Oracle® Beehive

Concepts

Release 2 (2.0.1.8)

E16644-06

August 2013

Documentation for Oracle Beehive users that describes the high-level concepts and features associated with Oracle Beehive.

ORACLE®

Oracle Beehive Concepts, Release 2 (2.0.1.8)

E16644-06

Primary Author: Joe Paradise

Contributing Authors: Raymond Gallardo, Pat Huey, Kristina Jensen, Roza Leyderman, Andrew Mitchell, Valarie Moore, Jay Rajiva, Josh Stanley, Sheela Vasudevan

Contributors: Henrik Blixt, Travis Bowles, Ryan Brueske, Vimal Chopra, Jason Davis, Jia-Der Day, Brennan Gaunce, Richard Hall, Marc-Andre Houle, Indira Iyer, Duane Jensen, Lenny Karpel, Tait McCarthy, Dave Mor, Paul Nock, Amar Padmanabha, Mark Paterson, Francois Perrault, Dan Rabe, Jamie Rancourt, Reza Rokni, Sudip Roy, Indira Vidyaprakash, Chen Zhou

Contents

3 Oracle Beehive Services

4 Oracle Beehive Deployment Concepts

8 Oracle Beehive Security Concepts

9 Oracle Beehive Integration Concepts

List of Figures

Preface

Welcome to Oracle Beehive Concepts Guide.

This guide describes the high-level concepts and features associated with Oracle Beehive. It contains the following topics:

> **Note:** This guide has not undergone any content change for this release. Only the related doc section, version number and date have changed. As and when this guide is revised, it will be updated on the Beehive 2.0 documentation library.

Audience

This document is intended for purchasers of Oracle Beehive Release 2.0.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Related Documents

For more information, see the following documents in the Oracle Beehive Release 2 (2.0) documentation library:

Administration Guides

- *Oracle® Beehive Administrator's Guide*
- *Oracle® Beehive Administrator's Reference Guide*
- *Oracle® Beekeeper Online Help (Integrated UA)*
- *Oracle® Beehive Integration Guide*

Application Development

- *Oracle® Beehive Application Developer's Guide*
- *Oracle® Beehive Business Views*
- *Oracle® Beehive Java Content Repository Java API Reference*
- *Oracle® Beehive RESTful Web Services API Reference*
- *Oracle® Beehive SOAP Web Services API Reference*

Installation Guides

- *Oracle® Beehive Installation Guide for Linux*
- *Oracle® Beehive Installation Guide for Microsoft Windows*
- *Oracle® Beehive Installation Guide for Solaris Operating System*
- *Oracle® Beehive Installation Help (Integrated UA)*

Online Helps

- *Oracle® Beehive Central*
- *Oracle® Beehive Webmail*
- *Oracle® Beehive Standards-based Clients*
- *Oracle® Beehive Team Collaboration*
- *Oracle® Beehive Conferencing*
- *Oracle® Beehive Extensions for Outlook Supplemental Help and Release Notes*
- *Oracle® Beehive Extensions for Explorer Supplemental Help and Release Notes*
- *Oracle® Beehive Extensions for Explorer (OBEE) (Integrated UA)*
- *Oracle® Beehive Extensions for Outlook (OBEO) (Integrated UA)*

Mobile Devices

- *Oracle® Beehive Using Windows Mobile Device*
- *Oracle® Beehive Using iPhone or iPad*
- *Oracle® Beehive Using BlackBerry*
- *Oracle® Beehive Registering and Configuring Mobile Devices*

Planning Guides

- *Oracle® Beehive Deployment Guide*
- *Oracle® Beehive Licensing Information*

Release Notes

- *Oracle® Beehive Release Notes*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1

Overview of Oracle Beehive

This module provides an overview of several high-level concepts and challenges related to enterprise collaboration, and discusses how Oracle Beehive addresses these challenges from the conceptual and feature perspectives.

This module contains the following topics:

Introduction to Oracle Beehive

Oracle Beehive is the next generation of Oracle's enterprise collaboration technologies. Oracle Beehive provides a unified collaboration application and platform comprised of a comprehensive set of integrated Java-based services, offering a new paradigm for enterprise collaboration solutions.

Oracle Beehive unifies common yet typically disjointed collaborative services, such as e-mail, time management, instant messaging, and content management, among others, and delivers them through standard protocol clients, integrated Web services, and familiar desktop tools such as Microsoft Outlook. This unified offering enables teams, individuals, and organizations to more easily collaborate, generate new information, make timely decisions, and, ultimately, take action.

Oracle Beehive allows IT departments to consolidate their collaboration-enabling infrastructures and implement people-centric, rather than tool-centric, applications in a centrally managed, secure, and compliant environment. The Oracle Beehive platform is built on proven and cost-effective Oracle technologies, such as Oracle Database and Oracle Application Server, which provide reliability, manageability, scalability, and performance.

Challenges of Enterprise Collaboration

There are many challenges to achieving consistent and effective collaboration throughout an enterprise. Some of the most common and far-reaching challenges that Oracle Beehive addresses include the following:

Disjointed Collaboration Tools

To collaborate, users must typically leverage a patchwork of separate and quite distinct tools for e-mail, time management, content management, and telecommunications. While each tool has its inherent strengths and benefits for its intended purpose, especially in the context of personal productivity, there is little or no cohesion among them when engaging in collaboration that is project-based, or that is within the context of a team, department, or line of business. As a result, users waste time and lose the contexts of their efforts when switching between different applications.

Oracle Beehive provides cohesive team workspaces that simplify and unify the user experience, empowering team members to collaborate effectively each from a client of their choosing. Even phones and voicemail no longer must be separated from computers and collaborative applications, and, instead, can consume Oracle Beehive services.

The unity provided by Oracle Beehive centralizes and streamlines many aspects of system administration, including hardware and software administration. System administrators no longer need to manage each application and its associated hardware separately, but can perform their day-to-day tasks from a single vantage point. Furthermore, existing and previously incompatible third-party collaborative components can now integrate easily by leveraging the open nature of the Oracle Beehive platform for a truly unified, cost-efficient, and effective solution.

Explosive Information Growth

Since the advent of the Internet and the communications technologies that it enables, enterprises have experienced an exponential growth of information that has lead to information overload. With so much content being created and distributed, it is often difficult to organize it intuitively, and then quickly find it when needed. Workers commonly ask, "Where is that e-mail my colleague sent me regarding a recent project?" or "Can I find the document my manager distributed last month?". Quite often the answers to these questions are "I don't know" and "No, I can't".

Also, despite the ubiquity and ease in which e-mail and instant messaging applications are used to communicate and exchange ideas, they often fail to capture the context of communications and information. That is, although they capture basic information such as the sender and the subject of a particular communication, they rarely, if ever, capture other important aspects such as the original creator of the content, the names of other contributors to the content or those who need to know about it, and the name of the project or the business unit to which it is associated. As a result, team members waste time searching for the supporting information and people that provide the contexts for their collaborative efforts, including the current and historical perspectives. Ultimately, this translates into productivity losses and inefficiencies.

Oracle Beehive solves these challenges by providing a platform that captures the context of all enterprise content and communications, and that enables users to organize it intuitively for future retrieval. Oracle Beehive also provides powerful enterprise search features that enable users to quickly find content of various data types, including e-mail, documents, and calendar entries, from a single entry point. This is useful in cases where the content hierarchy is unfamiliar or the exact location of the content is unknown.

Collaboration Among Geographically Dispersed Teams

Despite the recent technological advances in communications, there is still a disconnect between enterprise teams, especially among members distributed geographically across global locations. In fact, despite attempts to connect people, many collaborative tools and solutions are inadequate for the challenges of geographically dispersed teams. Factors such as team members working in different time zones and countries, integrations of dissimilar applications, and the system administration resources required to support distributed teams, solutions, and infrastructures, all undermine the effectiveness and efficiencies of collaborative technologies.

Oracle Beehive resolves these issues by providing a new paradigm of an open, yet unified collaborative platform. With Oracle Beehive, team members can work from anywhere and at anytime, and can stay connected to their projects and colleagues by leveraging any of Oracle Beehive's integrated collaborative services, including e-mail, instant messaging, voicemail, time and task management, and collaborative content management. Furthermore, Oracle Beehive's presence features allow individual team members to broadcast their current whereabouts and preferred methods of communication, enabling colleagues to contact each other instantly regardless of their locations.

With Oracle Beehive, team members distributed among various departments can share their documents easily. They can also subscribe to documents so that they are notified automatically when those documents change. This system-generated notification feature eliminates the need for other team members to manually create e-mail messages, both as a notification medium and as a document distribution mechanism. This also eliminates the risk of colleagues not being notified when important changes occur.

Finally, because Oracle Beehive is a unified platform, **system administrator**s can centrally manage their dispersed user populations and all aspects of the system, including services, servers, integrated third-party components, and hardware.

Disparate Data Silos

In addition to providing disjointed functionality, disparate collaboration tools create disparate silos of data, even when much of that data is actually related. For example, consider a team member who sends an e-mail to several colleagues to schedule a meeting, with the goal of discussing a project that is described in a document. In this case, the e-mail message may be stored on an e-mail server, the meeting entry on a time management server, the document on a file server, and so on. As a result, team members may have no way to relate or bind these items together, resulting in a loss of both organizational efficiencies and future retrieval capabilities. Since all these items are related, the applications that enable and manage them should also be related.

The unified approach of Oracle Beehive results in a single, virtual data silo, in which users can create and manage all of their personal and team-based content easily in one place.

Regulatory Compliance

The ability to implement and enforce corporate policies and control over content is critical for enterprises, not only to protect intellectual property, but also to comply with government regulations. Again, in cases where disjointed tools are the norm, and content processes are highly unorganized, it can be extremely difficult to achieve this goal. This is especially true when attempting to discover and audit records, as well as to initiate and enforce mandatory retention and disposition policies.

Oracle Beehive provides powerful core services and flexible integration capabilities to support stringent and dynamic compliance needs. With Oracle Beehive, enterprises can leverage the system to manage all content and communications, including e-mail, documents, instant messages, and voicemail.

Key Features of Oracle Beehive

Oracle Beehive provides many features and benefits for enabling effective enterprise collaboration, including:

- Comprehensive Set of Collaboration Services
- In-Context Workspaces
- Integration with Collaborative Applications and Other Components
- Custom Development
- Centralized Administration
- Flexible Deployment Options
- Clients for Accessing Oracle Beehive
- Delegation

Comprehensive Set of Collaboration Services

Oracle Beehive provides the full range of collaborative services for enterprise users, including:

- Time management
- Content and document management
- Task management
- Instant messaging
- E-mail
- Voicemail
- Discussion forums
- Online presence
- Contact management
- Mobile device support

In-Context Workspaces

An Oracle Beehive **workspace** is a virtual location and container that provides users a place and context for collaboration, and enables them to store the artifacts related to their collaborative activities. Oracle Beehive workspaces present features and information to users in context, that is, each workspace is created for a particular purpose, such as for a team, a project, a process, and so forth. The result is that users are always presented information that is relevant to them and their current activities.

Through workspaces, users can seamlessly collaborate with their colleagues, search intuitively to quickly find needed information, and easily track recent workspace activities and changes.

Integration with Collaborative Applications and Other Components

Oracle Beehive is a powerful and flexible platform that can seamlessly coexist with other collaborative applications and technologies. The wide range of supported integrations include as follows:

- E-mail and time management technologies such as Microsoft Exchange Server
- **Lightweight Directory Access Protocol (LDAP)** and user directory servers, such as Oracle Internet Directory and Microsoft Active Directory
- Enterprise anti-virus applications, such as Symantec Scan Engine

Oracle Beehive also exposes APIs and Web services that enable developers to leverage the platform and integrate it with their own focused solutions.

Custom Development

Oracle Beehive provides APIs that enable developers to create custom solutions that leverage the platform. These APIs include Oracle Beehive Web services.

The Oracle Beehive platform also provides key integration points for leveraging existing systems and components, including custom policies. Policies can be triggered by any of the system's more than 350 unique business events, such as when a user modifies a document or deletes an e-mail message.

Centralized Administration

Oracle Beehive provides system administrators with simplified and centralized Web-based administration capabilities through Oracle Beekeeper. Administrators can also leverage Oracle's command line tool (`beectl`) for streamlined execution of administrative functions. Features provided through these tools include:

- System configuration
- User and group management
- Client application management (installs, upgrades, and patches)
- Diagnostics
- Metrics

Flexible Deployment Options

Oracle Beehive supports a variety of flexible deployment options including:

- Single-server deployments
- Multi-server deployments
- Deployments across multiple network zones

Clients for Accessing Oracle Beehive

Users can access Oracle Beehive with a variety of clients, including:

- **Microsoft Outlook**: Through Oracle Beehive Extensions for Outlook, Oracle Beehive leverages the e-mail, calendar, task, and contact management capabilities provided by Microsoft Outlook as well as exposes other capabilities, such as team workspaces and document access. Oracle Beehive Extensions for Outlook is a Messaging Application Programming Interface (MAPI) service provider for Microsoft Outlook.

- **Microsoft Windows Explorer:** Oracle Beehive Extensions for Explorer provides users access to their workspaces and workspace content, such as folders and documents, through Microsoft® Windows® Explorer.
- **Beehive Webmail:** Oracle Beehive provides Web-based access to the system through Beehive Webmail, which is based on the open source Zimbra Web client. Beehive Webmail enables users to manage their e-mail, calendars, and contacts in a simple-to-use and Web-accessible interface.
- **Oracle Beehive Central:** Oracle Beehive Central is a Web-based client that provides users a central location to download supported clients and set their preferences for Oracle Beehive functionality. This includes the ability to delegate privileges for users' e-mail, calendars, tasks, notes, journals, and contacts.
- **Oracle Beehive Conferencing:** Oracle Beehive Conferencing is a feature-rich client that enables Oracle Beehive users to conduct Web-based meetings and presentations.
- **Oracle Beehive Team Collaboration:** Oracle Beehive Team Collaboration is a Web-based client that leverages dynamic, wiki page technology to support team collaboration activities in Oracle Beehive workspaces.
- **Standards-based clients:** Users can access Oracle Beehive with standard protocol clients based on Web-based Distributed Authoring and Versioning (WebDAV), Extensible Messaging and Presence Protocol (XMPP), Internet Message Access Protocol (IMAP), Simple Mail Transfer Protocol (SMTP), and Calendaring Extensions to WebDAV (CalDAV), to name a few. Oracle Beehive supports many proprietary and open source clients including Apple Mail, Microsoft Windows WebFolders, Mozilla Thunderbird, and Pidgin, among others.
- **Mobile clients:** Users can access Oracle Beehive with common standards-based mobile clients, and also through push e-mail for devices running Microsoft Windows Mobile.
- **Custom applications and portals:** Oracle Beehive Web Services APIs enable users to access the system through portals and custom applications.

Delegation

Oracle Beehive supports **delegation**, which is the ability of a user to grant another user the privileges necessary to act on his or her behalf. This includes the ability for the delegated user to read, write, and delete the original user's calendar entries, e-mail messages, documents, and contacts through a supported client, such as Oracle Beehive Extensions for Outlook.

Fundamental Oracle Beehive Terms and Concepts

Before delving into the functional and technical details of Oracle Beehive, it is important to understand several fundamental terms and concepts. Together, the following terms and concepts form the foundation of the system, enabling many of the collaboration-based features that it provides:

- Services
- Enterprises and Organizations
- Workspaces
- Entities, Actors, and Artifacts

Services

A service is a discrete implementation of specific functionality that users and other services can leverage to accomplish a task. The capabilities and interactions of services enable the full scope of functionality that Oracle Beehive provides.

Through supported client devices and graphical user interfaces (GUIs), Oracle Beehive visually exposes to users the features and functions of some services. Other services operate in the background and play low-level roles within the system such as enabling key integrations with other systems. Examples of services whose features Oracle Beehive exposes visually to users include the E-mail Service, the Time Management (Calendar) Service, and the Content Management Service. Examples of services whose roles enable underlying system functionality and are, therefore, mostly hidden from users include the Authentication Service, the Policy Service, and the Coexistence Service.

Enterprises and Organizations

An **enterprise** is a logical collection of the entities that comprise an Oracle Beehive deployment, such as organizations, workspaces, and users. Organizations are narrowly defined groups within an enterprise. Typically, an **organization** is defined by a department or line of business, but it can also be based on a project or other criteria.

The hierarchical relationship between enterprises and organizations in Oracle Beehive provides a logical structure for organizing users, groups, and workspaces, while enabling many aspects of the collaborative functionality offered by the system. This structure also enables system administrators to more easily manage users and workspaces through their organizational associations.

Workspaces

A **workspace** is a both a virtual location and a container that provides Oracle Beehive users a place to collaborate. Workspaces expose to users the many collaborative services that Oracle Beehive provides, enabling them to create, view, and manage e-mail messages, calendar appointments, meetings, tasks, address books, instant messages, documents, and so forth. From the user perspective, workspaces appear in supported Oracle Beehive clients.

Oracle Beehive provides two types of workspaces as follows:

- **Team Workspace:** A team workspace is a workspace that is shared by a team or group, and that supports the content and collaborative activities of its members.
- **Personal Workspace:** A personal workspace is a workspace that is primarily used by an individual user and that contains a mix of a user's private content and content from the team workspaces in which the user is a member.

Workspaces can be created for specific teams, projects, processes, or whatever criteria that makes sense. Based on this, workspaces are always in context for users and present only the features and content that are relevant to their particular activities.

Entities, Actors, and Artifacts

An **entity** is a securable, identifiable object in Oracle Beehive, such as a service, user, workspace, and **artifact**. In essence, every object in Oracle Beehive is an entity.

An **actor** is an entity, such as a user or service, that acts upon other entities.

Artifacts are another entity sub-class and represent objects that users can view, create, modify, or delete. Artifacts are the results of communications and other collaborative activities, and include e-mail messages, appointments, meetings, tasks, online discussions, notes, and documents. Oracle Beehive stores artifacts in Oracle Database.

2

Oracle Beehive Architecture

Built on Java 2 Platform Enterprise Edition (J2EE), Oracle Beehive provides a multi-tier architecture that leverages proven Oracle technologies, such as Oracle Database and Oracle Application Server, as well as other key Oracle and third-party components.

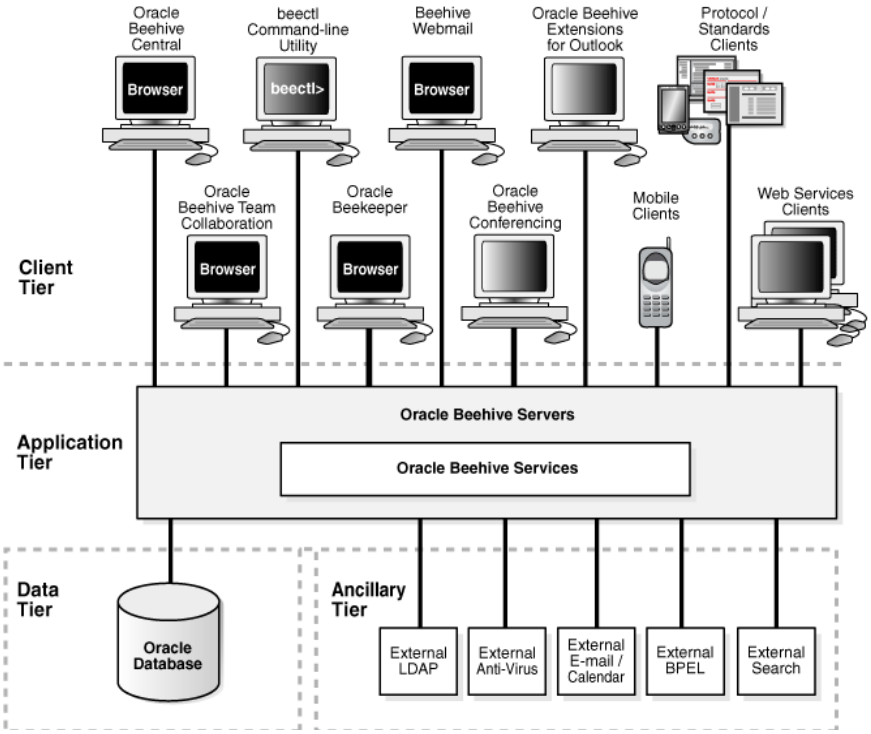
This module provides a high-level overview of the Oracle Beehive architecture and its supported components, and includes the following topics:

Overview of the Oracle Beehive Tiers

The Oracle Beehive architecture is divided into the following logical tiers:

- The Client Tier, which contains Oracle Beehive clients, as well as other supported clients and devices. For more information, see "Overview of the Client Tier".
- The Application Tier, which contains Oracle Beehive services and application server components. For more information, see "Overview of the Application Tier".
- The Data Tier, which contains Oracle Database to store system configuration and collaboration data. For more information, see "Overview of the Data Tier".
- The Ancillary Tier, which contains optional Oracle and third-party components that enhance or coexist with certain aspects of the system. For more information, see "Overview of the Ancillary Tier".

Figure 2–1 Oracle Beehive Logical Architecture



Overview of the Client Tier

The Client Tier is the face of the system and includes all supported clients and devices, including end-user clients, such as Oracle Beehive Team Collaboration, and system administration clients, such as Oracle Beekeeper and `beectl`. Oracle Beehive also supports clients and devices that leverage the following standardized protocols:

- Calendaring Extensions for WebDAV (CalDAV)
- Extensible Messaging and Presence Protocol (XMPP)
- File Transfer Protocol (FTP)
- Internet Message Access Protocol (IMAP)
- Push Internet Message Access Protocol (P-IMAP)
- Open Mobile Alliance Data Synchronization (OMA-DS)
- Simple Mail Transfer Protocol (SMTP)
- Web-based Distributed Authoring and Versioning (WebDAV)

The open nature of the Oracle Beehive platform also enables developers to build and implement custom clients in the Client Tier using Oracle Beehive Web services.

