

Marketing Web Site Project

## Technical Architecture

Submitted by



**DIGITAL BOARDWALK**

September 25, 2000

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## Technical Architecture Approval Process

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The Digital Boardwalk process for this Technical Architecture is as follows.

1. Digital Boardwalk creates the first draft of the Technical Architecture.
2. Digital Boardwalk submits the first draft to the client for review.
3. The client reviews the first draft.
4. The client identifies any technical issues that are missing, incompletely specified, or stated incorrectly.
5. The client submits the first draft to Digital Boardwalk with feedback.
6. Digital Boardwalk incorporates the feedback and issues the final version of the Technical Architecture.
7. The client approves and signs off the final version of the document.

## Technical Architecture Sign-Off

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The following signatures represent an understanding of the materials contained in this Technical Architecture document and agreement to the scope and responsibilities described therein.

|                               |       |  |       |
|-------------------------------|-------|--|-------|
| _____                         | _____ | _____                                      | _____ |
| Project Manager<br>The client | Date  | Application Architect<br>Digital Boardwalk | Date  |
| _____                         | _____ | _____                                      | _____ |
| Project Manager<br>The client | Date  | Project Manager<br>Digital Boardwalk       | Date  |



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## Introduction

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The purpose of this document is to outline the technical architecture and identify alternative solutions that meet the business requirements and goals of the client's Marketing Web Site. The architecture is designed to support the functional requirements as defined in the client's Marketing Web Site Functional Specification document as well as enabling the expansion that will be required in the future as a result of growth in service and traffic.

The principles governing the specification of the architecture include:

- The solution must provide the required performance for the anticipated short and long-term load on the system.
- The solution must be scalable without requiring significant alteration other than purchasing additional or higher performance hardware.
- The solution must be reliable to ensure that the level of availability falls within acceptable limits.
- The solution must be secure.
- The solution must be cost effective.
- The solution must be flexible to support future requirements without requiring extensive rework or limiting future choices.
- The solution must allow future expansion to support business growth with minimum service interruption.
- The solution must maximize the ability to continue operation during a hardware failure.
- The solution must be maintainable by the client.

These principles have been applied to each of the decisions made during the specification of the Technical Architecture. The result is an architecture that is tailored to the unique requirements of the client's IS Marketing Web Site. It should be noted that the architecture is highly dependent on business decisions and the final architecture will be based on decisions made by the client.



This document covers the following topics:

- Critical Business and Technical Requirements
- System Components
- Network Configuration Options
- Component Configuration Options
- Recommended Configuration
- Application Architecture

Should you have further questions please feel free to contact the Application Architect.

## *Terminologies*

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The following terms and acronyms are unique or significant to this document.

| Term         | Description  |
|--------------|--|
| ActiveX      | Microsoft's proprietary graphical component model  |
| ASP          | Active Server Page. A server side scripting language that is interpreted by the Web server.  |
| COM          | Component Object Model   |
| Cookie       | A general mechanism that server side connections can use to both store and retrieve information on the client side of the connection.          |
| CRM          | Customer Relations Management  |
| DMZ          | De-militarized Zone - An area of the architecture that is directly accessible to users on the Internet that cannot be guaranteed to be secure. |
| DTD          | Document Type Definition   |
| EJB          | Enterprise Java Beans  |
| HTML         | Hyper-Text Markup Language   |
| HTTP         | Hyper-Text Transfer Protocol   |
| IP           | Internet Protocol  |
| ISDN         | Integrated Services Digital Network  |
| J2EE         | Java 2 Enterprise Edition  |
| Java Servlet | A Java compiled component that runs within a Web server and responds to HTTP requests.   |
| JavaBean     | Java Component Model   |
| JDBC         | Java Database Connectivity   |



| Term    | Description   |
|---------|---|
| JSP     | Java Server Page. A server side scripting language that is used to generate a Java Servlet. |
| ODBC    | Open Database Connectivity  |
| RAID    | Redundant Array of Independent Disks  |
| RPC     | Remote Procedure Call   |
| SOAP    | Simple Object Access Protocol   |
| SQL     | Structured Query Language   |
| UDF     | User Defined Field  |
| UPS     | Uninterruptible Power Supply  |
| WYSIWYG | What You See Is What You Get  |
| XML     | Extensible Markup Language  |
| XSL     | Extensible Stylesheet Language  |



## Critical Business and Technical Requirements

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This section describes the critical business and technical requirements for the client's marketing web site.

### *Business Requirements*

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The Marketing Site Functional Specification outlines the detailed business requirements for the client's Marketing Site. The business requirements outlined below relate specifically to the Technical Architecture and are provided to ensure that these architectural level business requirements are satisfied.

