

Mobile, Web and USB Content Management Solution



Manage, Promote, and Deliver Mobile Content
Copyrighted – Please do NOT distribute

Introduction

Bulletpages

The Content Management Solution (CMS) enables the mass-market delivery of revenue generating mobile, web and USB content.



The Power

- The power of content – it holds a substantial key to exciting the user to browse the portal
- Branded content does hold a major factor for the “colour” on the portal
- However, unbranded content also does add substantial excitement to the offerings
- Content has to be judicious mix of the two to ensure there is a spread on the downloads – the copyright payouts then are not too high as an overall package

Ensuring Traffic

- Freshness on the portal – change the overall content offering every week. If possible, every day
- Focus content on the relevance for the moment – events, festivals, celebrity birthdays / anniversaries ought to be taken into account for the offerings
- Focus on the regional content needs of all the subscribers needs to be accounted for
- Ensure a judicious mix of offerings – music, games, images, applications, infotainment are all taken care of. Just not music alone !!!

Key Features

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Complete Content Management

Content Pricing and Promotions



Content Protection

Performance and Scalability



Simplified Integration

Device Management



Integrated Billing

Administration and Reporting



Functionality

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The functionality provided by the CMS can be largely split into

- Content Delivery
- Content Management
- Portal Creation
- Portal Management

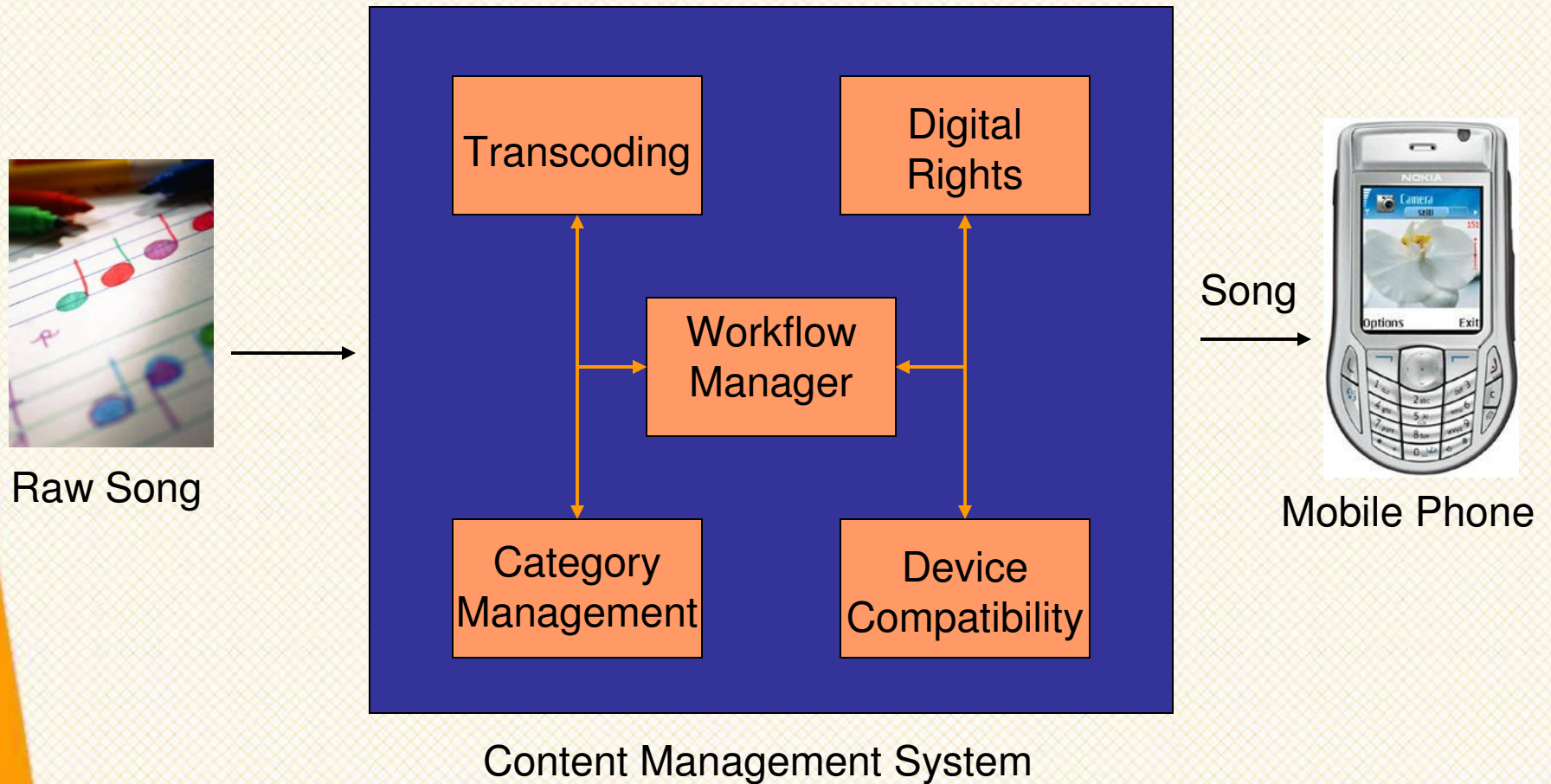
Content Delivery takes place within the context of the User Portal environment where end-users access and utilize services and content offered by an operator

