
# Administration Guide

## Version 5.2

Part Number: AG52-014

# About This Guide

This guide is intended for those responsible for implementing and administering the ZipLip system. To get the most out of this guide, the reader should have moderate to strong knowledge of mail servers and protocols. The reader will most likely be the individual or individuals responsible for managing the corporate mail infrastructure.

## What to Expect From This Guide

This guide will give you an overview of the ZipLip system and its core functionality and features. The guide includes information on configuring your ZipLip server, log files, database tables, managing the Mail Vault, monitoring, and backups. You will also learn about administering the advanced features and options of the ZipLip server.

## Conventions Used

Text in `Courier` indicates:

- Filenames, commands, and programs
- Text that you enter
- Text that the system displays

Words printed in *italics* are generic terms representing names to be devised by you.

Square brackets [] mean the material inside them is optional.

Braces {} mean that you must choose from the options listed inside them. If there is only one option in the braces, the braces mean the option can be repeated.

If a command line does not fit across the page, a backward slash (\) appears at the end of the line, and the command continues on the next line.

Where the following steps ask you to do something as root, log in as a normal user and then switch to super-user mode.

## Changes Made Since the Last Version of this Document

The following changes have been made to this document since the previous version:

- On page 2, the version number was changed from 13 to 14.
- This section was added.

- In Chapter 10, “MTA Processing,” the section “Using SNMP for Event Monitoring” was added on page 152.
- In Chapter 11, “Report Management,” the existing information was overhauled, and information about reports generated using the Compliance application was added.
- Because of the added information, pagination has changed. If you are printing replacement pages, we recommend you reprint the Table of Contents and from page 152 onward.

# Table of Contents

Chapter 1

# Getting Started with ZipLip

The ZipLip Data Exchange Platform is written in 100 % Java and is built on J2EE standards. The software can be run on multiple operating systems; Windows 2003 Server, Solaris, and Linux are currently supported. ZipLip servers are designed to scale using a farm of load-balanced middleware servers operating with a database. The middleware servers store necessary transient information in the database to allow transparent fail-over from one middleware server to another.

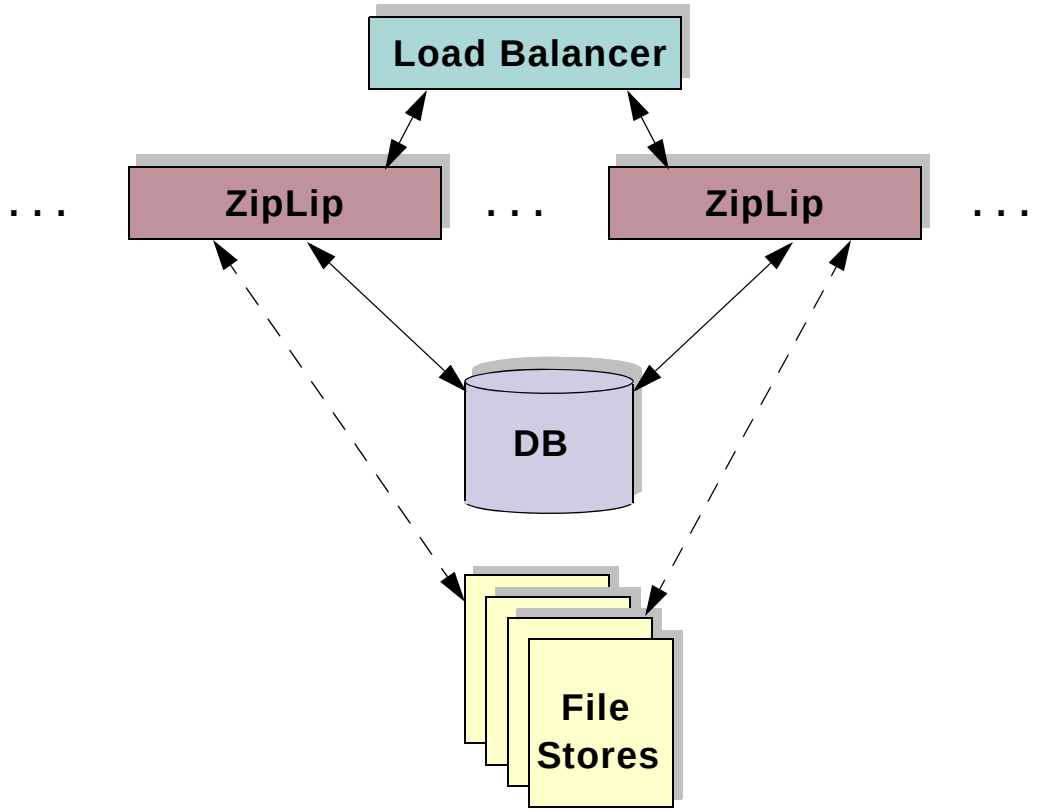



**Figure 1.1: ZipLip Clustering Architecture**

Figure 1.1 depicts the general deployment architecture of the ZipLip Server and Gateway products. Typically one or more ZipLip servers are attached to a load balancer for the purpose of load sharing and for transparent failover from one machine to another in the event of a failure on any given machine. ZipLip servers typically connect to an industrial-strength relational database such as Oracle or MS-SQL servers. The database is used to persist system and

application-specific data. The servers also access one or more common file servers typically implemented using a NAS or SAN solution for storing and retrieving application-specific files.

## ZipLip Applications

The ZipLip server is made up of several components that work together to provide security, compliance, and disaster recovery.

### Compliance

ZipLip protects companies from legal liability due to HIPAA, GLBA, NASD, and SEC regulations that require companies to conform to certain specific guidelines in regards to their messaging traffic. All messages can be reviewed before or after being sent; they can also be stored for later review.

### Unified Archival Admin

ZipLip archives messages from e-mail, instant messaging, and Bloomberg traffic all in one. This enables your company to keep all of this data easily accessible and search through it at a moment's notice. Messages can be archived using stubbing, which allows easy access for an administrator or end user, while freeing up storage resources and improving performance on the local machine.

**Note:** *Stubbing* is a method of archiving where the text of a message is replaced in an inbox with a "stub" containing a link to the message content in the system archives.

### Secure Messaging

ZipLip enables comprehensive end-to-end secure communications among staff, vendors, customers and partners. Unlike competing products, ZipLip's solution requires no client, supports both PKI and non-PKI secure messaging standards, multi-spectrum delivery (supports push, pull, and other delivery methods), can handle very large files (100MB+), and offers a centralized policy and rules engine.

### Virtual Storage

The virtual storage application lets organizations share valuable data with outside staff and partners without concerns of security breaches or inappropriate access. The virtual storage application creates a place where files and folders can be stored and accessed externally but cannot be accessed by unauthorized users. Data is transferred securely, without the need of installing clients, and you keep policy control and detailed audit trails of all activity.

## Basic Components

The ZipLip server and gateway is comprised of the following basic components:

- HTTP Web Server
- J2EE Application Server (supporting Java Servlets and JSP)

- Database Server
- File Server
- Write to WORM media (optional)

The ZipLip server requires an HTTP server to support the administrative interface. ZipLip supports a variety of external servers including Apache Web Server (Linux, Windows, Solaris) and IIS (Windows). The web servers listen to HTTP and HTTPS requests and transfer control to the J2EE Application Servers using connectors. The J2EE application server only needs to support Java Servlets and JSP standards. This enables ZipLip to run on lightweight Application Servers such as JRun, Tomcat as well as more robust Application Servers such as WebLogic and WebSphere. ZipLip Server components run within the Application Server and are typically invoked from the main `PmApp` Servlet. ZipLip servers provide several protocol Listeners including SMTP, POP3, IMAP4, FTP, and their TLS Versions. In addition, ZipLip supports two protocols built on HTTP; namely WEB-DAV and Web-Services. ZipLip Servers and gateways can be configured to serve requests from one or more of these protocols.

ZipLip software deployed within the application server persists its system and application data inside an industrial strength Database and File Servers. ZipLip software uses the Java Data Base Connectivity (JDBC) standard to connect to the database and a mechanism has been implemented to account for the SQL difference between different databases. This gives the ability for ZipLip to support different industrial strength databases such as ORACLE, MS-SQL Server, and Postgres. In addition, ZipLip can easily add support for DB2, Sybase and other databases that support JDBC.

ZipLip Software uses file systems to store large unstructured information such as e-mail messages, virtual storage files, and customization logos. The number of files typically runs in the millions and ZipLip's Vault Architecture enables virtualization of these files. The files can be stored on any media including NAS, SAN and Direct attached storage.

## Deployment Options

ZipLip software is built to fit within a customer's environment. Due to its flexibility, it can be deployed on Windows, Solaris, Linux, and AIX.

## Platform Components

The base ZipLip platform has several components and is described briefly in this section. All applications are built on top of this platform. The ZipLip platform is comprised of several components, some of which are described here.

### Domain and User Module

Users on the system are grouped into domains. The domains are organized in a hierarchical fashion; a domain can have a parent domain and subdomains. Each user on the system belongs to a domain. Domain and user information are stored in the database. A Domain carries information and privileges common to all its member users. ZipLip also has modules that integrate with directories such as Microsoft Active Directory and Lotus Domino.

### Database Communication Module

This component enables applications and core components to access the database in a uniform manner via JDBC. This module enables multiple databases to be accessed concurrently from a single runtime instance. All database operations performed on a database are abstracted as a named connection. A named connection typically refers to a single database, although it can be configured to access multiple databases. The named connection object maintains a pool of connections that the application and other components can use to perform operations. The SQL queries associated with the system and applications are externalized to the configuration files and each query is associated with a named connection. This gives the flexibility to support several databases and also gives the flexibility to partition database information across multiple databases. Though, this flexibility is available, typically only one database is deployed except during one time operations such as migration.

### Session Management Module

ZipLip Servers have a built-in Session Manager. All atomic operations need a session. Session object information consists of a user object, create date, last touch date, default language, default devices, and any other state variables. Applications and system components use this session information to perform security functions and customized presentation. Each session is associated with one or more transactions, and a single atomic operation is a transaction. The session objects can be persistent or non-persistent, and persistent sessions enable transparent failover from one machine to another. In addition, the Transaction manager keeps tracks of all transactions currently running on a single machine and monitoring the transaction manager information (from the **SysAdmin** application) gives visibility into what the server is doing.

### Configuration Module

The configuration module is what makes the system flexible, modular, and manageable. ZipLip configuration files consist of parameters System Administrators are expected to change and other parameters that act as glue between various components. The configuration files have been organized in a structure and operators are expected to modify only a few parameters. Apart from the configuration module, other critical configuration parameters are stored in the database in the System Registry.

### Caching Module

The caching module helps reduce the load on the database by storing objects that were constructed using the database or otherwise in memory for subsequent usage. The caching policy specified from the configuration files helps manage the stored object and reduce the memory requirements of the server. The caching module exposes cache utilization parameters through the system administration interface and thus helps in manageability of the ZipLip servers.

### Vault Storage Module

The Vault storage is used to virtualize storage of application and system files. Metadata associated with files in the vault is stored in the database while the actual is file is stored on the file system. The vault has two abstract notions: storage unit and disk volume. A *storage unit* contains one or more disk volumes and is associated with additional services such as

encryption, compression, failover, and escrow decryption. The *disk volume* refers to a physical storage on the disk. The vault is designed so files in it can be accessed from multiple operating systems concurrently.

### Security Infrastructure Module

The core security framework known as the Encryption Service Provider of ZipLip is built on top of Java standards such as Java Cryptographic Engine (JCE), Java Security Engine (JSE) and Java Secure Socket Engine (JSSE). This framework enables the application to transparently use security appropriate to the user and other session state variables. The framework enables the application to mix and match a variety of Symmetric algorithms from different providers such as Sun and RSA toolkits. The default version uses the SunJCE crypto engine. Transport security needed to perform secure SMTP, secure POP and secure IMAP is achieved using JSSE. Storage encryption is based on the framework.

### Coordinator Executor Module

The Coordinator Executor uses a Grid architecture. It provides a generic distributed task management framework and is responsible for distribution task across multiple machines and processes. One or more machines can be grouped into a virtual cluster. Each cluster has a live Global Coordinator (GC) and one or more Global Coordinators in standby mode. Each machine on the cluster has a Local Coordinator (LC). The Local Coordinators manage a set of executors; tasks include creating and resetting of executors. The number of executors on the machine can be set from the configuration file. The GC and LC maintain queues of tasks sorted according to scheduled time of execution, task priority, and arrival time. Applications typically submit their tasks to the LC on the local machine, and the LC forwards them to the live GC if the number of tasks exceeds a certain queue limit and if there is a live GC. The LC also polls the live GC for tasks when it doesn't have enough in its queue. Executors are spawned by the LC's requests for tasks, and the LC either gives a task if available or blocks until it finds one. Executors use the task handle, execute the task, return the status to the LC, and request the next task. The standby GC constantly checks if the live GC responds to a ping and if not, upgrades itself to the live state. The Coordinator Executor architecture distributes load across multiple systems, thus scaling the ZipLip System.

### Child Application Module

The ZipLip Child Application Module enables the starting and stopping of child execution units. Some Child units canbe run for the lifetime of the server, such as SMTP, POP, IMAP, and other listeners, while others shut down after completing their background tasks such as MailBox Manager and ReceivedMailCleaner. This module allows systems deployed with the same software to behave differently. The Child Applications can be started from a configuration file or from the SysAdmin application. These two mechanisms let child processes be started on a single machine. A child process needs to be started only once and only on one system in the cluster. This is done via the Global Task mechanism, which is a task run by the live Global Coordinator. The GC uses the task deployment table stored in the database for guaranteed deployment of tasks on one system in the cluster. These tasks include background tasks such as the mailbox manager, received mail cleaner, and automated reports. The global tasks mechanism enables the ZipLip system to guarantee time-critical tasks with no single point of failure.

### Presentation Module

The ZipLip presentation module makes it possible for a single runtime instance of the server to serve multiple application UIs, present information to multiple devices, serve content in multiple languages, and present a custom UI for multiple domains. ZipLip achieves this by using the session and state variables routing the results of any request to the correct JSP page for content rendition.

### Search Module

ZipLip has an index search framework which is used by the application to index unstructured contents such as messages. A modified version of the Lucene Search engine is used to index documents. The search can perform incremental indexing to add documents to the index as new documents arrive. The index search uses the ZipLip vaults to store its indexes.

### Internationalization Infrastructure Module

ZipLip can store, retrieve, and present text information in various languages, including double-byte languages such as Japanese and Korean. The ZipLip infrastructure can handle multiple languages from a single runtime instance. ZipLip has inbuilt infrastructure to support both fixed-length encoding, such as Unicode, and variable length encoding, such as UTF-8 and EUC. The session and the transaction carry the internationalization information; this information is used to redirect responses to the server to request to the appropriate JSP pages. ZipLip also has a tagging process and a precompilation methodology that easily localizes the base English JSP page to support other languages. Precompilation tools enable incremental localization and therefore help the localized version and the base English JSP pages to be in synch.

### Web Services API

The ZipLip Development Kit (ZDK) provides a SOAP-based API to make ZipLip server services available. The ZDK is built using a Web services framework. The transport layer for Web services is limited to HTTP and HTTPS. Web services enable the ZDK to easily support multiple programming languages and operating systems. Finally, special care has been to taken to support large data transfers. A ZDK-based client can exist within the LAN of the servers or communicate over the Internet. The server and the ZDK based clients communicate using Web services over HTTP and HTTPS and therefore do not require any special firewall requirements

### zVite Module

The patent-pending technology zVite enables easy collaboration and sharing of applications with anyone who has an e-mail account. The granularity of access is very fine, and access can be given at Project level and a single folder level with subfolder access. The access is associated with user-defined privileges such as read, write, and delete and a timeframe. Access granted through zVite is protected by a password mechanism and is assigned by the user who initiates the zVite creation. The user also can revoke access at any time to stop the sharing and can also monitor the activities of the shared user from detailed audit trails that are logged.

### Profiling Module

The profiling framework built into the session framework enables ZipLip to deliver top performance in its system. Each transaction within the session is automatically profiled, and

application modules can sub-profile the transactions. For example, all database access is profiled. At the end of the transaction, the profiles are written to the profile logs on a separate thread. The profile logs are very useful for proactively detecting any sluggishness in the server and pinpointing offending parts of the software.

### Other Modules

ZipLip has several other modules. These include MIME parsing, XML/XSL parsing and formatting, WebServices framework module, Regular Expression framework, Cross Scripting Prevention Module, Logging and Events Framework, Inbuilt Module status framework, Simplified Work flow Engine, Listener Framework, Schedulers, Object-Pooling, Customization Engine, and Data Copy Framework to facilitate migration and replication.Applications

## Understanding the ZipLip Platform

The ZipLip platform has several components which forms the general basis to build applications. ZipLip applications can be broadly classified into:

- System Administration (SysAdmin)
- Unified Archival Admin
- Secure Messaging (Postmaster)
- Compliance

The ZipLip Server supports a variety of protocols, including:

- HTTP and HTTPS (via Web Server and App Server)
- SMTP
- IMAP4
- FTP
- Web Services
- JMS (via App Server, used in integration only)

## Messaging Applications and Gateway

ZipLip's messaging products are comprised of the following major components:

- Mail Transfer Agent (MTA)
- Mail Store
- WebMail application
- SMTP Server
- IMAP4 Server
- Instant Messaging
- Bloomberg
- Search Indexing

## Mail Transfer Agent

The *Mail Transfer Agent* (MTA) is a software component that processes and routes messages. The MTA receives its messages from various other components. If a message is to be delivered to an external address, the MTA sends it out onto the Internet; otherwise, if the message is to be delivered to an internal address, the MTA processes it and then delivers it to another component. This process is illustrated in Figure 1.2.

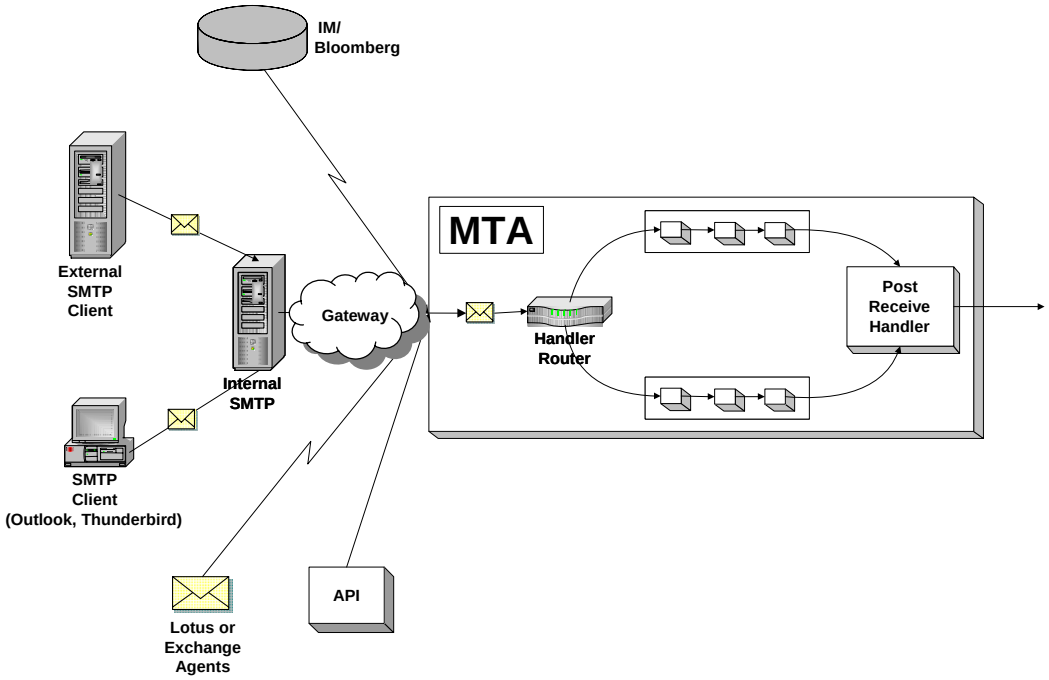



**Figure 1.2: Mail Transfer Agent**

A message can be received by the MTA in the following ways:

- The SMTP listener can pass incoming messages, addressed to internal and external users, received from external mail servers and from external mail clients such as Outlook, Netscape, Eudora and Gateway mail to the MTA.
- Servers running Lotus Domino, Microsoft Exchange, and IMAP can pass messages addressed to internal and external users from a user to the MTA.
- Instant Messaging and Bloomberg can log communication which is then passed as an e-mail message to the MTA.
- A plug-in component can pass messages addressed to internal or external users to the MTA using the methods in the ZipLip Development Kit (ZDK).
- The Queue Fetcher can fetch messages from a mail queue that is a storage directory and pass incoming messages addressed to internal or external users to the MTA. The queue can be populated by third-party SMTP server applications and by manually copying messages.

The MTA receives the e-mail messages from these sources and stages them before processing in two different ways

- Mail Queue – Mail to be processed is stored in a file directory. The main queue directory has three subdirectories: `queue`, `process`, and `done`. Initially all messages are written to

the queue directory. Before processing, the MTA moves the mail from the queue directory to the process directory and once the mail is processed (successfully or unsuccessfully) it is moved to the done directory.

- Database – Mail to be processed is stored in the database and the filesystem. The actual message is stored in the Vault, which has both a database record pointing to a file on the file system. Additional database records to keep track of mail and recipient states. These records include a database record in the ZLPReceivedMail table for each mail and one ZLPRecipientInfo record for each recipient within the message.

Both methods have pros and cons. The advantage with the queue approach is no database overhead. Disadvantages include poor error-handling and lack of visibility into mails when error occurs. In the database case, advantages include very good exception error handling, excellent monitoring capabilities, but a disadvantage in the overhead on the database. Although it is possible to use the mail queue or the Database to handle e-mail messages, ZipLip uses a hybrid scheme where by the MTA is extremely reliable and serviceable with very little database overhead. The hybrid approach first uses the mail queue for all incoming mail and if the mail cannot be processed in the first attempt (Unable to contact destination SMTP servers), the mail is moved from the queue to the database. Database overhead is therefore only incurred in situations where good visibility or error-handling are required.

The Mail Processing is modeled as a task to be executed by the Coordinator/Executor Module. When mail initially gets submitted by one of the methods to the MTA, the MTA stages the messages and then creates a task and submits the task to the LC. The task is finally given to an executor which then does the processing; this executor can be on the same or a different system. This distributed architecture makes the MTA extremely scalable and also provides support for scheduled delivery of mails.

The executor processes the message given by the LC. MTA processing is extremely flexible due to the ZipLip MTA Handler Architecture. The type of processing performed is specified in terms of chained-handler. The handling of mail can be defined in five steps:

1. Pre-processing Handler – Performed once for the entire message, this perform operations that are common to all recipients such as virus scanning, group list expansion, and advanced mail forwarding. The message also gets scanned to see if any phrases match those in the Lexicon. If the Lexicon is triggered, the message is tagged for review per the Rules engine. This handler can nest multiple handlers.
2. Archive Handler – This tags messages for retention. If tagged, messages are archived. It also indexes messages in the archive database.
3. Secure Mail Handler – This determines whether the message is to be encrypted or left unencrypted for each recipient. If applicable, the message is encrypted.
4. Delivery Handler – Delivery handler categorizes the recipients of the mail and groups them into categories RELAY, STORE, and LOOP-BACK. Delivery handlers also contain handlers for each category for performing these operations. For example, the RELAY handler further categorizes the recipients based on the delivery security requirements and then performs the SMTP delivery. Similarly, the STORE handler has additional processing, such as a personal spam filter and Folder Filtering before Storing the message in the mail store. This handler also relays messages to Microsoft Exchange and Lotus Domino servers.

5. Post-processing Handler – This is done once all recipients in the message are DONE (with or without errors). Handlers typically perform post-processing actions including sending undeliverable error message for completed mail with errors and rescheduling the next retry according to a retry policy.

Mail processing can fail due to system crashes, reboots, or for other normal reasons such as the destination server not responding. If the failure of a recipient is normal, the processing states are updated in the `ZLPReceivedMail` and `ZLPRecipientStatus` tables. If the message is in the queue, the message is moved to database before updating the states. For abnormal failures, the messages may get stuck in the `queue` directory or the `process` directory. In this situation, a background global task child process known as the `SMTPQueueFetcher` polls for files in the `queue` and `process` directories that are older than certain threshold, moves them to database, and schedules them for reprocessing. For failures that occur while processing a message stored in the database, the background child process `ReceivedMailFetcher` polls the `ZLPReceivedMail` tables for messages that need to be retried and submits them to the LC and GC for reprocessing.

The MTA has several advantages over existing MTAs provided by other vendors:

- It is very flexible; its behavior can be modified with very little effort.
- It is very scalable due to the Coordinator/Executor architecture.
- It is very reliable; all states are stored in persistent stores (database or files). Given a system crash, delivery of all messages is guaranteed.

## Mail Store

The mail store provides storage and retrieval services for messages. It is built on top of the *vault*, which is ZipLip's mechanism that provides for message encryption, audit trails, and storage of each message in an individual file.

ZipLip messages are stored in the database and filesystem. All metadata that corresponds to a single message is stored in the database, and the actual message itself is stored in the file system using the aforementioned Vault architecture.

Metadata includes pieces of information such as the message subject, the sent date, the folder name, the From address, the To address, the associated vault item ID, a password (if the message is a secure message), and message flags. Flags indicate if the message has been read, and if there are attachments. The metadata is stored in a ZLPMessage record.

The vault is a storage-related layer. It defines objects such as storage units, disk volumes, and vault items.

A *storage unit* is an object that is comprised of one or more disk volumes. A disk volume is a location where message data can be stored. Only one disk volume is "live" at any given time for a storage unit. Division of a storage unit into several disk volumes provides flexibility in moving disk volume data around while maintaining accessibility to messages.

The *vault item* is an object that contains the virtual path of the actual message and any password information. The actual physical path of the message is determined at runtime by the storage unit.

The vault can be configured so each message can be encrypted with the specified encryption scheme using the account owner's personal key. The vault also has escrow capabilities to retrieve messages in the event of the loss of the personal key.

The ZipLip software uses a Vault to hold data and Rules. The vault provides several storage virtualization benefits at the application layer, including:

- Unlimited storage that can be comprised of several different physical disk storage units.
- A single integration point that supports specialized storage systems, such as EMC Centera and HSM storage systems, such as Q-Star and Bridgehead, and other industry standard vaults, such as IBM Content Manager.
- Transparent encryption and compression of data.
- Storing files across many directories and filesystems simultaneously and enabling the server to overcome limitations of an operating system or filesystem.
- Partitioning based on date that enables physical separation of data. This enables incremental backup and replication.
- Easy management of data.

The mail store provides several major benefits:

- Only one copy of a message sent to multiple recipients within the same organization is stored.
- Pre-parsed MIME messages provide for easy loading and navigation of large messages. They also allow the WebMail application to support complex mail presentation schemes such as inline attachments, multi-part/alternative, and drafts.
- Generated events give the flexibility to modify the behavior of the mail store.
- The mail store architecture helps in supporting large mailboxes with ease.
- The mail store supports Single Instance Storage.

## HTML-Based Interface

The HTML-Based ZipLip application provides an abundance of features, including:

- Display of message summaries, such as subject, sender names, and sent dates.
- A Secure e-mail application.
- The ability to view the archive via the Web.
- The ability to search and sort messages based on a variety of criteria.
- A Compliance application.

## SMTP Listener

The SMTP listener supports SMTP Protocol as defined by RFCs 821 and 2821. In addition, the SMTP listener supports Message Size Declaration (RFC 1870) and Authenticated SMTP (RFC 2554). Connection pooling of Sessions enables quick session initialization. Tight integration of SMTP listener with ZipLip MTA reduces the end-to-end mail processing latency. The SMTP listener is a child process within the ZipLip and hence can be started from the configuration files or the SysAdmin Application.

## IMAP4 Listener

IMAP listeners support IMAP4 protocol as defined by RFCs 2060 and 2177 to access messages in the mail store. Secure IMAP over TLS (RFC 2595) is also supported.

## MIME Parsing

All e-mail messages that are received by the MTA for internal delivery are stored in the vault. RFC 822 and other Internet standard documents have defined the content and protocols used to exchange e-mail messages via the Internet. The ZipLip software stores a message with additional header information that is useful in supporting the IMAP and POP3 protocols. ZipLip's Java classes perform the MIME parsing.

Chapter 2

# Configuration

ZipLip relies on its configuration technology for the flexibility, manageability, and modularity of the platform. All system-specific settings are stored in either System Registry tables in the database or in configuration files. The definitions in the configuration files include database settings, queries, cache settings, connection pool settings (used for database and network connections), and entry point settings (separation of business logic from presentation).

The System Registry is a central point of control in the ZipLip system for the various system settings. In the System Registry you can edit settings for:

- Unified Archival Admin and Compliance
- System Configuration and User Authentication
- Web Applications
- MTA
- Listeners
- Secure Mail
- Document Conversion
- Language Parameters

A configuration file consists of name-value pairs in a text file that can be edited with a regular text editor. In addition to simple values, the configuration system can define and specify objects. Also, the definition of an object within the configuration file can use previously-defined objects. This creates a system with easily modified behavior that does not involve recompiling of any source code. Over 100 different object types are created during configuration.

ZipLip has designed the configuration parameters so most of the parameters that need to be changed either during installation or configuration can be set from the Web interface. The modified values are stored in the database and can be shared with other systems. The configuration technology also provides a flexible way to group systems. The Web interface provides the following benefits:

- Configuration changes made via the Web UI automatically applies to all machines and thus changes need be made once per group.
- Current parameter settings are visible from the Web interface
- All easily customizable variables are visible with appropriate help.
- All changes are logged to the System Audit table and can be easily controlled.

# Configuration File Structure

ZipLip uses configuration files extensively and has over 200 configuration files and is organized into a file structure. The System Administrator is not expected to change most of the configuration file. Configuration files are located in the `$ZipLip/zlserver/WEB-INF/config` directory with the following major subdirectories:

- `common` – Some common settings; typically no changes are needed here.
- `app` – Contains a nested set of directories, each signifying an application or major component. No changes are needed here necessary except during major customization. Changes here have to be made with care as they impact the proper running of the system.
- `i18n` – Contains a nested set of directories pertaining to a particular language. Again, no changes are needed.
- `runnable` – Files here contain the system runtime settings. Many of the settings here need to be modified by the System Administrator. Many parameters within here can be modified from the Web interface.

## Key Configuration Files

The following is a description of the key configuration files which need to be modified and set up for each new installation:

- `runnable/pmapp/pmapp.cfg` – The main configuration file; includes flags to turn on and off certain applications, and includes crucial settings for connecting to databases.
- `runnable/pmapp/pmappChild.cfg` – The child daemon configuration and automatic startup of child daemons.
- `runnable/pmapp/pmappURL.cfg` – This file needs to be modified for e-mail generated by ZipLip that contains a URL. It also needs to be modified if ZipLip is deployed behind a proxy server that rewrites URLS or requests.

The following parameters in `runnable/pmapp/pmapp.cfg` must be modified:

- `machine.local.ip` – The local IP address of the machine. The system automatically detects this. This parameter is used when the system administrator needs to force a specific IP address (such as when there are multiple NICs).
- `machine.local.name` – The local hostname (short version, usually truncated to three characters; used to identify the machine in a cluster). This is also detected automatically.
- `machine.local.host` – The local hostname (fully-qualified domain name)
- `SmDsURL` – The data source URL; used to identify the required database server location.
- `SmDsUserid` – The database login user ID; used in conjunction with the `SmDsPwd` field to identify database privileges.
- `SmDsPwd` – The database login password.
- `coord.cluster.default.name` – The default coordinator cluster name; must be the same for all machines in a cluster.

The following parameters in `runnable/pmapp/pmappURL.cfg` may need to be modified:

- `machine.local.ip` – The local IP address of the machine. When a system has multiple IP addresses, this parameter is used to force listening on a specific a specific IP address.
- `HAS_SSL` – This variable is normally set to false. If you are using SSL (HTTPS connections), set the value of this variable to `true`.
- Reverse URL redirections – If you have deployed ZipLip behind a proxy server that rewrites URLs or requests, add the following lines to the end of the `pmappURL.cfg` file:

```
//REVERSE URL REDIRECTIONS DUE TO PROXY SERVER RE-WRITING
//url.reverseMap.0=#wsi.config.StringNameValuePair~~http://localhost~~http://10.0.0.71
com.ziplip.url.prefix.reverseMap = #wsi.config.ArrayFactory~~url.reverseMap~~0
```

## How Configuration Files Are Loaded

When the J2EE Application Server starts up, it first loads the initialization parameters that bring up the rest of the system. These parameters can be found in `$ZipLip/zlserver/WEB-INF/web.xml`:

- `com.ziplip.config.dir` – Specifies the configuration directory, for example, "`/Marin/WEB-INF/Config`".
- `com.ziplip.root.dir` – Specifies the root directory of the application, such as "`/Marin`".
- `com.ziplip.prefix.appname` – Specifies the application prefix, such as "`/ps`". Do not change this after the initial installation, as notification e-mail messages contain URLs which use this parameter.
- `com.ziplip.url.prefix.secure`, `insecure`, `default` – Specifies Secure, Insecure and Default URL prefixes (used in notification e-mail messages), such as "`https://hostname/ps`".
- `com.ziplip.pmapp.config.main` – First configuration file loaded by the system, such as "`/Marin/WEB-INF/runnable/pmapp/pmapp.cfg`". Only change this value to reflect the full path of the `pmapp.cfg` file.
- `com.ziplip.pmapp.config.include` – Specifies the first configuration file is loaded in stage three. This file is loaded after the parameters from the main configuration file and the database registry are loaded.
- `com.ziplip.logs.dir` – Specifies the location of the directory into which the system dumps its logs, for example, "`/Marin/WEB-INF/Logs`".

The following is a description of how configuration files are loaded by the system before it can begin to serve requests.

1. The Application Server loads the parameters defined in `$ZipLip/zlserver/WEB-INF/web.xml`. The system then parses and loads the first configuration file specified in the `com.ziplip.pmapp.config.main` parameter, which is `$ZipLip/zlserver/WEB-INF/Config/runnable/pmapp/pmapp.cfg`.

**Note:** This file includes many other configuration files.

2. After loading `pmapp.cfg` and the associated files, the database is up, and the system begins to load default values from the configuration registry residing in the database that are common to all machines in the configuration group.
3. The System Registry is loaded.
4. After the database defaults are loaded, the Application Server loads the final stage of the configuration files, which is defined by the parameter `com.ziplip.pmapp.config.include`. This file is typically in `$ZipLip/zlserver/WEB-INF/Config/runnable/pmapp/` and is typically called `pmappIncludes.cfg`.
5. The `pmappIncludes.cfg` file loads the child daemons specified in the directory `$ZipLip/zlserver/WEB-INF/Config/runnable/pmapp/` in the file `pmappChild.cfg`. This file starts the SMTP, POP3, IMAP and FTP servers, depending on the configuration and is ready to serve requests. See Chapter 12, “Administrative Tasks,” on page 173 for information on editing `pmappChild.cfg`.

## Configuring Single Sign-On

Configuring user authentication for single sign-on is done in the ZipLip System Registry.

1. Click the left menu item **System Configuration**. Under **System Configuration**, click **Registry**.

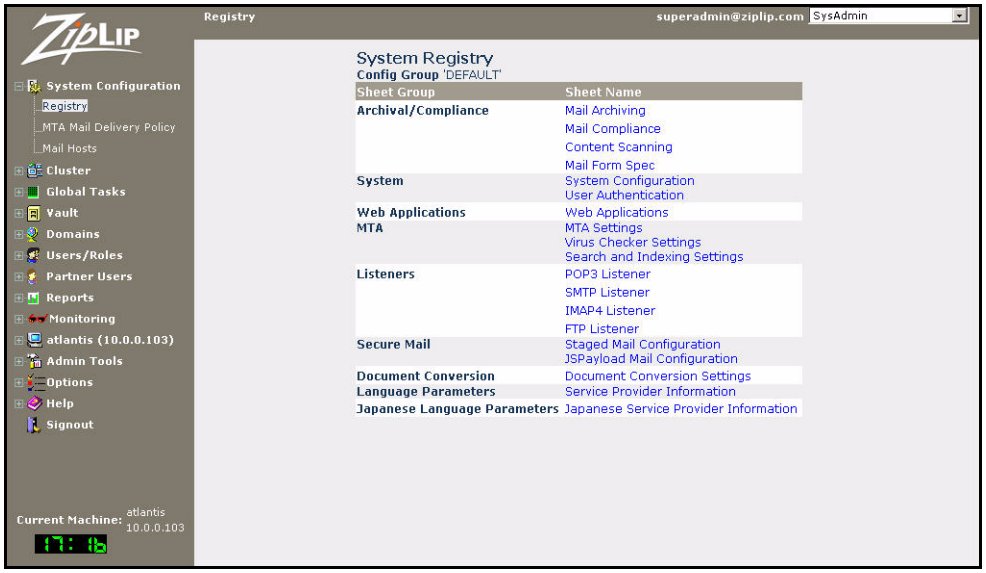



**Figure 2.1: System Registry pane**

2. In the **System Registry** pane to the right, click **User Authentication**.

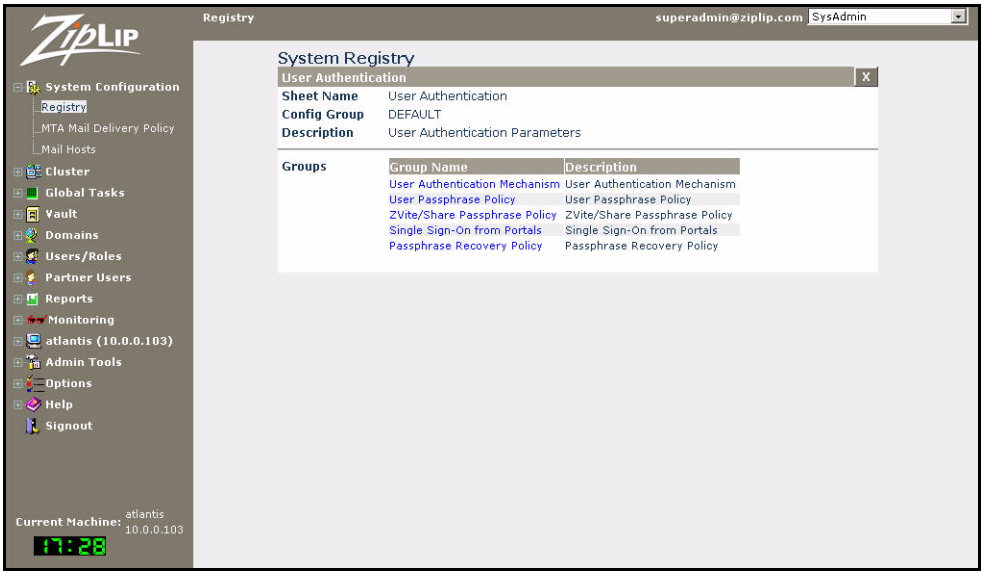



**Figure 2.2: System Registry - User Authentication pane**

3. In the **User Authentication** pane, select **Single Sign-On from Portals**.

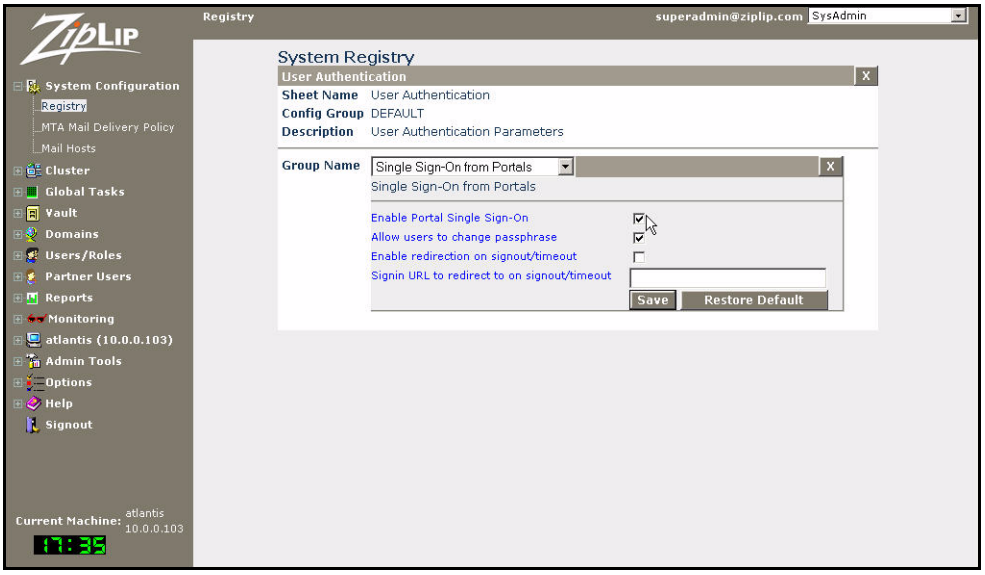



**Figure 2.3: System Registry - User Authentication - Single Sign-On from Portals pane**

4. In the **Single Sign-On from Portals** pane, check **Enable Portal Single Sign-On** to enable ZipLip to integrate with external portals.

**Note:** Enabling single sign-on from portals disables signing out directly from ZipLip.

Other options available are:

- **Allow users to change passphrase** – Check to enable users to change their own password from the external portal.
- **Enable redirection on signout/timeout** – Check to redirect the user to a specific URL upon signout from or timeout of the external portal. If you check this option, next to

**Signin URL to redirect to on signout/timeout**, enter the URL to which the user is to be directed.

When you have made completed the appropriate information for your site, click **Save** to save your changes, then click **OK** to the pop-up box saying you must restart ZipLip for your changes to take effect.

5. Restart ZipLip by entering the following in a command-line window or shell:

```
zlstop
zlstart
```

## Enabling LDAP Authentication

To enable LDAP user authentication during login:

1. Click the left menu item **System Configuration**. Under **System Configuration**, click **Registry**.
2. In the **System Registry** pane to the right (see Figure 2.1 on page 26), click **User Authentication**.
3. In the **User Authentication** pane (see Figure 2.2 on page 27), select **User Authentication Mechanism**.

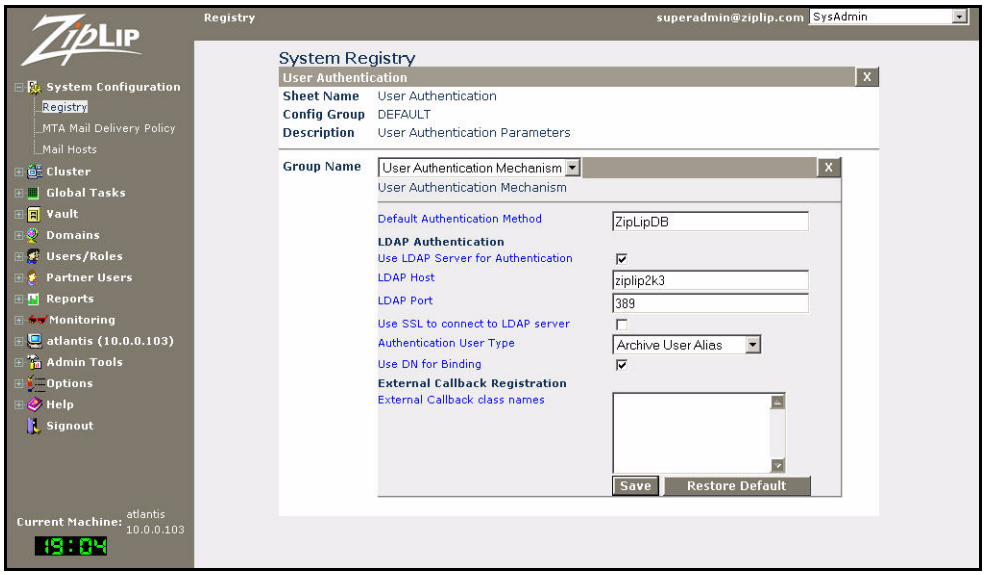



**Figure 2.4: System Registry - User Authentication - User Authentication Mechanism pane**

4. In the **User Authentication Mechanism** pane, complete the following fields:
   - **Default Authentication Method** – Enter a default authentication method. Default Authentication schemes known to ZipLip are:
     - `ZipLipDB` – Authenticate logon against the ZipLip server database.
     - `LDAP` – Authenticate logon against an LDAP server.
     - `ArchiveMailServer` – Authenticate against an archive server.

     If you leave this field blank it defaults to `ZipLipDB`.

- **Use LDAP Server for Authentication** – Check if you want to use an LDAP server for user authentication. If you have checked this option, complete the following:
  - **LDAP Host** – Enter the name of the LDAP host.
  - **LDAP Port** – Enter the port being used by the LDAP server.
- **Use SSL to connect to LDAP server** – Check if you want to use Secure Sockets Layer protocol to connect to the LDAP server.
- **Authentication User Type** – From the pull-down menu select one of the following to specify what to match the LDAP user address against:
  - **ZLPUser Address** – ZipLip user ID.
  - **Archive User Address** – Archive user ID.
  - **Archive User Alias** – Accept any archive user ID alias.
- **Use DN for Binding** – If checked, the user address is treated as an alias and the DN alias is looked up in the ZipLip database. If a DN alias is found, it is used for authenticating against the LDAP server; if not, the user address provided is used.
- **External Callback class names** – Enter external authentication callback class names to be registered with the server. For multiple entries, separate each class with a comma. Registration errors appear in the log file or the event logs.

When you have made completed the appropriate information for your site, click **Save** to save your changes, then click **OK** to the pop-up box saying you must restart ZipLip for your changes to take effect.

5. Restart ZipLip by entering the following in a command-line window or shell:

```
zlstop
zlstart
```

Chapter 3

# Database

ZipLip relies on an industrial strength relational database to store state, transient, and application information. The use of database enables ZipLip server to deal with concurrent data access from multiple machines/processes. A large portion of scalability and reliability of ZipLip server can be attributed to the use of database for dealing with the concurrent data.

## Database Configuration

ZipLip supports Oracle, MS SQL Server, and Sybase and can potentially support any JDBC database.

A database must be setup per the ZipLip Installation Guide. Typically after installing the database instance, the System Administrator is expected to run the installation scripts provided with the software. The scripts create several system and application tables with in the database. These tables are needed for ZipLip servers and applications to function. The database URLs and parameters in `$ZipLip/zlserver/WEB-INF/Config/runnable/pmapp/pmapp.cfg` need to be modified to give the ZipLip servers database access information. The following is an excerpt of this file for an Oracle database:

```
//Default Datasource URL, userid and password.
#define DB_DB2SQL_DEFAULT=false
#define DB_MSSQL_DEFAULT=false
#define DB_ORACLE_DEFAULT=true

//SmDsURL=jdbc:db2://127.0.0.1/ziplip
//SmDsURL=jdbc:microsoft:sqlserver://127.0.0.1:1433
SmDsURL=jdbc:oracle:thin:@127.0.0.1:1521:ZLDB
SmDsUserid = User
SmDsPwd = Password
```

This excerpt defines an Oracle instance named `ZLDB` located at `127.0.0.1:1521`; the user ID and password are specified. Upon startup, the ZipLip Platform tries to connect to this database. To use other databases, edit the configuration file and set the proper `#define` constant to `true`. For example, to use an MS SQL Server set `DB_MSSQL_DEFAULT` to `true` and the other databases to `false`, and comment and uncomment the proper `SmDsURL` lines.

After initializing the database, for efficiency reasons, the ZipLip server maintains a connection pool with the database. Depending on the default database, the connection pool properties are specified in one of the following files:

`$ZipLip/zlserver/WEB-INF/Config/app/db/oracle/dbcmap.cfg`

```
$ZipLip/zlserver/WEB-INF/Config/app/db/mssql/dbcmap.cfg
$ZipLip/zlserver/WEB-INF/Config/app/db/db2/dbcmap.cfg
```

The parameters specifiable are initial, optimal and maximum values for the database connections. This file also specifies the time to wait before creating and deleting connections. The following is an excerpt from the configuration file:

```
db.connections.initial=1
db.connections.optimum=2
//Connection Pool Policy
// slope,intercept,min,max

//For 0-10 connection wait of 100ms
dbc.policy.fn.0 = #wsi.util.PieceWiseFunction~~0~~50~~0~~5
dbc.policy.fn.1 = #wsi.util.PieceWiseFunction~~100~~100~~5~~10
dbc.policy.fn.2 = #wsi.util.PieceWiseFunction~~150~~1000~~10~~100
dbc.policy.fn = #wsi.config.ArrayFactory~~dbc.policy.fn~~3
```

The first two lines specify the initial and optimum number of database connections. During system startup, the connection pool associated with database is created. A specified number of database connections are initially created during the when the connection pool is created. This is specified by the `db.connections.initial` parameter. As the system runs, modules that need database connections request more connections from the pool. The pool returns a connection if there is a free one; otherwise, the pool waits a specified period of time before creating a new connection. The time to wait is a function of the current connection pool size. This function is defined as a piece-wise linear function as shown in the preceding code sample. If the current size exceeds a maximum number, the connection pool returns no connection. If the pool size goes beyond the optimum size, the background maintenance task tries to shrink the pool by closing unused connections.

## Important Database Tables

The following table is a quick overview of some important database tables the scripts in `$ZipLip/database/`*`mydatabase`*`/app` create (substitute your database name, such as "`oracle`", "`mssql`", or "`db2`", for *`mydatabase`*).

| Type of Table | Table Name | Description |
|---|---|---|
| User Information | `DomainInfo` | Stores Domain Information |
| | `ZipAccount` | User Information |
| System Registry and Customization Tables | `ParameterSet`, `ParameterElement` | Generic table for storing key value pairs, used by applications to store constants |
| Transient Tables | `EventLog` | Stores System and Application Events |

| Type of Table | Table Name | Description |
|---|---|---|
| User Session | `UserSession` | Stores Persistent Session information, allows failover of user sessions when one machine goes down |
| | `ProfileLog` | Stores profile information |
| | `SystemAudit` | Stores audit trail information for the session |
| | `ProtectedKey` | Stores password information for the session |
| | `UserAuthentication` | Stores user authentication information for a session |
| | `UserRoles` | Stores the user's roles for the session |
| | `SystemLock` | Keeps track of process locks. |
| | `ZLPolicy` | Stores policy information for the session |
| | `ZLPolicyRule` | Stores Rules for the session |
| | `RetentionPeriod` | Stores retention period definitions |
| Lexicon Related | `Classifier` | Stores rule categories |
| | `ClassifierEntity` | Stores rule types |
| | `Category` | Stores the category of the rule |
| | `CategoryAction` | Stores the actions that go with each rule |
| | `LexRule` | Stores Lexicon rules |
| | `LexPhrase` | Stores Lexicon phrases |
| | `LexPhraseSynonym` | Stores Lexicon synonyms |
| | `ClassifyReason` | Stores Lexicon reasons |
| | `ClassifierAuditTrail` | Stores the audit trail for the Lexicon, including actions taken and comments made |
| | `LexHits` | Stores the number of hits on a phrase in the Lexicon |
| | `LexHitsSummary` | Stores an aggregation of data about the number of hits on a phrase in the Lexicon |
| Search Related | `SearchStore` | Stores information about the Search Store |
| | `SearchStoreInstance` | Stores a given instance of the Search Store |
| | `InstanceDataFiles` | Stores the data files for a given instance of a search |
| | `EntitySearchStore` | Stores the Search Store to use for a domain, Department, or user |
| | `InstanceMergeDetails` | Stores merge details for a search |
| | `InstanceIntegrity` | Stores an integrity check of the search data |
| | `InstanceSegments` | Stores segments of search instances |

| Type of Table | Table Name | Description |
|---|---|---|
| Tracker Related | `TrackerDomainInfo` | Stores domain information |
| | `TrackerProject` | Stores information about a project, such as the folders and items (internal) |
| | `TrackerProjectPrivileges` | Stores privileges associated with a project |
| | `TrackerEntity` | Stores Compliance-related information, such as privileges, and options, for a Domain, Department, or User |
| | `TrackerItem` | Stores quarantined messages |
| | `TrackerAuditTrail` | Stores audit trail information |
| | `UserMailComplianceStat` | Stores mail Compliance statistics for a user |
| | `ComplianceMail` | Keeps track of all messages processed by the Compliance system whether or not they are caught for review. The table stores one entry per message per known user. This table is also used for compliance statistics reporting at a user level, such as how many messages were sent to a user in a given timeframe, and how many were prereviewed. |
| Global Coordinator State Information | `GlobalCoordCluster` | One record per cluster; stores the current live global coordinator |
| | `GlobalCoordRuntime` | One record per machine per cluster |
| | `TaskDrivers` | Stores information about tasks coordinated by the GC |
| | `TaskDriverRuns` | Stores information about tasks actually run by the GC |
| | `TaskStatus` | Stores status information about GC tasks |
| | `ReportVaultItem` | Stores the vault item information for a given report instance. |
| | `MigrationTask` | Stores migration task details, such as when the task started, when it ended, how many messages were processed, and how many were successful. |
| Vault Related | `VaultItem` | One record per item stored in the vault |
| | `DiskVolume` | One record per disk volume |
| | `DiskStorageUnit` | One record per disk storage unit |
| | `VaultContainerRefCount` | Stores the number of times a storage unit is referenced |
| | `VaultReplication` | Stores information about replicated units |
| | `StorageContainerLog` | Stores information about volumes that have been created. |
| | `DBStorageHeader` | Storage header for the database |
| | `DBStorageData` | Storage data for the database |

| Type of Table | Table Name | Description |
|---|---|---|
| zVite | `zViteInfo` | One record for each resource that is shared |
| | `zViteAccess` | Contains access control information for each zVite |
| | `zViteAuditTrail` | Contains audit trial information |
| E-mail Domain and User Related | `ZLPUser` | Stores e-mail account information |
| | `ZLPUserVacResponse` | Stores e-mail vacation response information |
| | `ZLPDomainInfo` | Stores domain privileges and settings |
| | `ManagedEmailDomain` | Stores all domains that the system manages. |
| | `Doc` | Stores e-mail attachments |
| | `StagedAttachment` | Stores staged attachments |
| | `UserEmailSig` | Stores e-mail accounts' signatures |
| Message Store Related | `ZLPMessage` | Stores message information. Ties to the VaultItem table. |
| | `ZLPFolder` | Stores folder information |
| | `ReceivedFileStore` | Stores the SMTP staging vault and other statistics related to SMTP mail flow. |
| Filters and AutoResponders | `ZLPFolderFilterRule` | Stores e-mail account folder filter rules |
| | `ZLPSpamFilterRule` | Stores e-mail and corporate level spam filter rules |
| | `AutoResponder` | Stores auto responder information pertaining to an e-mail account. |
| MTA Related | `ZLPReceivedMail` | Stores received e-mail messages. Typically used for retried messages, web e-mail, system mail, and secure mail. |
| | `ZLPRecipientInfo` | Stores ReceivedMail recipient information. One record per recipient |
| | `MTATranscript` | Logs certain MTA transactions |
| | `ZLHost` | Stores IP addresses, host names, and descriptions of them. |
| | `MTAExecutionTranscript` | If a message is not processed successfully, it is stored here, along with why it was not processed successfully (which system processed the message, when it was processed, the action that took place, and why). |
| | `ZLPViolator` | Stores data regarding which users have violated the mailbox quota limit. |
| | `ZLPViolatorTranscript` | Keeps track of the ZLPViolator data. |
| | `ZLPAdvancedForwarding` | Stores a description of the user options for where to forward mail. |
| | `ZLMailDeliveryOptions` | Stores mail delivery options |
| | `MessageSingleInstanceDigest` | For any given message, all the properties related to a single instance. |

| Type of Table | Table Name | Description |
|---|---|---|
| Archive Related | `ArchiveServer` | Stores Department and mail server information |
| | `ArchiveServerAgent` | Stores mail server agents |
| | `ArchiveUserInfo` | Stores information about all Department memebers relating to archiving and Compliance |
| | `ArchiveUserAlias` | Stores aliases for all users |
| | `EntityArchivePolicy` | Stores Compliance flags and policies (review flags, sampling rate) for domains, Departments, and users |
| | `ArchiveAuditTrail` | Stores the audit trail for the archive |
| | `WormArchive` | Location of WORM archiving information. |
| | `WormArchiveInstance` | Stores specific WORM archive instances. |
| | `ImportTask` | Stores all import tasks |
| | `AttyClientMessage` | Stores whether a message is marked for attorney client privilege |
| | `MailServerTransaction` | Stores mail server transactions |
| | `ExportTask` | Stores all export tasks |
| | `ArchiveServerAgentRuns` | Stores when the server agent has run |
| | `ArchiveUserRuns` | Stores information about the agent for each run for each user |

Chapter 4

# Retention Manager

When you set up archiving you need to have a policy that determines how long messages are kept in the archive. Storage management policies are set and tracked using the Retention Manager.

## Viewing and Editing Retention Periods

To view or edit retention periods, in the Unified Archival Admin application, in the left menu select **Retention Manager**. Under **Retention Manager** select **View/Edit Periods**. A list of defined **Retention Periods** appears in the right pane.

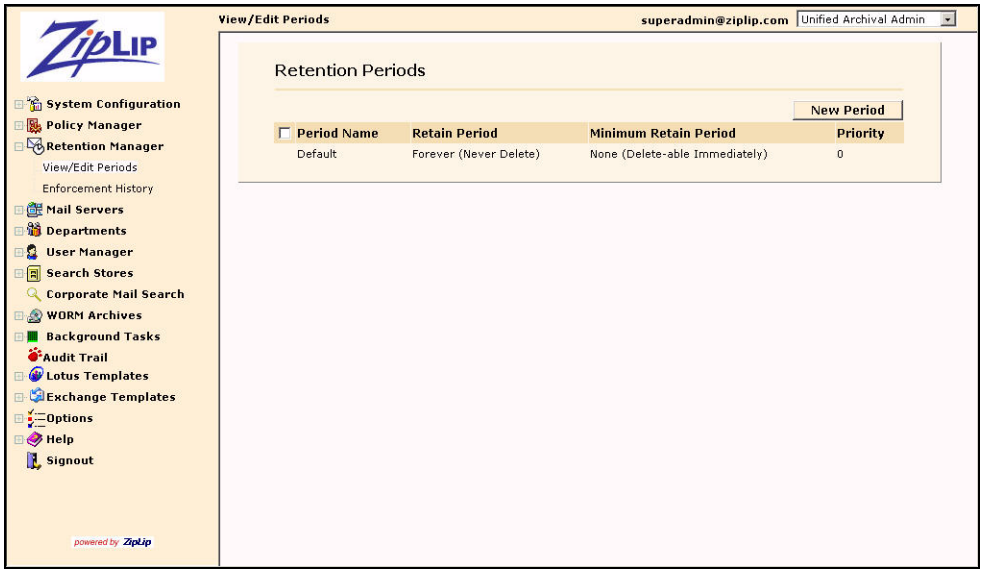



**Figure 4.1: Retention Periods list**

### Creating a Retention Period

ZipLip comes with a default retention period. To create an additional retention period:

1. In the **Retention Periods** pane click **New Period**. A pane in which you can enter a new retention period appears.

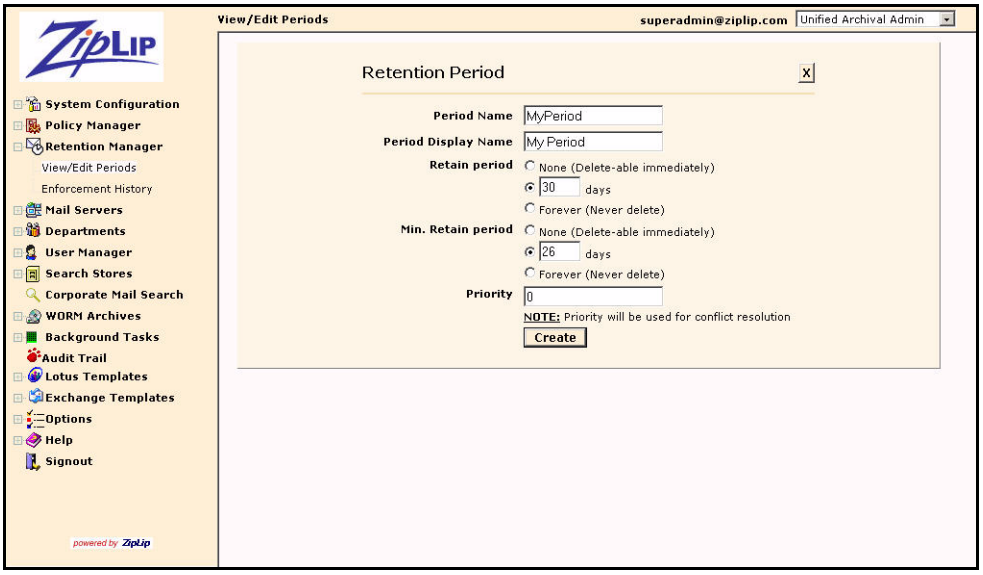



**Figure 4.2: New Retention Period pane**

2. Complete the following fields:
   - **Period Name** – Enter the case-insensitive name of the period as stored by ZipLip. Do not use spaces.
   - **Period Display Name** – Enter the case-insensitive name of the period as you want it displayed by ZipLip. This name may have spaces and special characters.
   - **Retain period** – The minimum amount of time to keep a message in the archive. Select one of the following:
     - **None (Delete-able immediately)**
     - **days** – Enter an integer representing the number of days for the messages to be retained.
     - **Forever (Never delete)**
   - **Min. Retain period** – The minimum amount of time a message is to be retained. The **Retain period** cannot be lower than this value. Select one of the following:
     - **None (Delete-able immediately)**
     - **days** – Enter an integer representing the minimum number of days for the messages to be retained.
     - **Forever (Never delete)**
   - **Priority** – An integer that determines the priority in the event of a conflict. The higher the number, the higher the message priority.
3. Click **Create** to create the new retention period.

The new retention period appears in the **Retention Periods** list.

