CLOUD COMPUTING

UNIT-5

DIFFERENCE BETWEEN CLUSTER/GRID/CLOUD COMPUTING

Cluster differs from Cloud and Grid in that a cluster is a group of computers connected by a local area network (LAN), whereas cloud and grid are more wide scale and can be geographically distributed. Another way to put it is to say that a cluster is tightly coupled, whereas a Grid or a cloud is loosely coupled. Also, clusters are made up of machines with similar hardware, whereas clouds and grids are made up of machines with possibly very different hardware configurations.

Common Standards in Cloud Computing

The Open Cloud Consortium

The purpose of the Open Cloud Consortium(OCC) is to support the development of standards for cloud computing and to develop a framework for interoperability among various clouds. The OCC supports the development of benchmarks for cloud computing and is a strong proponent of open source software to be used for cloud

computing. **OCC manages a testing platform and a test-bed for cloud computing called the Open Cloud Test-bed. The group also sponsors workshops and other events related to cloud computing. The OCC is organized into several different working groups. For example, the Working Group on Standards and Interoperability for Clouds That Provide On-Demand Computing Capacity focuses on developing standards for interoperating clouds that provide on-demand computing capacity.**

Some examples are-

- One architecture for clouds that was popularized by a series of Google technical reports describes a *storage cloud* providing a distributed file system, a *compute cloud* supporting MapReduce, and a *data cloud* supporting table services. The open source Hadoop system follows this architecture. These types of cloud architectures support the concept of on demand computing capacity.
- There is also a Working Group on Wide Area Clouds and the Impact of Network Protocols on Clouds. The focus of this working group is on developing technology for wide area clouds, including creation of methodologies and benchmarks to be used for evaluating wide area clouds. This working group is tasked to study the applicability of variants of TCP (Transmission Control Protocol) and the use of other network protocols for clouds. The Open Cloud Test-bed uses Cisco C-Wave and the UIC Teraflow Network for its network connections.

The Distributed Management Task Force(DFTM)

The Distributed Management Task Force enables more effective management of millions of IT systems worldwide by bringing the **IT industry together to collaborate on the**

development, validation and promotion of systems management standards. The group spans the industry with 160 member companies and organizations, and more than 4,000 active participants crossing 43 countries. The DMTF board of directors is led by 16 innovative, industry-leading technology companies. They include Advanced Micro Devices (AMD); Broadcom Corporation; CA, Inc.; Dell; EMC; Fujitsu; HP; Hitachi, Ltd.; IBM; Intel Corporation; Microsoft Corporation; Novell; Oracle; Sun Microsystems, Inc.; Symantec Corporation and VMware, Inc. With this deep and broad reach, DMTF creates standards that **enable interoperable IT management**. DMTF management standards are critical to enabling management interoperability among multi-vendor systems, tools and solutions within the enterprise.

The DMTF started the Virtualization Management Initiative (VMAN). The VMAN unleashes the power of virtualization by delivering broadly supported interoperability and portability standards to virtual computing environments. VMAN enables IT managers to deploy preinstalled, preconfigured solutions across heterogeneous computing networks and to manage those applications through their entire life cycle. Management software vendors offer a broad selection of tools that support the industry standard specifications that are now a part of VMAN. This helps in lowering support and training costs for IT managers. With the technologies available to IT managers through the VMAN Initiative, companies now have a standardized approach to

1. Deploy virtual computer systems
2. Discover and take inventory of virtual computer systems
3. Manage the life cycle of virtual computer systems
4. Add/change/delete virtual resources
5. Monitor virtual systems for health and performance

Open Virtualization Format

The Open Virtualization Format (OVF) is a fairly new standard that has emerged within the VMAN Initiative. **The OVF simplifies interoperability, security, and virtual machine life-cycle management by describing an open, secure, portable, efficient, and extensible format for the packaging and distribution of one or more virtual appliances. The OVF**

specifies procedures and technologies to permit integrity checking of the virtual machines (VM) to ensure that they have not been modified since the package was produced. This enhances security of the format and will help to alleviate security concerns of users who adopt virtual appliances produced by third parties. The OVF also provides mechanisms that support license checking for the enclosed VMs, addressing a key concern of both independent software vendors and customers. Finally, the OVF allows an installed VM to acquire information about its host virtualization platform and runtime environment, which allows the VM to localize the applications it contains and optimize its performance for the particular virtualization environment.

One key feature of the OVF is virtual machine packaging portability. Since OVF is, by design, virtualization platform-neutral, it provides the benefit of enabling platform-specific enhancements to be captured. It also supports many open virtual hard disk formats. Virtual machine properties are captured concisely using OVF metadata. OVF is optimized for secure distribution. It supports content verification and integrity checking based on industry-standard public key infrastructure and provides a basic scheme for management of software licensing. Another benefit of the OVG is a simplified installation and deployment process. The OVF streamlines the entire installation process using metadata to validate the entire package and automatically determine whether a virtual appliance can be installed. It also supports both single-VM and multiple- VM configurations and packages containing complex, multitier services consisting of multiple interdependent VMs.The OVF is designed to be extended as the industry moves forward with virtual appliance technology. It also supports and permits the encoding of vendor-specific metadata to support specific vertical markets.

Standards for Application Developers

The purpose of application development standards is to ensure uniform, consistent, high-quality software solutions. Programming standards are important to programmers for a variety of reasons. Programming standards help to improve the readability of the software, allowing developers to understand new code more quickly and thoroughly. Following are the application standards that are commonly used across the Internet in browsers, for transferring data, sending messages, and securing data. Using Ajax, a web application can request only the content that needs to be updated. This greatly reduces networking bandwidth usage and

page load times. Using asynchronous requests allows a client browser to appear more interactive and to respond to input more quickly. Sections of pages can be reloaded individually. Users generally perceive the application to be faster and more responsive. Ajax can reduce connections to the server, since scripts and style sheets need only be requested once.