- Provide a cost effective balance of functional and technical requirements against hardware and software costs
- Provide deployment flexibility to support an external hosting provider or allow the client to bring the web site into their own facilities
- Support the major browsers currently in use; IE 4.0, 5.0 and Netscape 4.0 for both PC and Macintosh
- Provide a high degree of availability to ensure that clients and visitors have timely access to the site
- Provide adequate security to prevent attacks and/or access to restricted areas
- Provide performance to support the current number of users and scalability to meet future demands
- Provide automated support for site administration where required
- Allow content to be provided automatically by the client's business region to personalize the user experience on the site
- Provide a strong, expandable platform able to support present and future business initiatives.



## ***Technical Requirements***

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This section describes technical requirements for the client's marketing web site and covers these topics:

- Package Integration Requirements
- Web Performance Requirements
- Availability Requirements
- Security Requirements
- Administration Tool Requirements
- Administration of the Web Site
- Disaster Recovery
- Statistical Reporting Requirements

### **Package Integration Requirements**

The client's Marketing Web Site must integrate with the client's CRM package Clientele while satisfying the following requirements:

- Provide seamless data integration with Clientele's database, without compromising the integrity of the data
- Minimize performance penalties or impact that may be incurred
- Provide a real-time link.



### Web Performance Requirements

The client’s Market Site must meet the following expected web traffic without requiring additional hardware or software:

| Type of Visitor | Source               | At Launch                            | Year One                             |
|-----------------|----------------------|--------------------------------------|--------------------------------------|
| Visitor         | From web statistics  | 2,000 visits/month<br>100 visits/day | 2,000 visits/month<br>100 visits/day |
| Clients         | From estimates email | 280 visits/month<br>28 visits/day    | 2,100 visits/month<br>105 visits/day |
| Partner         | From estimates email | 93 visits/month<br>5 visits/day      | 690 visits/month<br>35 visits/day    |
| Total           |                      | 133 visits/day                       | 240 visits/day                       |

### Availability Requirements

The client’s Marketing Site is expected to achieve a level of availability of 24/7. However, due to practical realities, a downtime not exceeding 1% is considered acceptable. It is recommended that availability be specifically addressed with the hosting provider when negotiating the hosting agreement for the site.

### Security Requirements

The web site must be protected to a reasonable degree from the following types of attacks:

- Unauthorized access to restricted areas of the site by the public or client IS employees
- Attacks intended to alter content, or destroy or damage the web site hardware or software
- Attacks intended to deny service to the client’s IS clients.

The primary level of security identified in this document will be provided through the use of hardware/software firewalls. This security architecture is deemed adequate to provide the level of security needed for the marketing site.



## Administration Tool Requirements

The client's Marketing Site is primarily a graphics oriented site where content management is a major requirement. The ability to easily add, modify and remove content from the site is necessary to ensure that the content can be refreshed on a regular basis.

## Administration of the Web Site

This Technical Architecture does not address the administration of the site. The administration of the client's Marketing Site is an organizational requirement that must be addressed by the client internally. To facilitate the development of an administration plan, the Technical Architecture provides an outline of the roles required to operate and maintain the client's Marketing Web site. These roles and responsibilities are outlined in "Appendix 1 – Maintenance Roles and Operations."

## Disaster Recovery

This Technical Architecture does not define a formal disaster recovery solution. All hardware and software devices identified within the Technical Architecture have redundancy options and features built-in to reduce the likelihood of failure. The Network Administrator working with the Web Hosting Facility provider will determine the disaster recovery plan in the event that the individual redundancy options fail. The role of the Network Administrator is defined in "Appendix 1 – Maintenance Roles and Operations."

Some of the options for ensuring no significant downtime is incurred in the event of a disaster include:

- A fully equipped, secondary back-up facility that can be brought into service as soon as the primary facility is affected
- Regular backup of the site content and data. This type of back up plan would only allow recovery in the case of the corruption or destruction of data
- A UPS at the primary site to guard against power bumps and/or temporary power outages.



## Statistical Reporting Requirements

This Technical Architecture does not describe a method of reporting and understanding the behavior and usage of the client's Marketing Web site. The monitoring and reporting on the behavior and usage of the client's Marketing Web site should be determined by the web hosting facility and the Network Administrator as described in "Appendix 1 – Maintenance Roles and Operations." A sample of a typical Web site behavior and usage report is described in "Appendix 2 – Sample Web Hosting Report", to assist the client with determining an appropriate reporting strategy.



## System Components

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This section describes the components that make up the CIS marketing web site and the functional requirements for each individual component. In later sections these components are shown in a number of different network topology arrangements and in a number of different vendor configurations to meet the client's needs. All hardware and software server components are required to be reliable and scalable to meet the present and future business and technical requirements defined earlier.

This section covers the following topics:

- Web Browser
- Web Administrator's Browser
- Web Server
- Web Database Server
- Streaming Server
- CRM Messaging Server [Optional]
- Firewall



## *Web Browser*

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The web browser manages the presentation and interaction with the user.

