

Oracle Calendar

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EXECUTIVE OVERVIEW

Oracle Calendar has the potential to become the connective tissue of your organization, with a unique ability to tie together crucial variables relating to your projects and processes – including time, place, users and resources – becoming far more than a mere personal schedule tracking device, but an integrated platform for improving time management.

Oracle Calendar drives real-time collaboration, managing calendar specific information such as context (time, location, attendees, notes, tasks), availability and priority on any platform, with any device.

While many calendar systems can offer adequate personal information management, true power comes from connecting people and places across distance and time. Driven by the power of the Calendar Server, Oracle Calendar steps in where current systems fall short of enterprise requirements, alleviating some of the pervasive problems in enterprise time management systems:

1. Instead of maintaining disparate calendar systems for group calendaring, resource scheduling, web conferencing, personal information management and events, etc., Oracle Calendar is a comprehensive calendaring and scheduling system that allows you to consolidate all your time management activities onto a secure, scalable, reliable platform and extend calendar data for use across different collaborative environments.
2. Legacy collaboration software relies on e-mail as a delivery vehicle for calendar data, causing time lags, and misrepresenting availability of users and resources in the system. Oracle Calendar's real-time functionality and high performance means the information that is represented in user's calendars is always up-to-date, always relevant – overcoming lag-time, and delays in business process execution.
3. Access to information is at the crux of any collaborative solution. Oracle Calendar's multi-channel access means users can choose from a range of platforms and methods to access centrally stored calendar data: the familiar Microsoft Outlook interface, dedicated calendar clients for Mac, Linux and Windows, browser access, integrated with your enterprise portal, or choose from a range of mobile and sync options.
4. Oracle Calendar provides a standards-based infrastructure to maintain interoperability, to ensure your enterprise is ready to support new, cutting-edge technologies, and to protect your investment against ever-changing IT challenges. Benefit from standards such as SyncML for server-based synchronization and iCalendar to coordinate cross-organizational meetings with customers, partners and suppliers.

ORACLE CALENDAR: BUILT FOR TODAY'S ENTERPRISE

Spanning an Organization

By connecting people and applications in an accessible, reliable and cost-effective manner, a calendar system provides a central store for information such as who, what, where, when and why that is always accessible, regardless of time or place, across the entire organization.

Oracle Calendar contains and processes the complex and dynamic matrix of individual, group and resource availability, and delivers it in a coherent manner, making it possible for end-users to easily interpret and use the information. This translates into powerful features such as real-time conflict checking, ensuring that there are no conflicting events scheduled at a particular time, and “suggest time & date”, where the Calendar Server can suggest a set of proposed meeting times based on user-defined criteria.

Oracle Calendar brings the power of group calendaring, resource scheduling and workflow into one integrated application, allowing people to combine location-based information and time sensitive data. Using the “group view”, a logical representation of the free/busy matrix, users can see the combined free busy times for a group of people and/or resources, allowing them to manually select the best time slot for the proposed activity. Users can also quickly find and book a resource based on specific criteria, such as location or resource type. And through integrated approval workflow, resource managers can ensure the appropriate allocation of resources.

With support for UTC and UTF-8 standards, Oracle Calendar can span time zones and cultures, connecting people and places no matter how dispersed they are. Using UTC (Coordinated Universal Time – formerly GMT or Greenwich Mean Time) ensures that all time references are made according to the global base time. Meetings are stored in the Calendar Server in the standard UTC time zone and then converted back to the local time zone for display on the client. This permits full time zone support and ensures that there is no ambiguity about the actual time of the event.

UTF-8 (UCS Transformation Format 8) is a standard format for the conversion and re-conversion of supported character sets to and from a base format, thus allowing the data in Oracle Calendar to be shared across the variety of supported platforms and languages. For example, a user in Japan schedules a meeting with two of his colleagues using Oracle Connector for Outlook on his Windows 2000 machine. He invites someone from his office that uses a Macintosh client, as well as someone from Korea who is using a Netscape browser to access the Web client. Each attendee's operating system uses a different character set, but because the server converts and stores the information in UTF-8, they are able to read the meeting details without any problems.

Oracle Calendar allows for enterprise-wide group and resource scheduling, with support for multiple platforms and access methods, including the familiar Microsoft Outlook interface, with integrated access to calendar, email, voicemail and faxes.

Oracle Calendar's underlying infrastructure offers organizations a truly enterprise-wide solution, rather than a workaround, where smaller, local deployments may be connected and/or synchronized. A key advantage in having a consolidated user community is the ease with which an organization can communicate with all its members. Through event calendars, Oracle facilitates this enterprise-wide communication, providing a means for storing, tracking and displaying contextual information surrounding any number of events. For instance, an organization may choose to setup an event calendar for the social committee and another for network maintenance, and educational institutions may choose to use event calendars to publish course schedules. The event calendar administrator or designate can easily populate the agenda with any information, then set the appropriate access rights, ensuring that only the intended audience is able to access it. Users can then view the event calendar and populate their own calendars with the information they need.

Oracle Calendar allows for enterprise-wide group and resource scheduling, with support for multiple platforms and access methods, including the familiar Microsoft Outlook interface, with integrated access to calendar, email, voicemail and faxes.

Access Channels

Access to information is the crux of any collaboration solution. Scalability and reliability are meaningless if the information can only be accessed from a few limited points. Oracle Calendar offers a wide variety of access channels, providing users with a choice of the one(s) that best suit their needs and personal work style. From desktop solutions to wireless synchronization, Oracle Calendar ensures that information is delivered in a timely, relevant manner.