ICEfaces Ajax Application Framework

ICEfaces is an integrated Ajax application framework that enables Java EE application developers to easily create and deploy thin-client rich Internet applications in pure Java. ICEfaces is a fully featured product that enterprise developers can use to develop new or existing Java EE applications at no cost. ICEfaces is the most successful enterprise Ajax framework available under open source. The ICEfaces developer community is extremely vibrant, already exceeding 32,000 developers in 36 countries. To run ICEfaces applications, users need to download and install the following products:

- Java 2 Platform, Standard Edition
- Ant
- Tomcat
- ICEfaces
- Web browser (if you don't already have one installed)

Data (XML, JSON)

Extensible Markup Language (XML) is a specification for creating custom markup languages. It is classified as an extensible language because it allows the user to define markup elements. Its purpose is to enable sharing of structured data. XML is often used to describe structured data and to serialize objects. Various XML-based protocols exist to represent data structures for data interchange purposes. Using XML is arguably more complex than using JSON which represents data structures in simple text formatted specifically for data interchange in an uncompressed form.

Both XML and JSON lack mechanisms for representing large binary data types such as images. XML, in combination with other standards, makes it possible to define the content of a document separately from its formatting. The benefit here is the ability to reuse that content in other applications or for other presentation environments. Most important, XML provides a basic syntax that can be used to share information among different kinds of computers, different applications, and different organizations without needing to be converted from one to another.

JavaScript Object Notation (JSON)

JSON is a lightweight computer data interchange format. It is a text-based, human-readable format for representing simple data structures and associative arrays (called objects). The JSON format is specified in Internet Engineering Task Force Request for Comment. The JSON format is often used for transmitting structured data over a network connection in a process called serialization. Its main application is in Ajax web application programming, where it serves as an alternative to the XML format. JSON is based on a subset of the JavaScript programming language. It is considered to be a language-independent data format. Code for parsing and generating JSON data is readily available for a large variety of programming languages.

Solution Stacks (LAMP and LAPP)

LAMP

LAMP is a popular open source solution commonly used to run dynamic web sites and servers. The acronym derives from the fact that it includes **L**inux, **A**pache, **M**ySQL, and **P**HP (or Perl or Python) and is considered by many to be the platform of choice for development and deployment of high-performance web applications which require a solid and reliable foundation. The combination of these technologies is used primarily to define a web server infrastructure or for creating a programming environment for developing software. The

combination of these technologies is used primarily to define a web server infrastructure or for creating a programming environment for developing software.

LAPP (Linux, Apache, PostgreSQL, and PHP(or Perl or Python))

The LAPP stack is an open source web platform that can be used to run dynamic web sites and servers. It is considered by many to be a more powerful alternative to the more popular LAMP stack. These advanced and mature components provide a rock-solid foundation for the development and deployment of high-performance web applications. LAPP offers SSL, PHP, Python, and Perl support for Apache2 and PostgreSQL. There is an administration front-end for PostgreSQL as well as web-based administration modules for configuring Apache2 and PHP. PostgreSQL password encryption is enabled by default. The PostgreSQL user is trusted when connecting over local Unix sockets. Many consider the LAPP stack a more secure out-of-the-box solution than the LAMP stack. The choice of which stack to use is made by developers based on the purpose of their application and the risks they may have to contend with when users begin working with the product.

Standards for Messaging

A message is a unit of information that is moved from one place to another. The term *Standard* also is not always clearly defined.

Simple Message Transfer Protocol (SMTP)

Simple Message Transfer Protocol is arguably the most important protocol in use today for basic messaging. Before SMTP was created, email messages were sent using File Transfer Protocol (FTP). A sender would compose a message and transmit it to the recipient as if it were a file. While this process worked, it had its shortcomings. The FTP protocol was designed to transmit files, not messages, so it did not provide any means for recipients to

identify the sender or for the sender to designate an intended recipient. If a message showed up on an FTP server, it was up to the administrator to open or print it (and sometimes even deliver it) before anyone even knew who it was supposed to be receiving it. SMTP was designed so that sender and recipient information could be transmitted with the message.

Post Office Protocol (POP)

SMTP can be used both to send and receive messages, but using SMTP for this purpose is often impractical or impossible because a client must have a constant connection to the host to receive SMTP messages. The Post Office Protocol (POP) was introduced to circumvent this situation. POP is a lightweight protocol whose single purpose is to download messages from a server. This allows a server to store messages until a client connects and
requests them. Once the client connects, POP servers begin to download the messages and subsequently delete them from the server (a default setting) in order to make room for more messages. Users respond to a message that was downloaded using SMTP.

Internet Messaging Access Protocol (IMAP)

Once mail messages are downloaded with POP, they are automatically deleted from the server when the download process has finished. Thus POP users have to save their messages locally, which can present backup challenges when it is important to store or save messages. Many businesses have compulsory compliance guidelines that require saving messages. It also becomes a problem if users move from computer to computer or use mobile networking, since their messages do not automatically move where they go. To get around these problems, a standard called Internet Messaging Access Protocol was created. **IMAP allows messages to be kept on the server but viewed and manipulated (usually via a browser) as though they were stored locally.**

Syndication (Atom, Atom Publishing Protocol, and RSS)

Content syndication provides citizens convenient access to new content and headlines from government via RSS (Really Simple Syndication) and other online syndication standards. Governments are providing access to more and more information online. As web sites become more complex and difficult to sift through, new or timely content is often buried.