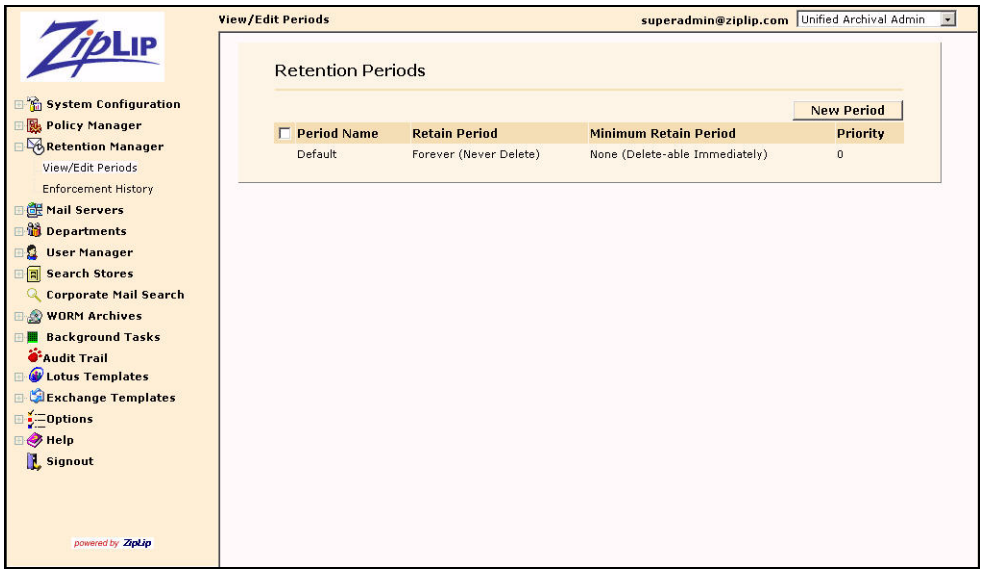



**Figure 4.3: Retention Periods list with new retention period**

## Editing a Retention Period

To edit a retention period, click on its name in the **Retention Periods** list. A pane appears in which you can change the **Retain period** and the **Priority**.

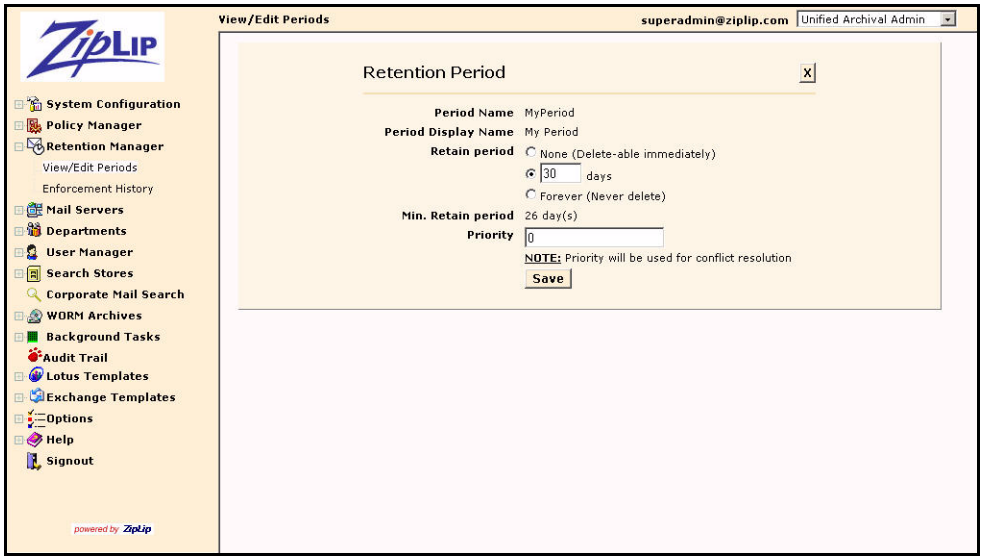



**Figure 4.4: Edit Retention Period pane**

When you have made your changes, click **Save**. To return to the **Retention Periods** list without making any changes, click the **X** in the upper right corner of the pane.

## Deleting a Retention Period

**Note:** You can edit the the **Default** retention period, but you cannot delete it.

To delete a retention period, in the **Retention Periods** list, select the checkbox next to each retention period you want to remove, or click the checkbox at the top of and click **Delete**, then click **OK** in the pop-up window.

# Viewing the Retention Enforcement History

ZipLip keeps a log of every time retention periods are enforced. To view these records:

1. In the Unified Archival Admin application, in the left menu select **Retention Manager**. Under **Retention Manager** select **Enforcement History**. The right pane

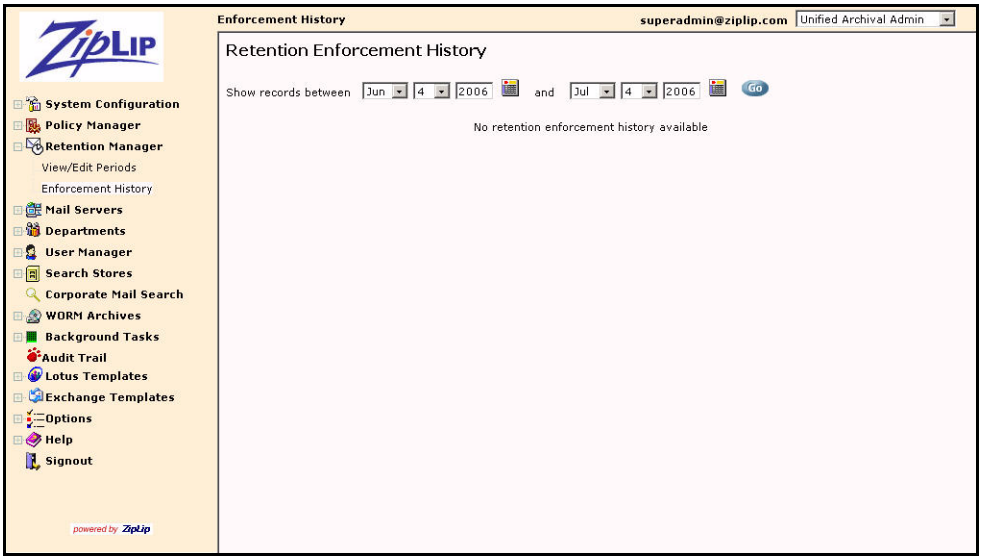



**Figure 4.5: Retention Enforcement History pane**

2. In the **Retention Enforcement History** pane you can enter the date range by using a combination of the pull-down menus, entering the year in the boxes, and clicking on the calendar ( ) icons. To close the calendar icon, left-click the mouse on any of the pull-down menus. Click Go. A list of records appears in the right pane.

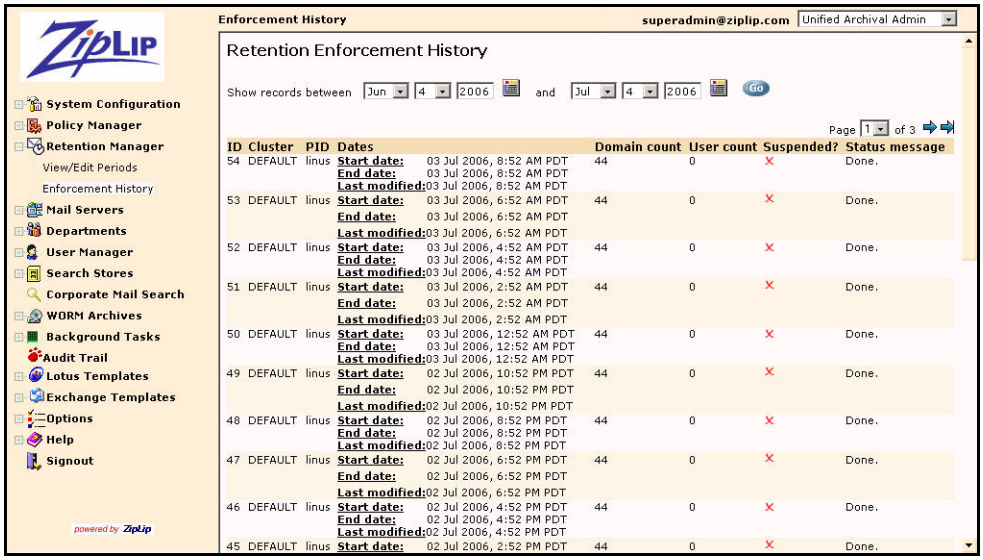



**Figure 4.6: Retention Enforcement Records pane**

3. To view details of a particular record, click on the **Dates**. The **Retention enforcement details** pane appears.

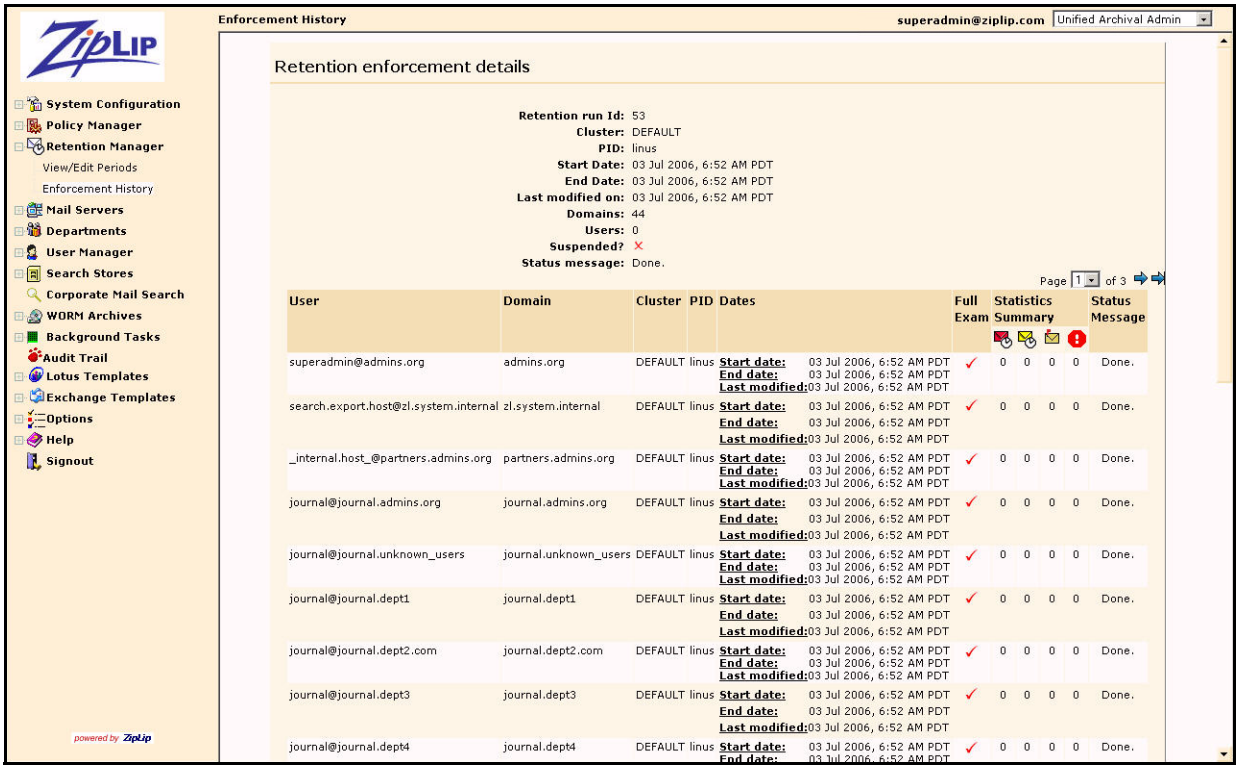



**Figure 4.7: Retention enforcement details pane**

4. To view details about a particular row, click on data in any column of the row. the Mail Purge details pane for that line appears.

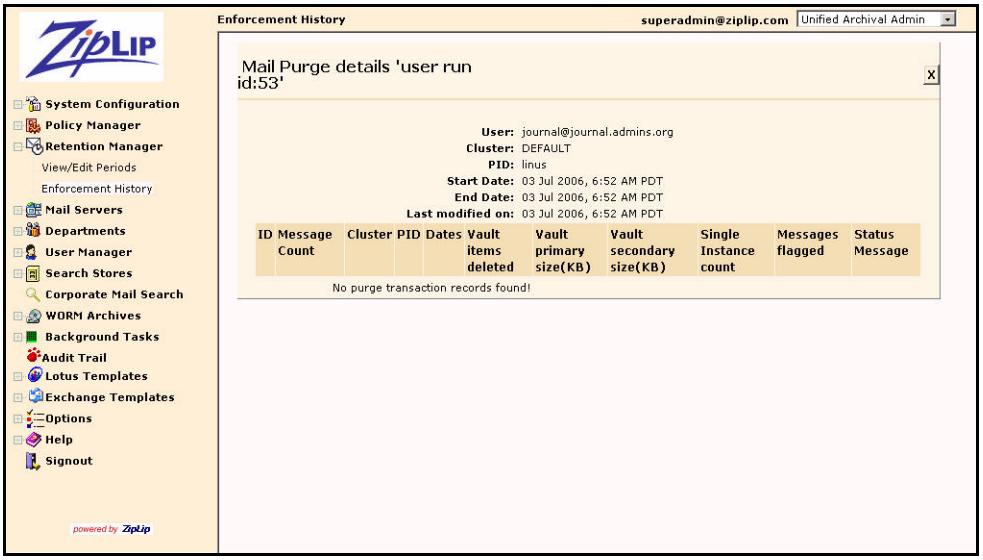



**Figure 4.8: Mail Purge details pane**

Chapter 5

# Policy Manager

The Policy Manager is where you create and edit storage management (Mailbox Management) and Compliance policies.

## Viewing and Editing Storage Management Policies

To view or edit storage management policies, in the Unified Archival Admin application, in the left menu select **Policy Manager**. Under **Policy Manager** select **Storage Management**. A list of defined **Archiving Policies** appears in the right pane.

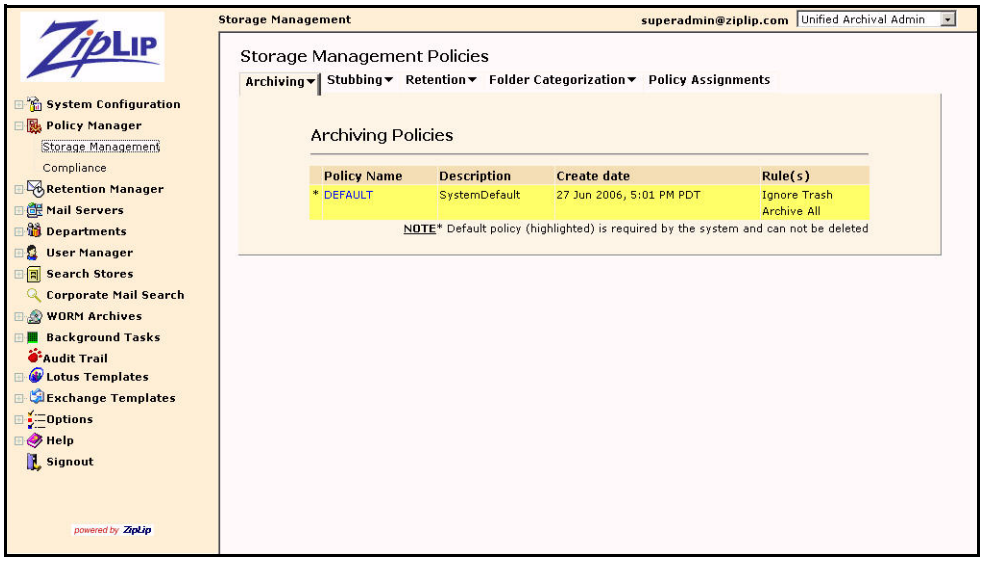



**Figure 5.1: Storage Management Policies - Archiving Policies tab**

### Creating a New Archiving Policy

ZipLip comes with a default archiving policy. To create an additional archiving policy:

1. Under the **Archiving Policies** tab select **New Policy**. A pane in which you can enter a new archiving policy appears.

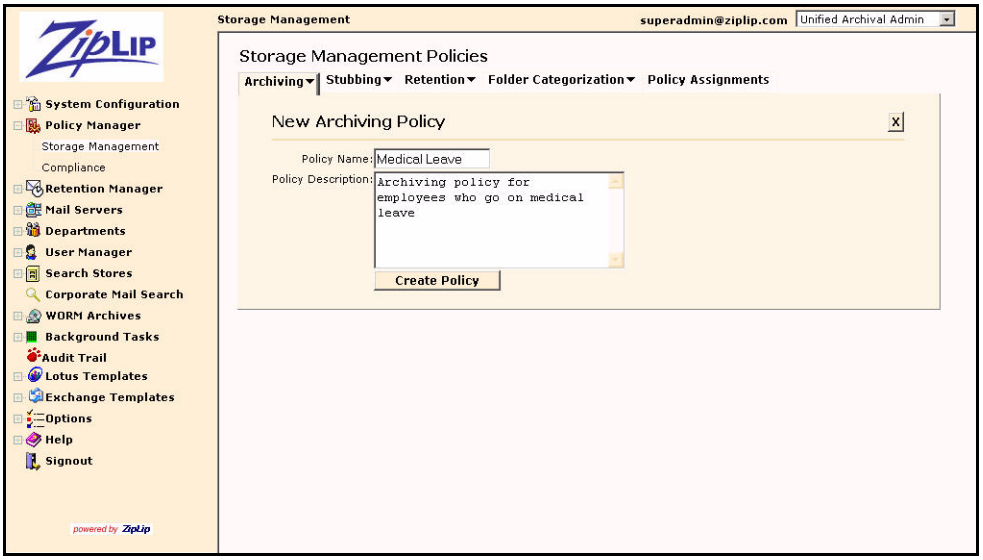



**Figure 5.2: New Archiving Policy pane**

2. Complete the following fields:
   - **Policy Name** – Enter the case-insensitive name (16 characters maximum) of the policy.
   - **Policy Description** – Enter a text description of the policy (optional).

   Click **Create Policy** to create the policy, or click the **X** in the upper right corner to return to the **Archiving Policy** tab without making any changes. After you click **Create Policy**, the **Archiving Policy** tab shows your new policy.

3. To add a new policy, under the **Archiving** tab select **New Policy**. The **New Archiving Policy** window appears.

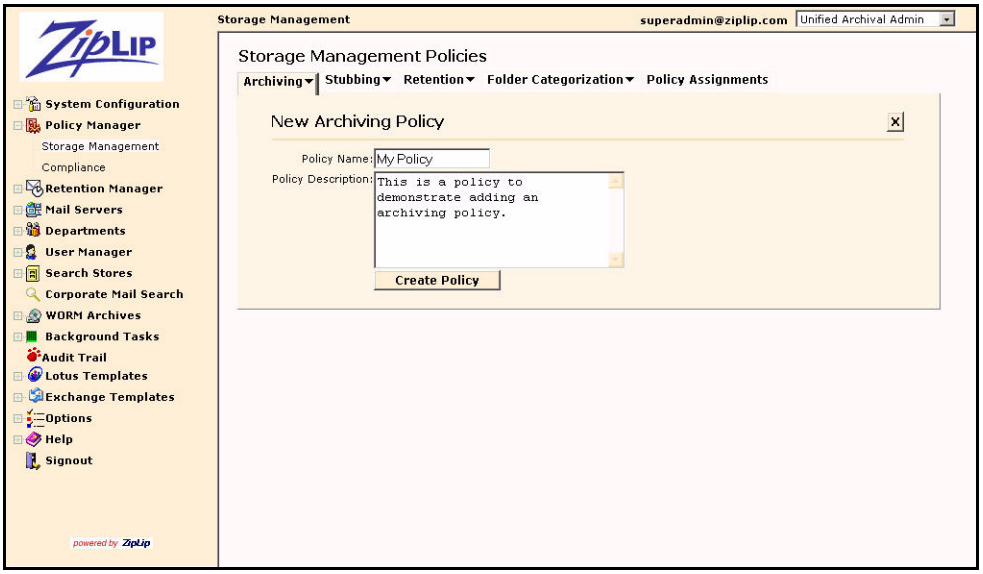



**Figure 5.3: New Archiving Policy window**

4. In the **New Archiving Policy** window, enter:
   - **Policy Name** – An alphanumeric name for the policy.

- **Policy Description** – An optional text description of this policy.

Click **Create Policy** to create the policy.

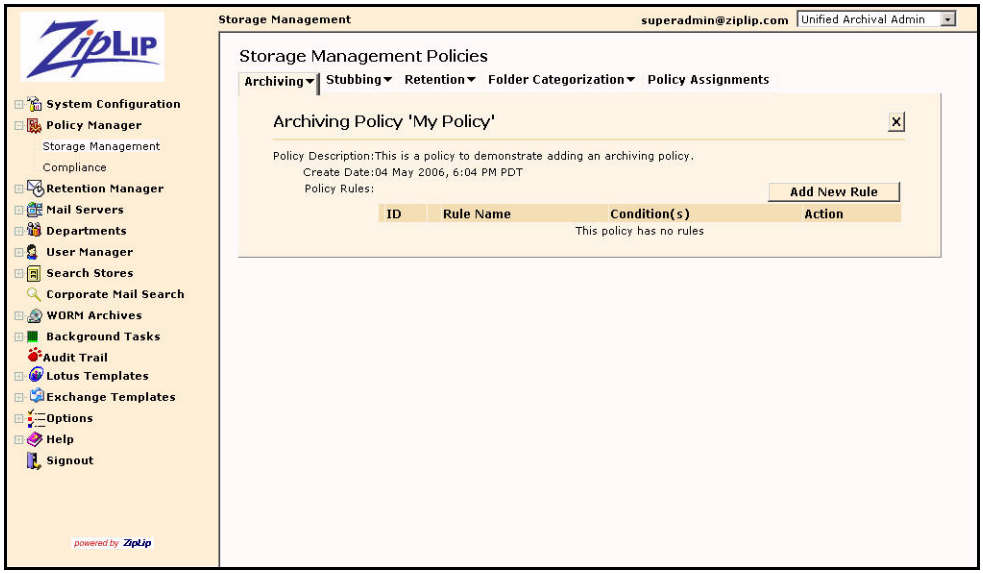



**Figure 5.4: Archiving Policy with no rules**

## Adding a Rule to an Archive Policy

To add a new rule to an archive policy:

1. In the Archiving Policy information pane (see Figure 5.4), click **Add New Rule**.

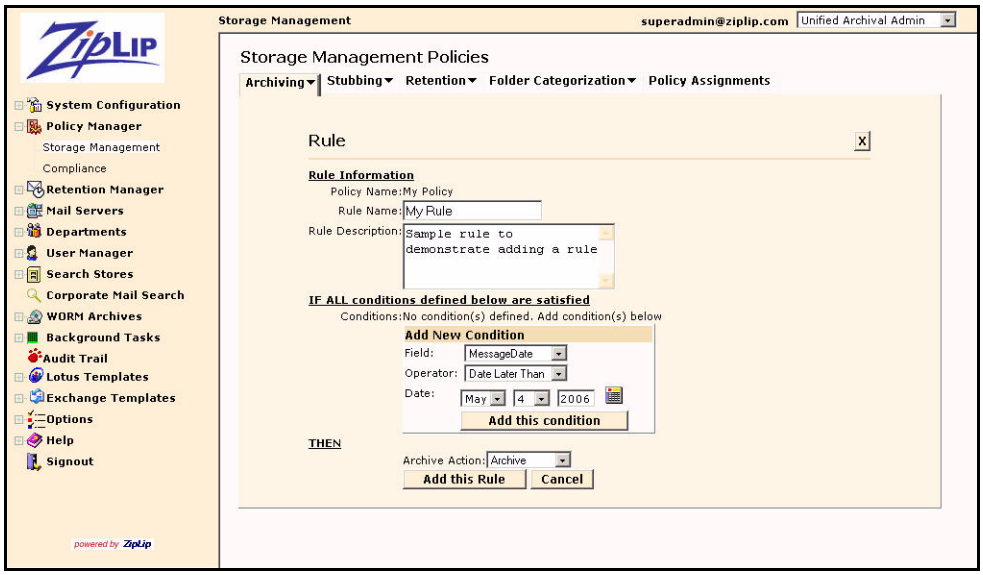



**Figure 5.5: Archiving Rule pane**

2. In the **Archiving Rule pane**, complete the following information:
   - **Rule Name** – Enter an alphanumeric name for the rule; avoid using special characters (Japanese text is allowed). Rule names are case-insensitive.

- **Rule Description** – (Optional) Enter a text description of the rule.
- **Add New Condition** – Rules need conditions on which to operate. You can add multiple conditions to a rule.
  - **Field** – From the pull-down menu, select **MessageDate**, **FolderType**, **MessageProperty**, **Subject**, **Age (days)**, or **Message Size KB**.
  - **Operator** – Select an operator from the pull-down menu. The choices in the **Operator** menu vary depending on which **Field** you select:

    **MessageDate** – Select **Date Later Than** or **Date Earlier Than**

    **FolderType** – Select **Equals (Match case)** or **Equals (Ignore case)**

    **MessageProperty** – Select **Equals (Match case)**, **Equals (Ignore case)**, **Contains Word**, or **Not Contains Word**

    **Subject** – Select Select **Equals (Match case)**, **Equals (Ignore case)**, **Contains Word**, or **Not Contains Word**

    **Age (days)** – Select **Less than** or **Greater than or equals**.

    **Message Size KB** – Select **Less than** or **Greater than or equals**.
  - **Pattern** – Enter a text pattern or number on which to operate.

  Click **Add this condition** to add the condition.
- **Action** – Select an action from the pull-down menu.
- **Archive Action** – From the pull-down menu, select **Archive**, **Don't Archive**, or **Delete**.

3. Click **Add this Rule** to add the rule and return to the **Archiving Policy** pane with the new rule added, or click **Cancel** to return to the **Archiving Policy** pane without creating this rule.

## Viewing and Editing Stubbing Policies

You can view and edit stubbing policies. In the left menu, select **Policy Manager**. Under **Policy Manager**, select **Storage Management**. In the **Storage Management Policies - Archiving Policies** pane, select the **Stubbing** tab. The **Stubbing Policies** pane appears.

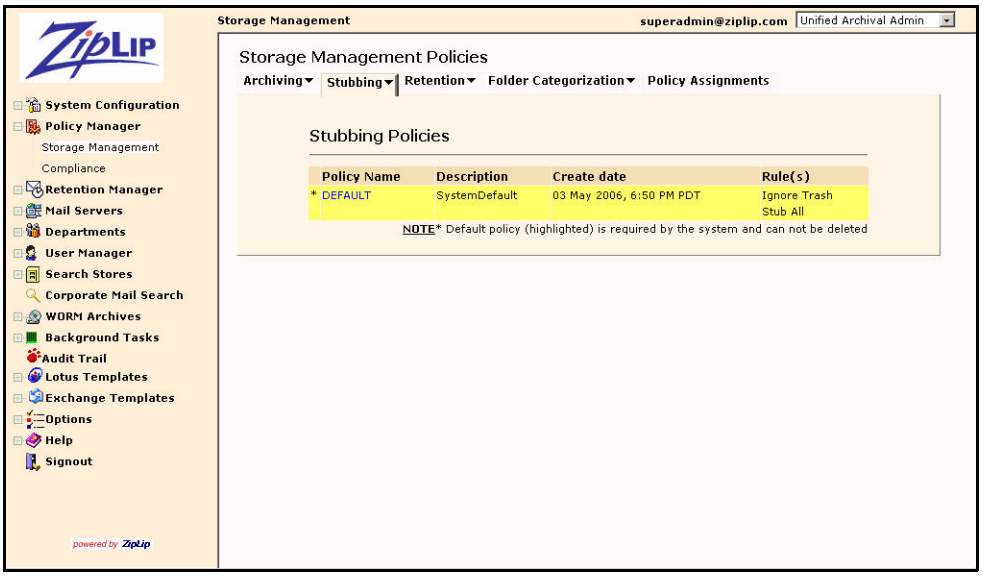



**Figure 5.6: Stubbing Policies pane**

**Note:** The **DEFAULT** policy is always present and is created during installation of the ZipLip system.

To create a new stubbing policy, under the Stubbing tab select **New Policy**. The **New Stubbing Policy** pane appears.

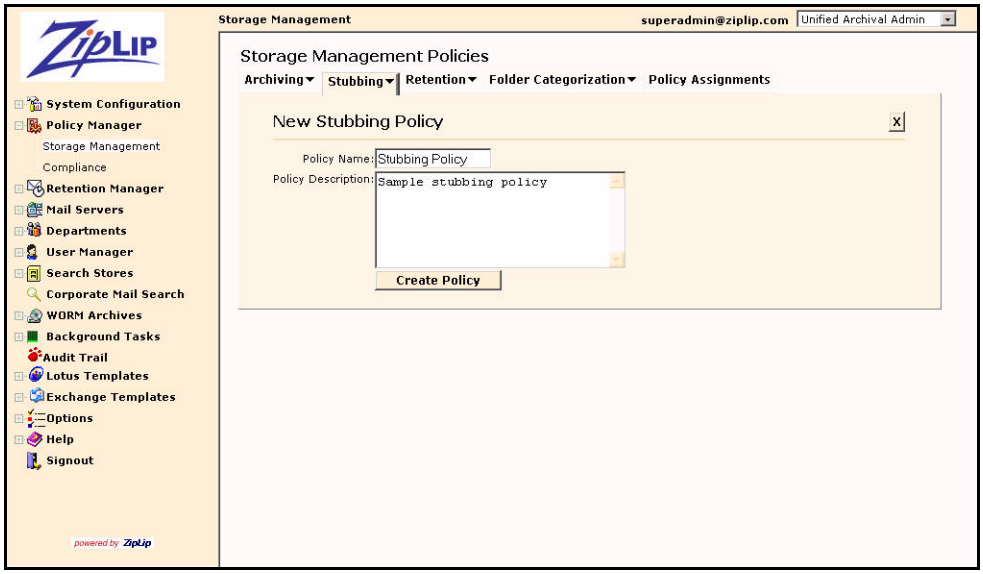



**Figure 5.7: New Stubbing Policy pane**

Enter an alphanumeric **Policy Name** (text-insensitive) and (optional) **Policy Description**. Click **Create Policy** to create this policy. The **Stubbing Policy** pane for this policy appears with no rules.

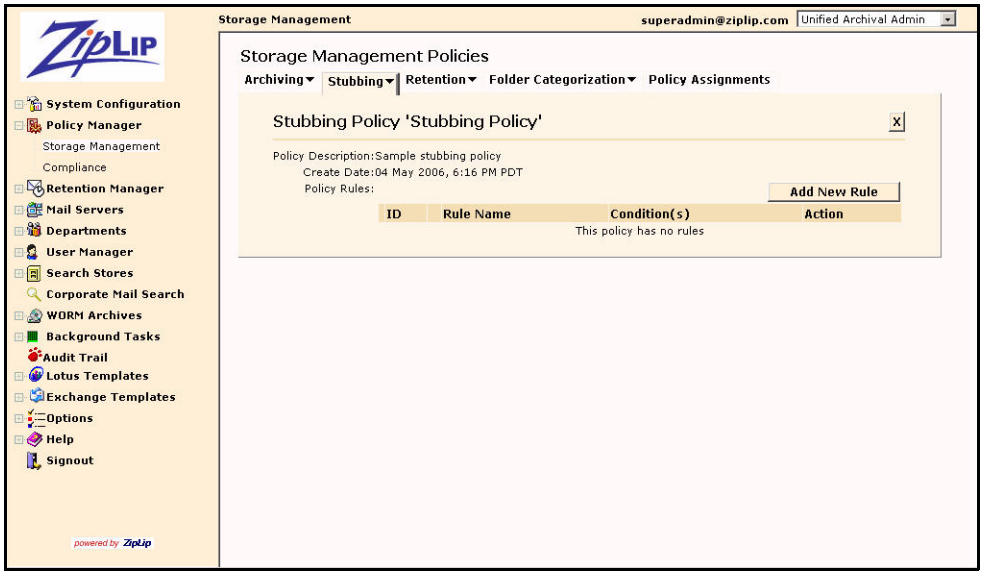



**Figure 5.8: Stubbing Policy pane for a new policy with no rules**

To add a rule to this policy, click **Add New Rule**. The **Stubbing Rule** pane appears.

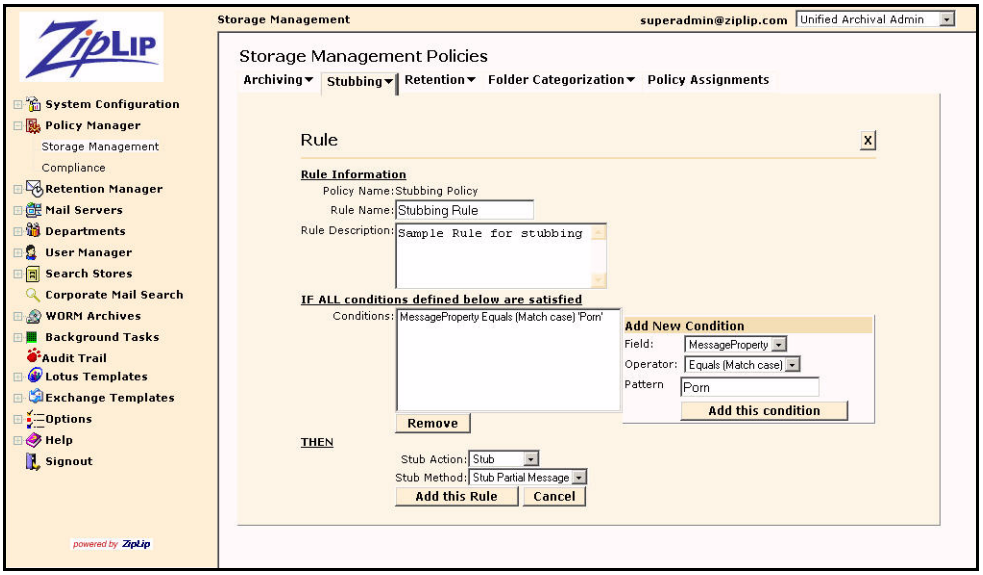



**Figure 5.9: Stubbing Rule pane**

In the **Stubbing Rule** pane, complete the following fields:

- **Rule Name** – Enter an alphanumeric name for the rule; avoid using special characters. Rule names are case-insensitive.
- **Rule Description** – (Optional) Enter a text description of the rule.
- **Add New Condition** – Rules need conditions on which to operate. You can add multiple conditions to a rule.
  - **Field** – From the pull-down menu, select **MessageDate**, **FolderType**, **Age (days)**, or **Message Size KB**.
  - **Operator** – Select an operator from the pull-down menu. The choices in the **Operator** menu vary depending on which **Field** you select:

    **MessageDate** – Select **Date Later Than** or **Date Earlier Than**

    **FolderType** – Select **Equals (Match case)** or **Equals (Ignore case)**

    **MessageProperty** – Select **Equals (Match case)**, **Equals (Ignore case)**, **Contains Word**, or **Not Contains Word**

    **Subject** – Select Select **Equals (Match case)**, **Equals (Ignore case)**, **Contains Word**, or **Not Contains Word**

    **Age (days)** – Select **Less than** or **Greater than or equals**.

    **Message Size KB** – Select **Less than** or **Greater than or equals**.
  - **Pattern** – Enter a text pattern or number on which to operate.

  Click **Add this condition** to add the condition.
- **Action** – From the pull-down menu, select **Stub**, **Don't Stub**, or **Delete**.
- **Stub Method** – From the pull-down menu, select one of the following options for stubbing methods:
  - **Stub Partial Message** – All but a portion of the initial part of the e-mail body is stubbed, allowing some of the context of message to be retained in the mailbox.

- **Attachments only** – Only the attachments of the messages are stubbed, leaving behind the body of the message.
- **Full Message Stub** – The entire message is stubbed in the mailbox.

4. Click **Add this Rule** to add the rule and return to the Archiving Policy pane with the new rule added, or click **Cancel** to return to the Archiving Policy pane without creating this rule.

## Stubbing Templates

When messages are stubbed, mailboxes contain a pointer to the stubbed message data. These are created using stubbing templates.

To modify and edit these templates, in the ZipLip Archival application, in the left menu, select **Lotus Templates** or **Exchange Templates**. Under **Lotus Templates** and **Exchange Templates** there are three types of stubbing templates corresponding to the three stubbing methods:

- **Full Message Stub**
- **Partial Message Stub**
- **Attachment Stub**

To view and modify these templates, in the left menu click on the name of the template, edit it in the text box in the right pane, then click **Save** to save it.

## Retention Policies

The retention policy specifies the lifecycle of the message. During e-mail processing, the mail server runs the retention policy to determine how long to keep each message.

To view retention policies, in the left menu, select **Policy Manager**. Under **Policy Manager**, select **Storage Management**. In the **Storage Management Policies - Archiving Policies** pane, select the **Retention** tab. The **Retention Policies** pane appears.

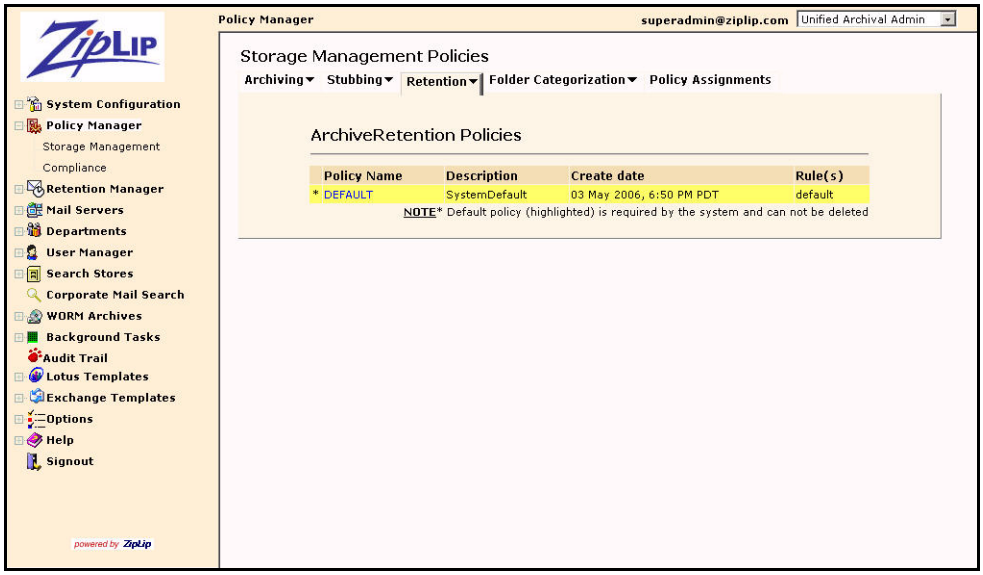



**Figure 5.10: Retention Policies pane**

## Associating Policies

Policies can be associated at the system level, Department level, or user level. The default policy is always at the system level.

### Overriding System Policies at the Department Level

To associate a policy with a Department other than the system **DEFAULT** policy:

1. In the left menu of the Unified Archival Admin application, select **Departments**. Under **Departments**, select **View/Edit**.
2. In the middle pane, select a Department. This example uses Department **My Department**.

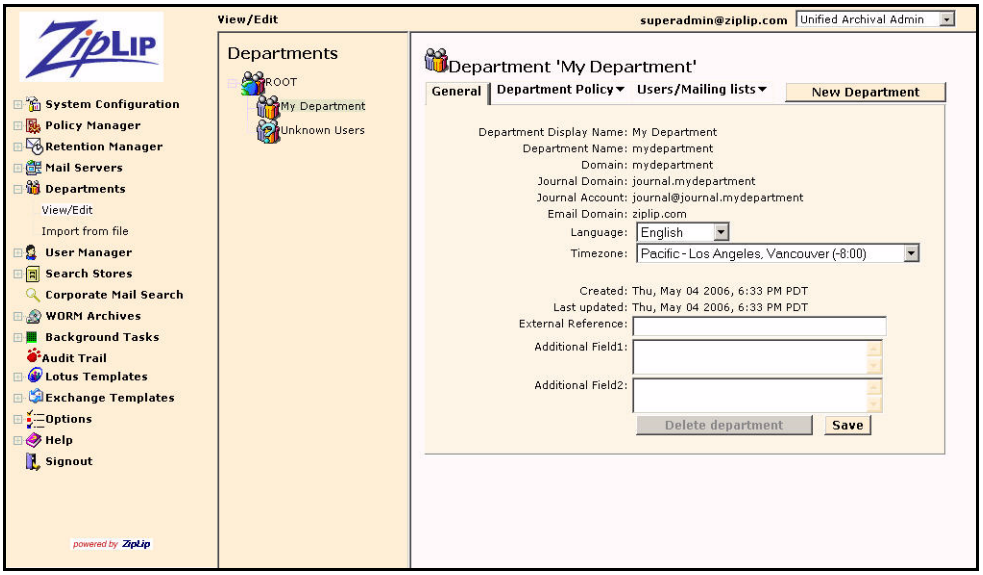



**Figure 5.11: Department General tab**

**Note:** The procedure for associating policies is the same whether done at the mail server or Department level.

3. Under the **Department Policy** tab select **Archive Policies**. The **Archive Policies** pane appears.

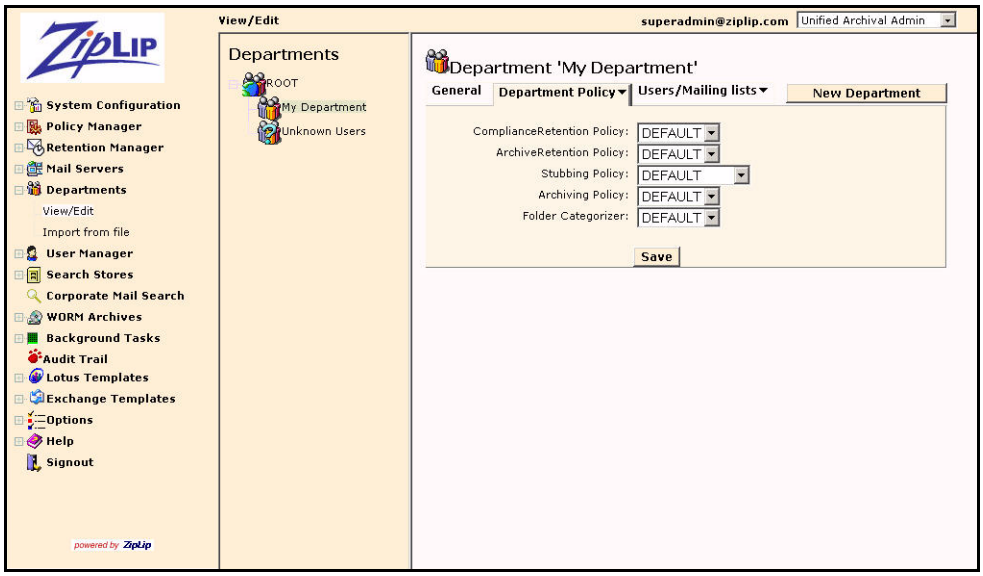



**Figure 5.12: Archive Policies pane**

4. In the **Archive Policies** pane, use the pull-down menus to change the associated **ComplianceRetention**, **ArchiveRetention**, **Stubbing Policy**, **Archiving Policy**, and **Folder Categorizer** as desired. Click **Save** to save your changes.

## Overriding Policies at the User Level

To customize policy associations at the user level:

1. In the left menu of the Unified Archival Admin application, select **User Manager**. Under **Departments**, select **Find/Edit users/mailing lists**.
2. In the **Find department members** window, enter search criteria for the user you want to modify or leave blank to return all users. Click **Find**.

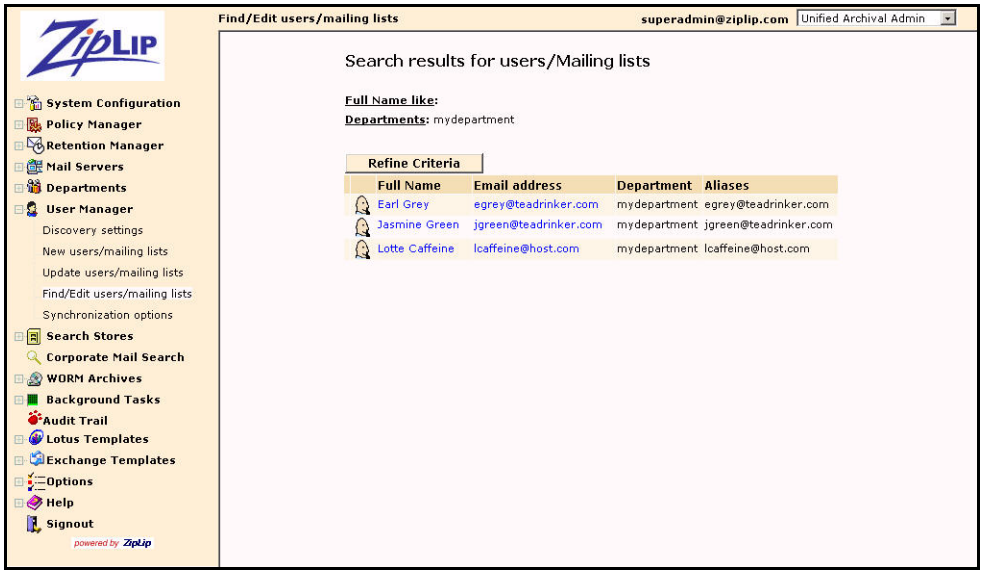



**Figure 5.13: Search results for users/Mailing lists pane**

3. In the list of users, click on either the **Full Name** or **Email Address** of the user whose policies you want to override. The **User Info** tab for that user appears.

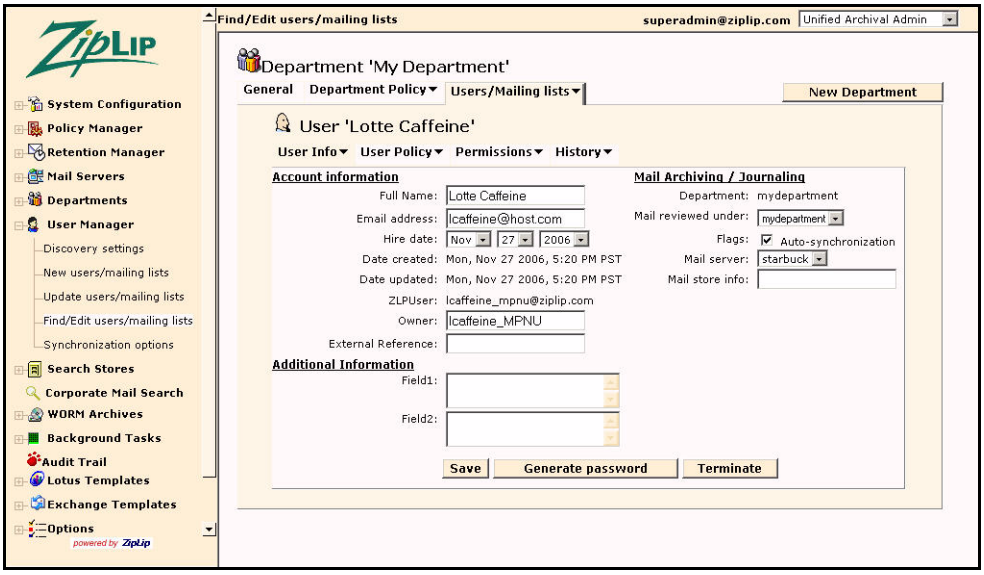



**Figure 5.14: User Info tab**

4. Under **User Policy**, select **Storage Management**.

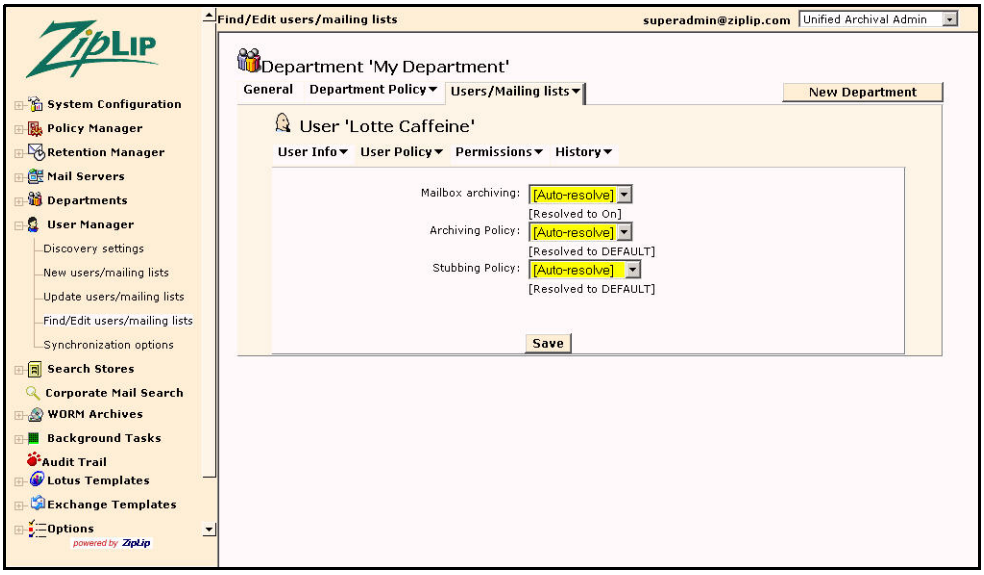



**Figure 5.15: User Policy tab**

From here you can use pull-down menus to change:

- **ComplianceRetention Policy** – The length of time ZipLip keeps the message for Compliance.
- **ArchiveRetention Policy** – The length of time ZipLip keeps the message in its archives.
- **Stubbing Policy** – When to leave a “stub” consisting of headers in a mailbox and a link to the original message.
- **Archiving Policy** – When to archive a message.

5. Click **Save** to save these settings.

# Policy Assignments

To view policy assignments, in the left menu, select **Policy Manager**. Under **Policy Manager**, select **Storage Management**. In the **Storage Management Policies - Archiving Policies** pane, select the **Policy Assignments** tab. The **Policy Assignments** pane that appears displays storage management policy assignments for the system and for all entities (Departments and users) with non-default policies assigned.

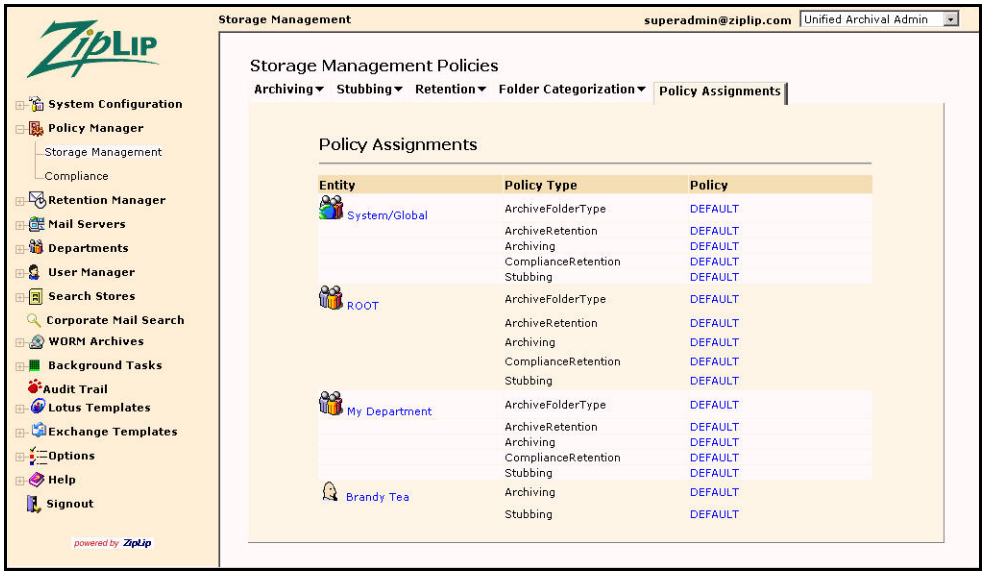



**Figure 5.16: Storage Management Policy Assignments pane**

To view or edit the default policies for an entity, click on its name. Selecting a Department takes you to the **Department Policy** screen; selecting a user takes you to the **Users/Mailing lists->User Policy** tab.

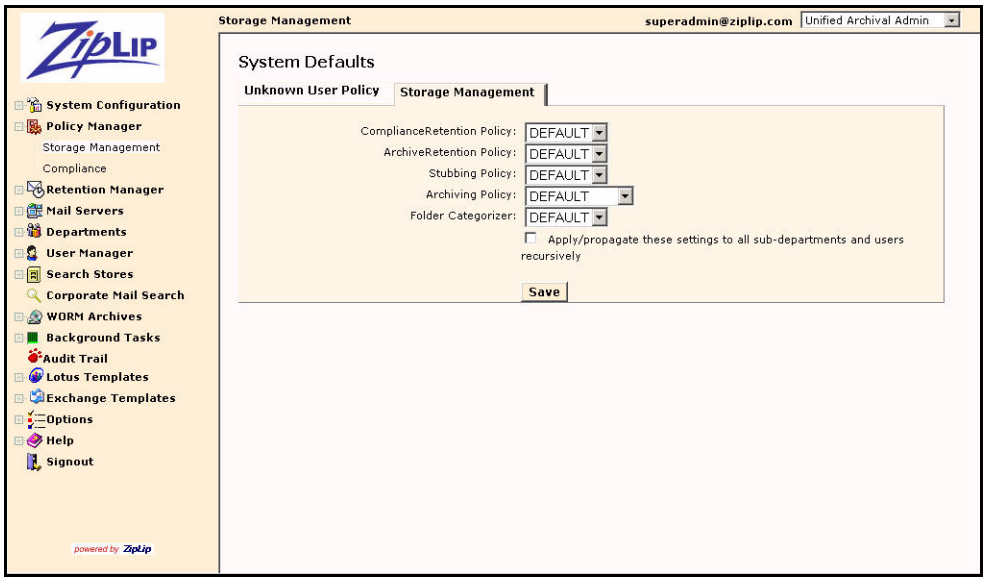



**Figure 5.17: User Policy tab**

From here you can use the pull-down menu to change the **Stubbing Policy** and **Archiving Policy**.

Selecting **System/Global** takes you to the **Storage Management** tab of the **System Defaults** pane.

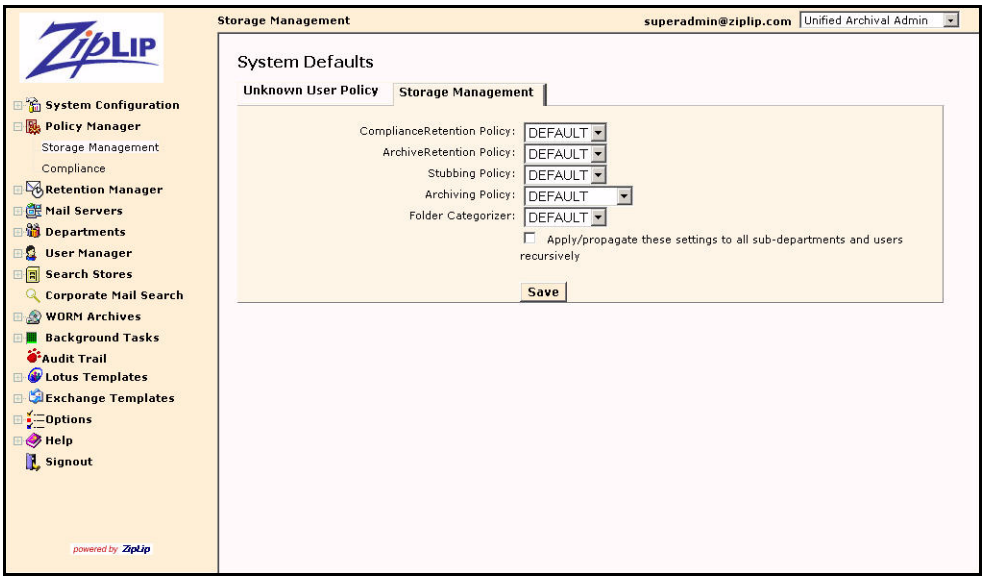



**Figure 5.18: Policy Assignments pane**

From here you can use the pull-down menus to change the associated **ComplianceRetention**, **ArchiveRetention**, **Stubbing Policy**, **Archiving Policy**, and **Folder Categorizer** as desired. You can also check the box next to **Apply/propagate these settings to all sub-departments and users recursively** to have your changes apply to all Departments and users under the selected entity (in this case, the changes would propagate system-wide). Click **Save** to save your changes.

## Compliance Policies

Compliance policies are also set using the Policy Manager. To view the available compliance retention policies, the left menu, select **Policy Manager**. Under **Policy Manager**, select **Compliance**. The **ComplianceRetention Policies** pane that appears displays the default Compliance retention policy assignments for the system and any other policies that have been created.

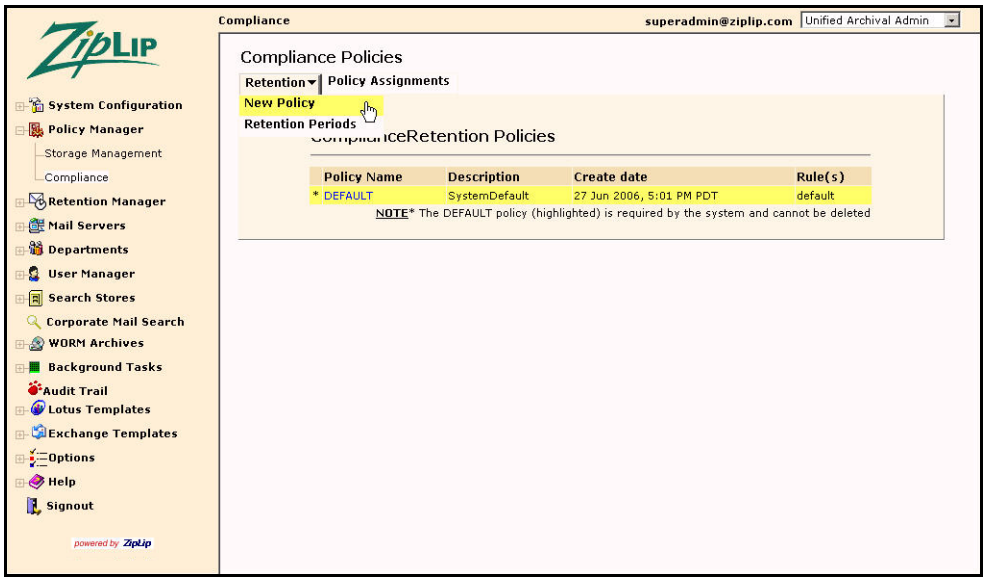



**Figure 5.19: Compliance Retention Policies pane**

## Creating a Compliance Retention Policy

To create a new Compliance retention policy, under the **Retention** tab select **New Policy**. The **New Compliance Retention Policy** pane appears.

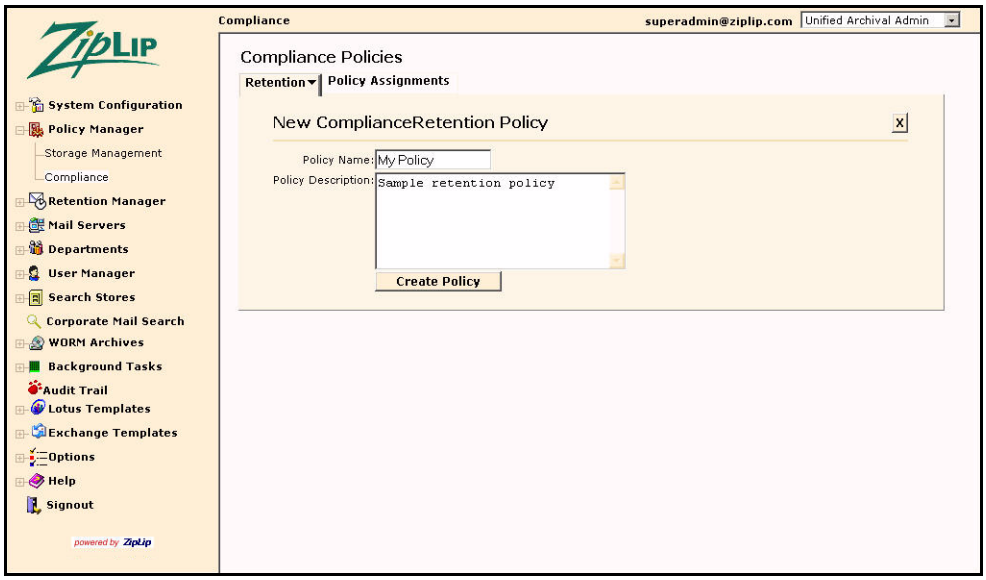



**Figure 5.20: New Compliance Retention Policy pane**

Enter an alphanumeric **Policy Name** (text-insensitive) and (optional) **Policy Description**. Click **Create Policy** to create this policy. The **ComplianceRetention Policy** pane for this policy appears with no rules.

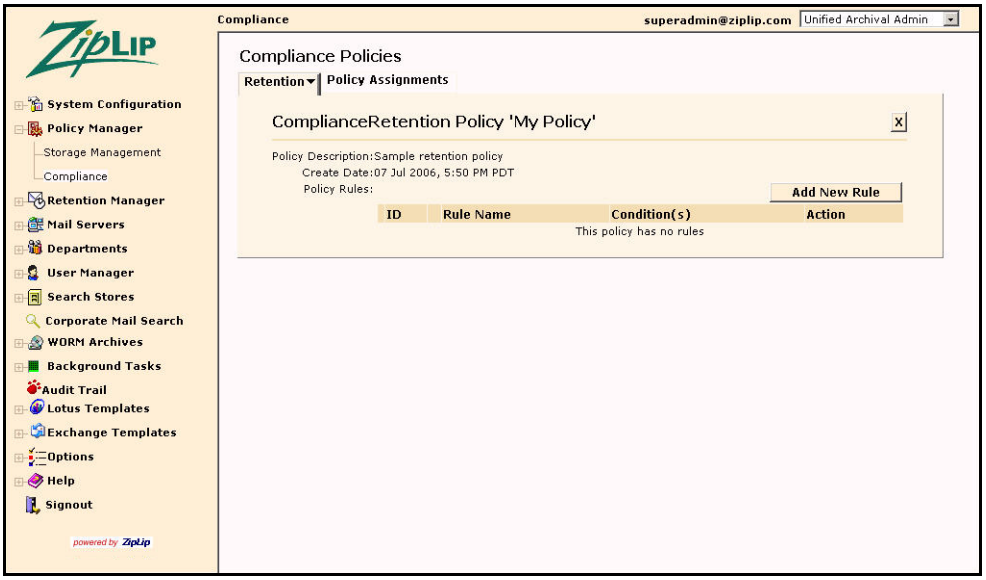



**Figure 5.21: ComplianceRetention Policy pane for a new policy with no rules**

To add a rule to this policy, click **Add New Rule**. The **Stubbing Rule** pane appears.

