across all enterprise application life cycle processes. It will allow Serena products to provide role-based views to give business managers only the information they need or specify, without unnecessary detail or technical detail unless warranted. |
| SAP | SAP AG is a Serena partner. Their flagship product, SAP/R3, is the market leader in ERP software. |
| SCCI | SCCI refers to Microsoft's standard Source Code Control interface, which is used by Serena ChangeMan DS to seamlessly integrate with other SCCI-compliant IDEs, including Visual Basic, Visual C++ and Borland JBuilder. |
| SCM | Software Change Management or SCM was envisioned by Serena Software in the early 1980s as a disciplined approach to managing change to worldwide corporate software programs throughout the application life cycle. SCM enables a software development team to identify those managed objects that will undergo change; establishes strict procedures for specifying, evaluating and approving changes; reports and audits changes that are made to ensure that quality has been maintained; and reconstructs the software to accommodate the changes that have been implemented. |
| Script | Script is another term for a macro or batch file. See also Macro. |
| SEI | The Software Engineering Institute (SEI) is a federally funded research and development center sponsored by the U.S. Department of Defense through the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. The SEI's core purpose is to help others make measured improvements in their software engineering capabilities through the establishment of standards, such as the Capability Maturity Model (CMM) or the Capability Maturity Model Integrated (CMMI). See also CMM and CMMI. |
| SI | A Systems Integrator or SI is a service provider. SIs for Serena may range from large, industry-recognized consultants who have the capability and experience to implement Serena software in multiple geographies on a large scale to smaller consultants who have established cross-industry and technical expertise across a particular region or country. |

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| Software Design | Software Design is the activity of planning the behavior and functionality of a software product. |
| Software Integration | Software Integration is the activity of merging multiple change sets into a single release or milestone. |
| Solution Providers | Solution providers enhance their hardware, software and service offerings by integrating, reselling or distributing Serena products. They include distributors, resellers, and system integrators who leverage the best-of-breed technology and solutions of Serena Software, Inc. to provide customers with ECM leading-edge business practices. In addition, they provide infrastructure services to leverage our customers' IT assets from the mainframe to the Web. Serena may also privately label, market and resell our partners' software or services. |
| Source Code | Source code refers to program instructions in their original form or when the programmer writes a program in a particular programming language such as COBOL, C++ or PL/1. A compiler translates the source code to object code and an assembler translates the object code to machine language. |
| StarTool | Serena StarTool products offer a full set of programmer productivity tools: file and data management, dump management, application performance management, I/O optimization and record backup for VSAM. |
| StarTool APM | Serena StarTool APM is used by application and systems programmers, primarily in post-production situations. It is also used during the development cycle, to analyze and offer insight into ways in which applications can be modified to improve their performance in the production environment. StarTool APM is used in real time and in batch mode to analyze and report on CPU utilization, wait time and I/O activity. |
| StarTool DA Batch | Serena StarTool DA Batch is a full-featured dump management, distribution, analysis and diagnostic system for both system (SVC) and application (SNAP) abends. It displays the failing instruction down to the source code level for both COBOL and assembler languages. It manages the archival and retrieval of z/OS and OS/390 system and SYSABEND dumps and monitors trends over time to deliver high availability infrastructure and applications. Serena StarTool DA Batch has the key features needed by analysts and developers to efficiently solve abends in mission-critical applications. |
| StarTool DA CICS | Serena StarTool DA CICS is a full-featured CICS dump management, notification, distribution and analysis system for both system and transaction abends. All dumps normally requested by CICS as well as all normal transaction dumps are supported by Serena StarTool DA CICS. When a dump is taken, it provides the functions needed to quickly debug the problem. It provides the notifications, an easy-to-use point-and-shoot capability, failing instruction identification and CICS screen capture. In addition, it provides the management needed to archive and retrieve dumps and to monitor trends over time to deliver the high availability required for today's e-business applications. |
| StarTool FDM | Serena StarTool FDM is Serena Software's comprehensive solution for file and data management, and a key element of its strategy for enabling application availability in the z/OS environment. StarTool FDM offers powerful functionality and benefits during both the pre- and post-production phases of the application development life cycle. StarTool FDM offers users a broad range of tools for manipulating the structure and contents of files and databases (direct, VSAM, IMS, PDS, PDSE, DB2, sequential, IAM and extended sequential). |
| StarTool IOO | Serena StarTool IOO is Serena Software's comprehensive solution for application performance tuning, and a key element of Serena Software's strategy for supporting application availability in the OS/390 environment. Serena StarTool IOO, the ultimate optimizer, is used to automatically and dynamically modify an application's I/O configuration. To achieve the most efficient performance within the production environment Serena StarTool IOO optimizes blocking and buffer management based on expert systems automated workload analysis. |