Overview of the Application Tier

The Application Tier is the core of the system and includes all Oracle Beehive server components, including interoperable, function-specific services that provide the system's enterprise collaboration features.

The Application Tier supports multiple Oracle Beehive server instances. Each Oracle Beehive server instance includes required components of Oracle Application Server 10*g*, which itself hosts the Oracle Beehive services, including:

- **Oracle HTTP Server:** The Web server component of Oracle Application Server 10*g*. Enables connections between supported clients over Hyper Text Transport Protocol (HTTP) and Secure Hyper Text Transport Protocol (HTTPS).
- **Oracle Application Server Containers for J2EE (OC4J):** J2EE v1.4 -compliant containers that provide an infrastructure for deploying, undeploying, and redeploying J2EE-compliant applications and modules. Oracle Beehive services are deployed in OC4J containers.

When you install Oracle Beehive, the required Oracle Application Server 10*g* components are pre-bundled and installed by default.

Each Oracle Beehive server instance also includes the Beehive Transport Infrastructure (BTI), which enables connectivity between supported clients and Oracle Beehive through its proprietary multiplexor protocol (MX). For more information, see "Overview of the Beehive Transport Infrastructure".

Overview of the Data Tier

The Data Tier is the information store for Oracle Beehive and contains Oracle Database, either as a single, standalone database instance or an Oracle Real Application Cluster (Oracle RAC). All system configuration and collaborative data for Oracle Beehive is stored in Oracle Database.

The Data Tier provides Oracle Database a layer of separation from the other tiers, ensuring, among other things, optimized security and system performance. Only the Database Access Framework (provided by Oracle Beehive) can access the Data Tier. Oracle Beehive services cannot access the Data Tier directly and must make all connections through the schemas provided by the Database Access Framework. For more information on the Database Access Framework, see "Overview of the Database Access Framework".

Overview of the Ancillary Tier

The Ancillary Tier contains any optional servers and applications that are external to the Oracle Beehive server. Typically, components in this tier are optional because Oracle Beehive already provides many of these capabilities, such as user directories, e-mail, and time management.

Oracle Beehive supports Ancillary Tier components to provide enterprises flexibility in their deployment choices, especially for those that want to leverage existing or specialized component investments. In either case, enterprises can choose to implement the components of this tier to coexist with or access key aspects of Oracle Beehive.

Examples of Oracle and third-party components in the Ancillary Tier include:

- Oracle Internet Directory
- Oracle Secure Enterprise Search
- Oracle Single Sign-On
- IBM Tivoli Directory Server
- IBM Tivoli Access Manager WebSEAL
- Microsoft Active Directory Server
- Microsoft Exchange Server
- Sun Java Directory Server

- OpenLDAP Directory Server
- Symantec Anti-Virus Scan Engine

Connections Between Oracle Beehive Tiers

Components in the Oracle Beehive tiers connect through the following system frameworks and components:

- The Database Access Framework, which supports connections between the Application and Data Tiers. For more information, see "Overview of the Database Access Framework".
- The **Beehive Transport Infrastructure (BTI)**, which supports client connectivity between the Client and Application Tiers. For more information, see "Overview of the Beehive Transport Infrastructure".
- The Event Framework, which manages all system events and notification logic that they initiate. For more information, see "Overview of the Event Framework".
- Oracle Beehive schemas, which segregate system, configuration, and collaborative data, and application code. For more information, see "Overview of Oracle Beehive Schemas".

Overview of the Database Access Framework

The Application and Data Tiers connect through the Database Access Framework, which provides a logical data structure and an optimized data management resource for Oracle Beehive. The Database Access Framework improves system performance and scaling capabilities, while reducing overall system complexity.

The Database Access Framework controls all access to the database through a connection pool that it manages. Services request connections to the database through the connection pool. Once a service receives the requested information, it returns the connection back to the connection pool. The Database Access Framework leverages Java Database Connectivity (JDBC) for these connections.

The Database Access Framework enables centralized management of data store resources and utilizations. It also simplifies database administration tasks that are external, yet related, to Oracle Beehive, including:

- Changing database connection information, such as database host names and Oracle RAC nodes
- Managing database connection pool sizes
- Gathering database usage metrics

Overview of the Beehive Transport Infrastructure

The **Beehive Transport Infrastructure (BTI)** enables connectivity between the Client and Application Tiers by providing the network-level infrastructure for both client-to-server and server-to-server communications. Specifically, the BTI provides port and connection management for Microsoft Outlook (with Oracle Beehive Extensions for Outlook) and non-HTTP, standard-based clients through its proprietary multiplexor protocol (MX).

In a typical enterprise client/server deployment, clients connect through a series of networks to a known port on a known server. However, in many cases, the communication channels must traverse firewalls, load balancing routers, forward and

reverse proxies, and demilitarized zones (DMZs). The BTI is designed for deployment in these complex network infrastructures, while providing optimal port and connection management.

The BTI is a bundled component of the Oracle Beehive server so it is always provided whether you deploy Oracle Beehive in the Application Tier or in a DMZ. The latter case provides another layer of security between clients connecting to the system and internal components such as Oracle Database. This increased level of security and control over client connections is particularly beneficial when client connections are expected to originate from points outside of your network, such as from the Internet or from other private networks.

Oracle Beehive also provides Oracle HTTP Server, which enables client connectivity over HTTP/HTTPS. This can be leveraged in cases where HTTP/HTTPS is the preferred method of enabling client connections that originate from external locations.

Overview of the Event Framework

Oracle Beehive is an event-driven platform. Many aspects of system functionality and service interoperability stem from the event-based design of the platform. To manage this complex and powerful design implementation, Oracle Beehive provides the Event Framework. The Event Framework manages all events that occur in the system, which includes initiating any notification logic and policies that may apply.

Oracle Beehive supports business events, which are events that trigger business logic, such as applying policies. Business events provide a unique integration point for Oracle Beehive that allows customers to customize business processes or initiate external processes based on specific activities or occurrences. An example of a business event is when a user creates a document and it initiates a specific approval and notification process.

The open design of Oracle Beehive enables organizations to customize and extend the Event Framework by integrating policies. For example, developers can write and integrate custom business logic that executes when corresponding events are triggered in the system. Oracle Beehive administrators can also customize Oracle Beehive business logic to suit their specific requirements.

Overview of Oracle Beehive Schemas

Oracle Beehive schemas logically segregate system, configuration, and collaborative data, and application code. In addition to organizing system, data, and configuration management, Oracle Beehive schemas also provide a significant security benefit by isolating each of the major data components that drive the system. Each Oracle Database in an Oracle Beehive deployment must contain one Oracle Beehive schema set.

An Oracle Beehive schema set consists of the following schema types:

- Code Schema
- Data Schema

Code Schema

The Code Schema contains all Procedural Language/Structured Query Language (PL/SQL) code used by Oracle Beehive. The Code Schema enables application-level cloning and code updates separate from system data. Benefits of these capabilities include easier and seamless patches and upgrades, since these tasks can be performed without any system downtime. The separation of PL/SQL code from system data also

reduces the amount of time required for system backups, as code backups are required less frequently.

The Code Schema also controls the access requests made by Oracle Beehive services to data residing in the Data Tier, as well as the connections from services to other Oracle Beehive schemas, which the services cannot connect to directly. Connections between Oracle Beehive services and the Code Schema are managed by the Database Access Framework.

Data Schema

The Data Schema is the primary repository of collaborative data for Oracle Beehive. In Oracle Beehive, each service owns specific tables and views for the data that it manages. However, a service can request data from the tables or views owned by another service. For example, the Calendar Service may request data from a table belonging to the E-mail Service, which, in turn, may refer to and request information from tables owned by the User Directory Service.

3

Oracle Beehive Services

This module provides an overview of the services provided by Oracle Beehive, and contains the following topics:

Overview of Oracle Beehive Services

Oracle Beehive offers discrete, function-specific services that interoperate seamlessly to provide a wide range of features for enterprise collaboration, compliance, third-party component connectivity, coexistence, user and system administration, and security. The services-oriented design of the system enables administrators to start and stop services as well as service instances.

This section provides a general overview of Oracle Beehive services, and includes the following topics:

Difference Between a Service and a Service Instance

In Oracle Beehive, the term *service instance* refers to a single instantiation of a service on a particular server. The term *service* typically refers to the collection of all instances of a particular service across all of the servers that host them.

You can control services at both the service and service instance levels. For example, you can start and stop a single instance of a service (the service instance) or all instances of a service (the service).

Note: In cases where only one instance of a service exists in an Oracle Beehive deployment, you, in effect, manage both the service and the service instance concurrently.

Types of Services Provided by Oracle Beehive

Oracle Beehive provides the following types of services:

- Core Services: Core Services perform fundamental system functions such as user management and **authentication**.
- Collaboration Services: Collaboration Services provide collaboration-specific functionality that is leveraged by teams and individuals, including e-mail, time management, and instant messaging.
- Enterprise Services: Enterprise Services provide functionality that is leveraged across the enterprise such as workspaces, mobile connectivity, event subscriptions and notifications, and search.
- Platform Services: Platform Services enable organizations to integrate Oracle Beehive with existing environments and third-party components, and customize the platform to suit their needs.

How Oracle Beehive Services Leverage Each Other

Oracle Beehive is built so that its services can leverage the platform and each other in a way that insulates each service from the implementation details of the others. For example, users can be maintained in Oracle Internet Directory, but the Instant Message Service doesn't need to be aware of this because the User Directory Service provides the required abstraction. Similarly, calendar information can be maintained in Microsoft Exchange Server, with only the Time Management Service having the configured awareness because it provides the required abstraction for that information. This approach also allows for the modular development and deployment of services.

How Oracle Beehive Services are Exposed to Users

The features and functions of some services are exposed visually to users through supported Oracle Beehive clients and devices, while others operate in the background supporting key integrations, and low-level roles within the system. For example, most features of the E-mail Service, the Time Management Service, and the Instant Messaging Service are exposed visually to users in workspaces, while features of the Authentication Service, the Policy Service, and the User Directory Service are not exposed as explicitly.

Also, the features and data of some services are exposed through other services. For example, the features of the Presence Service, which detects and displays to others a user's current availability, are exposed through the Instant Messaging Service. Through the Instant Messaging Service, the Presence Service displays whether or not a user is currently available, and it may also provide additional user-configured details such as the user's contact information, preferred method of communication, or current location.

Similarly, Presence Service-based data can originate from other services. For example, when a user attends a scheduled meeting, the Time Management Service can notify the Presence Service of this. The Presence Service can then expose that information through the Instant Messaging Service, and so forth.

Core Services

Core Services perform fundamental system functions such as user management and **authentication**. Core Services are essential to Oracle Beehive, that is, they enable the operational functioning and management of the system.

Oracle Beehive provides the following Core Services:

- Access Control Service
- Audit Service
- Authentication Services
- Client Management Service
- Device Management Service
- Event Services
- Policy Service
- Presence Service
- Management Service
- User Directory Service

Access Control Service

The Access Control Service supports and manages all aspects of user access to Oracle Beehive entities, including granting, restricting, and denying access. The Access Control Service provides its features and functions through a variety of mechanisms such as access control lists (ACLs), roles, privileges, and inheritance.

System **administrator**s can define **access control** rules at the role, group, and user levels, and can include such privileges as create, read, update, and delete. Custom access control parameters, definitions, and rules are also supported.

In Oracle Beehive, access control is based on an authenticated user's identity, as well as the entity or operation being requested. For example, system administrators have full access and privileges for most system entities, whereas users typically only have the similar rights for the entities that they own or that are owned by the groups and workspaces to which they are members.

Audit Service

The Audit Service is the service interface to the Oracle Beehive Audit Framework, which supports and manages all aspects of auditing for system and business events.

Authentication Services

The Authentication Services manage all aspects of user **authentication** for Oracle Beehive, including single sign-on (SSO), user repository authentication, authentication policies, and encryption. The Authentication Services leverage the components and protocols that support Java Authentication and Authorization Service (JAAS) and Simple Authentication and Security Layer (SASL). Client-specific authentication libraries can be supported as well.

The Authentication Services include the following services:

- Authentication Service
- Identity Provider Service

Authentication Service

The Authentication Service manages and supports a variety of authentication providers, including local authentication providers, existing LDAP servers, native Windows authentication providers, and Web-based SSO providers. The Authentication Service enables administrators to configure authentication modes. It also provides the following user-based authentication features:

- Session timeout
- Account lockout on repeated authentication failures
- Password modification, such as changing and resetting passwords
- Automatic login

Components and technologies supported by the Authentication Service include:

- Oracle Beehive Pluggable Authentication Framework (for customized Web-based login flows).
- Oracle Database
- Oracle Internet Directory (OID)
- Oracle Single Sign-On (OSSO)
- Microsoft Active Directory
- OpenLDAP Directory Server
- Sun Java System Directory Server

Identity Provider Service

The Identity Provider Service provides certificate authority features for Oracle Beehive, enabling the system to manage digital certificates and other related security credentials.

Client Management Service

The Client Management Service enables administrators to manage client software settings related to client connections, notification thresholds, and debugging.

The Client Management Service enables administrators to:

- Set session timeout values
- Enable trace logs and debug mode
- Set the node address on which to listen for incoming client requests
- Set the maximum number of pending notifications that the Client Management Service will hold for supported clients
- Suspend the threshold for the client notifications queue

Device Management Service

The Device Management Service enables system administrators to manage supported client software installed on computers, such as Oracle Beehive Integration for Outlook, and mobile devices.

Key features provided by the Device Management Service include:

- Upload new client versions, paths, and property files

- Search and list client versions
- Delete client versions and patches
- Specify target versions of clients for user groups
- Edit client properties
- Export client property files
- Manage cross-platform client applications, including versions, patches, and modules
- Define installable clients applications
- Upgrade, download, and enable client applications
- Execute remote commands such as data wipes, and requests for configuration information and client-side logs
- Manage device-based profiles and configurations

Event Services

The Event Services are the service interfaces to the Oracle Beehive Event Framework, and include the following:

- Events Service
- Object Event Publisher Service

Events Service

The Events Service manages business events and related configuration settings, including:

- Handles requests from the Subscription Service regarding subscriptions on business events
- The log level for business events processing
- The number of times the system should retry failed actions that result from business events

Object Event Publisher Service

The Object Event Publisher Service handles the notification logic for object-level events in Oracle Beehive.

Management Service

The Management Service enables administrators to manage a variety of aspects of the system through both Oracle Beekeeper and the command line utility (`beectl`), including scripting support for automated administration.

Administrative functions supported by the Management Service include:

- On-the-fly system and infrastructure configuration (host names, ports, connections, memory, and so on) and management (start, stop, refresh, and restart)
- Real-time usage and performance monitoring
- Trace parameter configuration, including attaching probes to transactions
- Identifying and examining errors in transactions

- Linking trace errors to log records
- Log level management
- Log file management including rotation and disposition functions (parameter and qualifier definitions)
- Log file repository management, including size management and truncation schedules
- Input file consumption, allowing more complex tasks and configuration without repetitive commands
- Integration with Oracle Enterprise Manager Grid Control, providing familiar administrative operations for root cause analysis, dashboards, baselining, and trending
- Remote monitoring through integration with existing Oracle and third-party system management tools and standardized protocols

Policy Service

The Policy Service enables organizations to centrally apply, manage, and store business logic for Oracle Beehive events. Administrators can create and apply policies in Oracle Beehive for a variety of business needs, including:

- To facilitate business processes in collaborative activities.
- To enforce business process and compliance requirements.
- To reduce system administration time and effort.

A policy is a set of server-side rules that defines what actions the system must take when one or more events occur. Policies can apply to any Oracle Beehive entity, including users, **artifact**s, services, and workspaces. Out of the box, the Policy Service provides functional policies that enforce defined logic on password creation, user provisioning and deprovisioning, and auditing.

Administrators with the appropriate privileges can view, create, enable, disable, update, and delete policies through the Oracle Beehive `beectl` utility. Administrators can also export policy definitions as XML files.

The Policy Service leverages the Oracle Beehive Event Framework, facilitating policy delegation for other services, and also provides the following key features:

- Policy and policy schema extensibility.
- An inheritance model that supports enterprise-level policies with exceptions and extensions for specified groups, levels, and entities.
- Policy templates that enable organizations to define the extensible characteristics of policies and the business rules that they contain.

Presence Service

The Presence Service supports and manages all aspects of user and resource presence for Oracle Beehive. Presence is the ability to detect and identify the status of a user or resource, and then display that status to other users and resources in one or more clients or applications. In other words, presence determines whether or not a user is or will be online and available, and, if so, to what capacity and in what location. Oracle Beehive provides a rich presence model that is exposed to users through supported clients and, most notably, through the Instant Message Services, although this model

goes beyond the basic presence capabilities typically associated with instant messaging applications.

With the Presence Service, users can set their current statuses manually in supported clients or have Oracle Beehive automatically determine and display their statuses for them. For example, Oracle Beehive can automatically change a user's status to **In a Meeting** when a meeting is scheduled to start and **Available** when the meeting is scheduled to end. Once set, other users will know whether a user is available, away (temporarily), or should not be disturbed, among other conditions.

Oracle Beehive supports presence settings that specify a user's current activity, such as attending a meeting, engaged in a personal activity, or the time of last input. Users can customize their presence settings and can also specify multiple presence sources, such as computers, applications, phones, and mobile devices.

The Presence Service is based on the Rich Presence Information Data (RPID) format. Developers can customize, integrate with, and extend the Presence Service through the Oracle Beehive API. Developers can also customize data provided by the Presence Service, such as status messages for users.

User Directory Service

This section discusses the User Directory Service, which provides comprehensive user and group management capabilities for Oracle Beehive. This section is divided into the following topics:

- Overview of the User Directory Service
- Features Provided by the User Directory Service
- User Directory Servers Supported by the User Directory Service
- Address Book Management Features Supported by the User Directory Service
- Ways that Users Can Leverage the User Directory Service

Overview of the User Directory Service

The User Directory Service manages all aspects of user directory management for Oracle Beehive and supports a variety of implementations including local storage of users and groups as well as integrations with existing Oracle and third-party user directories.

The User Directory Service enables Oracle Beehive administrators to intuitively manage users and groups, including the ability to add, modify, and delete them. The User Directory Service supports the Beehive Directory (either natively or through coexistence with external directories). It also enables static and dynamic group memberships that are based on integrations with query-based groups defined in external directories.

Features Provided by the User Directory Service

Key user directory management features provided by the User Directory Service include:

- Native user directory capabilities
- Optional integration with supported Oracle and third-party user directory servers

> **Note:** For the list of supported user directory servers, see "User Directory Servers Supported by the User Directory Service".

- Support for static and dynamic group memberships
- Contact management features such as address books and people lists

> **Note:** For more information, please refer to "Address Book Management Features Supported by the User Directory Service".

- Support for National Language Support (NLS) user aliases
- Customizable user attribute fields
- Attribute mapping with existing user directories
- User creation through pre-defined templates
- Import capabilities of directory data based on Extensible Markup Language (XML) files
- Bulk user management functions including create, delete, and modify users

Oracle Beehive provides additional user directory management features, including:

- Automatic addition of managers, direct reports, and peers to People lists
- Ability to store and retrieve large-valued properties for contacts, such as file attachments and descriptions

User Directory Servers Supported by the User Directory Service

The User Directory Service supports integration with the following user directory servers:

- Oracle Internet Directory
- IBM Tivoli
- Microsoft Active Directory
- OpenLDAP Directory Server
- Sun Java System Directory Server

Address Book Management Features Supported by the User Directory Service

The User Directory Service supports and manages all aspects of contact management for Oracle Beehive users in the form of address books and people lists. In Oracle Beehive, a contact is a person or group with which users can interact. For each contact, Oracle Beehive supports a variety of information such as the contact's name, alias, job title, phone number, address, e-mail address, and photo. Oracle Beehive also supports large-valued properties for contacts, such as file attachments and descriptions.

The User Directory Service provides the following address book types:

- **Directory:** The collection of all the groups and contacts within an enterprise, typically based on the organization's complete user directory.
- **Workspace:** A collection of groups and contacts that are specific to a workspace. Each workspace can have one or more workspace address books. The contacts in workspace address books may be shared with other workspaces and users.
- **Personal:** A collection of groups and contacts that are defined by and specific to a user. Each personal workspace can have one or more personal address books. The contacts in personal address books may be shared with other users and workspaces.

Note: The User Directory Service enables system administrators to define quotas for all address book types.

All address book types and user groups in Oracle Beehive also support external contacts, which are people who, although external to an enterprise, can be contacted by and collaborate with users. By default, all Oracle Beehive users are contacts, but not all contacts are users, such as in the cases of external contacts.

The User Directory Service also supports the contact-related needs of other Oracle Beehive services, such as the E-mail Service, the Instant Message Services, the Presence Service, and the Workspace Service, facilitating seamless communication and collaboration.

Ways that Users Can Leverage the User Directory Service

The User Directory Service enables uses to manage their workspace and personal address books, including the ability to import address books and add external contacts. Additionally, users can apply tags (referred to as categories in Microsoft Outlook) to their contacts, to further differentiate contact attributes for their convenience and productivity. Tags are typically user-defined and can include such names as Colleagues, Family and Friends, and Customers, among others.

Collaboration Services

Collaboration Services provide team-based collaborative functionality such as e-mail, time management, and instant messaging.

Oracle Beehive provides the following Collaboration Services:

- Content Management Services
- Discussions Service
- E-mail Service
- Instant Message Services
- Meeting Services
- Time Management Services
- Voice Message Service

Content Management Services

Content management is an essential part of team collaboration, enabling users to share and distribute documents throughout their organizations while concurrently maintaining control and tracking changes. Collaborative content management improves an organization's knowledge sharing and communication capabilities by making content more readily available to users in a structured and secure way.

The Content Management Services support all aspects of file and document life cycle management, especially for unstructured content. The Content Management Services also support integration with the Records Management Service.