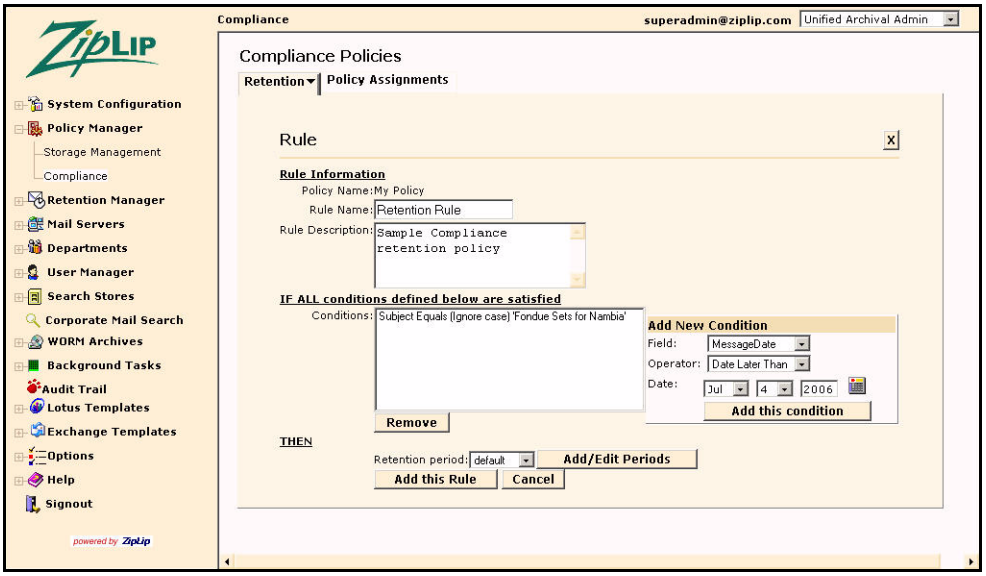



**Figure 5.22: Compliance Rule pane**

In the **Compliance Rule** pane, complete the following fields:

- **Rule Name** – Enter an alphanumeric name for the rule; avoid using special characters. Rule names are case-insensitive.
- **Rule Description** – (Optional) Enter a text description of the rule.
- **Add New Condition** – Rules need conditions on which to operate. You can add multiple conditions to a rule.
  - **Field** – From the pull-down menu, select **MessageDate**, **FolderType**, **Age (days)**, or **Message Size KB**.

- **Operator** – Select an operator from the pull-down menu. The choices in the **Operator** menu vary depending on which **Field** you select:

  **MessageDate** – Select **Date Later Than** or **Date Earlier Than**.

  **MessageHeader** – Select **Equals (Match case)**, **Equals (Ignore case)**, **Contains Word**, or **Not Contains Word**.

  **Subject** – Select **Equals (Match case)**, **Equals (Ignore case)**, **Contains Word**, or **Not Contains Word**.

  **Category** – Select **Equals (Match case)**.

  **AttachNameArray** – Select **Any Element Like (Ignore Case)**, **All Element not Like (Ignore Case)**, **Size Less than**, or **Size Greater than or equals**.

  **Message Size KB** – Select **Less than** or **Greater than or equals**.

- **Pattern** – Enter a text pattern or number on which to operate.

Click **Add this condition** to add the condition. To remove a condition, select it in the **Conditions** box and click **Remove**.

- **Retention Period** – From the pull-down menu, select a retention period. To add or edit a retention period, click **Add/Edit Periods**.

**Note:** For information on editing retention periods, see “Retention Policies” on page 49.

Click **Add this Rule** to add the rule and return to the **Compliance Policies** pane with the new rule added, or click **Cancel** to return to the **Compliance Policies** pane without creating this rule. Click the **X** in the upper right corner to return to the **Compliance Policies** pane.

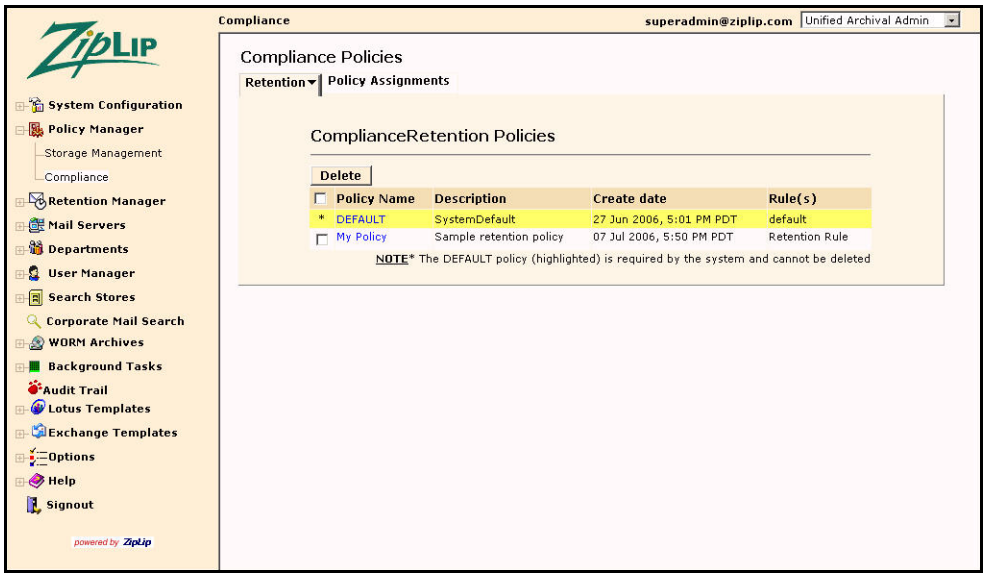



**Figure 5.23: Compliance Policies pane with new policy**

## Deleting a ComplianceRetention Policy

To delete a Compliance retention policy, in the **Compliance Policies** pane check the box next to the name of the policy and click **Delete**.

## Compliance Policy Assignments

To view and edit policy assignments for the system and for any Department or user with policies that override the system defaults, in the left menu, select **Policy Manager**. Under **Policy Manager**, select **Storage Management**. In the **Storage Management Policies - Archiving Policies** pane, select the **Policy Assignments** tab. The **Policy Assignments** pane that appears displays storage management policy assignments for the system and for all entities (Departments and users) with non-default policies assigned.

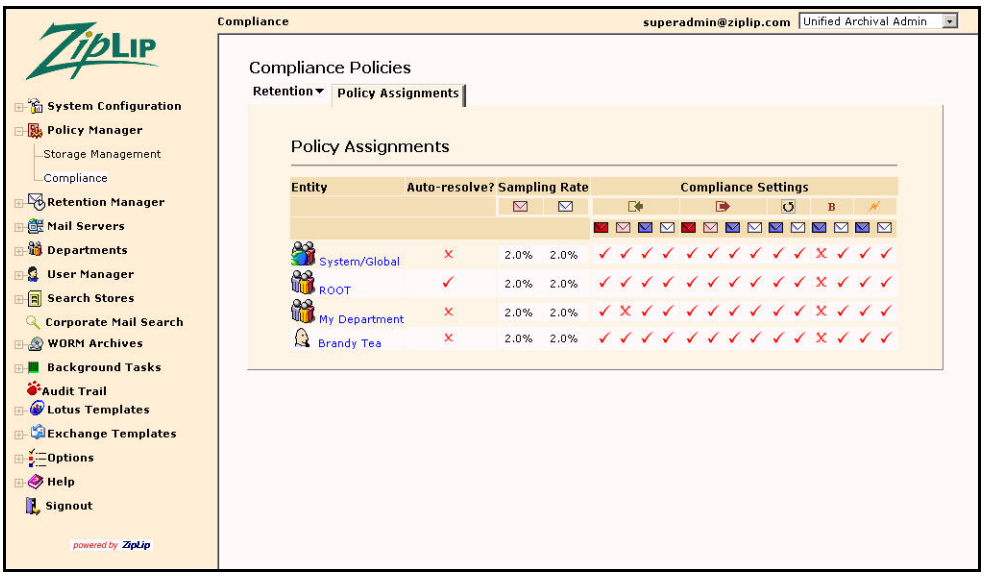



**Figure 5.24: Compliance Policy Assignments pane**

To view or edit the default policies for an entity, click on its name. Selecting a Department takes you to the **Department Policy** tab with Compliance settings showing; selecting a user takes you to the **Users/Mailing lists->User Policy** tab with Compliance settings showing.

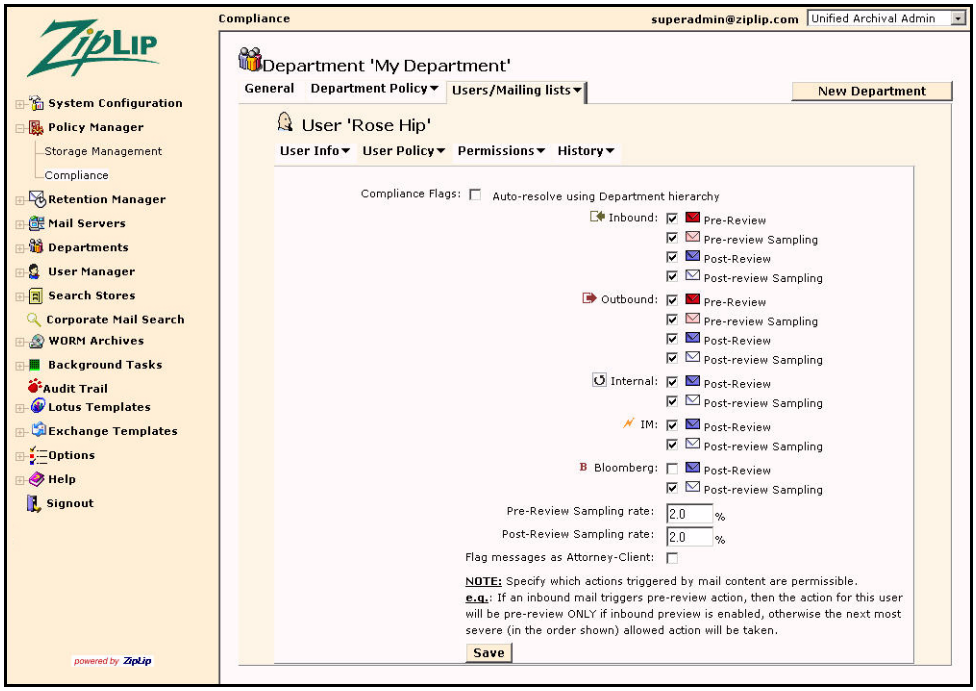



**Figure 5.25: User Policy tab**

From here you can check and uncheck the options to change the **Storage Management Policy**. Selecting **System/Global** takes you to the **Storage Management** tab of the **System Defaults** pane.

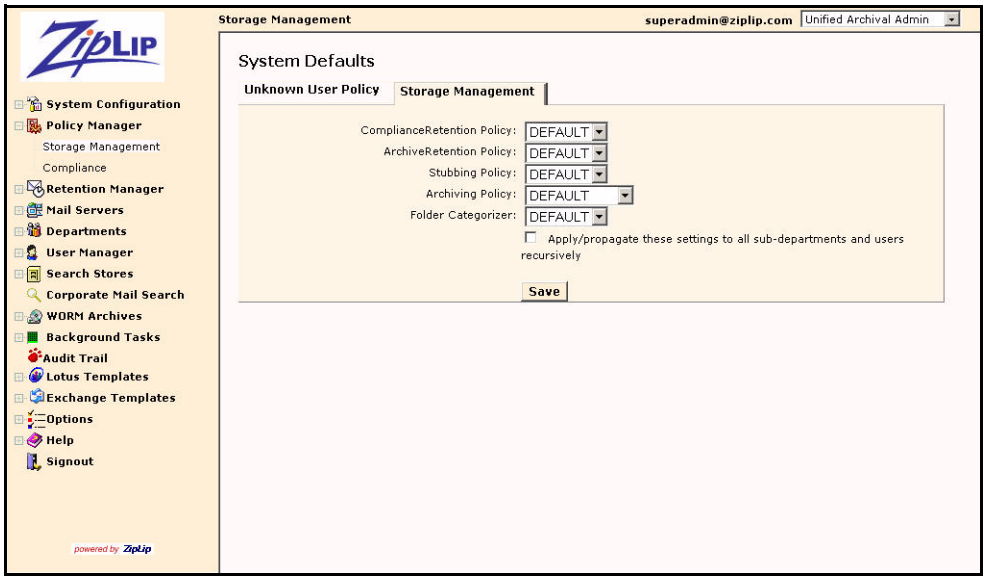



**Figure 5.26: Policy Assignments pane**

From here you can check and uncheck the options to change the **Storage Management Policy** as desired. You can also check the box next to **Apply/propagate these settings to all sub-departments and users recursively** to have your changes apply to all Departments and users under the selected entity (in this case, the changes would propagate system-wide). Click **Save** to save your changes.

Chapter 6

# Log Files

Each ZipLip server logs its state and transaction information to log files that give visibility into the operations of the server. Log files record details of transactions which can be used later to identify potential problems and evaluate system and hardware performance. This information is useful in making decisions to upgrade infrastructure, identify bottlenecks, and spot and debug errors.

## Log File Name Conventions

Log files start with respective prefixes. For example, `in` logs start with `in`. The date and time in which they are created are appended to the end of the filename. Often, for a long-running system, the log files are rolled over to keep the sizes of individual log files down.

The file `$ZipLip/zlserver/WEB-INF/runnable/pmapp/pmapp.cfg` contains the following parameters that control the logs:

```
log.flush = 10
log.rollOver= 86400
log.level = 12
```

where:

| | |
|---|---|
| `log.flush` | Defines the frequency of flushing in seconds (logs are automatically flushed). |
| `log.rollover` | Defines, in seconds, the period after which a new log is started or "rolled over." In this example, 86400 seconds denotes 24 hours; every 24 hours a new log file is started. |
| `log.level` | Denotes the priority level of the log. *Log levels* are priorities in the logging; 12 is the highest and 0 is the lowest. Logging events with a priority lower than the `log.level` are not logged. |

## Detailed Log Descriptions

The following types of logs are created by the ZipLip Server:

- `in` logs – These contain transaction information about HTTP transactions, SMTP listeners, POP3 listeners and other listeners. Details written to the in log include the date and time of the request and transaction status.

Searching for exceptions in the `in` logs can help determine the status of some server transactions. When an exception is logged, it usually means a request was not successful.

The `in` logs also maintain records of child process activity. Available information can include the date, time, and session information of connections made to SMTP and POP servers.

- `req` logs – All web requests are written to these logs.

  Request logs contain summary information about all the requests made to the Web servers, in sequence. They give a quick understanding of all the requests that came into the Web server.

- `out` logs – ZipLip servers send information from servers to a JSP Page for execution. The `out` logs record the information sent from the servers to JSP page. Since the information written to the `out` log creates some performance implications, the `out` log is primarily used for debugging.
- `pr` logs – These logs store the profile information of a transaction. Each transaction can have multiple profile line items depending on the profile log level and the transaction itself. Each line item contains a section ID, the start time, the elapsed time, and several other parameters. The section ID corresponds to a specified start and end point inside the software. By looking at the elapsed time you can identify potential performance issues and isolate a problem to a small code section within the ZipLip Software. This insight into the ZipLip server execution makes the server extremely manageable.

  In the following example we can identify the transaction number of `157554`. This transaction indicates an SMTP session (`smtp.start`) took 10 milliseconds to start (as determined from the second to last number). The transaction ID starts with the server's local machine name (`buc`) set in `pmapp.cfg`.

  ```
  1,bucUDVKP3TZYASWYCVJSX50VLMDRMST10OWT2MBWSKS,157554,1,1,smtp.start,10129
  48961486,10,1
  ```

  In the next example, transaction number `157720` was the result of the SMTP Queue Fetcher running. This transaction took 41 milliseconds to complete.

  ```
  1,buc0XD2P2SV1YNIRI4RP1KQ1ZHY51TYOXJNRNAHQGVK,157720,1,0,smtpQueueFetcher
  ,1012949542581,41,1
  ```

- `cp` logs – These logs contain information about connection pool usage. They track the number of connections at any point in time and help you understand whether the current connections are above or below the optimal number. The `cp` log also indicates (in seconds) how long a transaction held a connection. These logs are extremely important for tuning the system.
- `clus` log – This log contains coordinator cluster and fail-over state information. The `clus` log indicates the current cluster and live global coordinator for that cluster.
- `globalCoord` log – This log shows the state information of the global coordinator.

  The global coordinator log shows the number of tasks added to the global coordinator queue and delegated to a local coordinator. The number of rejected tasks can be tasks that were inadvertently tried twice. The following is an example of a `globalCoord` log:

  ```
  02.05.2002 02:43:34 PM PST:157569:->
  ```

```
(GlobalCoord22)02.05.2002 02:43:34 PM PST->GlobalCoordinator Errand
Current State:0
(GlobalCoord22)02.05.2002 02:43:34 PM PST->Global Coord
Status:queue=0;schQueue=0progress=0;added=11005;delegated=11005;success=0
;failed=0;removed=0;rejected=5;clogged=0
02.05.2002 02:43:41 PM PST:End-> 157032
```

- lCoord log – This log shows the state information of the local coordinator. The following example shows the status of the local coordinator. Notice that no tasks were delegated since only the global coordinator delegates tasks.

```
02.07.2002 06:37:23 PM PST:3601578:->
(VitalServices Errand_Runner8)02.07.2002 06:37:23 PM PST->Servicing Local
Coordinator; Current
Status:queue=0;schQueue=0progress=4;added=337402;delegated=0;success=3373
65;failed=33;removed=0;rejected=69;clogged=0
02.07.2002 06:37:23 PM PST:End-> 3601578
```

  The next line show the Local Coordinator polled the live Global Coordinator (`buc`) for tasks. The Local Coordinator polls for five tasks for each executor running. Therefore, this server has three executors running.

```
(VitalServices Errand_Runner8)02.07.2002 03:27:25 PM PST->Polling for max
of 15 from buc; Found 0;Current Status progress=4;nQueue=0
```

- `exec` logs – These logs record information about tasks or transactions processed by a specified executor. Each log is numbered and corresponds to a running executor.

  The following example shows the executor picking up the task for transaction ID `2BMCL2UC0RPYQAX0IEWVUCID0QNJAHYFUCBJ3PMB` and processing the transaction. In this case, the task is a message addressed to `xyz@ziplip.com`. The `status=1000` indicates the message was processed successfully.

```
02.07.2002 08:55:53 PM PST:2467:->
Processing job stId=2BMCL2UC0RPYQAX0IEWVUCID0QNJAHYFUCBJ3PMB.
(qab1)02.07.2002 08:55:54 PM PST->To Process
Single store get handler:xyz@ziplip.com
Opened Mail: 2BMCL2UC0RPYQAX0IEWVUCID0QNJAHYFUCBJ3PMB
Headers Parsed:
Store Mail Handler Preprocessing done, beginning to store
To Create Message Record:
DBConnection dbc.mattORCL has connect no 8
Creating Wmp:
Getting Attachment State:
Found Attachment State: false
Done Recipient ksigel@ziplip.com with status 1000
PostReceivedMail Handler: fDone=true
PostReceivedMail Handler: Returning status=1000
processed mail 2BMCL2UC0RPYQAX0IEWVUCID0QNJAHYFUCBJ3PMB
status=1000;NextRetry=never
To post Process
End 2467
```

The log files carry significant debugging and performance information. Monitoring the logs can help you find errors proactively. The amount of logs created by the ZipLip server can be

controlled by the `log.level` parameter. In the default mode, ZipLip logs a significant amount of information. Therefore, logs must be periodically moved to an archive or destroyed.

Chapter 7

# Domain and User Fundamentals

The domain and user are the fundamental concepts of ZipLip system. Users are assigned to a domain, and the domain is arranged in a hierarchical fashion. This design enables ZipLip system to manage and administer millions of users.

## User Privileges

A *user* is the lowest-level entity and is represented in the ZipLip system by a record in the ZipAccount and ZLPUser tables. Each user belongs to only one domain, and each domain may have a parent domain. A domain that has no parent domain is known as a *top-level domain*. A user can carry three fundamental privileges that allow wide range of access to the system:

- Domain Administrator
- System Administrator
- Super Administrator

A *Domain Administrator* can administer users belonging to a domain using the Postmaster application. Administration tasks include resetting of passwords of existing users, creating of additional users, and modifying users' privileges.

A *System Administrator* administers the technical aspects of the running ZipLip system. The System Administrator typically monitors the system, modifies vault settings, and starts child daemons. The System Administrator performs the necessary tasks using the **SysAdmin** application, which is the focus of this manual. A System Administrator cannot manipulate domains or Domain Administrator features unless they also possess Domain Administrator privilege or Super Administrator privilege. This separation of powers is important, as it lets a System Administrator keep the system functioning without granting them access to sensitive information pertaining to each domain.

Finally, the *Super Administrator* is the all-powerful user in the ZipLip Platform context. The Super Administrator has complete power over the ZipLip platform. A Super Administrator can assume the powers of any Domain Administrator and delete or change users' passwords and modify the runtime parameters of the server.

## Domains

A *domain* represents a group of users. Each domain is represented in the system by a `DomainInfo` Record and `ZLPDomainInfo` record. Domains carry certain privileges which are automatically transferred unless otherwise specified to users who are members of that domain.

Privileges and settings that are inherited include the e-mail domain, maximum number of users, expiry date, default language, and default privileges. In addition, each application can associate privileges to a domain. For example, the `ZLPDomainInfo` record stores domain privileges corresponding to the Messaging application.

Each domain can have a parent domain and inherits the parent domain's privileges unless otherwise specified. Domain Administrators can change the domain's privileges to be different than that of the parent. Applications use the domain's privileges to determine the default privileges for its users.

### Domain Routing

ZipLip's MTA and SMTP servers accept mail from external sources. To process the messages they need to know the domain routing type. There are three types of routing control: No Control, Full Control, and Full Relay.

All domains not defined in the system by default belong to the *No Control* category. Basically, the MTA doesn't recognize those domains and, unless the SMTP Server and MTA are designed to do open relay, inbound e-mail messages addressed to No Control domains are rejected.

*Full Control* domains are domains in which ZipLip server controls all the users belonging to the domain. Thus if the MTA or SMTP server receives mail for "`someone@testdomain.net`" and does not find the user "`someone`" in the `testdomain.net` domain, it rejects that mail because it has full authority on the domain.

*Full Relay* domains are domains in which all e-mail messages bound for the domain are forwarded to a third party, the ZipLip email server in this case will act as a simple proxy for e-mail messages of this domain. This is typically used when the ZipLip server is configured as a gateway.

## Domain Management

The ZipLip SysAdmin application provides a web-based interface for configuring, administering, and monitoring the entire ZipLip system. You must be either a Super Administrator or a System Administrator to login to this application. Only a Super Administrator can manage and administer domains.

To start the SysAdmin application, enter the following URL:

`http://myzipliphost/ps/app/home.jsp?domain=mydomain.com`

replacing *myzipliphost* with the host on which you have installed the ZipLip server and *mydomain.com* with your domain.

Complete the following fields:

- **Email Address** – Enter your e-mail address.
- **Passphrase** – Enter your ZipLip password.
- **Application** – From the pull-down menu, select **SysAdmin**.
- **Language** – From the pull-down menu, select a language.

Click **Login**. The SysAdmin welcome screen appears as shown in Figure 7.1.

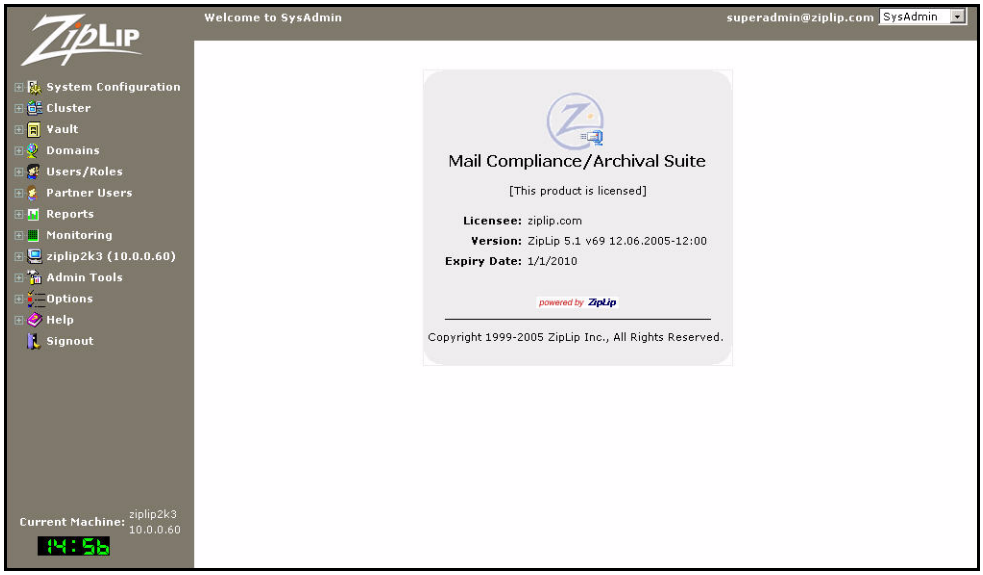



**Figure 7.1: ZipLip SysAdmin welcome screen**

## Creating Domains

1. Select **Domains** in the left menu.
2. Under Domains, select **Create New**. This opens the **Create New Domain** form as shown in Figure 7.2.

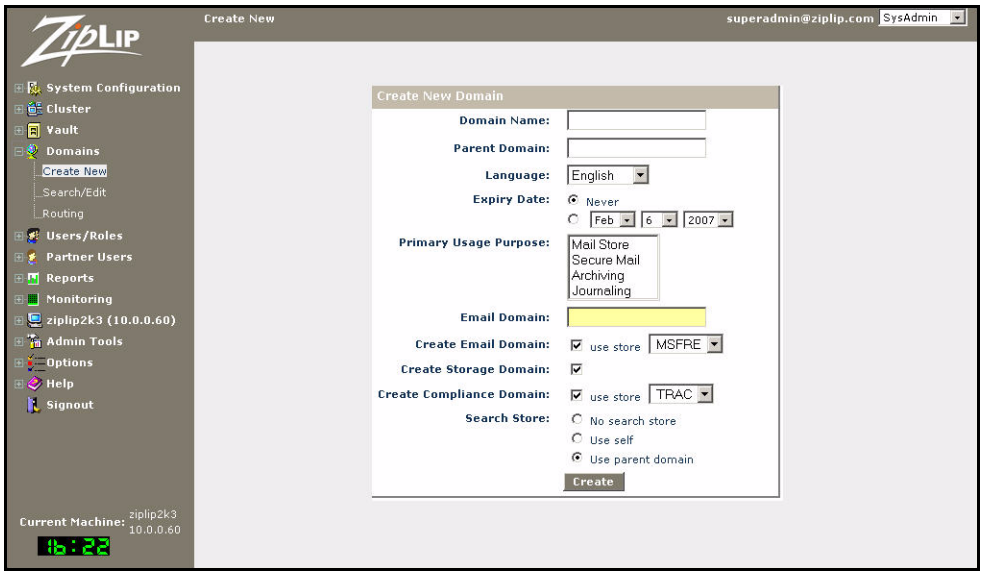



**Figure 7.2: Creat New Domain form**

3. Fill in the following fields:
   - **Domain Name** – Enter a name for the domain you want to create.
   - **Parent Domain** – (Optional) Enter a parent domain name, such as “ziplip.com”. If this domain is not to be a sub-domain of another domain, leave the field blank
   - **Language** – Select a default language for the domain from the pull-down menu.

- **Expiry Date** – Select **Never**, or select an expiration date for the domain from the pull-down menus.
- **Primary Usage Purpose** – Select one or more of the following: **Mail Store**, **Secure Mail**, **Archiving**, **Journaling**
- **Email Domain** – (Optional) Enter an e-mail domain, and check the box next to **Create Email Domain** to create an e-mail domain for this domain. An E-mail domain is the domain used by the e-mail application. This option is available only if you purchase the e-mail application.
- **Create Email Domain** – If you have created an e-mail domain, select a message store from the pull-down menu.
- **Create Storage Domain** – Check if you want to create a storage domain.
- **Create Compliance Domain** – (Optional) Check the box to create a Compliance domain. This option is only available if you purchased the Compliance application. If you check this option, use the pull-down menu to select a store.
- **Search Store** – Select one of the following options:
  - **No search store** – Check if you are not using a storage domain.
  - **Use self** – Use this host as the relative search store.
  - **Use parent domain** – Use the parent domain for the relative search store.

When you are ready, click **Create** to create the domain. A screen appears with a confirmation message saying the domain has been created successfully.

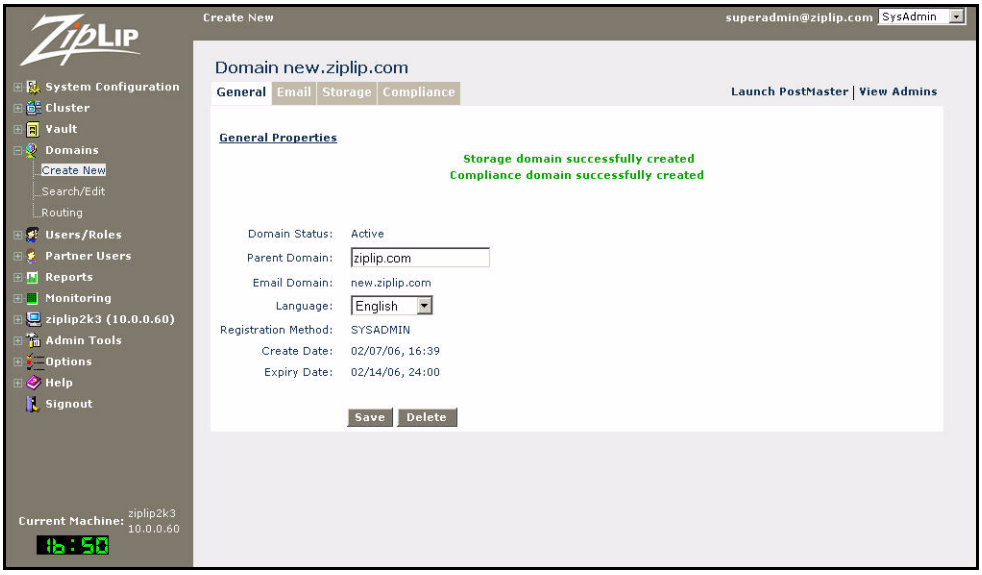



**Figure 7.3: Domain Creation Success screen**

## Searching for Domains

To search for a domain:

1. Click **Domains** in the main menu
2. Click **Search/Edit**.

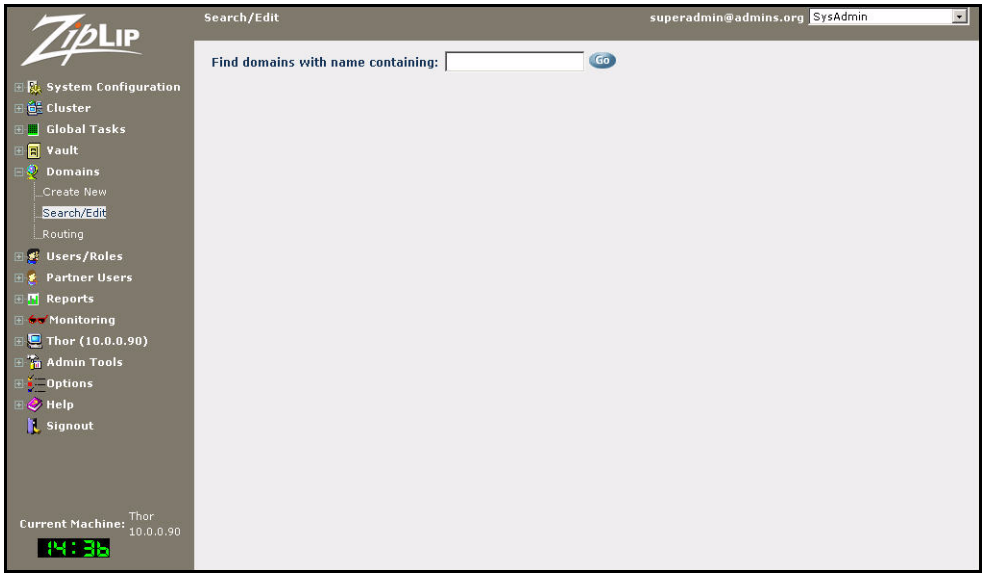
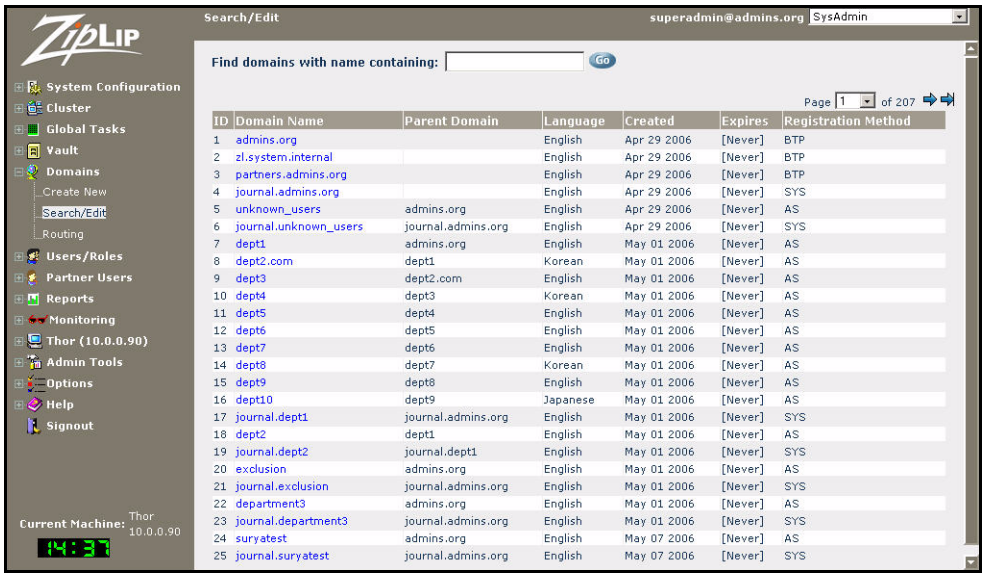



**Figure 7.4: Search for domains**

3. Enter text from the name of the domain for which you are searching, or leave blank to return all domains.
4. Click **Go** or press the Enter key. A list of domains containing the search string (or all domains) is returned similar to the screen shown in Figure 7.5.




| ID | Domain Name | Parent Domain | Language | Created | Expires | Registration Method |
|---|---|---|---|---|---|---|
| 1 | admins.org | | English | Apr 29 2006 | [Never] | BTP |
| 2 | zl.system.internal | | English | Apr 29 2006 | [Never] | BTP |
| 3 | partners.admins.org | | English | Apr 29 2006 | [Never] | BTP |
| 4 | journal.admins.org | | English | Apr 29 2006 | [Never] | SYS |
| 5 | unknown_users | admins.org | English | Apr 29 2006 | [Never] | AS |
| 6 | journal.unknown_users | journal.admins.org | English | Apr 29 2006 | [Never] | SYS |
| 7 | dept1 | admins.org | English | May 01 2006 | [Never] | AS |
| 8 | dept2.com | dept1 | Korean | May 01 2006 | [Never] | AS |
| 9 | dept3 | dept2.com | English | May 01 2006 | [Never] | AS |
| 10 | dept4 | dept3 | Korean | May 01 2006 | [Never] | AS |
| 11 | dept5 | dept4 | English | May 01 2006 | [Never] | AS |
| 12 | dept6 | dept5 | English | May 01 2006 | [Never] | AS |
| 13 | dept7 | dept6 | English | May 01 2006 | [Never] | AS |
| 14 | dept8 | dept7 | Korean | May 01 2006 | [Never] | AS |
| 15 | dept9 | dept8 | English | May 01 2006 | [Never] | AS |
| 16 | dept10 | dept9 | Japanese | May 01 2006 | [Never] | AS |
| 17 | journal.dept1 | journal.admins.org | English | May 01 2006 | [Never] | SYS |
| 18 | dept2 | dept1 | English | May 01 2006 | [Never] | AS |
| 19 | journal.dept2 | journal.dept1 | English | May 01 2006 | [Never] | SYS |
| 20 | exclusion | admins.org | English | May 01 2006 | [Never] | AS |
| 21 | journal.exclusion | journal.admins.org | English | May 01 2006 | [Never] | SYS |
| 22 | department3 | admins.org | English | May 01 2006 | [Never] | AS |
| 23 | journal.department3 | journal.admins.org | English | May 01 2006 | [Never] | SYS |
| 24 | suryatest | admins.org | English | May 07 2006 | [Never] | AS |
| 25 | journal.suryatest | journal.admins.org | English | May 07 2006 | [Never] | SYS |

**Figure 7.5: Domain Search results**

## Editing Domain Properties

To edit properties of a domain, in the **Domain Search results** screen, click on the name of the domain you want to edit. A screen appears showing the current general properties for this domain.

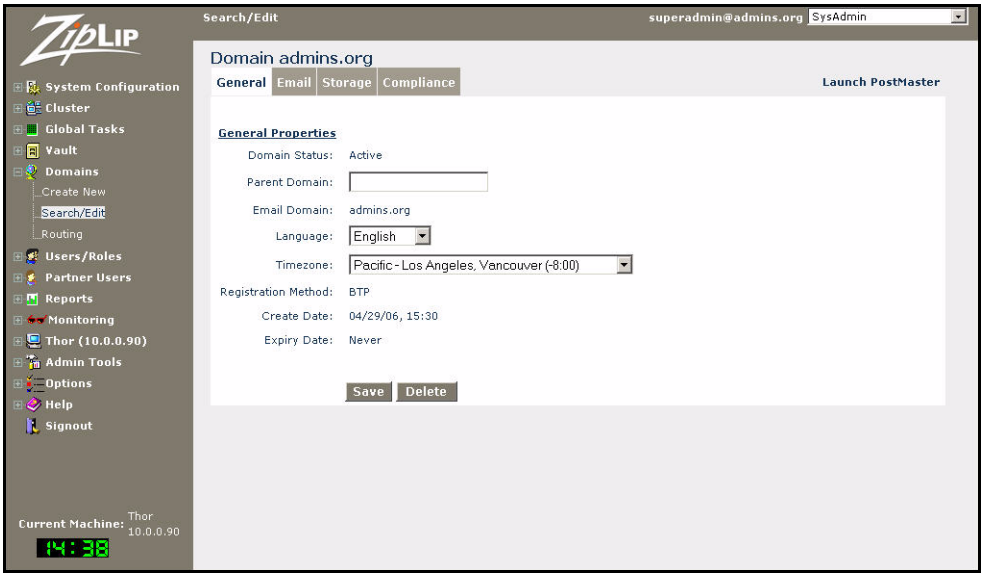



**Figure 7.6: General Domain Properties screen**

Here you can change the following:

- **Parent Domain** – The parent domain for this domain.
- **Language** – The default language of the domain, by selecting a different language from the pull-down menu.
- **Timezone** – The time zone in which the domain exists, by selecting a different time zone from the pull-down menu.

Click **Save** to save your changes, or click **Delete** to delete the domain.

## Editing E-mail Domain Properties

To edit e-mail properties of a domain:

1. In the **Domain Search results** screen, click on the name of the domain you want to edit. The General Domain Properties screen appears as shown in Figure 7.6.
2. Click the **Email** tab. A screen appears showing the e-mail properties for this domain.

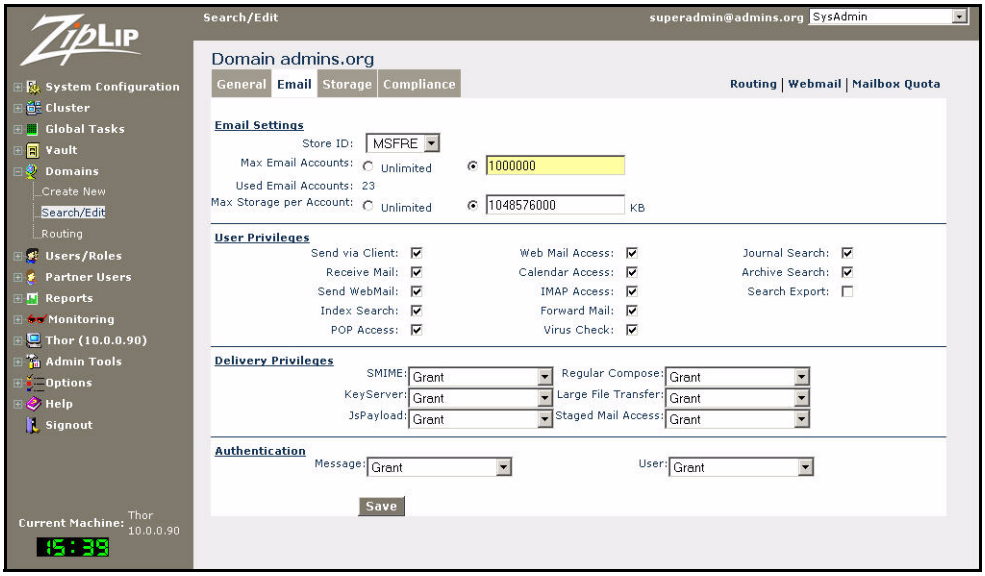



**Figure 7.7: Domain E-mail Properties screen**

3. Change any of the following, as appropriate:
   - **Email Settings**
     - **Store ID** – Use the pull-down menu to change the message store. To create additional stores, use the **Vault** function in the left menu.
     - **Max Email Accounts** – Select **Unlimited** to allow an unlimited number of e-mail accounts, or select the other box and enter the maximum number of e-mail accounts to allow in this domain.
     - **Max Storage per Account** – Select **Unlimited** to allow an unlimited number of e-mail accounts, or select the other box and enter the maximum e-mail accounts size in KB in this domain.
   - **User Privileges** – Check or uncheck any of the following domain user privileges to grant or revoke them, as desired:
     - **Send via Client** – Enables users to relay mail via SMTP.
     - **Receive Mail** – Enables users to receive WebMail.
     - **Send WebMail** – Enables users to send WebMail.
     - **Index Search** – Enables users to perform an indexed search over all messages.
     - **POP Access** – Enables users to access e-mail via POP.
     - **Web Mail Access** – Enables users to log into the WebMail application.
     - **Calendar Access** – Enables use of the Calendar in the WebMail application.
     - **IMAP Access** – Enables users to access e-mail via IMAP.
     - **Forward Mail** – Enables users to forward e-mail.
     - **Virus Check** – Enables ZipLip to perform virus checking on users' e-mail.
     - **Journal Search** – Enables end-users to search the Journaled mailboxes for e-mail that refers to them.
     - **Archive Search** – Enables end-users to search the archive serial stores.
     - **Search Export** – Enables users to export search results.

- **Delivery Privileges** – Use the pull-down menus to **Grant**, **Deny (allow override)**, or **Deny (no override)** domain delivery privileges, as desired
- **Authentication** – Use the pull-down menus to **Grant**, **Deny (allow override)**, or **Deny (no override) Message** and **User** authentication privileges, as desired.

4. Click **Save** to save your changes.

## Creating and Editing a Storage Domain

To create a storage domain:

1. In the **Domain Search results** screen, click on the name of the domain you want to edit. The General Domain Properties screen appears as shown in Figure 7.6.
2. Click the **Storage** tab. A screen appears showing the storage domain for this domain or, if there is none, offers you the chance to **Create** one.

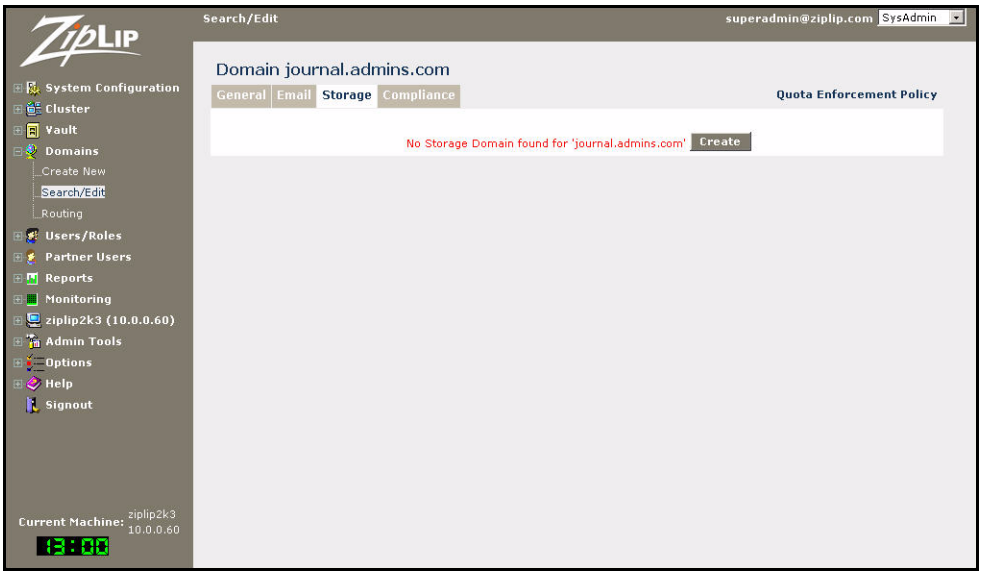



**Figure 7.8: Storage Domain screen**

3. Click **Create**. This creates the storage domain.

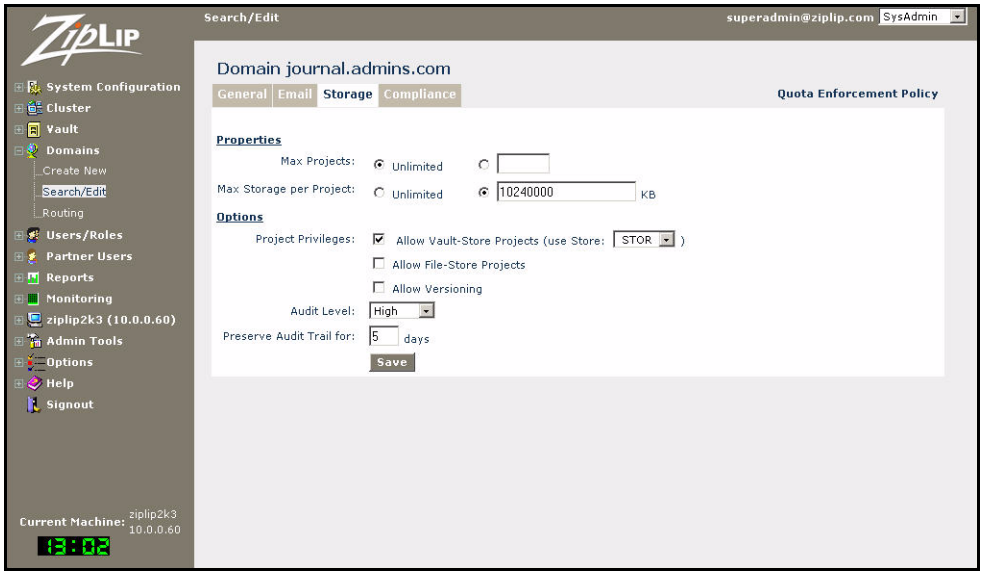



**Figure 7.9: Create Storage Domain screen**

4. Edit the following **Properties** and **Options**, as desired:
   - **Max Projects** – Select **Unlimited** to allow an unlimited number of storage accounts, or select the other box and enter the maximum number of storage accounts to allow in this domain.
   - **Max Storage per Project** – Select **Unlimited** to allow an unlimited amount of storage per account, or select the other box and enter the maximum storage per account in KB for this domain.
   - **Project Privileges**
     - **Allow Vault-Store Projects** – Check if you want to create a virtual file server. If you check this box, use the pull-down menu to select a default **Store** associated with this storage domain.
     - **Allow File-Store Projects** – Check to allow mapping of an existing file hierarchy residing on another server.
     - **Allow Versioning** – Check to allow ZipLip to set and increment version numbers.
   - **Audit Level** – Use the pull-down menu to select an audit level. Note that using a higher audit level consumes database space and makes subsequent queries for audit slower.
   - **Preserve Audit Trail for** – Enter the number of days to preserve the audit trail.
5. Click **Save** to save your changes.

## Creating and Editing a Compliance Domain

To create a Compliance domain:

1. In the **Domain Search results** screen, click on the name of the domain you want to edit. The General Domain Properties screen appears as shown in Figure 7.6 on page 70.
2. Click the **Compliance** tab. A screen appears showing the Compliance domain for this domain or, if there is none, offers you the chance to **Create** one.

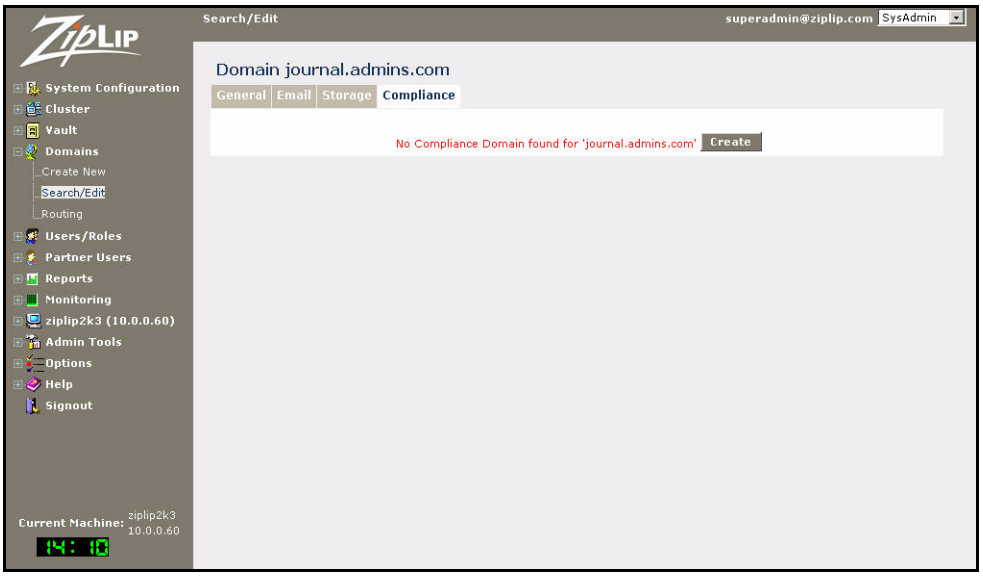



**Figure 7.10: Create Compliance Domain**

3. Click **Create**. This creates the Compliance domain.

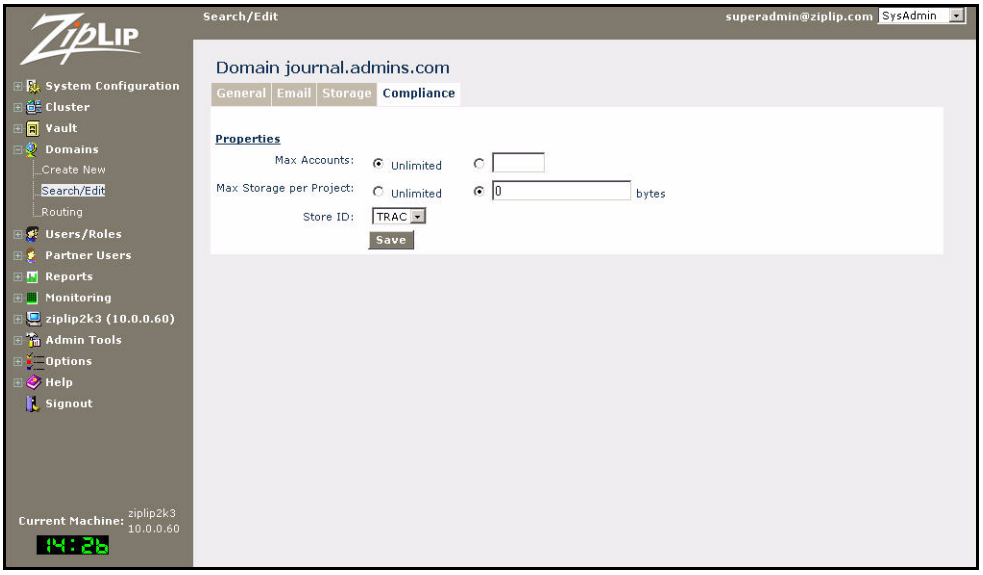



**Figure 7.11: Compliance Domain Properties sheet**

4. Edit the following **Properties**, as desired:
   - **Max Accounts** – Select **Unlimited** to allow an unlimited number of Compliance accounts, or select the other box and enter the maximum number of Compliance accounts to allow in this domain.
   - **Max Storage per Project** – Select **Unlimited** to allow an unlimited amount of storage per Compliance account, or select the other box and enter the maximum storage per Compliance account in KB for this domain.
   - **Store ID** – Use the pull-down menu to select the message store. To create additional stores, use the **Vault** function in the left menu.
5. Click **Save** to save your changes.

### Administering Domain-Level Settings (Postmaster Console)

To administer domain-level settings:

1. In the **Domain Search results** screen, click on the name of the domain you want to administer. The General Domain Properties screen appears as shown in Figure 7.6 on page 70.
2. Click the **Launch Poastmaster** link in the upper right corner of the pane. The Postmaster application is launched in a new window.

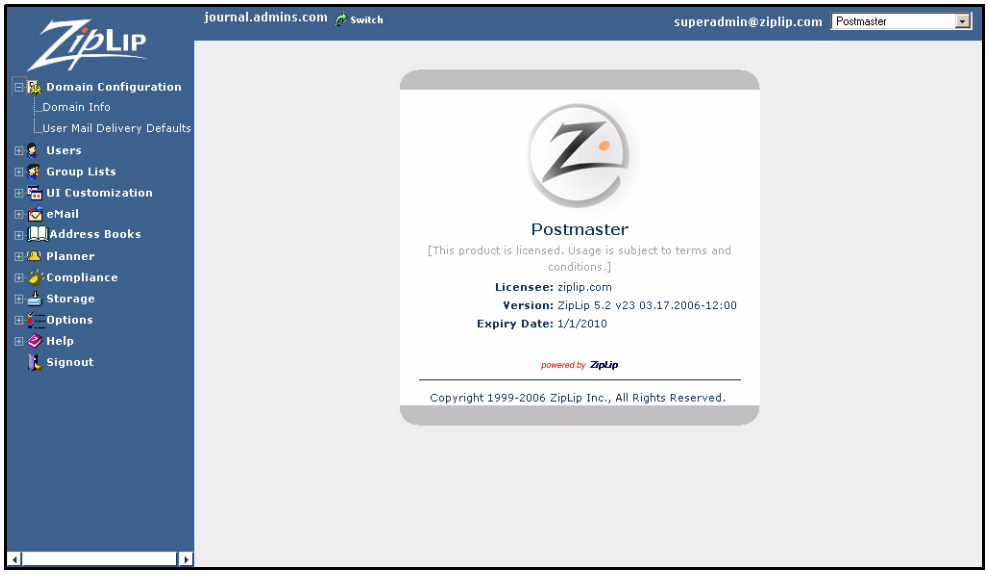



**Figure 7.12: Postmaster Application Welcome screen**

## Domain Routing

This section discusses the tasks involved with domain routing.

### Adding Domain Routing

Follow these directions to add domain routing.

1. Select **Domains** in the left menu of the SysAdmin application.
2. Under **Domains**, select **Routing**. This opens a screen where you can search for domains for which to show routing as shown in Figure 7.13.

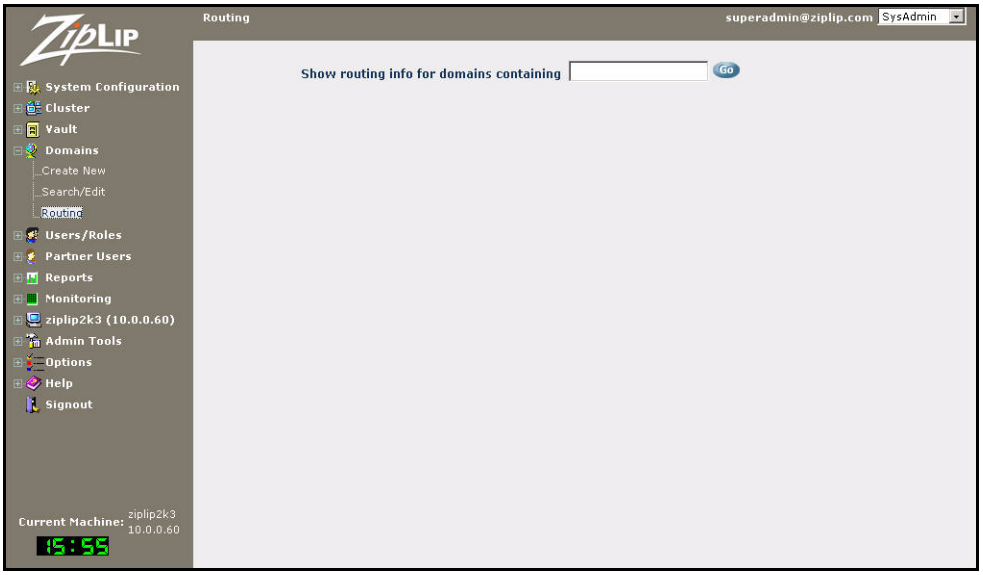



**Figure 7.13: Search for routing in domains**

3. Enter text from the name of the domain for which you are searching, or leave blank to return all domains.
4. Click **Go** or press the Enter key. A list of domains containing the search string (or all domains) is returned similar to the screen shown in Figure 7.5.

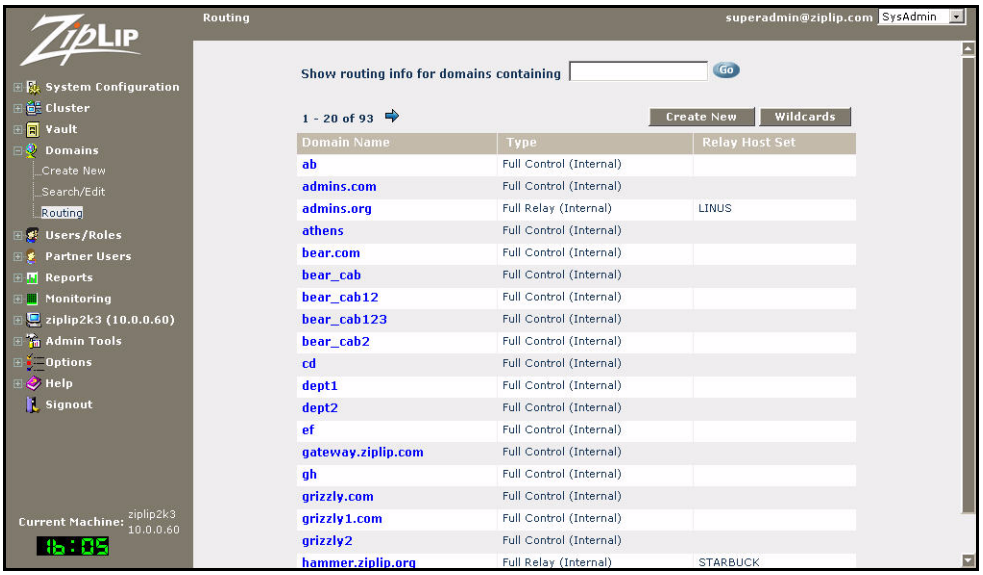



**Figure 7.14: List of Domains for Routing**

5. Click the **Create New** button in the upper right corner of the pane. A screen appears where you can enter information about routing records.

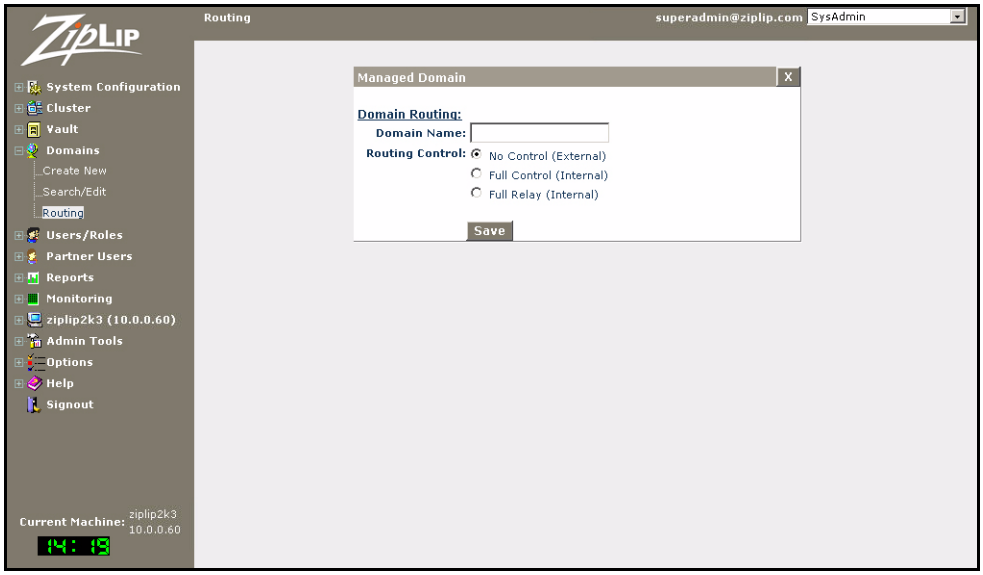



**Figure 7.15: Add Routing Record for a domain**

6. In the **Domain Name** field, enter the domain name for which you want to create a routing record.
7. Select the type of control for this domain:
   - **No Control (External)** – Give no control.
   - **Full Control (Internal)** – Give full control.
   - **Full Relay (Internal)** – Relay control. If you select **Full Relay**, use the pull-down menu that appears to select an **Internal Relay Host Set**.
8. Click **Save** to save the domain routing record, then click the “x” in the upper right corner to return to the list of domains for routing.

## Editing Domain Routing

To edit domain routing:

1. Select **Domains** in the left menu.
2. Under Domains, select **Routing**. This opens a screen where you can search for domains for which to show routing as shown in Figure 7.13 on page 76.
3. Click **Go** or press the Enter key. A list of domains containing the search string (or all domains) is returned similar to the screen shown in Figure 7.5 on page 69.
4. Click on the the domain name for which you want to change the routing information.

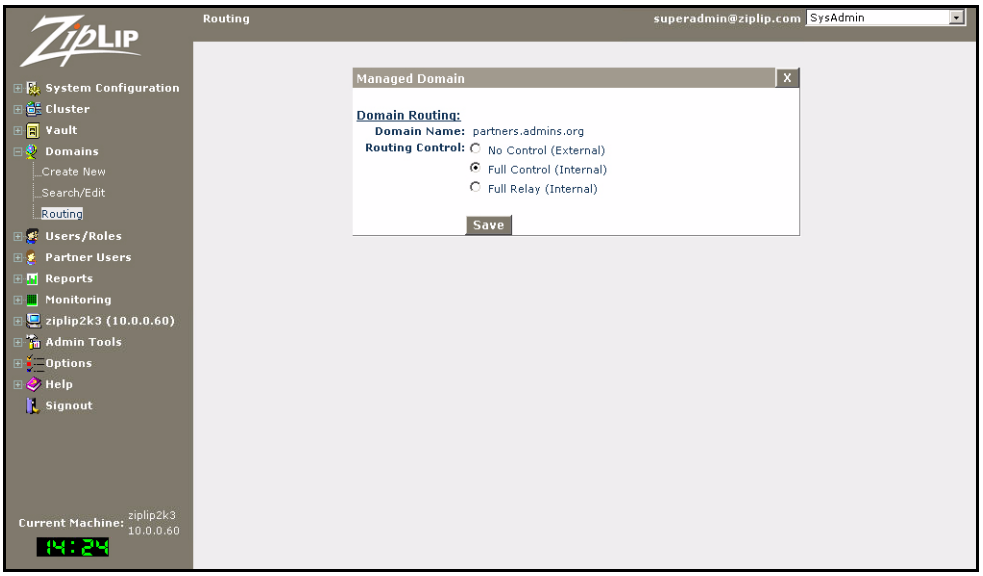



**Figure 7.16: Edit Routing Records pane**

5. Edit the following parameters, as desired:
   - In the **Domain Name** field, change the domain name for which you want to create a routing record.
   - Select the type of control for this domain:
     - **No Control (External)** – Give no control.
     - **Full Control (Internal)** – Give full control.
     - **Full Relay (Internal)** – Relay control. If you select **Full Relay**, use the pull-down menu that appears to select an **Internal Relay Host Set**.
6. Click **Save** to save the domain routing record, then click the “x” in the upper right corner to return to the list of domains for routing.