It has the following functional requirements:

- Supports HTML
- Supports media Plug-ins
  - Shockwave
  - Flash
- Supports audio and video streams
- Supports client side cookies
- Supports JavaScript
- Supports SSL

## *Web Administrator's Browser*

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The web administrator's browser Manages the content of the client's Marketing Web site. It has the following functional requirements:

- Microsoft's Internet Explore 5.0
- Support for JavaScript
- Support for SSL



## *Web Server*

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The web server manages the distribution of web page to the Internet, the delivery of email, maintenance of email address lists, and manages Threaded Discussions. It has the following functional requirements:

- Serves static HTML
- Serves images
- Runs server side scripting (i.e. ASP or JSP)
- Runs server components (i.e. COM or JavaBean)
- Generates and mails custom database driven emails
- Identifies invalid email addresses
- Serves HTML emails
- Manages Threaded Discussions

## *Web Database Server*

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The web database server manages the storage of messages within the Web Server's Threaded Discussion. It has the following functional requirement

- Store discussion messages

The web database server also has the following non-functional requirements:

- Reliable solution
  - Redundancy
  - RAID
- Scalable solution



## *Streaming Server*

---

The Streaming Server manages distribution of video and audio stream to the Internet. It has the following functional requirement:

- Serves video and audio context in streaming formats

The Streaming Server also has the following non-functional requirements:

- Supports today's and future popular streaming formats
- Reliable solution
  - Redundancy
  - RAID
- Scalable solution

**Note:** *The Streaming Server is included as a System Component in the technical architecture as it plays an integral part in the overall solution, however it is not included in the Component Configuration Options section of this document since the Marketing Web Site will be using CIS's existing Streaming Servers.*

## *CRM Messaging Server [Optional]*

---

The CRM Messaging Server manages the CRM requests between the Web Server and the CRM application. It has the following functional requirement:

- Accept and respond to SOAP requests coming from the Internet

The Streaming Server also has the following non-functional requirements:

- Reliable solution
  - Redundancy
  - RAID
- Scalable solution

The CRM Messaging Server is optional, and only required in Network Configuration Option 4. More details on CRM integration and how the CRM Messaging Server works can be found in "Network Option 4" and "CRM Integration."



## *Firewall*

---

Firewalls are security devices designed to protect the client's IS web site from unauthorized access and malicious attacks from the Internet. The firewall has the following functional requirement:

- Manage appropriate and block inappropriate Internet communication.

The firewall also has the following non-functional requirements:

- Reliable solution
  - Redundancy
- Scalable solution

Depending on which of the following network configuration options is ultimately selected, one to three firewalls will be required. Some of these firewalls may already be in place, i.e. the CRM hosting facility's Internet firewall.



## Network Configuration Options

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Five Network Configuration Options have been identified as potential options for the client's IS Marketing Site. This section outlines how the components, described earlier, would be positioned across the CIS extended network and covers the following topics:

- Network Security
- Network Option One
- Network Option Two
- Network Option Three
- Network Option Four
- Network Option Five

All of the options include support for:

- The CRM solution physically co-located with the web site and both located within the client's facilities
- The CRM solution physically separate from the web site with the CRM solution located within the client's facilities and the web site hosted by a third party hosting provider.

**Note:** *The Streaming Server is displayed in the following Network Diagrams as being accessed via the Internet and not located at the Web hosting facility. This is due to the fact that the client's Marketing Web Site will be using CIS's existing Streaming Servers.*



## *Network Security*

---

All five options are built on the same security framework. The following rules will be applied to the selected Network Configuration:

- At least one firewall will be located between the Internet and the Web Hosting Facility. The area behind this firewall will be referred to as the DMZ.
- The DMZ will only contain the servers that are directly accessed by Internet users. The Web Server is directly accessed by Internet users and therefore will be located in the DMZ; the Web Server's database is not directly accessed by Internet users but indirectly via the Web Server and therefore will not be located in the DMZ.
- One firewall will be located between the DMZ and the Secure Zone within the Web Hosting facility.
- The Secure Zone will contain all servers that do not require direct access by Internet users.
- If the site servers are located at multiple hosting facilities and server-to-server communication is provided through a 3rd party network or infrastructure, firewalls will be located at all points of contact between the Secure Zones and the 3rd party network. These firewalls will be configured to block all incoming traffic except communications from other Secure Zones; this is done by blocking all IP addresses with the exception of the IP addresses of the other Secure Zones. A VPN will also be established to encrypt all inter-zone communications.
- Each firewall should be of a different make and model.



The following diagram describes the security zones, their relationships to each other and the locations where firewalls are required.