The Content Management Services provide the following key features:

- Real-time status including whether the content is checked in or out, or currently in review

- Versioning, including the time of the last change and by whom
- Integration with workspaces, enabling users to post documents in workspaces for reviews and editing by other members
- Content locking at the user level (explicit) and system level (implicit)
- Support from desktop applications such as Microsoft Windows Explorer through WebDAV
- Ability to edit a document in place (in its current location)
- Standards and protocol support including WebDAV, JSR-170, Java Content Repository (JCR), File Transfer Protocol (FTP), and FTP over Transport Layer Security (TLS).

The Content Management Services include the following services:

- FTP Service
- JCR Service
- Remote Content Service
- WebDAV Service

FTP Service

The FTP Service supports and manages all content management-related features and settings that the system leverages through FTP and FTP over TLS, including:

- Support for FTP clients such as CuteFTP, WS_FTP, and SmartFTP
- Whether or not the specified FTP server is enabled for Oracle Beehive
- The port number at which the FTP Service will listen for requests
- The maximum number of ports the FTP Service can use for passive listening
- The buffer size between streams during content uploads
- The amount of time (in seconds) the service will allow a user session to remain inactive before terminating the session (timing out)

JCR Service

The JCR Service supports and manages all content-related features and settings that the system leverages over the Java Content Repository (JCR) protocol.

Remote Content Service

The Remote Content Service supports and manages all content-related features and settings for leveraging remote content repositories. The Remote Content Service supports Oracle Universal Content Management (Oracle UCM) only.

WebDAV Service

The WebDAV Service supports and manages all content management-related features and settings that the system leverages over the Web-based Distributed Authoring and Versioning (WebDAV) protocol, including:

- Support for WebDAV clients such as Microsoft Windows WebFolders
- Whether or not the specified WebDAV server is enabled for Oracle Beehive
- The default authentication scheme for WebDAV clients

- Length of time (in minutes) before Web browser-based and WebDAV-based client cookies expire
- The minimum value (in minutes) allowed for content locks
- Length of time (in minutes) before the system refreshes each active user's preferences
- The buffer size between streams during content uploads and downloads
- Shortcuts for content

Discussions Service

The Discussions Service enables organizations to host threaded, online discussion forums in which users can browse message boards, and post and respond to messages. Through the Discussions Service, users post messages about a topic within a forum. Other users can then browse and reply to these messages. The Discussions Service manages the relationships of these messages (peer, parent, or child) and organizes them accordingly for intuitive search, presentation, and navigation.

Key features provided by the Discussions Service include:

- Policy- and security-based filters including anti-spam capabilities
- Pre-defined roles (moderator, reader, contributor, editor)
- Permissions for users and groups
- Programmatic access through Web Services

E-mail Service

The E-mail Service supports all aspects of e-mail creation, delivery, and management for Oracle Beehive, including by exposing e-mail from coexisting systems to supported clients. The E-mail Service enables users to organize and manage their e-mail messages in the context of Oracle Beehive workspaces. Users can create, send, receive, read, mark (flag), copy, move, delete, and save drafts of e-mail messages.

The E-mail Service also provides or supports the following features:

- Delivery of voicemail messages and faxes as e-mail (leveraged through the Voice Message Service).
- Delivery of e-mail messages to groups and distribution lists (leveraged through the User Directory Service).
- Server-side rules (provided by the Subscription and Notification Services) for automated e-mail message management, enabling administrators and users to define a variety of actions, such as server-side sorting and categorization, for a wide range of events and conditions.
- Managing e-mail messages as records through integration with the Records Management Service.
- Anti-virus and anti-spam capabilities provided through supported applications.
- Automated delivery receipts for e-mail messages.
- Inclusion of custom and standardized disclaimers in e-mail messages.
- Administration capabilities, including message monitoring, logging, and reporting, as well as queue and quota management.

Instant Message Services

The Instant Message Services support all aspects of instant messaging for Oracle Beehive. With the Instant Message Services, users can send text-based messages in real time. Users can also attach files to messages, and can **broadcast** messages to multiple recipients simultaneously, including to entire groups.

Through supported Oracle Beehive clients, the Instant Message Services also enable seamless transitions between instant messaging modes and conference types, including persistent chats, text conferences, and voice chats and conferences.

The Instant Message Services include of the following services:

- Instant Message Service
- XMPP Service

Instant Message Service

The Instant Message Service provides core instant messaging features, including:

- Message encryption
- Rosters (buddy lists) based on Oracle Beehive address books and People lists
- Presence support (provided by the Presence Service) with customizable status settings
- Offline capabilities, such as sending an instant message through e-mail
- Server-side message transcripts

XMPP Service

The XMPP Service supports and manages all the features and settings that the system exposes through the Extensible Messaging and Presence Protocol (XMPP) v 0.9 and 1.0, including:

- Support for XMPP clients such as Pidgin (formerly Gaim), iChat, and Trillian Pro
- Multiple authentication methods
- Persistent chat rooms
- The list of all supported messaging agents
- The port number at which all XMPP servers will communicate
- The port number at which the system will encrypt messages over Secure Sockets Layer (SSL)
- The default language for messages

Meeting Services

The Meeting Services support and manage all aspects of online meetings including Web-based voice conferences and chat rooms, enabling meeting organizers and participants to conduct collaborative sessions online through Oracle Beehive Conferencing.

The Meeting Services provide the following key features:

- Simultaneous voice and audio support (full duplex)

Note: Although Oracle Beehive Conferencing supports Microsoft Windows Vista, the Oracle Beehive voice conference features are not yet certified for that operating system. Therefore, the quality and performance of Oracle Beehive voice conference on Microsoft Windows Vista may not be optimal.

- Recording and playback capabilities
- Customizable client viewing window, including zooming and window resizing
- Ability to manage meeting attendees online
- Ability to share and control desktops, documents, and applications
- Persistent chat rooms

The Meeting Services include the following services:

- Conference Service
- Conference Session Service
- OWC Streaming Service
- Transcoding Service

Conference Service

The Conference Service supports and manages many aspects of the Web conference features and settings provided by Oracle Beehive, including:

- The default mode (speaker or listener) of voice participants.
- The default length of time (in seconds) after which a conference will end if the host doesn't join it.
- The interval (in seconds) at which Oracle Beehive will push conference log records to persistent storage. These logs are used to restore sessions in the cases of service disruptions, therefore smaller intervals equate to more recent states.
- Various SIP-based configuration settings such as the gateway port, gateway Internet Protocol (IP) address, and the SIP container transport (User Datagram Protocol or Transmission Control Protocol).

Conference Session Service

The Conference Session Service manages various aspects of the sessions for Oracle Beehive voice and Web conferences including the transport layer and flow of live information.

OWC Streaming Service

The OWC Streaming Service manages the settings for HTTP tunneling, the Real Time Message Protocol (RTMP), and the Real Time Streaming Protocol (RTSP), including whether or not these services are enabled, their associated port numbers, and how many client connections are allowed.

Transcoding Service

The Transcoding Service supports and manages all the data- and audio-conversions for Oracle Beehive voice and Web conferences.

Time Management Services

The Time Management Services support all aspects of time and task management, as well as user, team, and resource scheduling for Oracle Beehive. The Time Management Services maintain and provide access to the latest calendar-based schedule information for all Oracle Beehive users, teams, and resources. This ensures that users can schedule meetings and presentations with each other easily and accurately, as well as reserve meeting rooms and equipment, all with minimal coordination efforts and schedule conflicts.

When creating a meeting, a task, or event with a specified timeframe, the Time Management Services enable users to invite other users, add details such as objectives and agendas, and attach documents.

Through workspaces, users can also leverage the Time Management Services to create notes and entries that inform others of upcoming dates, such as scheduled holidays and birthdays, and if they will be out of the office or otherwise unavailable. Users can also expose calendar entries in both their personal and team workspaces.

The Time Management Services provide the following key features:

- Automated reminders and **alert**s
- Recurring meetings
- Import and export of iCalendar data
- Invitations for meeting or event participants, including external contacts (through iCalendar)
- Designations for required and optional attendees
- Real-time schedule conflict checking and resolution capabilities
- Time zone support and synchronization
- Support for holiday calendars
- Support for the iSchedule and Calendaring Extensions to WebDAV (CalDAV) protocols

The Time Management Services include the following services:

- Alarm Service
- CalDAV Service
- Resource Directory Service
- Time Management Service
- Time Zone Service

Alarm Service

The Alarm Service handles all time management-related **alert**s for the system. The Alarm Service enables users to configure and receive alerts, such as reminders prior to meeting start times. The Alarm Service is also responsible for signaling the activation of other services at preconfigured times.

CalDAV Service

The CalDAV Service supports and manages all time management-related features and settings that the system leverages over the Calendaring Extensions to WebDAV (CalDAV) protocol. Supported clients include Apple iCal, Mozilla Lightning, and Mozilla Sunbird.

The CalDAV Service supports Internet Calendar Subscription, also known as WebCal Subscription. Internet Calendar Subscription can provide users with read access to collections of calendar entries through client applications that do not support the CalDAV protocol.

Resource Directory Service

The Resource Directory Service provides a common definition for all Oracle Beehive resources as well as a centralized location to access and manage resource entries. The Resource Directory Service manages all aspects of the resources provided in Oracle Beehive directories, enabling users to view and schedule resources through supported time management features. This includes related settings such as the total number of resources returned in search results. Resources typically include reservable, non-human entities such as a meeting rooms, computers, and projectors.

The Resource Directory Service enables administrators to define a variety of resources, including physical locations and equipment. Examples of physical locations that can be defined include classrooms, training rooms, conference rooms, offices, and cubicles. Examples of equipment that can be defined include projectors, monitors, and computers.

The Resource Directory Service enables users to perform the following tasks:

- Search for resources by name, type, capacity, or tag
- Manage resources and configure resource booking behavior
- Reserve resources through meeting invitations

Time Management Service

The Time Management Service provides the coordination services for the core aspects of Oracle Beehive calendars, scheduling, task management, and reminders. This includes support for multiple calendars and task lists in workspaces, automatic updates of group-based invitations and task assignments resulting from group definition changes.

Through the features provided by the Time Management Service, users can perform the following tasks:

- Manage team and personal calendars, tasks, and events
- Specify designates for calendars
- Verify free/busy status of other users and teams
- Invite users, teams, and workspace members to meetings
- Respond to invitations and task assignments
- Assign roles to meeting attendees such as **required**, **optional**, and so forth
- Manage subscriptions to calendars of interest and automatically receive invitations to new events
- Initiate user presence changes based on calendar events
- Assign tasks to users, groups, and workspaces

Time Zone Service

The Time Zone Service supports and manages all aspects of synchronizing user schedules and calendar entries across global time zones. The Time Zone Service, in

effect, is the central authority that unifies the coordination of all time zone-related components and activities in Oracle Beehive.

Voice Message Service

The Voice Message Service supports all aspects of voicemail and fax management for Oracle Beehive.

Through the Voice Message Service, users can perform the following tasks:

- Manage their voicemail messages and faxes (retrieve, archive, and delete).
- Record multiple voicemail greetings.
- Search their corporate directories through phones.
- Transfer calls to voicemail mailboxes, auto-attendants, and external numbers.

The Voice Message Service can be leveraged by the E-mail Service, enabling delivery of voicemail messages and faxes as e-mail. The Voice Message Service also supports multiple locations, including private branch exchanges (PBXs), and multiple languages, enabling enterprises to support a variety of network and user needs all within a single Oracle Beehive instance. Supported options include integration of existing telephony infrastructures with Oracle Beehive.

Enterprise Services

Enterprise Services provide extensions to functions that are leveraged at the enterprise level, such as search, mobile connectivity, and subscription and notification.

Oracle Beehive provides the following Enterprise Services:

- Information Rights Management (IRM) Service
- Mobility Services
- Records Management Service
- Search Service
- Subscription and Notification Services
- Workspace Service

Information Rights Management (IRM) Service

The Information Rights Management (IRM) Service supports information rights management of documents for Oracle Beehive through integration with Oracle Information Rights Management (Oracle IRM). Oracle IRM is an information security solution that uses encryption to seal content. Through the IRM Service, Oracle IRM, and policies created by administrators, Oracle Beehive controls access to sealed content, ensuring that only authorized users can open and use it. This control pertains not only to content saved locally on users' computers, but also extends to content distributed outside the firewall through e-mail and other means.

Mobility Services

Ideally, a user should be able to purchase the mobile device of his or her choice, take it out of the box, set it up quickly, and then make use of the collaborative capabilities that it provides. To ensure quick set up, continued ease of use, and increased user

productivity, enterprises require successful mobile device strategies. The Mobility Services provided by Oracle Beehive can be a key part of such a strategy, as they:

- Extend collaborative capabilities to the mobile device users.
- Provide key device management capabilities, such as enabling easy self-serve user setup where software and configuration settings can be pushed to devices automatically.
- Comply with open standards, protecting current investments for future generations of devices.

Oracle Beehive's Mobile Services along with a large partner community of device manufacturers and third-party vendors allow for a complete, secure, device- and network-agnostic mobile solution that supports a wide variety of mobile devices.

The Mobility Services provide the following key features:

- Automatic synchronization of e-mail, calendar, task, and address book data
- User-defined preferences including device behavior and control
- Self-service user provisioning
- Protocol server support and administration
- Support for Microsoft Windows Mobile Outlook through the Oracle Beehive Mobile Outlook Plug-in
- Support for third-party IMAP, OMA-DS, and XMPP clients
- Security features such as data wipes

The Mobility Services include the following services:

- Mobile Device Management Service
- Mobile Data Sync Service
- Mobile Mail Service
- Mobile Push Service

Mobile Device Management Service

The Mobile Device Management Service manages the communications and configuration settings for the Mobile Device Management Server, which enables connections between the Device Management Service and supported device-resident Mobile Device Management clients.

The Mobile Device Management Service supports the following settings:

- The maximum number of concurrent connections supported by the Mobile Device Management Server.
- The amount of time (in minutes) the service will allow a mobile session to remain inactive before terminating the session (timing out). Settings provided for both authenticated and non-authenticated sessions.
- The number of invalid commands a mobile client may send to the Mobile Device Management Server before the system terminates the session.

Mobile Data Sync Service

The Mobile Data Sync Service is based on OMA-DS 1.2 and provides for automatic synchronization of e-mail, calendar, task, and address book data for any mobile device with an OMA-DS compliant client. The service supports suspend/resume

functionality, compression, one-way synchronization, and default address books. The service also manages all mobile-related features and settings for OMA-DS standard clients, including:

- Whether or not support for OMA-DS is enabled.
- Whether or not synchronization is enabled for each mobile data type, including calendar, e-mail, and contact data.
- Whether or not MD5 authentication is enabled for connections between mobile clients and the Mobile Data Sync Server.
- Log file creation settings, including whether or not the system will create log files for synchronization sessions, and the number of days the system will retain these logs files.
- The maximum number of concurrent requests that the Mobile Data Sync Server will allow.
- The amount of time (in minutes) the service will allow a synchronization session to remain inactive before terminating the session (timing out).

Mobile Mail Service

The Mobile Mail Service provides a complete Push IMAP (P-IMAP) v0.6 implementation for real-time delivery of e-mail to users' mobile devices. The service also manages the features and settings related to push mail, including:

- The maximum number of concurrent users that the Mobile Mail Service will allow.
- The maximum number of e-mail messages that the Mobile Mail Service will allow in each user's mobile device inbox.
- The number of invalid login attempts that the Mobile Mail Service will allow each mobile user to make before closing a connection.
- Whether or not connections to the specified IMAP server are enabled.

Mobile Push Service

The Mobile Push Service is responsible for delivering notifications to push clients running on end users' mobile devices. It is, in essence, an event dispatcher for those devices. For example, Mobile Push Service alerts can indicate changes in user's inbox, calendars, task lists, and address books. Alerts can also prompt users to take action on corresponding device management events.

In addition, the Mobile Push Service manages the following features and settings:

- The Internet-accessible address, port number range, and type of the listener for the Mobile Push Server. Supported types include HTTP, TCP, and the Oracle Beehive Transport Infrastructure (BTI).
- The amount of time (in minutes) of inactivity the service will allow before terminating an unauthenticated session.
- The maximum number of concurrent connections that the Mobile Push Service will allow.
- The number of invalid login attempts that the Mobile Push Service will allow before closing a connection.

Records Management Service

The Records Management Service supports all aspects of records management of documents and e-mail for Oracle Beehive through integration with Oracle Universal Records Management (URM). Oracle URM enables organizations to manage their records and retention policies, disposition processes, and litigation holds or freezes in a central repository known as a Universal Records Management (URM) server. Organizations can then apply their policies, dispositions, and holds to content stored in other systems, such as Oracle Beehive. Although the life cycles of records associated with e-mail messages and documents are managed by Oracle URM, the artifacts themselves exist in the Oracle Beehive content and message repositories.

Search Service

The Search Service supports and manages all aspects of user-initiated, text-based searches for Oracle Beehive.

The Search Service enables users to search for e-mail messages, documents, and meeting entries through the following search features:

- Basic keyword searches
- Advanced, multiple criteria-based searches including tags and extended properties
- Directed searches limited to specific folders and folder hierarchies
- Wildcard searches
- Streaming results
- Search results manipulation, including sorting based on relevance and metadata
- Snippets presented with search results

The Search Service is optimized to maintain a complete up-to-date index for Oracle Beehive artifacts, which ensures sub-second response times and superior relevancy. To allow for searches across all enterprise information repositories, such as those outside of Oracle Beehive, the Search Service can be integrated with Oracle Secure Enterprise Search. In this case, Oracle Beehive is configured in Oracle Secure Enterprise Search as a federated data source.

For more information on this option, see one or both of the following topics:

- "Deploying Oracle Beehive with Oracle Secure Enterprise Search 10*g*" in the *Oracle Beehive Deployment Guide*.
- "Setting up Federated Sources" in the *Oracle Secure Enterprise Search 10g Administrator's Guide*.

Subscription and Notification Services

The Subscription and Notification Services support and manage all aspects of user-based subscriptions to business events and the resulting notifications. The Subscription and Notification Services enable users to subscribe to specific business events, such as document updates, and to be notified through one or more channels when those events occur. Supported notification channels include e-mail, instant message, and Simple Message Service (SMS).

Users can manage their subscriptions and notifications for a full range of important business events, including:

- Meeting invitations

- Task assignments
- Resource approvals
- Document changes

The Subscription and Notification Services supports user-defined delivery rules for each subscription and notification, including user-based notification preferences such as delivery to one or more notification channels as well as requests for additional information. Support for cloning and copying subscriptions can also be provided through custom development leveraging the BDK Service.

The Subscription and Notification Services include the following services:

- Notification Service
- SMPP Service
- Subscription Service

Notification Service

The Notification Service handles all aspects of creating and delivering messages and notifications for Oracle Beehive, including notifications on which users can take actions (referred to as **actionable** notifications). Message support includes e-mail and instant messages.

SMPP Service

The SMPP Service is responsible for the delivery of SMS messages over the Short Message Peer-to-Peer (SMPP) protocol.

Subscription Service

The Subscription Service handles all aspects of subscription logic for Oracle Beehive subscriptions.

Workspace Service

The Workspace Service supports all the features and functionality provided by Oracle Beehive personal and team workspaces. Workspaces are the core of the user experience with Oracle Beehive, especially in regard to the collaborative activities of teams. Therefore, the Workspace Service is responsible for consolidating and exposing, in a single location, the collaborative functionality provided by the other Oracle Beehive services, including:

- Time Management Services
- Content Management Services
- Discussions Service
- E-mail Service
- Instant Message Services
- Search Service
- Voice Message Service

Within workspaces, users can manage their artifacts in a way so that they are stored once but can be referenced by multiple workspaces. The Workspace Service also enables users to associate, categorize, and manage their artifacts using bonds, tags, metadata, and folders, as well as discard artifacts in trash folders, with archive,

restore, and purge capabilities. Workspace folder features that users can leverage include inheritance, versions, and locks. Users can also create associations, or bonds, between artifacts for intuitive organization and retrieval.

In addition to collaborating with other workspace members and managing their artifacts, the Workspace Service provides users with self-service administrative features, such as the ability to:

- Create new workspaces
- Edit workspace names and descriptions
- Specify workspace memberships
- List workspaces in the Workspace Directory
- Enable **open** or **invite-only** membership modes

The Workspace Service provides XML-based templates that serve as blueprints for creating workspaces, as well as for specifying default folder hierarchies and content, custom roles, and pre-seeded calendar events, tasks, contacts, and more. The Workspace Service also enables administrators to configure workspace settings, such as soft and hard quotas as well as default content versioning.

Platform Services

Platform Services enable organizations to leverage the Oracle Beehive platform and its APIs, and support integration and coexistence with third-party components, Web services, and custom solutions.

Oracle Beehive provides the following Platform Services:

- API Services
- Coexistence Service

API Services

The API Services enable organizations to build and integrate custom solutions that leverage the APIs that Oracle Beehive supports or provides, and include the following:

- BDK Service

BDK Service

The BDK Service enables organizations to build and integrate custom Web solutions with Oracle Beehive using Oracle Beehive RESTful Web Services. Oracle Beehive RESTful Web Services consists of APIs that are implemented with the principles of REST. The BDK Service exposes the configuration aspects of these APIs. The BDK Service also provides an abstraction of the Oracle Beehive Object Model, or BOM, which is what Oracle Beehive is built around and which exposes all user-facing collaboration functionality.

Coexistence Service

The Coexistence Service enables organizations to integrate and leverage existing, third-party systems and components, such as Microsoft Exchange Server 2003 or IBM Lotus Domino, with Oracle Beehive for maximum interoperability. This enables users of Oracle Beehive and users of other systems to collaborate with each other beyond the limited capabilities of e-mail.