Content Management takes place within an operator's administrative environment where Content Providers work with the operator to manage the

- Submission
- Approval and
- Publication of content to the User Portal environment.

Services

Complete Lifecycle Support



- **Distributed Downloading** - Same content can be:
 - Packaged
 - Priced
 - Promoted
 - Distributed

Differently to suit different market segments

- **Extensible Content Framework** - Support for extensive range of content types. New, legacy, and custom types can be added anytime
- **Content Aggregation** - Support for both:
 - External content aggregation using XML-based interfaces
 - External URLs hosted at 3rd party sites
- **Category Management** - Customizable category types and Multiple-level deep category types



Salient Features

- **Multi-content Downloading:** Wireless delivery of multiple content types through a unique distributed download architecture
- **Complete Content Management:** Manage the entire content lifecycle, from submission and verification to listing and delivery
- **Promote, Price, and Protect Content:** Market content directly to targeted users while supporting digital rights management (DRM)
- **Carrier-Grade Performance and Scalability:** Meets the high-performance and scalability requirements that operators demand
- **Open and Configurable Interfaces:** Easily integrates into an operator's existing network infrastructure, including gateways, subscriber directories, and billing systems
- **Device Management:** Rapidly provide support for new devices while ensuring content is only delivered to compatible devices
- **Administration and Reporting:** Complete Web-based administration with flexible reporting options

Content Management



Types

CMS provides operators with a platform to retail digital media for the following types of media:

Applications / Java Games

Ringtones

Music / Lyrics

Video Clips and Vidlets

Screensavers, Wallpapers

Images and derivatives

Logos / picture messages

Streaming Audio

BREW / Symbian Apps

Text feeds – news, astro, jokes



Allows adding new content types if and when needed

Publishing

Same content can be published on the Web as well as the Mobile portals



Web



Wap

Uploading

- Content providers and developers submit content to the CMS through the predefined interfaces
- A browser based Web interface used for Uploading
- Supports essentially two types of content uploads
 - Single upload - Single file at a time
 - Bulk upload - Multiple content upload as a batch
- Approval and publish – centrally for multiple customers / portals
- Multi language content meta-data uploading possible, including unicode support
- Support all relevant content meta data parameters

Warehousing

- Enables an operator to centrally manage a warehouse of content
- Content is stored in a hierarchical and logical directory structure that enables fast storage and retrieval of content
- Selective distribution of Content to multiple subscriber portals in order to support different affiliates in different physical locations
- Offers support for virtually all content types and other operator-specific content
- Can host content with :
 - Meta-data and downloadable files on CMS
 - Meta-data only on CMS and downloadable file remotely
 - Meta-data and downloadable file, both remote
- Search available on content warehouse for selective packaging / bundling / promotions etc..