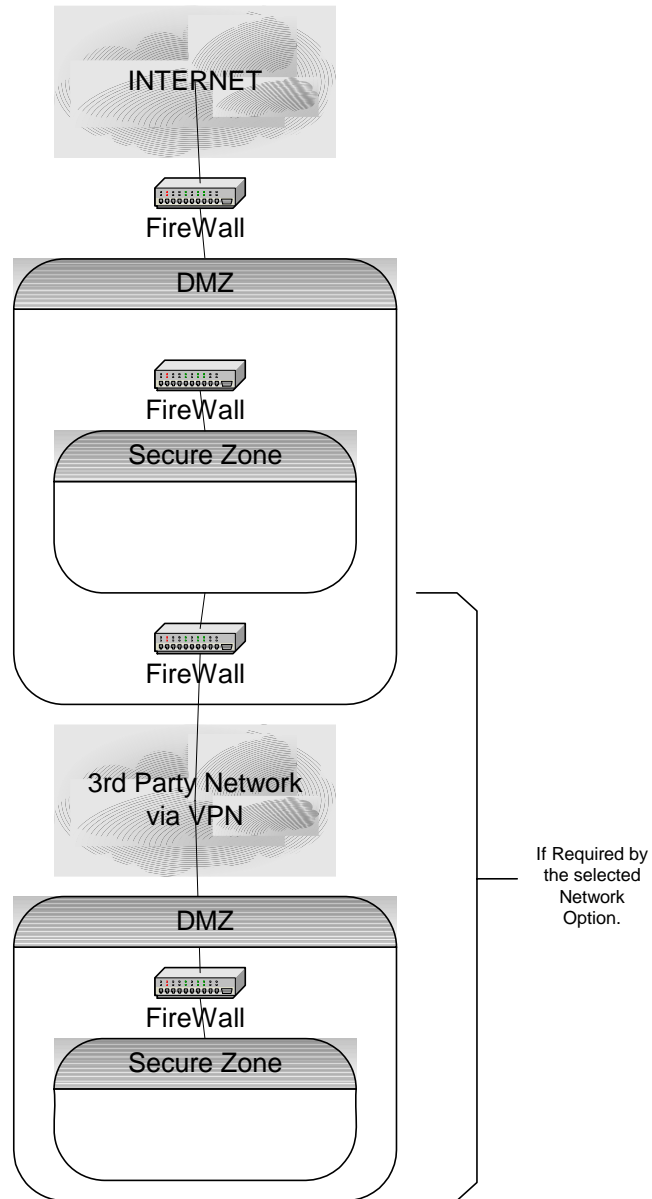


Figure 1 Security Zones diagram



## Network Option One

The implementation strategy calls for a Phase 1 release that will not include any direct integration with Clientele. Network option 1 addresses the network topology of this initial release. Due to the fact that there are no direct communications between the web server and the CRM package, the CRM Server is not included in this network option. Due the fact that the CRM integration is not included in phase 1, the following functionality is also not included in this network option:

- Client Support services
- Support Forum
- Web Database (only required to implement the Support Forum functionality)

The following diagram depicts Network Option One.

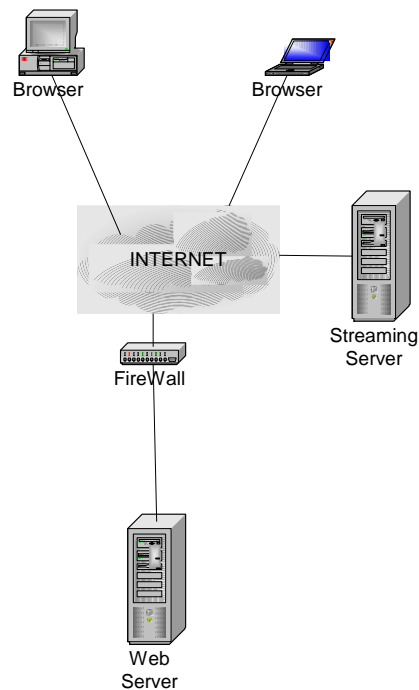


Figure 2 No CRM, Single Hosting Facility Network Diagram

For more information regarding how the Web Server will interact with the CIS CRM package see the “CRM Integration” section.



## *Network Option Two*

---

This option addresses the final release of the client's Marketing Web site. This option places all web site and CRM servers at the same physical hosting facility.

Network Option Two has the following advantages:

- Network performance is high since all servers are located at one facility and messages passed between servers never leave the high-speed local network.
- Higher network reliability due to the fact that there is no dependence on 3rd party network infrastructure management and support.
- Reduced database costs due to the reuse of existing database servers and their database administrators. CIS can share its Clientele's Microsoft SQL Server database with the Web Database Server.

Network Option Two has the following disadvantages:

- The support staff at the CIS CRM hosting facility will require additional skills and administrative tasks. This is due to the fact that they will be administrating the existing infrastructure as well as the web servers for the Marketing Site.
- Additional bandwidth maybe required at the CRM hosting facility to support the higher volume of traffic through the web server.