End-User Access to Cloud Computing

YouTube

YouTube is the leader in online video, and a premier destination to watch and share original videos worldwide across the Internet through web sites, mobile devices, blogs, and email. YouTube allows people to easily upload and share video clips on the YouTube web site. On YouTube, people can view first-hand accounts of current events, find videos about their hobbies and interests, and discover the quirky and unusual—all from videos shared by other subscribers. Founded in February 2005, YouTube received funding from Sequoia Capital and was officially launched in December 2005. Chad Hurley and Steve Chen were the first members of the YouTube management team and currently serve as chief executive officer and chief technology officer, respectively. Within a year of its launch, in November 2006, YouTube was purchased by Google in one of the most talked-about acquisitions to date. Since then, YouTube has struck Partnership deals with content providers such as CBS, the BBC, Universal Music Group, Sony Music Group, Warner Music Group, the NBA, and many more.

Facebook

Facebook, Inc., is a leading engineering company located in the heart of Silicon Valley. Facebook was formerly called The facebook and is a free-access social networking web site that is operated and privately owned by Facebook, Inc. While he was a student at Harvard University, Mark Zuckerberg founded Facebook with his roommates, Dustin Moskovitz and Chris Hughes, fellow computer science majors at Harvard. Initially, site membership was limited to Harvard students. Later, membership access was expanded to other colleges in the greater Boston area, the Ivy League, and Stanford University. It later expanded to include any university student, then to any high school student, and, finally, to anyone 13 years old and over. Getting onto Facebook is easy.

Zoho

Zoho is an office productivity suite from AdventNet, Inc., which was founded in 1996. The Zoho product is supported by over 120 developers. To date, Zoho has launched 15 different applications, and more are in the works. Zoho Mail provides ample storage space. You can store and search through every email you have ever sent or received, and it offers offline support so you can take your mail with you. You can read and compose emails without an active Internet connection and send them out once you are connected. Zoho Mail supports both traditional folders as well as labels. A label is a type of folder that you can customize by both name and color. Zoho Mail offers advanced, self-learning algorithms that keep unwanted spam out of your inbox and deliver only legitimate emails. Using Zoho, you can have a personalized email address or create one using the zoho.com domain. Also, there is support for mobile users. Zoho Mail can be read from an iPhone, and support for other mobile phones is expected this year. Integrated instant messaging (IM) is available, so you can send instant messages from within Zoho Mail and, best of all, you don't need to download a separate client.

DimDim Collaboration

Dimdim invested more than 15 person-years of engineering development into making a product to support complex web meetings. This free service lets anyone communicate using rich media in real time. Unlike competing web conference products, Dimdim does not require users to install software on their computers in order to attend a web meeting. Users can start or join meetings using only a few mouse clicks. Dimdim is available as open source software, and it already integrates with CRM and LMS software so it can be extended easily. It is extremely flexible, available in hosted and on-site configurations, and easily customizable.

Dimdim Open Source Community Edition v4.5, code named "Liberty," is meant for developers and highly technical enthusiasts, and for use in noncritical environments. It has nearly all of the features touted by the commercial version of Dimdim (Enterprise) and is based on open source streaming and media components. Dimdim Enterprise is based on commercial streaming and media components (Adobe Flash Server) and runs on top of their SynchroLive Communication Platform. Dimdim has a simple user interface that is easy for presenters and attendees to learn. Meeting hosts and attendees do not have to install anything to broadcast audio or video, because all that is needed is a very tiny plug-in (which is required only if you want to share your desktop.) The free version is not a limited-feature trial

product. Dimdim Free boasts a powerful feature set that allows anyone to host meetings with up to 20 people simultaneously using diversified platforms such as Mac, Windows, and Linux.

Mobile Internet Devices and the Cloud

What Is a Smartphone?

a smartphone is a mobile device that offers advanced capabilities beyond those offered by a typical mobile phone. Modern versions come with PC-like functionality. Many of the newer models have customized operating systems and associated software that provides a standardized interface. Nearly all smartphones have advanced features such as email, Internet access, instant messaging, etc.

Smartphones are much more than just another cell phone. They provide instant access to the web, which translates into immediate collaboration capability.

Mobile Operating Systems for Smartphones

Many regard the smartphone as a minicomputer with a phone. Most smartphones use an identifiable and open source operating system, often with the ability to add user applications.

iPhone

The Apple iPhone uses 4G technology, and its operating system (OS) is based on the Darwin OS. Darwin forms the core set of components on which both the Mac OS X and iPhone OS are based. Darwin is compatible with Single UNIX Specification version 3 (SUSv3) and POSIX UNIX applications and utilities. The iPhone touts features such as Global Positioning System (GPS) mapping, support for enterprise applications such as Microsoft Exchange, the new App Store, etc. The iPhone is a wide-screen mobile device very much like the iPod. It provides users a rich interface with HTML email and an outstanding web browser. The iPhone let us customize our home screen with applications and web clips of your choosing. we can arrange the icons any way you want or even create as many as nine home screens, each customizable to your needs. iPhone supports rich HTML email which allows you to see email attachments in their original format. The iPhone supports more than a dozen file and image formats, including PDF, Microsoft Word, Excel, PowerPoint, and iWork attachments.