Meta Parameters

- **Language** – CMS currently supports subscriber portals in 8 languages including English, Arabic, French, Spanish, and German
- **Title** – The name of the content that appears on the subscriber portals. This can be later modified during the content approval stage
- **Category** – The category name to which a content is associated with. Can be either retained or changed during the content approval stage
- **Content Id** – The Content Provider's internal identifier for the content
- **Album/ Movie** – The movie or album name of movie or music related content
- **Singer** – The singer of a musical content
- **Copyright** – The copyright holder of the content. Relevant for revenue sharing
- **Short and long descriptions** – These parameters can be used to specify some additional information and Help text with the content
- **Availability** – The Availability is the time period for which the content can remain 'Live' on the subscribers' portal
- **Status flag** – There are three flags that a content is associated with – Pending, Approved, and Rejected
- **Keywords** – On the portal, the subscribers can search for contents on the basis of these keywords
- **Billing price point** – CMS supports an Online Charging module. Authorized users can create multiple pricepoints for each content type

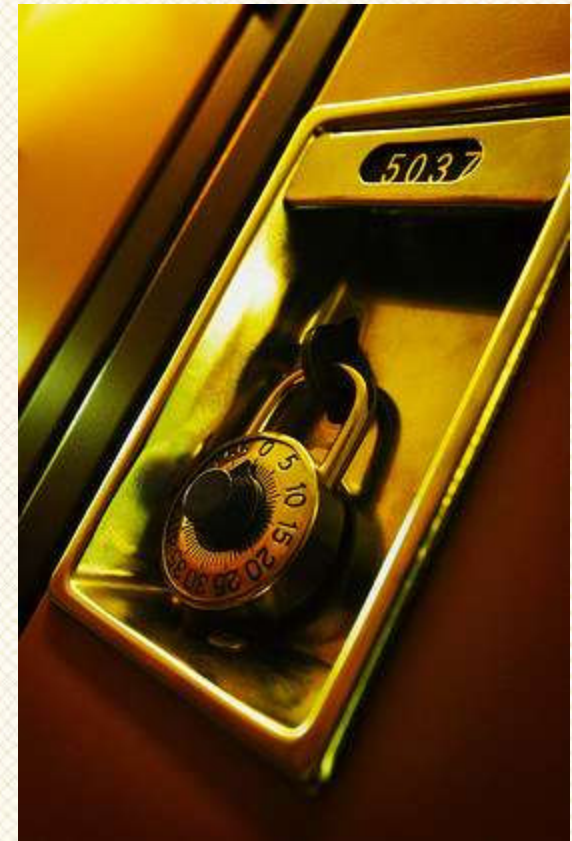
Transcoding

- CMS automatically converts content from one size to another and format to another
- Used when a Content Provider uses Single upload mechanism to upload a content
- CMS generates the same content in all the dimensions that the platform supports
- Transcoding is supported for following content types:
 - Wallpapers
 - Animated wallpapers
 - Color logos
 - Videos
 - Monotones
 - Polytones
 - Truetones
 - Mp3 and Full-track songs



Digital Rights

- Support for OMA (Open Mobile Alliance) DRM standard – versions 1.0 and 2.0
- Wrapping on the fly – hence allows content storage from any CP, even the basic ones
- Supports 3 use cases:
 - Forward lock
 - Combined delivery
 - Separate delivery
 - Flexible price points against settings on the activation key delivery
 - Key delivery over SMS or over WAP



Administration Interface



Client Management

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- Manage the contact and login details of
 - Content Provider
 - Content Approver
 - Content Publisher
 - Portal managers
 - Customer Care personnel
 - Report Reader
- Enable/disable content upload
- Manage the list of copyright agencies
- Manage digital rights
- Add/delete content categories
- Maintain pricing and tax information for the content
- Maintain content types
- Maintain handset details
- Maintain details about geographical regions



Portal Management

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- Manage / Create WAP Portal
- Choose from multiple portlets in any combination, offers infinite design combinations
- Manage / Create Website
- Manage Content Indexing (WAP)
- Manage Content Indexing (WEB)
- WAP Push Sitemap
- Create cross promotions / bundles / discounts / subscription services etc..



Portal Creation

- Mobile contents are sold to the subscribers using portals
- CMS supports creation of three kinds of portals
 - Web-based
 - WAP-based
 - SMS-based
- Portals are linked with CMS and can be updated from a single interface
- Can support mini portals within a master portal for specific customising – regional / user behaviour / subscriber profiling
- Portals integrated with other sub-systems such as logging and billing
- Can toggle between portlets for a UI change – basic content placement remains constant. Quick and easy !!!