Chapter 8

# Vault Store Fundamentals

ZipLip applications require the storage and retrieval of large numbers of files. The ZipLip Vault Store is ZipLip's answer to widespread, efficient and scalable management of storage.

The Vault virtualizes disparate storage spaces in forms of hard disks or NAS or SAN storage into a single flat space so data or files can be stored across different disks and storage devices and have the application manage its use of space.

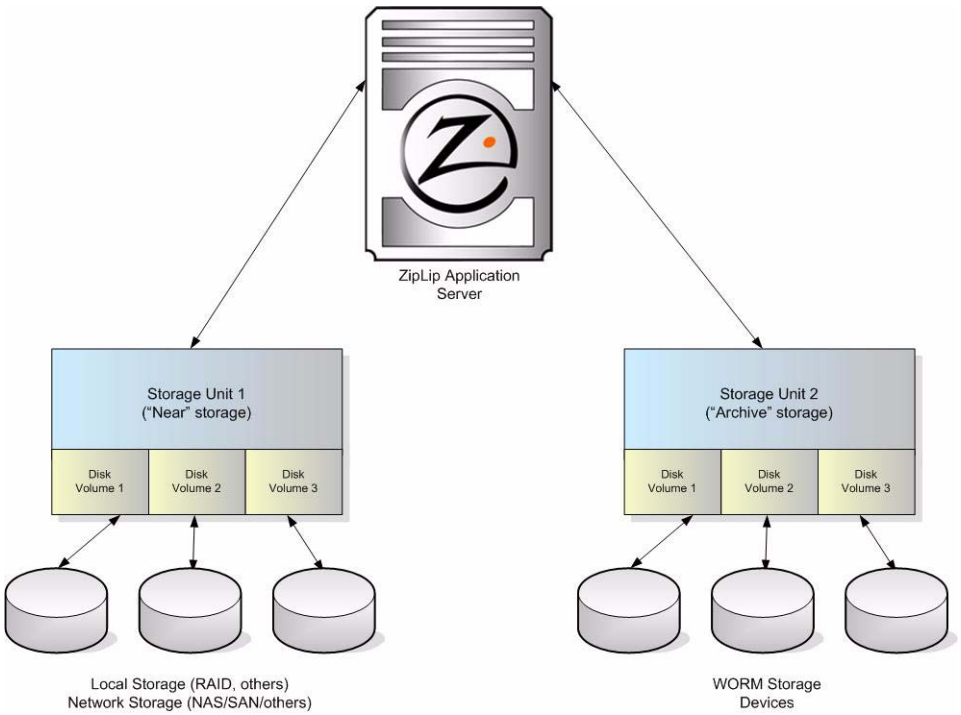



**Figure 8.1: ZipLip Vault Architecture**

There are two concepts used in the Vault: disk volume and storage unit.

The *disk volume* is the lower-level logical unit that is closely tied to the physical storage. In the case of disk stores such as RAID, NAS, or SAN, this signifies a physical directory on the disk. The disk volume has a name, an internally generated short name, and data properties such as root path for the physical directory and the alternate root path for failover. In addition, a disk volume can be writable, in which case new data can be written to it, whereas readable disk volumes are used for read only. The disk volume is represented as a record in the `DiskVolume` table.

A disk volume typically denotes a physical directory within a disk. This is the directory the ZipLip Platform manages. It typically creates around 25 directories and stores data in these directories.

A *storage unit* is a collection of one or more disk volumes. Its purpose is to provide a logical name for the collection of disk volumes or disks it manages. A storage unit is a logical unit of the vault at which the application layer interacts. All applications write to a particular storage unit at any given time. The storage unit has a name, an internally generated short name, a type, and data properties for encryption, compression, partitioning, and replication. The storage unit data is represented as a record in the `DiskStorageUnit` table. The **SysAdmin** application enables creation of storage units.

An application points to a file within the storage unit's name, and it is up to the storage unit to retrieve the file depending on which storage volume it resides. The storage unit controls all the logic of distributing and load balancing the filesystem; these operations are transparent to the calling application. The storage unit also controls whether the stored data is encrypted or compressed.

There are two kinds of disk volumes in each storage unit: Live and Not Live. There can be only one live disk volume within a storage unit. All file creation operations performed on the storage unit automatically go to the live volume. This is used mainly to aid in the incremental backup. As new disk volumes are regularly added, the old live disk volumes are set to non-live and ultimately can be backed up to media because there are no changes made on the non-live storage volumes.

ZipLip comes with the following default storage units:

| Storage Unit | Purpose |
|---|---|
| suresource | Used for system resources such as attachments and logs. |
| susecureResource | Used for system resources such as attachments and logs in a secure environment. |
| sustaging | Used for the temporary database queue. |
| suzlsecure | Used for secure e-mail messages. |
| suzlregular | Used for standard e-mail messages. |
| susearch | Used for Lucene search segments and indexes. |
| sustoresecure | Used for secure file storage. |
| sustoreregular | Used for standard file storage. |
| suzlcomplianceSecure | Used to store annotations of secure messages in Compliance. |
| suzlcomplianceRegular | Used to store annotations of messages in Compliance. |
| suzlreport | Used for reports. |

Each storage unit is typically associated with an application's functionality. The core applications require the following storage units:

- **Resource Storage Unit** – All custom logos, customs message templates, and other resources are stored here rather than on a secure storage unit.
- **Report Storage Unit** – This is used to store system-generated reports. Depending on the preference, regular or secure storage units are used.

## Messaging Application-Related Storage Unit

The messaging application has a secure storage unit and a set of message stores. Each Message Store has a set of storage units:

**Staging Storage Unit** – This Storage unit is used by the MTA to stage e-mail messages to be processed. This storage unit is considered to be transient; other applications may also use it to store its transient files. For example, Web mail uses this staging storage unit to store uploaded attachments before assembling an outgoing message.

**Regular Storage Unit** – This storage unit is used to store regular user e-mail messages. Depending on policy, this storage unit can be made secure or insecure.

**Secure Storage Unit** – This storage unit is used to store users' secure e-mail messages. This storage unit typically uses the Secure type.

**Search Storage Unit** – This storage unit is used by the Search component to store indexed e-mail messages. Use only regular storage units here.

## Virtual Storage Application-Related Storage Unit

The virtual application has the following set of storage units:

**Regular Storage Unit** – This is used to store insecure project files. Typically this uses a regular storage unit.

**Secure Storage Unit** – This is used to store secure project files. Use a Secure storage unit here.

The vault provides scalable, flexible and efficient framework to store unstructured content such as e-mail, files, and tracker items. Fundamentally, the *vault* is a virtual layer with the metadata written to the database and the actual file written to the file system. The vault also provides several storage virtualization benefits at the application layer, including:

- Unlimited storage that can be comprised of several different physical disk storage units.
- A single integration point that supports specialized storage systems, such as EMC Centera and HSM storage systems, such as Q-Star and Bridgehead, and other industry standard vaults, such as IBM Content Manager.
- Transparent encryption and compression of data.
- Storing files across many directories and filesystems simultaneously and enabling the server to overcome limitations of an operating system or filesystem.
- Partitioning based on date that enables physical separation of data. This enables incremental backup and replication.
- Easy management of data.

The vault virtualization is enabled by three major concepts: Storage Unit, Disk Volume, and Vault Item.

## Partitioning

*Partitioning* allows data to be grouped by time. Common means of partitioning include hour, day, week, and month. This allows separation of data for backup purposes. Partitioning changes

the directory used for storage within a disk volume. More frequent partitioning results in more directories with fewer files in a given partition.

## Vault Item

The *vault item* represents the actual unstructured data and is represented by a `VaultItem` record. Typically, the number of records in the vault item are in the same order as the number of e-mail messages and files stored in the system and consequently can have a very high row count. The `VaultItem` record is represented by a unique string identifier and applications typically store it along with a key to access the data. The vault record can carry up to two virtual locations, and each virtual location has the following structure:

```
suShortName/dvShortName/partition/partition_type/sub-partition/rel_path/
rel_path
```

In most cases, the vault item record only has one primary virtual location, and this is converted to a physical path.

## Storage Unit Types

ZipLip supports storage units that can be broadly classified into two categories:

- Generic filesystem-based storage units including SAN, NAS, RAID, and JBOD, and HSM software with filesystem views such as Q-Star and Legato Disk Extender.
- Third-party storage units such as EMC Centera, IBM Content Manager, and BridgeHead.

### Filesystem-Based Storage Units

Filesystem-based storage units, also called disk-based storage units, are the most commonly used vault type. The unit presents itself as a standard filesystem and the server has complete read and write privileges. The disk volume corresponding to this storage type stores the `root` path. The vault creates as many subdirectories as required. In this scheme, a new directory is created for each partition. For example, if the partition type is `month`, a new directory is created every month, and data created for those months is written to that directory or its subdirectory. When a new vault item is created, the right partition is chosen and, based on the disk volume setting, an additional two subdirectories are chosen. The filename is the same as the `vaultitem` identifier.

For example, the identifier:

```
GFOJAMEDAPD0HUIPNUJ1OBCIIMEOMBNSAIKHJZAE
```

could have the virtual location:

```
H/H/200507/8/4
```

### Third-Party Storage Units

Third-party storage units, also known as content-based storage units, are most commonly used for Unified Archival Admin and Compliance requirements. The unit requires the use of third-party libraries that access a remote server. The minimum requirements for such a library are to:

- write a file or stream (returning a tag)
- read a file or stream (using the tag obtained during writing)
- check a file for existence (using a tag)
- delete a file (using a tag).

Retention policies are accommodated with name and period mapping to ZipLip retention time policies. The server has complete read and write privileges. The disk volume corresponding to this storage type stores the server name and authentication parameters (username, password). The vault creates a cache for the file as required. The `root` directory for the cache is defined via the **SysAdmin** application:

1. Click the left menu item **System Configuration**, then **Registry**. In the **System Registry** pane, click **System Configuration**.
2. In the **System Configuration** pane, click **Vault Global Settings**.

The use and clean up of the directory is handled by ZipLip.

In this scheme, a new directory is created for each partition. For example, if the partition type is `month`, a new directory is created every month, and data created for those months are written to that directory or its subdirectory. When a new vault item is created, the right partition is chosen and, based on the disk volume setting, an additional two subdirectories are picked. The filename is the same as the `vaultitem` identifier.

For example, if the identifier is:

```
GFOJAMEDAPD0HUIPNUJ1OBCIIMEOMBNSAIKHJZAE
```

The two virtual locations would be:

```
H/H/200507/8/4;ABMZ4FGPO3DJEeK142JKEODFW92
```

and

```
G/N/200508/12/14;91 3 ICM8 icmnlsdb11 ZL_G_N59 26
A10001001A05D28B43706B7150218 A05D28B43706B715021 14 1022
```

# Failover

To provide redundancy, vault items can be stored in both a primary and alternate or *failover* location. The following forms of failover are available.

## Internal Disk Volume

With a filesystem-based disk volume, vault items can be copied to an alternate root directory using replication. The alternate root directory has the same directory structure as the primary root directory. When this occurs, the alternate root directory can be used for failover when the primary root directory is unavailable (disk unavailable, disk replacement).

## Vault Item

Vault items can be copied to an alternate storage unit and disk volume using replication. When this occurs, the alternate location can be used for failover when the primary location is unavailable (disk unavailable, disk replacement).

## Replication

In replication, vault items are copied from filesystem-based disk volumes to any other storage unit and disk volume, including third-party based disk volumes. If the target is filesystem-based, the directory structure and file names are preserved. ZipLip requires the compression and encryption settings to match between the source and target storage unit for performance reasons.

A progress file named `zl.rep` is created in the source directory to mark which vault items have been incrementally processed. Partitions that are replicated are stored in the `VaultReplication` table. When a partition is completely processed, its state is changed so no further processing takes place.

Replication of a storage unit either operates on a complete partition (full backup) or incrementally. To ensure that all processes have finished writing to a vault item during incremental replication, only files more than two hours old are replicated.

### Methods of Replication

*Internal disk volume replication* copies directories and files from the primary root directory to an alternate root directory. This method preserves all partitioning.

*Disk volume replication* copies vault items from a source disk volume to a target disk volume. Because the write occurs at a different time than the source vault item, the partition data is lost.

### Modes of Replication

*Copy* makes a copy of the source file to the target replication storage unit and disk volume. The target location is stored in the vault item as a failover location. The target replication disk volume is marked as a mirror and may not be used as a source for replication.

*Move* makes a copy of the source file to the target replication storage unit and disk volume, then deletes the source file. The target location is stored in the vault item as the primary location.

*Delayed delete* makes a copy of the source file to the target replication storage unit and disk volume, then deletes the source file after a given time. The target location is stored in the vault item as the failover location. After the source file is deleted, the failover location is moved to the primary location.

## File Striping

To activate file striping, put multiple writable disk volumes in the same storage unit. Files are written to all writable disk volumes in round-robin fashion. This allows the administrator to place files on separate physical disks for performance.

## Configuring a SnapLock Volume for the ZipLip Server

To use a NetApp SnapLock storage unit with ZipLip you need:

- SnapLock version 7.1 or higher.
- Filer version 5.3 or higher.

You need to set up the SnapLock volume before you set up ZipLip for the SnapLock storage device. To accomplish this:

1. Connect to Filer.
2. Enable the SnapLock license. Enter:
   `license add snaplock_license_code`

   where *snaplock_license_code* is your license code for SnapLock.
3. Initialize ComplianceClock™.
   `date -c initialize`

**Note:** You can only initialize ComplianceClock for the system; make sure the clock time is set correctly. Once you have initialized ComplianceClock you can display it using the `date -c` command.

4. Create the SnapLock volume. Enter:
   `vol create volume_name -L`

   where *volume_name* is the name of your SnapLock disk volume. For example, the command:

   `vol create snaplock -L Enterprise 3`

   creates a SnapLock volume named "`snaplock`" containing three disks.
5. Set up the retention period defaults.
   - The maximum retention period is the longest allowed retention period for any files or Snapshot copies committed to WORM state on the SnapLock volume. Any file or Snapshot copy committed to WORM state with a greater retention period is automatically assigned this retention period. To set it, enter:
     `vol options volume_name snaplock_maximum_period duration`

     where *volume_name* is the name of your SnapLock disk volume and duration is the time period as an integer followed by "`d`" for days and "`y`" for years. For example, the command:
     `vol options snaplock snaplock_maximum_period 10y`

     sets the maximum retention period for volume `snaplock` to ten years.
   - The minimum retention period is the shortest allowed retention period for any files or Snapshot copies committed to WORM state on the SnapLock volume. Any file or Snapshot copy committed to WORM state with a lesser retention period is automatically assigned this retention period. To set it, enter:
     `vol options volume_name snaplock_minimum_period duration`

     where *volume_name* is the name of your SnapLock disk volume and *duration* is the time period as an integer followed by "`d`" for days and "`y`" for years. For example, the command:

```
vol options snaplock snaplock_minimum_period 1d
```

sets the minimum retention period for volume `snaplock` to one day.

- The default retention period is the retention period assigned to any files or Snapshot copies committed to WORM state on the SnapLock volume without an explicitly-assigned retention period. To set it, enter:

  `vol options volume_name snaplock_default_period duration`

  where *volume_name* is the name of your SnapLock disk volume and *duration* is the time period as an integer followed by "`d`" for days and "`y`" for years. For example, the command:

  ```
  vol options snaplock snaplock_default_period 30d
  ```

  sets the default retention period for volume `snaplock` to 30 days.

6. Create a qtree in the SnapLock volume. Enter:

   `qtree create /vol/volume_name/directory`

   where *volume_name* is the name of the SnapLock volume and *directory* is the name of the qtree directory. For example:

   ```
   qtree create /vol/snaplock/ZipLip
   ```

   creates a qtree named "`ZipLip`" in the volume "`snaplock`".

7. Share the SnapLock volume through CIFS. Enter:

   `cifs shares -add share_name filer_path`

   where *share_name* is the name of the SnapLock volume and *filer_path* is the path to the filer qtree. For example:

   ```
   cifs shares -add ZipLip /vol/snaplock/ZipLip
   ```

   generates a CIFS share named accounting based on the qtree `/vol/snaplock/ZipLip`.

## Setting Up a SnapLock Storage Unit in ZipLip

To set up a SnapLock storage unit in ZipLip:

1. Log into the ZipLip Archive application as a privileged user.

   Enter the following URL:

   `http://myzipliphost/ps/app/home.jsp?domain=mydomain.com`

   replacing *myzipliphost* with the host on which you have installed the ZipLip server and *mydomain.com* with your domain.

   Complete the following fields:

   - **Email Address** – Enter your e-mail address.
   - **Passphrase** – Enter your ZipLip password.
   - **Application** – From the pull-down menu, select **SysAdmin**.
   - **Language** – From the pull-down menu, select a language.

   Click **Login**. The SysAdmin welcome screen appears similar to the one in the following figure.

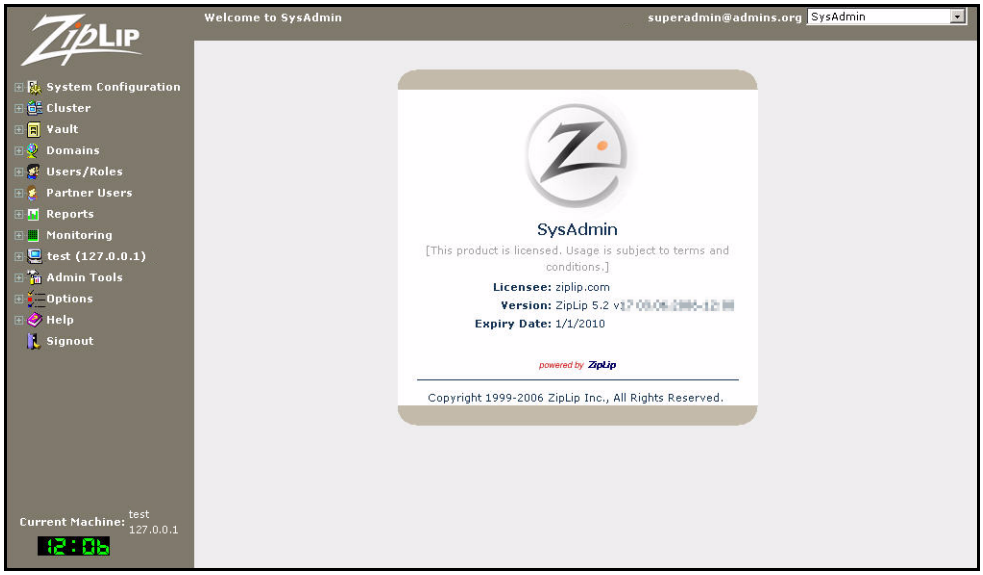



**Figure 8.2: SysAdmin welcome screen**

2. In the left menu, select **Vault**. Under **Vault** select **Storage Units**. A list of storage units available for ZipLip appears in the right pane.

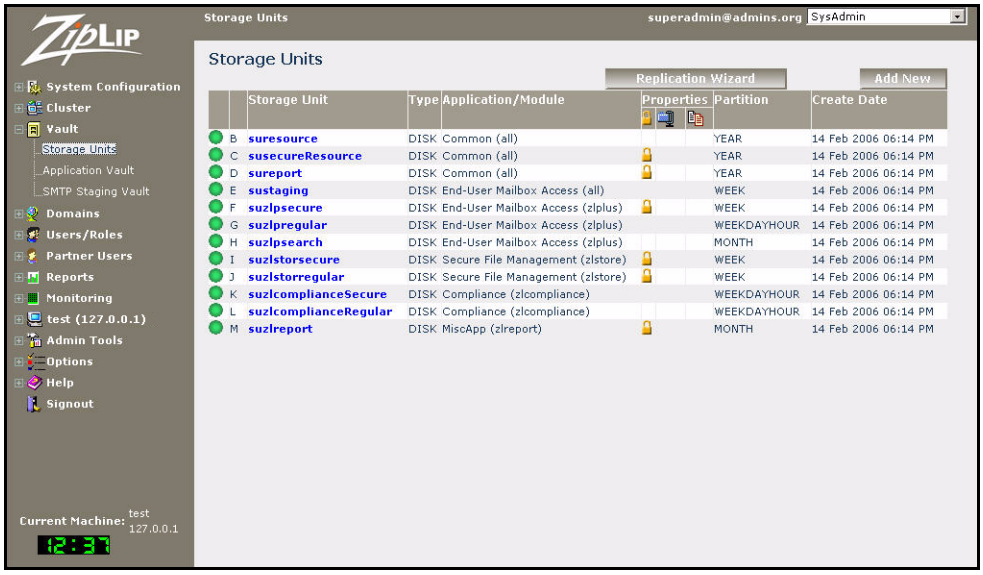



**Figure 8.3: Storage Units screen**

3. Click **Add New** to start the Storage Unit Wizard.

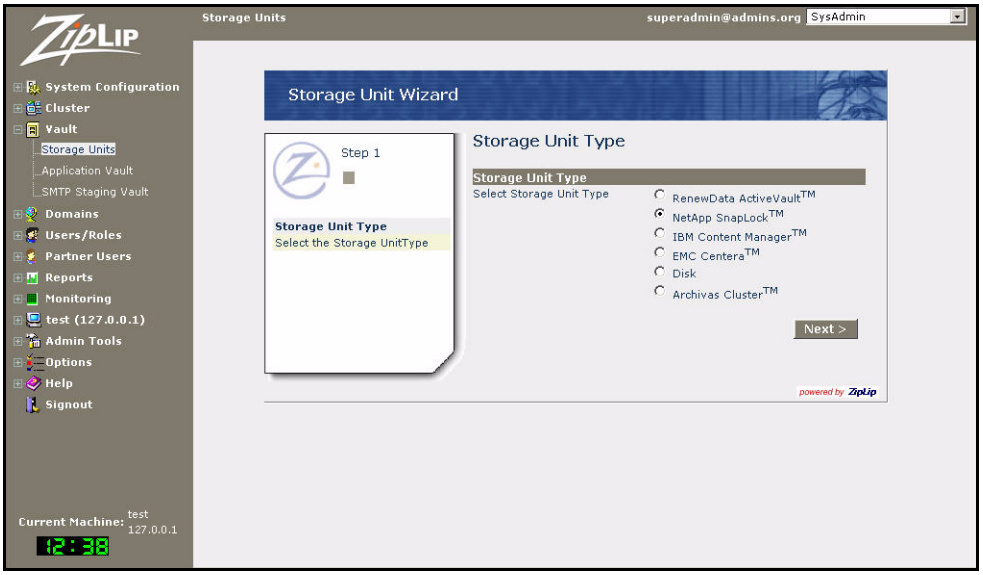



**Figure 8.4: Storage Unit Wizard – Storage Unit Type screen (SnapLock)**

4. In the Storage Unit Type page of the Storage Unit Wizard, select **NetApp SnapLock**. Click **Next** to continue.

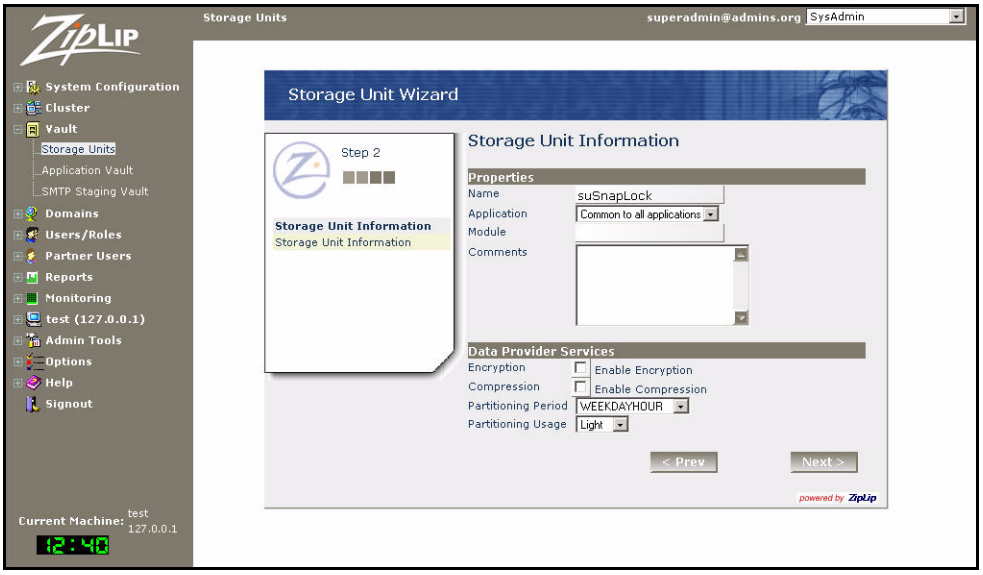



**Figure 8.5: Storage Unit Wizard – Storage Unit Information screen**

**Note:** From the **Storage Unit Wizard – Storage Unit Information** screen to the end of the wizard you can also click **Prev** to go back to the previous screen.

5. In the **Storage Unit Information** screen, complete the following information:
   - **Properties**
     - **Name** – Enter a name for the StorageUnit here. This example uses “suSnapLock”.
     - **Application** – Select the ZipLip application that uses this vault. If this vault is used by all applications, select **Common to all applications**.

- **Module** – Leave blank.
- **Comments** – Enter a description for the storage unit you are creating (optional).

- **Data Provider Services**
  - **Encryption** – Check to have this storage unit be encrypted. ZipLip recommends you leave it unchecked. If you are creating a Replication Vault, this value *must* match that of the original Vault.
  - **Compression** – Check to enable compression for this storage unit. ZipLip recommends you leave it unchecked. If you are creating a Replication Vault, this value *must* match that of the original Vault.
  - **Partitioning Period** – Use the pull-down menu to specify how often you wish to partition the storage unit. This example uses **WEEKDAYHOUR** (recommended for high-volume storage). If you are creating a Replication Vault, this value *must* match that of the original Vault.
  - **Partitioning Usage** – Use the pull-down menu to define the depth and width of the folders created. This example uses the recommended value **Light**.

Click **proceed** to continue. The **Disk Volume Information** screen appears.

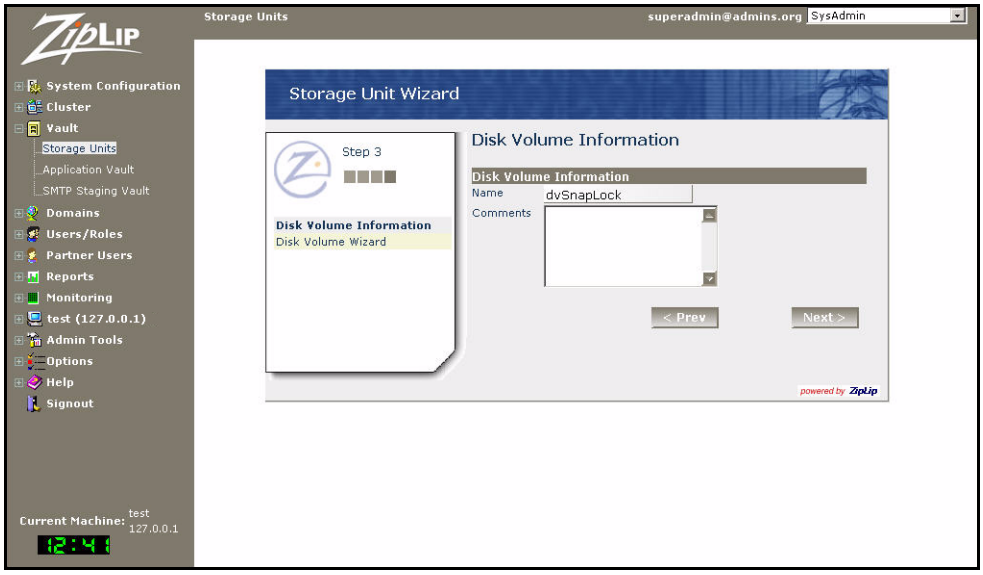



**Figure 8.6: Storage Unit Wizard – Disk Volume Information screen**

6. Enter the following disk volume information:
   - **Name** – Enter a name for identifying this disk volume. This example uses “dvSnapLock”.
   - **Comments** – (Optional) Enter a description of the volume.

   Click **Next** to continue to the **NetApp SnapLock Disk Volume Information** screen.

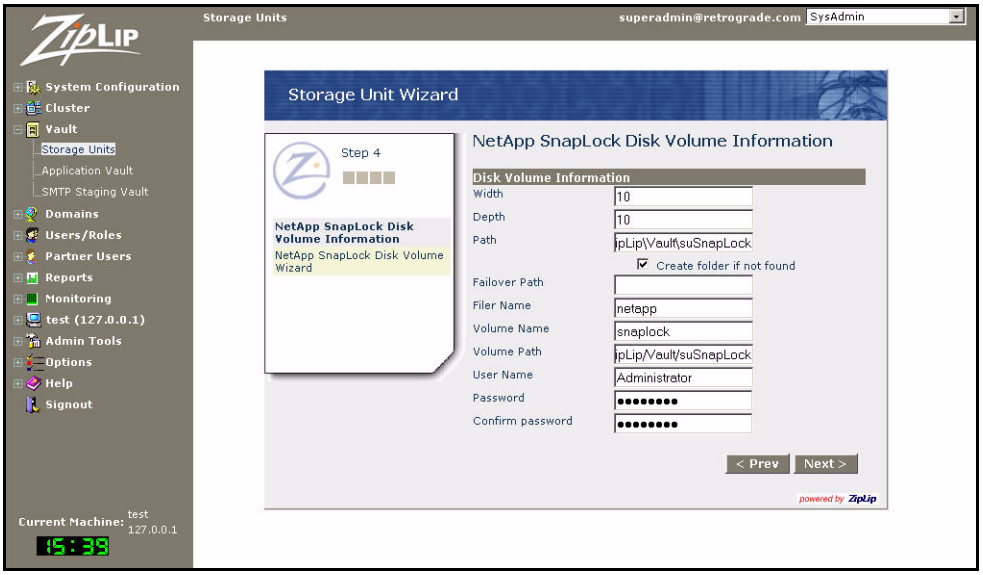



**Figure 8.7: Storage Unit Wizard – NetApp SnapLock Disk Volume Information screen**

7. Complete the following information:
   - **Width** – Enter a numeric value for the width of the disk volume. This example uses "`10`" for light use; ZipLip recommends "`25`" for heavy use.
   - **Depth** – Enter a numeric value for the depth of the disk volume. This example uses "`10`" for light use; ZipLip recommends "`25`" for heavy use.
   - **Path** – Enter the UNC path or other network-available path for the SnapLock disk volume. This example uses the path `\\netapp\ZipLip\Vault\suSnapLock`.
   - **Create folder if not found** – Check to create the path for the disk volume if it doesn't already exist.
   - **Failover Path** – Enter the failover path for the disk volume. This is used for replicated volumes or IP addresses.
   - **Filer Name** – Enter the NetApp Snaplock filer host name.
   - **Volume Name** – Enter the NetApp volume name for identifying the shared SnapLock disk volume. This example uses "`snaplock`".
   - **Volume Path** – Enter the local path on the SnapLock disk volume. This example uses the path `ZipLip/Vault/suSnapLock` on the volume `/vol/snaplock`.
   - **User Name** – Enter the user name to connect to the SnapLock disk volume.
   - **Password** – Enter the password to connect to NetApp Snaplock
   - **Confirm password** – Enter the password again.

   Click **Next** to continue to the **Confirm Wizard Submission** screen.

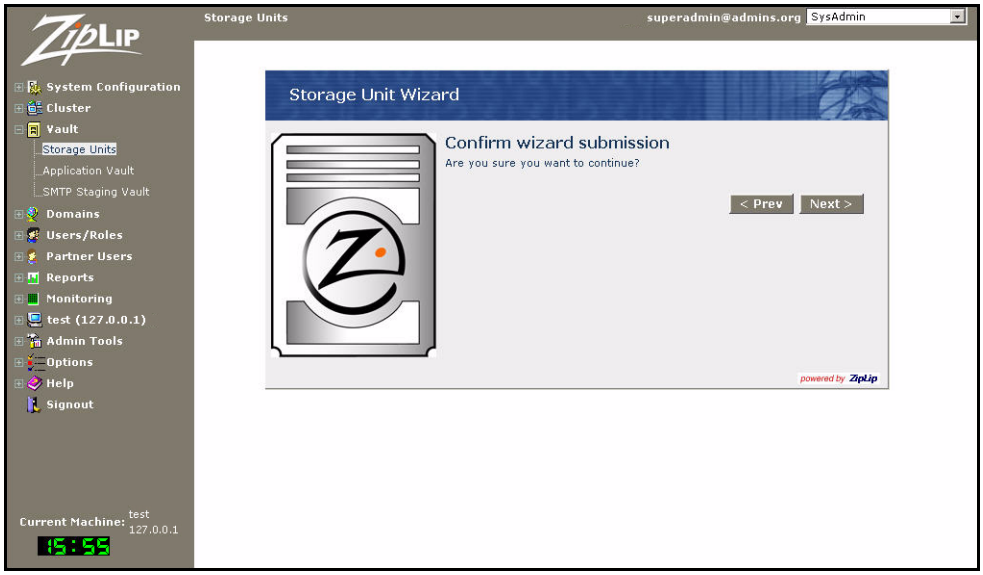



**Figure 8.8: Storage Unit Wizard – Confirm Wizard Submission screen**

8. Click **Next** to confirm your submission. In the pop-up window that appears, click **OK** to continue. The **Storage Unit Wizard – Success** screen appears.

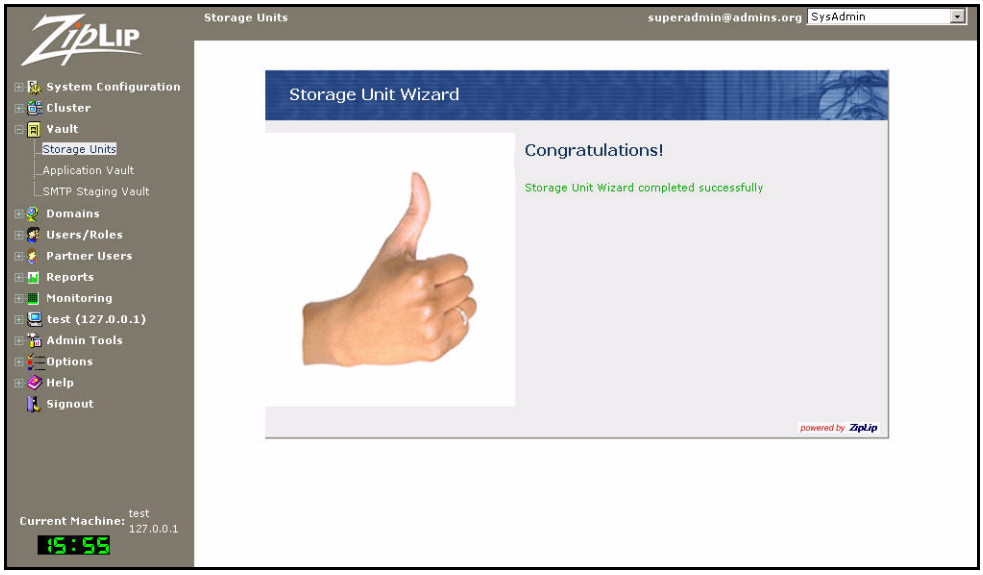



**Figure 8.9: Storage Unit Wizard – Success screen**

## Configuring the ZipLip Server for a Centera Storage Unit

To configure the ZipLip server for a Centera storage unit:

1. Locate the EMC Centera SDK for the installed platform. (This is required for shared libraries. If you have an EMC PowerLink account, use it to obtain the latest SDK.)
2. On Microsoft Windows Server, copy the following library files from the EMC Centera SDK to the `%ZIPLIP_HOME%\bin` directory:
   - `FPLibrary.dll`

- `PAI_module.dll`
- `FPParser.dll`

On Solaris, copy the following `*.so` files from the EMC Centera SDK Solaris version to the `$ZIPLIP_HOME/bin` directory:

- `libFPLibrary32.so`
- `libPAI_module32.so`
- `libFPParser32.so`

Centera provides a 32-bit as well as a 64-bit version of the files; only copy the files that apply to your architecture. Create symbolic links to these files if required.

**Note:** For more information, see the installation script provided with the Centera SDK version.

3. Collect the following data for connection:
   - Server name or IP address (ensure connectivity by using `ping`).
   - Port number (default is 3218 for TCP and UDP).
   - Application name (assigned from the EMC Centera cluster to an application using the cluster for storage for authorization purposes).
   - Application password (assigned from the EMC Centera cluster to an application using the cluster for storage for authorization purposes).

## Creating an EMC Centera Disk Volume

Several `*.dll` or `*.so` files are necessary for an EMC Centera disk volume to work with ZipLip. EMC usually supplies these files.

To create an EMC Centera disk volume in ZipLip:

1. In the ZipLip **SysAdmin** application, in the left menu, click **Vault**, then under **Vault**, click **Storage Units**. A list of storage units appears.

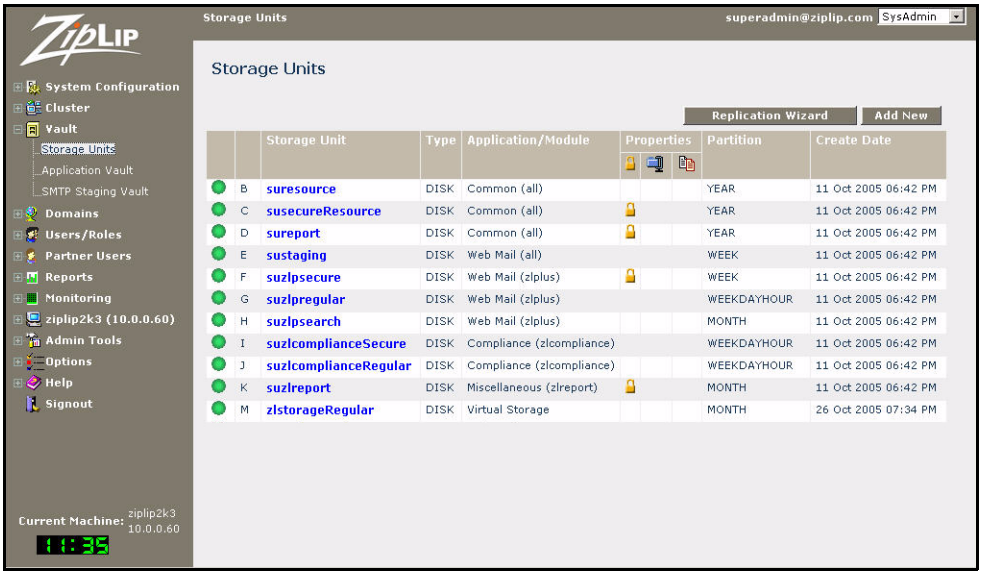



**Figure 8.10: Storage Units screen**

2. In the **Storage Units** screen, click the **Add New** button. This starts the **Storage Unit Wizard**.


**Figure 8.11: Storage Unit Wizard – Storage Unit Type screen**

3. In the **Storage Unit Wizard – Storage Unit Type** screen, select **EMC Centera**.

   Click **Next** to continue to the **Storage Unit Information** screen.

**Note:** From the **Storage Unit Wizard – Storage Unit Information** screen to the end of the wizard you can also click **Prev** to go back to the previous screen.

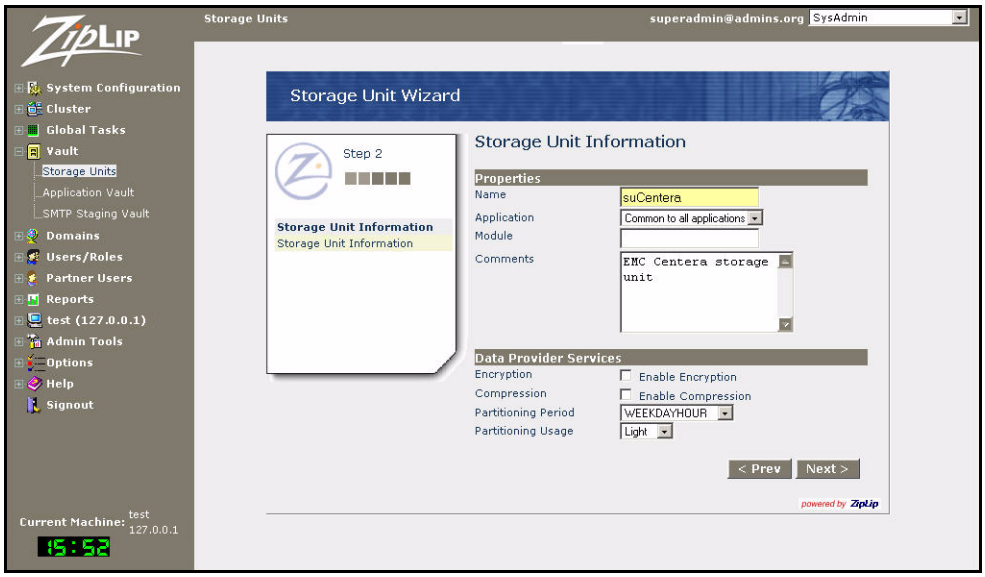



**Figure 8.12: Storage Unit Wizard – Storage Unit Information screen**

4. In the **Storage Unit Information** screen, enter the following information:
   - **Properties**
     - **Name** – Enter a name for the StorageUnit here. This example uses “suCentera”.

- **Application** – Select the ZipLip application that uses this vault. If this vault is used by all applications, select **Common to all applications**.
- **Module** – Leave blank.
- **Comments** – Enter a description for the storage unit you are creating.

▪ **Data Provider Services**

- **Encryption** – Check to have this storage unit be encrypted. ZipLip recommends you leave it unchecked. If you are creating a Replication Vault, this value *must* match that of the original Vault.
- **Compression** – Check to enable compression for this storage unit. ZipLip recommends you leave it unchecked. If you are creating a Replication Vault, this value *must* match that of the original Vault.
- **Partitioning Period** – Use the pull-down menu to specify how often you wish to partition the storage unit. This example uses **WEEKDAYHOUR**. If you are creating a Replication Vault, this value *must* match that of the original Vault. For example, if you are setting up replication from the ZLPRegular storage unit to the suCentera storage unit you are creating here, make sure the partition periods for both storage units are identical.
- **Partitioning Usage** – Use the pull-down menu to define the depth and width of the folders created. This example uses the recommended value **Light**.

Click **Next** to continue. The **Disk Volume Information** screen appears.

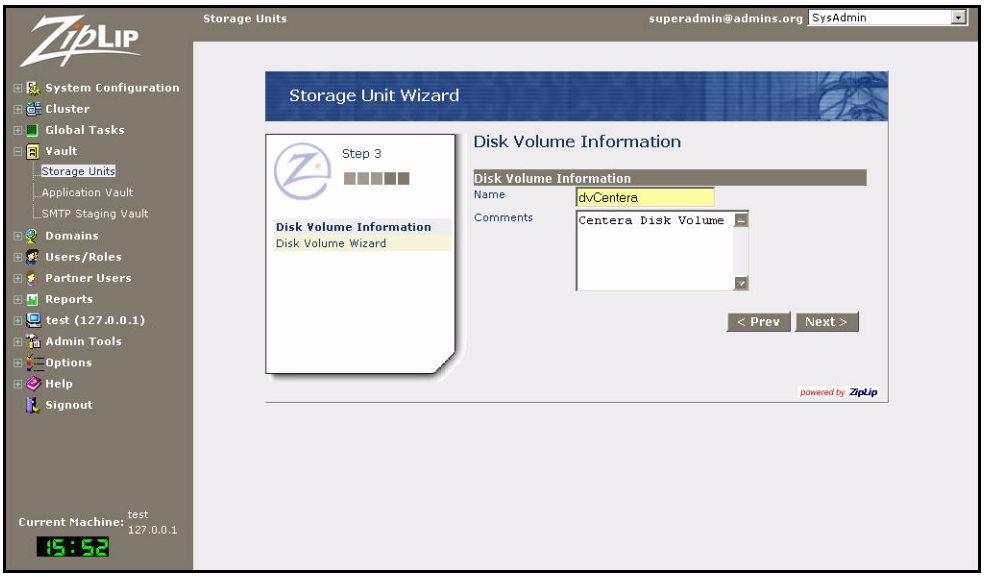



**Figure 8.13: Storage Unit Wizard – Disk Volume Information screen**

5. Enter the following disk volume information:
   - **Name** – Enter a name for identifying this disk volume. This example uses “dvCentera”.
   - **Comments** – (Optional) Enter a description of the volume.

   Click **Next** to continue to the **Centera Disk Volume Information** screen.

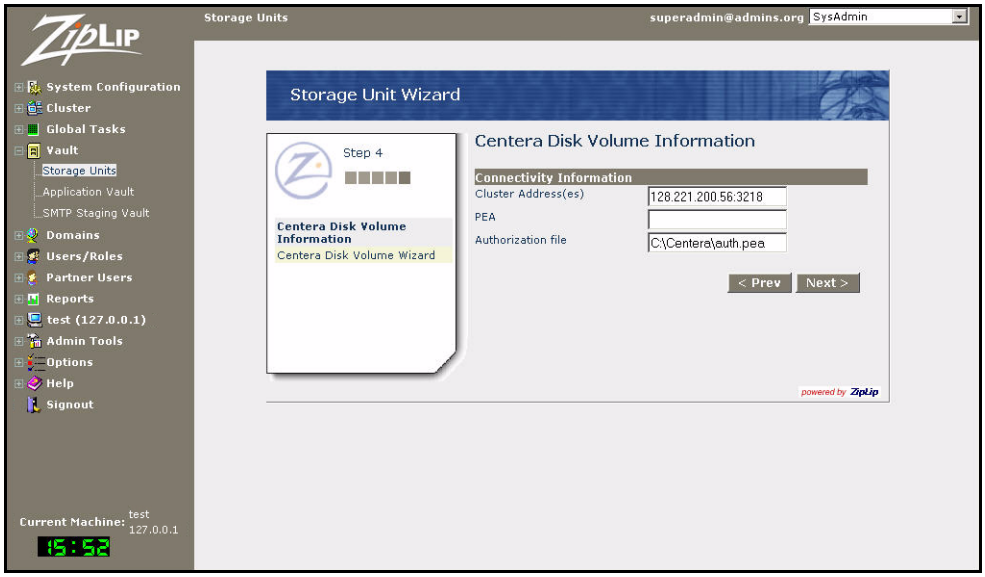



**Figure 8.14: Storage Unit Wizard – Centera Disk Volume Information screen**

Enter the following information:

- **Cluster Address(es)** – Enter a comma-separated list of cluster addresses for the EMC Centera server. If the port number is not the default, add "*:port*" to the cluster addresses.

**Note:** The host 128.221.200.56:3218 is the EMC Centera public server. Do not use in your actual production site.

- **PEA** – Enter the authentication information in the format: `name=`*`application_name`*`,secret=`*`application_password`*
- **Authorization file** – If you did not specify PEA authentication information, specify the location of the file containing a provided PEA file from the EMC Centera cluster. If you have provided PEA information, leave this field blank. Make sure the authorization file resides locally on the ZipLip server.

Click **Next** to continue to the **Centera Retention** confirmation screen.


**Figure 8.15: Storage Unit Wizard – Centera Retention confirmation screen**

6. The **Centera Retention** confirmation screen contains a warning message advising you to make sure the EMC retention periods exist and are set up correctly on the Ziplip system before continuing.

   To verify this, use Control-N to create a new browser window and either log into or use the upper right pull-down menu to switch to the **Unified Archival Admin** application. In the left menu of the **Unified Archival Admin** application, select **Policy Manager**; under **Policy Manager**, select **Compliance**.

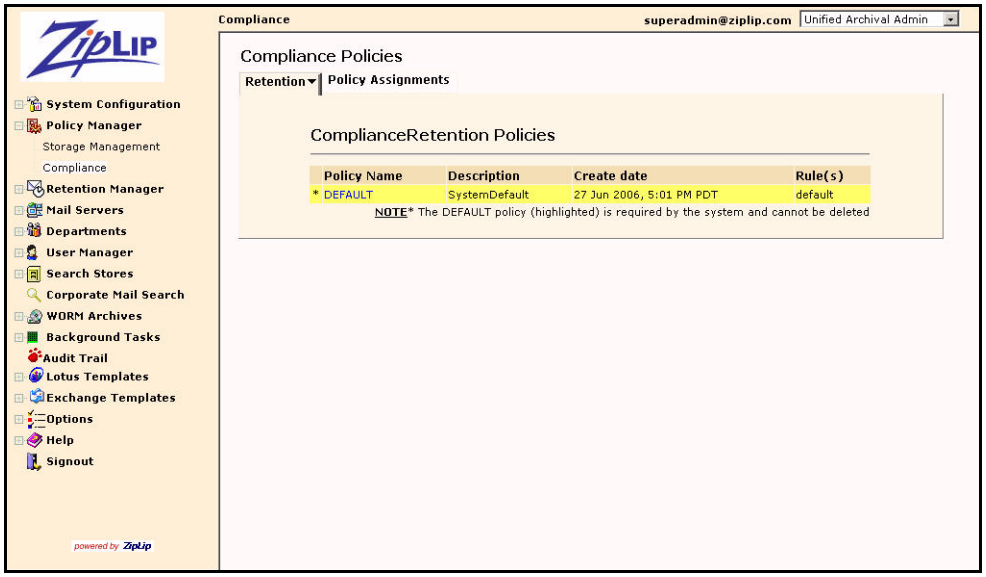



**Figure 8.16: Compliance Policies screen**

In the **Compliance Policies** screen, under the **Retention** tab, select **DEFAULT**.

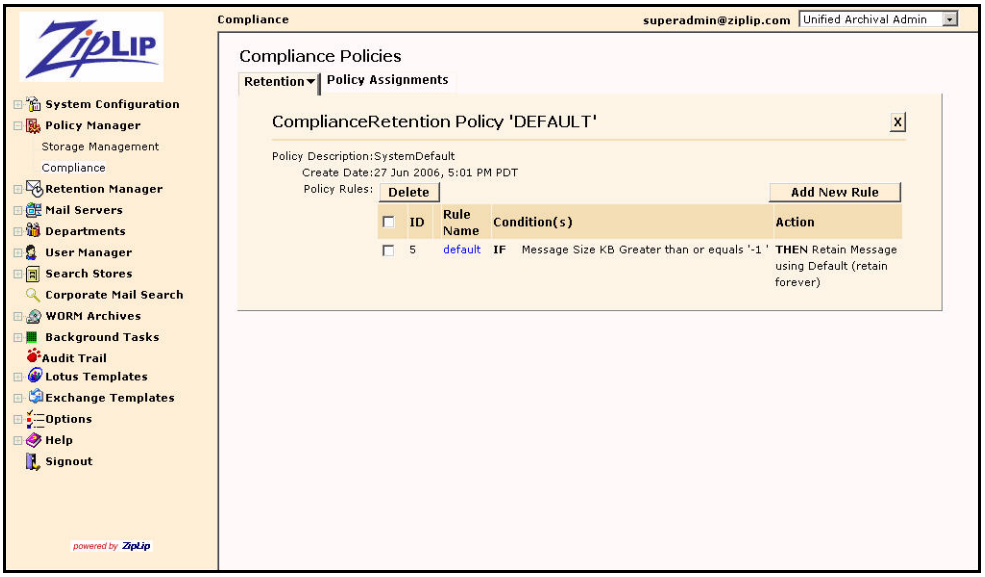



**Figure 8.17: ComplianceRetention Policy DEFAULT screen**

In the **ComplianceRetention Policy DEFAULT** screen, under the **Retention** tab, in the **Rule Name** column select **default**.

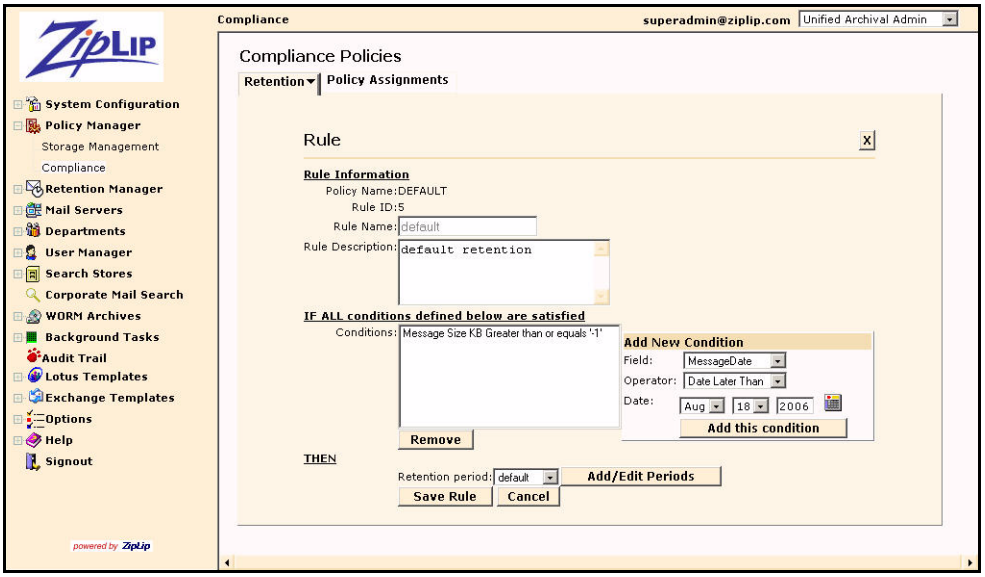



**Figure 8.18: Compliance Policy Rule screen (default)**

The value of "-1" for message size means this rule applies the **default** retention period to every message. Click **Add/Edit Periods**.

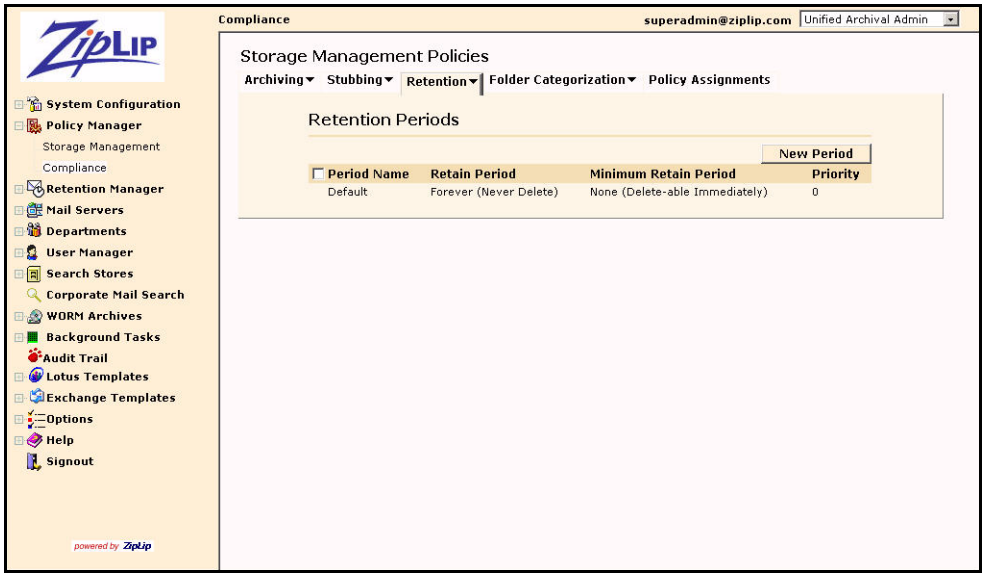



**Figure 8.19: Storage Management Policies Retention Periods tab**

In the **Storage Management Policies Retention Periods** tab, in the **Period Name** column, select **Default**.

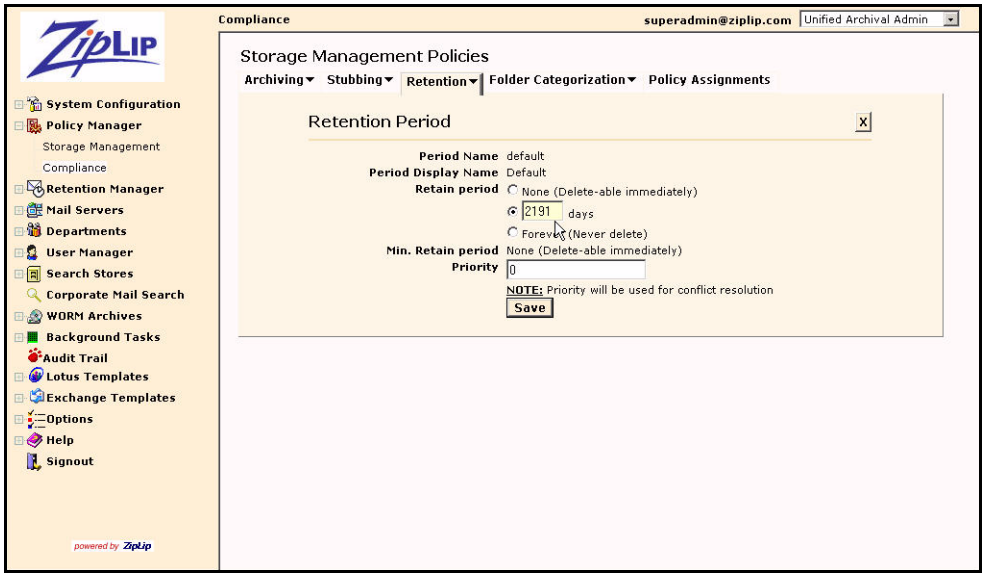



**Figure 8.20: Default Retention Period pane**

In the **Default Retention Period** pane, select the button next to **days** and enter the number of **days** you want to retain messages in the archive. This example uses (365*6)+1, or 2191 days, which is six years, assuming one leap year in the span.

**Note:** Consult your chief compliance officer before changing the retention policy in this pane.

Click **Save** to save your change.

Once you have verified the retention periods exist, in the Storage Unit Wizard, click **Next** to go to the **Confirm Wizard Submission** screen.

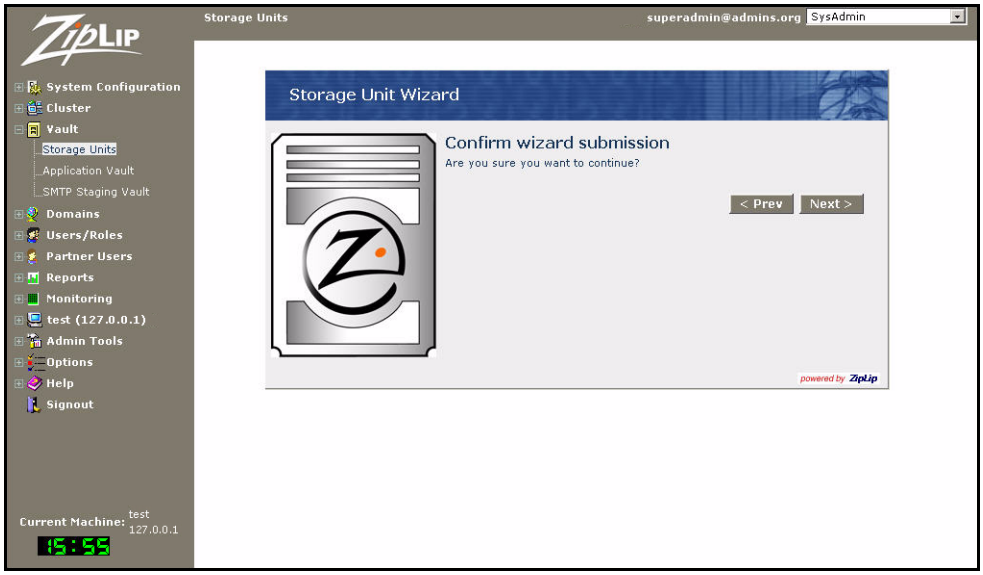



**Figure 8.21: Storage Unit Wizard – Confirm Wizard Submission screen**

7. Click **Next** to confirm your submission. In the pop-up window that appears, click **OK** to continue. The **Storage Unit Wizard – Success** screen appears.

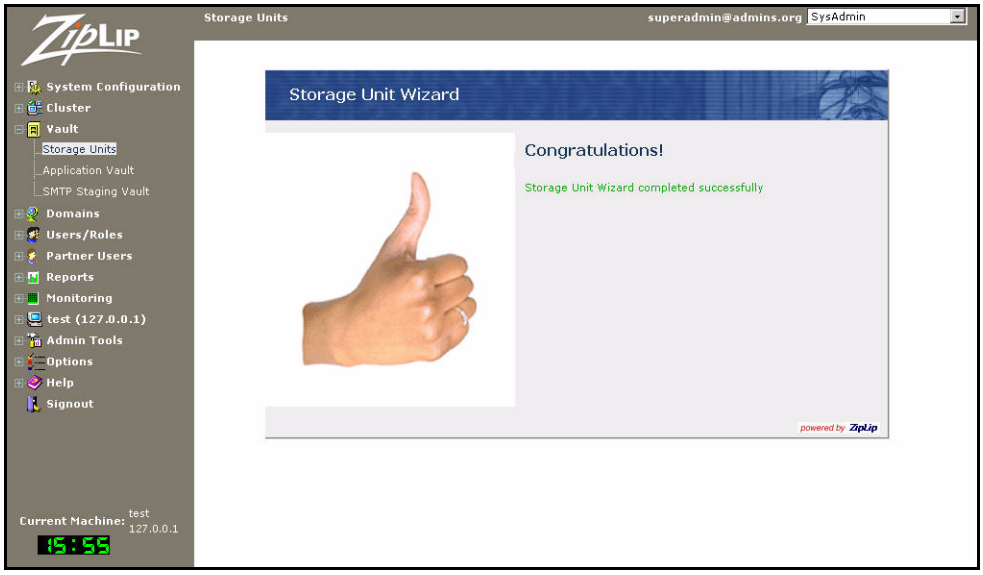



**Figure 8.22: Storage Unit Wizard – Success screen**

To verify the new EMC Centera storage unit has been created, in the left menu, click **Vault**, then under **Vault**, click **Storage Units**.