The Coexistence Service also provides for a non-intrusive deployment approach, giving users a choice in how they create and manage their e-mail, calendar entries, and tasks, either from Oracle Beehive or from other clients, such as Microsoft Outlook. With this approach, users can be introduced to Oracle Beehive and its contextual environment without needing to immediately adopt and adapt to it.

4

Oracle Beehive Deployment Concepts

This module provides an overview of several concepts related to deploying Oracle Beehive, and contains the following topics:

- Key Oracle Beehive Deployment Terms and Concepts
- Oracle Beehive System Deployment Scenarios
- Oracle Beehive Client Deployment Options

Key Oracle Beehive Deployment Terms and Concepts

This section provides an overview of several fundamental terms related to deploying Oracle Beehive, including:

- Sites
- Instances
- Enterprises and Organizations
- Collaboration Coexistence

Sites

A site is a collection of hardware in a specific geographic location and on which Oracle Beehive runs. A site can support multiple instances of a variety of components including Oracle Beehive servers and Oracle Database instances. Oracle Beehive currently supports only one site per deployment.

Instances

An instance is an Oracle Beehive server that is running on a computer in an Oracle home (`ORACLE_HOME`). An instance may respond to requests from a specific enterprise. Oracle Beehive supports one server instance on each computer.

Enterprises and Organizations

An enterprise is a container for all of the users, groups, and resources that are a part of a single Oracle Beehive deployment. Typically, an enterprise includes all of the users, groups, and resources within a company. Oracle Beehive supports one enterprise for each deployment.

Enterprises are the containers for organizations, which are groups defined by a department, line of business, project, or other criteria.

The hierarchical relationship between enterprises and organizations in Oracle Beehive provides a logical structure for organizing users, groups, and resources. This structure also allows system administrators to more easily manage users, groups, and resources through their organizational associations.

Collaboration Coexistence

Through the Coexistence Service, enterprises can integrate Oracle Beehive with other supported systems (or applications) so that certain data or functionality can be viewed or leveraged by users of both systems. This capability, referred to as Oracle Beehive *collaboration coexistence*, enables users to perform actions in one system, such as send e-mail messages or schedule meetings, and then view or receive the results of those actions in both systems. Currently, Oracle Beehive supports collaboration coexistence for Microsoft Exchange Server 2003, Microsoft Exchange Server 2007, and IBM Lotus Domino Server.

Through collaboration coexistence, Oracle Beehive provides enterprises a non-intrusive deployment approach that gives users a choice in how they access their data, either from Oracle Beehive or other clients, such as Microsoft Outlook (with Oracle Beehive Extensions for Outlook and connected to Microsoft Exchange). With this approach, users can be introduced to Oracle Beehive and its contextual environment without needing to immediately adopt and adapt to it. This approach also enables users of third-party systems to leverage Oracle Beehive functionality through their existing applications.

Oracle Beehive provides collaboration coexistence through the Oracle Collaboration Coexistence Gateway, which is a logical part of the Coexistence Service. The Oracle Collaboration Coexistence Gateway is an Oracle proprietary solution that provides the connection between Oracle Beehive and supported enterprise messaging solutions. For more information, refer to the following topics:

- "Oracle Beehive Integration with IBM Lotus Domino Server"
- "Oracle Beehive Integration with Microsoft Exchange Server 2003 or 2007"

Oracle Beehive System Deployment Scenarios

Oracle Beehive provides a flexible system deployment model that supports several distinct scenarios, including:

- Deployments with Oracle Beehive on a Single Computer
- Deployments with Multiple Oracle Beehive Instances on Multiple Computers
- Deployments with Oracle Beehive Across Network Zones

Deployments with Oracle Beehive on a Single Computer

Oracle Beehive can be deployed on a single computer. In this case, the system can leverage a single Oracle Database instance that may be located on the same computer or on a different computer, although the latter is recommended. The system can also leverage a database cluster, located among several other computers, using Oracle Real Application Clusters (Oracle RAC).

Out of the box, Oracle Beehive provides all required user directory components so it can function as an independent system. It can also integrate with external corporate directories, if preferred or required.

Deploying Oracle Beehive on a single computer is suitable for test environments, development environments, and small production environments. Due to the lack of its failover capabilities, this deployment scenario is unsuitable in cases where very high levels of guaranteed services are required.

For more information on these scenarios and the considerations that each entail, see "Oracle Beehive Deployment Configurations" in the *Oracle Beehive Deployment Guide*.

Deployments with Multiple Oracle Beehive Instances on Multiple Computers

Oracle Beehive supports deployments where multiple Oracle Beehive server instances are distributed across multiple computers. In this scenario, each computer hosts one Oracle Beehive server instance, which can be accessed through a load balancing router (LBR).

In this scenario, each instance runs all available services provided with Oracle Beehive. For example, if you have 5 computers, each with a Oracle Beehive server instance, you will 5 instances of the User Directory Service, the E-mail Service, and so forth. However, each service is instantiated as a single instance, or as a collection of all of the available instances.

This deployment scenario requires either a single database instance or an Oracle RAC cluster. From the user directory standpoint, you can integrate Oracle Beehive with an external corporate directory, or you can deploy it as a standalone system that leverages its own user directory capabilities and features.

Typically, a deployment with multiple Oracle Beehive instances across multiple computers is used in test environments, large production environments, or in situations where a higher level of service (high availability) is required. Test environments in this scenario can either be replicas of their associated production environments (recommended) or they may be scaled-down versions that mimic production environment topologies but with less hardware. Cloning of Oracle Beehive instances is supported to facilitate this process.

For more information on these scenarios and the considerations that each entail, see "Oracle Beehive Deployment Configurations" in the *Oracle Beehive Deployment Guide*.

Deployments with Oracle Beehive Across Network Zones

Oracle Beehive supports deployments across networks zones, which are used to logically split the different layers of Oracle Beehive into the following areas:

- Client Access Zone
- Application Zone
- Data Zone

Firewalls and multiple network zones are supported in this deployment scenario, providing increased security measures where user access to the system is required from corporate networks and the Internet. Network zones such as corporate intranets or demilitarized zones (DMZs) are also supported. Oracle Beehive services may have a dedicated system on which they run so that only the required services are exposed in the DMZ.

In this scenario, the Client Access Zone is separated from the other zones and their services, and resides in a separate network layer such as a DMZ. Firewalls may exist between the different zones, and a reverse proxy may also be present in the Client Access Zone. To provide higher levels of service (high availability), this deployment scenario may also consist of multiple computers each running an Oracle Beehive

server instance. For more information, see "Deployments with Multiple Oracle Beehive Instances on Multiple Computers".

Typically, organizations deploy Oracle Beehive in this scenario for the increased security that it provides. This scenario protects core data (in the Data Zone) behind several layers (zones) and barriers. Similarly, this scenarios also protects application logic while seamlessly providing users needed access and functionality. Network connectivity layers are thin but, upon successful authentication, allow full access to available services.

For more information on these scenarios and the considerations that each entail, see "Oracle Beehive Deployment Configurations" in the *Oracle Beehive Deployment Guide*.

Oracle Beehive Client Deployment Options

The Oracle Beehive platform provides a unified client implementation model that supports the following end-user client and device deployments:

- Oracle Beehive Deployments with Oracle Beehive Central
- Oracle Beehive Deployments with Oracle Beehive Conferencing
- Oracle Beehive Deployments with Oracle Beehive Extensions for Explorer
- Oracle Beehive Deployments with Oracle Beehive Extensions for Outlook
- Oracle Beehive Deployments with Oracle Beehive Team Collaboration
- Oracle Beehive Deployments with Oracle Beehive Webmail
- Oracle Beehive Deployments with Standards-based and Open Source Clients
- Oracle Beehive Deployments with Mobile Devices

Oracle Beehive Deployments with Oracle Beehive Central

Oracle Beehive Central is a Web-based client that is automatically deployed during the Oracle Beehive installation process. To access Oracle Beehive Central, users need only to launch a supported Web browser and enter the URL designated for Oracle Beehive Central for their deployment. Typically, this URL appears in the following format:

```
http://<Your-Server-Name>:<Port-Number>/bcentral/
```

Oracle Beehive Deployments with Oracle Beehive Conferencing

Oracle Beehive Conferencing requires a client installation on the computers of individual users. Administrators can make the Oracle Beehive Conferencing client installation package available to users through Oracle Beehive Central, internal websites, or traditional desktop software delivery tools. Users can then download and install the Oracle Beehive Conferencing client on their computers.

The Oracle Beehive Web Conferencing Center is automatically deployed during the Oracle Beehive installation process. The Oracle Beehive Web Conferencing Center is an interface for users to join or start Oracle Beehive conferences. However, to join or start a conference, users need to first install the Oracle Beehive Conferencing client.

For more information on deploying Oracle Beehive Conferencing and Oracle Beehive Web Conferencing Center, see "Oracle Beehive Deployments with Oracle Beehive Conferencing" in the *Oracle Beehive Deployment Guide*.

Oracle Beehive Deployments with Oracle Beehive Extensions for Explorer

Oracle Beehive Extensions for Explorer requires installation on the computers of individual users. To access, download, and install on users' computers, Oracle Beehive provides a download agent that administrators can make available to users on internal websites. Upon execution, the download agent connects users to Oracle Beehive, challenges them for their credentials, and enables them to download and install Oracle Beehive Extensions for Explorer. Users can delete the download agent once they complete the installation.

By default, Oracle Beehive provides the Oracle Beehive Extensions for Explorer installation package as a zip file (`.zip`) in the Device Management Application Repository. The contents of the zip file include a Windows executable installation program (`.msi`) and an Extensible Markup Language (XML) file that describes the installation program.

Oracle Beehive Deployments with Oracle Beehive Extensions for Outlook

Oracle Beehive Extensions for Outlook requires installation on the computers of individual users. To access, download, and install on users' computers, Oracle Beehive provides a download agent that administrators can make available to users on internal websites. Upon execution, the download agent connects users to Oracle Beehive, challenges them for their credentials, and enables them to download and install Oracle Beehive Extensions for Outlook. Users can delete the download agent once they complete the installation.

Note: In addition to the download agent distribution model, administrators can manage and distribute the Oracle Beehive Extensions for Outlook installation package through Microsoft Windows Server 2003 SP 2 for Windows Terminal Services. Oracle Beehive Extensions for Outlook can also leverage Windows Terminal Services once it is installed.

By default, Oracle Beehive provides the Oracle Beehive Extensions for Outlook installation package as a zip file (`.zip`) in the Device Management Application Repository. The contents of the zip file include a Windows executable installation program (`.msi`) and an Extensible Markup Language (XML) file that describes the installation program.

Oracle Beehive also provides a language pack application module for Oracle Beehive Extensions for Outlook as well as a profile migration tool that enables users to migrate certain preferences and settings, such as LDAP settings and personal folders files (`.pst`), from previous Microsoft Outlook installations.

Oracle Beehive Deployments with Oracle Beehive Team Collaboration

Oracle Beehive Team Collaboration is a Web-based client that is installed by default during the Oracle Beehive installation. No separate installation on users' computers or Oracle Beehive servers is required.

After Oracle Beehive is installed and configured, users can access and leverage Oracle Beehive Team Collaboration simply by launching a supported Web browser and entering the URL configured for the client. Typically, this URL appears in the following format:

```
http://<Your-Server-Name>:<Port-Number>/teamcollab/
```

Oracle Beehive Deployments with Oracle Beehive Webmail

Note: As of Oracle Beehive Release 1.5, Oracle Beehive Webmail no longer needs to be installed in a separate Oracle home.

Oracle Beehive Webmail is a Web-based client that requires installation on an Oracle Beehive server instance. The Oracle Beehive Webmail installation is bundled with the Oracle Beehive installation and can be performed as part of the latter's installation procedure. Once installed and configured on an Oracle Beehive server instance, users can access and leverage Beehive Webmail simply by launching a supported Web browser and entering the URL configured for the client. Typically, this URL appears in the following format:

```
http://<Your-Server-Name>:<Port-Number>/zimbra/
```

Oracle Beehive Deployments with Mobile Devices

Oracle Beehive enables users of supported mobile devices to receive and send collaborative data. For administrators managing these users and their devices, Oracle Beehive provides many useful functions including the ability to create configuration files for client application installations, provision client applications, and upload device logs, among others.

Before being able to access their collaborative data from mobile devices, users must register their devices with the Oracle Beehive Device Management Service, and then download, install, and configure one or more supported clients based on their settings for their deployments.

For more information, refer to one or more of the following topics:

- For information on the types of mobile clients and related features that Oracle Beehive supports, see "Mobile Device Families Supported by Oracle Beehive".
- For information on the administrative tasks required to deploy mobile devices with Oracle Beehive, see "Oracle Beehive Deployments with Mobile Devices" in the *Oracle Beehive Deployment Guide*.
- For the complete list of mobile devices that Oracle Beehive supports and for details on how to configure them, see *Oracle Beehive Mobile Client Help* at the following location:

  `http://www.oracle.com/technology/products/beehive/beehive_users/2_0/mobile.htm`

Oracle Beehive Deployments with Standards-based and Open Source Clients

Oracle Beehive supports several standards-based protocols, enabling users to access Oracle Beehive information with commonly available clients. Typically, standards-based and open source clients require installation on the computers or devices of individual users. For details on how to install a particular client, please refer to the documentation provided with the client that you want to install.

For the complete list of standards-based and open source clients that Oracle Beehive supports, and for details on how to configure them, see *Oracle Beehive Standards-based Client Help* at the following location:

`http://www.oracle.com/technology/products/beehive/beehive_users/2_0/standards.htm`

5

Oracle Beehive Workspace Concepts

This modules provides an overview of Oracle Beehive workspaces and contains the following topics:

Overview of Oracle Beehive Workspaces

A workspace is a virtual location that enables Oracle Beehive users to seamlessly perform a wide range of collaborative activities in a single, intuitive place. In workspaces, users can create, view, and manage e-mail messages, calendar entries, meetings, tasks, **address book**s and **contact**s, instant messages, and documents.

Each workspace is created for a particular purpose or objective, such as for a project, a team, or an activity, or some combination. Based on this, workspaces are always in context for the members who belong to them, presenting only the features and content that are relevant.

From the user perspective, workspaces are listed in an enterprise-level workspace directory. Users access the workspaces to which they belong, as well as other public workspaces that appear in the workspace directory, through supported Oracle Beehive clients and devices.

Accessing Oracle Beehive Workspaces

Users and systems can access workspace content and functions through one or more of the following:

- Supported Oracle Beehive clients, such as Oracle Beehive Integration for Outlook, Oracle Beehive Extensions for Explorer, Oracle Beehive Team Collaboration, Oracle Beehive Webmail, and standards-based clients.
- Oracle Beehive Platform Software Developer's Kit (SDK)

Types of Workspaces Provided by Oracle Beehive

Oracle Beehive provides the following types of workspaces:

- Team Workspaces
- Personal Workspaces

Team Workspaces

A team workspace is a workspace that is shared by a team or group, and that supports the content and collaborative activities of its members. A team workspace can only be accessed by its members.

Team workspaces enable members to collectively organize and manage the content and activities that are related to their collaborative efforts for a particular project, line of business, or another common goal. Examples of the activities facilitated by team workspaces include scheduling team meetings, creating and assigning tasks, and distributing documents for other team members to review.

Personal Workspaces

A personal workspace is a workspace that is primarily used by an individual user, although users can share information from their personal workspaces with others. A personal workspace contains a mix of a user's private content and content from the team workspaces in which the user is a member. For example, users who enroll in their team workspace calendars will receive meeting invitations from their team workspaces in their personal workspaces. By default, Oracle Beehive provides one personal workspace for each user.

Personal workspaces enable users to view and manage all of their content and collaborative activities in one primary location, including those that fall outside the scope of their team workspaces. Examples of additional activities supported by personal workspaces include scheduling a personal appointment, creating a personal task or reminder, and writing and sending an e-mail to someone outside the enterprise.

Oracle Beehive Workspace Properties and Settings

Oracle Beehive workspaces contain properties that workspace coordinators can specify. Common workspace properties include the following:

- **Workspace name:** The name of the workspace.
- **Description:** A brief description or summary of the workspace.
- **Owner:** The person who created the workspace and who is typically the primary point of contact for requests or issues related to the workspace.
- **Location:** The Oracle Beehive deployment to which the workspace belongs.
- **Workspace URL:** The Uniform Resource Locator (URL) for the workspace.
- **Logo:** An image file that appears in the workspace header.
- **E-mail address:** A designated e-mail address for the workspace. Oracle Beehive automatically forwards to workspace participants all e-mail messages sent to this address.
- **Public access:** Whether or not the workspace is open to users who are not workspace participants.

Workspace coordinators can also configure the following workspace settings:

- The default forum for discussion posts.
- The default location for document uploads.
- The default destination for new wiki pages.
- The default role assigned to new workspace participants.
- Whether or not participants are automatically enrolled in the workspace calendar.
- Whether or not versioning is enabled for workspace documents.

Templates for Oracle Beehive Workspaces

Oracle Beehive provides templates that enable system administrators and workspace coordinators to quickly apply specific features, processes, and designs to their workspaces. Workspace templates provide a convenient way to apply properties that are specific to a company, group, project, or function.

Oracle Beehive provides the following workspace templates out of the box:

- **Basic Team Workspace template:** The Basic Team Workspace template is designed for general use in team-based workspaces. This template provides the broadest coverage of collaborative features and options, and it is not specific to any particular type of group or function.

  The Basic Team Workspace template contains a wiki home page that members can edit to add information about the workspace and some tasks to guide the coordinators as they configure the workspace. It also contains a default calendar, a discussion forum, and folder for sharing documents.

  By default, workspaces based on the Basic Team Workspace template are listed in the system's public workspace directory, although users must receive invitations to join them.

- **Community of Practice workspace template:** The Community of Practice Workspace template is designed for workspaces where users who share common interests can post topics or discussions of interest and share best practices. The template contains an FAQ template and a wiki home page that members can edit to add information about their community of practice. It also provides default tasks (to guide the coordinators as they configure the workspace), a wiki page, and a discussion forum and folder to share best practices with other community members.

  By default, workspaces based on the Community of Practice Workspace template are listed in the system's public workspace directory. Any enterprise user can join them, with or without an invitation.

- **Project Workspace template:** The Project Workspace template is designed for time-constrained or date-defined projects. This template provides the Oracle Beehive features and options that facilitate collaborative, team-based projects, such as repeating status meetings and a best practices folder hierarchy for optimized management of project content.

  The Project Workspace template contains a set of tasks that can be used to initiate the project and a few wiki pages that can be used to create a business case, project plan, project completion analysis, and meeting agenda. It also contains a default calendar, a discussion forum, and a folder for sharing documents.

By default, workspaces that are based on the Project Workspace template are not listed in the system's public workspace directory and members may join them by invitation only.

- **Personal Workspace template:** The Personal Workspace template is designed for personal workspaces, which are used solely by individual users to view and manage all of their content and collaborative activities in one primary location, including those that fall outside the scope of their team workspaces.

  By default, workspaces that are based on the Personal Workspace template are not listed in the system's public workspace directory. Also, although a user may not join another user's personal workspace, users can grant access to each other's personal workspaces.

Roles Provided by Oracle Beehive Workspaces

To help control access to workspaces and to coordinate the management of team workspace activities and tasks, Oracle Beehive provides workspace roles. Roles are predefined permission sets that determine what features and content users can or cannot access within a given team workspace. Users may be assigned more than one role for each team workspace.

Oracle Beehive provides standard roles as well as support for custom roles. Standard roles are provided out of the box and offer common delineations of user privileges that can be leveraged by most organizations. Custom roles are defined by administrators and can be based on existing organizational roles or on any other criteria that fits the particular hierarchical structure or division of responsibilities within an enterprise.

Oracle Beehive provides the following standard workspace roles out of the box:

- **Workspace Coordinator:** A user with full administrator-level privileges for the workspace and who is responsible for its creation and on-going maintenance.
- **Workspace Member:** A user with full access to workspace content and who can create, read, update, and delete that content.
- **Workspace Viewer:** A user who can only access and read workspace content.
- **Workspace Participant Coordinator:** A user with limited administrator-level privileges for the workspace. Workspace Participant Coordinators can invite new members, approve new membership requests, and apply roles to new and existing members.
- **Workspace Document Coordinator:** A user with limited administrator-level privileges for the workspace. Workspace Document Coordinators can manage workspace content, such as by locking or unlocking folders and files.
- **Workspace Reviewer:** A user who has read-only privileges for workspace content with ability to comment, post, and reply to discussion topics.

Tasks Workspace Coordinators Can Perform in Oracle Beehive Workspaces

Workspace coordinators can perform a variety of workspace-related tasks, including:

- Create and delete workspaces.
- Apply predefined templates, policies, processes to workspaces.
- Manage workspace groups and members such as adding users to or deleting users from workspaces, or by assigning roles.

- Manage access to workspaces by locking workspaces or by applying grant or deny settings at the workspace, user, and artifact levels.
- Configure mount points to remote content repositories created and managed by system administrators.
- Manage workspace quotas.

Tasks End Users Can Perform in Oracle Beehive Workspaces

In workspaces, users can perform the full range of collaborative tasks including creating and managing e-mail messages, calendar appointments, meetings, tasks, contacts, instant messages, discussions, and documents.

Users can also perform the following workspace-related tasks:

- Join or leave workspaces.
- Create and manage wiki pages in team workspaces.
- Search for content and other artifacts.
- Create personal tags, which enable users to organize personal workspaces and artifacts using custom, commonly-used tags that are based on individual needs and preferences.

Application developers can also leverage the Oracle Beehive Platform SDK to create solutions that enable users to perform these and other collaborative tasks through supported and custom end-user clients. For more information, see *Oracle Beehive Application Developer's Guide*.