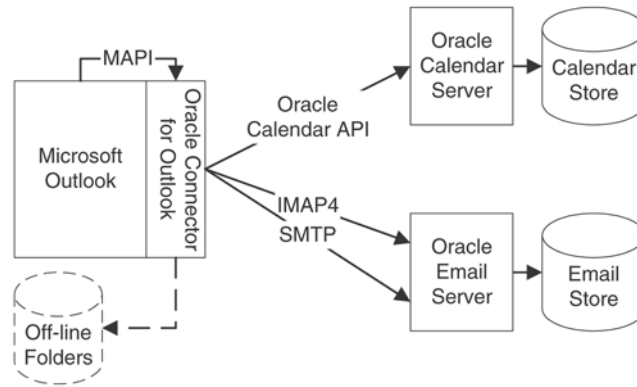
Oracle Connector for Outlook

Oracle Connector for Outlook extends Microsoft Outlook to provide a unified environment for e-mail, voicemail, fax and real-time calendaring. As a MAPI service provider, Connector for Outlook communicates directly with the Calendar and Email servers, converting e-mail, fax, voicemail and calendar data into MAPI constructs for display in the Outlook interface.

Using IMAP4 and SMTP protocols, the Connector for Outlook communicates with the Oracle Email server(s), which handles incoming/outgoing e-mail messages, voicemail messages and faxes. It also connects with the Calendar Server using the Oracle Calendar API for meetings, events, tasks, contacts, notes and journals. Because it maintains a persistent connection with the server, changes to a users schedule are immediately reflected on the desktop. The user can also synchronize their offline store with the information on both the calendar and e-mail servers in the event that they need access to their information while not on the network.

Oracle Connector for Outlook can coexist freely with a number of other service providers that interact with Outlook through MAPI, such as the Personal Folders, Personal Address Book and virus protection software. In essence, users maintain the features available in Outlook, such as Journals, Tasks, Notes, Contacts and access to online collaboration tools (Web Conferencing), with one major advantage;

real-time calendaring. Because Outlook no longer relies on Microsoft Exchange for calendaring, it is no longer subject to the deficiencies of a message-based solution. Users now have instant access to relevant information, bringing more power to features such as auto-pick, checking availability and attendance status and PDA/mobile device synchronization using supported Outlook synchronization tools.



Oracle Calendar Desktop Client

The desktop client provides feature rich calendaring to users running Windows, Macintosh, Linux and Solaris. With full support for cross-platform environments, organizations can choose any combination of server and client platforms to extend support to all employees. And, since it maintains the norms and conventions of each operating system (OS), the desktop client is intuitive to use. Mac users will feel at home using the desktop client on Mac OS X while Windows users will find all they need by right-clicking on the application and accessing the context menus. Maintaining OS conventions flattens the learning curve, permitting the user base to get up and running quickly without the need for costly training, thus decreasing the total cost of ownership.

Designed with the power user in mind, Oracle Calendar desktop client offers fast and easy access to the calendar data, no matter whether you are online or offline. The desktop client can be configured to download the agendas of frequently invited people, resources or groups. Users maintain the ability to resolve scheduling conflicts and locate another user, even when they are not connected to the network.

Oracle Calendar Web Client

The Web client enables performant, feature rich calendaring over the Internet/Intranet, permitting users to have full access to their calendars away from their desks. Developed along side the other clients, the Web client incorporates the latest enhancements in functionality, ensuring that it even fulfills the needs of the power user.

The Web client is also fully integrated with the Oracle Collaboration Suite portal. Much like Outlook, the Collaboration Suite portal gives users an integrated environment for e-mail, calendaring, voicemail and fax. It also encompasses the other components of Collaboration Suite; Files, Wireless & Voice, Web Conferencing and Search, making it the most complete collaborative tool available to end-users.

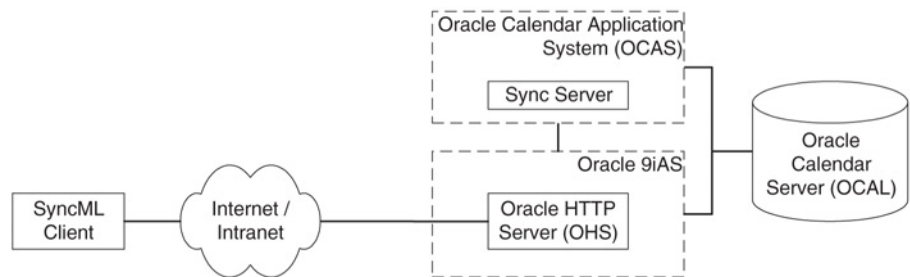
Synchronization Tools

Oracle Calendar offers two synchronization tools for mobile devices, allowing users to synchronize their data while connected to the network so they can access it off-line later.

Oracle Sync Server

Based on standards defined by the Open Mobile Alliance (formerly the SyncML Initiative), Oracle Sync Server synchronizes calendar information between Oracle Calendar Server and other devices over an HTTP connection. The SyncML standard lets Oracle Sync Server transfer calendar data between SyncML-compliant devices and the Calendar Server using standard data formats such as iCalendar, vCalendar and vCard. Whether through a physical connection to the network, or using wireless Internet technologies, the Sync Server provides a means for mobile devices to connect to the server from anywhere, removing the dependence on desktop Clients.

Using a SyncML client, a user connects to Oracle Sync Server through Oracle HTTP server. Then, wrapping standard representations for data objects in SyncML markup, the SyncML client sends all newly modified calendar data for a specified time period to the Sync Server. The Sync Server then queries the Calendar Server for all changes made during the same time period, which is delivered in standard format by the Oracle data provider.



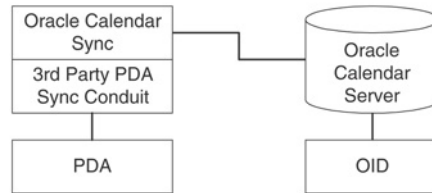
The synchronization engine converts both sets of data from the various formats to a unified object model. It then compares the information from the two sources and determines the appropriate sync actions to take, reformatting the data into the original data format and sending it to the appropriate data repository.

Any existing conflicts, such as a meeting moved on both the server and the mobile device, are resolved at this stage. Oracle Sync Server uses intelligent conflict resolution; determining who owns the event, and who is permitted to modify it.