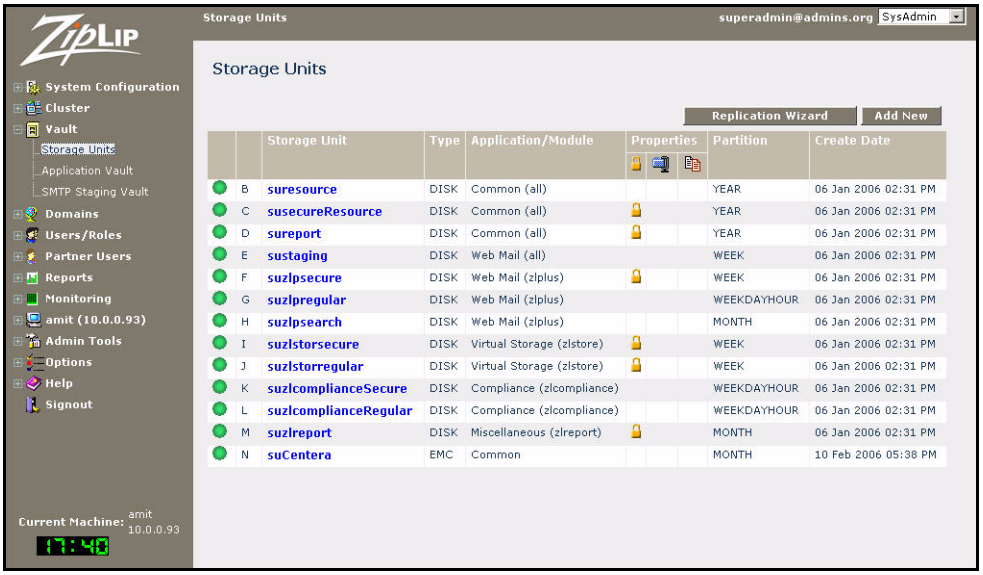



**Figure 8.23: Storage Units screen with new EMC storage unit**

The **Storage Units** screen appears, this time with the newly-created suCentera storage unit at the bottom of the list as shown in Figure 8.23.

## Replicating a ZipLip Storage Unit to a Centera Storage Unit

Follow these instructions to replicate a ZipLip storage unit (in this example, **suzlpregular**) to an EMC Centera storage unit (in this example, **suCentera**).

1. In the ZipLip **SysAdmin** application, in the left menu, click **Vault**, then under **Vault**, click **Storage Units**. A list of storage units appears (see Figure 8.3 on page 87).
2. In the **Storage Units** screen, select the source storage unit you want to replicate (in this example, **suzlpregular**).

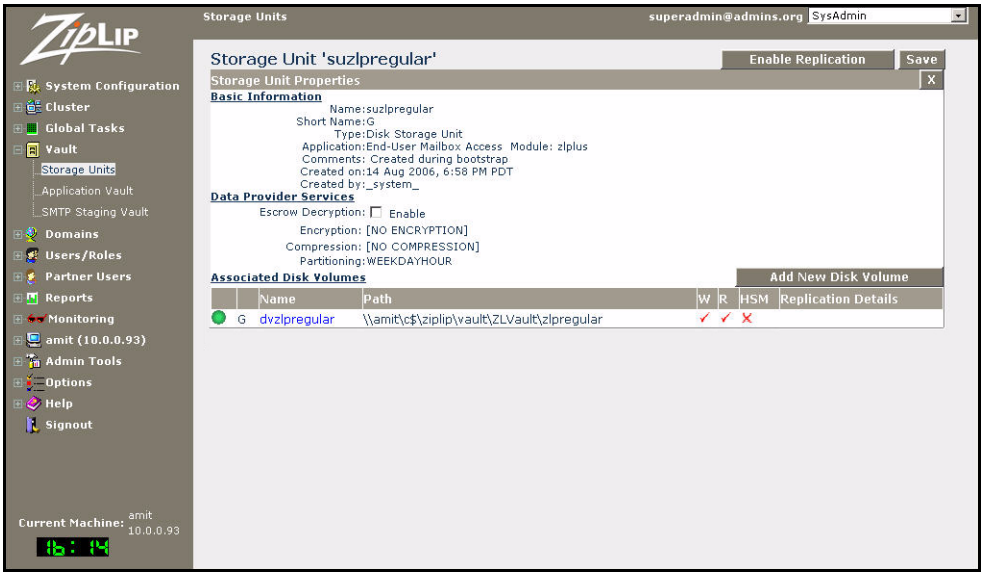



**Figure 8.24: Storage Unit Properties screen ('suzlpregular')**

3. In the **Storage Unit Properties** screen for **suzlpregular**, in the upper right corner click **Enable Replication** to start the Replication Wizard.

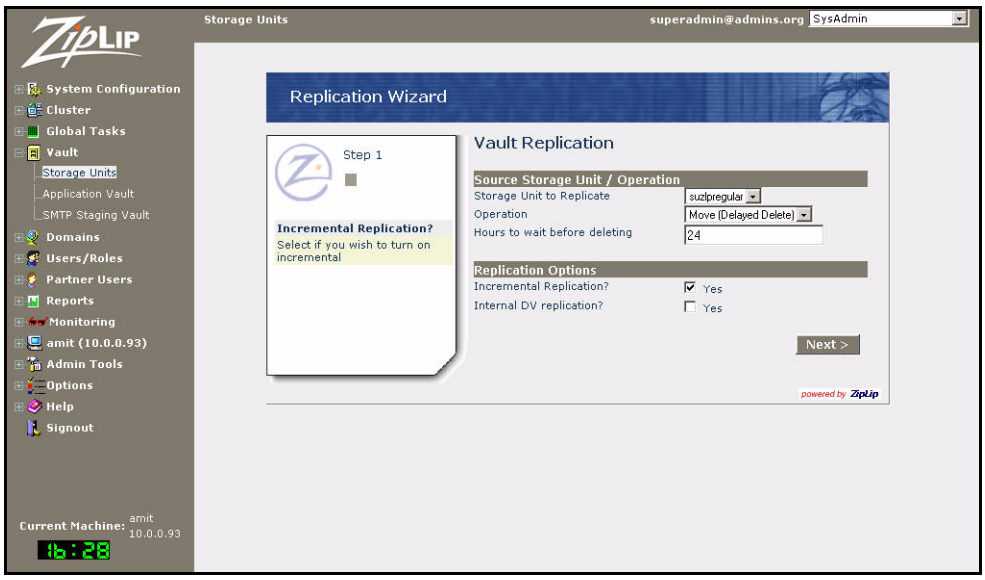



**Figure 8.25: Replication Wizard – Vault Replication screen**

4. In the **Replication Wizard – Vault Replication** screen, complete the following:
   - **Storage Unit to Replicate** – Select the source storage unit from the pull-down menu (suzlpregular).
   - **Operation** – Select **Move (Delayed Delete)** from the pull-down menu to copy messages from the source Vault to the destination Vault as soon as the Vault Replication Background task is run, but wait a specified time (set in the **Hours to wait before deleting** field) before deleting the original messages from the source Vault.
   - **Hours to wait before deleting** – Enter the number of hours to wait before deleting messages from the source Vault.
   - **Incremental Replication –** Check the Yes box**.**
   - **Internal DV replication** – Leave unchecked, as it is not applicable here.

   Click **Next** to continue.

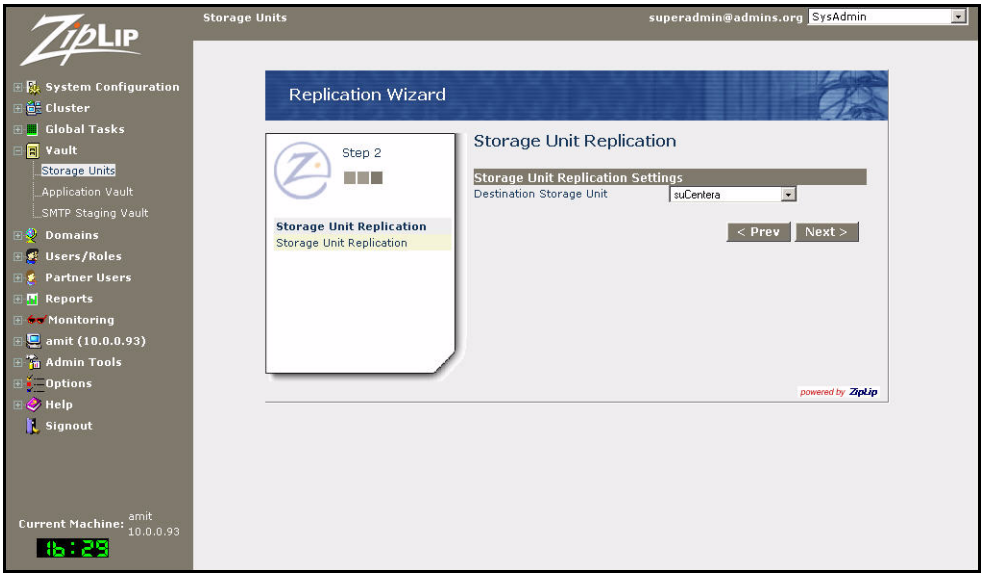



**Figure 8.26: Replication Wizard – Storage Unit Replication screen**

5. In the **Replication Wizard – Storage Unit Replication** screen, use the pull-down menu to select the destination Vault (in this example, **suCentera**). Click **Next** to continue.

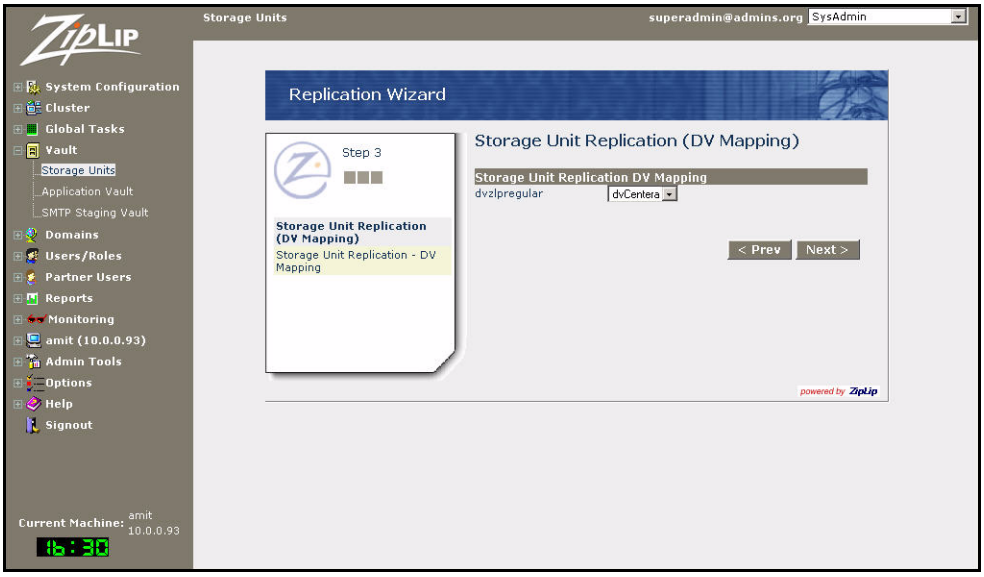



**Figure 8.27: Replication Wizard – Storage Unit Replication (DV Mapping) screen**

6. In the **Replication Wizard – Storage Unit Replication (DV Mapping)** screen, use the pull-down menu to select the destination Vault (in this example, **dvCentera**). Click **Next** to continue to the **Replication Wizard – Confirmation** screen.

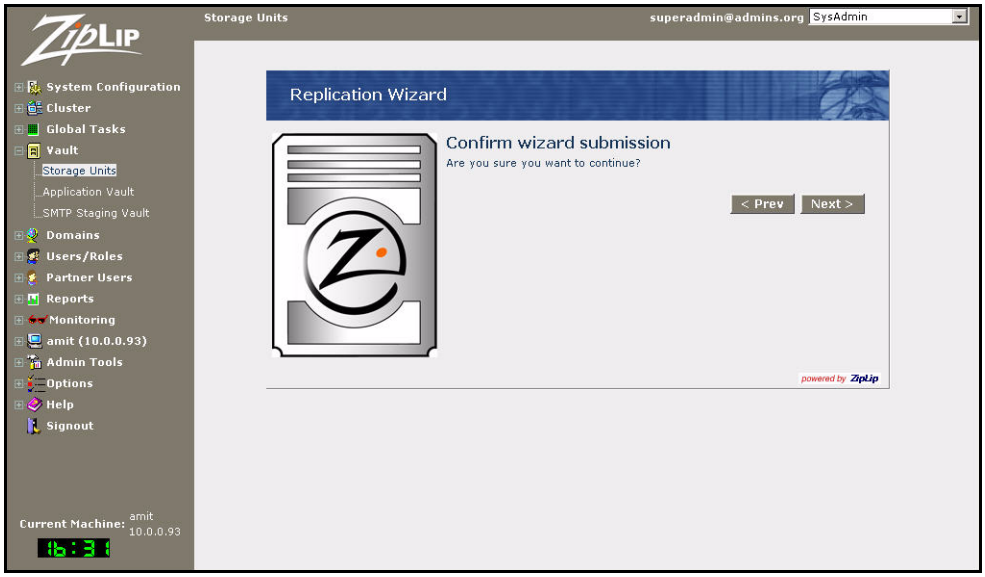



**Figure 8.28: Replication Unit Wizard – Confirmation screen**

7. Click **Next** to confirm your replication. In the pop-up window that appears, click **OK** to continue. The **Replication Wizard – Success** screen appears.

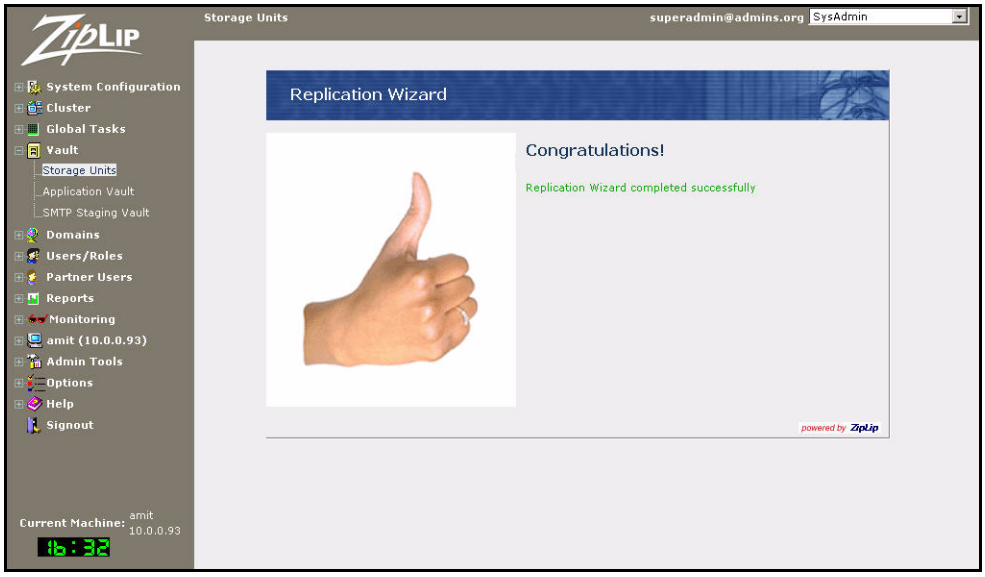



**Figure 8.29: Replication Unit Wizard – Success screen**

8. To verify the replication, in the left menu under **Vault** select **Storage Units**.

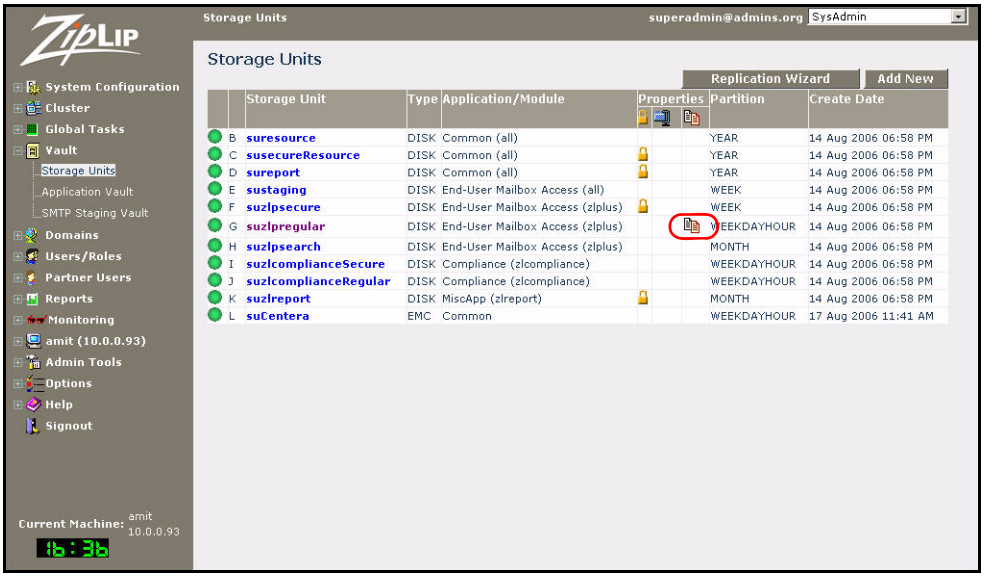



**Figure 8.30: Storage Units screen with replicated unit**

The icon next to **suzlpregular** indicates that it is a replicated storage unit.

Once you have defined the source and destination storage units for replication, you need to start the Vault Replication background task to start the replication. To accomplish this:

1. In the left menu, select **Global Tasks**. Under **Global Tasks** select **View/Schedule Tasks**.

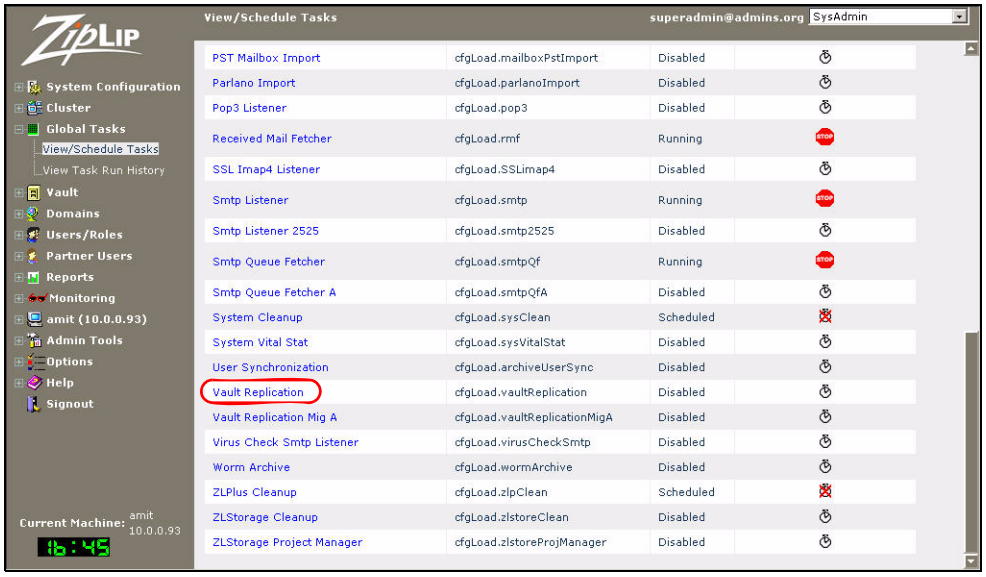



**Figure 8.31: Global Tasks list screen**

2. In the **Global Tasks** list screen, scroll down and select **Vault Replication**.

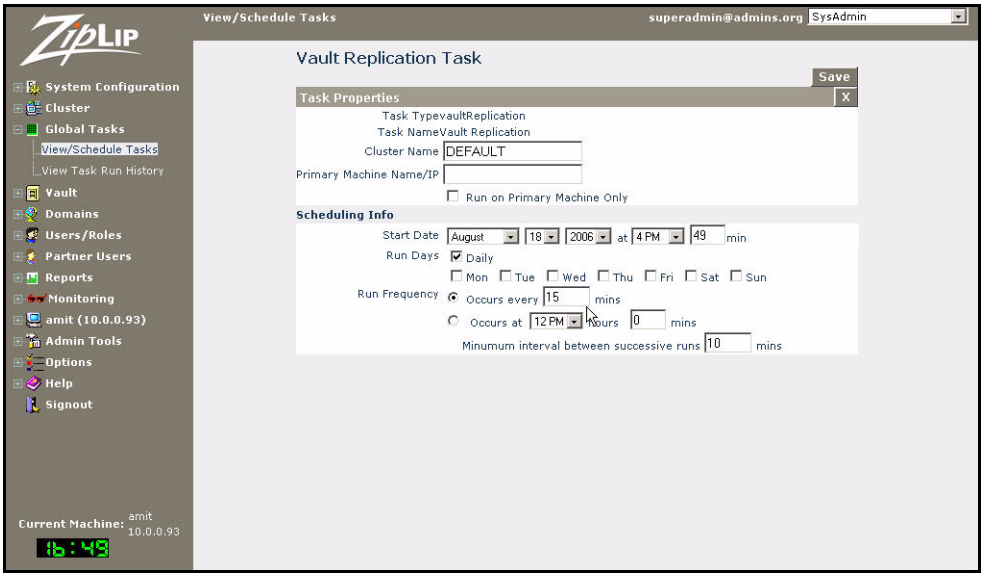



**Figure 8.32: Vault Replication Task screen**

3. In the **Vault Replication Task** pane, set the **Run Frequency** to `15` mins. In the upper right corner click **Save** to save your change and run the task.

The task now runs every 15 minutes and creates a time-stamped log file in the ZipLip `logs` directory.

## Changing the Centera Server Address in a Disk Volume

Follow these instructions to change an EMC Centera server address in a disk volume.

1. Collect the following data for connection:
   - Server name or IP address (ensure connectivity using `ping`)
   - Port number (default is 3218 for TCP and UDP)
   - Application name (assigned from the Centera cluster)
   - Application password (assigned from the Centera cluster)
2. In the **Storage Units** screen (see Figure 8.23), click on the name of the EMC Centera storage unit you want to edit. A **Storage Unit Properties** screen for the Centera storage unit appears similar to the one in Figure 8.33.


**Figure 8.33: Storage Properties Screen for an EMC Centera storage unit**

3. Click on the disk volume name (**dvCentera**). A Disk Volume Details pane appears similar to the one in Figure 8.34.

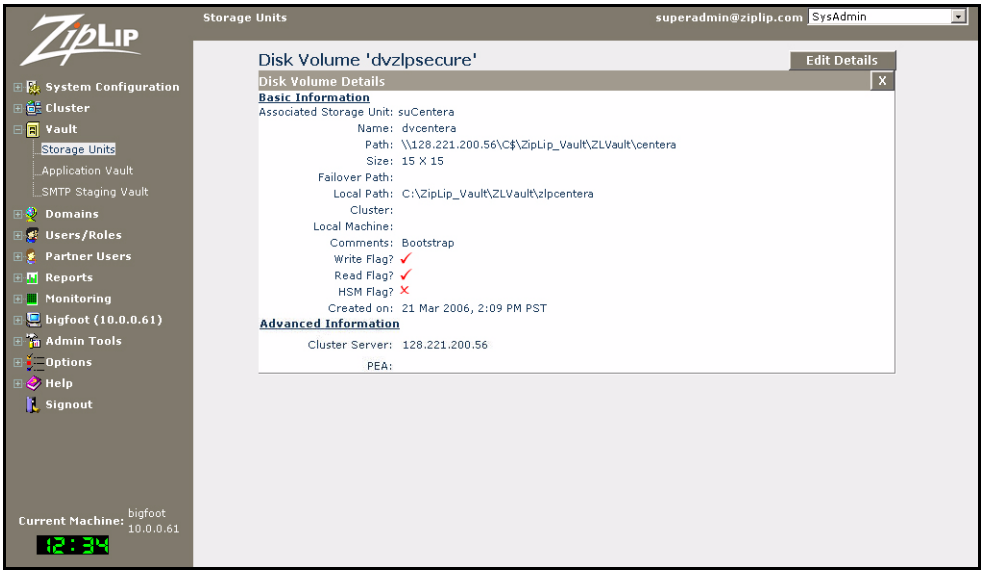



**Figure 8.34: Centera Disk Volume Details pane**

4. In the **Disk Volume Details** pane, click the **Edit Details** button in the upper right corner to start the Centera Disk Volume Wizard.

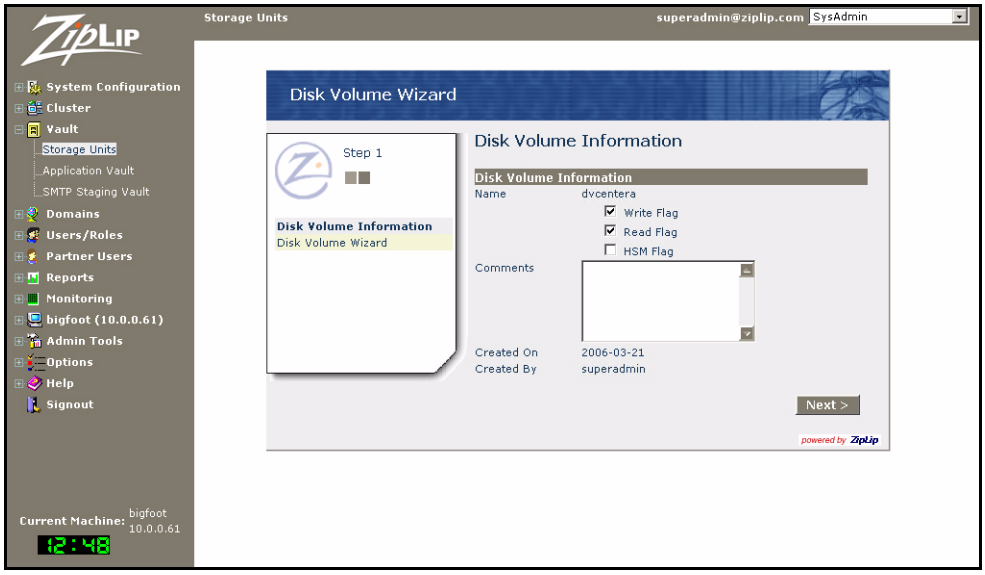



**Figure 8.35: Centera Disk Volume Wizard – Disk Volume Information screen**

5. In the **Disk Volume Information** screen, change the following as desired:
   - **Write Flag** – When checked, allows this volume to be written.
   - **Read Flag** – When checked, allows this volume to be read.
   - **HSM Flag** – When checked, use hierarchical storage management
   - **Comments** – Add or edit comments as desired.

   Click **Next** to continue to the **Connectivity Information** screen.

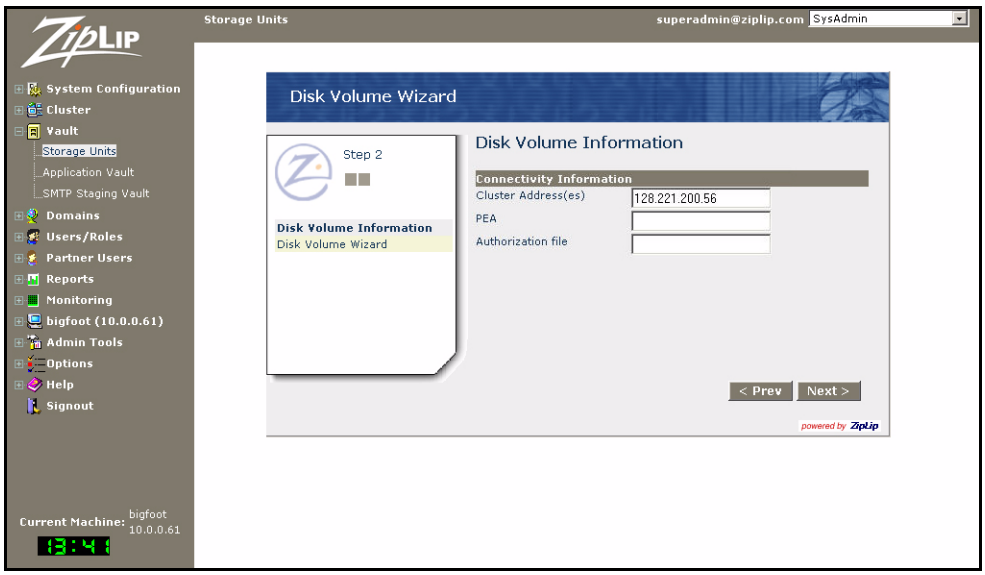



**Figure 8.36: Centera Disk Volume Wizard – Connectivity Information screen**

6. In the Connectivity Information screen, change the following as desired:
   - **Cluster Address(es)** – Enter a comma-separated list of cluster addresses for the EMC Centera server. If the port number is not the default, add ":*port*" to the cluster addresses.

**Note:** The host 128.221.200.56:3218 is the EMC Centera public server. *Do not use* in your actual production site.

- **PEA** – Enter the authentication information in the format: `name=`*`application_name`*`,secret=`*`application_password`*
- **Authorization file** – If you did not specify PEA authentication information, specify the location of the file containing a provided PEA file from the EMC Centera cluster. If you have provided PEA information, leave this field blank.

Click **Next** to continue to the **Centera Retention** confirmation screen.


**Figure 8.37: Centera Disk Volume Wizard – Centera Retention screen**

7. The **Centera Retention** confirmation screen contains a warning message advising you to make sure the EMC retention periods exist and are set up correctly on the Ziplip system before continuing.

   Once you have verified the retention periods exist, back in the Disk Volume Creation Wizard, click **Next** to go to the **Confirm Wizard Submission** screen.

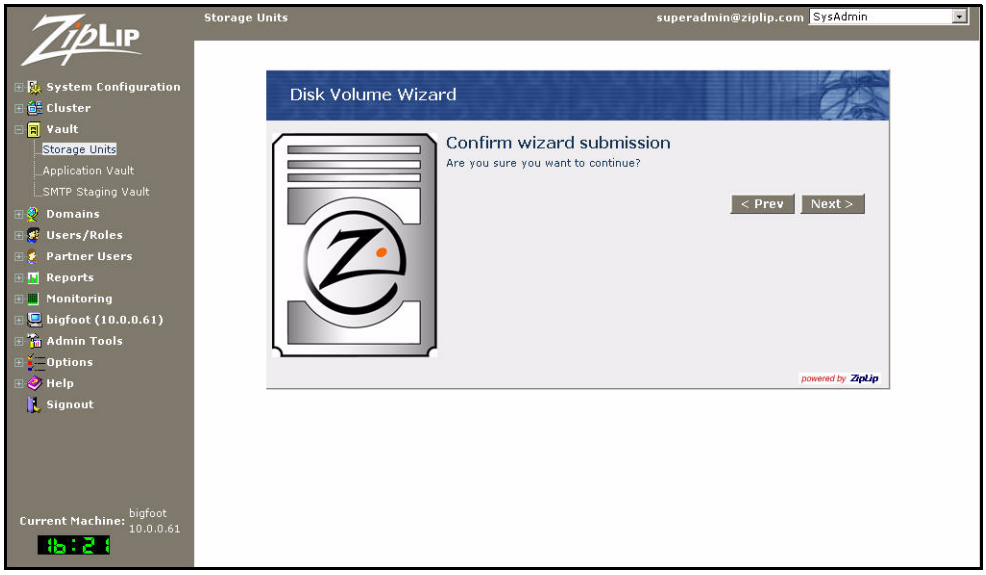



**Figure 8.38: Centera Disk Volume Wizard – Confirm Wizard Submission screen**

8. Click **Next** to confirm your submission. In the pop-up window that appears, click **OK** to continue. The **Centera Disk Volume Wizard – Success** screen appears.


**Figure 8.39: Centera Disk Volume Wizard – Success screen**

To verify the EMC Centera storage unit has been changed:

1. In the left menu, click **Vault**, then under **Vault**, click **Storage Units**.
2. In the In the **Storage Units** screen (see Figure 8.23), click on the name of the EMC Centera storage unit you want to edit.
3. In the **Storage Unit Properties** screen, click on the disk volume name (**dvCentera**). In the Disk Volume Details pane (see Figure 8.34), you can view the changes you have made.

# Centera Storage Unit Disaster Recovery

This section contains instructions for disaster recovery of an EMC Centera storage unit in various situations.

## Connection

Collect the following data:

- Server name or IP address (ensure connectivity using ping)
- Port number (default is 3218 for TCP and UDP)
- Application name
- Application password

## Storage Unit Creation

Collect the following data:

- Name
- Encryption setting (on/off, what method)
- Compression setting (on/off, what method)
- Storage Unit short name
- Partitioning period
- Partitioning usage

## Disk Unit Creation

Collect the following data:

- Name
- Cluster Addresses
- PEA user name and password
- Disk volume short name

## Working With Disk Volumes and EMC Centera Clusters

For instructions on updating a disk volume for a replicated EMC Centera cluster, see “Changing the Centera Server Address in a Disk Volume” on page 105.

For information on creating a disk volume for an EMC Centera disk in the ZipLip database, see “Creating an EMC Centera Disk Volume” on page 92.

To update a disk volume for an EMC Centera disk in the ZipLip database:

1. Determine the original short name for storage unit.
2. Determine the original short name for disk volume.
3. Either contact ZipLip technical support, or if you are comfortable using SQL, connect to the ZLDB database and enter the following:

```
select * from DiskStorageUnit
update DiskStorageUnit set ShortName='correct_short_name'
  where dsuId = created_disk_storage_unit_ID
update DiskVolume set ShortName='correct_short_name' where
  dvId = created_disk_storage_unit_ID
```

## How To Create an IBM Content Manager Storage Unit

To create an IBM Content Manager Storage Unit:

4. In the **Storage Units** screen, click the **Add New** button. This starts the **Storage Unit Wizard**.

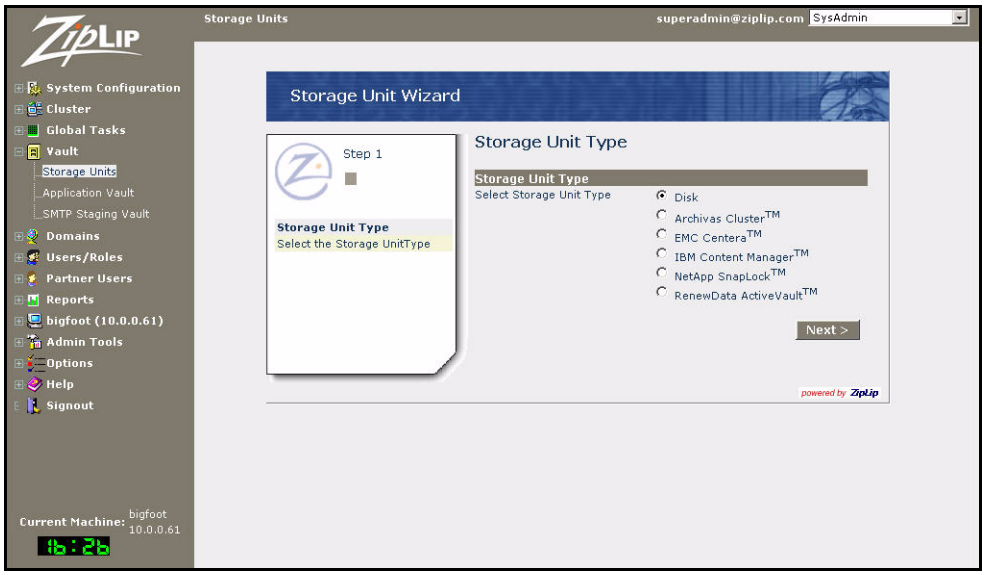



**Figure 8.40: Storage Unit Wizard – Storage Unit Type screen**

5. In the **Storage Unit Wizard – Storage Unit Type** screen, select **IBM Content Manager**.

   Click **Next** to continue to the **Storage Unit Information** screen.

**Note:** From the **Storage Unit Wizard – Storage Information Unit** screen to the end of the wizard you can also click **Prev** to go back to the previous screen.


**Figure 8.41: Storage Unit Wizard – Storage Unit Information screen**

6. In the **Storage Unit Information** screen, enter the following information:
   - **Properties**
     - **Name** – Enter a name for the StorageUnit here. This example uses “suIBM”.
     - **Application** – Select the ZipLip application that uses this vault. If this vault is used by all applications, select **Common to all applications**.
     - **Module** – Leave blank.
     - **Comments** – Enter a description for the storage unit you are creating.
   - **Data Provider Services**
     - **Encryption** – Check to have this storage unit be encrypted. ZipLip recommends you leave it unchecked. If you are creating a Replication Vault, this value *must* match that of the original Vault.
     - **Compression** – Check to enable compression for this storage unit. ZipLip recommends you leave it unchecked. If you are creating a Replication Vault, this value *must* match that of the original Vault.
     - **Partitioning Period** – Use the pull-down menu to specify how often you wish to partition the storage unit. This example uses **MONTH** (recommended). If you are creating a Replication Vault, this value *must* match that of the original Vault.
     - **Partitioning Usage** – Use the pull-down menu to define the depth and width of the folders created. This example uses the recommended value **Light**.

   Click **Next** to continue. The **Disk Volume Information** screen appears.

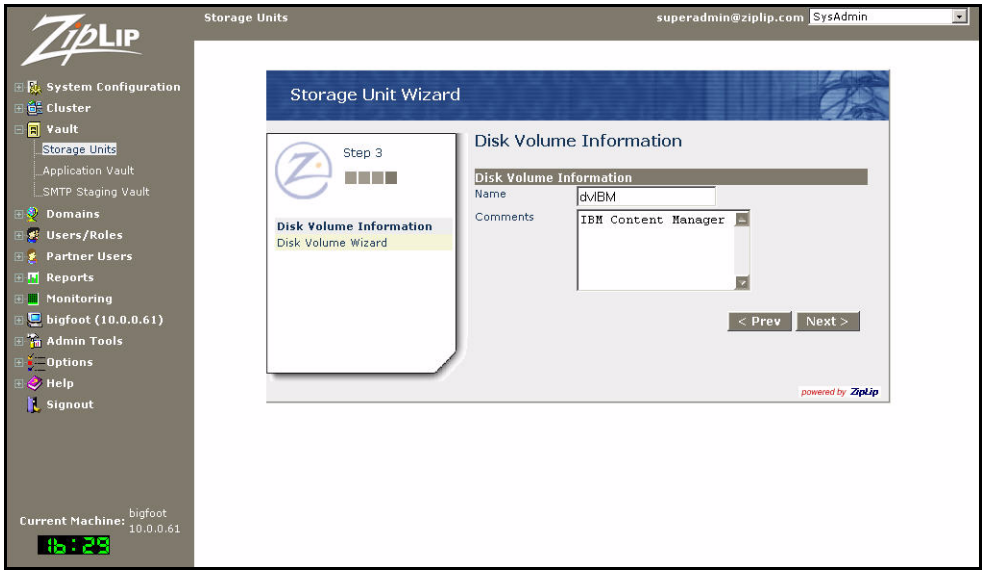



**Figure 8.42: Storage Unit Wizard – Disk Volume Information screen**

7. Enter the following disk volume information:
   - **Name** – Enter a name for identifying this disk volume. This example uses “dvIBM”.
   - **Comments** – (Optional) Enter a description of the volume.

   Click **Next** to continue to the **IBM Disk Volume Information** screen.

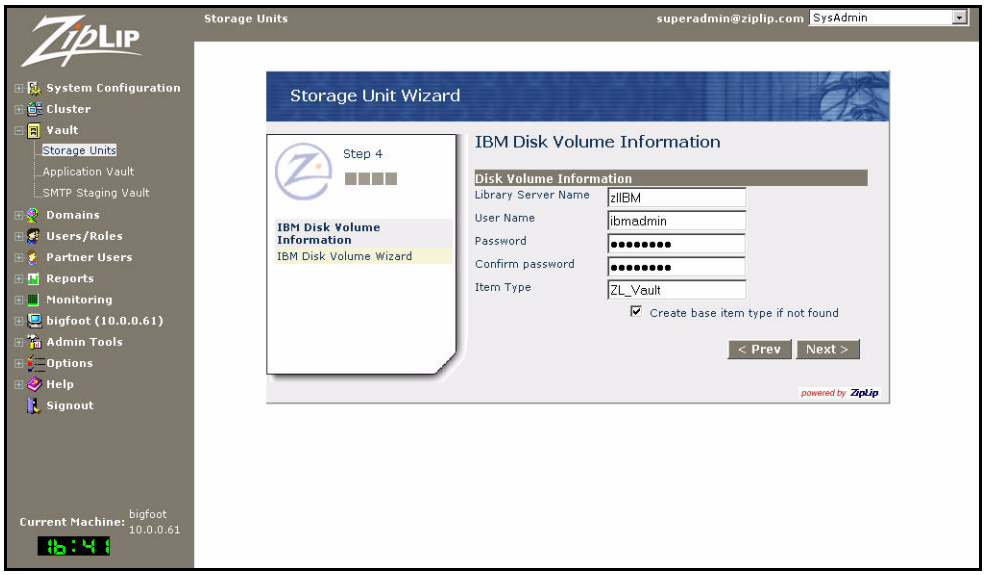



**Figure 8.43: Storage Unit Wizard – IBM Disk Volume Information screen**

Enter the following information:

- **Library Server Name** – Enter the IBM Content Manager library server name. This example uses “zlIBM”.
- **User Name** – Enter the username needed to connect to the IBM Content Manager. This example uses “ibmadmin”.

- **Password** – Enter the password associated with the IBM Content Manager username.
- **Confirm password** – Re-enter the password associated with the IBM Content Manager username.
- **Item Type** – Enter an item type up to 15 characters long to store vault items in the IBM Content Manager. This example uses “ZL_Vault”.
- **Create base item type if not found** – Check to create the base item type if none exists.

Click **Next** to continue to the **Confirm Wizard Submission** screen.

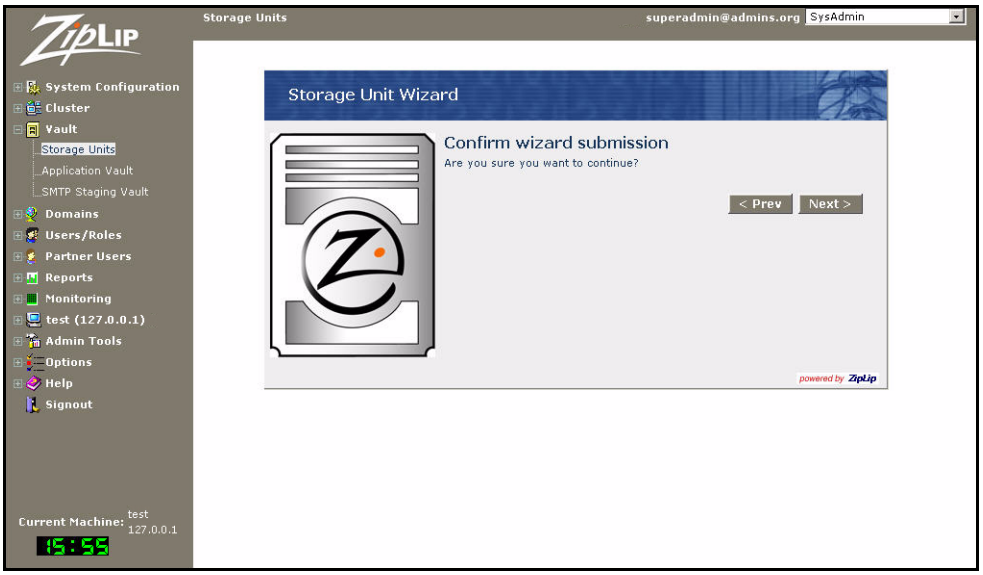



**Figure 8.44: Storage Unit Wizard – Confirm Wizard Submission screen**

8. Click **Next** to confirm your submission. In the pop-up window that appears, click **OK** to continue. The **Storage Unit Wizard – Success** screen appears.

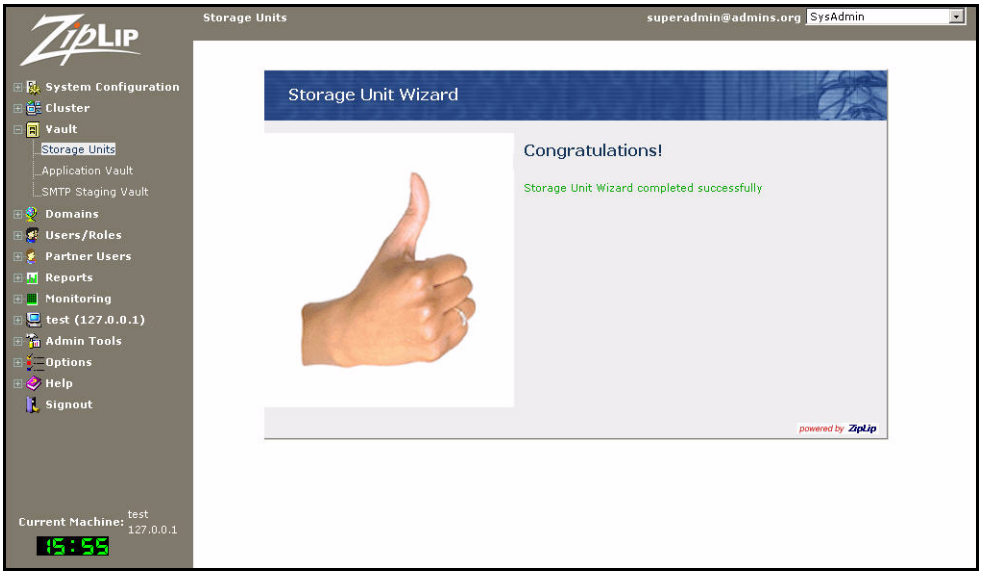



**Figure 8.45: Storage Unit Wizard – Success screen**

To verify the new **IBM Content Manager** storage unit has been created, in the left menu, click **Vault**, then under **Vault**, click **Storage Units** to see the new unit at the bottom of the list.

## Creating an Archivas Cluster Disk Volume

To create an Archivas Cluster disk volume in ZipLip:

1. In the ZipLip **SysAdmin** application, in the left menu, click **Vault**, then under **Vault**, click **Storage Units**. A list of storage units appears.

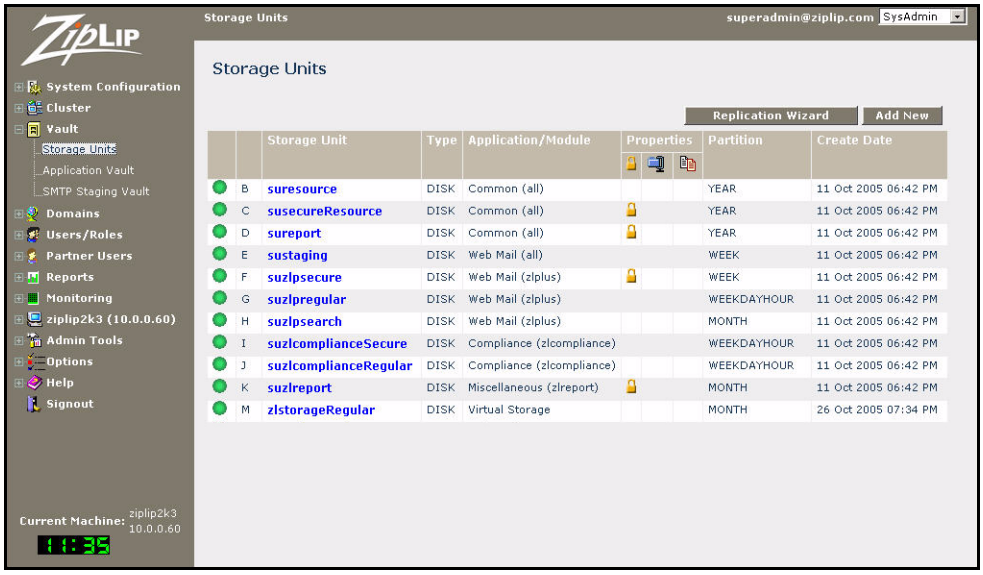



**Figure 8.46: Storage Units screen**

2. In the **Storage Units** screen, click the **Add New** button. This starts the **Storage Unit Wizard**.

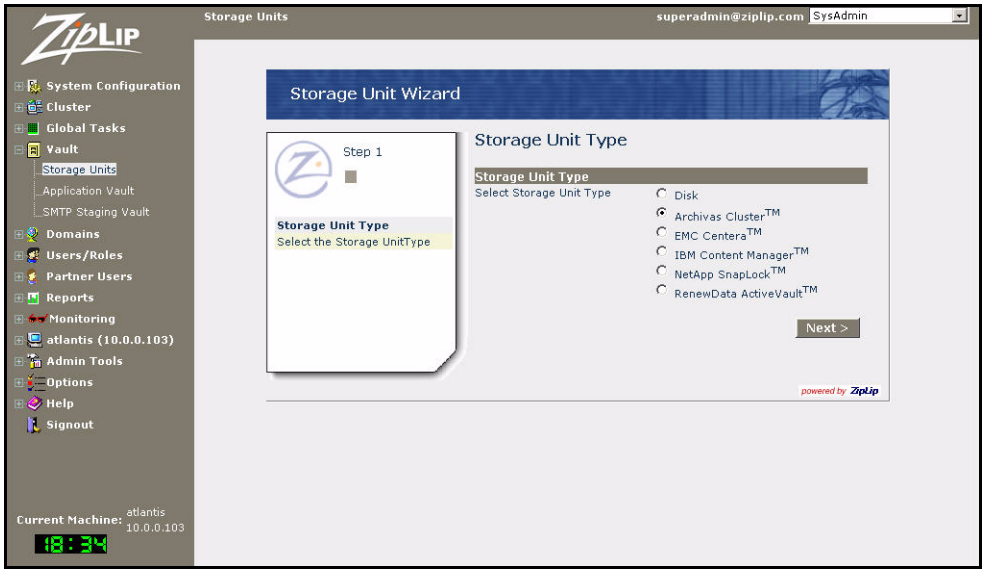



**Figure 8.47: Storage Unit Wizard – Storage Unit Type screen**

3. In the **Storage Unit Wizard – Storage Unit Type** screen, select **Archivas Cluster**.

   Click **Next** to continue to the **Storage Unit Information** screen.

**Note:** From the **Storage Unit Wizard – Storage Unit Information** screen to the end of the wizard you can also click **Prev** to go back to the previous screen.

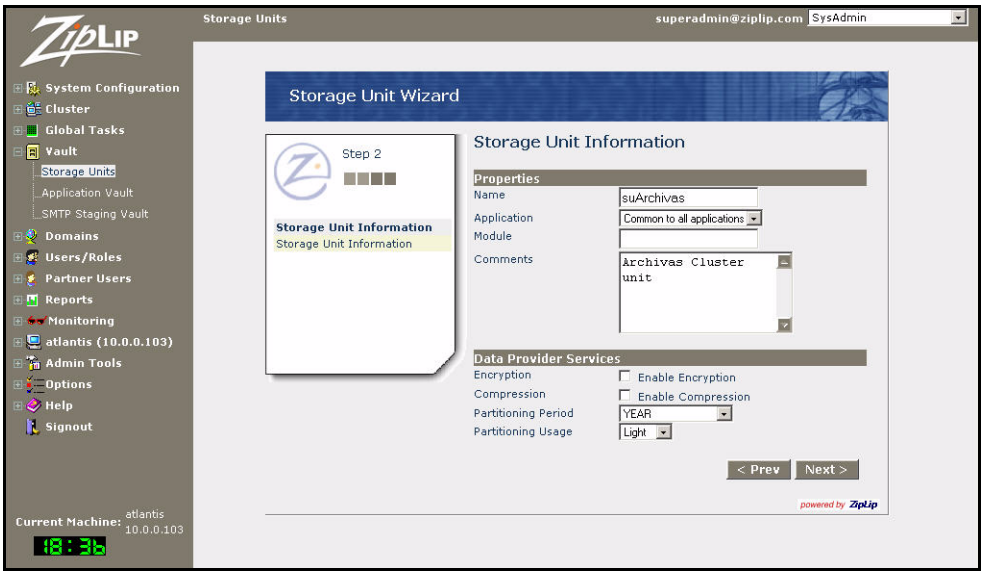



**Figure 8.48: Storage Unit Wizard – Storage Unit Information screen**

4. In the **Storage Unit Information** screen, enter the following information:
   - **Properties**
     - **Name** – Enter a name for the StorageUnit here. This example uses “suArchivas”.
     - **Application** – Select the ZipLip application that uses this vault. If this vault is used by all applications, select **Common to all applications**.
     - **Module** – Leave blank.
     - **Comments** – Enter a description for the storage unit you are creating.
   - **Data Provider Services**
     - **Encryption** – Check to have this storage unit be encrypted. ZipLip recommends you leave it unchecked. If you are creating a Replication Vault, this value *must* match that of the original Vault.
     - **Compression** – Check to enable compression for this storage unit. ZipLip recommends you leave it unchecked. If you are creating a Replication Vault, this value *must* match that of the original Vault.
     - **Partitioning Period** – Use the pull-down menu to specify how often you wish to partition the storage unit. This example uses **YEAR**. If you are creating a Replication Vault, this value *must* match that of the original Vault. For example, if you are setting up replication from the ZLPRegular storage unit to the storage unit you are creating here, make sure the partition periods for both storage units are identical.
     - **Partitioning Usage** – Use the pull-down menu to define the depth and width of the folders created. This example uses the recommended value **Light**.

Click **Next** to continue. The **Disk Volume Information** screen appears.

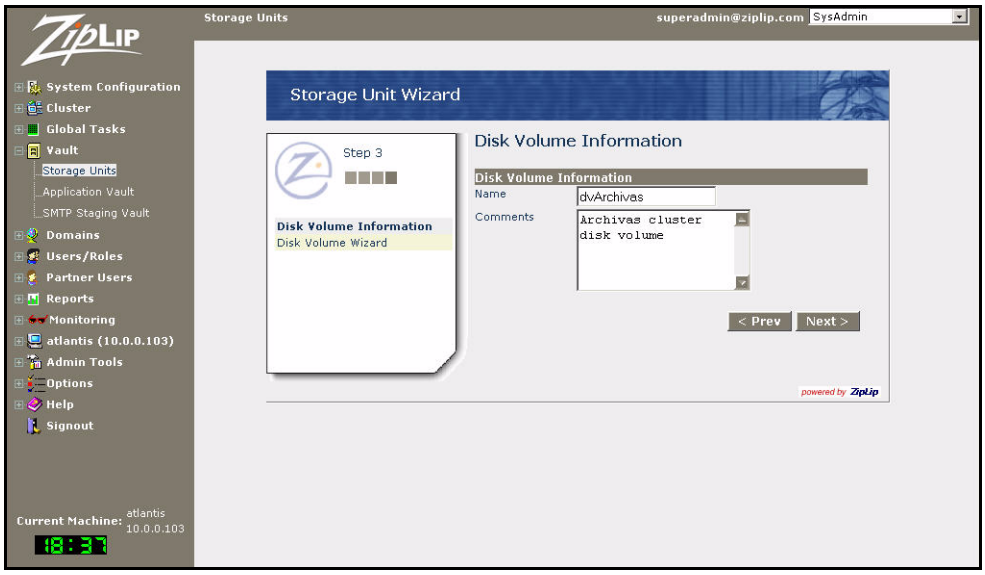



**Figure 8.49: Storage Unit Wizard – Disk Volume Information screen**

5. Enter the following disk volume information:
   - **Name** – Enter a name for identifying this disk volume. This example uses "dvArchivas".
   - **Comments** – (Optional) Enter a description of the volume.

Click **Next** to continue to the **Archivas Cluster Disk Volume Information** screen.

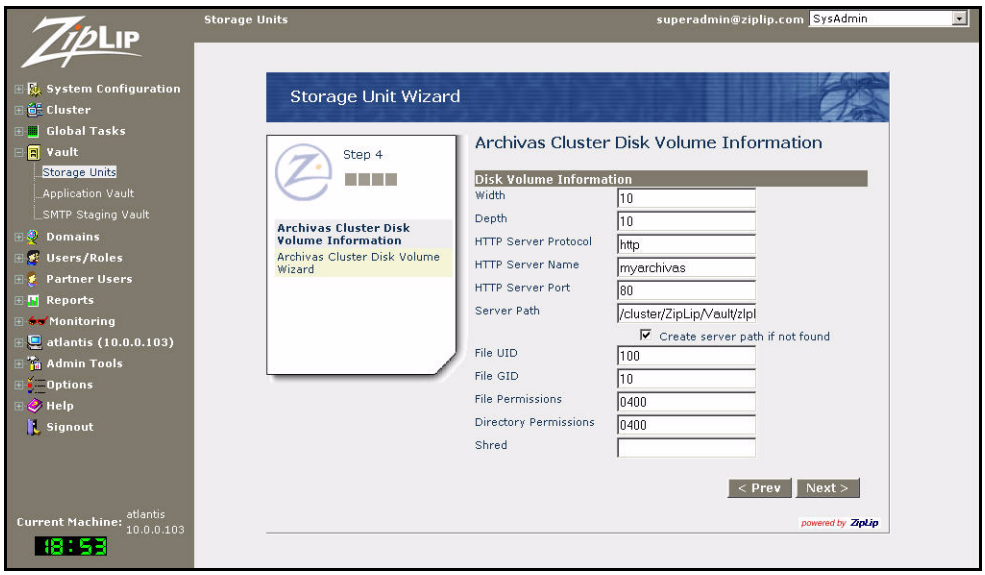



**Figure 8.50: Storage Unit Wizard – Archivas Cluster Disk Volume Information screen**

Enter the following information:

- **Width** – Enter the width for the disk volume.
- **Depth** – Enter the depth for the disk volume.

- **HTTP Server Protocol** – Enter the HTTP server protocol (either “`http`” or “`https`”). ZipLip recommends you use “`http`”.
- **HTTP Server Name** – Enter the URL of the Archivas Cluster HTTP server.
- **HTTP Server Port** – Enter the HTTP server port (the default value is 80).
- **Server Path** – Enter the UNC path or other network-available path for the Archivas Cluster disk volume. This example uses “`/cluster/ZipLip/Vault/zlRegular`”.
- **Create folder if not found** – Check to create the path for the disk volume if it doesn’t already exist.
- **File UID** – Enter the UID for created files. ZipLip recommends you make this number unique so it is easily distinguished when other applications use the Archivas Cluster.
- **File GID** – Enter the GID for created files. ZipLip recommends you make this number unique so it is easily distinguished when other applications use the Archivas Cluster.
- **File Permissions** – Enter the file permissions setting in octal on the HTTP server, or leave blank to accept the default settings on the Archivas cluster.
- **Directory Permissions** – Enter the directory permissions setting on the HTTP server, or leave blank to accept the default settings on the Archivas cluster.
- **Shred** – Enter “1” to have files “shredded” after deletion, or leave blank to accept the default settings on the Archivas cluster.

Click **Next** to continue to the **Confirm Wizard Submission** screen.

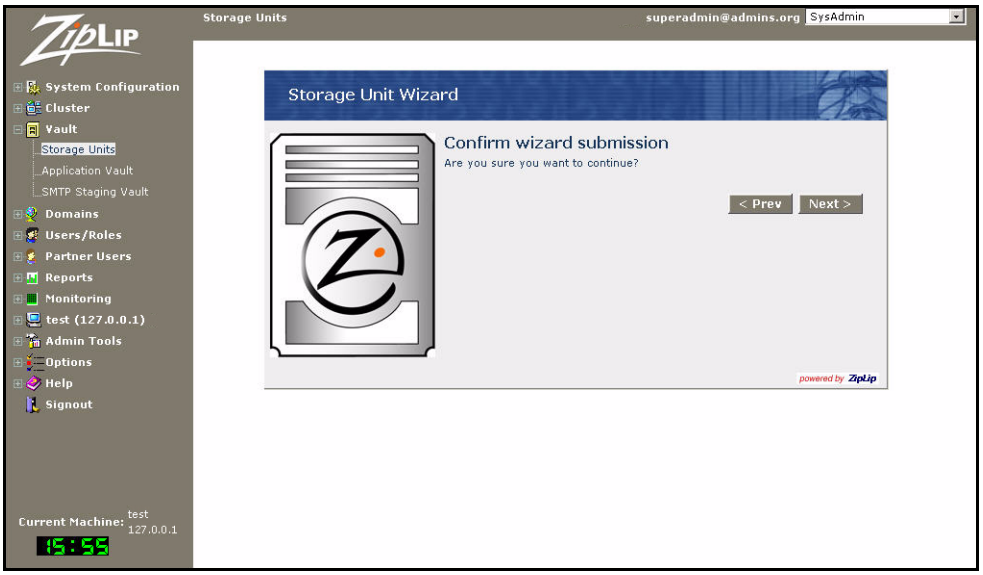



**Figure 8.51: Storage Unit Wizard – Confirm Wizard Submission screen**

6. Click **Next** to confirm your submission. In the pop-up window that appears, click **OK** to continue. The **Storage Unit Wizard – Success** screen appears.

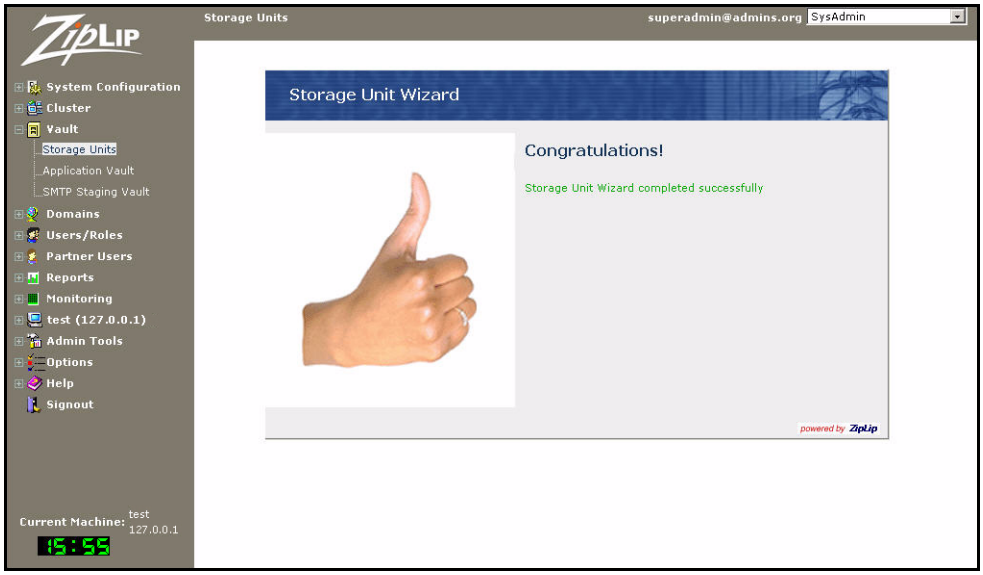



**Figure 8.52: Storage Unit Wizard – Success screen**

## Creating a Disk Storage Unit

To create a disk storage unit in ZipLip:

1. In the ZipLip **SysAdmin** application, in the left menu, click **Vault**, then under **Vault**, click **Storage Units**. A list of storage units appears.