Google (Android)

Android is a software platform and operating system for mobile devices that is based on the Linux kernel. It was originally developed by Google and later with the Open Handset Alliance (which is a group of more than 30 technology and mobile companies). The Android operating system is the first complete, open, and free mobile platform. An Android Software Development Kit is available to help developers get started on new applications. Android allows developers to write managed Java code to control a mobile device. Developers can distribute their applications to users of Android mobile phones. There is a marketplace called Android Market that enables developers to easily publish and distribute their applications directly to users of Android-compatible phones.

Blackberry

The BlackBerry solution consists of smartphones integrated with software that enables access to email and other communication services. Developed by the Canadian company Research In Motion (RIM), the BlackBerry is a wireless handheld device originally introduced in 1999 as a two-way pager. In 2002, RIM released their version of the smartphone, named BlackBerry. It supported push email, mobile telephony, text messaging, internet faxing, web browsing, and other wireless information services. BlackBerry first made progress in the commercial marketplace by concentrating on enterprise The BlackBerry offers an end-to-end encryption solution with two transport encryption options, Advanced Encryption Standard (AES) and Triple Data Encryption Standard (Triple DES) for all data transmitted between their BlackBerry Enterprise Server and licensed BlackBerry smartphones. Private encryption keys are generated in a secure, two-way authenticated environment and are assigned to each BlackBerry smartphone user. Each secret key is stored only in the user's secure enterprise email account and on the user's BlackBerry smartphone. Data sent to the BlackBerry is encrypted by the BlackBerry Enterprise Server using the private key retrieved from the user's mailbox. Next, the encrypted information is transported securely across the network to the smartphone, where it is decrypted using the key stored on the smartphone. Data remains encrypted in transit and is never decrypted outside of the corporate firewall email. The BlackBerry has a built-in QWERTY keyboard, optimized for "thumbing" (the use of only the thumbs to type). System navigation is primarily accomplished by a scroll ball in the middle of the device (older devices used a track wheel on the side). Their current solution gives mobile

users access to email, phone, data, applications, games, and the Internet from a state-of-the-art smartphone

Windows Mobile

Windows Mobile is a compact operating system offering a set of basic applications commonly found on mobile devices. It is based on the Microsoft Win32 API. Devices that run Windows Mobile include pocket PCs, smartphones, portable media centers, and on-board computers for certain automobiles. Windows Mobile is designed to appear similar to desktop versions of Microsoft Windows. The platform supports third-party software development.
Originally, Windows Mobile appeared as the pocket PC 2000 operating system, then known as Windows Compact Edition (CE). Since then, Windows Mobile has been updated several times.

Ubuntu Mobile Internet Device (MID)

Ubuntu MID Edition is designed specifically for mobile internet devices (MIDs). Ubuntu MID is based on the popular Linux distribution Ubuntu. Ubuntu MID is highly flexible and customizable. It is an open source platform that is best suited to the kind of product differentiation that reaches target users in the mobile marketplace. MIDs generally have the following common features and attributes:

1. Small size/form factor, typically a 4- to 7-inch touch screen
2. Physical and/or virtual keyboard
3. Wi-Fi, 3G, Bluetooth, GPS, WiMAX
4. 2- to 8-GB Flash or disk storage
6. OpenGL 3D graphics support
7. USB, camera, headphone jack, speakers, microphone
8. Customizable (Flash or Clutter -based) user interface

UNIT-1ST

Nimbus

Nimbus is a toolkit that, once installed on a cluster, provides an infrastructure as a service cloud to its client Amazon EC2 WSDL web service APIs. Nimbus is free and open-source software, subject to the requirements of the Apache License, version 2. Nimbus supports both the hypervisors Xen and KVM and virtual machine schedulers Portable Batch System and Oracle Grid Engine. It allows deployment of self-configured virtual clusters via contextualization. It is configurable with respect to scheduling, networking leases, and usage accounting.

Nimbus: Cloud Computing Software

- Nimbus goals:
  - Allow providers to build clouds
    - Private clouds (privacy, expense considerations)
    - Workspace Service: open source EC2 implementation
  - Allow users to use cloud computing
    - Do whatever it takes to enable scientists to use IaaS
    - Context Broker: turnkey virtual clusters
  - Allow developers to experiment with Nimbus
    - For research or usability/performance improvements
    - Community extensions and contributions

EUCALYPTUS

The Eucalyptus cloud platform pools together existing virtualized infrastructure to create cloud resources for infrastructure as a service, network as a service and storage as a service. **The name Eucalyptus is an acronym for Elastic Utility Computing Architecture for Linking Your Programs To Useful Systems.**

Eucalyptus was founded out of a research project in the Computer Science Department at the University of California, Santa Barbara, and became a for-profit business called Eucalyptus Systems in 2009. Eucalyptus Systems announced a formal agreement with Amazon Web Services (AWS) in March 2012, allowing administrators to move instances between a Eucalyptus private cloud and the Amazon Elastic Compute Cloud (EC2) to create a hybrid cloud. The partnership also allows Eucalyptus to work with Amazon's product teams to develop unique AWS-compatible features.

Eucalyptus features include:

- Supports both Linux and Windows virtual machines (VMs).
- Application program interface- (API) compatible with Amazon EC2 platform.
- Compatible with Amazon Web Services (AWS) and Simple Storage Service (S3).
- Works with multiple hypervisors including VMware, Xen and KVM.
- Can be installed and deployed from source code or DEB and RPM packages.
- Internal processes communications are secured through SOAP and WS-Security.
- Multiple clusters can be virtualized as a single cloud.
- Administrative features such as user and group management and reports.