Portal Publishing

- CMS supports setting up of multiple Portal Owners on the platform
- For each Portal Owner CMS generates a blank Web and WAP portal
- Multiple portlets available for each portal – use in any combination of the portlet anywhere on the WAP site
- Multiple Web site templates also available on the platform for each portal
- Content Publisher adds contents and customizes the look-and-feel
- CMS allows choice of language for the portal
- CMS can also create region-wise portal by registering multiple Portal Owners in CMP
- Content Publisher can publish only those contents that have passed a quality check
- To publish content on the portal, the Content Publisher makes use of a *Indexing*
- The contents with higher index number appear before contents with lower index number

Portal Options....

- Basic logic :
 - Place any content anywhere and at any price
 - Bring in any combination of content positioning anywhere
 - Change content meta – data anywhere on the portal
- Recommend / Gift content
- Rate downloaded content, automatically offer this as “Telco recommendations”
- Scrollers on every page – promotional text messages customised to every page, can be linked to a remote feed also
- Pre-configured cross promotion links available for adding to every download page
- Happy Hours – buy 3, get 1 free and any other combination available. Pre-configure for the week and automatically available on the WAP sites
- Subscription packages – create multiple options and offer anywhere on the site.
- Bookmark any page with a customised title – collected under “My favourites”, add / delete / edit anytime

Portal Adaptation

- Both **Web** and **WAP portals** are a series of customizable pages where contents and content categories can be added
- Design of the page can also be customized for banners, color, and other look-and-feel attributes
- An **SMS portal** allows a series of menus to be defined and deployed on any short code
- Users can navigate the menu by selecting the appropriate option
- The system keeps track of the user's last command, so that users can select a simple A,B.. option while replying
- The final message from the SMS portal could be a WAP Push pointing to the location of the GPRS content or binary VAS content contained in a text message
- Automatic handset based rendering – create one portlet for automatic mapping to devices – WML, WML lite, xHTML, basic xHTML, advanced xHTML, blackberry, communicator etc., all supported

Subscription Engine

- Advanced options available :
 - Mobile content downloads
 - Text feeds – news, astro, jokes
 - 3G feeds from the helix streaming server
- Flexible pricing options :
 - Pay once, content free
 - Pay once and per content delivery billing
 - Pay per content delivery
- Can combine multiple subscription packs into a single pack also, with pricing flexibility also
- Subscription renewal – auto or single shot
- Fixed duration / delivery until cancellation
- Customisable subscriber message :
 - Subscription acknowledgement / start
 - Renewal alert / re-subscription
- WAP / SMS services into one / individual packages
- Club / content push

Campaigns

- **Campaign Management**

- Campaign definition
- Create advertisements
- Select promotions
- Sponsored content
- “Content bundling” of various types of content for occasions like a festival, new movies, etc



- **Send to a Friend**

- Person-to-person marketing strategy
- Out-of-network support for friends with the use of shortcodes

- **Branding**

- Customizable retail store-fronts with the operators’ look and feel and promotional offers
- Customizable look and feel of the content

- **Pricing** - Flexible pricing plans. Pricing plans include free, pay once, pay per download, pay per use, pay per period, subscriptions, and trials

- **Exhaustive Data analysis**

- subscriber response,
- re-engineer subscriber DB for next campaign

3G integration

- Integrated with a Helix streaming server
- Bring in the pricing option here – the subscription engine is linked to the 3G feeds
- Single point content loading interface – bulk or single files
- Auto FTP to streaming server – linked to the download services
- Can toggle between streaming and download feeds from single interface

..... Future proof

Search Functionality

- Integrated with the Google Mobile / Yahoo mobile API for search (GMAPI)
- Delivers both on deck and off-deck content and browsable search capabilities
- Integrates with the Google and the Yahoo Ad servers
- Customisable search result display options on the handsets.....
- Display on device is based on the basic re-defined WAP portal UI – seamless UI for master portal and search results

Device Management

- CMS includes a comprehensive Device Database of over 4,000 devices
- Device Attributes include
 - Device capability (e.g. XHTML-MP, WML, HTML4.0)
 - Physical attributes
 - Device type (e.g. PDA, HTML Browser)
 - Device characteristics (e.g. is color capable, supports .gif images, supports J2ME, etc.)
 - Supported formats
 - Software capabilities of devices
 - Device classes
- These attributes enable the system to identify the requesting device for content delivery
- Device Database alerted and updated dynamically
- CMS sends an alert to the O&M team if the server is unable to find an exact match within its profiles
- No dependency on the manufacturer to share the device detail