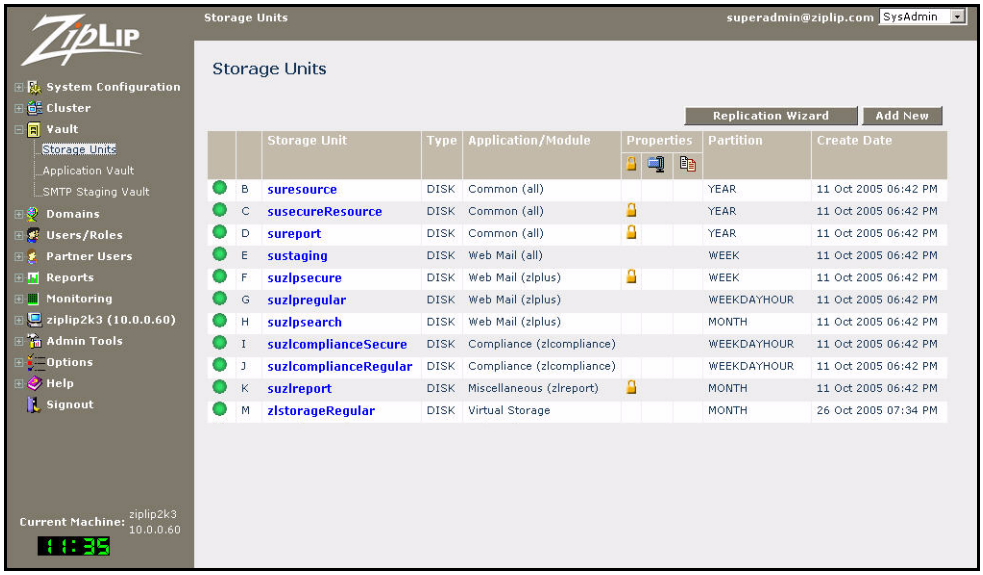



**Figure 8.53: Storage Units screen**

2. In the **Storage Units** screen, click the **Add New** button. This starts the **Storage Unit Wizard**.

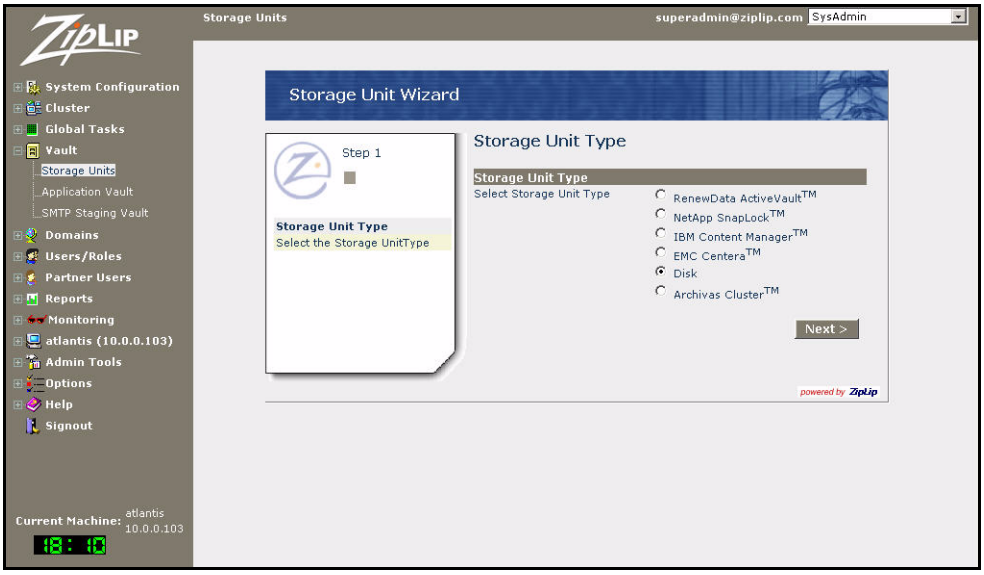



**Figure 8.54: Storage Unit Wizard – Storage Unit Type screen**

3. In the **Storage Unit Wizard – Storage Unit Type** screen, select **Disk**.

   Click **Next** to continue to the **Storage Unit Information** screen.

**Note:** From the **Storage Unit Wizard – Storage Information Unit** screen to the end of the wizard you can also click **Prev** to go back to the previous screen.

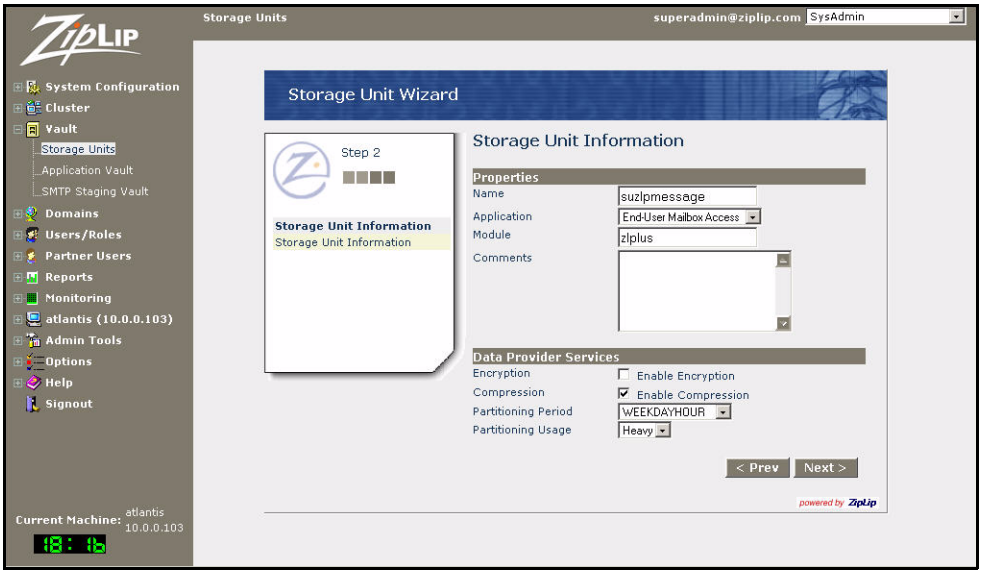



**Figure 8.55: Storage Unit Wizard – Storage Unit Information screen**

4. In the **Storage Unit Information** screen, enter the following information:
   - **Properties**
     - **Name** – Enter a name for the Storage Unit here. This example uses “suzlpmessage”.

- **Application** – Select the ZipLip application that uses this vault. If this vault is used by all applications, select **Common to all applications**. This example uses **End-User Mailbox Access**.
- **Module** – Enter a module name.
- **Comments** – Enter a description for the storage unit you are creating (optional).

▪ **Data Provider Services**

- **Encryption** – Check to have this storage unit be encrypted; leave unchecked to have the storage unit be unencrypted. ZipLip recommends you leave it unchecked. If you are creating a Replication Vault, this value *must* match that of the original Vault.
- **Compression** – Check to enable compression for this storage unit. ZipLip recommends you check this field. If you are creating a Replication Vault, this value *must* match that of the original Vault.
- **Partitioning Period** – Use the pull-down menu to specify how often you wish to partition the storage unit. This example uses **WEEKDAYHOUR** (recommended). If you are creating a Replication Vault, this value *must* match that of the original Vault.
- **Partitioning Usage** – Use the pull-down menu to define the depth and width of the folders created. This example uses the recommended value **Heavy**.

Click **Next** to continue. The **Disk Volume Information** screen appears.

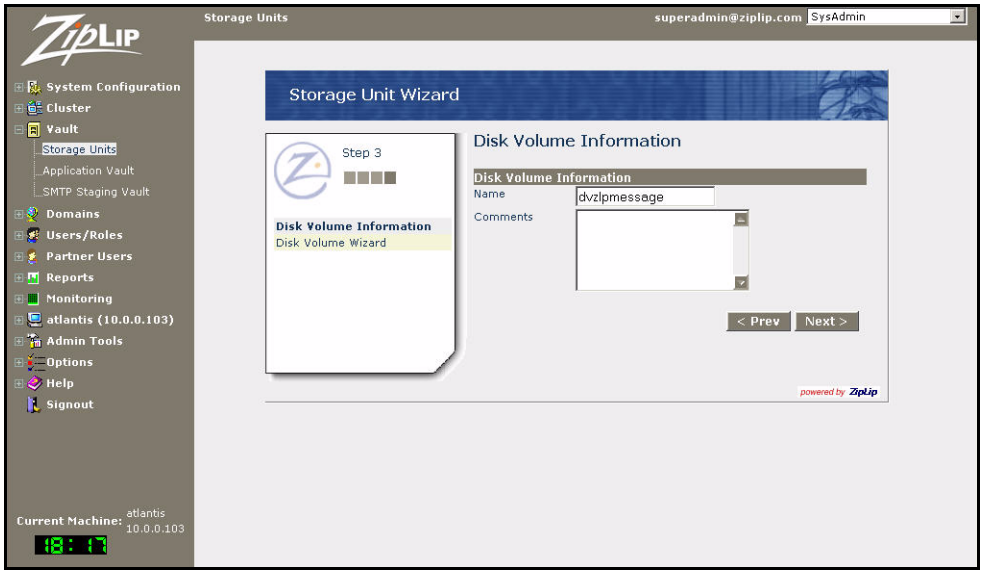



**Figure 8.56: Storage Unit Wizard – Disk Volume Information screen**

5. Enter the following disk volume information:
   - **Name** – Enter a name for identifying this disk volume. This example uses “dvzlpmessage”.
   - **Comments** – (Optional) Enter a description of the volume.

   Click **Next** to continue to the **Disk Volume Information** screen.

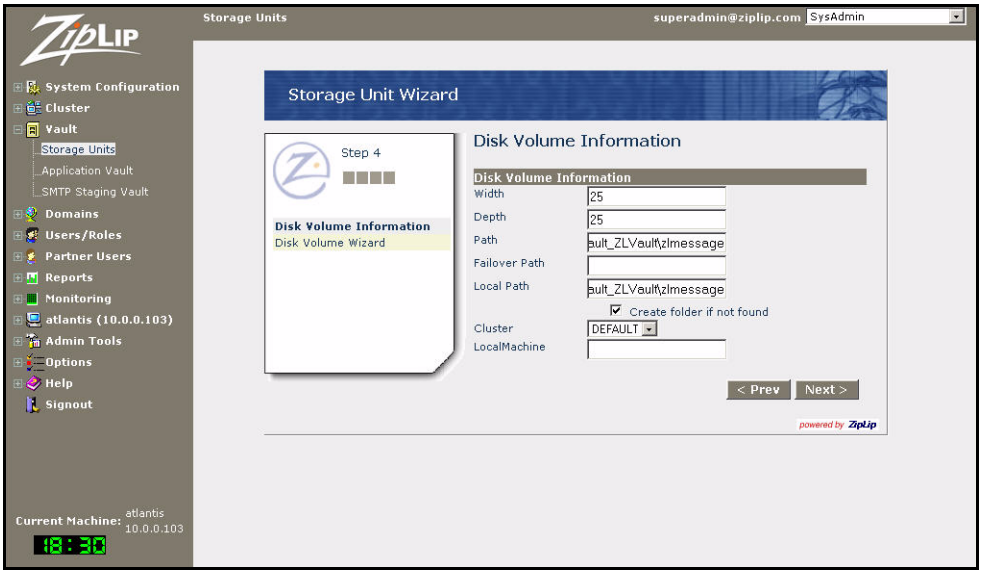



**Figure 8.57: Storage Unit Wizard – second Disk Volume Information screen**

Enter the following information:

- **Width** – Enter a numeric value for the width of the disk volume. This example uses “25”.
- **Depth** – Enter a numeric value for the depth of the disk volume. This example uses “25”.
- **Path** – Enter the path (physical location) for the disk volume.
- **Failover Path** – (Optional) Enter the failover path for the disk volume.
- **Local Path** – If applicable, enter the local path for the disk volume.
- **Create folder if not found** – Check to create the folder if it does not exist.
- **Cluster** – Use the pull-down menu to select a cluster.
- **LocalMachine** – Enter the local machine for the disk volume.

Click **Next** to continue to the **Confirm Wizard Submission** screen.

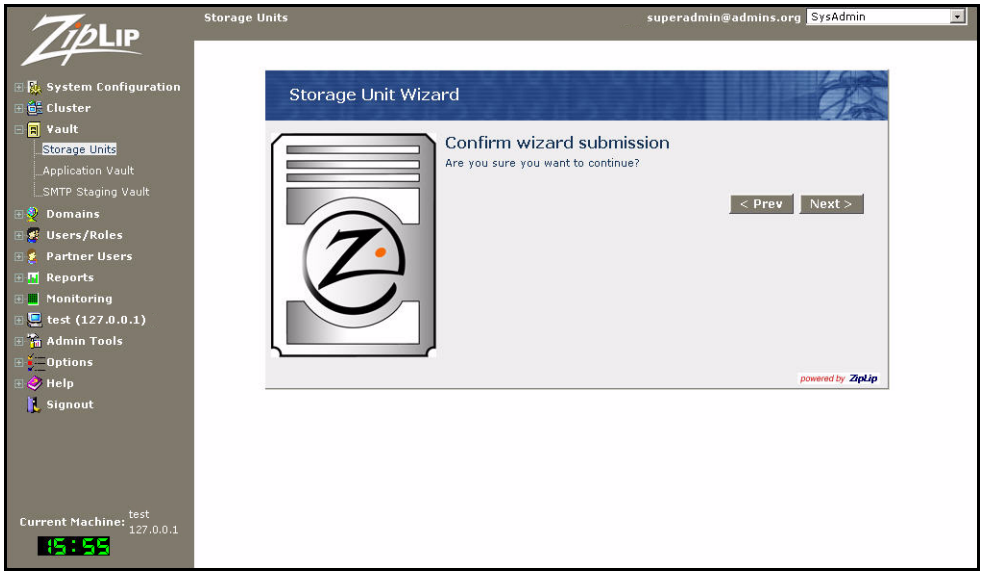



**Figure 8.58: Storage Unit Wizard – Confirm Wizard Submission screen**

6. Click **Next** to confirm your submission. In the pop-up window that appears, click **OK** to continue. The **Storage Unit Wizard – Success** screen appears.

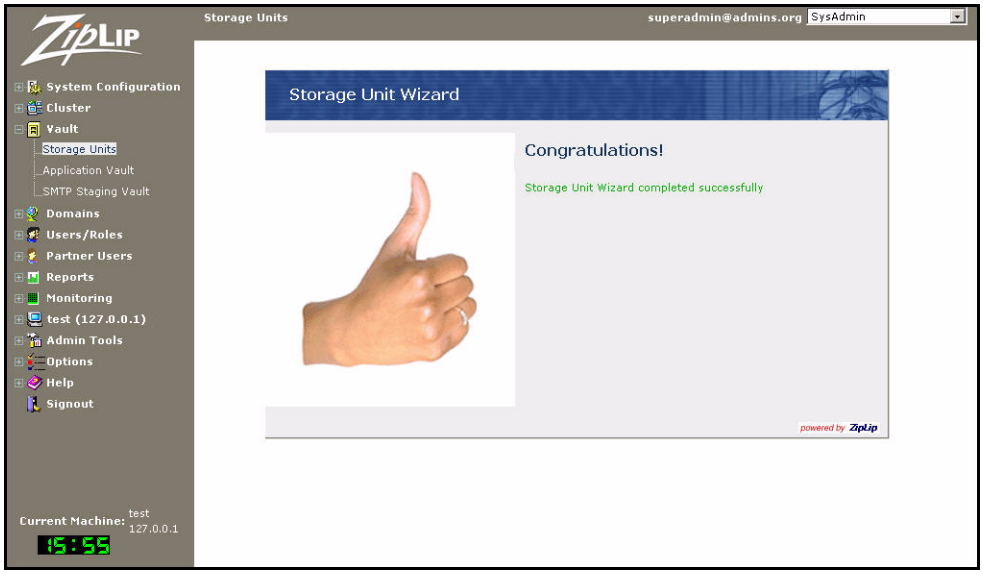



**Figure 8.59: Storage Unit Wizard – Success screen**

## Changing the Storage Unit Associated With Mail Storage

To change the storage unit associated with a message store:

1. In the left menu, select **Vault**. Under **Vault**, select **Application Vault**.
2. In the **Application Vault Systems** pane, click the **Mail** tab. The **Application Vault Mail** pane appears.

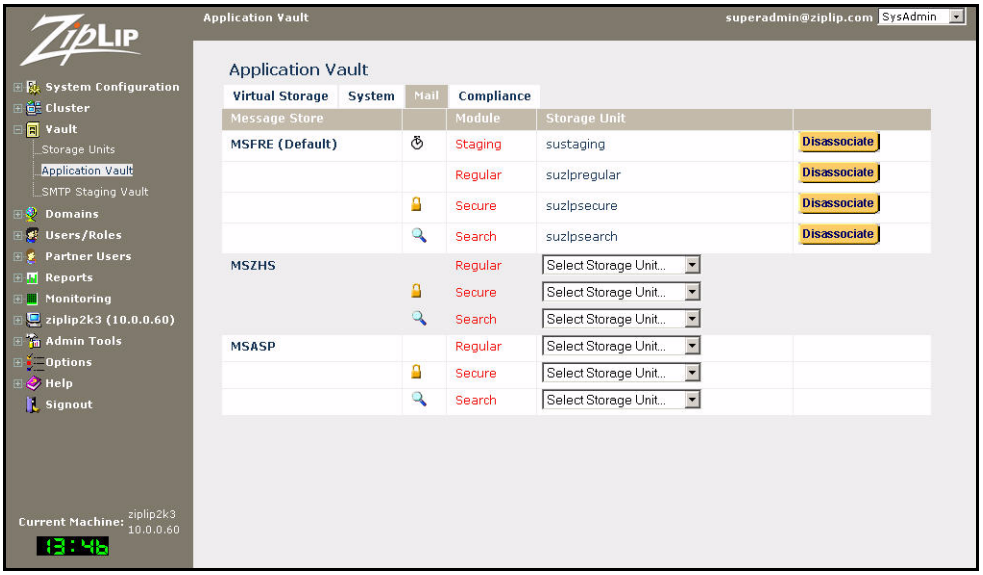
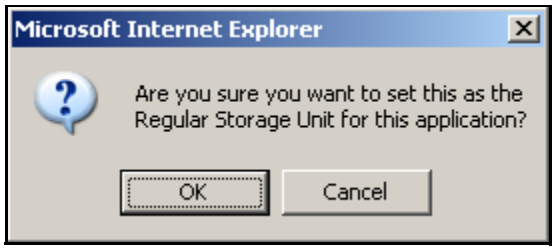



**Figure 8.60: Application Vault Mail pane**

3. Next to the volume on which you want to change the storage unit, click the **Disassociate** button. This example uses Message Store MSFRE (Default), Module **Regular**. A pop-up warning window appears.


4. Click **OK** to continue.
5. In the **Application Vault Mail** pane the **Storage Unit** name is replaced by a pull-down menu. Select a different storage unit from the menu. A pop-up window appears asking you to confirm your choice.




6. Click **OK** to confirm your selection.

# Vault Management

Managing a vault involves creating, modifying, and monitoring disk volumes and storage units.

## Creating Disk Volumes

To create a disk volume.

1. In the left menu, select **Vault**. Under **Vault**, select **Storage Units**.
2. In the **Storage Units** screen (see Figure 8.10 on page 92), select the name of a storage unit to which you want to add a disk volume. The **Storage Unit Properties** screen appears.
3. In the **Storage Unit Properties** screen, click the **Add New Disk Volume** button. This starts the **Disk Volume Wizard**.

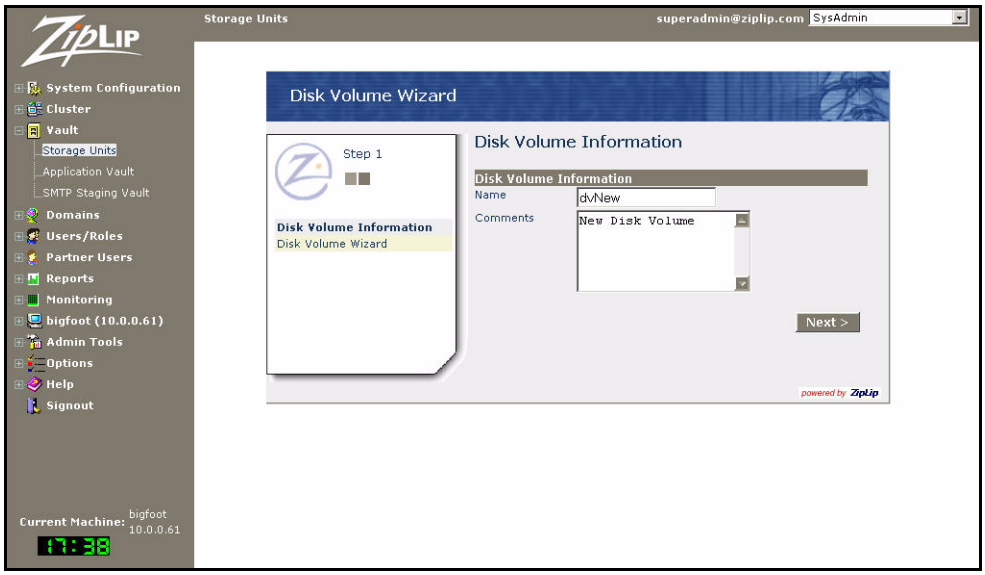



**Figure 8.61: Disk Volume Wizard screen**

4. Enter the following:
   - **Name** – Enter a name for the disk volume you wish to create. Do not include non-alphanumeric characters in the name.
   - **Comments** – (Optional) Enter comments about the disk volume.

   Click **Next** to continue to the **Disk Volume Information** screen.

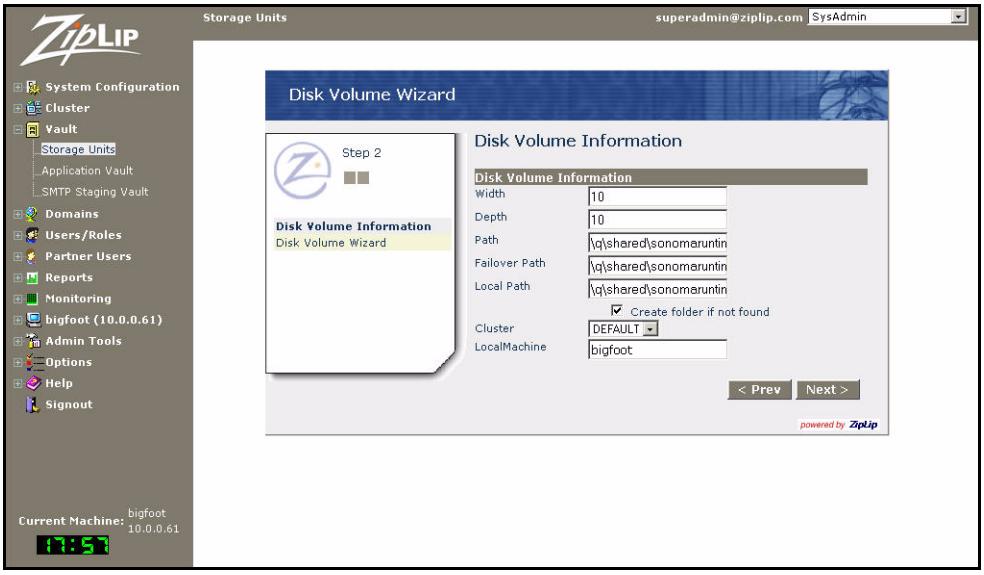



**Figure 8.62: Disk Volume Wizard – Disk Volume Information screen**

5. Complete the following fields:
   - **Width** – Enter a numeric value for the width of the disk volume.
   - **Depth** – Enter a numeric value for the depth of the disk volume.
   - **Path** – Enter the path (physical location) for the disk volume.
   - **Failover Path** – Enter the failover path for the disk volume.
   - **Local Path** – If applicable, enter the local path for the disk volume.
   - **Create folder if not found** – Check to create the folder if it does not exist.
   - **Cluster** – Use the pull-down menu to select a cluster.
   - **LocalMachine** – Enter the local machine for the disk volume.

   Click **Next** to continue to the **Confirm Wizard Submission** screen.

**Note:** To change a previous screen, click **Prev**, change the information, then click **Next**.

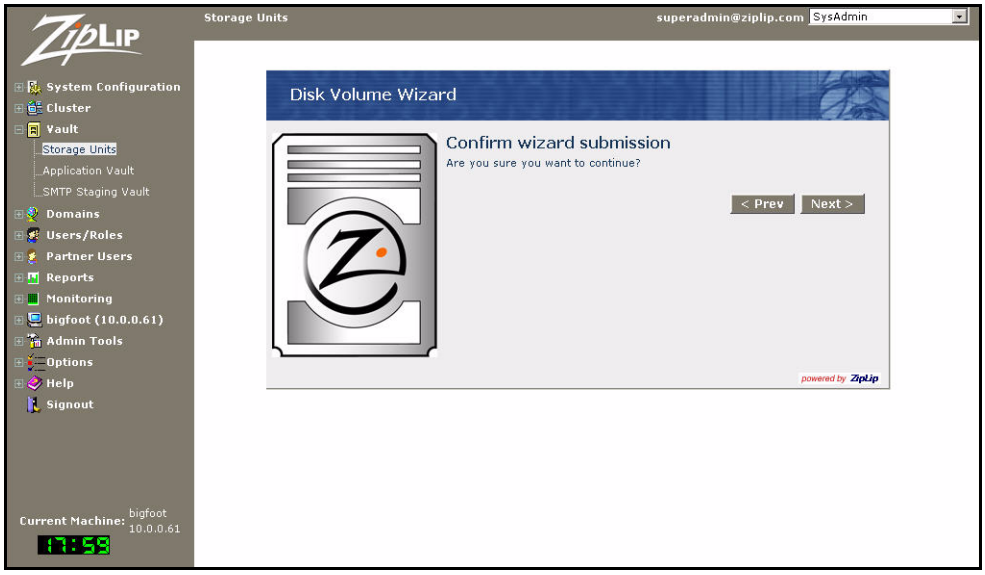



**Figure 8.63: Disk Volume Wizard – Confirm Wizard Submission screen**

6. Click **Next**. A pop-up box appears asking whether you want to continue. Click **OK** to continue. A screen appears confirming the creation.

**Note:** Disk Volumes *cannot* be deleted.

## Modifying a Disk Volume

To edit a disk volume:

1. In the left menu, select **Vault**. Under **Vault**, select **Storage Units**.
2. In the **Storage Units** screen (see Figure 8.10 on page 92), select the name of a storage unit contaning a disk volume you want to modify. The **Storage Unit Properties** screen appears.
3. In the **Storage Unit Properties** screen, select the name of the disk volume you want to modify. The **Disk Volume Details** screen appears.

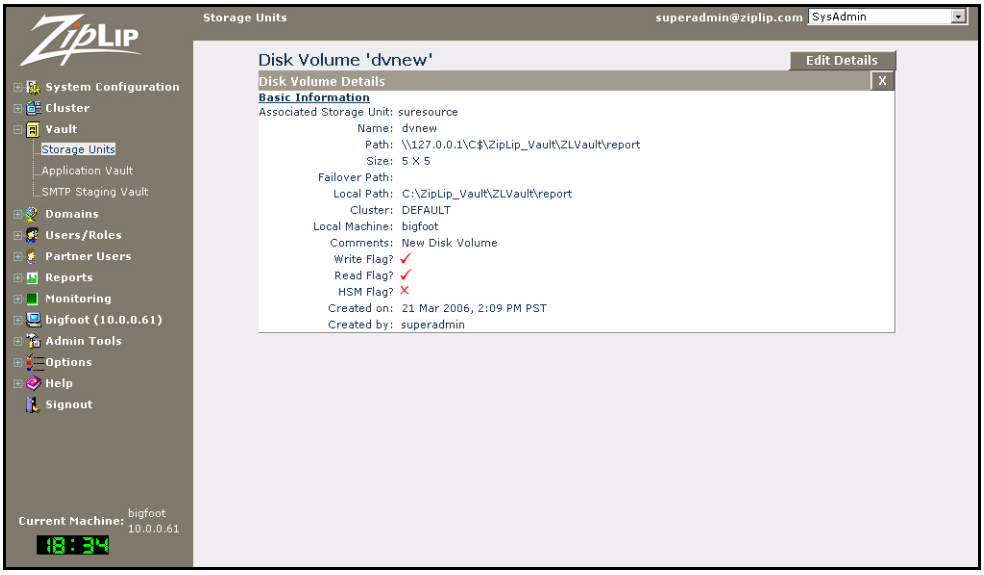



**Figure 8.64: Disk Volume Details screen**

4. In the **Disk Volume Details** screen, click the **Edit Details** button to start the **Disk Volume Wizard**.

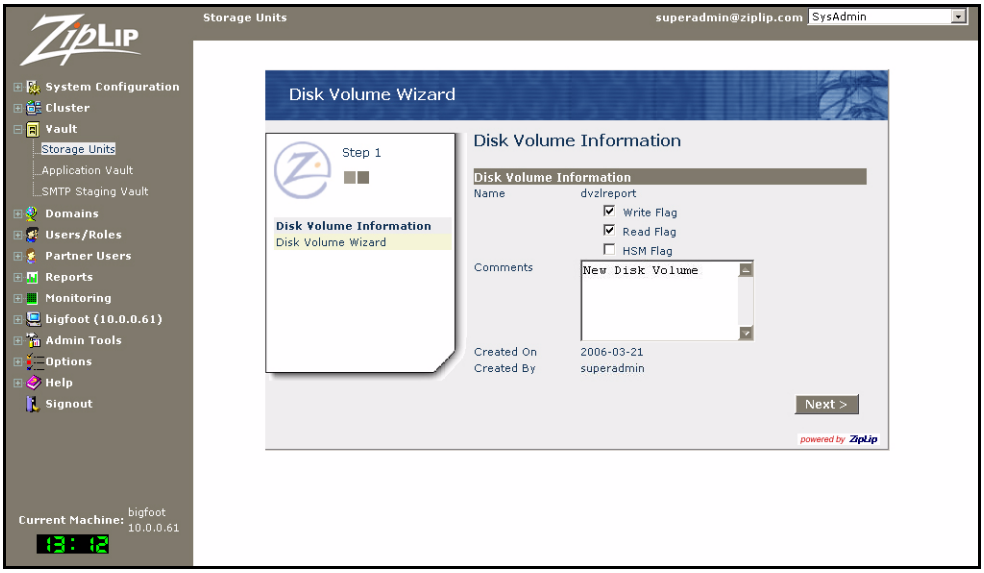



**Figure 8.65: Disk Volume Wizard screen**

5. The fields are similar to those when you create a disk. In this example you can change the following information, as appropriate:
   - **Write Flag** – When checked, allows this volume to be written.
   - **Read Flag** – When checked, allows this volume to be read.
   - **HSM Flag** – When checked, use hierarchical storage management
   - **Comments** – Add or edit comments as desired.

   Click **Next** to continue to the **Disk Volume Information** screen.

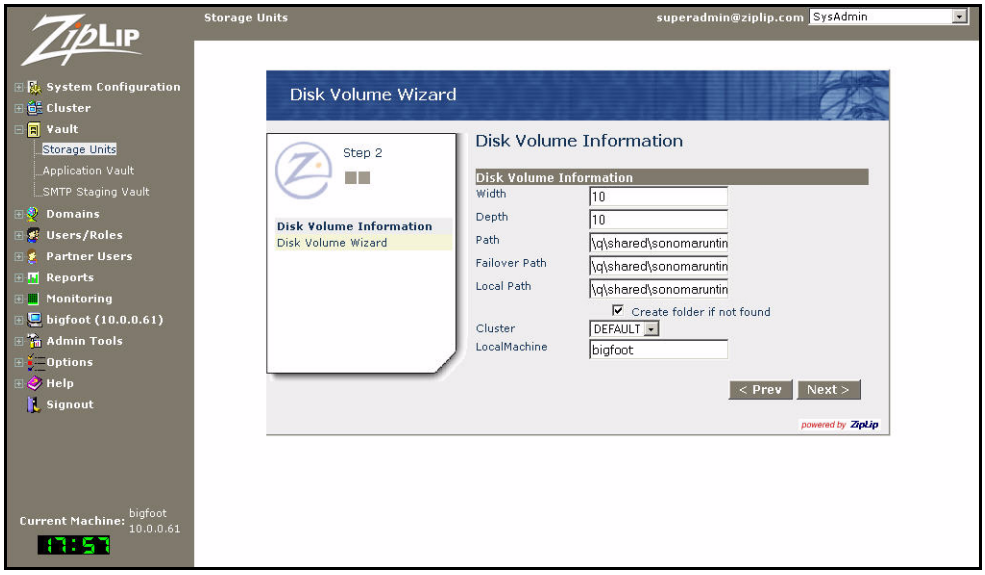



**Figure 8.66: Disk Information Wizard – Edit Disk Volume Information screen**

6. Edit the following fields, as appropriate
   - **Width** – Enter a numeric value for the width of the disk volume.
   - **Depth** – Enter a numeric value for the depth of the disk volume.
   - **Path** – Enter the path (physical location) for the disk volume.
   - **Failover Path** – Enter the failover path for the disk volume.
   - **Local Path** – If applicable, enter the local path for the disk volume.
   - **Create folder if not found** – Check to create the folder if it does not exist.
   - **Cluster** – Use the pull-down menu to select a cluster.
   - **LocalMachine** – Enter the local machine for the disk volume.

   Click **Next** to continue to the **Confirm Wizard Submission** screen.

**Note:** To change a previous screen, click **Prev**, change the information, then click **Next**.

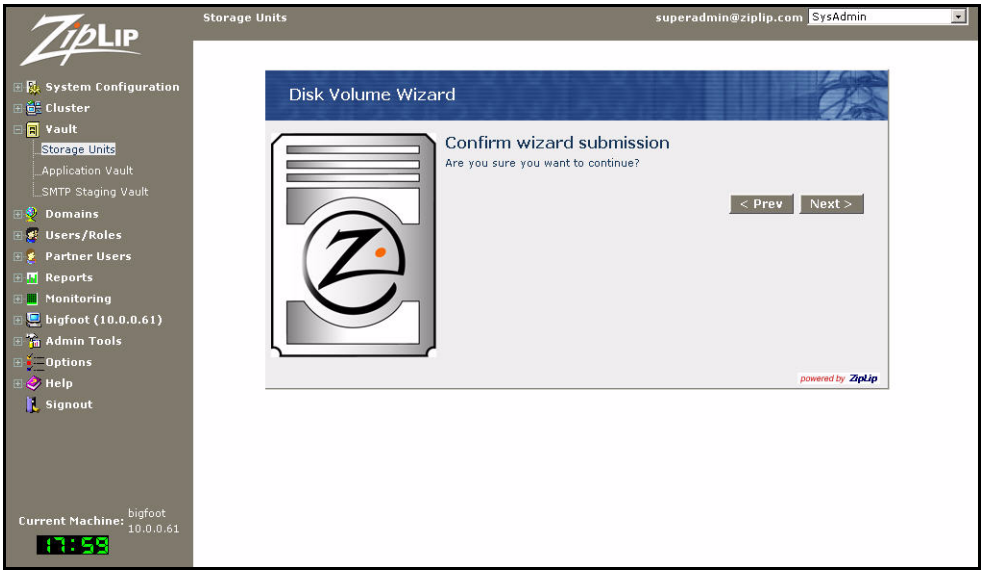



**Figure 8.67: Disk Volume Wizard – Confirm Wizard Submission screen**

7. Click **Next**. A pop-up box appears asking whether you want to continue. Click **OK** to continue. A screen appears confirming the creation.

## Monitoring Disk Volumes

To monitor information in the disk volumes:

1. In the left menu, select **Vault**. Under **Vault**, select **Storage Units**.
2. In the **Storage Units** screen (see Figure 8.10 on page 92), select the name of a storage unit in which you want to view a disk volume. The **Storage Unit Properties** screen appears.
3. In the **Storage Unit Properties** screen, the **Associated Disk Volumes** are listed at the bottom. Click on the name of a disk volume to view its properties.

In the Disk Volume Details screen (see Figure 8.64 on page 128) you can see the storage unit associated with it, the size of the volume (width, depth), creation date, flags, and paths of the disk volume (physical location of the volume).

## Monitoring Storage Units

1. In the left menu, select **Vault**. Under **Vault**, select **Storage Units**.
2. In the **Storage Units** screen (see Figure 8.10 on page 92), select the name of a storage unit you want to monitor. The **Storage Unit Properties** pane appears.

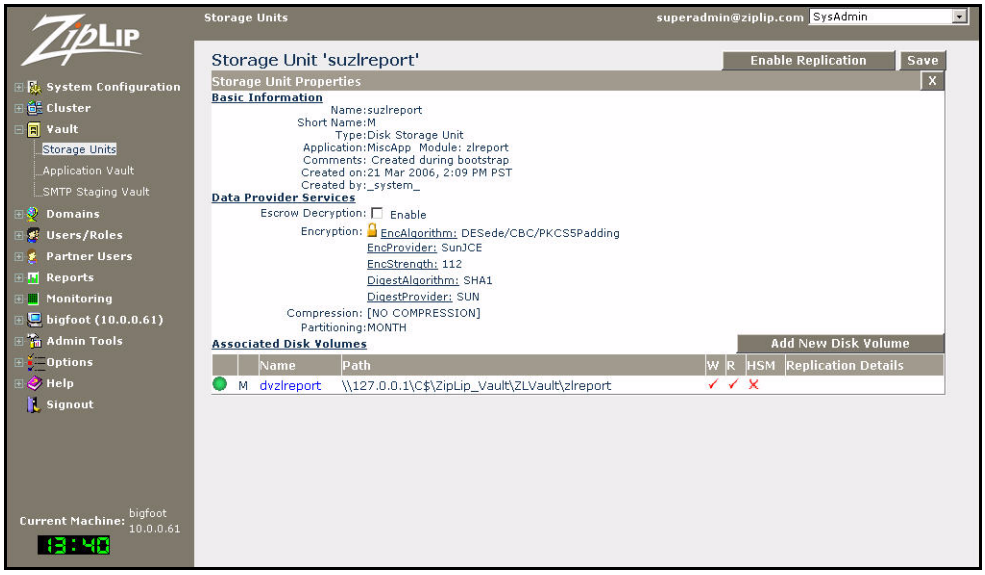



**Figure 8.68: Storage Unit Properties pane**

3. The pane shows the disk name, short name, type, application, module, any comments, creation date and user, whether encryption and compression are enabled, the type of partitioning, and all associated disk volumes. You can also enable or disable **Escrow Decryption**.

To return to the **Storage Units** screen, click the “x” in the upper right corner of the pane.

## Managing Stores and Storage Units

To change the association of a system store and a storage unit:

1. In the left menu, select **Vault**. Under **Vault**, select **Application Vault**.
2. Click any of the application tabs to see a list of stores available, as shown in the following figure:

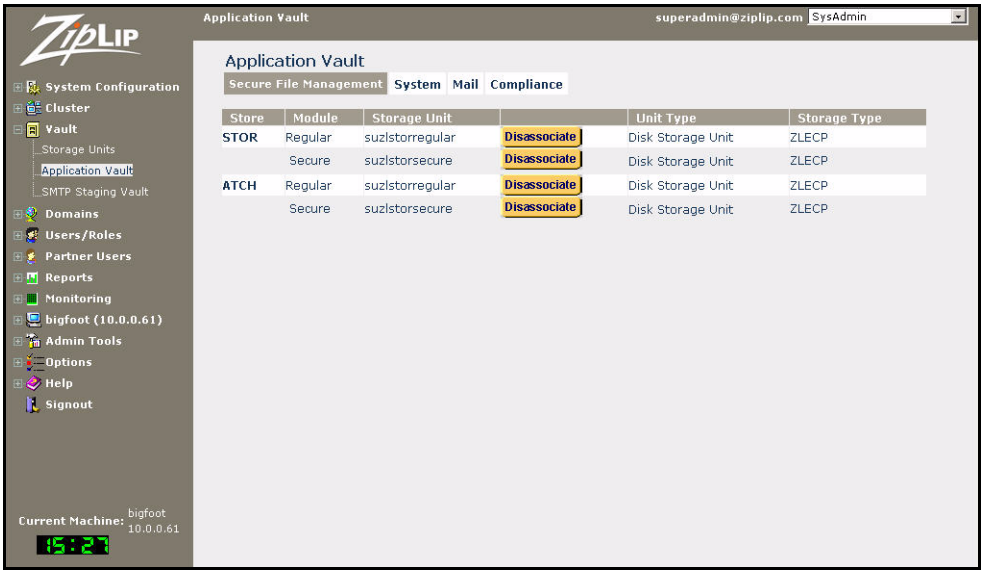


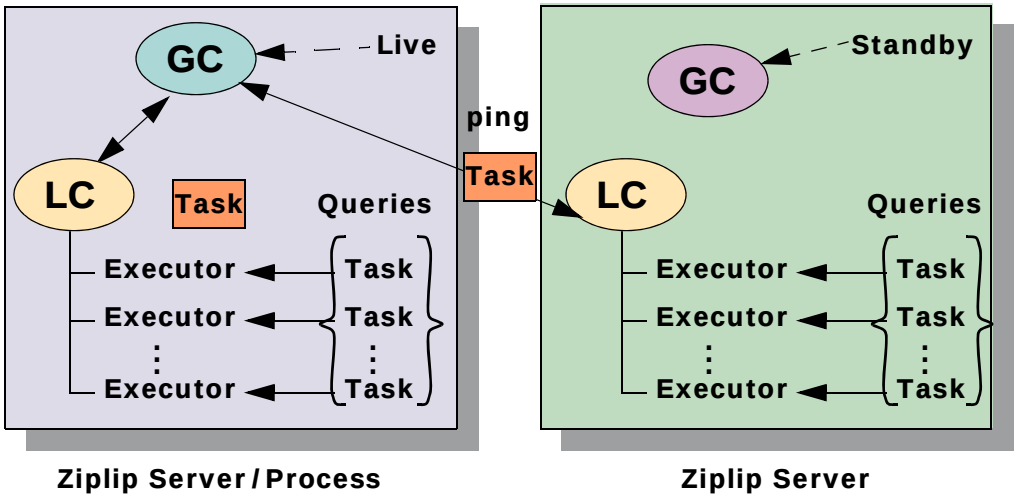

**Figure 8.69: Application Vault – Secure File Management tab**

3. To disassociate a specific store from a storage unit, click the **Disassociate** button next to it, then click **OK** in the pop-up window to confirm.
4. To associate a specific store with a storage unit, select a storage unit from the pull-down menu next to the store you want to modify, then click **OK** in the pop-up window to confirm.

Chapter 9

# Coordinator / Executor

The ZipLip Platform relies on the Coordinator/Executor architecture for ensuring scalability, failover, and load balancing. The architecture consists of nodes running in a logical cluster. The nodes in a cluster communicate with each other through the use of the database and TCP/IP sockets. There can be more than one cluster in a TCP/IP subnet.




Each node, typically a single system, contains a Local Coordinator and one or more Executors. Each *Executor* is a single worker that can execute any arbitrary task one at a time, such as processing and sending an e-mail message. The Local Coordinator assigns work and manages the Executors residing in the same system. When all the Executors are doing work and there is more work to be done, the Local Coordinator contacts the Global Coordinator and passes the work to the Global Coordinator.

The Global Coordinator knows all the nodes in the cluster. There is also no single point of failure, as a cluster is usually configured to have more than one machine running a Global Coordinator. Although there can only be one Live Global Coordinator at any one time to which all nodes submit work, there can be multiple Backup Global Coordinators monitoring the activities of the Live Global Coordinator to ensure proper operation. When the Live Global Coordinator is not responding, one of the remaining Backup Global Coordinators becomes the new Live Global Coordinator. All failover activity is transparent to different nodes and allows work to flow smoothly.

Each system has a cluster object which keeps track of the Live Global Coordinator. The Local Coordinator uses the information in the cluster object to poll the Live Global Coordinator for more tasks if it doesn't have enough tasks. The Local Coordinator also transfers tasks to the Global Coordinator if it is overloaded or if a task has stayed in its queue beyond a certain time. Thus the Live Global Coordinator functions as a task distributor. An application running on any machine has a choice to submit tasks to the Local Coordinator or directly to the Live Global Coordinator. Adding more machines into the cluster increases the total processing capability in a linear fashion.

All failover and Global Coordinator activity is logged in the `globalCoord` logs. Local Coordinator activity is logged to the `lc` logs, and Executor activity is logged into the various `exec` logs, with each Executor getting its own log file.

## Coordinator/Executor Configuration

The parameters for Coordinator/Executors can be modified from the configuration files.

### Cluster Name

The default cluster name for a machine may be modified in `$ZipLip/WEB-INF/Config/runnable/pmapp/pmapp.cfg`. Locate and change the name to the variable `coord.cluster.default.name`.

### Local Coordinator Parameters

The local coordinator parameters for a machine may be modified in `$ZipLip/WEB-INF/Config/app/shared/pmappSystem.cfg`. The following is an excerpt of the necessary parameters in the file:

```
coord.taskMgr.maxSchedule = 100
coord.taskMgr.maxScheduleTime = @TEN_MIN_MS@

coord.cluster.name = @coord.cluster.default.name@
coord.cluster.pollingInterval = @TWO_MIN_MS@
coord.cluster.nReload = 5

coord.localCoord.cluster = @coord.cluster.default.name@
coord.localCoord.initialExecutors = 5
coord.localCoord.pollingInterval = 5000
```

The last two parameters are important.

`coord.localCoord.initialExecutors` – This variable denotes the number of Executors the machine spawns. Setting a high number causes more CPU and disk resources in this system to be consumed.

`coord.localCoord.pollingInterval` – This variable denotes how often, in milliseconds, the Local Coordinator polls the Global Coordinator for work.

## Global Coordinator

There are no settings for Global Coordinators, apart from having to run a Global Coordinator at startup. Not all nodes in the cluster need to run a Global Coordinator, as it might entail a fair amount of network traffic and CPU usage when a machine is voted to be the Live Global Coordinator. The following chapters contain information on how to start the Global Coordinator as a Child Process at startup.

Chapter 10

# MTA Processing

The Mail Transfer Agent, or MTA, is the major component in the ZipLip e-mail server which handles all mail from various sources, such as SMTP and IMAP. The MTA is built to be extremely scalable, flexible, and reliable. The MTA uses the Coordinator/Executor architecture to handle mail processing tasks.

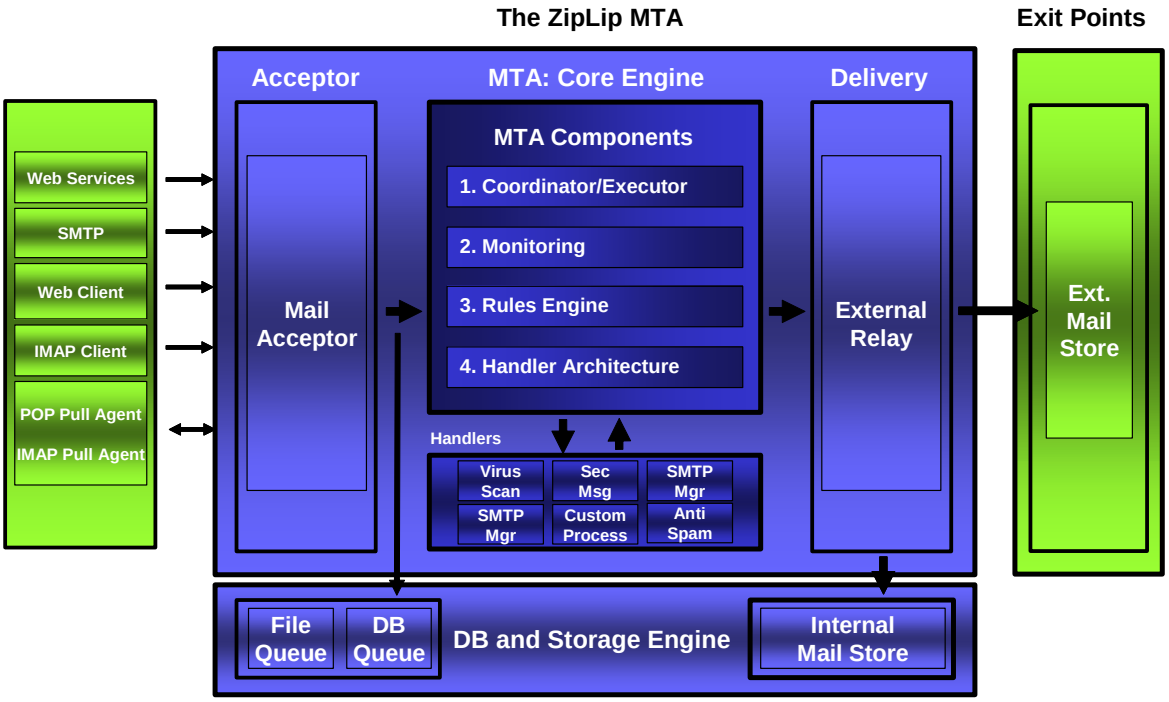



**Figure 10.1: ZipLip MTA Architecture Diagram**

The MTA temporarily stores files in the SMTP Staging Vault, which can be viewed in the SysAdmin application by selecting **Vault** and under **Vault** selecting **SMTP Staging Vault**.

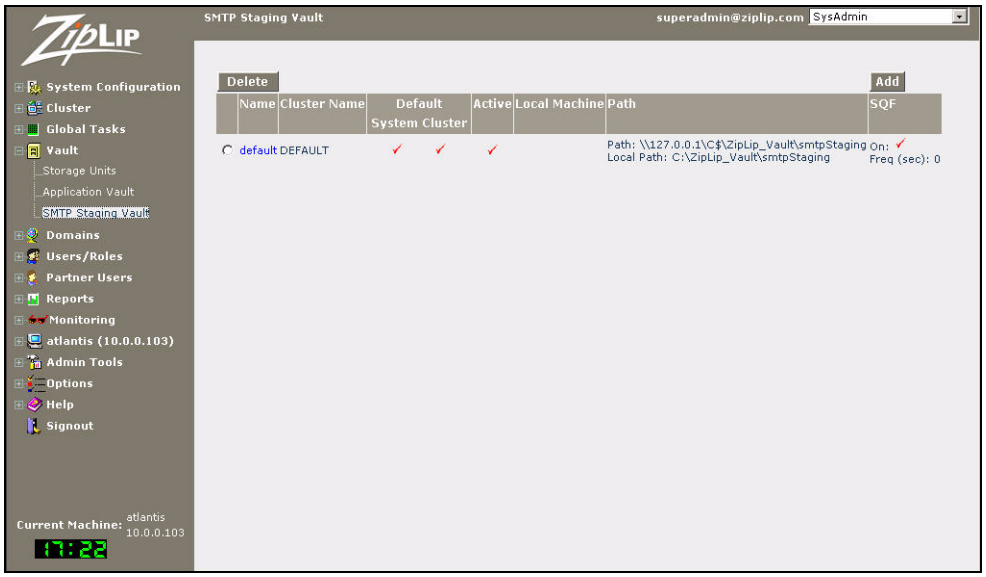



**Figure 10.2: SMTP Staging Vault**

In the example shown in Figure 10.2, the path to the SMTP Staging Vault is shown as:

```
Path: \\127.0.0.1\C$\ZipLip_Vault\smtpStaging
Local Path: C:\ZipLip_Vault\smtpStaging
```

The SMTP Queue provides high performance in processing e-mail, as it uses very few resources when handling a large number of incoming messages. Mail is sent to the MTA for processing in the SMTP Queue and the Staging Vault as follows:

1. The SMTP Listener starts writing a new file for each new message it receives over the network into the `queue` directory under the SMTP Staging Vault (in this example, `C:\ZipLip_Vault\smtpStaging\queue`).
2. When the message transfer has finished, the SMTP Listener task submits a mail processing job to the Local Coordinator.
3. If the Local Coordinator is too busy to run the job, it passes it back to the Global Coordinator, which then decides which other Local Coordinator to use. This may be a different system than the one with the SMTP server.
4. The selected Local Coordinator delegates the task to an *Executor*, which is a thread that does processing within ZipLip.
5. The Executor moves the file to the `process` directory (in this example, `C:\ZipLip_Vault\smtpStaging\process`) before processing.
6. If, in the parsing of the original e-mail, if there is some kind of syntax error causing a failure in the parsing process, the message is moved to the `dead` folder (in this example, `C:\ZipLip_Vault\smtpStaging\dead`).
7. The Executor continues processing the message. Once the message is processed successfully it is moved to the system Vault.
8. If the “Use Done Folder” option is checked for the SMTP Staging Vault, a copy of the message is also placed into the `done` directory (in this example, `C:\ZipLip_Vault\smtpStaging\done`).

9. If the e-mail cannot be delivered (for example, if the recipient's SMTP server is down or the DNS cannot find the mail server), it is moved to the database queue (ZLStaging in the Vault) and reprocessed for the time specified in the System Registry (default is three days).
10. If the e-mail cannot be delivered after the maximum allowed reprocessing time, it is bounced back to the sender and deleted from the ZipLip system.
11. The SMTP Queue Fetcher task cleans the `done` directory (in this example, `C:\ZipLip_Vault\smtpStaging\done`) according to the policy specified in configuration files.

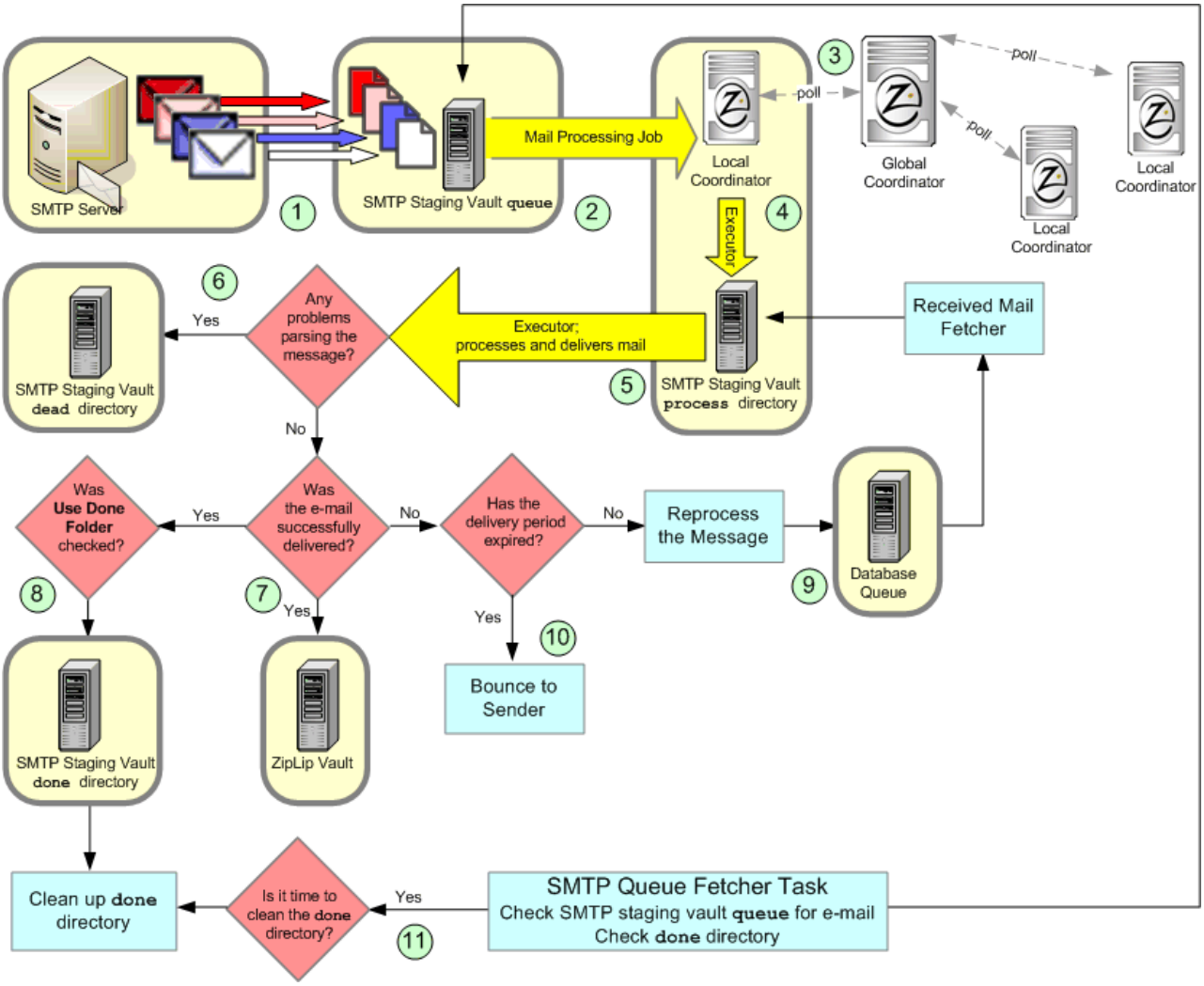



**Figure 10.3: ZipLip MTA Process Flow**

By staging a message in the Staging Vault, the MTA uses the Vault Store to copy a message into the Staging Vault. This submits the message to the database queue and creates pointers to this message in the `ZLPReceivedMail` and `ZLPRecipientInfo` tables. These tables are polled by an administrative process and retried for a specified number of times or period of time.

MTA processing information is logged to the `MTATranscript` table. Information on the state of a particular message can be found using the web-based ZipLip **SysAdmin** application. The

MTA also uses the `MTATranscript` table to detect loops, to set up rate control policies, and construct automated reports to monitor MTA processing.

## Configuring the SMTP Staging Vault

The SMTP Queue and Staging Vault can be assigned using the SysAdmin application. To assign one or more queue stores:

1. In the SysAdmin application, select **Vault**. Under **Vault**, select **SMTP Staging Vault**.

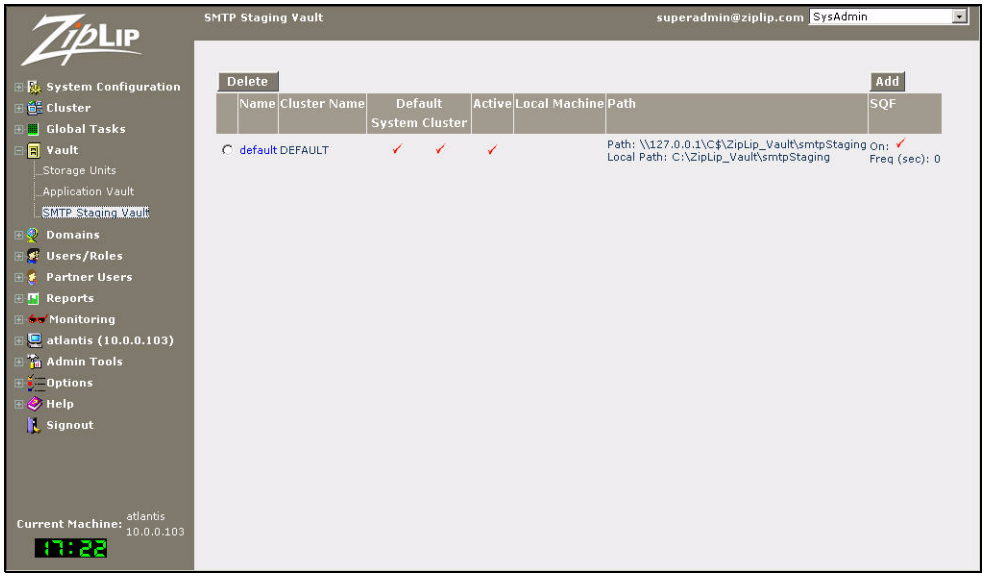



**Figure 10.4: SMTP Staging Vault**

In the example shown in Figure 10.4, the path to the **default** SMTP Staging Vault is shown as:

```
Path: \\127.0.0.1\C$\ZipLip_Vault\smtpStaging
Local Path: C:\ZipLip_Vault\smtpStaging
```

2. To further examine an SMTP Staging Vault, click the name of the Vault (in this case, **default**).

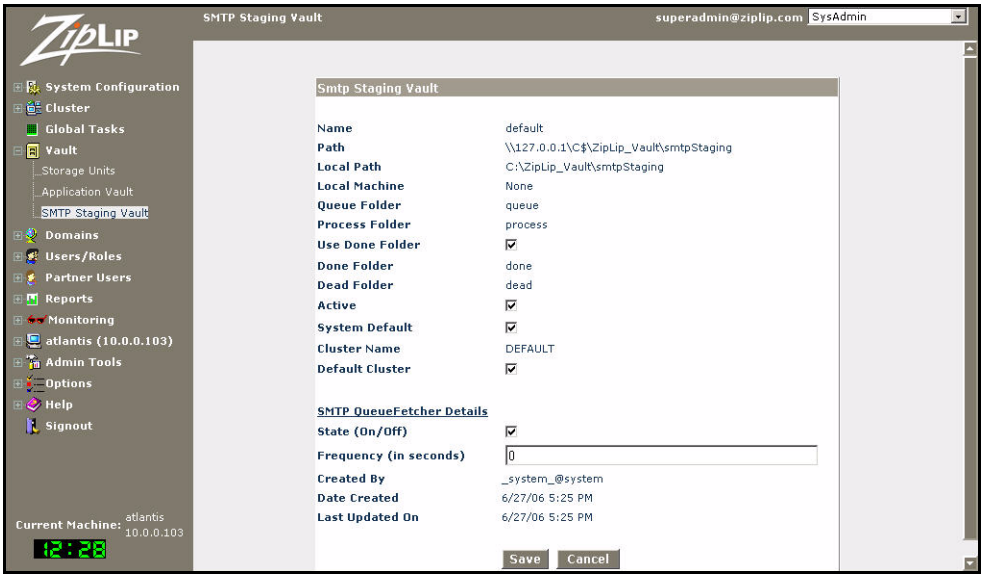



**Figure 10.5: SMTP Staging Vault details screen**

3. The **SMTP Staging Vault** details screen for the Vault contains the following information:
   - **Name** – The name of this Vault (in this case, **default**).
   - **Path** – The network path to this Vault (in this case, **\\127.0.0.1\C$\ZipLip_Vault\smtpStaging**).
   - **Local Path** – The path to this Vault on the local system (in thie case, **C:\ZipLip_Vault\smtpStaging**).
   - **Local Machine** – None
   - **Queue Folder** – The name of the SMTP staging queue folder (in this case, **queue** as in `C:\ZipLip_Vault\smtpStaging\queue`).
   - **Process Folder** – The name of the folder that holds mail being processed (in this case, **process** as in `C:\ZipLip_Vault\smtpStaging\process`).
   - **Use Done Folder** – Check to have a copy of each successfully processed message copied into a folder in the staging queue. This is mostly used for debugging.
   - **Done Folder** – The name of the folder that holds copies of succesfully processed messages (in this case, **process** as in `C:\ZipLip_Vault\smtpStaging\process`).
   - **Dead Folder** – name of the folder that holds copies messages that could not be processed (in this case, **dead** as in `C:\ZipLip_Vault\smtpStaging\dead`).
   - **Active** – Check to make this staging Vault active.
   - **System Default** – Check to make this Vault the default SMTP Staging Vault for this system.
   - **Cluster Name** – The name of the ZipLip cluster this Vault uses (in this case, **DEFAULT**).
   - **Default Cluster** – Check to make this cluster the default ZipLip cluster for the SMTP Staging Vault for this system.
   - **State (On/Off)** – Checking this turns on the SMTP QueueFetcher tasks. Check to process mail; uncheck to stop mail processing.