Version 3.3, which became generally available in June 2013, adds the following features:

- Auto Scaling: Allows application developers to scale Eucalyptus resources up or down based on policies defined using Amazon EC2-compatible APIs and tools
- Elastic Load Balancing: AWS-compatible service that provides greater fault tolerance for applications
- CloudWatch: An AWS-compatible service that allows users to collect metrics, set alarms, identify trends, and take action to ensure applications run smoothly
- Resource Tagging: Fine-grained reporting for showback and chargeback scenarios; allows IT/ DevOps to build reports that show cloud utilization by application, department or user

- Expanded Instance Types: Expanded set of instance types to more closely align to those available in Amazon EC2. Was 5 before, now up to 15 instance types.
- Maintenance Mode: Allows for replication of a virtual machine's hard drive, evacuation of the server node and provides a maintenance window.

AMAZON WEB SERVICE

Amazon Web Services (AWS) is a comprehensive, evolving cloud computing platform provided by Amazon.com. Web services are sometimes called cloud services or remote computing services. The first AWS offerings were launched in 2006 to provide online services for websites and client-side applications.

To minimize the impact of outages and ensure robustness of the system, AWS is geographically diversified into regions. These regions have central hubs in the Eastern USA, Western USA (two locations), Brazil, Ireland, Singapore, Japan, and Australia. Each region comprises multiple smaller geographic areas called availability zones.

The growing AWS collection offers over three dozen diverse services including:

- CloudDrive, which allows users to upload and access music, videos, documents, and photos from Web-connected devices. The service also enables users to stream music to their devices.
- CloudSearch, a scalable search service typically used to integrate customized search capabilities into other applications.
- Dynamo Database (also known as DynamoDB or DDB), a fully-anaged NoSQL database service known for low latencies and scalability.
- Elastic Compute Cloud, which allows business subscribers to run application rogramsand can serve as a practically unlimited set of virtual machines (VMs).
- ElastiCache, a fully managed caching service that is protocol-compliant with Memcached, an open source, high-performance, distributed memory object caching system for peeding up dynamic Web applications by alleviating database load.

- Mechanical Turk, an application program interface (API) that allows developers to integrate human intelligence into Remote Procedure Calls (RPCs) using a network of humans to perform tasks that computers are ill-suited for.
- RedShift, a petabyte-scale data warehouse service designed for analytic workloads, connecting to standard SQL-based clients and business intelligence tools.
- Simple Storage Service (S3), a scalable, high-speed, low-cost service designed for onlinebackup and archiving of data and application programs.

All AWS offerings are billed according to usage. The rates vary from service to service.

UNIT-3RD

Exploring Online Calendar Applications

Most computer users today have embraced keeping their schedules on their PCs. Not that the old-fashioned wall-hanging calendar is dead, it's just that it's a whole lot easier to track appointments and events electronically; the computer does all the busywork for you.

The problem, however, with using calendar software (such as Microsoft Outlook or Windows Calendar) is that all your appointments have to reside on a single computer. If you keep a personal calendar on your home PC, you can't reference it from work or when you're travelling. That limits the calculator program's usefulness. That's why, instead of using a calendar that's wedded to a single computer, many users are moving to web-based calendars.

A web-based calendar service stores your calendars on the Internet, where they can be accessed from any computer that has an Internet connection. This lets you check your schedule when you're on the road, even if your assistant in the office or your spouse at home has added new appointments since you left. Web-based calendars are also extremely easy to share with other users in any location, which make them great for collaborative projects.

Google Calendar

The most popular web-based calendar today, no doubt due to its association with the web's most-used search engine, is Google Calendar (calendar.google.com). Google Calendar is free, full featured, and easy to use. It lets you create both personal and shared calendars, which makes it ideal for tracking business group, family, and community schedules

Yahoo! Calendar

One of Google Calendar's primary competitors is Yahoo! Calendar (calendar.yahoo.com), hosted by its search competitor Yahoo! This web-based calendar looks, feels, and functions quite similarly to Google Calendar, and is also free for anyone to use. most web-based calendars have a similar visual look. (How different can you make a calendar look, anyway?) One subtle difference in Yahoo! Calendar, however, is the presence of an Add Task button. This reflects Yahoo! Calendar's offering of tasks in addition to events. You can still add individual items to your daily schedule, but you can also add longer-term tasks and have their due dates show up on your calendar.

Windows Live Calendar

Because Google and Yahoo! both offer web-based calendars, it's no surprise that the third-largest search site also has a competitive offering. Windows Live Calendar (mail.live.com/mail/calendar.aspx) is Microsoft's web-based calendar, actually part of the Windows Live Hotmail email service. Windows Live Calendar looks a lot like both of its primary competitors. It offers tasks, like Yahoo! Calendar, and also lets you schedule meetings with other calendar and Hotmail users.

Naturally, you can share your calendars with authorized users for group collaboration.

Apple MobileMe Calendar

Apple's MobileMe (www.me.com) is a new competitor in the web-based apps market. It includes online mail, contacts, and calendar, as well as an online photo gallery and file storage The MobileMe Calendar is, of course, a web-based calendar that can be accessed from any computer connected to the Internet, Mac or Windows. What makes it more unique and potentially more useful is that it can also be accessed from Apple's iPhone, which makes it a truly mobile calendar. As with competing calendars, you can display MobileMe in daily, weekly, or monthly modes.

AOL Calendar

America Online isn't quite the powerhouse that it used to be, but it still has millions of users, both paid subscribers and free web users. Any registered user can access AOL Calendar (calendar.aol.com), which integrates with the AOL Instant Messenger (AIM) service for both instant messaging and email. As with competing calendars, AOL Calendar lets you share calendars with authorized users; your calendars can be either private or public.