6

Oracle Beehive Management and Administration Concepts

This module provides an overview of several concepts related to the management and administration of Oracle Beehive, and includes the following topics:

- Key Oracle Beehive System Management and Administration Features
- Tools for Oracle Beehive Administrators
- Management and Administration Domains and Activities in Oracle Beehive

Key Oracle Beehive System Management and Administration Features

Oracle Beehive provides the following key system management and administration features:

- Scriptable command-line administration with support for input file consumption
- Central configuration repository
- Hierarchical process control, configuration, and tuning
- Client provisioning and automatic remote updates
- Support for integration with existing Lightweight Directory Access Protocol (LDAP) servers, facilitating flexible group and user provisioning and management
- Flexible quota management
- Audit and logging policies
- Log file management including rotation and disposition
- Centralized log repository with the ability to export log records
- Ability to configure trace parameters and trace repository, and export trace results
- Transaction-level error examination and identification, including linking trace errors to log records

Tools for Oracle Beehive Administrators

Oracle Beehive is a powerful and flexible platform that can be completely functional with a single Oracle Database instance. It can also seamlessly interoperate with other key technologies, such as LDAP and e-mail servers, and leverage the specialized capabilities that those solutions provide.

To manage this offering, **administrator**s have several options, from tools that enable them to manage Oracle Beehive specifically, to the tools that are provided with and

designed for the other supported components. Management tools for these supported components include Oracle Database Control and Oracle Enterprise Manager Grid Control, among others.

This section contains details on the tools that administrators can use to manage and monitor Oracle Beehive. For details on the tools that enable administrators to manage and monitor other supported components, see the documentation provided with those components.

Oracle Beehive supports the following tools for administrators:

- The `beectl` Utility
- Oracle Beekeeper
- Oracle Enterprise Manager Grid Control

The `beectl` Utility

Oracle Beehive provides a command-line utility, `beectl`, for streamlined and automated execution of administrative functions. Administrators execute commands in a supported operating system shell. The utility provides visual enhancement features, such as column text-wrapping, staggering, and display width options as well as functional aids, such as search features for quick retrieval of commands.

The `beectl` utility provides the following modes of operation:

- **Prompt mode:** Enables administrators to issue one-time commands. Useful for writing custom scripts where the output from one command might impact later invocations.
- **Shell mode:** Enables administrators to set common options to avoid repeating them for every command. Provides slightly faster execution than prompt mode since common data structures are initialized once instead of repeatedly.
- **File input mode:** Enables administrators to specify a file or batch to execute commands. Provides faster execution since common data structures are initialized once. Executions will halt if any command fails although previously executed commands will not roll back unless explicitly requested using the `-continue` command.

The `beectl` utility is installed automatically with Oracle Beehive and does not require a separate desktop installation. The utility is located in the `$ORACLE_HOME/beehive/bin` directory and is accessible by the user account that was used to install Oracle Beehive.

Oracle Beekeeper

The Oracle Beehive administration client, Oracle Beekeeper, is a secure, browser-based client built on Oracle ADF Faces technology. Oracle Beekeeper provides Oracle Beehive administrators centralized and role-based access to system configuration and management, user and group administration, and monitoring functions.

Oracle Beekeeper provides a wide range of functions for managing Oracle Beehive, including those that are related to Oracle Application Server infrastructure components and Oracle Database. However, Oracle Beekeeper only supports elementary administrative functions for these underlying components, such as initial configuration functions. Advanced functions for these underlying components are provided through other tools.

Oracle Beekeeper requires a server-based installation that is separate from the Oracle Beehive installation. Oracle Beekeeper installation program is provided with the Oracle Beehive installation kit. Once installed and configured, administrators simply need to access the configured URL to launch Oracle Beekeeper, log on to the system, and access the administrative features and information that it provides. Oracle Beekeeper supports the Hypertext Transfer Protocol Over Secure Socket Layer (HTTPS) for secure communications.

Note: For security reasons, Oracle strongly recommends using SSL encryption in your Oracle Beekeeper installation.

Oracle Beekeeper supports the following Web browsers in the Windows, Linux, and Mac OS X operating systems:

- Mozilla Firefox 2.0
- Microsoft Internet Explorer 6.0
- Microsoft Internet Explorer 7.0

Oracle Enterprise Manager Grid Control

Oracle Enterprise Manager Grid Control offers a centralized environment with which organizations can manage their complete Oracle IT infrastructure, including systems running Oracle and non-Oracle technologies. Oracle Enterprise Manager Grid Control provides a broad set of administration, configuration management, provisioning, end-to-end monitoring, and security capabilities.

With Oracle Enterprise Manager Grid Control, administrators can monitor Oracle Beehive availability, performance, and usage. Administrators can also define performance metrics and thresholds, and receive alerts when metrics exceed these thresholds.

Additionally, Oracle Enterprise Manager Grid Control can be used to install Oracle Beehive. This option requires the Oracle Beehive Provisioning Application, which is provided with Oracle Beehive. However, Oracle Enterprise Manager Grid Control is not provided with the Oracle Beehive media package and must be installed separately.

For details on how to integrate Oracle Enterprise Manager Grid Control with Oracle Beehive, see "Integrating Oracle Enterprise Manager Grid Control with Oracle Beehive" in the *Oracle Beehive Integration Guide*.

Oracle Beehive supports Oracle Enterprise Manager 10*g* Release 5 Grid Control (10.2.0.5) and later.

Management and Administration Domains and Activities in Oracle Beehive

This section provides details on the following Oracle Beehive domains, components, and activities, of which administrators should be aware to successfully manage the system:

- Access Control
- Auditing
- Client and Device Applications
- Cloning

- Coexistence
- Configuration (General)
- Content
- Devices
- Enterprises and Organizations
- Messaging
- Policies
- Process Control
- Records Management
- Resources
- Search
- Subscriptions and Notifications
- System Information
- Time Management
- Users
- Workspaces

Access Control

Oracle Beehive provides a robust and highly-configurable model for controlling users' access to various system features and content such as files, folders, workspaces, and calendars. The Oracle Beehive model includes access control entries (ACEs), access control lists (ACLs), access control fields, access type names and identifiers, roles, and sensitivities.

Using the `beectl` command-line utility, administrators can manage these aspects of **access control** in the following ways:

- **Access control fields for entities:** List and modify access control fields for entities.
- **Access type names and identifiers:** List available access type names and identifiers.
- **ACEs in local ACLs:** Add, modify, list, and delete ACEs, in respect to the local ACLs of entities.
- **ACEs in the ACLs of sensitivity entities:** Add, modify, list, and delete ACEs, in respect to the ACLs of sensitivity entities.
- **Assigned roles:** Add, modify, list, and delete assigned roles.
- **Delegated roles:** Add, modify, list, and delete delegated roles.
- **Role definitions:** Add, modify, list, and delete role definitions.
- **Sensitivities:** Add, modify, list, and delete sensitivities.

Auditing

Oracle Beehive provides the Audit Service as part of the Audit Framework, which enables administrators to track system and user-level activities for the purposes of

increased security, compliance, and data integrity. This includes the ability to conduct focused user audits and other reporting options.

Using the `beectl` command-line utility, administrators can manage auditing in the following ways:

- **Audit events:** List audited events.
- **Audit policies and audit policy templates:** Add, modify, list, and delete audit policies and audit policy templates.
- **Audit trails:** Add, modify, export, list, and delete audit trails.

Client and Device Applications

Oracle Beehive supports a variety of client applications, including Oracle Beehive Extensions for Outlook, standards-based clients, and auto-attendants for supported phones and Voice over Internet Protocol (VoIP) products.

Through its robust and granular support of client applications, Oracle Beehive simplifies and centralizes for administrators client application management. This includes the ability to manage application versions, patch sets, and the modules that they contain. This also includes the ability to manage client configurations through application configuration files.

Using the `beectl` command-line utility, administrators can manage client applications in the following ways:

- **Auto-attendant prompts:** Upload, list, and delete auto-attendant prompts.
- **Auto-attendant documents:** Print Auto-attendant Markup Language (AAML) documents.
- **Auto-attendants:** Add, modify, update, rename, list, and delete auto-attendants.
- **Client application configurations:** Create, download, upload, list, and delete client application configuration files.
- **Client application modules:** List client application modules.
- **Client application patch sets and versions:** List and delete client application patch sets and versions.
- **Client applications:** Provision, list, and delete client applications.
- **Seeds for Internet Protocol (IP) phone password generators:** Reset the seeds for IP phone password generators.

Cloning

Using the `beectl` command-line utility, administrators can clone existing Oracle Beehive Application Tier instances and OC4J instances.

Coexistence

Oracle Beehive supports coexistence with Microsoft Exchange Server 2003, enabling users of Oracle Beehive and Microsoft Exchange Server to seamlessly collaborate using e-mail, time management features, tasks, and workspaces.

The Oracle Beehive coexistence solution leverages the Oracle Collaboration Coexistence Gateway, which provides, among other things, coexistence connectors between Oracle Beehive and Microsoft Exchange Server. Coexistence connectors handle all of the conversions, deliveries, and updates of e-mail, calendar entries,

contacts, and user availability (free/busy) information between Oracle Beehive and Microsoft Exchange Server.

To implement the Oracle Beehive coexistence solution, administrators must add and configure coexistence connectors based on the requirements of their deployments. Typically, there is one connector between each Oracle Beehive server and Microsoft Exchange Server routing group.

Administrators must also provision user accounts to individual coexistence connectors. Each user account may only be provisioned to one connector. This requirement applies to all user accounts that want to leverage the coexistence solution, regardless of whether they are mastered in Oracle Beehive or Microsoft Exchange Server.

Using the `beectl` command-line utility, administrators can manage the following aspects of coexistence:

- **Coexistence connectors:** Add, modify, list, and delete coexistence connectors.
- **Coexistence user accounts:** Modify (provision and deprovision) and list coexistence user accounts.

Configuration (General)

Using the `beectl` command-line utility and the common framework for all services, administrators can configure the following aspects of the system:

- **Components:** List components.
- **Component configuration:** Activate, clear, list versions of, modify, and validate configurations for various components.
- **Configuration repository:** Modify and list the configurations of Oracle Beehive central configuration repositories.
- **Connection pools:** Modify and list connection pools.
- **Database views and parameters:** Modify Oracle Beehive-based views of databases and related parameters.
- **DMZ configuration:** Add Oracle Beehive DMZ instances.
- **Port numbers:** List and modify available port numbers.
- **Properties:** Modify, list, and delete properties.
- **Property metadata:** List metadata for properties.
- **Search:** Modify search configurations.
- **Secure properties:** Modify secure properties.
- **Virus scan engine configuration:** Add, delete, modify policies for, and test connectivity with virus scan engines.

Content

Oracle Beehive provides the Content Management Services, which support all aspects of file and document life cycle management, especially for unstructured content. Using the `beectl` command-line utility, administrators can manage content in the following ways:

- **Documents:** Import documents.

- **File system directories:** Add, list, and delete file system directories and other locations where `BFILE` can be stored and accessed.
- **File system directory references:** Add, list, and delete references to file system directories and other locations where `BFILE` can be stored and accessed.

Devices

Oracle Beehive supports a variety of mobile devices, and enables administrators to manage those devices centrally. Using the `beectl` command-line utility, administrators can manage user devices and related aspects in the following ways:

- **Device commands:** Add and list device commands.
- **Device profiles:** Upload, list, and delete device profiles.
- **Device types:** List and delete device types.
- **Devices:** List and block devices.
- **Log files:** Upload device log files.
- **SyncML messages:** Download SyncML messages from end-user sessions (for troubleshooting purposes).

Enterprises and Organizations

An enterprise is the container for all of the users, groups, and resources that are a part of a single Oracle Beehive instance. An enterprise is also the container for organizations, which are groups that are typically defined by a department, line of business, project, or other criteria.

Using the `beectl` command-line utility, administrators can manage enterprises and organizations in the following ways:

- **Enterprises:** List and modify an enterprise.
- **Organizations:** Add, modify, list, and delete organizations.

Messaging

Oracle Beehive provides a robust messaging framework that supports all messaging needs through a variety of channels including e-mail, faxes, instant messages, voicemail, and newsgroup discussions. Using the `beectl` command-line utility, administrators can manage the following aspects of messaging for the system:

- **E-mail Service port numbers:** Specify port numbers for the E-mail Service.
- **E-mail Service queue:** Enable or disable asynchronous queue processing for the E-mail Service.

For more information about managing these settings, see "Managing the E-mail Service" in the *Oracle Beehive Administrator's Guide*.

Policies

Oracle Beehive provides and supports templates that leverage XML-based schemas to define policies and apply them to business events. Using the `beectl` command-line utility, administrators can manage policies and their related aspects in the following ways:

- **Policies (general):** Add, download, modify, list, export, and delete policies.

- **Policy actions:** Add, list, and delete actions for policies.
- **Policy schemas:** Add, modify, list, and delete schemas for policies.
- **Policy templates:** Add, modify, list, and delete templates for policies.
- **Events:** List business events and event details, such as payload and current subscriptions.

Process Control

Oracle Beehive allows administrators to control system processes and related components such as service instances, OC4J instances, Oracle Beehive Infrastructure Monitors, and Oracle Beehive HTTP server components. Using the `beectl` command-line utility, administrators can start, restart, stop, shut down, and get the statuses of these and other processes and components.

Records Management

Oracle Beehive provides records management capabilities for documents and e-mail through the Records Management Service and integration with Oracle Universal Records Management (URM). Using the `beectl` command-line utility, administrators can manage the following aspects of records management:

- **Configuration:** Configure records management settings for documents and e-mail.
- **Connections:** Create and edit connections to URM instances.
- **File plans:** Retrieve and display file plans from URM instances.
- **Policies:** Create and edit records management policies.

Resources

Oracle Beehive supports resources, which typically include reservable, non-human entities such as meeting rooms, computers, projectors, and so forth. Using the `beectl` command-line utility and Oracle Beekeeper, administrators can manage resources in the following ways:

- **Resource root classifications:** Modify resource root classifications.
- **Resources:** Add, modify, list, and delete resources.

Search

Oracle Beehive provides powerful search capabilities that enable users to search for content across **artifact**s, such as e-mail, calendar entries, and documents. Using the `beectl` command-line utility, administrators can start and stop search crawl processes for specific artifact types.

Subscriptions and Notifications

Oracle Beehive provides the Subscription and Notification Services, which support user- and administrator-defined subscriptions to business events and the resulting notifications through one or more channels. To help support and manage this wide-ranging and potentially complex offering, Oracle Beehive provides subscription and notification templates out of the box, which explicitly define the rules associated with each for defined events. Administrators can also upload new and updated templates, as needed. The system also provides commands for copying and cloning individual subscriptions.

Using the `beectl` command-line utility, administrators can manage the following aspects of subscriptions and notifications for the system:

- **Notification templates:** Upload user notification templates.
- **Subscription templates:** Upload user subscription templates.
- **Subscriptions:** Add, copy, clone, and modify user subscriptions.

System Information

Using the `beectl` command-line utility, administrators can perform the following system information-related tasks:

- **Commands:** List commands and the metadata for commands.
- **Entity types:** List supported entity types.
- **Error codes:** Export error codes and list error code catalogs.
- **Logs:** Export logs.
- **Statistics:** List statistics.
- **Version:** List Oracle Beehive version information.

Time Management

Oracle Beehive provides the Time Management Services, which support all aspects of calendar-based time and task management for the system. These services enable user and resource scheduling that is synchronized across global time zones. Using the `beectl` command-line utility and Oracle Beekeeper, administrators can manage the following aspects of the time management features that the system provides:

- **Calendars:** List calendars.
- **iCalendar files:** Import and export iCalendar files.
- **Task lists:** List task lists.
- **Time zones:** Import, modify, and list time zones.

Users

Oracle Beehive enables administrators to easily and centrally manage users and their user accounts in many ways. This includes the ability to create user preference profiles and apply them to user accounts. User preference profiles consist of sets of predefined preferences or settings such as the maximum number of addresses allowed in a user's **personal address book**.

Using the `beectl` command-line utility, administrators can manage users in the following ways:

- **Address counts:** List and modify (set) maximum address counts.
- **Coexistence users:** Modify and list coexistence users.
- **Custom attributes:** Add, list, and delete custom user attributes.
- **Directory profiles:** Add, list, and delete directory profiles.
- **External user data:** Download user data from external directories.
- **Groups:** Add, modify, list, purge, and delete groups.
- **Preference profiles:** Add and list preference profiles.

- **Preference properties:** Add, list, and delete preference properties.
- **Preference sets:** Add, modify, list, and delete preference sets.
- **Public user attributes:** Add, list, and delete public user attributes.
- **Users:** Add, list, modify, purge, and delete users.

Workspaces

A workspace is a virtual location where Oracle Beehive users collaborate and create, view, manage, and search for the content related to their collaborative efforts. Each workspace is created for a particular purpose or objective such as for a project, a team, or a reoccurring activity.

Oracle Beehive provides workspace templates that leverage XML-based schemas to define the specific features, processes, and designs for workspaces. Workspace templates and their associated schemas provide convenient ways to apply properties that are specific to a company, group, project, or function.

Oracle Beehive workspaces support tags, which are predefined labels that administrators and users can apply to artifacts.

Using the `beectl` command-line utility, administrators can manage the following aspects of workspaces:

- **Tags:** Add, apply, delete, remove, and list tags in workspaces.
- **Organizations:** Add organizations to workspaces.
- **Personal workspaces:** Modify personal workspaces.
- **Team workspaces:** Add, delete, and modify team workspaces.
- **Workspaces (general):** List workspaces.
- **Workspace templates:** Add, delete, list, and modify workspace templates.
- **Workspace template schemas:** Download workspace template schemas.

7

Oracle Beehive End-User Clients

Oracle Beehive provides a common model that enables a wide variety of clients and devices to connect with the platform. Once connected to the platform, supported clients and devices can access and leverage the collaborative services and data that it provides.

Oracle Beehive provides several out-of-the-box client options for enterprise users. Oracle Beehive also supports several standardized protocols, enabling organizations to integrate and deploy standards-based clients, as well as mobile devices, easily with the platform. Organizations can also integrate and deploy custom clients or incorporate Oracle Beehive clients into existing interfaces such as portals.

This module provides an overview of the end-user clients and devices that Oracle Beehive supports, and includes the following topics:

Oracle Beehive Extensions for Explorer

Oracle Beehive Extensions for Explorer is an extension to Microsoft® Windows® Explorer that provides Oracle Beehive users direct access to their workspaces and workspace content, such as folders and documents. Oracle Beehive Extensions for Explorer also facilitates seamless team collaboration. For example, users can launch Oracle Beehive conferences directly from Windows Explorer, where they can share and discuss workspace content in real time.

Oracle Beehive Extensions for Explorer includes the following features:

- Desktop-direct Oracle Beehive workspace management:
  - Browse, view, configure workspaces
  - View workspace properties, preference settings, and version history

  - Explore and restore deleted workspace folders and documents
  - Shortcuts (links) to Beehive documents and folders within Beehive workspaces
  - Start the Oracle Beehive Team Collaboration client
- Folder-level management:
  - Browse heterogeneous folders within workspaces
  - Add, delete, copy, and move folders within workspaces
- Document management, collaboration, and access:
  - Drag-and-drop functionality to Oracle Beehive workspaces
  - View document properties and version history
  - Document storage, sharing, and version control, with check in, check out, and cancel checkout capabilities
  - Apply and modify sensitivities
  - Add, delete, and rename documents in workspace folders and local system files
  - Copy and move documents across workspace folders and local system files
  - Offline access to folders and documents
  - Schedule and start meetings or send e-mail directly from workspace documents
  - Start Oracle Beehive Conferencing from workspace documents
  - Access WebDAV documents online with Copy URL feature
  - Edit-in-place functionality

  Oracle Beehive Extensions for Explorer is supported on the Microsoft Windows XP, Vista (32-bit), and Windows 7 (32-bit) operating systems.

For more information on the tasks that you can perform with Oracle Beehive Extensions for Explorer, see *Oracle Beehive Extensions for Explorer Help* at the following location:

`http://www.oracle.com/technology/products/beehive/beehive_users/2_0/obee.htm`

Oracle Beehive Extensions for Outlook

Oracle Beehive Extensions for Outlook is a Messaging Application Programming Interface (MAPI) service provider for Microsoft Outlook. Oracle Beehive Extensions for Outlook extends the functionality of Microsoft Outlook by providing Outlook users with unified access to Oracle Beehive-based collaborative features and data, including team and personal workspaces, in a familiar environment. Through Oracle Beehive Extensions for Outlook, users can leverage advanced personal productivity features for e-mail, time management, documentation management, tasks, contacts, notes, and journals.

Oracle Beehive Extensions for Outlook is supported in Windows XP, Vista (32-bit), and Windows 7 (32-bit and 64-bit) operating systems with the following versions of Microsoft Outlook:

- Microsoft Outlook 2003

- Microsoft Outlook 2007
- Microsoft Outlook 2010

Oracle Beehive Extensions for Outlook requires installation on the computers of individual users. Access to the installation package can be provided to users as a download from internal websites or Oracle Beehive **administrator**s can push the package to users by leveraging the Device Management Service (DMS), which is exposed through the `beectl` command-line utility.

For more information on the tasks that you can perform with Oracle Beehive Extensions for Outlook, see *Oracle Beehive Extensions for Outlook Help* at the following location:

`http://www.oracle.com/technology/products/beehive/beehive_users/2_0/obeo.htm`

Oracle Beehive Central

Oracle Beehive Central is a Web-based client that provides users a central location to download supported clients and set their preferences for Oracle Beehive functionality. This includes the ability to delegate privileges for users' e-mail, calendars, tasks, notes, journals, and contacts.

Oracle Beehive Central supports Mozilla Firefox 2.0 in the Windows, Linux, Mac OS X, and Solaris operating systems, and Microsoft Internet Explorer 7.0 in the Windows operating system only.