- **Frequency (in seconds)** – A frequency of "**0**" as in this example means e-mail is processed constantly. Raise this number if the system is highly loaded and you want to run the SMTP QueueFetcher task less frequently.
- **Created By** – The user who created this Vault (in this case, **_system_@system** because it was created during the ZipLip installation process).
- **Date Created** – The date on which this Vault was created (in this case, **6/27/06 5:25 PM**).
- **Last Updated On** – The date on which this Vault was last updated (in this case, **6/27/06 5:25 PM**).

To save any changes you have made to the vault, click **Save**. To return to the **SMTP Staging Vault** list, click **Cancel**.

## Mail Queue Monitoring

This section contains instructions on how to monitor the mail-related queues.

### Monitoring MTA Activity

To view transcripts of MTA activity, in the SysAdmin application, select **Monitoring** in the left menu. Under **Monitoring**, click **MTA Monitor**. The **MTA Transcript Search** screen appears

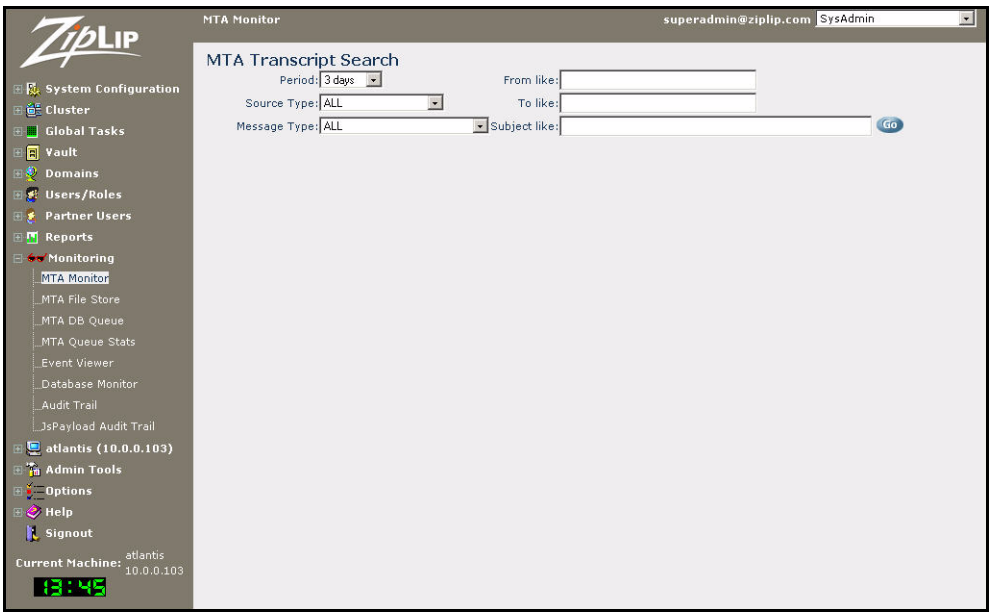



**Figure 10.6: MTA Transcript Search screen**

From here you can search the MTA Queue for messages processed anywhere from within 30 minutes to three days. Use the pull-down menus and blanks to specify the following criteria:

- **Period** – Select a duration ranging from 30 minutes (mins) to 3 days.
- **Source Type** – Select ALL for all messages, or select a specific source type.
- **Message Type** – Select ALL for all messages, or select a specific message type.

- **From like** – Leave blank to return messages from any address, or enter a string the From field must contain.
- **To like** – Leave blank to return messages addressed to any address, or enter a string the To field must contain.
- **Subject like** – Leave blank to return messages from any address, or enter a string the Subject field must contain.

Click **Go** to start the search. The **MTA Transcript Search** screen now contains a list of messages processed by the MTA that fit the search criteria.

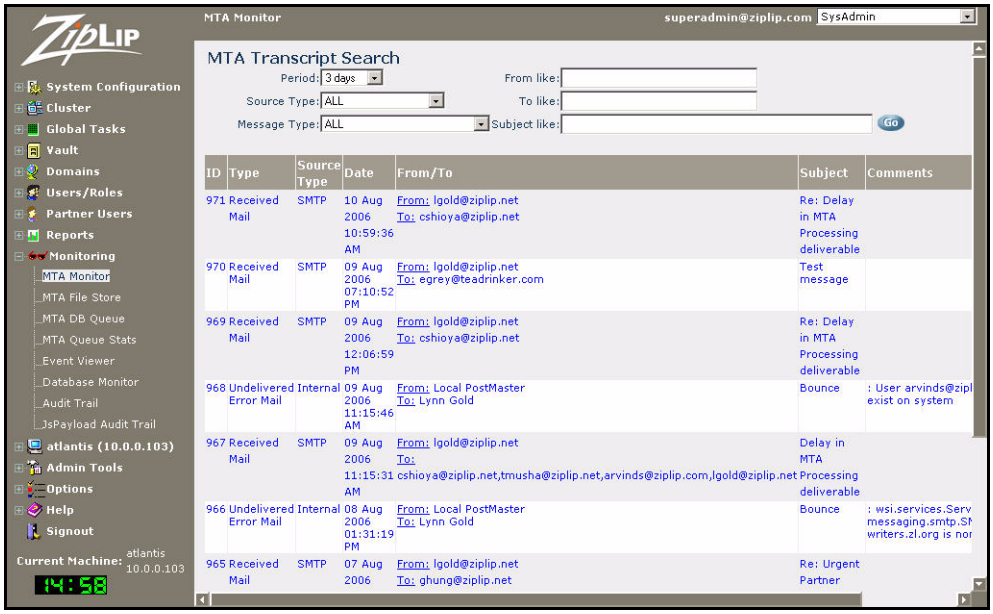



**Figure 10.7: MTA Transcript Search results screen**

Clicking on any of the links shows you a transcript containing a summary of the message headers, direction, source type, and size, as well as processing information similar to the one shown in Figure 10.8.

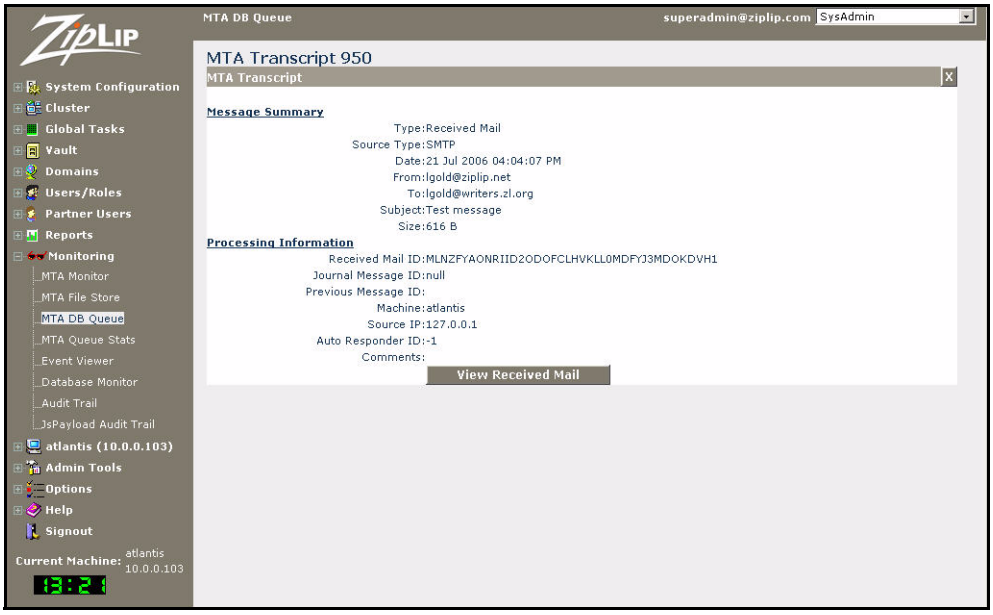



**Figure 10.8: MTA Transcript screen**

## Monitoring the MTA File Stores

To get the path for the SMTP staging vault and the name of its subdirectories, click **Monitoring** in the left menu. Under **Monitoring**, click **MTA File Store**. The **MTA File Store** screen appears.

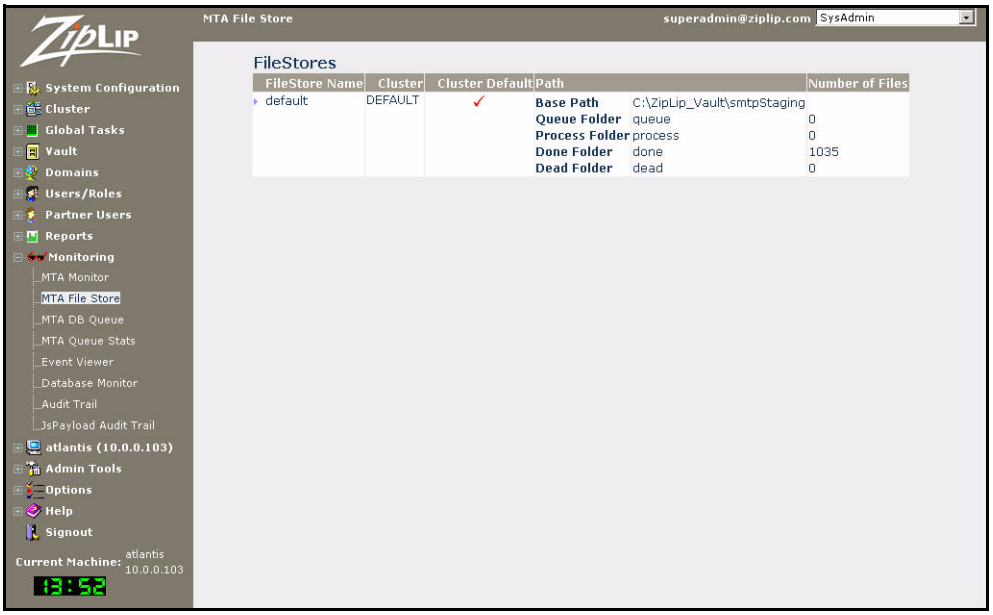



**Figure 10.9: MTA File Store screen**

Here you can view the following:

- **FileStore Name** – This column contains the name of the file store (in this case, **default**).

- **Cluster** – This coumn contains the name of the cluster for this file store (in this case, **DEFAULT**).
- **Cluster Default** – Whether this is the default path for this file store.
- **Path** – The various filesystem paths for the file store:
  - **Base Path** – The base file structure on which the file store resides (in this case, **C:\ZipLip_Vault\smtpStaging**).
  - **Queue Folder** – The folder under the base file structure that holds the mail queue (in this case, **queue**, as in `C:\ZipLip_Vault\smtpStaging\queue`).
  - **Process Folder** – The folder under the base file structure that holds mail being processed (in this case, **process**, as in `C:\ZipLip_Vault\smtpStaging\process`).
  - **Done Folder** – The folder under the base file structure that holds transcripts of processed mail (in this case, **done**, as in `C:\ZipLip_Vault\smtpStaging\done`).
  - **Dead Folder** – The folder under the base file structure that holds transcripts of mail that could not be processed after a specified retry time (in this case, **dead**, as in `C:\ZipLip_Vault\smtpStaging\dead`).
- **Number of Files** – The number of files in each of the file store subdirectories.

## Monitoring the Message Queue

To monitor the message queue, click **Monitoring** in the left menu. Under **Monitoring**, click **MTA DB Queue**. The **MTA Queue Summary** screen appears.

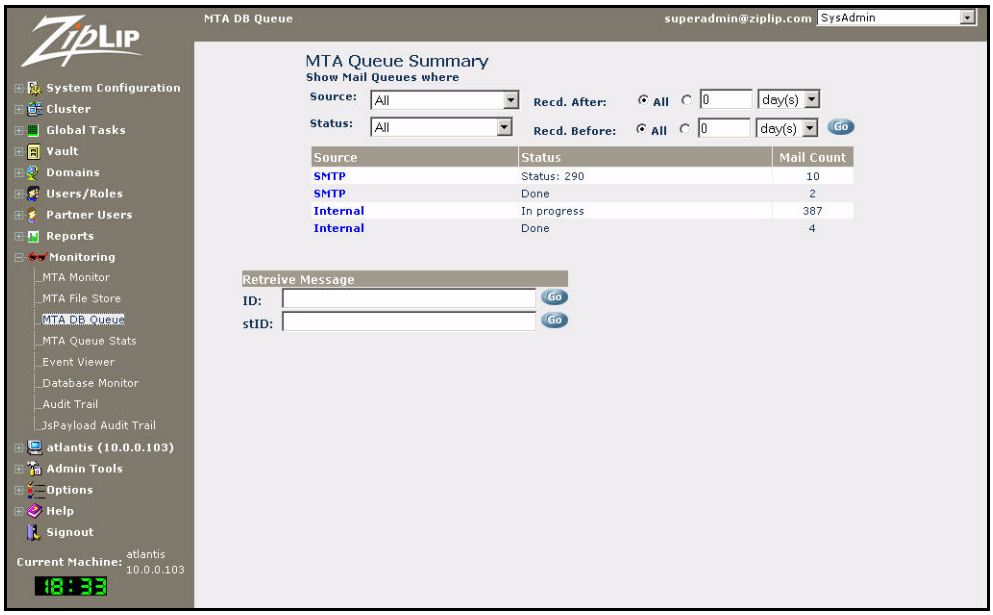



**Figure 10.10: MTA Queue Summary screen**

Here you can see a summary of the mail queue with information such as the mail source and number of messages in the queue.

- To filter based on source type, select one of the following source types from the **Source** pull-down menu and click the **Go** button.

- To filter the queue based on status, select a status from the **Status** pull-down menu and click the **Go** button.
- To filter based on date, select the received **Date** and click **Go**.
- To retrieve a specific message, enter the ZipLip message ID in the box to the right of **ID**, or enter its message ID string in the box to the right of **stID**. Click **Go** to the right of the box in which you entered data to view the **Received Mail** screen for the specified message. Figure 10.12 on page 147 shows an example **Received Mail** screen.
- To view a specific queue, click its name in the **Source** column. The **Mail Source** screen for the specified queue appears.

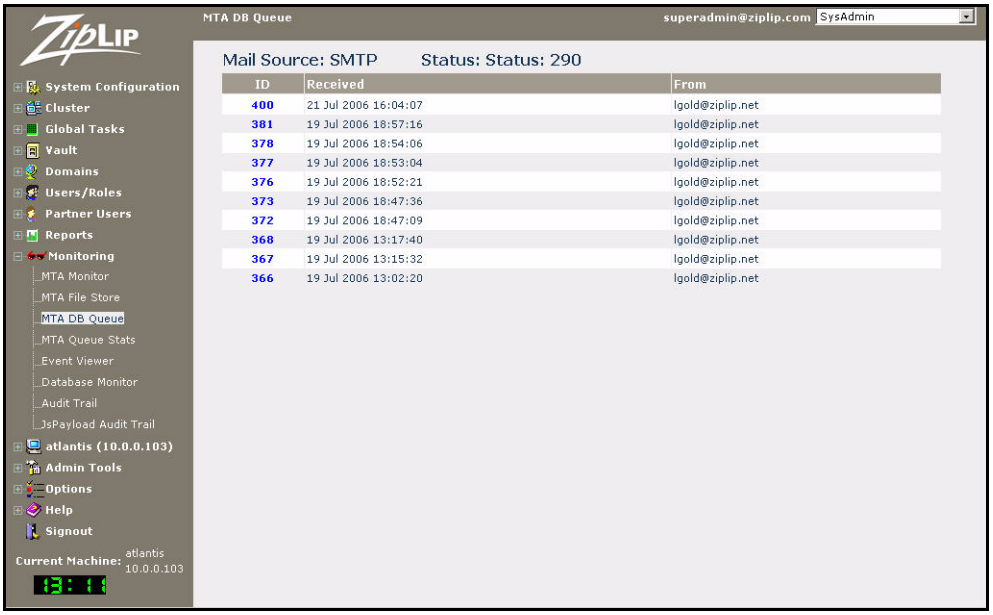



**Figure 10.11: Mail Source screen for a specified queue (SMTP)**

To view the message headers for a specific message in that queue, click on the message ID. A screen appears similar to the one in Figure 10.12 showing the message headers and other details about the message.

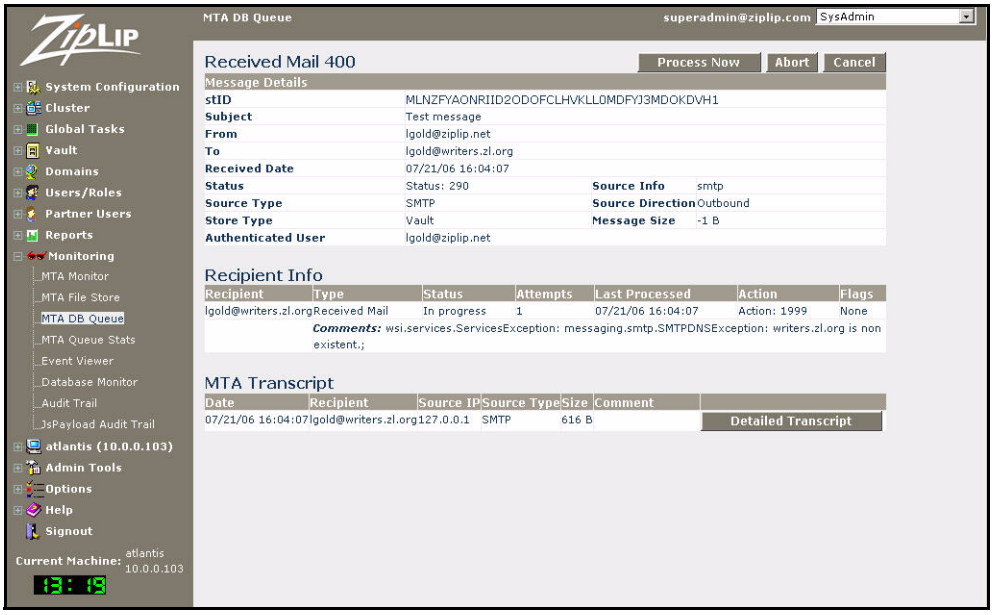



**Figure 10.12: Received Mail screen**

In the **Received Mail** screen you can:

- click the **Process Now** button to schedule the message for processing by the MTA.
- click the **Abort** button to permanently abort processing of the message. A pop-up box appears; click **OK** to permanently kill the message.
- click the **Cancel** button to return to the **Mail Source** screen.
- click the **Detailed Transcript** button to see a detailed transcript of the processing of the message similar to the example in Figure 10.8 on page 144.

To return to the **Received Mail** screen, click the **View Received Mail** button.

## Monitoring the SMTP Queue

To monitor the SMTP queue, click **Monitoring** in the left menu. Under **Monitoring**, click **MTA File Store**. The **MTA FileStores** screen appears.

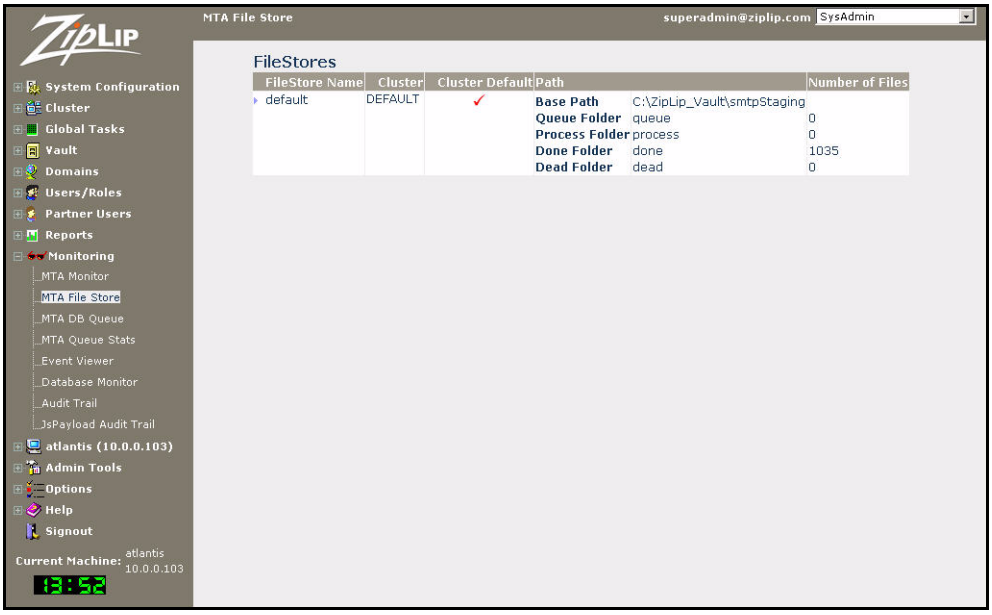



**Figure 10.13: FileStores screen**

This shows a summary of the SMTP queue with the number of files in each directory.

- Too many messages in the **Queue Folder** indicates more Executors need to be added to the cluster because it is not processing mail fast enough.
- Too many messages in the **Process Folder** indicates a content filtering segment, such as a virus scanner, is taking too long.
- Too many messages in the **Done Folder** indicates it might be time to make sure the SMTP Queue Fetcher is running correctly.

## Monitoring MTA Queue Statistics

To monitor MTA queue statistics, click **Monitoring** in the left menu. Under **Monitoring**, click **MTA Queue Stats**. The **MTA Queue Statistics** screen appears.


**Figure 10.14: MTA Queue Statistics screen**

This summary of mail processing in the cluster contains a table of five values:

- **Scheduled** – These are used by some applications to delay sending e-mail to a later time.
- **Scheduled Done** – The number of scheduled messages that have been properly delivered.
- **Queued** – Messages waiting in the mail queue.
- **Done** – All successfully sent messages.
- **Failed** – Messages that did not reach their destination.

**Queued**, **Done**, and **Failed** refer to all messages whether they are in the SMTP Queue or the Staging Vault.

## Setting Up Event Monitoring

To determine how you monitor your ZipLip system:

1. Click **System Configuration** in the left menu. Under **System Configuration**, click **Registry**.
2. In the **Registry** pane, click **System Configuration**.
3. In the **System Configuration** pane, click **System Monitoring**.

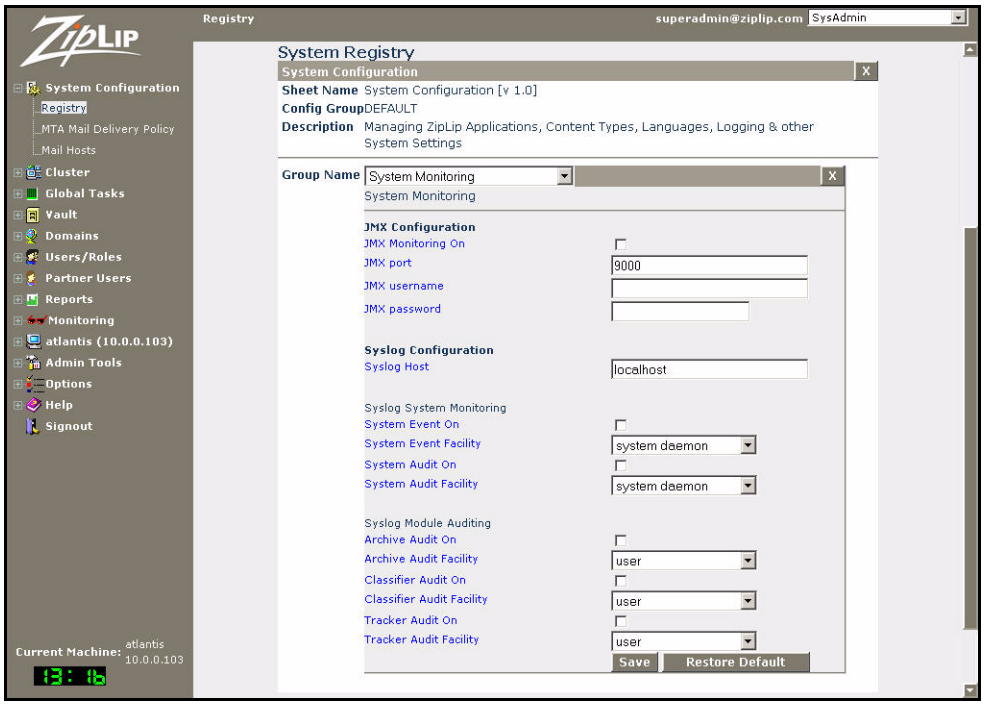



**Figure 10.15: System Registry - System Monitoring pane**

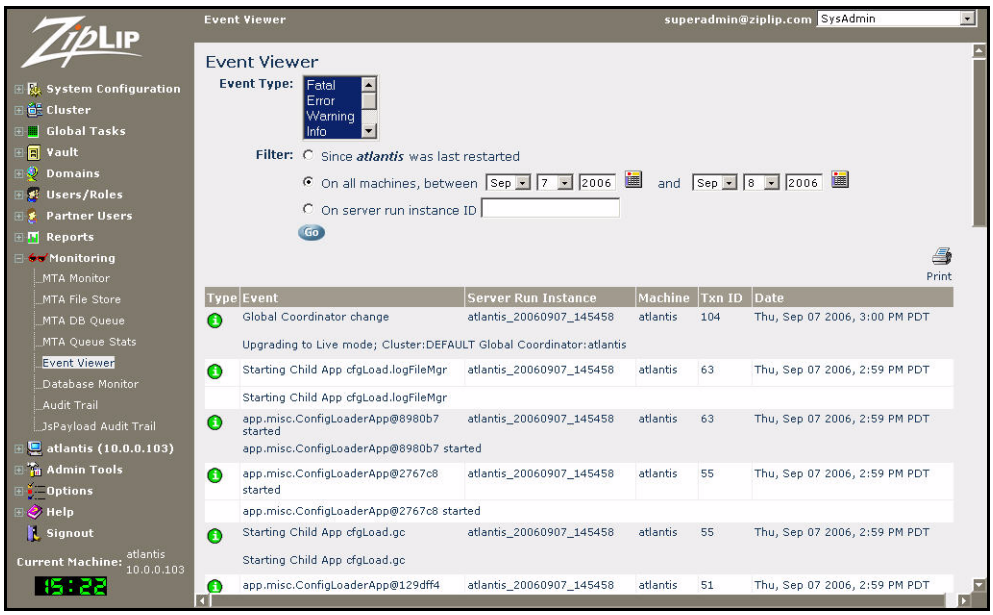
4. In the **System Monitoring** pane, configure the following parameters to suit your needs:
   - **JMX Monitoring On** – Check to use Java Management Extensions (JMX) to monitor ZipLip activity from remote consoles.
   - **JMX port** – Enter the port for JMX monitoring. The default value is 9000.
   - **JMX username** – If you are using JMX monitoring, enter the username for JMX monitoring.
   - **JMX password** – If you are using JMX monitoring, enter the password for the JMX monitoring username.
   - **Syslog Host** – To use syslog system monitoring, enter a syslog server to receive messages from the ZipLip server.
   - **System Event On** – Check to enable syslog monitoring of system event messages.
   - **System Event Facility** – Use the pull-down menu to select the facility name for system event messages.
   - **System Audit On** – Check to enable syslog monitoring of system audit messages.
   - **System Audit Facility** – Use the pull-down menu to select the facility name for system audit messages.
   - **Archive Audit On** – Check to enable syslog monitoring of archive audit messages.
   - **Archive Audit Facility** – Use the pull-down menu to select the facility name for archive audit messages.
   - **Classifier Audit On** – Check to enable syslog monitoring of Classifier audit messages.
   - **Classifier Audit Facility** – Use the pull-down menu to select the facility name for Classifier audit messages.
   - **Tracker Audit On** – Check to enable syslog monitoring of Tracker audit messages.

- **Tracker Audit Facility** – Use the pull-down menu to select the facility name for Tracker audit messages.

To save your settings, click **Save**, then click **OK** to the message warning you that you must restart the ZipLip server for your changes to take effect.

## Using the Event Viewer

The Event Viewer enables ZipLip to monitor activity. To use the Event Viewer, in the left menu, click **Monitoring**. Under **Monitoring**, click **Event Viewer**. The **Event Viewer** screen appears.




The columns have the following meanings:

- Type – An icon depicting the type of event. One of the following:
  - – Fatal or Error; mouse over the icon to see which type of event was triggered
  - – Warning
  - – Information
  - – Register
  - – Module
  - – Unknown
- **Event** – If successful, shows the type of event. If not successful, shows the type of exception, along with the location of the exception and details.
- **Server Run Instance** – The instance of the ZipLip server.
- **Machine** – The system on which the event occurred.
- **Txn ID** – ZipLip internal transaction ID number.
- **Date** – The date and time on which this event occurred.

ZipLip uses this information for debugging.

# Using SNMP for Event Monitoring

SNMP lets your management console monitor how the ZipLip server is running. The ZipLip SNMP agent talks SNMP protocol on one side, JMX on the other.

## Configuring ZipLip for SNMP Monitoring

To configure ZipLip for SNMP monitoring you must edit the following file:

On Windows:

```
%ZIPLIP_HOME%\ZLSNMPAgent\config\zlSnmp.cfg
```

On Solaris, Linux, or AIX:

```
$ZIPLIP_HOME/ZLSNMPAgent/config/zlSnmp.cfg
```

This file contains SNMP configuration variables for the agent. The management station needs to know the following values. Set these so the management station can get to you, or set the management station values to match these values:

For SNMP version 1 or version 2:

```
__snmpPool.SNMPport=9161
__snmpPool.SNMPread=public
__snmpPool.SNMPwrite=private
```

For SNMP version 3:

```
__snmpPool.SNMPport=9161
__snmpPool.SNMPcontextEngineId=
__snmpPool.SNMPcontextName=
__snmpPool.SNMPuserName=initial
__snmpPool.SNMPuseAuthentication=false
__snmpPool.SNMPauthenticationProtocol=@__snmp.authentication.MD5@
__snmpPool.SNMPuserAuthenticationPassword=
__snmpPool.SNMPusePrivacy=false
__snmpPool.SNMPuserPrivacyPassword=
```

The JMX server talks to the JMX host (in this case, `localhost`). The settings in this section of the configuration file must match the settings in the ZipLip System Registry (see Figure 10.15 on page 150):

```
__snmpPool.JMXhost=localhost
__snmpPool.JMXport=9000
__snmpPool.JMXuser=
__snmpPool.JMXpass=
__snmpPool.JMXdomainname=ZLServer/@machine.local.name@
```

The last value (`@machine.local.name@`) must be set to something meaningful to ZipLip and the SNMP agent. The ZipLip naming system starts out with the name of the local system. This string is correct if you are the running ZipLip server and JMX on the same system. If you are running the ZipLip server and the SNMP agent on separate systems, you need to change this value to "`ZLServer/`*`name.of.ziplip.server`*".

To have SNMP traps that tell the management station when something goes wrong, add a trap target based on your version of SNMP.

SNMP version 1:

```
__snmpPool.snmpTrap.target.v1=#com.ziplip.snmp.SnmpAddress~~localhost~~@__sn
mp.trap.port.default@~~@__snmp.version.1@~~@__snmpPool.SNMPread@~~@__snmpPoo
l.SNMPwrite@
```

SNMP version 2:

```
__snmpPool.snmpTrap.target.v2c=#com.ziplip.snmp.SnmpAddress~~localhost~~@__s
nmp.trap.port.default@~~@__snmp.version.2c@~~@__snmpPool.SNMPread@~~@__snmpP
ool.SNMPwrite@
```

SNMP version 3:

```
__snmpPool.snmpTrap.target.v3=#com.ziplip.snmp.Snmp3Address~~localhost~~@__s
nmp.trap.port.default@~~@__snmp.version.3@~~@__snmpPool.SNMPcontextEngineId@
~~@__snmpPool.SNMPcontextName@~~@__snmpPool.SNMPuserName@~~@__snmpPool.SNMPu
seAuthentication@~~@__snmpPool.SNMPauthenticationProtocol@~~@__snmpPool.SNMP
userAuthenticationPassword@~~@__snmpPool.SNMPusePrivacy@~~@__snmpPool.SNMPus
erPrivacyPassword@
```

In the appropriate line, replace localhost with the system name or IP address of the management station or trap reciever. You may also have to replace "`@__snmp.trap.port.default@`" with a port number (usually `162`).

## Installing and Starting SNMP on Windows

To install the SNMP service on Windows:

1. Open a command prompt and change to the `%ZIPLIP_HOME%\ZLSNMPAgent\bin` directory.

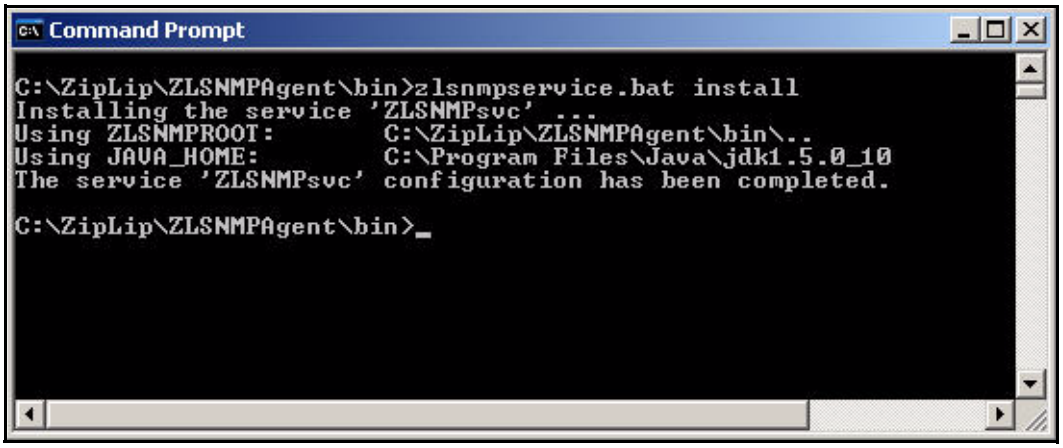



**Figure 10.16: Running the SNMP agent installation script**

2. Enter:

   ```
   zlsnmpservice.bat install
   ```

The syntax for running the installation script is:

`zlsnmpservice.bat` *`command`* `[`*`service_name`*`]`

where *command* is one of the following:

- `install` – Install the service using `zlsnmpsvc` as the service name. The service is installed using default settings.
- `remove` – Remove the service from the system.
- `update` – Update the service on the system.

and *service_name* (optional) is the name of your new service.

To start the ZLSNMP agent, enter:

```
net start zlsnmpsvc
```

To stop the ZLSNMP agent, enter:

```
net stop zlsnmpsvc
```

To verify that the ZLSNMP agent is installed and running, open a command prompt window and enter `services.msc`. This opens the Windows services console.

Scroll down to the bottom of the list to where the ZipLip SNMP agent is listed, as shown in Figure 10.17.

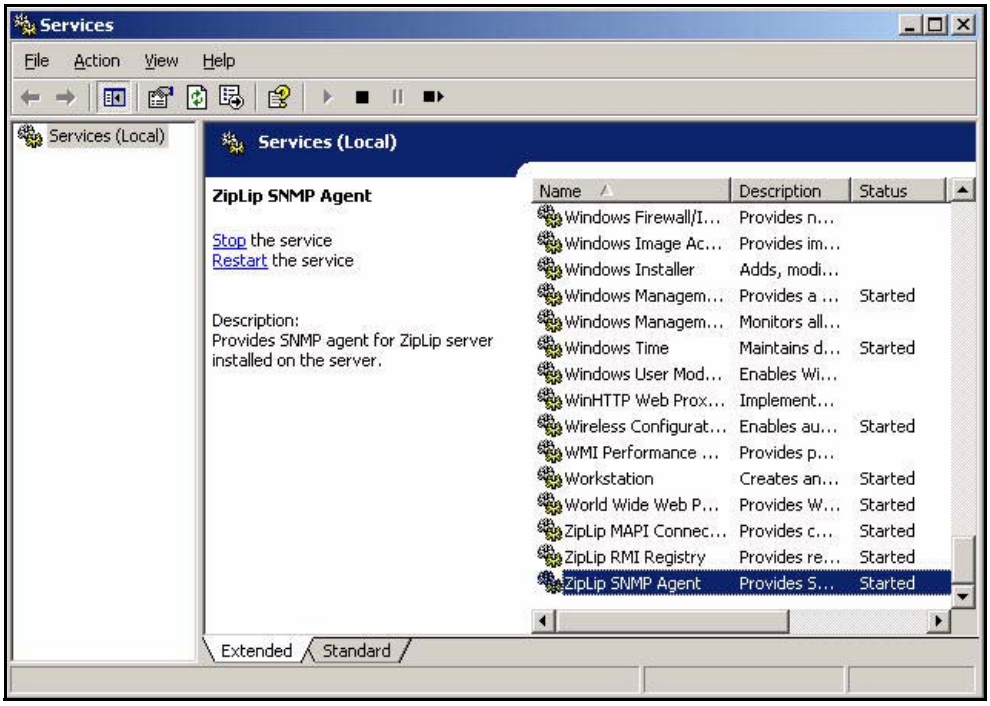



**Figure 10.17: ZLSNMP service**

To change startup parameters for the ZipLip SNMP agent, in a command window, enter:

```
%ZIPLIP_HOME%\ZLSNMPAgent\bin\zlsnmpsvcw
```

To run the SNMP agent interactively, enter:

```
%ZIPLIP_HOME%\ZLSNMPAgent\bin\zlSnmp.exe
```

## Installing and Starting SNMP on Solaris, Linux, or AIX

To install the SNMP service on Solaris, Linux, or AIX, run the `zlSnmp.sh` script in the `$ZIPLIP_HOME/ZLSNMPAgent/bin` directory.

Chapter 11

# Report Management

Reports help gather statistical information about a system. The ZipLip SysAdmin application contains preset reports that enable you to gather statistical information about your system. Reports in ZipLip work as background tasks that keep running at a specified interval. The system can also send out automatic e-mail messages when the reports are generated. The ZipLip Compliance Suite also lets users with *Compliance Administrator* and *Compliance Auditor* roles create system reports. You can dynamically generate reports in ZipLip Compliance, and you can schedule reports using the ZipLip SysAdmin application.

This chapter covers scheduling of reports and understanding the different types of reports.

## Generating Reports in the SysAdmin Application

To select a report to schedule:

In the left menu of the SysAdmin application, select **Reports**. Under **Reports**, select **Reports -> Create New**. The **Available Reports** screen appears.

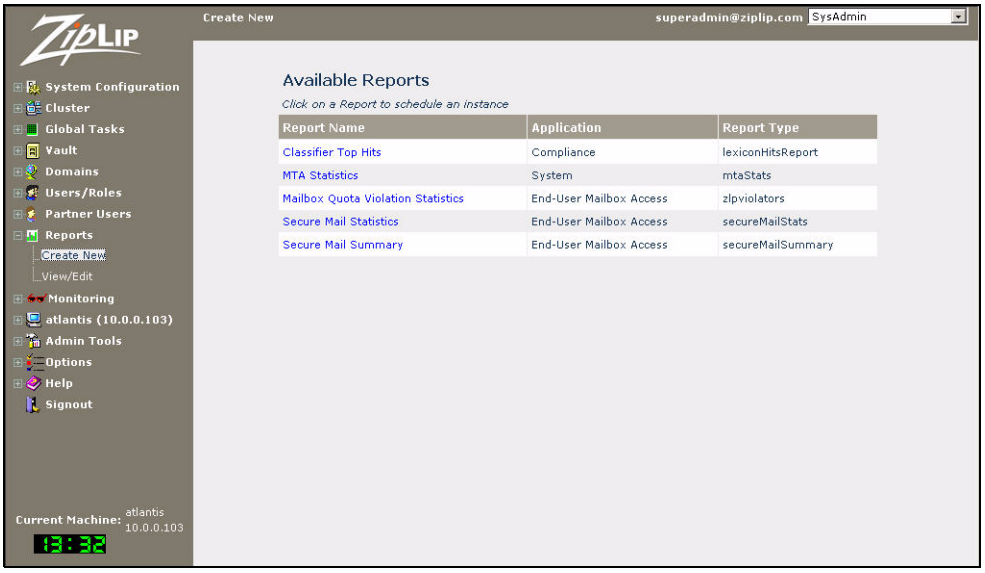



**Figure 11.1: Available Reports screen**

The different types of reports available are:

- **Classifier Top Hits** – This report provides information about the top *n* classifier hits where *n* can be specified while creating the report. This information includes rule information such as ID, Hit Count, Name, Main Phrase, Result Category, Include Phrase, Exclude Phrase, and Synonyms.
- **MTA Statistics** – This report provides information about mail processes, including:
  - **Mail Retry Counts** – the number of times ZipLip has retried to send a message
  - **Machine v/s Mails Processed** – the number of e-mail messages processed by each system in the specified time period
  - **Time v/s Mails Processed** – the amount of e-mail messages processed, by hour
  - **Source v/s Mails Processed** – the number of messages of each mail source type processed
  - **System Standard Values** – tables containing lists of **Mail Source Values** and **Message Type Values**
- **Mailbox Quota Violation Statistics** – This report provides information about which users have exceeded their mailbox quotas, when, and by how much.
- **Secure Mail Statistics** – This report provides information about secure e-mail message traffic, including: the total number of secure e-mail messages sent by specfic users, users who sent more than a specified number of secure e-mail messages, users who received more than a specified number of secure e-mail messages, and the number of secure e-mail messages sent over a specified number of days.
- **Secure Mail Summary** – This report provides hourly and weekly summaries about secure e-mail message traffic.

## Scheduling Reports in the SysAdmin Application

To create a new instance of a report, select a report in the **Available Reports** screen. A screen appears in which you can schedule this report as a background task. For example, the following is the form for a new **Classifier Top Hits Report**.

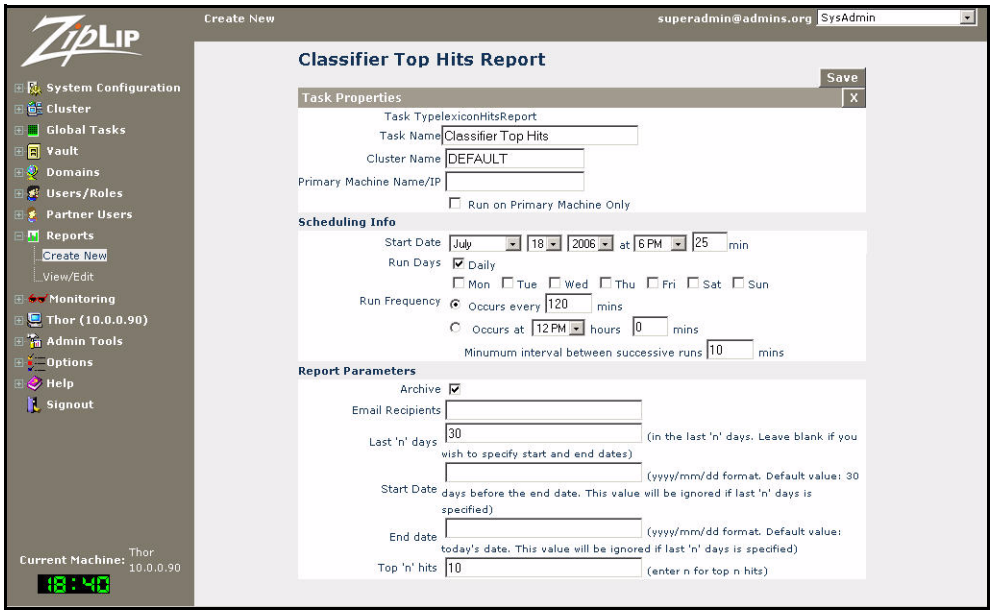



**Figure 11.2: New Classifier Top Hits Report screen**

Specify the following task properties:

- **Task Name** – The name of the report.
- **Cluster Name** – The name of the machine cluster on which this report is to run.
- **Primary Machine Name/IP** – The name or IP address of the primary system in the cluster on which this report is to run.
- **Run on Primary Machine Only** – Check to only run this report on the primary system.
- **Scheduling Info:**
  - **Start Date** – Use the pull-down menus and box to set the date and time to start the task.
  - **Run Days** – Either check **Daily** or check one or more days of the week this task is to run.
- **Report Parameters**
  - **Archive** – Check to archive mail sent to users specified in the **Email Recipients** field.
  - **Email Recipients** – Enter e-mail addresses to receive the report.
  - **Last 'n' days** – The default value is 30 days; this means the report will contain data from the last 30 days. Leave this field empty if you want to specify an exact date.
  - **Start Date** – The required start date in the format "yyyy/mm/dd". Only fill in this field if the **Last 'n' days** field is left blank. If this field is left blank, the start date is set to 30 days before the end date.
  - **End date** – The required end date in the format "yyyy/mm/dd". Only fill in this field if the **Last 'n' days** field is left blank. If this field is left blank, the end date is set to today's date.
  - **Top 'n' hits** – Enter the number of most relevant rows to appear in the generated reports. This field is unique to the **Classifier Top Hits** report.

Click the **Save** button in the upper right corner of the screen to schedule the report.

**Note:** All other reports require similar data for scheduling.

## Viewing, Editing, and Disabling Scheduled Reports

To view the different types of already scheduled reports:

1. In the left menu of the SysAdmin application, select **Reports**. Under **Reports**, select **Reports -> View/Edit**. The **Scheduled Reports** screen appears.


**Figure 11.3: Scheduled Reports screen**

2. To disable a scheduled report, click the icon, then in the pop-up window click **OK** to confirm.

   To edit a scheduled report, click a report name in this screen. A screen appears in which you can edit report parameters.

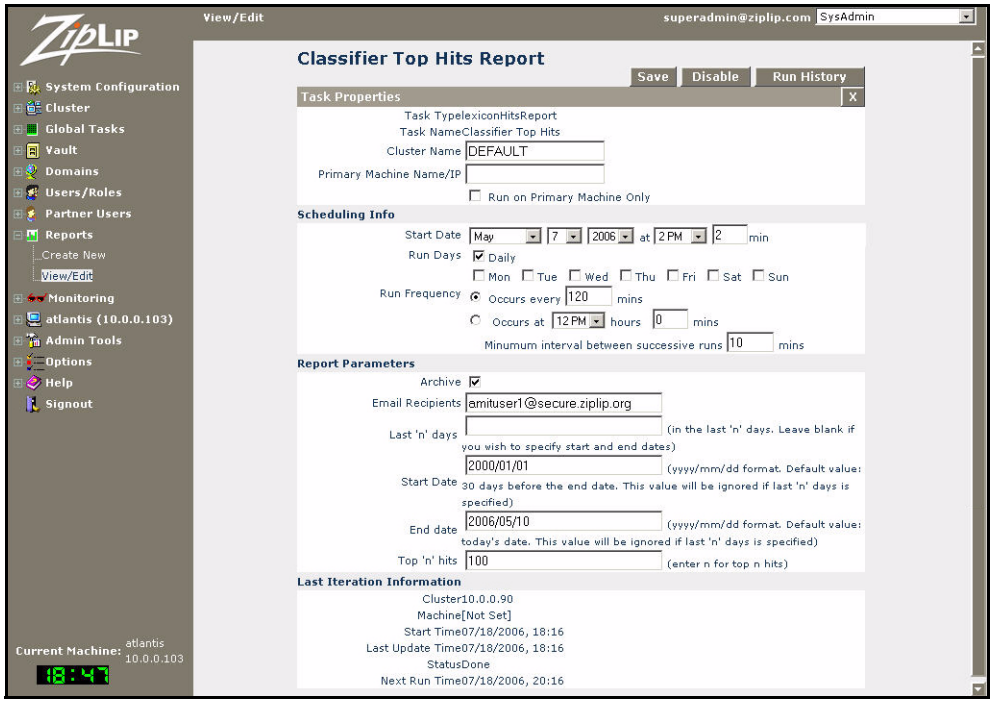



**Figure 11.4: Edit Scheduled Report screen**

3. This screen has two additional buttons to the right of **Save** labeled **Disable** and **Run History**. Click **Disable** to disable the background report process and prohibit future runs of this report. Click **Run History** to see the report iterations run so far.

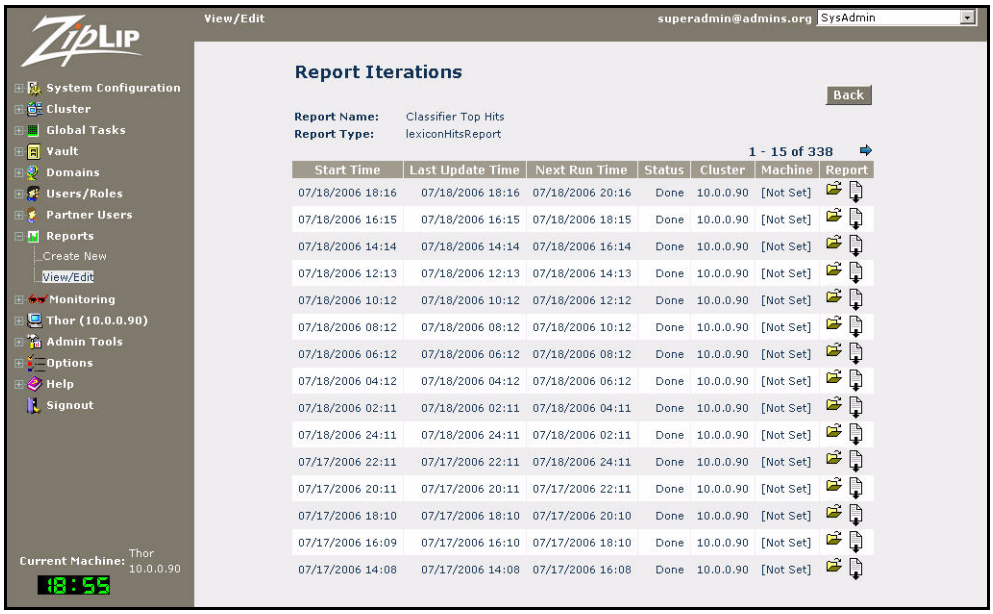



**Figure 11.5: Report Iterations screen**

4. To view iterations, click the icon; to download iterations in HTML forma,t click the icon. Click the **Back** button to return to the **Edit Scheduled Report** screen.

   To return to the **Scheduled Reports** screen, click the "**x**" in the upper right corner.

# Viewing Automatically Generated Reports

In addition to the reports available in the **Reports** menu item, ZipLip automatically generates a report that can be e-mailed to all reviewers and Department heads daily.

## Configuring the Department Reviewer Statistic Report

To configure and run this report:

1. In the left menu of the SysAdmin application, select **Global Tasks**. Under **Global Tasks**, select **View/Schedule Tasks**.

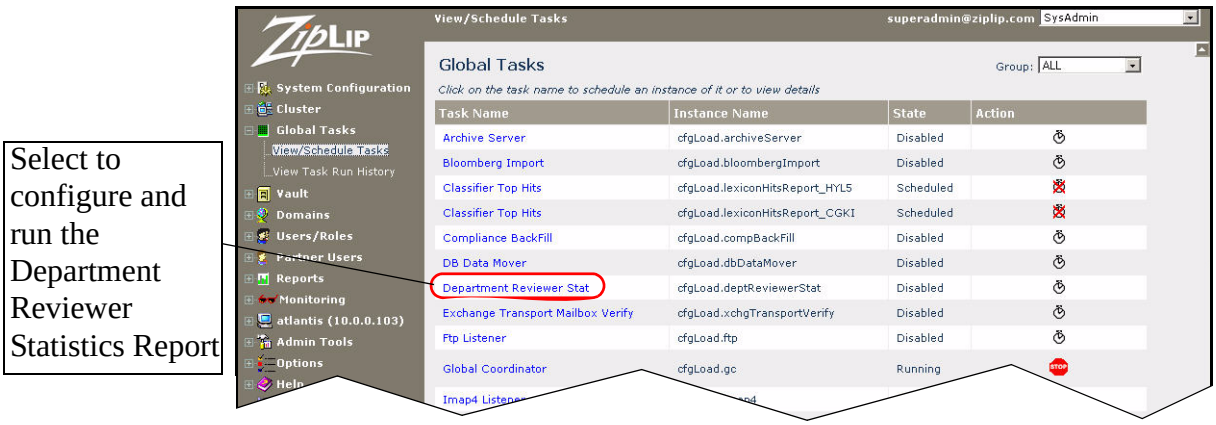



**Figure 11.6: Global Tasks screen**

2. Select **Department Reviewer Stat**. A screen appears in which you can configure and schedule this report.

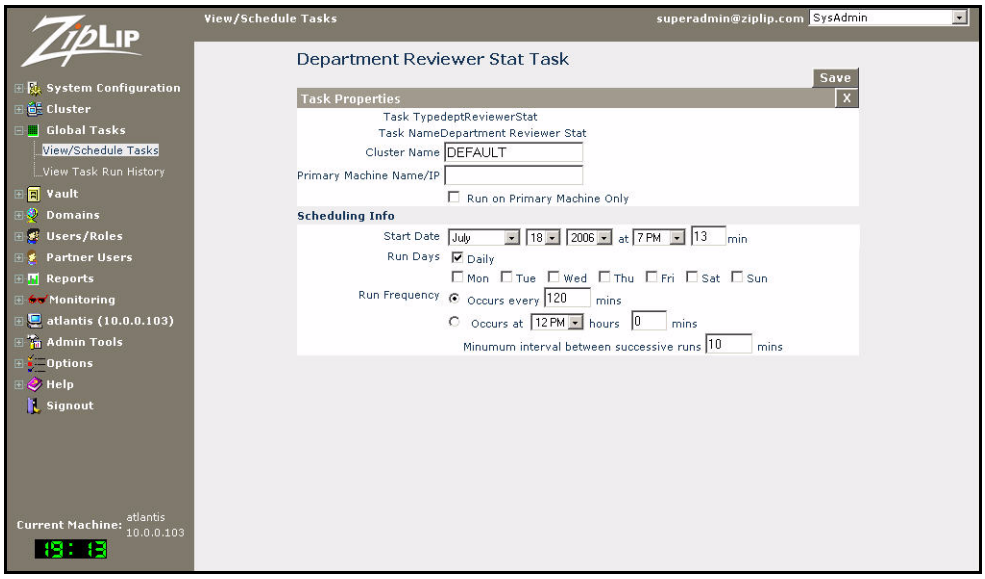



**Figure 11.7: Department Reviewer Stat Task form**

3. In the **Department Reviewer Stat Task** form, set the following parameters:

- **Cluster Name** – The name of the machine cluster on which this report is to run.

- **Primary Machine Name/IP** – The name or IP address of the primary system in the cluster on which this report is to run.
- **Run on Primary Machine Only** – Check to only run this report on the primary system.
- **Scheduling Info:**
  - **Start Date** – Use the pull-down menus and box to set the date and time to start the task.
  - **Run Days** – Either check **Daily** or check one or more days of the week this task is to run.
  - **Run Frequency** – Either enter a value in **Occurs every _ mins** or use the pull-down menu and box to set a precise start time (**Occurs at _ hours and _ mins**). The default value is `120` (two hours).
  - **Minumum interval between successive runs** – Enter, in minutes, the minimum time between runs of this report. The default value is `10`.

Click **Save** in the upper right corner to schedule the task, or click the "**x**" in the upper right corner to return to the **View/Schedule Tasks** screen. Once you have clicked **Save** the report runs as scheduled.

If you have previously run this report, two additional buttons appear at the top.

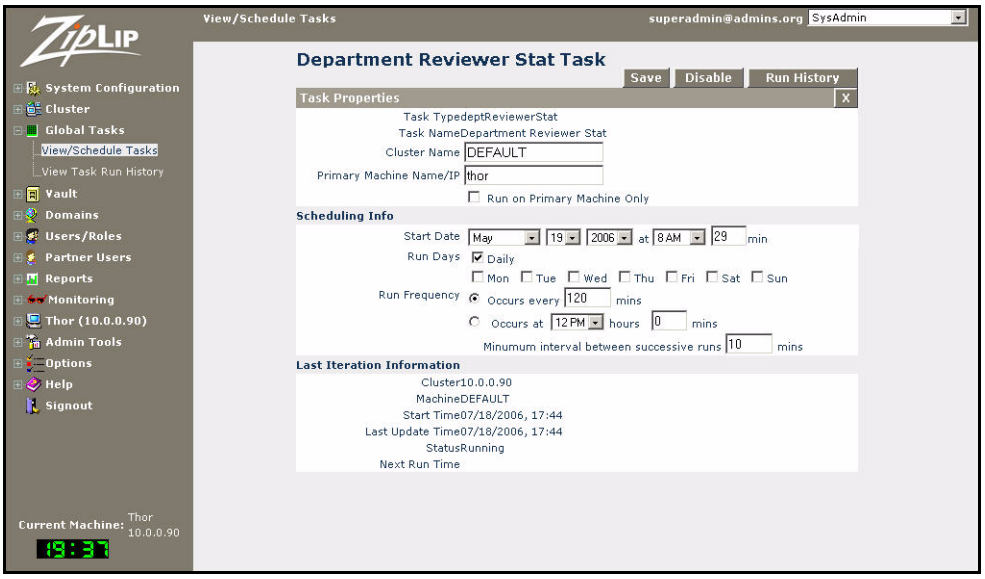



**Figure 11.8: Edit Department Reviewer Stat Task form**

Click **Disable** to disable the background report process and prohibit future runs of this report. Click **Run History** to see the report iterations run so far.

## Viewing the Department Reviewer Statistics Report

To view the report from the SysAdmin application:

1. In the left menu, select **Global Tasks**. Under **Global Tasks**, select **View Task Run History**. The **Background Tasks Runs** screen appears.

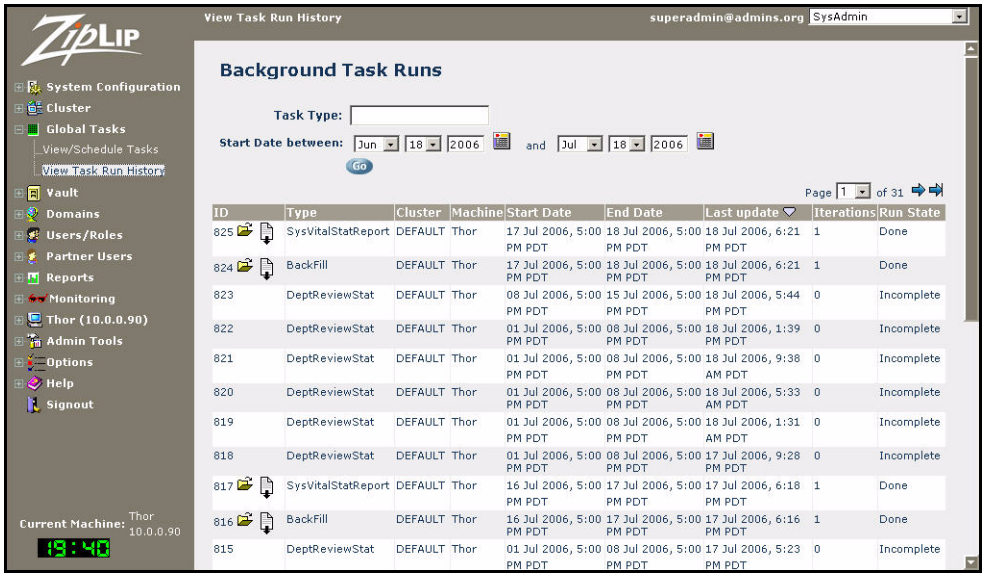



**Figure 11.9: Background Tasks Runs screen**

2. In the **Background Tasks Runs** screen, to only show the Department Reviewer Statistics report, in the **Task Type** box, enter **DeptReviewStat**. The screen only shows runs of the Department Reviewer Statistics report.

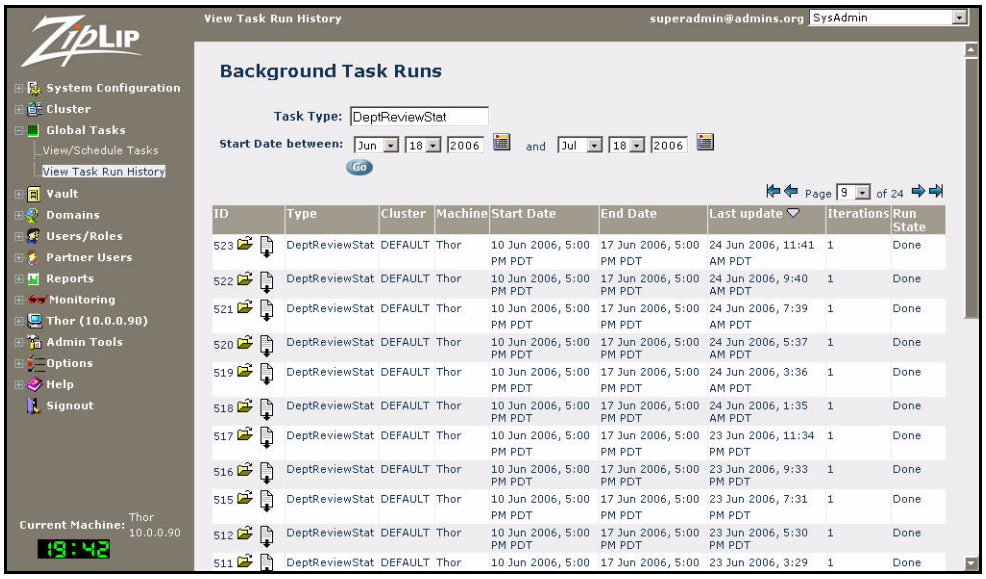



**Figure 11.10: Background Tasks Runs screen - DeptReviewStat only**

3. To view a report in XML format, click the icon. To download the report in XML format, click the icon.

## Creating a Report in the Compliance Application

To create a new report, select **Reports** in the Main Navigation Menu bar. The **Report** screen appears.