Reporting



Administration

- Administration interfaces
- Ability to communicate with external billing and reporting systems
- Internal reports



Salient Features

- **Wide Variety of Report Types:** Some of the different types of report layout features conditional, summary, form and multiple details.
- **Fast and Easy Report Creation/Maintenance**
- **Microsoft Office Integration:** The Reports have Add-ins for exporting data into Microsoft Excel and Microsoft Access to make reporting from Office data quick and easy.
- **Interactive:** The Reports can be enhanced further by adding drill-downs, alerting, parameter prompts, hyperlinks, field highlighting, running totals, Top N, Bottom N, sorting to turn reports into compelling, interactive content.
- **Complex Reports Made Easy:** Reports address complex requirements with expert-driven features including grouping, sorting
- **High Performance Report Processing:** Comprehensive support for SQL database servers enables faster report processing and better use of network resources.
- **Instant Deployment:** The Reports can be accessed from anywhere due to their availability on the internet. This feature is highly beneficial when replacing an old Report with a new/enhanced version.
- **Easy to Manage:** The system provides easy administration of all objects, folders and servers.
- **Accessing the Database:** An authorized OCG Operator can connect to Database using supported native, ODBC and OLE DB connectivity.

Sample Reports

- Download Report
- Hourly Download Report
- CP Wise Download Report
- Top Download Report by MSISDN
- Mobile Model wise Download Report
- Extensive revenue reporting
- Content Download Report by
 - Artist
 - Album / Movie
 - Record Label
 - Copyrights
 - Device
- Real time traffic reports



Subscriber Experience



Portal Features

Some of the features that the Web/WAP portals support are

- Multiple languages
- Multiple templates
- Customizable look and feel
- Subscriber session
- Buddy lists
- Gift, recommend, or download content
- Redeemable loyalty points
- Search facility
- Automatic listing of top downloaded content under a special section
- Happy hours
- Download history
- View recommendations
- Content preview
- WML/xHTML support on WAP
- Device management
- Content Rating and Recommendation
- Extensive cross promotional links possible

All the above features can be customized using the CMS graphic user interfaces (GUIs)