The following diagram depicts Network Option Two.

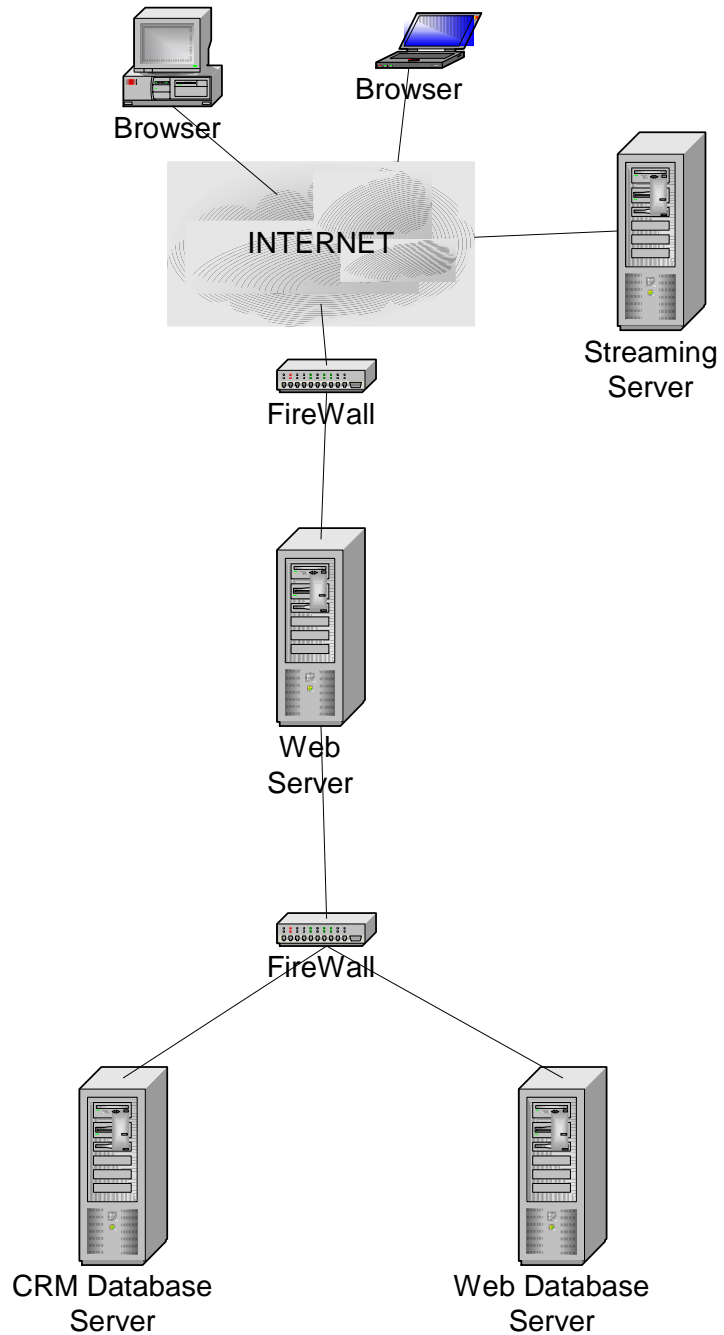


Figure 3 CRM, Single Hosting Facility Network Diagram



## Network Option Three

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This option addresses the final release of the client's Marketing Web site. This option splits the web hosting and CRM hosting and places them in two separate hosting facilities. A point-to-point leased line (i.e. ISDN, T1, or T3) will provide the communication between the two hosting facilities.

Network Option Three has the following advantages:

- This option allows for a 3rd party to manage the administration for the CIS web site.
- Reduced database costs in the form of reusing the existing database server and its database administration. Clientele's Microsoft SQL Server database can be shared with the Web Database Server.

Network Option Three has the following disadvantages:

- Additional cost of a leased ISDN line.
- Additional cost of two firewalls. The two firewalls will be located at both ends of the ISDN line. The two firewalls are in addition to the firewall protecting the web hosting facility for the Internet in all proposed Network Options.
- Reduced performance on web pages that require CRM access or functionality. The impact on performance will correspond to the difference between the web hosting network (100Mbit/s) and the speed of the point-to-point leased line (128Kbit/s to 8Mbits/s). The CRM package will be managing client and CIS staff passwords so authentication for every web visitor will require CRM access.
- Additional bandwidth may be required at the CRM hosting facility to support CRM requests coming from the web server. This would require less additional bandwidth than the additional bandwidth required in option 2.
- Security risks as client information will be transmitted via a 3rd party infrastructure. The exposed data would be primarily the user authentication information.



The following diagram depicts Network Option Three.