For more information on the tasks that you can perform with Oracle Beehive Central, see *Oracle Beehive Central Help* at the following location:

`http://www.oracle.com/technology/products/beehive/beehive_users/2_0/central.htm`

Oracle Beehive Conferencing

Oracle Beehive Conferencing is a feature-rich, desktop client that enables Oracle Beehive users to conduct Web-based meetings and presentations. Oracle Beehive Conferencing provides the following features and capabilities:

- Schedule and create instant meetings
- Voice conferencing
- Presentation management
- Desktop sharing
- Ability to record conferences
- Attendee list management
- Intra-conference instant chats
- Meeting alerts and requests

The Oracle Beehive Conferencing client is supported on both Windows and Macintosh operating systems.

Oracle Beehive also provides the Oracle Beehive Web Conferencing Center, which enables users to view, start, join, filter, delete, and refresh their scheduled conferences through supported Web browsers.

For more information on the tasks that you can perform with Oracle Beehive Conferencing and the Oracle Beehive Web Conferencing Center, see *Oracle Beehive Conferencing Help* at the following location:

http://www.oracle.com/technology/products/beehive/beehive_users/2_0/conferencing.htm

Oracle Beehive Team Collaboration

For users familiar with accessing team knowledge bases through Web-based technologies, Oracle provides Oracle Beehive Team Collaboration. Oracle Beehive Team Collaboration leverages dynamic, wiki page technology to support team collaboration activities in Oracle Beehive workspaces.

Through Oracle Beehive Team Collaboration, users can perform the following collaborative tasks:

- Create and manage workspaces.
- Manage workspace memberships by adding participants and assigning workspace roles to them.
- Create and manage workspace calendar events.
- Create and manage workspace documents through user-defined, hierarchical folder directories.
- Through mount points created by workspace coordinators, access content hosted on remote repositories.
- Create and manage team-based wiki sites.
- View the history of changes for wiki pages and restore previous versions.
- Post comments and reply to previously-posted comments on wiki pages.
- Post announcements for important events, activities, and notices.
- Subscribe to RSS-based feeds, enroll in workspace calendars, and view recent activities to stay updated on the latest workspace activities.
- Apply tags to workspace content for identification and categorization.

Oracle Beehive Team Collaboration supports the following Web browsers on the Microsoft Windows XP, Microsoft Vista, Mac OS X, and Linux operating systems:

- Apple Safari 4
- Microsoft Internet Explorer 7
- Mozilla Firefox 3.x

For more information on the tasks that you can perform with Oracle Beehive Team Collaboration, see *Oracle Beehive Oracle Beehive Team Collaboration Help* at the following location:

http://www.oracle.com/technology/products/beehive/beehive_users/2_0/teamcollab.htm

Oracle Beehive Webmail

Oracle Beehive Webmail is a powerful online messaging and collaboration tool providing instant anytime access to your Beehive mail, calendar, contacts, tasks, and workspace content.

In addition, Oracle Beehive Webmail extends calendar management features by allowing you to schedule and join Beehive conferences. You can also organize, search, and tag content, view and manage your personal and team workspaces, build multiple address book hierarchies, and share and delegate address books, mail folders, calendars, and tasks lists.

Oracle Beehive Webmail is based on the open source Zimbra Web client and supports the following Web browsers in the Windows (Vista and XP) and Mac OS operating systems:

- Apple Safari 3
- Mozilla Firefox 2.0
- Mozilla Firefox 3.0
- Microsoft Internet Explorer 6.0
- Microsoft Internet Explorer 7.0

For more information on the tasks that you can perform with Oracle Beehive Webmail, refer to the *Oracle Beehive Webmail Help* at the following location:

http://www.oracle.com/technology/products/beehive/beehive_users/2_0/zimbra.htm

Mobile Device Families Supported by Oracle Beehive

Oracle Beehive provides wireless access to your e-mail, calendar events, tasks, and contacts allowing you to stay connected to your team directly from your phone wherever you go. The Oracle Beehive Mobile Communicator allows you to keep in touch using instant Messaging and search the directory for users directly from your iPhone, BlackBerry, or Windows Mobile phone.

For help on using mobile devices with Oracle Beehive, see the Registering and Configuring Mobile Devices Help at:

http://www.oracle.com/technetwork/middleware/beehive/documentation/mobile20-169228.pdf

Standards-based and Open Source Clients Supported by Oracle Beehive

Oracle Beehive supports a variety of standards-based protocols, enabling organizations to deploy and integrate commonly-available, as well as custom, clients to access Oracle Beehive data and leverage its robust feature set for the following needs:

- **File access and document management:** Provided through support for Web-based Distributed Authoring and Versioning (WebDAV), File Transfer Protocol (FTP), FTP over Transport Layer Security (TLS), and JSR-170.
- **E-mail:** Provided through support for Internet Message Access Protocol (IMAP) and Simple Mail Transfer Protocol (SMTP).
- **Time management:** Provided through support for Calendaring Extensions to WebDAV (CalDAV).
- **Instant messaging:** Provided through support for Extensible Messaging and Presence Protocol (XMPP).
- **Mobile e-mail and data synchronization:** Push Internet Message Access Protocol (P-IMAP) and Open Mobile Alliance Data Synchronization (OMA-DS).

For the complete list of standards-based and open source clients that Oracle Beehive supports, and for details on how to configure them, see *Oracle Beehive Standards-based Client Help* at the following location:

`http://www.oracle.com/technology/products/beehive/beehive_users/2_0/standards.htm`

Telephony Clients Supported by Oracle Beehive

Oracle Beehive provides interfaces to voicemail, auto-attendant, and user directory features for the following telephony client types:

- Standard Phones
- VoIP Products

Standard Phones

Oracle Beehive provides interfaces that enable users to manage their Oracle Beehive voicemail and access auto-attendant features from any phone.

VoIP Products

Oracle Beehive provides interfaces to voicemail, auto-attendant, and user directory features for the following Voice over Internet Protocol (VoIP) products:

- Cisco IP Communicator
- Cisco Unified IP Phones 7900 Series

The interfaces provide text-based menus that enable users to leverage these supported products to manage their voicemail and to browse the user directories for their enterprises.

8

Oracle Beehive Security Concepts

This module provides a high-level overview of the Oracle Beehive features and concepts related to several aspects of security, and includes the following topics:

Goals of Security in Oracle Beehive

In Oracle Beehive, security is a critical, and perhaps the most important, aspect of the system. Oracle Beehive provides a comprehensive approach to security that encompasses all levels of the system and that is designed to achieve the following goals:

- Ensure that Oracle Beehive remains secure and available at all times.
- Prevent Oracle Beehive as well as its services, data, and user accounts from being compromised in any way regardless of intent, malicious or otherwise.
- Protect the integrity of Oracle Beehive data and ensure that it remains private and secure at all times.
- Prevent unauthorized users from accessing the system, its services, or its data at all times.
- Allow Oracle Beehive users to access only the services, workspaces, and data for which they are authorized.
- Enable administrators and users to easily leverage and configure the security features of the system for their particular needs.

- Provide administrators relevant, real-time information and tools to quickly address security-related issues if they occur.

Key Security-related Terms and Concepts in Oracle Beehive

This section provides an overview of fundamental terms related to security in Oracle Beehive, including:

- Privileges
- Roles

Privileges

Privileges are system-defined access rights to various functions within Oracle Beehive. Some privileges grant users access to services such as e-mail, instant messaging, and time management. Other privileges grant administrators access to auditing, user administration, and role management functions. By default, the system grants users privileges to a core set of functions encapsulated by roles.

Roles

Roles are predefined sets of privileges, or role definitions, that may be assigned to users and groups within team workspaces. Roles determine what privileges assignees may possess, such as the workspace features and content that users can or cannot access. Roles are convenient because they enable administrators and users to provide several different layers of privileges to heterogeneous user populations.

Roles may be assigned manually to specific users. Users and groups may also be associated with role definitions for specific scopes, such as a workspace. This is referred to as an assigned role.

Users may be assigned more than one role per team workspace. Typically, workspace coordinators are responsible for creating and assigning roles.

Authentication in Oracle Beehive

Authentication is the process of identifying a user for the purpose of granting or denying the user access to the system. Typically, authentication is achieved through verification of user-provided credentials, such as a username and password. Authentication is a prerequisite for other Oracle Beehive security measures, such as access control, authorization, and accountability.

Oracle Beehive supports robust and stringent user authentication through the Authentication Service. The Authentication Service provides support for a variety of authentication providers, including local authentication providers, existing LDAP servers, and Web-based SSO providers. It also provides user-based authentication features such as automatic login and account lockout on repeated authentication failures.

Oracle Beehive supports Simple Authentication and Security Layer (SASL), which is a method for adding authentication support to connection-based protocols. To use SASL, a protocol includes a command for identifying and authenticating a user to a server and for optionally negotiating protection of subsequent protocol interactions. If the use of SASL is successfully negotiated, then a security layer is inserted between the protocol and the connection.

Authorization and Access Control in Oracle Beehive

Authorization is the process of granting or denying a user access to services, features, and entities, such as artifacts. Authorization ensures that the system grants actors access to entities in compliance with the security policies defined for those entities. Access decisions are based on the authenticated identity and the privileges given to the requesting user.

Authorization is a superset of access control, which is the mechanism that grants or denies Oracle Beehive users the ability to perform various actions such as to create, view, modify, or delete entities. With Oracle Beehive, access control can be applied explicitly on entities through access control list (ACLs). For example, a user can specify that a particular piece of content (a text file) can only be viewed by a particular group of users, while it can be viewed, modified, and deleted by another group of users. Additionally, access control can be applied to users implicitly through the use of roles.

For more information, refer to one or more of the following related topics:

- Access Control Lists (ACLs)
- Access Control Entries (ACEs)
- Access Types

Access Control Lists (ACLs)

An ACL is a list of one or more access control entries (ACEs) that applies to a specific entity in Oracle Beehive and that defines who can access the entity and with what privileges. ACLs can also be used to explicitly deny certain users or groups access to entities.

Oracle Beehive supports the following types of ACLs:

- Local ACLs (LACLs)
- Sensitivity ACLs

Local ACLs (LACLs)

LACLs are unnamed access control lists that apply to individual entities. When an administrator or user specifies who can access an entity and how they may access it, Oracle Beehive creates a LACL and applies it to the entity.

Sensitivity ACLs

A sensitivity ACL (or sensitivity) is a named ACL that administrators and users can define and apply to entities within a given workspace. Sensitivities solve the usability problem of having too fine-grained control or not enough control. Common sensitivities include private, confidential, normal, and public.

A sensitivity can be applied to multiple entities in a workspace simultaneously, enabling users to group multiple entities into the same access control category. Oracle Beehive allows administrators and users to define and apply any number of sensitivities, although Oracle Beehive Extensions for Outlook users may only apply existing sensitivities defined by users provisioned in Oracle Beehive.

Access Control Entries (ACEs)

An ACE is an entry in an ACL of an Oracle Beehive entity, such as a file, folder, workspace, or calendar. Each ACE contains the following values:

- **Accessor:** The other entities, such as users or groups, whose access to an entity is explicitly defined.
- **Access type:** The allowable methods for accessing an entity, such as read, write, discover, execute, and delete.
- **Access qualifier:** Whether each defined accessor is granted or denied access to the entity for each supported access type.

Access Types

The access type is the component of an ACE that specifics how a user may access an object. An ACE can include one or more of the following access types:

- Read
- Write
- Discover
- Execute
- Delete

Auditing in Oracle Beehive

Auditing is the act of capturing and evaluating historical records of system events to assess system performance, track user activities, and identify issues, among other goals. The results of effective auditing include timely and informed decisions and actions, especially when resolving security threats or preventing them from occurring.

Auditing user-related, administrator-related, and content-related activities is critical for compliance, security forensics, and legal discovery purposes in today's information technology-enabled environments. Moreover, auditing is no longer a matter of best practices. Increasingly, enterprises need to comply with regulatory measures and legal requirements to ensure that granular system use is reportable and presentable.

For these purposes, Oracle Beehive provides a robust and highly-configurable Audit Framework and its interface, the Audit Service. Combined, these components enable administrators to fulfill their organizations' regulatory compliance and legal requirements, and ensure the secure day-to-day operations of their Oracle Beehive deployments. Within this framework, administrators can monitor and trace a wide range of system events including user activities and changes to system configuration settings.

Anti-virus Support in Oracle Beehive

Computer-based viruses, especially those transmitted through e-mail messages, have long been a concern in any IT-enabled environment. Viruses negatively impact productivity, which can result in lost revenue for organizations. Therefore, it is critically important to prevent and eliminate viruses wherever and whenever possible.

To mitigate threats from viruses, Oracle Beehive provides the Oracle Beehive Virus Scanner. The Oracle Beehive Virus Scanner provides the following key features:

- Integration with the E-mail Service and the Device Management Service
- Integration with Symantec Scan Engine v5.1.2 and v5.1.4
- Support for Internet Content Adaptation Protocol (ICAP) 1.0

Administrators can manage the Virus Scanner through `beectl`. To manage supported third-party scanners, such as Symantec Scan Engine, administrators should leverage the tools provided with or for those products.

The Oracle Beehive Virus Scanner also provides the following features:

- Scan Types and Modes in Oracle Beehive
- Quarantines and Other Virus Resolution Features
- Filtering

Scan Types and Modes in Oracle Beehive

Oracle Beehive supports the following scan types and modes, either natively in the Virus Scanner or by leveraging a third-party scanner such as Symantec Scan Engine:

- Inline Scanning
- In-Place Scanning
- Streamed Scanning

Inline Scanning

Inline scanning refers to automatic scanning of artifacts, such as e-mail messages, at the time they are created or introduced to the system. That is, before they are accessible to users.

In-Place Scanning

In-place scanning refers to the scanning of artifacts on a file system that is accessible to Virus Scanner and a supported third-party scanner.

Streamed Scanning

Streamed scanning refers to the scanning of data that is streamed over a network to a supported third-party scanner. Typically, this type of scanning is performed in conjunction with inline scanning.

Quarantines and Other Virus Resolution Features

Oracle Beehive supports quarantines and other resolutions for artifacts that are found to contain viruses. For most artifacts, if the Oracle Beehive Virus Scanner discovers a virus, it quarantines the artifact. While quarantined, the artifact may be visible to users, that is, it may appear in search results or when a user browses its location. However, the system will deny read access to the artifact until the issue is resolved. Resolutions can include repairing the artifact by removing the virus, overwriting the artifact, or deleting the artifact from the system entirely.

Note: Oracle Beehive handles infected e-mail messages in a different manner than other artifacts. If the Oracle Beehive Virus Scanner discovers an inbound e-mail message that is infected with a virus, it replaces the infected portion of the message with predefined text. Typically, the replacement text indicates to the recipient of the e-mail that the e-mail contained a virus, that the virus has been removed, and that the resulting e-mail message has been altered so that its original meaning may have changed.

For infected client applications, such as for mobile devices, Oracle Beehive provides additional measures that include blocking infected modules from being uploaded to or downloaded from the system. For example, if an administrator inadvertently attempts to upload an infected client application to the system, the Oracle Beehive Virus Scanner will block the attempt by aborting the procedure. Or, if a previously uploaded client application is later found to be infected, say after an administrator updates the system's virus definitions, then Oracle Beehive will lock the client application on the server and prevent users from downloading it to their mobile devices. During this time, the infected client application remains visible to administrators so that they can resolve the issue appropriately.

Filtering

Administrators can configure the Oracle Beehive Virus Scanner for integration with external scan servers, such as Symantec Scan Engine, to filter artifacts. Filtering is essentially the ability to treat certain artifacts differently based on specific criteria, including:

- File name
- File or e-mail message size
- E-mail subject line
- E-mail origination, such as a specific domain or address

Deployment- and Network-level Security in Oracle Beehive

Oracle Beehive is built on top of proven and secure Oracle technologies, such as Oracle Database and Oracle Application Server, so it offers the highest levels of security.

The network architecture for Oracle Beehive allows information technology departments to set up multiple security zones. Typically, this consists of an intranet, a demilitarized zone (DMZ), and external networks such as the Internet. Each zone can be separated by firewalls that are configured to monitor other firewalls, so that if one firewall fails, another assumes its duties.

Oracle Beehive is designed to support the full range of secure deployment options. Security mechanisms in Oracle Beehive are aimed at ensuring that practical, real-world deployment constraints can be achieved easily to minimize security risks. These constraints may include the need to securely deploy Oracle Beehive in a DMZ, with other aspects of the system and especially Oracle Database, existing in the corporate intranet protected by firewalls and other security components and measures.

Policy-based Security in Oracle Beehive

A policy is a set of rules and associated actions that restricts or modifies system behavior based on specified events. Typically, policies are applied to events or collections of events. A policy dictates how Oracle Beehive should respond whenever an event occurs, such as the restrictions that apply to a particular user in a specific situation.

Examples of security-based policies include the following:

- A password policy that dictates what rules must be followed when creating a password, such as the minimum, maximum, and types of characters allowed (or required) for all user passwords.

- An auditing policy that dictates when auditing records should be written to the audit repository.
- A policy for documents that triggers an approval process requiring an action by one or more authorized users.

Standards-based Security in Oracle Beehive

Oracle Beehive is built on Java 2 Platform Enterprise Edition (J2EE) and supports standards-based protocols, such as HTTP, and markup languages, such as HTML and XML. Oracle Beehive security features also support proven security-based open standards, such as Security Assertions Markup Language (SAML), secure Sockets Layer (SSL), Transport Layer Security (TLS), and X.509, to name a few. This support enables secure client-server communications, as well as service-to-service authentication, and facilitates interoperability with third-party products for added security measures.

User Account Security in Oracle Beehive

Oracle Beehive provides the following features related to the security of user accounts:

- Session timeout due to inactivity (specified by administrators).
- Account locking (facilitated by administrators).
- Password expiration after a specified number of days.
- Password history, to ensure that passwords are not reused for a specified amount of time or for a specified number of password changes.

Mobile Device Security in Oracle Beehive

Oracle Beehive provides several security-based features that prevent malicious and unintentional actions through supported mobile devices, as well as the potentially negative consequences for those devices and the system itself.

Oracle Beehive's security-based features for mobile devices include the following:

- Secure Communications Over HTTPS
- Authentication Requirements for Mobile Devices
- Clearing Data on Mobile Devices
- Blocking Mobile Devices

Secure Communications Over HTTPS

By default, Oracle Beehive transmits and receives all communications between supported mobile devices and the system using Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS). In fact, to transmit communications between devices and the system over less secure methods, such as HTTP, requires Oracle Beehive administrators to explicitly enable those connections, which Oracle does not recommend. Leveraging HTTPS ensures that transmissions of mobile e-mail messages and other confidential information are always encrypted and are, therefore, secure.

Authentication Requirements for Mobile Devices

Due to the portability of mobile devices and their potential for exposure to unauthorized users, especially through theft or loss, it is critical that they support reliable and secure authentication features. Typically, these features are designed for and implemented on mobile devices by mobile device manufacturers.

Oracle Beehive provides support for many common mobile device authentication methods, including SyncML MD5 authentication. However, this support depends on the methods that each mobile device manufacturer provides and the available options that your enterprise subsequently chooses. For example, in some cases, users may be required to provide their credentials for actions related to system connectivity only, such as logging in to Oracle Beehive or installing supported client updates. In other cases, users may be required to authenticate for all actions including whenever they power on their devices.

For more information on the authentication features supported by the mobile devices that your enterprise wants to deploy with Oracle Beehive, please refer to the documentation provided with those devices.

Clearing Data on Mobile Devices

Loss of mobile devices, especially through theft, is always a risk and concern for device owners and the IT departments. In cases where Windows-based mobile devices are lost, stolen, or must be deprovisioned, such as when an employee leaves a company, Oracle Beehive enables administrators to perform data wipes remotely, to clear all of the programs and data from the devices.

Blocking Mobile Devices

Oracle Beehive enables administrators to prevent individual mobile devices from accessing the system. Again, this can be very useful in cases where mobile devices are lost, stolen, or must be deprovisioned. To block a specific mobile device, an administrator only needs to specify the ID for the mobile device through the appropriate `beectl` command.

For example:

```
beectl add_blocked_device --device 123456
```

9

Oracle Beehive Integration Concepts

This module provides an overview of the various Oracle and third-party software components that organizations can integrate with Oracle Beehive. This module includes the following topics:

Calendar Integration Between Oracle Beehive Deployments with iSchedule

Oracle Beehive supports the Internet Calendar Scheduling Protocol (iSchedule). iSchedule enables interoperability between different calendaring and scheduling systems. With iSchedule, users in connected systems can perform common calendaring and scheduling tasks, such as scheduling and rescheduling meetings, responding to meeting requests, and searching for free-busy time of other users, regardless of which system a user resides.

Oracle Beehive 2.0 supports iSchedule interoperability between Oracle Beehive deployments only. For more information on integrating calendaring and scheduling

between Oracle Beehive deployments, see "Enabling Cross-Scheduling Between Oracle Beehive Deployments with iSchedule" in *Oracle Beehive Deployment Guide*.

Oracle Beehive Integration with External User Directories

Oracle Beehive provides flexible user account management and provisioning by supporting both native and system-external user directory options. With Oracle Beehive, administrators can manage user account data either natively in Oracle Beehive itself or externally through integration with a supported LDAP-based user directory server. Oracle Beehive, which provides this flexibility for user account management through the User Directory Service (UDS), supports the following user directory servers:

- Oracle Internet Directory
- IBM Tivoli Directory Server
- Microsoft Active Directory Server
- OpenLDAP
- Sun Java System Directory Server

In addition to configuring UDS for integration with these supported external user directory servers, administrators have the option to configure the Authentication Service to leverage the same external users directories for authentication attributes such as user names and passwords.

To learn more about how Oracle Beehive integrates with external user directories, see the following topics:

- Mastering User Accounts in External User Directories
- Importing User Account Data from External User Directories
- Synchronizing User Account Data Between Oracle Beehive and External User Directories

Mastering User Accounts in External User Directories

When you integrate Oracle Beehive with an external user directory server, the external directory becomes the master source for user account attributes. In other words, the external directory is the point of reference or source of truth for those attributes. All external user directory servers that integrate with Oracle Beehive are considered master sources.