Portal Demo

Bulletpages

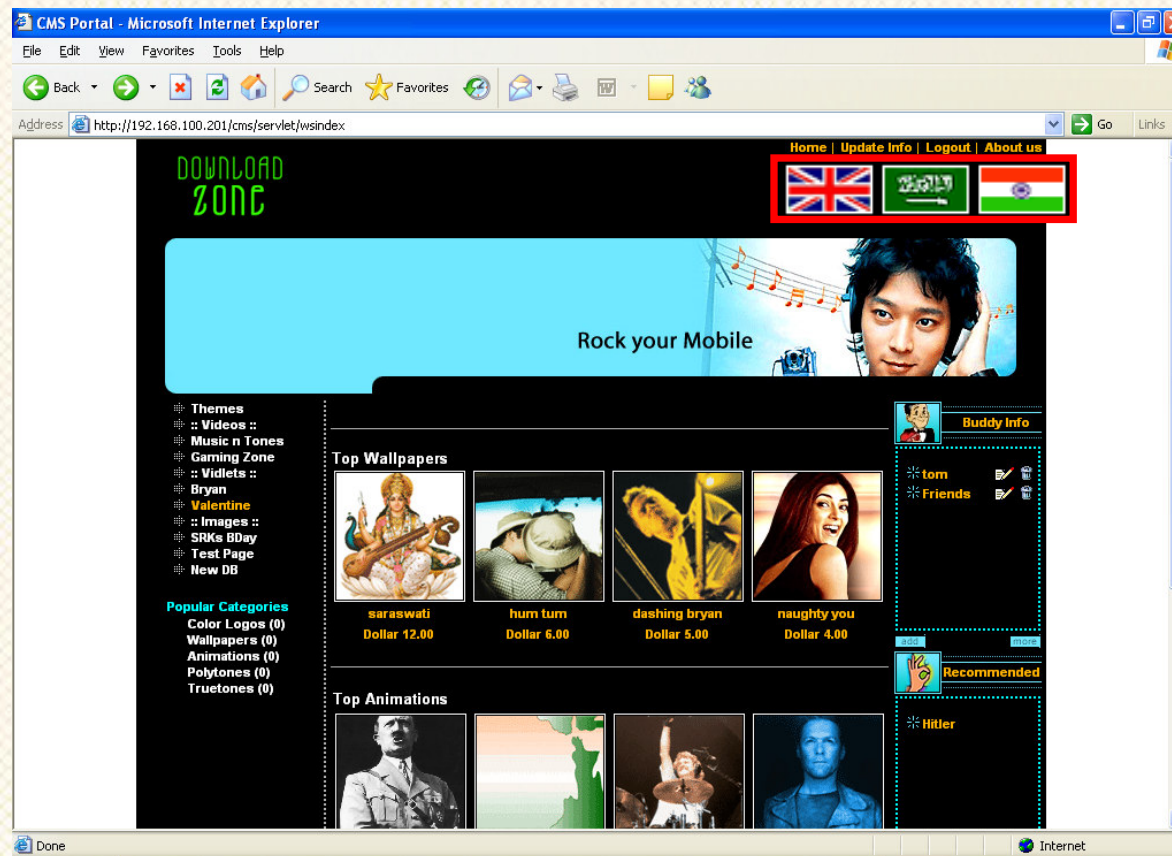
Subscriber Login

The screenshot shows a web browser window with the following elements:

- Browser Title:** CMS Portal - Microsoft Internet Explorer
- Address Bar:** http://192.168.100.201/cms/servlet/wsindex
- Page Header:** Home | Update Info | Logout | About us
- Navigation:** A red-bordered box contains the text "Welcome kusun".
- Main Banner:** "Rock your Mobile" with a background image of a person wearing headphones.
- Left Sidebar:**
 - DOWNLOAD ZONE**
 - Themes
 - Videos
 - Music n Tones
 - Gaming Zone
 - Vidlets
 - Bryan
 - Valentine
 - Images
 - SRKs BDay
 - Test Page
 - New DB
 - Popular Categories:**
 - Color Logos (0)
 - Wallpapers (0)
 - Animations (0)
 - Polytones (0)
 - Truetones (0)
- Right Sidebar:**
 - Buddy Info:** tom, Friends
 - Recommended:** Hitler
- Top Wallpapers:**
 - saraswati: Dollar 12.00
 - hum tum: Dollar 6.00
 - dashing bryan: Dollar 5.00
 - naughty you: Dollar 4.00
- Top Animations:** Four small image thumbnails.

Portal Languages

Multi-language Support



Categories

Category Management

The screenshot shows a web browser window titled "CMS Portal - Microsoft Internet Explorer". The address bar displays "http://192.168.100.201/cms/servlet/wsindex". The page content includes a "DOWNLOAD ZONE" header, a "Rock your Mobile" banner, and a navigation menu on the left. A red-bordered box highlights the "Popular Categories" section, which lists:

- Truetones (0)
- Polytones (7)
- Mp3 (1)

The page also features a "Top Wallpapers" section with four items: "iswati" (12.00), "hum tum" (Dollar 6.00), "dashing bryan" (Dollar 5.00), and "naughty you" (Dollar 4.00). Other sections include "Buddy Info" with a user profile for "tom", "Recommended" with a "Hitler" item, and a "Test Page" link in the left menu.

Community (Buddy)

Buddy List

The screenshot displays a web browser window with the following elements:

- Browser Title:** CMS Portal - Microsoft Internet Explorer
- Address Bar:** http://192.168.100.201/cms/servlet/wsindex
- Page Header:** Home | Update Info | Logout | About us
- Navigation:** Welcome kusun, with flags for UK, Hindi, and India.
- Main Banner:** Rock your Mobile
- Left Sidebar:**
 - Themes
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 - Test Page
 - New DB
- Popular Categories:**
 - Color Logos (0)
 - Wallpapers (0)
 - Animations (0)
 - Polytones (0)
 - Truetones (0)
- Top Wallpapers:**
 - saraswati (Dollar 12.00)
 - hum tum (Dollar 6.00)
 - dashing bryan (Dollar 5.00)
 - naughty you (Dollar 4.00)
- Top Animations:** (Four thumbnails)
- Buddy Info:** (Highlighted with a red box, showing a profile picture and the text 'Buddy Info')
- Recommended:** (Section with a 'Hitler' link)