Oracle Calendar Sync

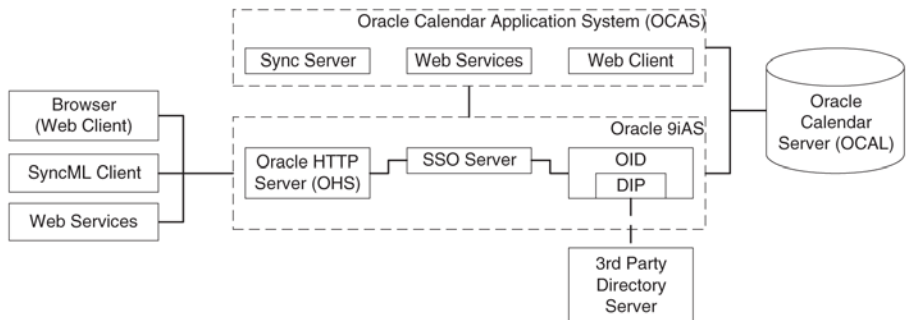
Oracle Calendar also offers more traditional desktop/cradle synchronization with Palm OS handheld and Windows CE 3.x and above devices. Users can synchronize events, contacts, notes and tasks between their PDA and the Oracle Calendar Server, gaining access to information such as meeting attendees/resources and attendee status – extending the PDA beyond Personal Information Management (PIM).

Oracle Calendar replaces the desktop application with a conduit directly linked to the calendar store. Oracle’s sync preference menu allows the user to customize the amount of information that is synchronized, as well as download attendee lists and meeting details. A detailed log of all transactions helps you keep track of all changes made on both the calendar and handheld side.



Integration with Oracle 9i Application Server

The Oracle Calendar Application System (OCAS) is delivered by Oracle HTTP server (OHS), a component of Oracle 9i Application Server. OCAS comprises the Web client, Sync Server and Web Services, which make use of fastCGI technology to establish a set of persistent connections to the Calendar Server. Whenever there is a call to an OCAS component, OHS requests the calendar data through one of the open connections. The number of persistent connections is entirely configurable, allowing organizations to adjust the setting based on their usage statistics. This technology reduces the server load and permits the quickest access to the Calendar Server (OCAL).



Oracle Internet Directory

Oracle Internet Directory (OID) is an extensible directory server that is part of the Oracle 9i infrastructure. Taking full advantage of the scalability, performance, security and high availability this architecture affords, it acts as the central user repository for Collaboration Suite components as well as other Oracle applications. These components frequently store data such as user preferences and configurations and policies directly in OID, making them accessible to other applications. This limits the replication of user data across Collaboration Suite and other Oracle applications.

OID is a central point for directory integration and synchronization, supporting all the flexibility and compatibility of the LDAP v3 directory standard. With Oracle's Directory Integration Platform (DIP), organizations can keep their current directory infrastructure, maintaining bi-directional synchronization between the master information repository and OID. Essentially, Oracle Internet Directory behaves as a cache for the directory server information – all administration can be carried out on the master LDAP repository. However, unlike in a traditional directory cache, any changes to directory information made through Oracle applications are made in OID and propagated back to the master directory by DIP.

Whether an organization decides to consolidate their directory information in OID, or maintain their existing directory infrastructure, Oracle Calendar account information will always be current, without the need for manual synchronization.

Oracle Calendar is time management built for a suite – centrally storing all time-based data for streamlined access and across integrated Oracle Collaboration Suite features like Web Conferencing, Wireless & Voice and Oracle Internet Directory.

Single Sign-On

Integration with 9iAS also allows the Oracle Calendar Web client to benefit from Single Sign-On as an authentication method. Once a user is authenticated via the Single Sign-On server (9iAS SSO), their session information is carried through all other applications in the portal. Requests are no longer routed to 9iAS SSO, but are passed directly to the appropriate applications.

The first time a user requests access to Oracle Calendar via the Collaboration Suite, the request is routed by the Oracle HTTP server (OHS) to 9iAS SSO, which verifies whether a valid SSO cookie is set. If the SSO cookie is not present, 9iAS SSO requests a username and password, validates the user's credentials against OID, and sets an encrypted, non-persistent cookie in the browser.

Once a valid SSO cookie is set, 9iAS SSO sends an encrypted token back to the Calendar application, confirming that the user is authenticated. The Calendar application also sets a cookie on the browser, confirming the user's right to access the application. Subsequent requests are no longer routed through 9iAS SSO, but are sent directly to the Calendar application. For more information on SSO, see the security section under deployment considerations.

Access Controls

Because Oracle Calendar has the power to bring everyone in an organization together, it has built-in measures to ensure that privacy and confidentiality are not compromised. Users have the ability to set specific access rights for their calendars, which are stored on the server and applicable to all access channels. In this way, access to personal information can be restricted, right down to the individual meeting. It is even possible for an individual to determine whether another individual or group of individuals has the right to invite them to an event.

Events and tasks are divided into 4 categories, public, normal, confidential and private. Public events are viewable by everyone on the system, while other events are completely configurable. Users can determine whether individuals or groups can view the meeting details and attachments, the meeting times, or nothing at all.

Users can also setup designate rights. These rights bestow proxy abilities upon other users. For instance, an executive may give designate rights to their assistant, permitting them to book meetings on their behalf. Designate rights can be given to book events and tasks, as well as reply to events on behalf of another person. Like other access rights, designates rights are general enough to apply to an entire agenda, yet specific enough to be applied to individual meetings.

Accessibility

The advent of new technologies has made information available through multiple channels, such as computers, Personal Digital Assistants (PDA) and mobile phones. This has posed many new challenges to people with disabilities, often making information difficult, if not impossible to retrieve. For instance, the visually impaired cannot rely solely on a computer monitor as a means of information dissemination. Moreover, reliance on the mouse as an input device may cause problems for people with impaired motor skills. Oracle's commitment to people with disabilities goes beyond simply making information available. It extends to ensure that modern technologies are used to enhance the experience of people with disabilities. Oracle is actively engaged with other market-leading technology vendors in addressing apparent technical hurdles.