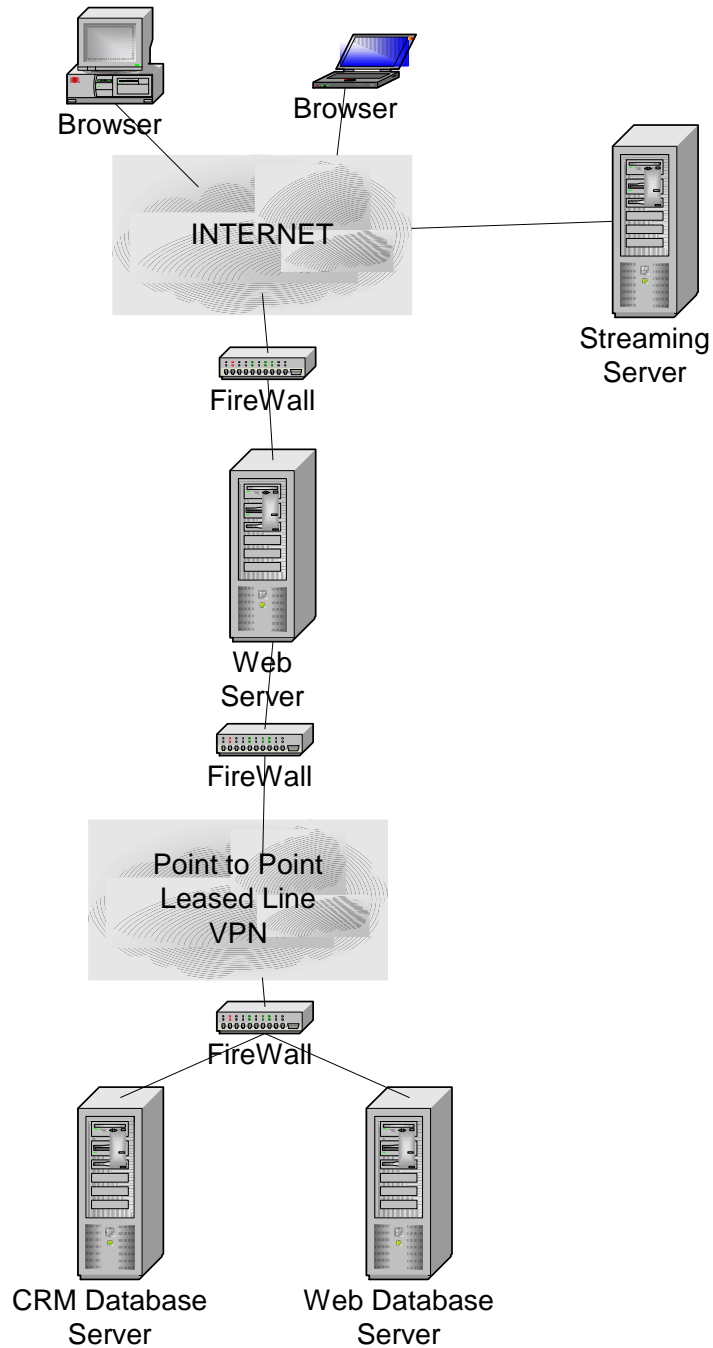


Figure 4 CRM, Multiple Hosting Facility over ISDN Network Diagram



## ***Network Option Four***

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This option addresses the final release of the client's Marketing Web site. This option splits the web hosting and CRM hosting and places them in two separate hosting facilities. This option differs from option 3 by using the Internet to communicate between the web hosting facility and the CRM hosting facility.

Network Option Four has the following advantages:

- Cost savings by eliminating the point-to-point leased line costs
- Allows for a 3rd party to manage the administration for the CIS web site.

Network Option Four has the following disadvantages:

- Additional cost of one firewall. The firewall will be located at the CRM hosting facility to protect it from the Internet. The firewall is in addition to the firewall protecting the web hosting facility from the Internet in all of the other proposed Network Options.
- Addition of a dedicated database to the web hosting facility to provide database functionality to the Web Database Server.
- Reduced performance on web pages that required CRM access or functionality. The CRM package will be managing client and CIS staff passwords so authentication of all web visitors will require CRM access.
- Additional bandwidth may be required at the CRM hosting facility to support CRM requests coming from the web server. This would require less additional bandwidth than the additional bandwidth required in option 2.
- Addition cost of the CRM Messaging server. The nature and presence of the CRM Messaging server will nominally increase the time to perform a Web server to CRM database request.
- Security risks as client information will be transmitted via a 3rd party infrastructure. The exposed data will primarily be user authentication information.



The following diagram depicts Network Option Four.