Subscriber Portal

Bulletpages

Recommendations

The screenshot shows a web browser window titled "CMS Portal - Microsoft Internet Explorer". The address bar displays "http://192.168.100.201/cms/servlet/wsindex". The page content includes a navigation menu with links for "Home", "Update Info", "Logout", and "About us". A "Welcome" message is displayed for a user named "kusum". The main content area features a "DOWNLOAD ZONE" header and a large banner with the text "Rock your Mobile" and an image of a person wearing headphones. Below the banner, there are several sections: "Top Wallpapers" with four items (saraswati, hum tum, dashing bryan, naugh) and "Top Animations" with four items. A "Recommended" section is highlighted with a red box, showing a hand icon and the word "Recommended". The browser's status bar at the bottom indicates "Done" and "Internet".

WAP Portal



J2ME

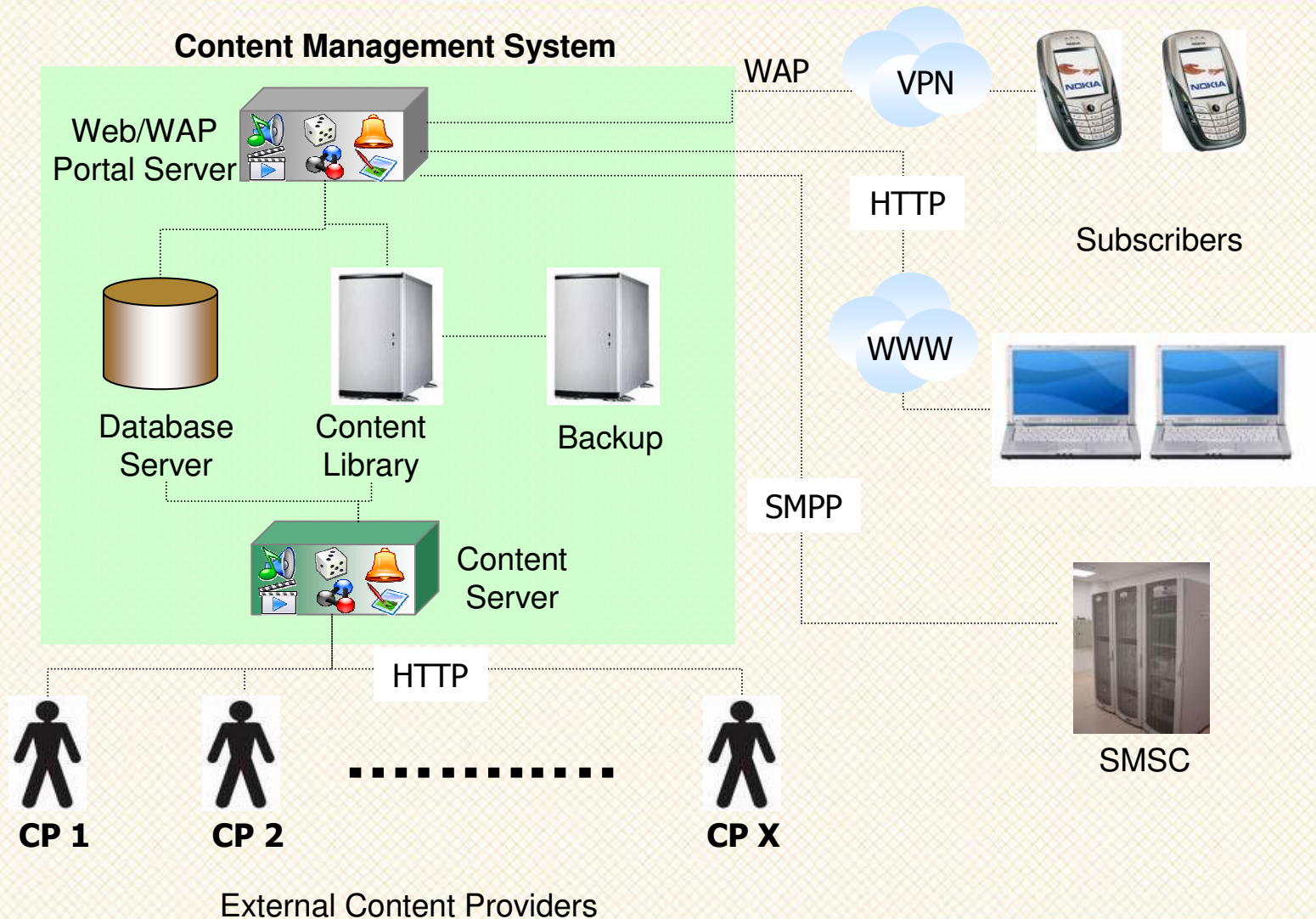
WML

Symbian

xHTML



Network Diagram



Availability

The data is stored on the Database Server, to ensure high **availability** this server has several means of **redundancy** built in, namely:

- Use of RAID Technology on *all* disks
- Redundant Online Log files
- Multiple Power Supplies per Server
- Multiple/Redundant CPUs
- UPS Backups and

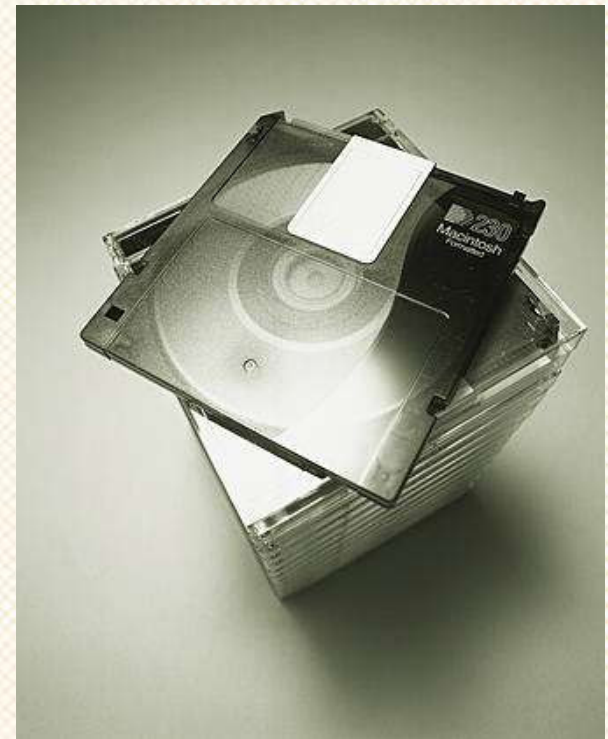
In addition to the redundancy contained on a single server, the data is replicated on the Backup Server (approx. 5 minutes behind) using standard mySQL Replication APIs.

This means that even if multiple disks failed and the multiple backup tapes failed, data could be recovered from the Backup Server.