Oracle Calendar incorporates standards defined in Section 508 of the Americans with Disabilities Act (ADA), a government initiative to provide access to electronic information to people with disabilities. Some of the Section 508 requirements are the ability to set custom color schemes, to interface with text-to-speech translators, to access all functions through the keyboard, and to set up simple menu structures.

As with other Oracle products, Oracle Calendar adheres to the most recent Section 508 requirements. Together with Hardware, OS and Assistive Technology (AT) product manufacturers, Oracle is part of a technology stack that provides the complete accessibility solution.

REAL-TIME AVAILABILITY

Calendar data is only useful if it is up-to-date. Stale information provides little use to someone who needs to know what is happening at a specific moment in time. Originally designed for small offices, message-based solutions rely on e-mail as a delivery vehicle for calendar data. E-mail messages are used to carry event invitations and details, as well as attendance status. This information only becomes viewable to others once it has been processed through an attendee's e-mail inbox. These systems fail the moment a user is cutoff from e-mail for an extended period of time.

Some message-based systems have tried to overcome this deficiency by invoking server-side rules for processing data in a user's inbox. However, this leads to even more inaccuracies since the data is processed using a set of inflexible criteria. Although a meeting may be accepted/declined and published by these rules, it may not be an accurate reflection of the user's real intent. They may have accepted a meeting that the rules dictate the system to reject, or the user may want to tentatively accept the meeting, or leave it as unconfirmed in case something urgent pops-up. This is further complicated by the fact that many systems do not show refused meeting invitations in the calendar view. Oracle Calendar allows users to choose to show refused meetings, giving them a precise overview of the day, week or month.

A good analogy would be the difference between newspapers, which are updated at the time of print (message-based), and live news broadcasts, which can be up-to-the-second (real-time). Since employees work together in an evolving environment, they need to rely on the real-time technology of Oracle Calendar to bring them accurate, timely information.

Unless a user is actually monitoring their e-mail constantly, message-based systems will never be able to give an accurate representation of their availability, leading to both over-booked time, where a user is double or triple booked, and an incorrect representation of free time, where a user's time has been blocked off for meetings they never intend to attend.

Oracle Calendar's real-time technology allows Calendar "clients" to connect with the Calendar "server" via persistent connections, providing instantaneous access to the database. When a user creates/modifies a meeting or event, a single record is instantly created/updated in the calendar database and shared by anyone needing to access it, giving them an up-to-the-second view of free/busy time. This translates into quick searches and up-to-date information, including unconfirmed and newly scheduled events, while minimizing the need for network and resource intensive data replication.

Moreover, Oracle Calendar drives real-time alerts and notifications through Collaboration Suite, removing the dependence on random schedule checking by the end user. Through Oracle Email and Wireless & Voice, Oracle Calendar delivers relevant content to those who need it, when they need it.

With Oracle Calendar, information is represented in user's calendars in real-time – always up-to-date, always relevant – preventing miscommunication and double-bookings and keeping everyone on the same page.

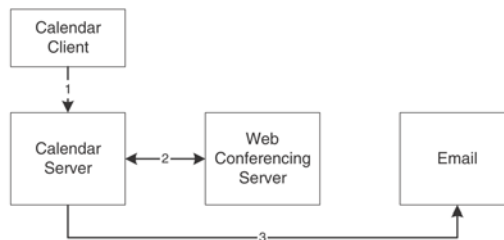
INTEGRATION WITHIN COLLABORATION SUITE

Deployed as part of Collaboration Suite, Oracle Calendar is connected with email, file sharing, voicemail, fax, web conferencing, wireless & voice capabilities and enterprise searching, providing an integrated suite of applications to meet the collaborative needs of today's workforce.

Oracle Web Conferencing

New for Collaboration Suite 9.0.4 is Web Conferencing, an online collaboration tool providing employees, customers, and partners with a common, flexible, Web-based environment for meetings and presentations. Oracle Calendar lets users schedule and join Web Conferences directly from within the calendar application.

Once a user classifies an event as a Web Conference, the Calendar Server communicates with the Web Conference server and obtains the URL for that event. This Web address is then embedded in the meeting so that attendees can view the meeting details and access the Web Conference directly from their calendars. Rather than relying on information contained in an email trail, this schema provides a common repository for information such as the meeting URL, dial-in information and agenda, as well as any pre-meeting documents that need to be reviewed.



1. Client designates a meeting as a Web Conference
2. Calendar Server requests and obtains conference details from Web Conference Server
3. Notification sent to users via e-mail

Furthermore, with the ability to record and archive Web Conferences, users can use their calendar to go back and access previous Web Conferences they may have missed or wish to review, giving them a much more logical way in which to browse scheduled events.

Oracle Wireless & Voice

Already supporting device synchronization for mobile users through the SyncML-based Sync Server, Oracle Calendar further extends the collaborative environment by supporting wireless and voice access to the calendar data. An independent study by iGillottResearch revealed that mobile access to collaborative applications like Calendar could save between five and six hours per employee per week.

The Wireless & Voice server (Oracle9iAS Wireless) grants this access in three unique and complimentary ways:

The first level of connectivity is achieved through the Collaborative Alert Engine. Alerts are messages pushed to a subscriber to provide topic-relevant information. The Calendar application allows users to set a variety of alerts for meetings, events, and tasks. The Alert Engine receives this content from the Calendar Server in real-time, applies a set of filtering rules based on the user's preferences, and delivers the alert to any device via WAP push, Email, SMS messages, instant messaging or voice. Taking this one step further, Oracle9iAS Wireless introduces the concept of presence management, whereby a user's "presence" determines the appropriate means of contact based on location, availability, device capability and personal preference. This eliminates missed notifications as the alerts are automatically routed to the user, no matter where they are or which device they are using.