Oracle Beehive supports user account mastering on a field by field basis. Mastering user accounts refers to managing account attributes in a specific location, such as an external user directory. However, even when an external user directory is present and is used as a master source, it is possible to master certain user account attributes in UDS. In fact, this is a requirement for certain Oracle Beehive-based attributes, such as voicemail passwords and instant messaging user names.

Importing User Account Data from External User Directories

Prior to integrating Oracle Beehive with an external user directory, administrators must import user account data from the external user directory to UDS. This is a straightforward process that involves creating two XML files. The first file contains the mappings between the user account attributes in the external user directory and UDS.

The second file contains the list of user accounts that will be synchronized between the external user directory and UDS.

For more information, including the steps to integrate an external user directory with Oracle Beehive, see "Integrating an External User Directory with Oracle Beehive" in the *Oracle Beehive Integration Guide*.

Synchronizing User Account Data Between Oracle Beehive and External User Directories

To maintain data consistency between Oracle Beehive and an external user directory, UDS synchronizes with the external user directory server at regular intervals. The default interval period is 30 seconds, although Oracle Beehive administrators can change this setting to suit their organizations' needs. Every time UDS synchronizes with an external user directory server, it obtains only the records that changed during the previous interval. UDS then updates its records accordingly.

Note: The directory synchronization process is unidirectional, that is, changes in an external user directory are imported into UDS only. User account data in UDS is never promoted to external user directories.

Oracle Beehive Integration with Third-Party Single Sign-On Providers

Out of the box, Oracle Beehive is configured with the Java Single Sign-On Service (JSSO), which provides a single sign-on experience for users across all Oracle Beehive Web-based applications. Oracle Beehive also supports integration with OracleAS Single Sign On, and provides a Pluggable Authentication Framework for custom integration with third-party single sign-on providers.

To integrate Oracle Beehive with a third-party single sign-on provider, such as IBM Tivoli Access Manager WebSEAL, you must create and deploy a Java plug-in through the Oracle Beehive Pluggable Authentication Framework. For more information, see "Oracle Beehive Pluggable Authentication" on the Oracle Beehive page on Oracle Technology Network. This page provides a sample plug-in for redirect-style single sign-on providers and another sample plug-in for IBM Tivoli Access Manager WebSEAL, which is a reverse proxy-style single sign-on provider.

Oracle Beehive Integration with Oracle Database

Oracle Beehive stores all of its data such as collaborative, configuration, and audit data, as well as its log archives in Oracle Database. Every Oracle Beehive deployment must have at least one Oracle Database instance installed and available prior to installing Oracle Beehive.

Oracle Beehive supports the following Oracle Database 11*g* releases:

- Oracle Database 11*g* Release 1 (11.1.0.7)
- Oracle Database 11*g* Release 1 (11.2.0.1)

Note: Oracle Beehive supports the option to deploy a secondary database instance dedicated to the system's search functions. This option should be considered in large deployments as it may provide significant performance improvements for search-related features. For more information on this option, please contact Oracle Support.

Oracle Beehive Integration with Oracle Information Rights Management (Oracle IRM)

Oracle Information Rights Management (Oracle IRM) is an information security solution that uses encryption to seal content. Through the Information Rights Management (IRM) Service, Oracle IRM, and policies created by administrators, Oracle Beehive controls access to sealed content, ensuring that only authorized users can open and use it. This control pertains not only to content saved locally on users' computers, but also extends to content distributed outside the firewall through e-mail and other means.

For more information on integrating Oracle Beehive with Oracle IRM, see "Integrating Oracle Information Rights Management with Oracle Beehive" in the *Oracle Beehive Integration Guide*.

Oracle Beehive Integration with Oracle Real Application Clusters (Oracle RAC)

Oracle Beehive supports Oracle Real Application Clusters (Oracle RAC). With Oracle RAC, you can deploy Oracle Database across multiple computers so that they each share a single physical database. This is useful for deployments that need to achieve high availability and scalability, especially on low cost hardware. With Oracle RAC, the number of computers across which Oracle Database is distributed is invisible to Oracle Beehive and its users.

Oracle Beehive supports affinity toward Oracle RAC database instances, providing more efficient user sessions and balanced database workloads. Currently, database instance affinity is supported by the E-mail Service and the Event Framework only. With the E-mail Service, affinity is based on the instance associated with a user's Internet Message Access Protocol (IMAP) session. Support for other Oracle Beehive services and affinity types will be provided in later releases.

For more information on integrating Oracle Beehive with Oracle RAC, see *Oracle Beehive Deployment Guide*.

Oracle Beehive Integration with Oracle Secure Enterprise Search 10*g*

Oracle Beehive maintains its own optimized search index enabling users to perform comprehensive searches across all Oracle Beehive artifacts. At the enterprise level, however, other information repositories might exist and contain information that users need. For example, depending on their roles, knowledge workers might need to find expense reports or purchase requisitions stored outside of Oracle Beehive. This level of search across all enterprise information repositories is provided by Oracle Secure Enterprise Search 10*g*.

Oracle Secure Enterprise Search has been designed as a stand-alone enterprise search solution. It incorporates best-in-class indexing, crawling, and security capabilities to create a reliable and comprehensive search solution for any organization. To leverage

this powerful option, organizations can integrate Oracle Beehive with Oracle Secure Enterprise Search 10*g*. With this integration, Oracle Beehive becomes a federated data source of Oracle Secure Enterprise Search 10*g*.

For more information on integrating Oracle Beehive with Oracle Secure Enterprise Search 10*g*, see "Integrating Oracle Secure Enterprise Search 10g with Oracle Beehive" in the *Oracle Beehive Integration Guide*.

Oracle Beehive Integration with OracleAS Single Sign-On (OSSO)

Out of the box, Oracle Beehive is configured with the Java Single Sign-On Service (JSSO), which provides a single sign-on experience for users across all Oracle Beehive Web-based applications. In addition, you may register Oracle Beehive as a partner application with OracleAS Single Sign-On (OSSO), which means that you may delegate the authentication function to the single sign-on server. For more information on this option, see "Configuring Single Sign-On with Oracle Beehive" in the installation guide for your operating system.

Oracle Beehive Integration with Oracle Universal Content Management (Oracle UCM)

Oracle Universal Content Management (Oracle UCM) enables users to view and collaborate on content through its document management, Web content management, digital asset management, and records retention capabilities. Through integration with Oracle UCM, Oracle Beehive enables users to leverage these powerful capabilities. Oracle Beehive supports Oracle UCM 10*g* Release 3 or later.

For more information on how to integrate Oracle Beehive with Oracle UCM, see "Integrating Oracle Universal Content Management with Oracle Beehive" in the *Oracle Beehive Integration Guide*.

Oracle Beehive Integration with Oracle Universal Records Management (URM)

Oracle Universal Records Management (Oracle URM) enables organizations to manage their records and retention policies, disposition processes, and litigation holds or freezes in a central repository known as a Universal Records Management (URM) server. Organizations can then apply those policies, dispositions, and holds to content stored in other systems, such as Oracle Beehive. Oracle Collaboration Suite provides integration with Oracle URM through the Records Management Service.

For more information on integrating Oracle Beehive with Oracle URM, refer to "Integrating Oracle Universal Records Management with Oracle Beehive" in the *Oracle Beehive Integration Guide*.

Oracle Beehive Integration with Oracle Wallet

Oracle Wallet is a component of Oracle Application Server 10*g* that provides important authentication capabilities. A wallet is a password-protected container that stores authentication and signing credentials, including private keys, certificates, and trusted certificates, all of which are used by Secure Sockets Layer (SSL) for strong authentication.

Oracle Wallet provides an encrypted Transport Layer Security (TLS) communication channel that some Oracle Beehive services require, such as the XMPP Service. Oracle

Wallet is also required when configuring Oracle Beehive Web Services for Security Assertions Markup Language (SAML) authentication.

For more information on integrating Oracle Beehive with Oracle Wallet, see *Oracle Beehive Deployment Guide*.

Oracle Beehive Integration with Cisco Voice Gateway

Oracle Beehive provides its voicemail and fax functionality through integration with Cisco Voice Gateway. This includes enabling users to access and manage voice messages from a telephone or as audio files in their e-mail inboxes.

For more information, including the steps to deploy Oracle Beehive Voicemail with Cisco Voice Gateway, see "Integrating Cisco Voice Gateway with Oracle Beehive" in the *Oracle Beehive Integration Guide*.

Oracle Beehive Integration with IBM Lotus Domino Server

Oracle Beehive supports integration with IBM Lotus Domino Server through the Oracle Collaboration Coexistence Gateway. The Oracle Collaboration Coexistence Gateway is an Oracle proprietary solution that allows Oracle Beehive users to schedule meetings with IBM Lotus Domino Server users, and vice versa. Additionally, this solution allows IBM Lotus Domino Server users to leverage Oracle Beehive features without being migrated from IBM Lotus Domino Server.

This section includes the following topics:

- Types of Users Supported by the Oracle Collaboration Coexistence Gateway for IBM Lotus Domino Server
- Oracle Collaboration Coexistence Gateway Concepts for IBM Lotus Domino Server

For details on how to integrate IBM Lotus Domino Server with Oracle Beehive, refer to "Integrating IBM Lotus Domino Server with Oracle Beehive" in the *Oracle Beehive Integration Guide*.

Types of Users Supported by the Oracle Collaboration Coexistence Gateway for IBM Lotus Domino Server

This section provides details on the types of users that Oracle Collaboration Coexistence Gateway supports for IBM Lotus Domino Server, including:

- Lotus Notes Foreign User
- Coexisting Domino User
- Non-Coexisting Domino User
- Coexisting Beehive Users

Lotus Notes Foreign User

A Lotus Notes Foreign User is a user who does not have a mailbox in the Lotus Domino environment, free/busy information on the Lotus Domino environment, and does not belong to the Domino server domain (in other words, the user comes from a different domain). This user is defined in the Lotus Domino server directory or as part of a contact list of Lotus Notes users.

The only way to distinguish a Foreign User from other users is through the e-mail address domain. For example, a Lotus Notes Foreign User could be an Oracle Beehive user.

Coexisting Domino User

A Coexisting Domino user is a user who resides on IBM Lotus Domino Server. Similar to Oracle Beehive users, a Coexisting Domino user can collaborate with and view free/busy information of coexisting Oracle Beehive users.

Additionally, coexisting Domino users can also perform the following tasks:

- Collaborate with other users on the same system.
- View free/busy information of Oracle Beehive users.
- Collaborate with Oracle Beehive users as though they were users native to Lotus Domino.
- Use Oracle Beehive clients, such as Oracle Beehive Team Collaboration and Oracle Beehive Conferencing, and supported instant messaging clients.

Non-Coexisting Domino User

A non-coexisting Domino user resides solely on an existing third-party system. A non-coexisting Domino user is not aware of the existence of Oracle Beehive. No coexistence solution is provided to this group of users. Although these users may exist in the Oracle Beehive Global Address List, an Oracle Beehive user cannot view the free/busy information of these users or schedule these users. All communication between Oracle Beehive users and non-coexisting Domino user on third-party systems is accomplished using e-mail.

A non-coexisting Domino user can perform the following tasks:

- Collaborate with other users on the same system.
- View the free/busy information of Oracle Beehive users.
- Collaborate with Oracle Beehive users by e-mail.

Coexisting Beehive Users

Coexisting Beehive users have Oracle Beehive as messaging and scheduling system. Coexisting Beehive users can perform the following tasks:

- Use all available Oracle Beehive services.
- Collaborate with other Oracle Beehive users.
- Collaborate with coexisting third-party users as if they were Oracle Beehive users.

Oracle Collaboration Coexistence Gateway Concepts for IBM Lotus Domino Server

This section defines Oracle Collaboration Coexistence Gateway concepts that are specific to IBM Lotus Domino Server.

This section includes the following topics:

Coexistence Connector Domino Databases

The Coexistence Connector requires that the following five databases be created within the IBM Lotus Domino Server system:

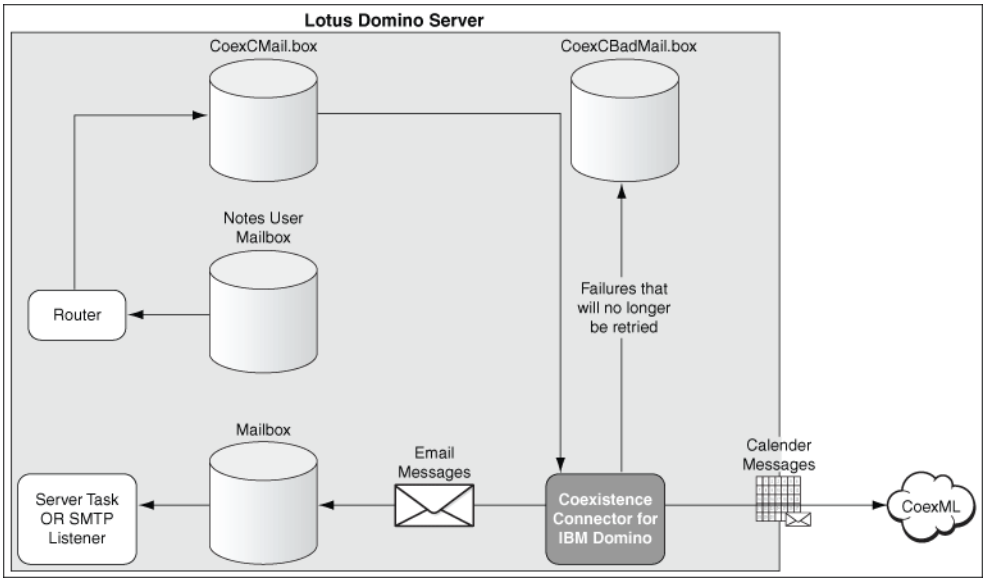
1. The first database is called *Coex Mail Box* and is derived from a Domino *Mail Router Mailbox* template. This database is used by Domino because it routes all outgoing messages destined to coexisting Oracle Beehive users.
2. The second database is called *Coex Import Box* and is derived from a Domino *Mail Router Mailbox* template. This database is used by Domino as it routes all outgoing import request messages destined to coexisting Oracle Beehive users.
3. The third database is called *Oracle Free/Busy database* and is derived from a Domino *Local free time info* template. This database is used by the Coexistence Connector to cache all the free/busy information of the coexisting Oracle Beehive user so that the Domino server task can retrieve the free/busy information of the Oracle Beehive user and return it to the Lotus Notes clients.
4. The fourth database is called *Oracle Coexistence Storage database* and is used to store all coexistence-related configuration information.
5. The fifth database is the *Coex Bad Mailbox* and it contains failed messages destined to Oracle Beehive that will no longer be retried.

How Lotus Notes Handles E-mail and Calendar Information

Lotus Domino is a message-based system. Both e-mail and calendaring information are classified as messages and get routed through the same components in the system. The only noticeable difference between calendaring messages and e-mail messages is in the way they are interpreted by the Lotus Notes client.

Figure 9–1 outlines how e-mail and calendaring messages are routed in the Lotus Domino system.

Figure 9–1 Lotus Domino System: Handling E-mail and Calendar Information



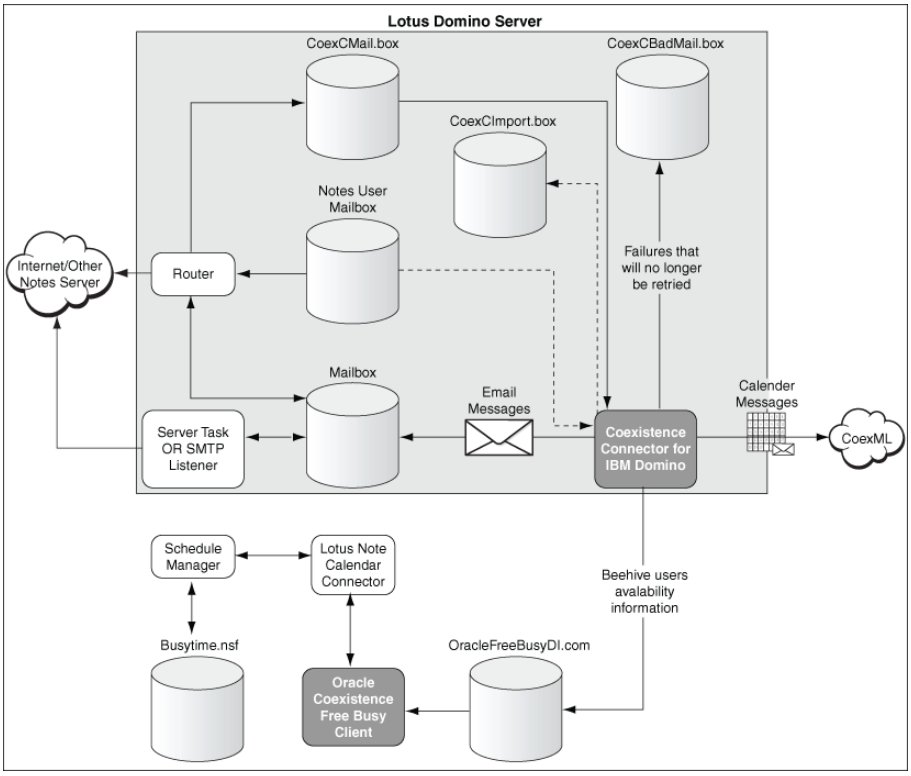
How the Collaboration Coexistence Connector Handles E-Mail and Calendar Information

When a Lotus Notes user invites a foreign user (a coexisting Oracle Beehive user) to a meeting, the Lotus Domino server redirects the message to the database referenced in the foreign domain document (which is represented in the Figure by `CoexCMail.box`). The Coexistence Connector gets notified when new messages arrive in that database and it then processes them and sends them to the Oracle Beehive user.

If the message in question is a calendar invitation, then the Coexistence Connector will send it to Beehive by `CoexML`. If the message is an e-mail message, then the Coexistence Connector will re-route it back to the Lotus Domino server by the `Mail.box` database and have the Domino server send it by SMTP.

Figure 9–2 shows how the Collaboration Coexistence Connector handles e-mail and calendar information.

Figure 9–2 Collaboration Coexistence Connector: Handling E-mail and Calendar Information



Oracle Beehive Integration with Microsoft Exchange Server 2003 or 2007

Oracle Beehive supports integration with Microsoft Exchange Server 2003 or 2007 through the Oracle Collaboration Coexistence Gateway. The Oracle Collaboration Coexistence Gateway is an Oracle proprietary solution that allows Oracle Beehive users to schedule meetings with Microsoft Exchange Server users, and vice versa. Additionally, this solution allows Microsoft Exchange Server users to leverage Oracle Beehive features without being migrated from Microsoft Exchange Server.

This section discusses Oracle Beehive coexistence as it relates to Microsoft Exchange Server, and includes the following topics:

- Features Provided by Oracle Beehive Collaboration Coexistence
- Configuration Options for Oracle Beehive Coexistence
- User Types Supported by Oracle Beehive Coexistence
- Overview of the Oracle Collaboration Coexistence Gateway for Microsoft Exchange Server

For details on how to integrate Microsoft Exchange Server 2003 or 2007 with Oracle Beehive, see "Integrating Microsoft Exchange Server 2003 or 2007 with Oracle Beehive" in the *Oracle Beehive Integration Guide*.

Features Provided by Oracle Beehive Collaboration Coexistence

Oracle Beehive collaboration coexistence with Microsoft Exchange Server enables users of both systems to collaborate transparently with each other beyond the limited capabilities of e-mail. This includes the ability to leverage the following features through clients of both Oracle Beehive and Microsoft Exchange Server:

- **Time management:** Users can create, view, and manage meeting entries through Oracle Beehive or Microsoft Exchange Server. This includes inviting (to meetings) users hosted by either system.
- **Task management:** Users can create, assign, view, and manage tasks in both Oracle Beehive and Microsoft Exchange Server. This includes assigning tasks to users hosted by either system.
- **E-mail management:** Users can create, view, and manage e-mail messages through Oracle Beehive or Microsoft Exchange Server.
- **Contact management:** Users can create, view, and manage contacts through Oracle Beehive or Microsoft Exchange Server.

Configuration Options for Oracle Beehive Coexistence

Oracle Beehive coexistence provides a non-intrusive configuration approach, giving users a choice in how they access their data, either natively from Oracle Beehive or from Microsoft Exchange Server. With this approach, users can be introduced to Oracle Beehive and its contextual environment without needing to immediately adopt and adapt to it. It is also possible to configure Oracle Beehive coexistence so that users of Oracle Beehive and Microsoft Exchange Server can collaboratively schedule meetings, view free/busy information, and receive post-invitation event updates without being aware of each other's systems.

Enterprises can leverage Oracle Beehive collaboration coexistence with Microsoft Exchange Server by configuring their users in the following manner:

- Cross-scheduling Coexistence with Microsoft Exchange Server

Cross-scheduling Coexistence with Microsoft Exchange Server

Note: This collaboration coexistence option requires the installation of the Oracle Collaboration Coexistence Gateway on Microsoft Exchange Server. For more information, see "Overview of the Oracle Collaboration Coexistence Gateway for Microsoft Exchange Server".

Cross-scheduling coexistence with Microsoft Exchange Server enables two distinct user sets to schedule meetings with one leveraging Microsoft Exchange Server through

Microsoft Outlook, and the other leveraging Oracle Beehive through a supported client. This includes cross-scheduling with visibility of free/busy information for users of both systems.

User Types Supported by Oracle Beehive Coexistence

Oracle Beehive coexistence with Microsoft Exchange Server supports the following user types:

- Active Directory Contacts
- Active Directory Users
- Coexisting Third-Party Users
- Non-Coexisting Third-Party Users
- Oracle Beehive Users

Active Directory Contacts

A Microsoft Active Directory contact is a user who does not have a Microsoft Exchange Server mailbox, and who resides on a different system. For example, an Active Directory contact could be an Oracle Beehive user.