If the Database Server is not available, the Backup server can be manually configured to assume the role.

Backup and Data Restoration

- Backups can be provided by Veritas Backup Exec software
- Full backups are recommended 3 times a week with incremental backups provided on the alternate days
- All backups are done ONLINE, requiring zero downtime and are typically performed in off hours to reduce any conflict of resources
- Recovery / Restoration is as simple as restoring the latest Veritas backup tape



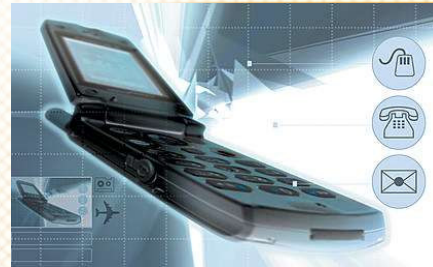
Scalability

- The open architecture approach allows a highly flexible and scalable platform
- For increase in transactions, the CMS can simply be scaled up by adding more Servers
- Apart from providing a highly scalable platform this also allows high availability of the system
- The best installation handles over 400,000 mobile downloads a day!!!
- Pure Linux and a SQL server installation



Future Solutions

- Bring in a Multiplayer gaming engine – integration with the Terraplay gaming server / engine
- User customisable look and feel for a personalised WAP / Web portal
- Integration with a complete Media Management Centre –
 - Campaigns and promotions
 - Contests and opinion polls
 - Exhaustive data analysis for user behaviour on content
 - Exhaustive user broadcast lists – integrated with subscriber behaviour on content
- User self care – view download history and can resend, gift, recommend content from here
- On Device portals – Java and Symbian for an extended user experience with cached content



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