The second level of integration is achieved with voice access to the calendar. Using VoiceXML, Oracle9iAS Wireless allows users to connect to the Calendar Server using voice channels, such as a telephone or mobile phone. Voice commands are received by a voice gateway, which translates the voice commands into VoiceXML and sends it to Oracle9iAS Wireless. The Wireless and Voice server communicates with the Calendar Server, performs the necessary actions and retrieves the appropriate information. The data is then sent back to the gateway in VoiceXML, translated into a logical voice pattern, and relayed back to the end user. Since Oracle supports standards, organizations are not locked into a particular voice solution and are free to choose whichever VoiceXML-compliant gateway they prefer.

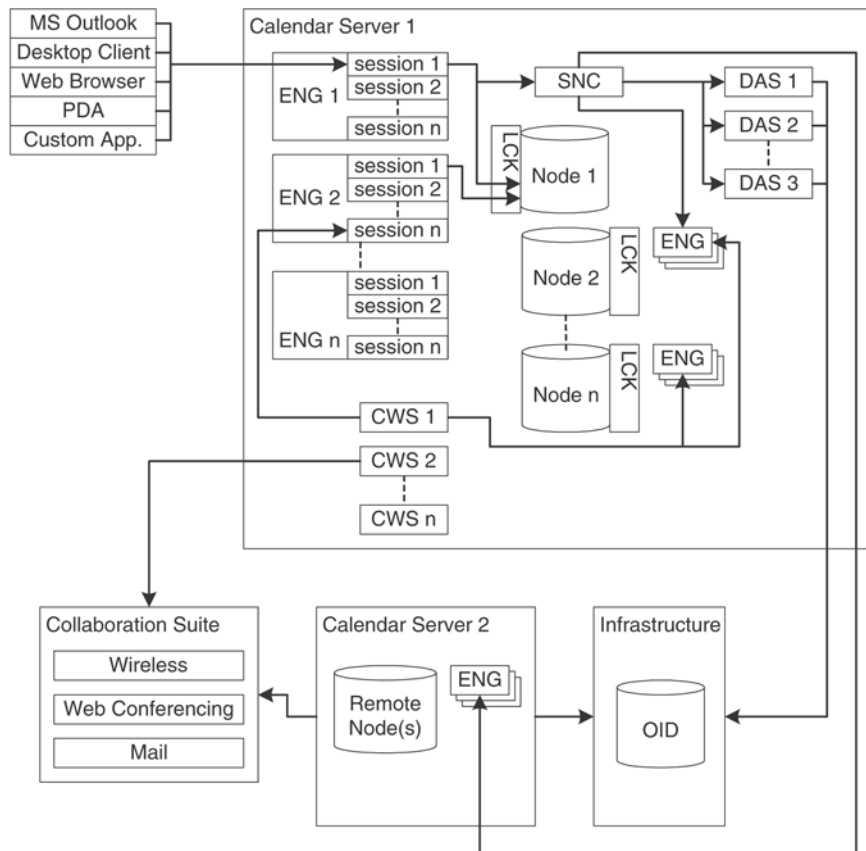
Finally, much like voice access, Oracle9iAS Wireless offers access to Oracle Calendar from a variety of wireless devices, supporting a multitude of technologies. Users send requests to a gateway which interprets the command and relays it to Oracle9iAS Wireless. Again, the Wireless server accesses the Calendar Server and relays the information back to the gateway, which in turn translates the data to the appropriate format and relays it to the user. Oracle9iAS Wireless functions on 2G, 2.5G and 3G networks to support any wireless device, including WAP and i-mode compliant devices. Mobile users have complete access to their schedule from anywhere, using Oracle9iAS Wireless to view, create, modify and delete events from their agenda.

HIGH-PERFORMANCE CALENDAR SERVER

Oracle Calendar's superior architecture permits the server to be less resource intensive and handle more users than any other calendaring system. Since the database is optimized for calendaring and not another application, calendar data can be indexed to provide high performance queries on time sensitive criteria, such as date ranges. Also, by using pointers rather than replicating data, table sizes are kept to a minimum. This reduces the load on the server and increases system efficiency, making Oracle Calendar a fast and scalable solution.

Already hampered by delays and inaccuracies due to unprocessed or rules-driven processing of a user's e-mail inbox, message-based systems are further delayed by the lag time involved with data replication across all the servers in a system. With Oracle Calendar, organizations can consolidate many remote servers into one central environment. This architecture helps people work together more efficiently, increasing their productivity while virtually eliminating double booking.

Using a conglomeration of finely tuned processes (services), the Calendar Server manages all access to the data store, optimizing performance, scalability and hardware usage. The multi-threaded **Calendar Engines** (ENG) service all requests for access to the database (Node). They can be configured to handle a large number of requests; either by spawning new threads (sessions) within the same ENG process, or by spawning new ENG processes altogether (to handle large increases in demand). The **Lock Manager** (LCK) ensures orderly access to the data by queuing and processing each request on a first in, first out basis.



This schema has great advantages over message-based systems in that the ENGs are pulling data from the actual data store, and not a published, out of date representation of it. And the multi-session architecture ensures rapid access to the data, regardless of the volume of incoming requests.

The **Directory Access Server (DAS)** services any request for information stored in OID, such as account information and preferences. Multiple instances of the DAS can be configured depending on an organization's requirements. The **Synchronous Network Connection (SNC)** brokers the incoming requests from the ENG, handing them off to an available DAS.

In the event that there is more than one Node or more than one Calendar Server configured in a network, the SNC will broker connections between the ENGs for the various Nodes. At startup, the SNC opens and maintains a configured number of TCP/IP connections for each Node, which it uses to handle the requests between them, such as reading a user's agenda that is on another Node.