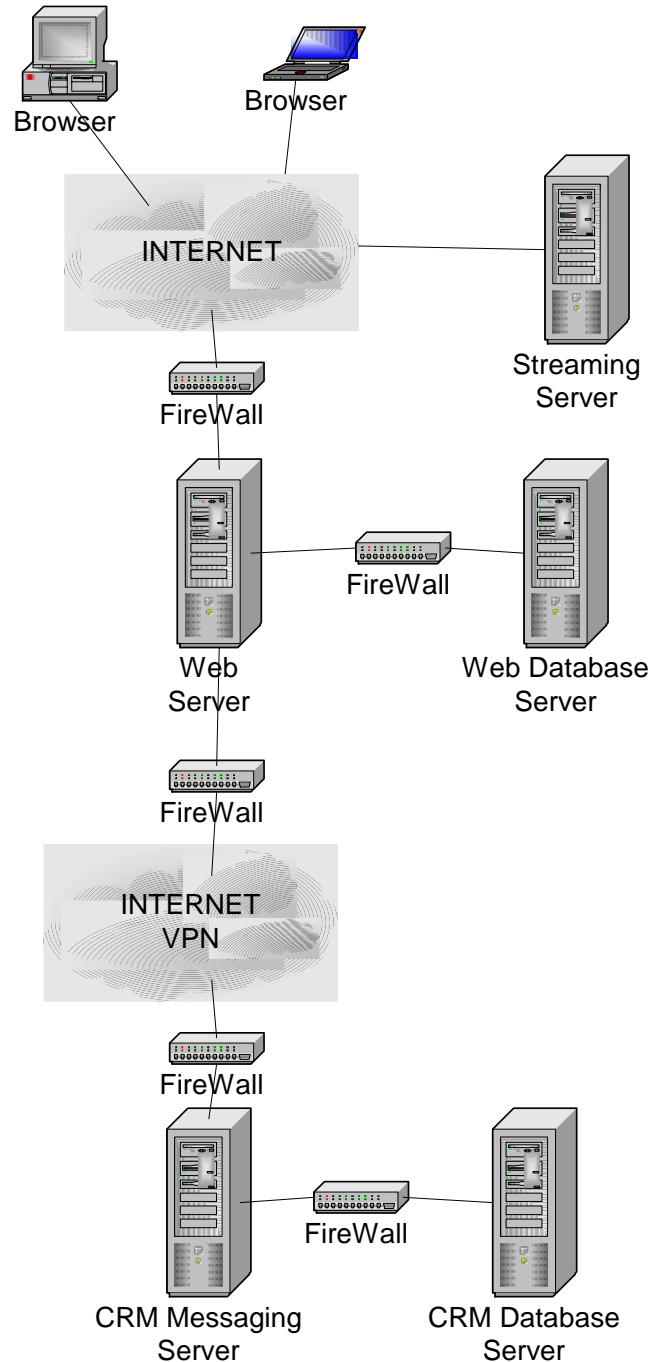


Figure 5 CRM, Multiple Hosting Facility over IP Network Diagram



Digital Boardwalk recommends that if the Hosting facilities for the Marketing Web Site and the CRM implementation are separate and if they are communicating via the Internet then the CRM Messaging Server should be built and that communication with the Messaging Server should be incorporated into the Web Server. JDBC or ODBC is not suitable or a recommended method of communicating with a database over the Internet. SOAP is a suitable, interoperable method of communicating; the CRM Messaging Server would accept SOAP requests while fulfilling them by accessing the CRM database using JDBC or ODBC. See "Figure 6 CRM Messaging Server Deployment". SOAP is an excellent RPC protocol that is built upon XML and will provide the functionality described in the Request Brokering Object in the "CRM Integration" section.

The dedicated database for the Web Database Server at the Web hosting facility could be moved to the CRM hosting facility, this would again allow for the sharing of the CRM's Microsoft SQL Server database. This would reduce hardware and software costs at the Web hosting facility, while increasing the bandwidth requirements for the CRM hosting facility. The CRM Messaging Server would become a more general SOAP Messaging Server as it would be facilitating the same style of SOAP to ODBC requests as described previously for the Web Database Server.



The following diagram depicts CRM Messaging Server Deployment.

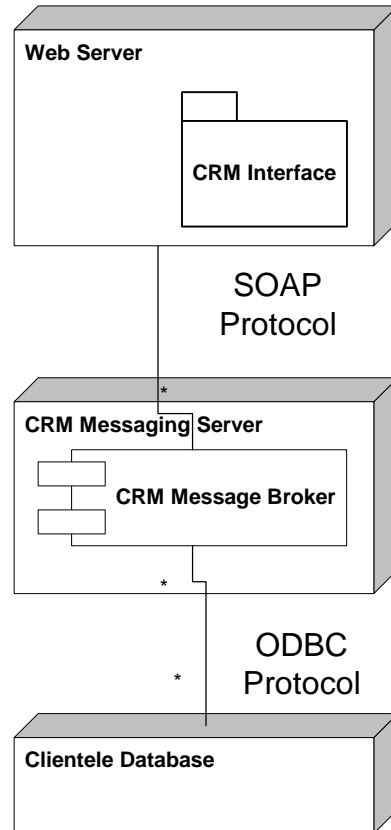


Figure 6 CRM Messaging Server Deployment



## *Network Option Five*

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This option addresses the final release of the client's Marketing Web site. This option splits the web hosting and CRM hosting and places them in two separate hosting facilities. This option differs from option 3 and 4 by introducing a web client database at the web hosting facility, to provide the client related information without having to integrate with the CRM package. Client information would include company and employee information, requests of sales contact, requests of support contact, and marketing questionnaire results.