CalendarHub

Beyond Google, Yahoo!, Apple, and their ilk, many independent sites offer full-featured web-based calendars. Perhaps the most notable of these is CalendarHub (www.calendarhub.com) CalendarHub offers all the features found in the previously discussed webbased calendars—private/public calendars, sharing/collaboration, multiple calendars, task-based to-do lists, and the like. In addition, CalendarHub lets you publish calendars on your blog or website, which makes it great for creating sites for community groups, sports teams, and the like. Other users can sign up to receive email notification of new events, or subscribe to RSS feeds for any calendar view. And, of course, it's completely free.

Calendars Net

Calendars Net (www.calendars.net) is a free web-based calendar designed for companies or individuals who want to add interactive calendars to their websites. A typical calendar fits into a frame on your website, with little coding required. The site also hosts personal calendars in the cloud.

Jotlet

Here's another way to add web-based calendar functionality to your website. Jotlet (www.jotlet.net) is a JavaScript API and library that you can use to build rich calendar functionality into any web page. If you're skilled in HTML programming, this is a good way to build a calendar-based page. The Jotlet API is free for noncommercial use, and also available (for a fee) for commercial sites.

Exploring Online Scheduling Applications

As anyone in a large office knows, scheduling a meeting can be a frustrating experience. Not only do you have to clear time from all the attendees' individual schedules, you also have to make sure that the right-sized meeting room is available at the designated time. Experts claim that it takes seven emails or voice mails to arrange a single meeting; a typical businessperson can spend more than 100 hours each year just scheduling meetings. Enter, then, the online scheduling application. This web-based app takes much of the pain out of scheduling meetings, for both large and small groups**. The typical app requires all users to enter their individual calendars beforehand. When you schedule a meeting, the app checks attendees' schedules for the first available free time for all. The app then generates automated email messages to inform attendees of the meeting request (and the designated time), followed by automatic confirmation emails when attendees accept the invitation. Professionals who schedule appointments with their clients—doctors, lawyers, hairdressers, and the like—face similar scheduling challenges. For this purpose, separate web-based appointment scheduling applications exist.** These apps function similarly to traditional meeting schedulers, but with a focus on customer appointments.

Jiffle

web-based solutions for meeting scheduling is Jiffle (www.jifflenow.com), which schedules meetings, appointments, and the like for the enterprise environment. To track employees' free time, it synchronizes seamlessly with both Microsoft Outlook and Google Calendar.

Presdo

Unlike Jiffle, Presdo (www.presdo.com) is a scheduling tool that isn't limited to a single company. Presdo lets you schedule meetings and events with anyone who has an email address.own Jiffle Calendar application.

Diarised

Diarised (www.diarised.com) is, like Presdo, a web-based meeting maker that users across different companies can use. It helps you pick the best time for a meeting by sending out emails to invitees, letting them choose the best times for them, and then sending you a summary of those best dates. You pick the final date, Diarised notifies everyone via email, and your meeting is scheduled.

Windows Live Events

Event scheduling is now part of Microsoft's bag of tricks. Microsoft's Windows Live Events (home.services.spaces.live.com/events/) is a customized version of its Live Spaces offering; it lets Live Spaces users organize events and share activities between participants.

Schedulebook

Schedulebook (www.schedulebook.com) offers several different types of webbased scheduling services. Depending on the application, you can use Schedulebook to schedule employees, customers, or other interested parties.

The company's three offerings are

- **Schedulebook Professionals**, which is a business-oriented schedule/calendar/planning application
- **Schedulebook Office**, which schedules the use of any shared resource, such as company meeting rooms or even vacation homes
- **Schedulebook Aviation**, which is used by the aviation industry to schedule aircraft, flight training, and similar services

Exploring Online Planning and Task Management

iPrioritize

Sharing to-do lists is important for families, community groups, and businesses.

Your to-do list might be as simple as a grocery list or as complex as a list of activities for a community program or business project. Whatever the application, iPrioritize (www.iprioritize.com) is a good basic to-do list manager.

Bla-Bla List

Bla-Bla List (www.blablalist.com) is another simple to-do list manager. It's web based, of course, so you can access your lists from any location at any time. You can even publish your lists via RSS so that family and coworkers can get instant updates.

Hiveminder

Hiveminder (www.hiveminder.com) is similar to all the previously discussed to-do list managers. What's nice about Hiveminder is that you can enter list items in a kind of freeform fashion, and it will help you create and prioritize lists based on your "brain dumps."

Remember the Milk

When you need to "remember the milk" at the grocery store, check out the aptly named Remember the Milk (www.rememberthemilk.com) web-based todo list manager. Once you create a list, you can arrange reminders via email, instant messaging, or text messages to your mobile phone.

Ta-da List

Here's another web-based to-do list manager. Ta-da List (www.tadalist.com) lets you make all sorts of lists, share them with friends, family, and coworkers, and then check off items as they're completed.

Tudu List

Tudu List (www.tudulist.com) is a little different from other to-do list managers in that it also includes a web-based calendar. Items are added both to the appropriate to-do list and to your calendar, on the date they're due.

TaskTHIS

TaskTHIS (taskthis.darthapo.com) is similar to most other to-do list managers, but offers the ability to add extended notes to any individual task. You can publish your tasks via RSS or share with others via the web.

Vitalist

Like other to-do list managers, Vitalist (www.vitalist.com) organizes all sorts of tasks and projects. It's unique in that it uses the Getting Things Done (GTD) workflow methodology popularized by management consultant David Allen.

TracksLife

Trackslife (www.trackslife.com) is a database-oriented task manager. Each “track” is a separate database that combines columns of money, numbers, words, paragraphs, and yes/no responses. The application sends out reminders of critical events via email or RSS.