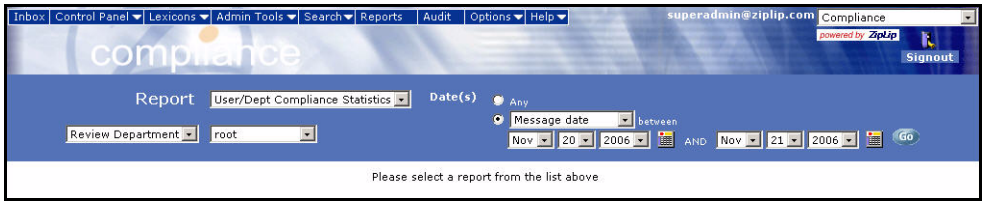



**Figure 11.11: Reports screen (empty)**

From the pull-down menus and radio buttons you can select the following:

- **Report** – one of the following:
  - **User/Dept Compliance Statistics** – This report provides information about messages caught for review, including their status, type, and count in the specified period.
  - **Reviewer Action Statistics** – This report lists information about messages such as departments, corresponding reviewers, actions taken by reviewers, and a count of the number of messages reviewed and taken action upon in the specified period.
  - **Department review statistics** – This report summarizes the review statistics for each Department in the specified time period. It shows the number and type of messages, the number of messages that have been reviewed, and the number of messages awaiting review. Department review statistics are generated every week.
- **Date(s)** – select an appropriate option, depending upon the type of report you are generating:
  - **User/Dept Compliance Statistics** – Select **Any**, or select **Message date** between or **Last modified date** between and use the pull-down menus or calendar icon to select the date range.
  - **Reviewer Action Statistics** – Select **Any** or select **Reviewed date** between and use the pull-down menus or calendar icon to select the date range.
  - **Department review statistics** – Select **Any** or select **Processed date** between and use the pull-down menus or calendar icon to select the date range
- Reviewer critieria – Select one of the following:
  - **Review Department** – Return results from the Review Department (the Department under which this user's e-mail messages are reviewed) as specified using the pull-down menu to the right of this one, or if **ALL** is selected, reviews all Departments. Note that the Review Department might not be the Department to which this user belongs.
  - **Reviewer name like** – Return results where the reviewer's username contains the string entered in the box that appears to the right of this menu.
  - **Reviewer alias like** – Return results where the reviewer's alias contains the string entered in the box that appears to the right of this menu.

Once you have selected the report and parameters, click **GO** to generate the report in the bottom pane of the screen.

## Interpreting Compliance Reports

This section explains how to interpret the dynamic reports you can generate using ZipLip Compliance.

## Interpreting User/Dept Compliance Statistics Reports

This report can generate statistics for a specific Department, users, or user aliases as defined within ZipLip. Figure 11.12 shows a **User/Dept Compliance Statistics** report generated for the "mydepartment" Department.

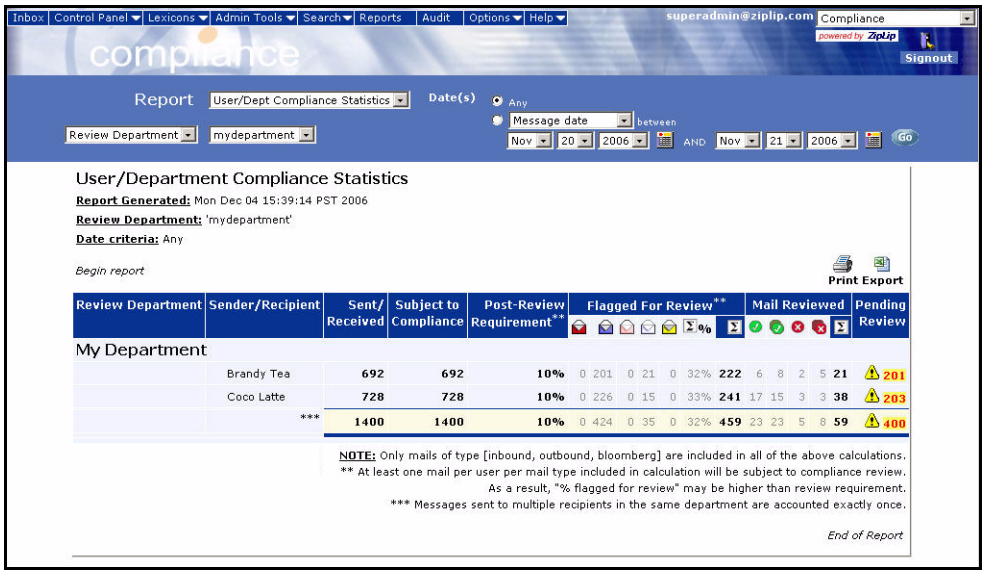



**Figure 11.12: User/Department Compliance Statistics report for a Department**

Figure 11.13 on page 166 shows a **User/Dept Compliance Statistics** report generated for user "Brandy Tea."

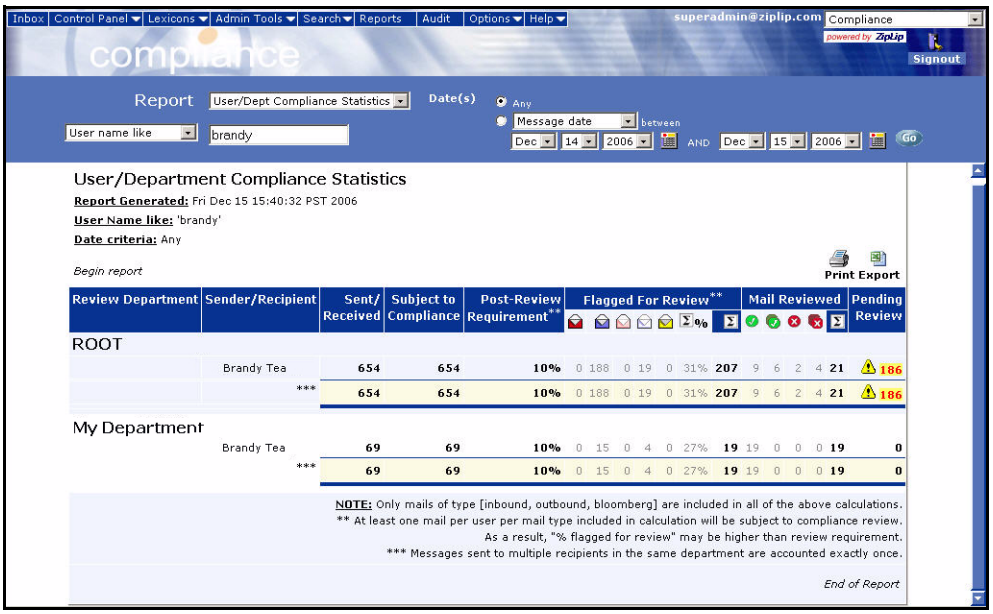



**Figure 11.13: User/Department Compliance Statistics report for a user**

Figure 11.14 shows a **User/Dept Compliance Statistics** report generated for alias "brandy."

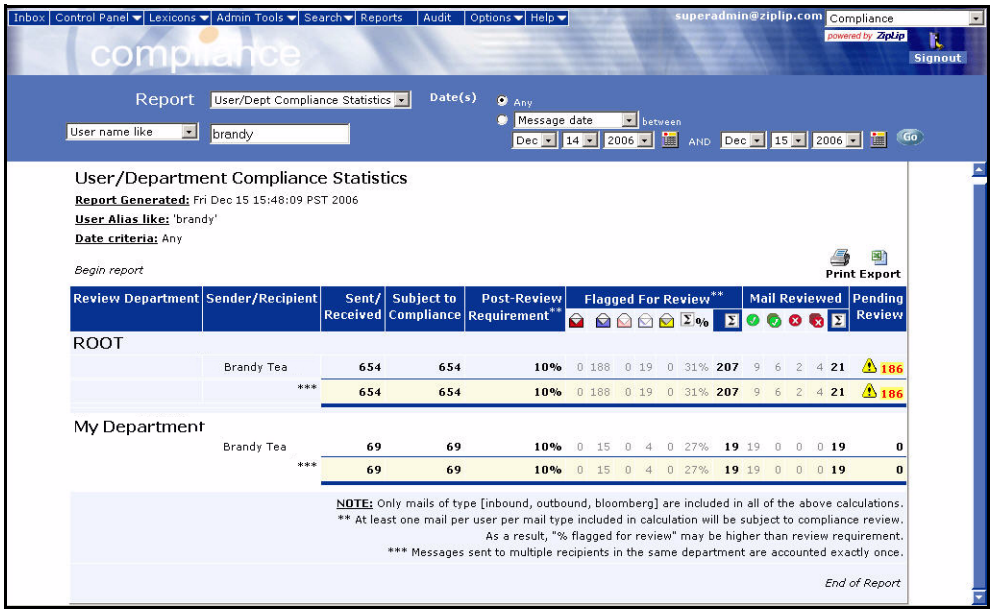



**Figure 11.14: User/Department Compliance Statistics report for an alias**

The report contains the following columns:

- **Review Department** – The Review Department (the Department under which this user's e-mail messages are reviewed) or Departments to which the report pertains. Note that the Review Department might not be the Department to which this user belongs.
- **Sender/Recipient** – The user who has sent or received e-mail messages processed by ZipLip Compliance in the specified time period. An alert (⚠) icon appears in this column if the percentage of messages caught by Compliance is less than the review requirement.
- **Sent/Received** – The combined number of messages this user has sent and received in the specified time period.
- **Subject to Compliance** – The number of e-mail messages that have been tagged as subject to compliance because they either triggered the Lexicon or were caught in random Pre-review or Post-review. This does not include messages that are tagged as single instance messages (that were already tested for compliance and are thus not subject to compliance again), forced pass-through messages, or messages migrated from another mailsystem.
- **Post-Review Requirement** – The percentage of e-mail messages randomly caught for Post-review.
- **Flagged For Review** – This denotes how many messages and percentage of messages were flagged for various types of review:
  - **Content Pre-review** – The number of messages flagged for Pre-review because they triggered the Lexicon.
  - **Content Post-review** – The number of messages flagged for Post-review because they triggered the Lexicon.
  - **Random Pre-review** – The number of messages randomly selected for Pre-review.
  - **Random Post-review** – The number of messages randomly selected for Post-review.
  - **Backfill** – The percentage of messages held to backfill the random review quota.
  - **% Total** – The total percent of messages flagged for any kind of review.

- **Mail Reviewed** – This denotes the number of messages that have actually been reviewed:
  - **Reviewed** – The number of messages that have been individually approved.
  - **Bulk Reviewed** – The number of messages that have been bulk approved.
  - **Reviewed (follow-up)** – The number of messages that have been individually rejected.
  - **Bulk Reviewed (follow-up)** – The number of messages that have been bulk rejected.
  - **Total** – The total number of messages that have been reviewed.
- **Pending Review** – The number of e-mail messages pending review.

You can print a copy of this report by clicking the icon or save a copy of any report in CSV format (readable by MS Excel) by clicking the icon.

When you click the icon, a pop-up box appears showing the automatically-generated filename (ComplianceStatsReport*yymmdd*.csv). You can **Open** the file in a spreadsheet program such as MS Excel, **Save** the file, or **Cancel** the download.

**Note:** Exporting reports from huge Departments can be time-consuming, especially during peak working hours.

## Interpreting Reviewer Action Statistics Reports

This report generates statistics for a specific Department, users, or user aliases as defined within ZipLip. This report is not real-time and it is generated by a task that runs weekly. Figure 11.15 shows a **Reviewer Action Statistics** report generated for the “mydepartment” Department.

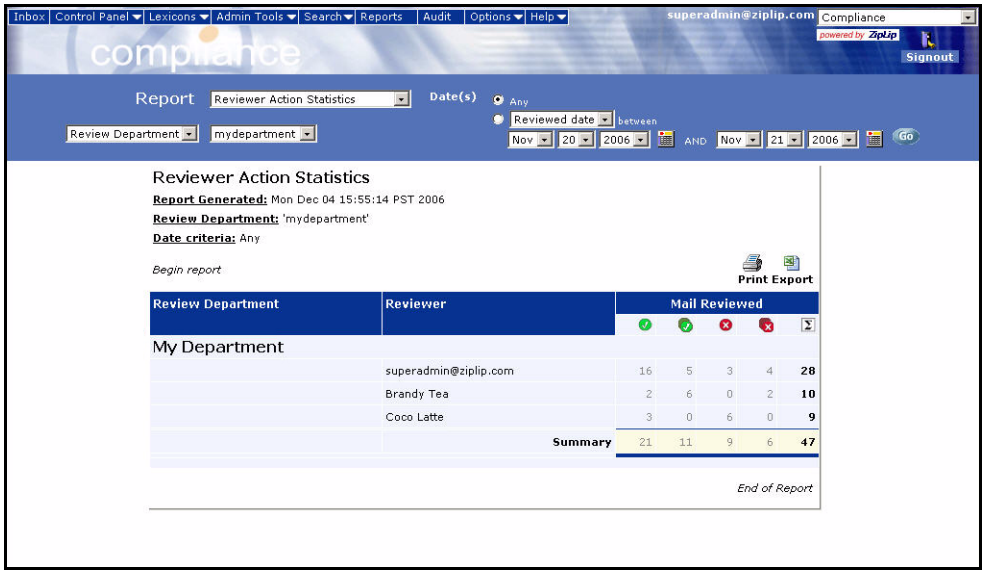



**Figure 11.15: Reviewer Action Statistics report for a Department**

The report contains the following columns:

- **Review Department** – The Department or Departments to which the report pertains.
- **Reviewer** – Each reviewer for that Department.

- **Mail Reviewed** – This denotes the number of messages that have been reviewed:
  - **Reviewed** – The number of messages that have been individually approved.
  - **Bulk Reviewed** – The number of messages that have been bulk approved.
  - **Reviewed (follow-up)** – The number of messages that have been individually rejected.
  - **Bulk Reviewed (follow-up)** – The number of messages that have been bulk rejected.
  - **Total** – The total number of messages that have been reviewed.

You can print a copy of this report by clicking the icon or save a copy of any report in CSV format (readable by MS Excel) by clicking the icon.

When you click the icon, a pop-up box appears showing the automatically-generated filename (ReviewerActionsReport*yymmdd*.csv). You can **Open** the file in a spreadsheet program such as MS Excel, **Save** the file, or **Cancel** the download.

**Note:** Exporting reports from huge Departments can be time-consuming, especially during peak working hours.

## Interpreting Department Review Statistics Reports

This report lists information about messages that have been reviewed for one or more specified Review Departments. It lists Departments, the time period, reviewers, actions taken by the reviewers, and a count of the items acted upon in the specified time period. Figure 11.16 shows a **Department Review Statistics** report generated for the "mydepartment" Review Department.

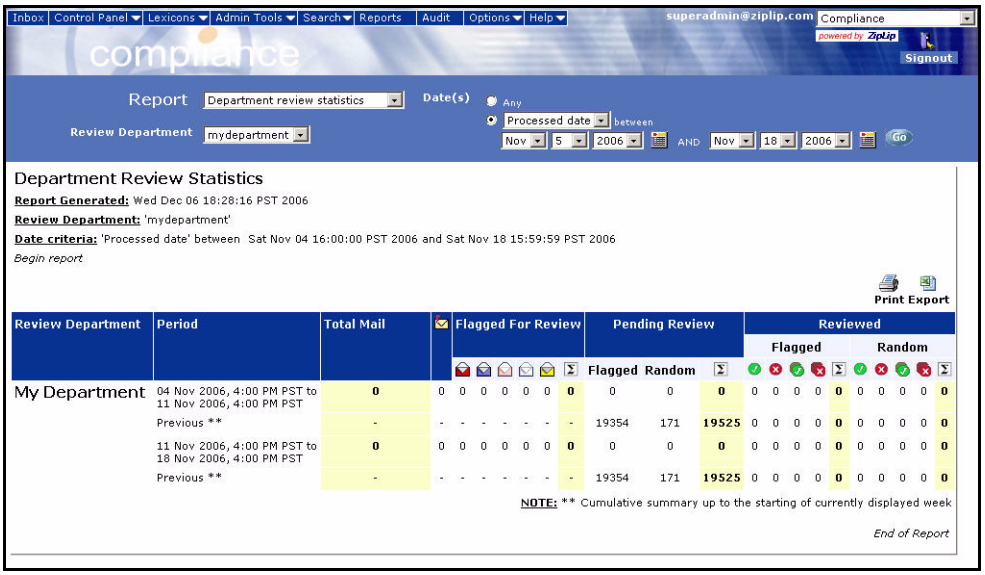



**Figure 11.16: Department Review Statistics report**

The report contains the following columns:

- **Review Department** – The Department or Departments to which the report pertains.

- **Period** – The time period for which this report was issued. Department review statistics are generated every week, so multiple weeks can appear in this report.
- **Total Mail** – The total number of e-mail messages processed in that period.
- **Compliance not required** – The number of e-mail messages that were not caught for compliance.
- **Flagged For Review** – This denotes how many messages and percentage of messages were flagged for various types of review during that period:
  - **Content Pre-review** – The number of messages flagged for Pre-review because they triggered the Lexicon.
  - **Content Post-review** – The number of messages flagged for Post-review because they triggered the Lexicon.
  - **Random Pre-review** – The number of messages randomly selected for Pre-review.
  - **Random Post-review** – The number of messages randomly selected for Post-review.
  - **Backfill** – The percentage of messages held to backfill the random review quota.
  - **Total** – The total number of messages flagged for any kind of review.
- **Pending Review** – This denotes how many messages were awaiting review during that period:
  - **Flagged** – The number of messages flagged for various types of review.
  - **Random** – The number of messages randomly selected for review.
  - **Total** – The total number of messages pending review.
- **Reviewed** – This denotes the total number of messages that were reviewed in the specified time period:
  - **Flagged** – The number of messages flagged for various types of review:
    - **Reviewed** – The number of messages that have been individually approved.
    - **Bulk Reviewed** – The number of messages that have been bulk approved.
    - **Reviewed (follow-up)** – The number of messages that have been individually rejected.
    - **Bulk Reviewed (follow-up)** – The number of messages that have been bulk rejected.
    - **Total** – The total number of messages that have been reviewed.
  - **Random** – The number of messages randomly selected for review:
    - **Reviewed** – The number of messages that have been individually approved.
    - **Bulk Reviewed** – The number of messages that have been bulk approved.
    - **Reviewed (follow-up)** – The number of messages that have been individually rejected.
    - **Bulk Reviewed (follow-up)** – The number of messages that have been bulk rejected.
    - **Total** – The total number of messages that have been reviewed.

You can print a copy of this report by clicking the icon or save a copy of any report in CSV format (readable by MS Excel) by clicking the icon.

When you click the icon, a pop-up box appears showing the automatically-generated filename (DeptReviewStatsReport*yymmdd*.csv). You can **Open** the file in a spreadsheet program such as MS Excel, **Save** the file, or **Cancel** the download.

**Note:** Exporting reports from huge Departments can be time-consuming, especially during peak working hours.

Chapter 12

# Administrative Tasks

This chapter summarizes the **SysAdmin** application by describing the various monitoring sections of the application. This chapter also contains a discussion of child applications and how to enable them.

## System Monitoring

Apart from log files, the ZipLip platform can be monitored through the **SysAdmin** application. There are menu items for working with important subsystems such as the Global Coordinator, the Database, and Entry Points. While some generic events are logged into the event logs, these logs are present only in the database and they are there to provide more than just informational purposes but are used to compose statistics which are used by the system to modify its behavior, for example, the `MTATranscript` table is used to limit users who send out too many e-mail messages in a day and to prevent spammers. Event logs are accessible from the SysAdmin application. Using a combination of log files and SysAdmin tools, an administrator can get a clear picture of the running system.

### Monitoring Global Coordinators

To monitor Global Coordinators, select **Cluster** in the left menu. Under **Cluster**, select **Global Coordinator**. The **Global Coordinators** screen appears in the right pane.


**Figure 12.1: Global Coordinators screen**

The **Global Coordinators** screen shows the list of machines running Global Coordinators on the system network.

The upper table shows a list of Global Coordinators on the network, their IP addresses, process name, and tasks statistics. There are four possible states for a Global Coordinator: Initializing, Live, Standby, and Dead. The lower table shows a task summary of the Live Global Coordinator.

## Monitoring Database Connections

To monitor database connections, select **Monitoring** in the left menu. Under **Monitoring**, select **Database Monitor**. The **Database Monitor** screen appears.

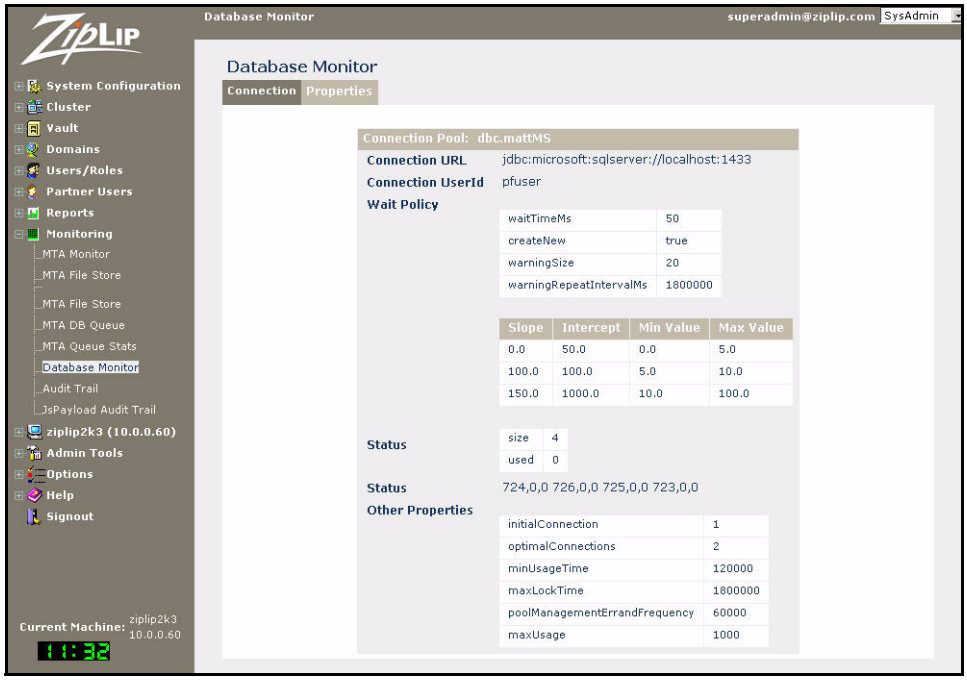



**Figure 12.2: Database Monitor screen**

The **Database Monitor** screen displays statistics pertaining to the database connection pool, such as the wait policy for creating new database connections and the graph for the connection creation algorithm. Status shows the number of connections allocated at the moment and how many are being used. Other properties show the parameters of this database pool.

Selecting the **Properties** tab shows the list of database connections other machines in the cluster have obtained. This is useful to determine which machine in the cluster is taking up most of the database connections.

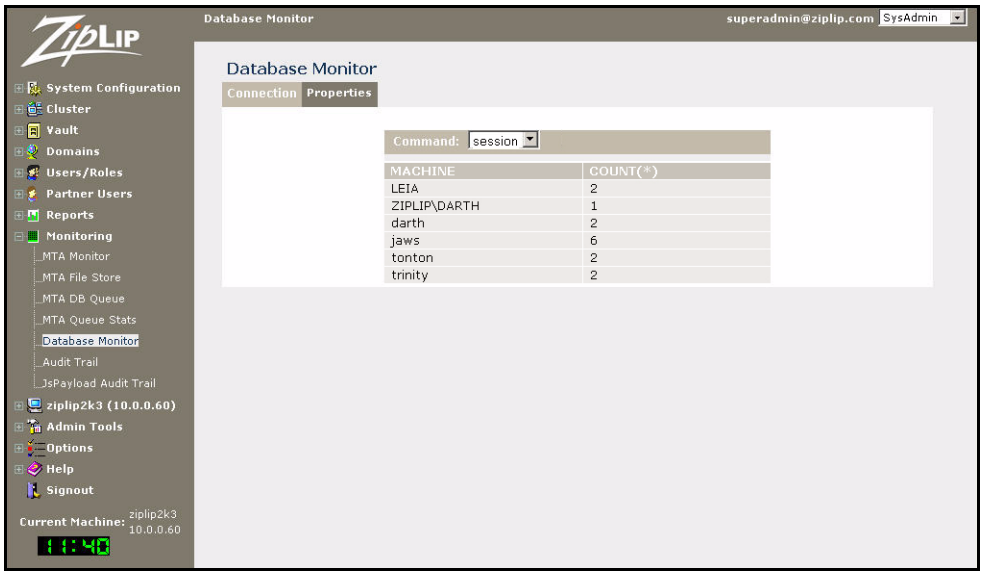



**Figure 12.3: Database Properties screen**

# Monitoring and Administrating Systems

This section discusses the various tasks involved with monitoring and administering systems.

## Monitoring Systems

To monitor systems, select **Cluster** in the left menu. Under **Cluster**, select **Machines**. A screen appears showing the list of available machines on the system network.

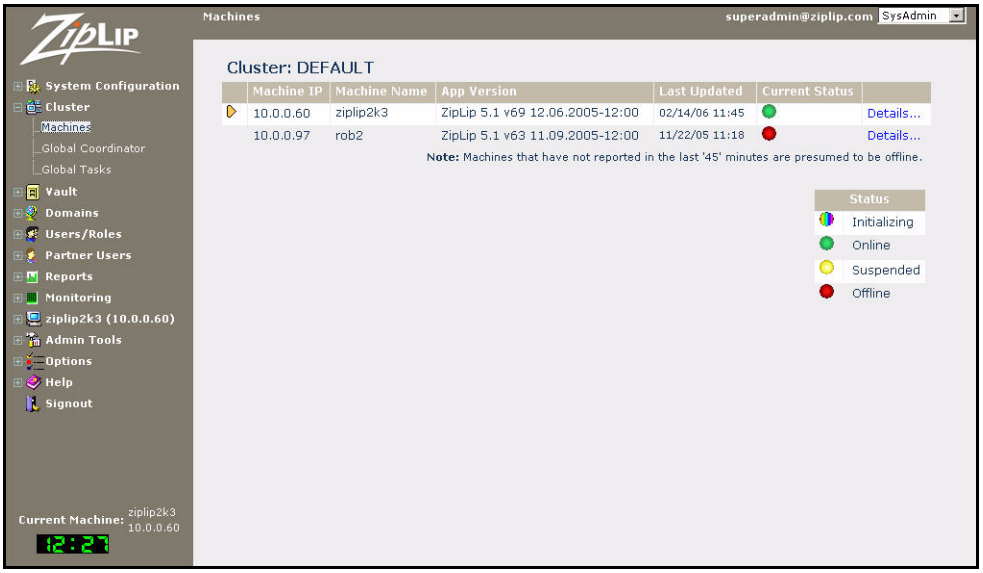



**Figure 12.4: Machines screen**

The table shows a list of systems on the network, their IP addresses, the application version each system is running, and the date and time each system was last updated. The machine to which you are currently pointing is shown with a small arrow next to its IP address. This screen also shows machine status. A green circle indicates the machine was alive at the time when data was last refreshed. A red circle indicates a dead machine. A multicolored circle indicates the machine is initializing, and a yellow one indicates it is suspended.

To switch to a different machine context, click on the IP address of the machine to which you want to connect. A new window appears with the context switched to the machine on which you clicked.

## Monitoring Entry Point Statistics

To monitor entry point statistics, select your system in the left menu. Under your system name and address, select **Entry Point Stats**. A list of entry point statistics for the **SysAdmin** application appears.

**Note:** Entry point statistics are local to a specific machine. To view the entry point statistics for a different system, you must first connect to that system.

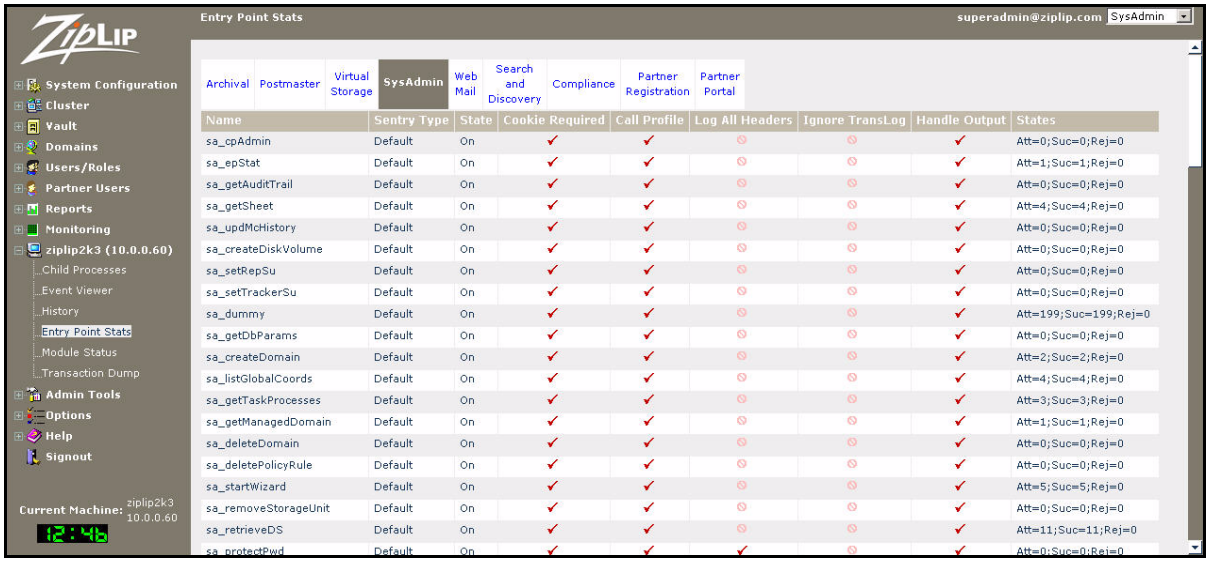



**Figure 12.5: SysAdmin Entry Point Statistics screen**

To view the entry point statistics for a different application, click on the tab of the application you want to monitor. For example, to view entry point statistics for the **Postmaster** application, click on the **Postmaster** tab.

## Monitoring Machine Event History

To monitor the event history for your system, select your system in the left menu. Under your system name and address, select **Event Viewer**. A list of events for this system appears.

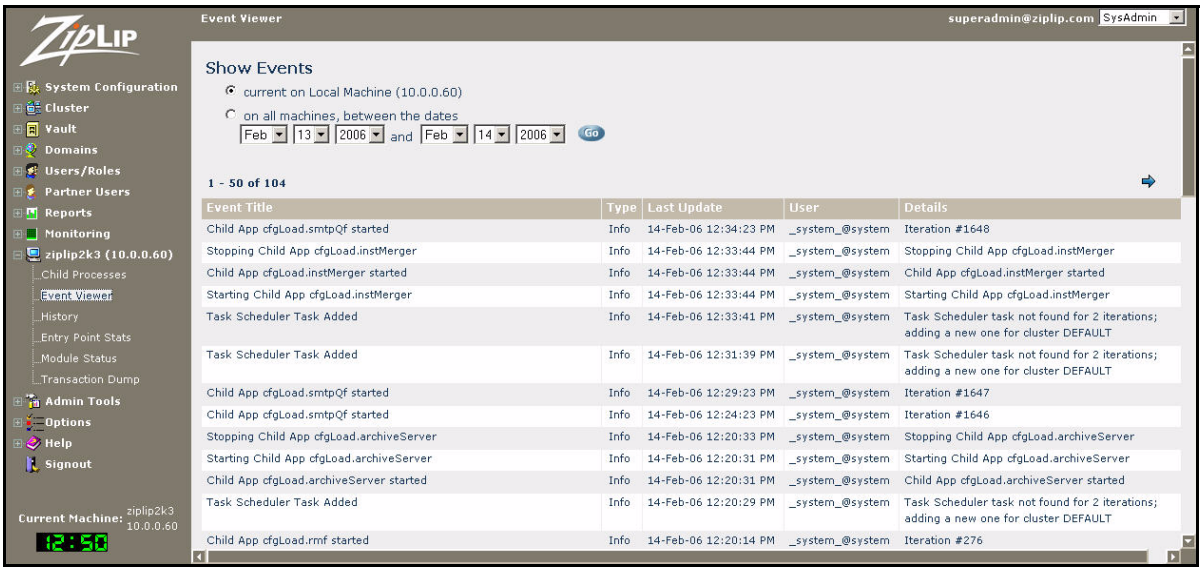



**Figure 12.6: Show Events screen**

The event title and details tell you if anything is awry in the cluster.

## Viewing the System Audit Trail

As the Super Administrator it is useful to look at the system audit trail. In the left menu, select **Monitor**. Under **Monitor**, select **Audit Trail**.

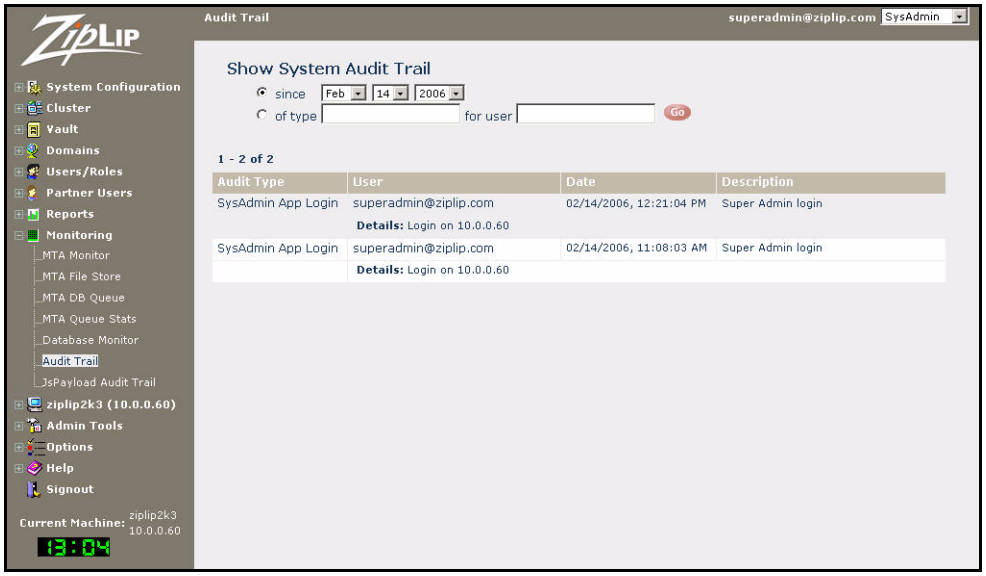



**Figure 12.7: Show System Audit Trail screen**

The **Show System Audit Trail** screen contains a list of important audit events such as Super Administrator login event. This list of audit events is distinct from the regular Local Machine Events. Monitor this log for Domain or System Administrator security violations.

## Monitoring System Module Status

To monitor the status of modules running on your system, select your system in the left menu. Under your system name and address, select **Module Status**. The **System Module Status** screen appears.


**Figure 12.8: System Module Status screen**

This screen shows a list of modules running on the current system, along with their properties and status. To monitor other modules on this system, click on the respective tab corresponding to the particular module.

To view details for any of these modules, click on the Module Name. A screen appears showing the details of that particular module.

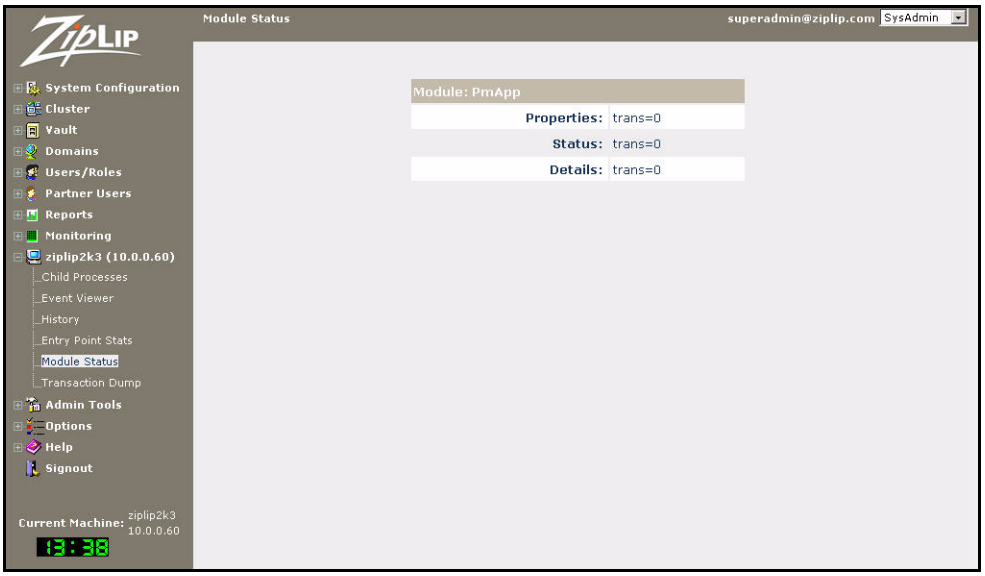



**Figure 12.9: Module Status Details**

## Starting, Stopping, and Creating Child Processes

To start, stop, or create a child process, select your system in the left menu. Under your system name and address, select **Child Processes**. The **Child Processes** screen appears.

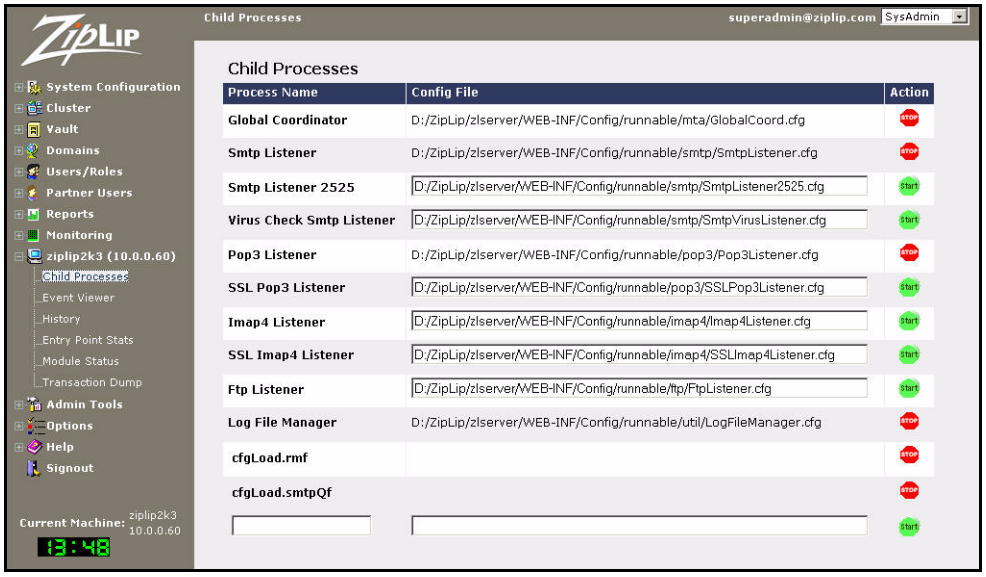



**Figure 12.10: Child Processes screen**

The **Child Processes** screen contains a list of child processes you can start or stop.

**Note:** The Child Processes listed are local to the system to which you are currently connected. To start or stop child processes on a different system, you must connect to that system.

- To start a child process, make sure that the path of the configuration file where the process is located is correct, then click the start button.
- To stop a process, click the stop button corresponding to the process you want to stop.
- To create and start a new child process that is not listed, in the blank space at the bottom of the list enter a name for the process, enter the full path of location of the configuration file, and click the start button.

To make sure a child application starts with the server every time, edit the configuration file:

```
$ZipLip/WEB-INF/Config/runnable/pmapp/pmappChild.cfg
```

The following is an excerpt from the file.

```
//
_child.2 = #pm.ScheduleChildAppOperation~~@_zlplus.cp.cfgLoad.SSLsmtp@~~star
t~~9000~~@te.misc@
//
_child.3 = #pm.ScheduleChildAppOperation~~@_zlplus.cp.cfgLoad.virusCheckSmtp
@~~start~~9000~~@te.misc@
_child.4 = #pm.ScheduleChildAppOperation~~@_zlplus.cp.cfgLoad.pop3@~~start~~
10000~~@te.misc@
//
_child.5 = #pm.ScheduleChildAppOperation~~@_zlplus.cp.cfgLoad.SSLpop3@~~star
t~~10000~~@te.misc@
_child.6 = #pm.ScheduleChildAppOperation~~@_zlplus.cp.cfgLoad.imap4@~~start~
~10000~~@te.misc@
```

```
//
_child.7 = #pm.ScheduleChildAppOperation~~@_zlplus.cp.cfgLoad.SSLimap4@~~sta
rt~~10000~~@te.misc@
_child.8 = #pm.ScheduleChildAppOperation~~@_zlplus.cp.cfgLoad.ftp@~~start~~1
0000~~@te.misc@
```

Child applications that start at server startup do not have `//` at the beginning of the lines. To have `_child.2`, which is the SSL SMTP server, start up at server startup, delete the leading `//` in front of `_child.2`.

Chapter 13

# Storage Backup and Redundancy

Business continuity is a fundamental goal of any organization. You need to ensure continuity of operations in case of a system failure or disaster. The ZipLip platform is designed to offer very high availability. When properly configured the ZipLip system can be made available 24 hours a day, seven days a week. There is a tradeoff between system and data availability and the cost of the solution. This section addresses the various issues.

Backing up data is very important due to the following reasons :

- human errors
- disk and system failures
- disasters such as fires, earthquakes, floods, and power outages
- archival purposes

The ZipLip platform uses the database and the filesystem to store its data. The three most important data to protect are:

- configuration settings of each middleware server and database
- database information
- information stored in the Vaults

Losing any of this information could result in system failure.

## Protecting Configuration Files

The configuration files are usually changed only during installation or on rare occasions to tune performance. To protect these files, archive them along with the ZipLip Software.

## Protecting the Database

ZipLip stores all the state and metadata information inside the database. Since all the middleware machines point to the same database, the uptime of the ZipLip system corresponds directly to the uptime of the database. ZipLip works with many industrial database including Oracle, MS-SQL server, and DB2. To protect the database, regularly backup all data associated with the database. Although the rest of the section focuses on Oracle databases, the methodologies also apply in principle for the other databases.

## Protecting the Oracle database

Data within the Oracle database is stored in the instance data files and the control files. Backup of the data within Oracle is done by one of the following ways:

- export import
- cold backup
- hot backup using archive logs
- point-in-time snapshot solutions

*Export import* is a logical backup method that works well for small databases. It is also useful when you want to defragment the data files within Oracle. In this method, automatic scripts export tables to an export file at appropriate times. The exported file can be imported into another Oracle instance, and the configuration files can be modified to point to the new database. Depending on the size of the database, the export can take anywhere from five to 30 minutes, and the importing of the data can take about five to ten times the time of export. For a large database the import time can be as high as six hours, and if backup recovery is initiated, the system will not be available for six hours. ZipLip therefore recommends only using this approach to migrate or defragment Oracle data files.

*Cold backup* is an offline physical backup approach where the physical data files and control files corresponding to the database are backed up. During the copying, all the files must be in a consistent state and therefore the database should be brought down. It is highly recommended that a cold back up is made from time to time. But to do this requires a back up window and if the solution needs to highly available, cold backup can be made using Snap-Shot solutions (see in Point in Time Snap Shot section). For traditional cold backup, it takes in hours to perform cold backup for medium to large databases and consequently the system will not be available during this period. Therefore for highly available conditions use snap-shot solutions.

*Hot backup*, as it pertains to the Oracle database, is achieved by running the database in archive log mode. Oracle stores uncommitted transactions inside a set of log files known as redo logs. These uncommitted transactions are later flushed to the data file from a background process. In archive log mode, the redo logs are copied to the archive log so the archive log contains all modifications to the database since the last physical backup. The standby database can be kept in sync by applying changes to data in the archive logs. See Oracle Manuals for more details. In addition, products from Veritas and other backup vendors makes this task easier.

*Point-in-time snapshots* provide a very good option. In this approach, the file server or virtualization software quickly marks the blocks of data and associates it to a snap shot. When blocks are subsequently modified by the database, a copy of the old block is made and is associated with the current copy; and another snapshot points to the old blocks. This process takes only a fraction of second. The blocks in the snapshot can be mounted onto a filesystem, and thus a static copy of the files or blocks is available. Since the files in the snapshot do not change, these files can be copied to another system or to tapes for offsite and online backup. Most of the NAS and SAN solutions support point-in-time snapshots. In addition, NAS solutions such as Network Appliance have special checkpoint software for Oracle that allow taking a snapshot of the blocks associated with Oracle physical files while maintaining consistency. This approach therefore allows you to perform a cold backup of an Oracle database without having to take it down.

## Protecting Vault Information

Unstructured information is stored in the form of files inside the vault. A vault can be conceptually thought of as a set of directories, which contain several files and subdirectories. A database record in the `VaultItem` table points to a file within the vault. The vault architecture groups the files into a set of disk volumes. New files are created only in the Live disk volume. On Not Live disk volumes only reads and deletes are performed. Because of the way files are created inside the vault, it is possible to have files that are not referred to by the `VaultItem` table. These files are known as *orphan* files. You can run the background process `DvOrphanRemover` to remove orphaned files. Backup of the files in the vault directories is similar to backing up a filesystem. To be consistent with the database, ZipLip recommends you backup the database before backing up the directories. Also make sure all background cleanup tasks are stopped during the backup so vault items are consistent with the backed up database. Alternatively, you can use the point-in-time snapshot technique described in the “Protecting the Oracle database” on page 184 to make sure the database and filesystem backups are consistent.

## Offsite and Online Backups

While backing up data, you needs to consider both offsite and online backups. Offsite backups are sometimes needed for disaster recovery. Onsite backups are needed for recovery from media failure, system failure, or human error. Ideally, onsite backups are conducted in a way to cause minimal downtime. System deployment includes considering the times to backup and analyze the mean recovery time for each failure and have an appropriate correction. Requirements for recovery time determine the type of redundancy your installation requires. The smaller the recovery time, the higher the cost.

Chapter 14

# Troubleshooting and FAQ

The following is a compendium of frequently asked questions and debugging procedures.

**Problem: I'm having trouble connecting to your secure Web site.**

This is usually due to one of two reasons:

1. Your browser may not support encryption.
2. You may be behind a corporate firewall and your corporate policy may not allow secure connections.

**Problem: I'm getting a message that says "HTTP 1.1/ 500 Server Error".**

Sometimes our Web site may be very busy. Although we have configured our systems for maximum scalability, the surging demand for secure e-mail may tax our current resources. We apologize for any inconvenience while we ramp up to meet demand.

**Problem: A network error occurred when sending the ZipLip message.**

There was a failure in the network connection from your computer to the ZipLip Web site. Please contact your network manager or system administrator.

**Problem: I am not able to see the Browse button for attachments.**

You may be using Microsoft IE 3.0 or another browser that does not support attachments. To correct this problem, you can download a patch from Microsoft to add this attachment functionality to your browser, or you can upgrade your browser to a newer version.

**Problem: I received a ZipLip notification e-mail, but when I click on the message number, nothing happens.**

Your e-mail software may have some trouble opening the link. Cut and paste the entire message number from your notification e-mail message to your browser URL line and press the Enter key.

**Problem: I clicked on the message number in the e-mail, but it says my message has expired.**

You either tried to access a message that was sent you more than 30 days ago and has since been deleted, or you tried to access a message more than 24 hours after you first picked it up. Both of these restrictions were added to protect your confidential information.

**Problem: My questions were not answered here. Where can I get more help?**

Visit http://www.ZipLip.com or send e-mail to help@ZipLip.com

# Appendix A

## ZipLip E-mail Features Summary

The following tables contain a list of e-mail handling features supported by the ZipLip server.f

| Mailsystem Features |
|---|
| POP3 connectivity |
| IMAP4 access |
| Configurable mailbox storage quota |
| Corporate Spam List management |
| Integrated SMTP listener and sender |
| Policy based message routing features |
| Private domains |
| Designate affiliate users with partial domains |
| Vault storage architecture |
| Integrated personal and corporate address book |
| Integrated PIM (Personal Information Management) |
| E-mail integration with virtual storage |
| LDAP connectivity |
| WAP enabled |
| Easy integration with mail clients such as outlook express |
| Support cookie authentication and single sign on |
| Authenticated SMTP |
| Multiple SMTP queues to support policy based mail processing |
| E-mail integration with the billing module |
| Configurable database connection pool architecture to optimize DB connections |
| Efficient error handling procedures to present comprehensive error messages to users |
| User and system activity reports (log files) for easier bug analysis and activity management. |

| Message Management |
|---|
| Compose standard mail |
| Compose secure mail |
| Upload signature |
| Designate Cc & Bcc recipients |

| Message Management |
| --- |
| Choose addresses from address book during message composition |
| Attach files to a message |
| Save message drafts |
| Include original message during 'Reply' or 'Reply All' as inline text |
| Set importance of the message |
| Schedule messages |
| Add sender's address to address book |
| Designate sender's name for outgoing mails |
| Request receipt confirmation for secure mail |
| Set an alternative 'Reply To' address |
| Set expiry for secure message |
| Forward messages with attachment |
| Show embedded images, shockwave flash etc. |
| Send message as text or HTML |
| Download attachments from a received mail |
| Filter incoming mails to specific folders |
| Notification of a received message to outside e-mail accounts |
| Save sent messages |
| Set vacation response |
| Auto responders |
| Spam block a particular mail address or an entire domain |
| Virus check on all incoming mails and uploading attachments |
| E-mail Spell check |
| Search engine incorporated with the mail system |

| Folder Management |
| --- |
| Create folders |
| Create nested subfolders |
| View folders in an explorer-style folders tree |
| Delete / Edit folders |
| Move messages between folders |
| Folder name validation (check for special characters) |
| Create public (shared) folders |
| Sort messages in a folder based on subject, sender, date |
| Empty trash folder |

| Message Search Engine |
| --- |
| Privilege based search |
| Search for messages (text based) |

| Message Search Engine |
| --- |
| Subject-based search |
| Size-based search |
| Folder-based search (all folders, specific folders etc.) |
| Header-based search (From/To/Cc etc.) |
| Search based on clauses like containing, beginning with and ending with |
| Search based on dates (received date, sent date etc.) |

| Address Book Management |
| --- |
| Personal address book |
| Corporate address book |
| Nicknames / Aliases |
| Manage mailing lists |
| Accessible using wireless devices |
| Edit Personal address book |
| Create Personal LDAP Server access |
| Search for addresses in specified address book |
| Send mail to contacts in address book |
| Send mail to LDAP addresses |

| Display Options |
| --- |
| Low bandwidth / High bandwidth interface |
| Display message preview |
| Display all message headers |
| Designate number of messages to be displayed per page |
| Selectively turn on display of message attributes such as size, date and day, status (read or unread) |
| Low bandwidth / High bandwidth interface |
| Display message preview |
| Display all message headers |

| Messaging Options |
| --- |
| Specify default compose security mode (send regular mail or secure mail by default) |
| Save sent messages |
| Notification to outside e-mail accounts |
| Mail forwarding to outside e-mail accounts |
| Mail receipt confirmation |
| Attach original message on forwarding |
| Specify From-name |
| Specify Reply-To Address |
| Specify Vacation Response Message |
| Enable/Disable Vacation response |

| Signatures |
| --- |
| Create signatures |
| Delete Signatures |
| Specify default signature |
| Update signatures |

| Folder Filter Rules |
| --- |
| From address based filters |
| Subject based filters |
| Contains, does not contain, begins with, ends with clauses |
| Match case option |
| Deliver messages to nested subfolders |

| Spam List Management |
| --- |
| Block e-mail addresses from sending e-mail (Add to Red List) |
| Block entire domain from sending e-mail (Add to Red List) |
| Allow specific e-mail address to send e-mail, from a blocked domain (Add to Green List) |
| Delete e-mail address or domain from Red List |
| Delete e-mail address or domain from Green List |

| User Profile Management |
| --- |
| Update user password, password hint question, and hint response |
| “Forgot Password” feature to assign passwords upon validating hint response |
| Update other user-specific information (zip code, time zone, and country) |

| User Profile Management |
| --- |
| Update user password, password hint question, and hint response |
| Forgot Password' feature to assign passwords upon validating hint response |
| Update other user specific information (zip code, time zone and country) |
| Update user password, password hint question, and hint response |
| Forgot Password' feature to assign passwords upon validating hint response |

| Localization |
| --- |
| English, Japanese, Chinese, Russian, others |
| Multilingual e-mail address resolution and composition |

| Security (assumes ZL Secure) |
| --- |
| Webmail over secure socket layer (SSL) |
| Secure and standard messages secured via encryption |
| Vacation response and signatures are encrypted and stored |
| POP over SSL |
| Password hashing |
| Public Key Infrastructure support |
| IP address validation to access various administration modules |
| Cache blocking |
| Session expiration using cookies |

| High Availability |
| --- |
| Hardware failover |
| Backup and recovery procedures |
| Regular DB and file backup at remote locations |
| No single point failure |
| Redundant hardware components |
| Dynamic load balancing of web server requests |
| Servers such as POP, SMTP, mail store can be quickly scaled to accommodate heavy traffic |
| Availability of hot spares in network storage |

| Supported Platforms and Databases |
| --- |
| Platforms – Sun Solaris SPARC, Linux, Windows NT/2000 |
| Databases – Oracle, MS SQL, DB2, and Sybase |

# Appendix B

## Global Tasks

The ZipLip SysAdmin application contains Global Tasks you can run. To access these, select **Global Tasks**. Under **Global Tasks**, select **View/Schedule Tasks**.

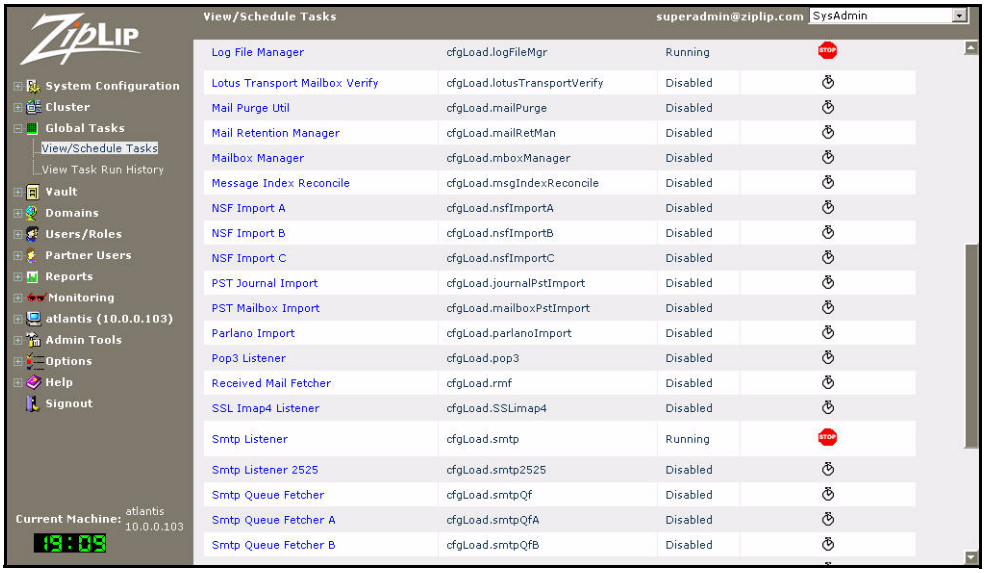



**Figure B.1: Global Tasks screen**

To view or schedule any of these global tasks, click on the name of the task.

| Task Name | Function |
|---|---|
| Archive Server | Run all Journaling and Archiving agents associated with all mail servers. |
| Bloomberg Import | Import data from the Bloomberg daily data file into the ZipLip archive. |
| Compliance Backfill | Performs post-review of messages according to the sampling requirement. |
| DB Data Mover | Takes information from certain key tables and merges them into a larger table. This must be run for reports to work. |
| Department Reviewer Stat | Sends information about e-mail review statistics to Department heads and reviewers. |
| Exchange Transport Mailbox Verify | Make sure the Exchange Transport mailboxes in ZipLip match the mailboxes in Exchange. |
| Ftp Listener | *Not currently implemented.* |
| Global Coordinator | Balance loads between the Local Coordinators. |
| Imap4 Listener | *Not currently implemented.* |

| Task Name | Function |
|---|---|
| Index Document Delete Driver | Remove deleted messages from the index. |
| Instance Merger | Merge all search index temporary instances into the master index to make messages available for searching. |
| Integration Tasks | Perform integration tasks. |
| Log File Manager | ZIP the current log files, put them into the logs/oldLogs directory, and create new logs. |
| Lotus Transport Mailbox Verify | Make sure the Lotus Transport mailboxes in ZipLip match the mailboxes in Domino; also removes deleted and expired messages from the ZipLip server. |
| Mail Purge Util | Remove expired messages from the archive. (No longer necessary.) |
| Mail Retention Manager | Based on policies, removes objects such as mail messages, database entries, and index entries from ZipLip. |
| Mailbox Manager | Remove old webmail messages. (No longer necessary.) |
| NSF Import A, NSF Import B, NSF Import C | Import NSF files from Lotus notes into ZipLip. |
| PST Journal Import | Import PST journal files from Exchange into ZipLip. |
| PST Mailbox Import | Import PST mail files from Exchange into ZipLip. |
| Parlano Import | Import data from Parlano instant messages into ZipLip for archiving and Compliance. |
| Pop3 Listener | Run a POP3 server. |
| Received Mail Fetcher | Queries the database to see if there is any mail that has not been processed. Also requeues mail that was not successfully processed in the first pass. |
| Search Reconciliation | Perform search reconciliation. |
| SSL Imap4 Listener | Run an IMAP4 SSL server. Note that SSL must be running on the client. |
| Smtp Listener | Run an SMTP server. |
| Smtp Listener 2525 | Run an SMTP server on port 2525. |
| Smtp Queue Fetcher, Smtp Queue Fetcher A, Smtp Queue Fetcher B | Poll from the SMTP mail flow queue directory. Also deletes mail over an hour old in the done directory. |
| System Cleanup | Purges deleted domains and other deleted files from the system. |
| User Synchronization | Synchronize users between ZipLip and the mail server directories. |
| Vault Replication | Copies data bewteen vaults. |
| Vault Replication Mig A | Copies migrated data between vaults. |
| Virus Check Smtp Listener | *Not currently implemented.* |
| Worm Archive | Run the WORM archive driver. |
| ZLPlus Cleanup | Removes terminated and deleted accounts and domains from the system. |
| ZLStorage Cleanup | Remove old secure share files. |
| ZLStorage Project Manager | *Not currently implemented.* |

# Appendix C

## Batch Files

The ZipLip server comes with batch files under `%ZIPLIP_HOME%bin`. The following table lists and describes them.

| Batch File | Description |
|---|---|
| `base64.bat` | Encrypt or decrypt using base64 encoding. |
| `bin.bat` | Changes the directory to `%ZIPLIP_HOME%/bin`. |
| `cl.bat` | Runs the config loader with the supplied options. |
| `cleanJrunLogs.bat` | Deletes all unused JRun logs. |
| `cleanJspc.bat` | Clears the JSP cache. |
| `cleanlogs.bat` | Deletes all unused ZipLip logs, Tomcat logs, and JRun logs. |
| `compileJSP.bat` | Compiles JSP pages. |
| `convertLIB.bat` | Flattens *.jar files in the `%ZipLip_Home\zlserver\WEB-INF\lib` directory. |
| `config.bat` | Change to the `%ZIPLIP_HOME%\zlserver\WEB-INF\config` directory. |
| `crawler.bat` | Mail generator; crawls the Internet and generates e-mail content (body and attachments). |
| `crawlerjp.bat` | Japanese e-mail generator; crawls the Internet and generates Japanese language e-mail content (body and attachments). |
| `db.bat` | Change to the `%ZIPLIP_HOME%\database` directory. |
| `failover.bat` | Sets up the failover system. |
| `HexDump.bat` | Creates a hexadecimal dump of the values in the file supplied. |
| `hten.bat` | Change to the `%ZIPLIP_HOME%\zlserver\zlplus\ui\html\en` directory. |
| `incrbuild.bat` | No longer used. |
| `jrstart.bat` | Start jrun. |
| `jrstop.bat` | Stop jrun. |
| `jrunlogs.bat` | Change to the `\Program Files\Allaire\Jrun\logs` directory. |
| `keyview.bat` | Converts mail attachments into a format ZipLip can parse. |
| `ldap.bat` | Discover users from LDAP and AD. |
| `lin.bat` | Search manually using a Lucene query as input. |
| `logs.bat` | Change to the `%ZIPLIP_HOME%\logs` directory. |

| Batch File | Description |
|---|---|
| lp.bat | In Notepad, edit the file:<br>C:\Program Files\Allaire\Jrun\servers\default\local.properties |
| make1.bat | Sample file for building a jrun program on Windows. |
| makeProxy.bat | No longer applicable. |
| makew.bat | Sample file for building a jrun program on Windows. |
| MapiProxy.bat | MAPI proxy setting and conection test. |
| movelogs.bat | Move the Jrun logs to the specified directory. |
| movesh.bat | Move the Jrun logs to the specified directory every three hours. |
| out.bat | Use Notepad to edit %CATALINA_HOME%\logs\stdout.log. |
| per.bat | Sets up a MAPI proxy. |
| pmdebug.bat | For internal debugging use. |
| pranal.bat | Profile analysis; shows time consumed for earch task or process. |
| restart.bat | Runs zlstop.bat and zlstart.bat to restart ZipLip. |
| restartoo.bat | Restart Open Office (no longer needed). |
| runProxy.bat | Can be used to manually run the MAPI proxy. |
| server.bat | Change to the %ZIPLIP_HOME%\zlserver\WEB-INF\classes directory. |
| shut.bat | Shut down the system and go to the failover system. |
| smtpDoneDel.bat | Clear the SMTP staging queue directory. |
| startup.bat | Run the config loader with the startup configuration. |
| stop.bat | Stop the Jrun and IIS processes. |
| tcjsp.bat | Change to the JSP cache directory (%CATALINA_HOME%\work\Catalina\localhost\ps\org\apache\jsp). |
| tclogs.bat | Change to the Tomcat logs directory (%CATALINA_HOME%\logs). |
| tcstart.bat | Start Tomcat. |
| tcstop.bat | Stop Tomcat. |
| testCenteraConnection.bat | Test the connection to the EMC Centera device. |
| testFilerConnection.bat | Test the connection to the NetApp Filer. |
| testICMConnection.bat | Test the connection to the IBM Content Manager. |
| timer.bat | Backup the log files and shut down ZipLip. |
| w3start.bat | Start the IIS service. |
| w3stop.bat | Stop the IIS service. |
| ZExchangeTest.bat | Retrieve Journaled e-mail messages from Exchange. |
| zipliptc.bat | Move the contents of %ZipLip_Home%\bin\config\tomcat5 to %CATALINA_HOME%. |
| ZLStart.bat | Start the ZipLip server and all associated services. |
| ZLStop.bat | Stop the ZipLip server and all associated services. |

# Index

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**W**



**Z**