The **Corporate-Wide Services (CWS)** allow the exchange of information between Nodes, ensuring that events involving users on multiple Nodes are kept locally on each Node, guaranteeing rapid access to each person's information. Other functions such as e-mail notifications, wireless alerts, Web Conferencing integration, server-side reminders and communication with OID are also handled by CWS, which can be shared between one or more instances of itself.

Standards-Based Data Model

By defining and implementing standards for the format, transport and storage of data rather than pushing proprietary technologies, Oracle sets the stage for the unification and exchange of enterprise data. The use and support of object-oriented calendar events such as iCalendar (iCal), vCalendar (vCal) and vCard empowers developers to build tools that facilitate data interchange between various, disparate application areas, ultimately bridging the virtual islands of information that exist within most organizations.

As information systems become more and more integrated with business processes, the need to extract and use the information gathered becomes more and more vital. Without a proper strategy for managing information, organizations will be at a competitive disadvantage vis-à-vis companies possessing a strategy for sharing information with employees, customers, suppliers and partners. Standard data formats are the glue that will hold together any "knowledge worker" strategy and ensure the smooth transition of information across applications, departments and organizations.

A key differentiator between message-based systems and Oracle Calendar is the way the calendar data is stored. Because of the optimized database, calendaring functions are more efficient and less taxing on the system. While message-based solutions try to compromise existing message structures, adapting pre-defined fields such as the "subject", "body", and "to" fields, Oracle Calendar data is stored using a format optimized for calendaring, representative of iCal objects.

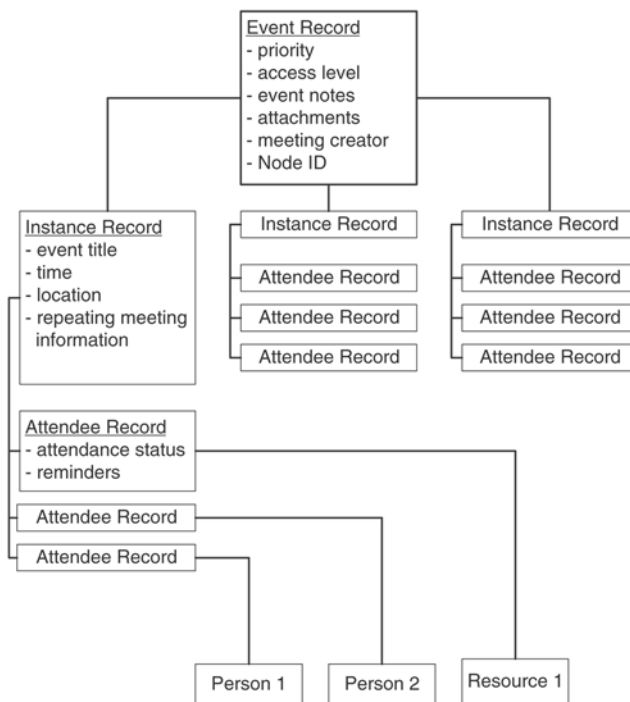
Based on vCalendar, iCalendar objects contain both the calendar details and the format by which they are defined, enabling the exchange of calendar data between applications or systems. Encoded using Multipurpose Internet Mail Extensions

(MIME), iCal objects can be exchanged using a variety of transports, including SMTP and HTTP.

The creation of an event generates three record types, the “event” record, the “instance” record, and the “attendee” record. The event record contains information about the event details, such as priority, access level, event notes and attachments. It also identifies the meeting creator and the Node that the event was created on.

Each occurrence of the meeting will have its own instance record. The instance record keeps track of information such as the event title, time and location. In order to support the widest variety of access channels, Oracle Calendar supports two methods for defining recurring meetings, simply applying recurrence rules to a single instance of an event, or generating multiple instances of an event based on a set of recurrence rules.

Finally, an attendance record is generated for each entity, such as a user or a resource, invited to an instance of an event. The attendance record is used to track information such as the item’s attendance status and reminder settings.



Now that the data is stored in a calendar specific format, it can be easily manipulated, queried and exported, providing real-time calendaring to both end-users and other applications.

A standards-based infrastructure allows Oracle Calendar to interoperate with disparate departmental calendar systems, other Oracle solutions like E-Business Suite and 3rd party business applications, and extend to fit your enterprise environment with a sophisticated Software Development Kit (SDK) and Web Services toolkit.

Interoperability

While Oracle Calendar is scalable enough to encompass an entire organization, there are many reasons why an enterprise may wish to run pockets of users on another system. For instance, a group of users may be using a mission critical, custom built application that is locked in to legacy Lotus Domino technology, requiring more time to be transitioned to an open-ended, Oracle solution. Or, an organization may choose to consolidate its many Exchange servers into one central Oracle server one department at a time.

Furthermore, collaboration extends beyond departments or workgroups, spanning entire organizations and even reaching customers, suppliers and partners. Because of the amount of data being shared, organizations must establish strategies to share and disseminate information, bringing knowledge to their workforce. Co-existence of business applications is key to an organization's "knowledge worker" strategy. Contextual collaboration, the sharing of information across business applications, both within and external to the enterprise is necessary in order to remain competitive.

Through its standards-based technology, Oracle Calendar can co-exist with other enterprise systems, such as Oracle's E-Business Suite, or be extended to reach 3rd party systems, such as a partner's resource scheduler. Oracle Calendar further leverages the interoperability offered by iCal, allowing direct synchronization between disparate calendar systems. Through the use of SyncML, Oracle Sync Server synchronizes iCal data with other SyncML compliant servers.

This level of co-existence will be further enhanced with Oracle Calendar's future implementation of Transport-Independent Interoperability Protocol (iTIP), Message-Based Interoperability Protocol (iMIP) and Calendar Access Protocol (CAP). These protocols will redefine the way in which calendar data is accessed and exchanged between applications, allowing for functionality such as querying 3rd party systems for free/busy times. Oracle's forward thinking, standards-based approach to applications development ensures that organizations can continue to leverage their existing investment in enterprise solutions – benefiting from the latest technology advancements.