Active Directory Users

A Microsoft Active Directory user resides on Microsoft Exchange Server and has an Exchange mailbox. The Exchange mailbox can contain e-mail, calendar, and task items, among other objects.

Coexisting Third-Party Users

A coexisting third-party user resides on a third-party system, such as Microsoft Exchange Server, but has the ability to schedule meetings with and view free/busy information of Oracle Beehive users. Conversely, Oracle Beehive users are able to schedule meetings with and view free/busy information of coexisting third-party users. These users can perform the following tasks:

- Collaborate with other users on the same system
- View Oracle Beehive users as users native to Microsoft Exchange Server
- Collaborate with Oracle Beehive users as if they are users native to Microsoft Exchange Server

Non-Coexisting Third-Party Users

A non-coexisting third-party user resides solely on an existing third-party system. These users are not aware of the existence of Oracle Beehive. No coexistence solution has been provided to this group of users. Although these users may exist in the Oracle Beehive Global Address List, an Oracle Beehive user cannot view the free/busy information or cross-schedule with these users. All communication between Oracle Beehive users and non-coexisting third-party users is accomplished using e-mail. Non-coexisting third-party users can perform the following tasks:

- Collaborate with other users on their systems
- View Oracle Beehive users as external users
- Collaborate with Oracle Beehive users through e-mail

Oracle Beehive Users

An Oracle Beehive user leverages Oracle Beehive for all content types and can perform the following tasks:

- Use all available Oracle Beehive services
- Collaborate with other Oracle Beehive users
- Collaborate with coexisting third-party users as if they are Oracle Beehive users

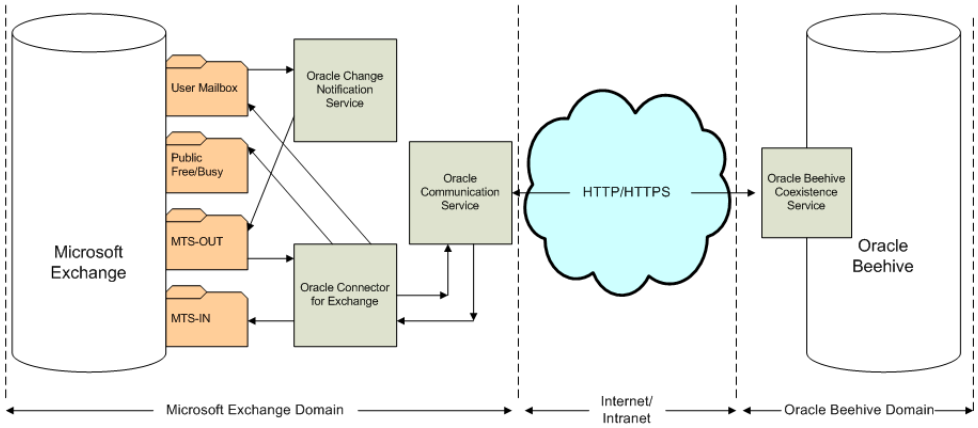
Overview of the Oracle Collaboration Coexistence Gateway for Microsoft Exchange Server

The Oracle Collaboration Coexistence Gateway is an Oracle proprietary solution that enables Oracle Beehive collaboration coexistence by providing the connection between Oracle Beehive and Microsoft Exchange Server. Oracle Collaboration Coexistence Gateway contains the following components:

- Oracle Beehive Coexistence Service
- Oracle Connector for Exchange
- Oracle Communication Service
- Oracle Change Notification Service for Exchange

These components update and propagate data between Oracle Beehive and Microsoft Exchange Server, which may include meeting entries, contacts, e-mail messages, and folders. Figure 9–3 depicts these components as they relate to the Oracle Collaboration Coexistence Gateway architecture, which includes Microsoft Exchange Server, third-party software, and related information flows.

Figure 9–3 Oracle Collaboration Coexistence Gateway Architecture



Oracle Beehive Coexistence Service

The Oracle Beehive Coexistence Service runs in an OC4J container that is installed with Oracle Beehive. The service is automatically enabled when Oracle Beehive is installed and it is required in order to implement the Oracle Collaboration Coexistence Gateway. The Oracle Beehive Coexistence Service relays data between the Oracle Connector for Exchange and Oracle Beehive.

Oracle Connector for Exchange

The Oracle Connector for Exchange is an Oracle Collaboration Coexistence Gateway service that is responsible for the following tasks:

- Converting outgoing messages to an accepted Oracle Beehive format and dispatching the delivery to the Oracle Communication Service
- Delivering Oracle Beehive meeting requests, responses, and cancellations to Microsoft Exchange users
- Updating free/busy information

Oracle Communication Service

The Oracle Communication Service plays a vital role in facilitating the exchange of information between Oracle Beehive and Microsoft Exchange Server. The Oracle Communication Service is responsible for the transmission of all messages between the two systems and distinguishes between different message types, including e-mail messages, calendar entries, and contacts.

Oracle Change Notification Service for Exchange

The Oracle Change Notification Service for Exchange is the Oracle Collaboration Coexistence Gateway service that is responsible for the following tasks:

- Detecting changes to the personal data (e-mail, contacts, and calendar events) of team collaboration-enabled users
- Detecting changes to free/busy information for third-party coexisting users
- Dispatching changes to Oracle Connector for Exchange

Oracle Beehive Integration with Symantec Scan Engine

Oracle Beehive supports integration with Symantec Scan Engine. This provides another option for organizations that want to leverage existing Symantec Scan Engine instances or that want anti-virus features beyond what the Oracle Beehive Virus Scanner provides. Through this integration, organizations can leverage the scan types and modes that Symantec Scan Engine provides, as well as its artifact and message filtering capabilities. Oracle Beehive supports Symantec Scan Engine version 5.1.2 and later.

For more information on the anti-virus capabilities of the Oracle Beehive Virus Scanner, see "Anti-virus Support in Oracle Beehive". For more information on integrating Oracle Beehive with Symantec Scan Engine, see "Integrating Symantec Scan Engine with Oracle Beehive" in the *Oracle Beehive Integration Guide*.

10

Oracle Beehive Platform Development Concepts

Oracle Beehive enables developers to build and integrate applications with the platform using the Oracle Beehive Development Kit (BDK). This module provides high-level details on the Oracle BDK, and includes the following topics:

Overview of the Oracle Beehive Development Kit (BDK)

The Oracle BDK provides Oracle Beehive RESTful Web Services, which consists of APIs that enable developers to build Web applications for Oracle Beehive deployments. These APIs are implemented with the principals of REST, Representational State Transfer. RESTful (Representational State Transfer) Web services are Web services that are implemented with the principles of REST:

- API URLs point to the resource being used rather than a generic method endpoint.
- Requests use standard HTTP verbs for simplified CRUD methods:
  - Create, POST
  - Update, POST
  - Retrieve, GET
  - Delete, DELETE
- Create and Update data is sent as a POST body (JSON and XML).
- Every request returns a full (or at least standard) representation of the object created, updated, or retrieved.

Benefits of the Oracle Beehive Development Kit (BDK)

The Oracle BDK provides the following benefits:

- Shields developers from the complexities of the underlying Oracle Beehive data model by exposing only relevant data objects
- Provides RESTful Web services that expose user-focused methods
- Provides data accessors, manipulators, and collaborative actions through relevant types and methods

- Provides a unified abstraction of the Oracle Beehive collaboration model and system functionality
- Supports solutions that interoperate with and consume Oracle Beehive services without requiring them to be on the same application server

Building Custom Solutions with the Oracle Beehive Development Kit (BDK)

With the Oracle BDK, developers can build a variety of custom solutions on the Oracle Beehive platform. These solutions can leverage the full range of the platform's collaborative offerings including its entities (users, groups, artifacts, workspaces, and so forth) and functionality (time management, e-mail, content management, instant messaging, notification, presence, and so forth).

Examples of custom solutions that can be implemented with the Oracle BDK include:

- A consumer-oriented solution that automatically creates workspaces whenever customers contact a company's customer service department to report issues. Each workspace remains open and accessible until its associated issue is resolved.
- A contact management application that imports a user's contacts and their contact information from a spreadsheet or comma-delimited text file to the user's Oracle Beehive personal address book.
- A self-service workspace solution that enables users to create, list, and join workspaces through a designated Web page. When creating workspaces, the solution enables users to specify new workspace members.
- A solution that graphically represents the relationships between Oracle Beehive artifacts based on one or more attributes, such as entity ID. This solution would enable users to intuitively traverse the relationships of all of the artifacts to which they have access.

Glossary

access control

The mechanism that grants or denies Oracle Beehive users the ability to perform various actions, such as add, view, modify, or delete entities. Access control can be applied explicitly on objects through access control lists (ACLs) containing access control entities (ACEs). Additionally, access control can be applied to users implicitly through the use of roles. See also: **access control entry (ACE)**, **access control list (ACL)**, **access type**, **privilege**, **role**, **sensitivity**.

access control entry (ACE)

An entry in an **access control list (ACL)** on an accessible object, such as a file, folder, workspace, or calendar. Each ACE contains three values: the entity, which specifies the object to which the ACE applies; the accessor, which specifies for whom this ACE applies (such as a user or members of a specified group); and a string defining access types (read, write, discover, execute, and delete). See also: **access control**, **access control list (ACL)**, **access type**.

access control list (ACL)

A list of one or more access control entities (ACEs) that applies to a specific object in Oracle Beehive and that defines who can access the object and with what privileges. See also: **access control entry (ACE)**, **privilege**, **sensitivity**.

access type

The component of an **access control entry (ACE)** that specifies how a user can access an object, if at all. An ACE can include one or more of the following access types: view, modify, discover, execute, and delete. See also: **access control**, **access control entry (ACE)**.

actor

An **entity**, such as a user or a service, that can act upon other entities.

address book

A list of people and their contact information entered or specified by a user or a group of users for facilitating collaboration.

administrator

A user who has special privileges, such as the ability to manage and control aspects of the system. See also: **system administrator** and **workspace administrator**.

alert

A time-sensitive message to one or more users that typically requires the immediate attention of its recipients, sometimes in the form of actionable responses. See also: **notification**.

artifact

A type of **entity** that users can view, create, modify, or delete. Artifacts are the results of communications and other collaborative activities, and include e-mail messages, meeting entries, online discussions, and documents, to name a few. Oracle Beehive stores artifacts in Oracle Database.

authentication

The process of verifying credentials, such as a user name and password, for granting or denying a user access to the system.

authorization

The process of granting or denying a user access to services, features, and artifacts. Authorization is a superset of **access control**.

Beehive Transport Infrastructure (BTI)

Enables connectivity between Oracle Beehive and supported clients. The BTI enables client connections to navigate and traverse obstacles such as firewalls, forward and reverse proxies, load balancers, virtual hosts, and demilitarized zones (DMZs) while ensuring secure, stable, and persistent connections.

broadcast

A one-way communication, such as an instant message, that a user, an administrator, or the system sends to multiple users simultaneously.

business event

An **event** that triggers business logic, such as applying policies. An example of a business event is when a user creates a document and it initiates a specific approval and notification process. See also: **object event**.

chat

An online discussion that occurs between two or more Oracle Beehive users through instant messaging.

coexistence

The ability to integrate Oracle Beehive with another system (or application) so that current data from each system is exposed to the users of the other system. Currently, Oracle Beehive supports coexistence with Microsoft Exchange Server 2003 only.

collaboration

The process of two or more people working together for a common objective.

contact

A person who is associated with Oracle Beehive users. A contact is either an internal contact (an enterprise or extended-enterprise user) or an external contact (outside of an enterprise). By default, all Oracle Beehive users are contacts, but external contacts do not have user accounts. Directories as well as workspace and personal address books can contain internal contacts, however only workspace and personal address books can contain external contacts.

contact list

See **people list**.

container

A special type of object that can hold other objects within it. Containers include all of the various levels of scope, such as enterprise, organization, and workspace, as well as specialized containers such as folders (which contain files) and calendars (which contain calendar events).

content

A type of **artifact** that users can create, edit, delete, share, collaborate on, provide links to, and version. Typically, content refers to documents and images (graphic files) although it can also include e-mail messages, meeting notes, spreadsheets, project plans, reports, transcripts from online chats, and so forth.

demilitarized zone (DMZ)

A computer host or small network that an enterprise inserts as a neutral zone between its internal, private network and the Internet. A DMZ prevents unauthorized users from accessing systems that contain confidential or proprietary data. In effect, DMZs act as proxy servers and provide another layer of network security, especially when used with firewalls.

delegate

A user who has been granted the necessary privileges to act on behalf of another user.

delegation

The act or process of granting a user the necessary privileges to act of behalf of another user.

directory

The collection of all the groups, users, and their associated contact information within an Oracle Beehive deployment. Users can access the directory for their deployment to look up basic contact information about other users. See also: **personal address book**.

discussion

A threaded, post-based conversation about a particular topic or subject, and that is typically moderated by a user with the appropriate privileges.

distribution list

A contact list whose members are interested in receiving information about a specific topic. Users can subscribe to and unsubscribe from distribution lists, or they can be added and removed by administrators.

enterprise

The top-level container for all entities in an Oracle Beehive deployment, which can include any number of organizations, users, and workspaces. In Oracle Beehive Release 1, each Oracle Beehive deployment can have only one enterprise. See also: organization, workspace.

entity

An object in Oracle Beehive, such as a service, user, workspace, or artifact. In essence, every object in Oracle Beehive is an entity.

event

An occurrence in Oracle Beehive that is the result of a user or system-based action. Examples include when an administrator provisions a new user, a user saves changes to a document, or an allotted disk space quota is reached. Events can trigger rules, policies, and other events. All events can be logged. See also: **business event**, **object event**.

external contact

A person who does not have a user account in Oracle Beehive but who is related to, regularly contacted by, or who potentially collaborates with one or more Oracle Beehive users. Oracle Beehive users can add external contacts to their workspace address books and personal address books.

Global Address List (GAL)

The Microsoft Exchange Server equivalent of an Oracle Beehive **directory**.

group

A defined collection of users or resources (or some combination thereof) that are related based on a line of business, a project, a location, or another common association.

Lightweight Directory Access Protocol (LDAP)

An Internet protocol that applications use to look up contact information from a server, such as a central directory. LDAP servers index all the data in their entries. Filters can be used to select a specific person or group, and return the precise information that was requested. An example of an LDAP server is Oracle Internet Directory.

meeting

A gathering, whether in-person or online, where users collaborate about a particular subject or project. A meeting is defined by its subject matter, location, mode of communication, attendees, resources, and start and end times.

node

A server in a network deployment of Oracle Beehive. Oracle Beehive supports deployments with multiple nodes that exist in the same site.

notification

A mechanism for informing the user of something that has happened in the system, possibly through an alert. Users subscribe to notifications to track changes such as changes to a document or to a meeting time and location. See also: **alert**, **subscription**.

object event

An **event** that is based on changes in Oracle Beehive entities, such as users, documents, and workspaces, and that affect low-level aspects of the system only, such as updating a row in a database table. An example of an object event is when a system administrator provisions a user and no other business logic applies, other than enabling the user to log in and use the system. See also **business event**.

organization

A logical grouping of users, groups, workspaces, and resources at a level lower than the enterprise level. An enterprise can contain any number of organizations, and an organization can contain any number of sub-organizations and workspaces. Users can

be provisioned at an organization level, and they can access entities and collaborate across organizational boundaries if system-based permissions are granted. Also, the system exposes many entities, such as the **directory**, across all organizations. See also: **enterprise**.

people list

A set of contacts that an Oracle Beehive user creates for communicating through instant messages. Users can organize their people lists by adding groups and hierarchies.

personal address book

An address book in a user's personal workspace. Personal address books can be shared with other users and workspaces, but can have only one owner.

personal workspace

A workspace for and owned by a single user, and that others cannot access and view unless the user specifically grants them permission. Personal workspaces can contain links to the content from the team workspaces to which a user belongs, but not vice versa. By default, every enterprise and extended-enterprise user in Oracle Beehive has a personal workspace, which is created during user account provisioning. All users can each have only one personal workspace. See also: **team workspace**, **workspace**.

policy

A set of rules with associated actions used for restricting or modifying the default behavior of Oracle Beehive. Typically, policies are applied to events or collections of events. A policy dictates how Oracle Beehive should behave whenever an event occurs. Examples of policies include: a password policy dictating what rules must be followed when creating a password; an auditing policy dictating when auditing records should be written to the audit repository. See also: **event**.

presence

The ability to manually configure or automatically detect the current and future status of a user or resource, and then display that information to other users.

principal

User-provided credentials, such a user name and password, that enable the system to authenticate the user.

privilege

System-defined levels of access to various functions within Oracle Beehive. Some privileges grant user-level access to services such as e-mail, instant messaging, and time management. Other privileges grant administrator-level access, such as access to auditing functions, user administration, and roles management. By default, all users (all members of the ALL_USERS default group) are granted a set of privileges providing user-level access to all Oracle Beehive services.

quota

The amount of available storage space, whether actual (physical) or virtual, allocated for a particular entity such as a workspace.

remote document

A document or a piece of content that is physically present in an external repository. The RemoteDocument object is an Oracle Beehive proxy object that refers to a physical document in an external repository.

remote folder

A folder that is physically present in an external repository. The RemoteFolder object is an Oracle Beehive proxy object that refers to a physical folder in an external repository.

remote repository

An Oracle Beehive configuration object that represents a physical deployment of a supported repository type, such as an Oracle Universal Content Management (Oracle UCM) deployment of Content.oracle.com. The RemoteRepository object contains the actual values for all the attributes required to connect to the remote repository, as specified in the remote repository definition.

remote repository definition

An Oracle Beehive configuration object that defines the set of attributes that are required to access a specified remote repository type. Also, defines any custom properties specific to the repository.

remote share

Also referred to as a *remote mount point*. An Oracle Beehive configuration object that points to a specific folder or location in a remote repository. Refers to a folder (root) in a remote repository, similar to a UNIX mount point. For certain repositories, such as Oracle UCM, this could also represent search criteria.

resource

An entity that users can search for, reserve, and use for a specified period of time, such as a conference room or a projector. In Oracle Beehive, users search for and reserve resources through the features provided by the Time Management Service.

role

Predefined permission sets that can be assigned to users and groups within team workspaces, and that determine what workspace features and content assignees can or cannot access. Users can be assigned more than one role for each team workspace. Typically, workspace coordinators are responsible for creating and assigning roles. See also: **privilege**.

scope

An organizational level, used for collecting users and managing access. Oracle Beehive supports the following scope types: **enterprise**, **organization**, and **workspace**.

sensitivity

A named **access control list (ACL)** defined and applied to entities by administrators and users. Sensitivities solve the usability problem of having too fine-grained control or not enough control. Common sensitivities include private, confidential, normal, and public. A sensitivity can be applied to multiple entities simultaneously, enabling users to group multiple entities into the same access control category. Oracle Beehive allows administrators and users to define and apply any number of sensitivities, although Oracle Beehive Extensions for Outlook users can only apply existing sensitivities defined by users provisioned in Oracle Beehive.

service

A discrete implementation of specific functionality that users and other services can leverage to accomplish a task. The capabilities and interactions of services enable the full scope of functionality that Oracle Beehive provides.

site

A collection of hardware in a specific geographic location and on which Oracle Beehive runs.

subscription

A special type of policy that allows a user to be informed, through a notification message, whenever a particular event takes place. Oracle Beehive administrators can expose to users various events to which they can subscribe, allowing users to select subscriptions themselves from a client of choice, and manage how they want the system to deliver notifications. For example, a user could subscribe to a folder within a public workspace to receive a notification whenever files within that folder change. See also: **notification**, **policy**.

system administrator

An Oracle Beehive user with full system access and privileges, and who is responsible for the deployment, configuration, and maintenance of the Oracle Beehive software as well as the computers and networks on which it resides. System administrators troubleshoot hardware and configuration problems, apply software patches, perform upgrades, monitor system performance, and ensure the smooth operation of the Oracle Beehive deployment. See also: **administrator** and **workspace administrator**.

tag

A mechanism for classifying and organizing artifacts, typically according to business usage. For example, *Request for Proposal (RFP)* or *Monthly Sales Report* can be tags for documents. Tags can be hierarchical with parent-child-sibling relationships and any number of tags can be applied to an artifact. Tags can also contain properties, such that when a user applies a tag to an artifact, the artifact inherits the properties of the tag.

team workspace

A workspace that supports the content and collaborative activities of a particular workgroup, and that can be accessed and viewed by its members. Users can belong to and view more than one team workspace at a time. An example of a team workspace could be a sales workspace for a specific sales account. See also: **personal workspace**, **workspace**.

text conference

An online meeting between Oracle Beehive users in which instant messaging features, such as a chat room and text messages, are used.

time management

All of the various functions involving calendars and schedules, including scheduling meetings, assigning tasks, and applying time zones. Oracle Beehive provides its time management features through the Time Management Service.

Web conference

An online meeting between Oracle Beehive users over the Web in which one or more conferencing channels are used such as video, voice, text, or desktop sharing.

whiteboard (verb)

The process of presenting a dedicated window to other Web conference participants for the purposes of drawing or highlighting. Whiteboarding includes the ability to take a screenshot of a computer's desktop to highlight specific areas.

workspace

A named entity that defines a place and context for collaboration as well as for storing the artifacts related to the collaborative activities of an individual or a team. Typically, a workspace has two or more members and is created for collaboration on a project or an activity, such as a workspace created by a sales team for a specific account. Oracle Beehive exposes its collaborative services to users through workspaces. Users access and collaborate in workspaces through supported Oracle Beehive clients. See also: **personal workspace**, **team workspace**.

workspace administrator

A user who has administrator-level privileges for a workspace, which are typically granted through a role such as a Workspace Coordinator. Some users can have broader workspace administration privileges, such as the ability to create team workspaces at the organization or enterprise level.

Index

A

B

C

D

E

F

G

H

I

J

M

N

O

P

R

S

T

U

V

W

X