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| StarTool RB VSAM | Serena StarTool RB VSAM is an intelligent VSAM backup and synchronization tool for MVS, OS/390 and z/OS. It maximizes productivity for storage administrators and operations managers by making more effective use of the existing backup window. It reduces the daily backup by identifying and backing up only the changed data. Consequently, it reduces the resources necessary to back up data and eliminates the unnecessary and unproductive time currently being spent by data centers. |
| Sybase PowerBuilder | Sybase PowerBuilder is an Integrated Development Environment or IDE. See also IDE. |
| Synchronize | To synchronize is to retrieve a version of a file from a source area and create an identical copy in a target area, without updating the status of the file. The purpose of this is to get current copies of files into a target location for use or review, but not for the purpose of update. |
| System Analysis | System analysis is the modeling of the system's functions and data. It may include data modeling, event response and object-oriented analysis. |
| Task | A task is an assignable unit of work that is a component of a process. |
| TCP/IP | Transmission Control Protocol/Internet Protocol or TCP/IP is a suite of protocols that defines Internet communications. |
| TeamTrack | Tightly integrated with Serena ChangeMan DS, Serena TeamTrack is a Web-architected, secure and highly configurable enterprise change request, process management and issue-tracking solution. Serena TeamTrack empowers application development teams to improve communication and development processes across the enterprise. Serena TeamTrack helps rapidly to automate and enforce business processes, manage issues throughout the entire life cycle of projects, and facilitate collaboration with all stakeholders across the enterprise and beyond. |
| TestDirector | TestDirector is a software test program supported by Serena ChangemanDS. |
| Together ControlCenter | Borland Together ControlCenter is an Integrated Development Environment or IDE. See also IDE. |
| TPF | TPF has been the high-volume transaction-processing (HVTP) platform of choice for many of IBM's largest customers for many years. These customers are from various industries, including airlines, lodging, finance, health and travel. |
| Training, Services and Certification Partners | TSC partners deliver Serena software product training or consulting services on behalf of or in addition to those offered by Serena. These partners augment Serena staff with added expertise and personnel to provide Serena customers with another channel to gain knowledge. Our certification partners help Serena maintain a competitive edge through industry-recognized certification. |
| TSO/ISPF | TSO/ISPF or Time-Sharing Option/Interactive System Productivity Facility is IBM's editor for the mainframe. Users can browse and update datasets and view batch job output using TSO/ISPF. Operations staff, production control staff, applications programmers, systems programmers and end users use TSO/ISPF. |
| URL | URL is an abbreviation of Uniform Resource Locator, the global address of documents and other resources on the World Wide Web. The first part of the address indicates what protocol to use, and the second part specifies the IP address or the domain name where the resource is located. |
| VCM | VCM or Version and Configuration Management is a standard of the Eclipse Open Source Consortium for source code control. See also SCC. |
| Version | In Serena ChangeMan DS, a version is a number that is assigned to a file upon check in to a production area. |
| Version Control | In Software Change Management, Version Control is a system for controlling the different versions of software. |

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| View | A view is the image of the system presented to any one user. Based on the permissions assigned to the user, the view shows only those facilities (such as functions, areas and projects) that the user is allowed to work on or have access to. |
| Virtual Single Repository | In Serena ChangeMan DS, a virtual single repository is the sum of all source repositories the data about which is kept in the metadata repository on the main server. See also Metadata, Repository and Agent. |
| Visual SlickEdit | This cross-platform editing tool can be used in conjunction with Serena ChangeMan products. |
| Volume | Volume is a mainframe term for the information recorded on a single disk unit or recording medium. Indirectly, a volume can refer to the unit of recording medium itself. On a non-removable media storage device such as a disk drive, the terms may also refer, indirectly, to the storage device that is associated with the volume. When a user stores multiple volumes on a single storage media transparent to the program, the volumes are referred to as logical volumes. |
| VSAM | The Virtual Storage Access Method or VSAM is a file and record management system used on IBM mainframes. See also Access Methods. |
| Web | The Web (World Wide Web) is a system of Internet servers that support specially formatted documents. The documents are formatted in a language called HTML (HyperText Markup Language) that supports links to other documents, as well as graphics, audio and video files. |
| Web Browser | A Web browser is a GUI interface that allows end users to view and access information from the Internet or private intranets. Two of the most popular Web browsers are Netscape Navigator and Microsoft Internet Explorer. |
| Web Site | A Web site is a location on the World Wide Web. Each Web site contains a home page, which is the first document users see when they enter the site. The site might also contain additional documents and files. Each site is owned and managed by an individual, company or organization. |
| WSAD | WebSphere Studio Application Developer, or WSAD is IBM's core application development environment for building and maintaining Java 2 Platform, Enterprise Edition (J2EE) and Web services applications. Built on Eclipse V2.1 innovations and written to J2EE specifications, Application Developer optimizes and simplifies J2EE application development with best practices, visual tools, templates and code generation. WSAD is the most comprehensive development environment in its class. |
| XML | XML or eXtensible Markup Language is a Web programming language that allows customized tags to enable the definition, transmission, validation, and interpretation of data between applications and between organizations. |
| Yankee Group | Yankee Group is a respected technology analyst firm located in Boston Massachusetts. |
| zSeries | IBM hardware platform supporting operating systems including z/OS, OS/390, Linux on zSeries, zVM, TPF and VSE. |



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