Extensibility

While Oracle Calendar is flexible enough to integrate and co-exist with many existing business systems, there may also be a need for some level of customization. Oracle Calendar comes complete with a Software Development Kit (SDK) and a Web Services toolkit, allowing developers to extend the power of Oracle Calendar and offer even tighter integration between business processes, ensuring that an organization can leverage its existing infrastructure to get the most return from the investment made in corporate data.

Oracle Calendar SDK

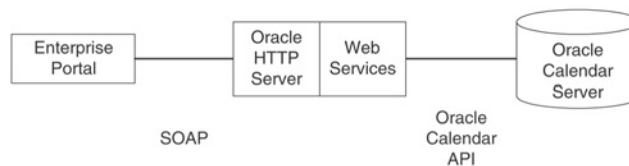
Oracle Calendar SDK (CSDK) contains a set of files and libraries that can be incorporated into custom built applications, allowing them to have direct access to the Calendar Server. CSDK supports standards such as iCal, vCal and vCard, and is already positioned to support their XML representations, xCal and xCard, providing the most flexible and extensible vehicle for information transfer between disparate applications.

Written in C/C++, and having native C and Java interfaces, CSDK can be incorporated into applications developed using C/C++, Java, Visual Basic and a host of other languages. CSDK also supports many data types including meetings, tasks and contacts, allowing organizations to support additional functionality, such as shared contact management. Further enhancing the value of CSDK is its support for multiple platforms, including Windows, Solaris, Linux, HP-UX and MacOS.

CSDK's uses are endless, limited only by an organizations needs and creativity. From simple client side reminder programs to server side import and export utilities, CSDK provides developers with the key to the wealth of information contained in the Oracle Calendar store.

Oracle Calendar Web Services Toolkit

Oracle Calendar Web Services (OCWS) are a collection of existing and emerging technologies that provide a means of integrating calendar data into application environments using Web-based technology. With a combination of Extensible Markup Language (XML), Simple Object Access Protocol (SOAP), Web Service Description Language (WSDL), Universal Description, Discovery Integration (UDDI) and Hyper Text Markup Language (HTTP), OCWS can be used to integrate calendaring functionality directly into corporate portals or to build applications that can source data directly from remote applications using HTTP connections.



In order for remote systems to communicate, OCWS uses xCal objects, which are transmitted over an HTTP connection. By formatting iCal information in XML, the xCal object contains both the information and the definition of what the information represents. For instance, if the iCal object contains a meeting with several attendees, the xCal representation would contain a list of names attached to that meeting. This information is defined as an attendee list, and the receiving server can then process the list of names, mapping that data to appropriate fields in its database structure. The SOAP envelope used to contain the xCal object

contains information about how the receiving server should read the xCal data. It basically separates the data into sections such as the header and body, so that the receiving server can properly parse the information.

Using this standards-based technology, Oracle Calendar maintains an open-ended infrastructure that enables enterprises to communicate across platforms and empowers employees with an integrated collaborative environment.

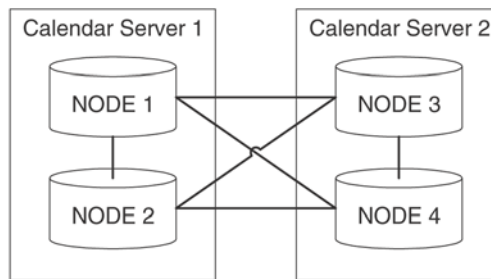
DEPLOYMENT CONSIDERATIONS

Calendar Server

While Oracle Calendar is the most scalable calendar application, there are various reasons why an organization may want to separate and network several repositories (Nodes) together, such as separating employees based on department or time zone. Multiple Nodes can exist for a single instance of the server, in other words on one single machine, or can be spread across several instances. These Nodes are linked together to form a Node network.

To ensure fast response times during directory lookups, such as inviting an attendee or booking a resource, essential user and resource information is copied locally to each Node. Users' agendas, however, are kept local to the Node their account is created on. In order to minimize data replication, only events requiring the presence of users on separate Nodes are replicated to the other data repositories. While this model both increases performance and reduces the strain on network bandwidth, it also ensures that information is retrieved directly from the source Node, eliminating false information due to data replication lag times.

When an event is created involving users on separate Nodes, the event information is copied to the remote Nodes, including all details and attachments, giving the invited user(s) quick access to the event data. Only one copy of the event exists on each Node, with each user/resource account pointing to it for reference. This limits the size of the data tables while maintaining the performance levels necessary to guarantee real-time collaboration.



The advanced Node network allows multiple Nodes to act together as one centralized calendar store, no matter how large or distributed the deployment may be. By organizing and distributing user/resource accounts appropriately, administrators can minimize the amount of data transfer, reduce the number of

event records and increase the performance of Oracle Calendar, all while maintaining the benefits of real-time calendaring.

Security

Security breaches can severely harm an organization. Not only is there a cost associated with the value of a company's proprietary information, but there is also a cost associated with the resulting downtime. When a system's security is compromised, it can take an exorbitant amount of effort to track down and correct the problem, leading to increased operations costs. Since operations costs represent the largest portion of the total cost of ownership (TCO) of any system, security breaches can have adverse effect on TCO.

As part of Collaboration Suite, Oracle Calendar is developed on an "unbreakable" infrastructure. Beyond system availability and reliability, Oracle Calendar ensures that confidential information is protected from malicious attacks. Using a number of security levels, organizations can ensure that their sensitive data is closely guarded against unsanctioned viewers.

Furthermore, to ensure that users are who they say they are, all clients require authentication to communicate with the server. The authentication method may vary from a simple username and password to integrated authorization schemas such as Single Sign-On (SSO) and Kerberos.

Integration with Oracle9iAS allows Oracle Calendar to benefit from SSO's tried and proven security. Supporting a variety of authentication technologies including Kerberos, DCE, smartcards, token cards, biometrics and public key infrastructure (PKI) via standard X.509 certificates and SSL, Oracle9iAS SSO can be configured to fit the security needs of every organization. This extensible platform can also service 3rd party applications, giving an organization's employees one single point of authentication for all corporate web applications, and the semblance of a single, unified Enterprise Information Portal.