Voo2Do

Voo2Do (www.voo2do.com) moves beyond simple to-do list management into more sophisticated priority management. This web-based application lets you set up different projects, organize tasks by project, track time spent and remaining on a given task or project, publish task lists, and even add tasks via email.

HiTask

More sophisticated task management can be had with HiTask (www.hitask.com), a business-oriented task manager. Tasks are added to your calendar and color tagged for easy viewing. The task manager and scheduler both utilize drag-and-drop editing, and you can share and assign tasks and projects to a group of people via the web.

Zoho Planner

Zoho Planner (planner.zoho.com) is perhaps the most sophisticated task planner evaluated here. With Zoho Planner, you create a new page for each project you’re working on,
To that project, you add lists with individual to-dos within each list. Each list item can include extensive notes as well as images. You can share each project page with users you designate. Each todo item also appears on your central calendar.

Collaborating on Event Management

Scheduling a company meeting is one thing; putting together a large-scale event, such as a conference or seminar or trade show, is quite another. An undertaking of this scale involves more than just clearing a few schedules and making sure the conference room is free at 10 a.m. on Friday. A big event is a big project with lots of individual tasks. To stage a successful event, you have to market it to potential attendees, sign up those attendees, process their fee payments, make sure that the event space and conference rooms are properly scheduled, handle travel and hotel arrangements, register attendees when they arrive onsite, manage

event workers, and make sure everything runs on time during the event. It's a tremendous undertaking. It's not surprising, therefore, that several companies have introduced web-based event management applications. What's nice about hosting these apps in the cloud is that you can work on the same master database whether you're in your office before the event or sitting at the registration desk during the event.

Event Planning and Workflow Management

A successful event starts well in advance of its opening date. There are tons of details involved in an event of any size, and managing all those tasks takes quite a bit of computing horsepower—just the thing cloud computing can help you out with. Most event management applications include robust task planning modules, similar to what you'd find in higher-end task management applications or lower-end project management apps

Event Marketing

Unless you let people know about your event, you could be disappointed with the final attendance. To that end, many event management applications include modules to help you market your event.

For example, many apps offer web-based email marketing, which lets you promote your event via targeted email messages. Other apps help you create your own event website (on their cloud computers), which also helps to promote your event.

Event Calendar

Another part of your event marketing mix is an event calendar—an online calendar that displays all the happenings within your overall event. This proves particularly useful if you're hosting a conference or trade show made of lots of individual panels, sessions, or meetings. You can post each individual event on the main event calendar, easily accessed by any attendee or potential attendee with a web browser.

Facilities Scheduling

Unless you're running a one-room meeting, chances are your event involves

multiple rooms and maybe event multiple locations. If so, you need to be able to schedule different rooms for different components of your event; when a participant or group asks for a room, you need to be able to see what's available and when.

To that end, most event management apps include a facilities scheduling module. Ideally, this module ties into the event host's systems, giving you complete power over room or hall scheduling.

Advance Registration

Most larger events require or encourage advance registration of participants. To that end, most event management apps include a web-based registration module, where attendees can sign up (and, in most cases, pay) for the event.

Payment Processing

Collecting payment for your advance and onsite registrants is a key part of the event management experience. You want the event management software to tie payment processing into the registration process, letting you accept payment via credit card, PayPal, or whatever other payment methods you accept.

Travel Management

If you're running a real "hands-on" event, you might want to consider offering travel services to select attendees. This may be as simple as arranging ground transfer services (taxis, buses, and so on) between your local airport and the event hotel, or as advanced as linking into an online travel site or airline reservations system to provide flight reservations. Although not all event management applications offer this type of functionality, it is available with some apps if you need it.

Housing Management

More common is a housing management module that helps match event attendees with available rooms at your event hotel. Many attendees prefer to have the event host handle their hotel reservations, so that you serve as kind of a "one-stop shop" for all your attendees needs. The best event management apps link directly from advance registration and payment into the hotel's

reservation system—and then let you confirm rooms and such at the event site.

Onsite Registration

Your attendees sign up (and probably pay) for your event in advance. But when they arrive on opening day, you need to sign them in, print out badges, provide a welcoming packet, and so forth. All of these tasks are managed by the event management application's onsite registration module. Ideal onsite registration ties into the advance registration and, optionally, the housing management modules of the application. And, because it's all web based, you can manage all onsite activities via a notebook PC at the event site, accessing your main database in the cloud.

Budget Management

Running an event is an expensive and complex undertaking; your overall budget includes hundreds of individual expense items. To that end, your event management application should include a robust accounting or budget management module, to track both your expenses and your income.

Collaborating on Word Processing

How Web-Based Word Processing Works

Microsoft Word is a software program that is installed on your computer's hard disk. Web-based word processors, in contrast, are hosted in the cloud, not on your hard drive—as are the documents you create with these applications.

Exploring Web-Based Word Processors

There are a half-dozen or so really good web-based word processing applications, led by the ever-popular Google Docs.

Google Docs

Google Docs (docs.google.com) is the most popular web-based word processor available

today. Docs is actually a suite of applications that also includes Google Spreadsheets and Google Presentations; the Docs part of the Docs suite is the actual word processing application. Like all things Google, the Google Docs interface is clean and, most important, it works well without imposing a steep learning curve. Basic formatting is easy enough to do, storage space for your documents is generous, and sharing/ collaboration version control is a snap to do.

Adobe Buzzword

Buzzword (buzzword.acrobat.com) is Adobe's entry into the web-based word processor marketplace. Unlike Google Docs, Buzzword runs in Flash, which might be problematic for users with older PCs or those with slow Internet connections. That said, Flash implementation gives Buzzword a snazzy interface and some advanced editing and formatting features.

ajaxWrite

Unlike most other web-based word processors, ajaxWrite (www.ajaxwrite.com) doesn't work with Internet Explorer. Instead, you have to use the Firefox web browser. This not unimportant caveat aside, ajaxWrite's simple interface and clean workspace makes it well liked by many users.

Docly

Docly (www.docly.com) is an interesting application, designed especially for professional writers. What sets Docly apart from other web-based word processors is its focus on copyright management, including the ability to assign a document a Creative Commons license or a traditional "all rights reserved" license. This means that not only can you share and publish your Docly documents, you can also offer them for sale.

Glide Write

Glide Write (www.glidedigital.com) is part of the Glide Business suite of webbased applications. Glide Write itself is an elegant word processor that just happens to integrate seamlessly with other Glide applications, including email and chat. In addition, Glide documents can be viewed on a number of smartphones, including the iPhone, T-Mobile SideKick, and a handful of Treo and BlackBerry models.

iNetWord

The iNetWord (www.inetword.com) web-based word processor is a full-featured application. As you can see in Figure 11.8, iNetWord features a tabbed interface, with each open document appearing on its own tab. You get support for page backgrounds, borders, page numbering, tables, images, and the like. It even comes with a number of predesigned templates for common types of documents.

Collaborating on Spreadsheets

Office users and home users alike use spreadsheets to prepare budgets, create expense reports, perform "what if" analyses, and otherwise crunch their numbers.

And thus we come to those spreadsheets in the cloud, the web-based spreadsheets that let you share your numbers with other users via the Internet. All the advantages of webbased word processors apply to web-based spreadsheets— group collaboration, anywhere/anytime access, portability, and so on.

Benefits of Web-Based Spreadsheets

A web-based spreadsheet application carries with it all the same benefits as you get with other web-based applications:

- Your spreadsheets can be accessed from any Internet-connected computer, not just the computer you originally created the spreadsheet with.
- Your spreadsheets are still accessible if you have a computer problem or hard disk crash.
- You an easily share your spreadsheets with others—enabling workgroup collaboration with users in other locations.

In addition, most web-based spreadsheets today are free—which is not the case with Microsoft Excel and the Office suite. This is especially appealing to cash-starved organizations and even large corporations looking to improve the bottom line. Free is a lot better than the hundreds of dollars per user that you'll pay for Microsoft Office.

Collaborating on Databases

In the past, a large database had to be housed onsite, typically on a large server. That limited database access to users either located in the same physical location or connected to the company's internal database—and excluded, in most instances, traveling workers and users in remote offices. This, in turn, limited the usefulness of the data contained in the database. Today, thanks to cloud computing technology, the underlying data of a database can be stored in the cloud—on collections of web servers—instead of housed in a single physical location. This enables users both inside and outside the company to access the same data, day or night, which increases the usefulness of that data. It's a way to make data universal.

Blist

One of the newest entrants in the web-based database market is Blist (www.blist.com). Blist is a relatively easy-to-use database designed for nontechnical businesspeople; in fact, the company bills it as something of a cross between a spreadsheet and database program.

Cebase

Cebase (www.cebase.com) lets you create new database applications with a few clicks of your mouse; all you have to do is fill in a few forms and make a few choices from some pull-down lists. Data entry is via web forms, and then your data is displayed in a spreadsheet-like layout.

Dabble DB

Similar to Cebase is Dabble DB (www.dabbledb.com). Like Cebase, Dabble DB makes it easy to create new databases and add new records. Your data can be displayed in a number of different views, including the spreadsheet-like table view. You can then sort, group, and filter your data; create various types of reports; and use your data to generate graphs, calendars, and maps. Dabble DB offers three ways to share your data. The Pages option enables you to collect data from other users without granting access to the underlying database. The Users option lets other users access the raw data in the database. And the Schema option uses the Dabble DB JavaScript API to let others interact with your data on other websites.

Lazybase

Lazybase (www.lazybase.com) is a simple online database, better suited for individuals than for large businesses.

TeamDesk

TeamDesk (www.teamdesk.net) is, like QuickBase, a powerful web-based database management application that facilitates advanced application development. You can work from predefined applications for many business functions or create your own custom apps. The TeamDesk Application Library includes applications for project management, marketing, sales, customer support, human resources, billing, and other business functions.

Trackvia

Trackvia (www.trackvia.com) is similar to TeamDesk, in that it lets you create your databases from dozens of sample applications or completely from scratch. You can choose to view several predefined reports for each database application or generate a custom report.

Collaborating on Presentations

Microsoft PowerPoint has ruled the desktop forever, and it's proven difficult to offer competitive functionality in a web-based application; if nothing else, slides with large graphics are slow to upload and download in an efficient manner.

That said, there is a new crop of web-based presentation applications that aim to give PowerPoint a run for its money. The big players, as might be expected, are Google and Zoho, but there are several other applications that are worth considering if you need to take your presentations with you on the road—or collaborate with users in other locations.

BrinkPad

BrinkPad (www.brinkpad.com) is a Java applet that works inside any web browser. It lets you create, save, and publish your presentations and slide shows on the web. It also lets others share and collaborate on your presentations.

Empressr

Empressr (www.empressr.com) offers more functionality than BrinkPad and similar applications, via an interface that should be somewhat familiar to PowerPoint users. You can

insert text, shapes, tables, or charts onto any slide. You can even create custom slide backgrounds.