Oracle Calendar's integration with Kerberos allows for the use of the Kerberos server as a method of authentication to the Calendar Server. Kerberos tickets are obtained by the client and sent to the Calendar Server for authentication. The Calendar Server authenticates against the Kerberos server then, based on the results, grants or denies access to the client.

Oracle Calendar also relies on its extensible Authentication, Compression and Encryption (ACE) framework to secure server-to-server and server-to-client communication. Authentication is used to initiate secure communication, compression is used to compact the data in order to reduce the amount of network bandwidth required, and encryption is used to encode the data for added security. This framework can be customized to fit any organizations needs, balancing security and network performance, and ensuring that all calendar access is protected by the safeguards incorporated in the Calendar Server.

Finally, because the calendar system is separate from e-mail, the Calendar Server is less likely to be subject to virus attacks. Email born viruses such as Melissa and Code Red can cause mail servers to come to a crashing halt. Since message-based systems rely on e-mail as the transport method for calendar data, organizations using Microsoft Exchange or Lotus Domino would lose access to their calendar system each time their mail server crashed. Oracle Calendar is not at risk to such attacks as the Calendar Server manages calendar data exclusively.

Administration

Operations costs, including system administration, help desk staff and end-user training, typically account for the largest portion of the total cost of ownership (TCO). Since a large part of the cost of operations is server administration, reducing the cost involved with administering the server can greatly reduce TCO.

Organizations can create multiple administrator accounts for Oracle Calendar, each with varying levels of administration rights. In this way, administration of the server can be delegated to more than just one person. Oracle Calendar Administrator, Oracle Calendar's Web administration tool, provides a fast and secure way for a centralized administration team to administer the entire network of Calendar Servers. Using the Oracle9iAS infrastructure, Calendar Administrator runs either CGI or fastCGI scripts through Oracle HTTP Server, connecting server administrators to the Calendar Server, without requiring them to directly login to the machine.

Administrators also have the freedom to setup silent or automatic logins, allowing the Calendar Administrator to be integrated with an organizations Web administration portal. This provides administrators with a simple way to perform routine tasks such as starting and stopping the server, managing accounts, groups and holidays, transferring events from one user to another, backing-up a user's account and modifying the server attributes.

More functionality can be achieved through the command line tools. Useful for troubleshooting, administrators can use the command line interface to invoke various logs, capturing detailed error messages that are useful in debugging issues with the system. They can also provide useful statistics such as the server activity or most popular clients used (Windows desktop client, Connector for Outlook, etc.).

Aside from shipping with over 50 command line utilities, Oracle Calendar also allows administrators to develop their own custom scripts. These scripts may be scheduled or run manually to perform useful tasks such as pre-populating an agenda when an account is created. The built-in utilities allow administrators to perform complex tasks such as backing up a Node or archiving information. Substantial documentation is available for the command line utilities, describing both how to use them and the desired results.

Data Loss Prevention

Oracle Calendar provides administrators with a complete array of tools to help them backup, archive and restore calendar data. The tools are flexible enough to meet various organizational requirements and fit with managed document retention programs.

The backup utilities can be run against live servers, and can be configured to backup an individual node, or the entire system. While the backup utilities copy a node, they lock the database, preventing all write commands such as the creation of an event. Users can still browse their calendars in read-only mode. Any write actions are queued until the backup procedure is complete, ensuring no loss of data or productivity.

Oracle Calendar can also be setup in a mirrored environment, ensuring that there are always multiple up-to-date copies of the server. Companies can choose the level of protection that best suits their needs, from simple nightly (off-peak) backups, to more complex backup and archive schemas where mirrored volumes are swapped in and out, archived and re-synchronized.

Migration

Migrating from a legacy system can be one of the most costly endeavors an organization can make. Without the proper planning or the proper tools, application migration can often negate the benefits of the new system. Oracle's migration tools include complete calendar data migration for applications such as Microsoft Exchange, Sun ONE software and Meeting Maker, ensuring a smooth and secure transition to a real-time, scalable environment.

Microsoft Exchange Migration Tool

Oracle's migration tools comprise of a set of utilities that allow enterprises to move both their email and calendar data from multiple Microsoft Exchange servers to a consolidated Oracle environment. The accounts are first created in OID, which can either act as the master directory server, or be synchronized with an existing directory server, then followed by the migration of user data into the Oracle repository. The migration tool encompasses email, calendar, notes, journal, task and contact data folders, as well as any subfolders that users may have created. While basic import and export utilities can be used to migrate calendar data, the Oracle migration tool maintains all the meeting attributes, including information such as attendee lists and attendance status. This means that the original value of the data is maintained and companies can use it as a foundation to build a better collaborative environment. Furthermore, since the migration window is completely configurable, organizations can take advantage of the opportunity to clean out and archive older data, ensuring that on relevant information is used to populate the new Oracle system.

CONCLUSION

More than just personal information management, Oracle Calendar is time management built for a suite. Leveraging the power of Collaboration Suite, Oracle Calendar enables members of an organization to organize collaborative activities from any location or device, providing up-to-date availability information, resource management through integrated workflow, easy access to shared documents and the ability to schedule and participate in Web Conferences.

As part of an overall “knowledge worker” strategy, Oracle Calendar’s real-time, standards-based infrastructure allows contextual information to be shared by other business applications – offering organizations and individuals intelligent, time and presence-aware services beyond traditional group calendaring and scheduling – all within a secure, highly available environment.

Oracle’s forward looking development will continue to build upon technologies such as the SyncML-based Sync Server and Web Services, as well as emerging technologies such as iMIP, iTIP and CAP – ensuring that organizations can offer collaborative services beyond the limits of the corporate network – reaching customers, suppliers and partners.



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