Network Option Five has the following advantages:

- Improved network performance since all servers are located at one facility and messages passed between servers never leave the fast local network.
- Increased network reliability due to the fact that there is no dependence on 3rd party network infrastructure management and support.
- Cost saving over Network Option 3
  - No point-to-point leased line costs
  - No additional firewalls required
- Cost saving over Network Option 4
  - No CRM Messaging Server
  - No additional firewalls required
- This option allows for a 3rd party to manage the administration for the CIS web site.

Network Option Five has the following disadvantages:

- Reduced accuracy, duplicated, inconsistent, and decentralized customer information. The lack of centralized quality information about a business customer can potentially lead to poor marketing decisions and lost opportunities.
- Expansion of a Web Database to provide client information storage.



The following diagram depicts Network Option Five.

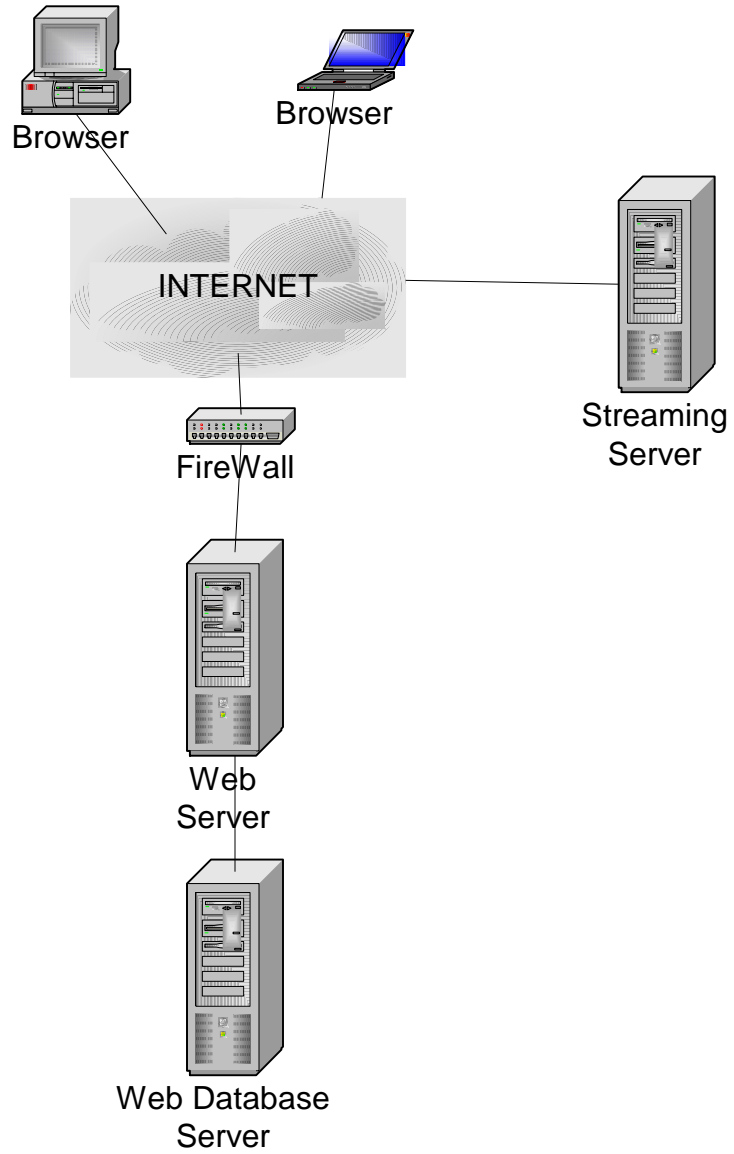


Figure 7 Custom Client Database, Single Hosting Facility Network Diagram



## Component Configuration Options

---

This section describes two potential and complete Technical Architecture options. Both options describe the hardware and software components, and how these components meet the business and application architecture requirements.

### *Component Option One*

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Component Option One presents a very strong platform for building high traffic web sites with enterprise level functionality. The iPlanet Web Server provides an enterprise business platform that will operate on a Sun Solaris or Microsoft Windows NT environment. This ability to support multiple hardware platforms will enable CIS to grow without affecting parts of the Web site's software code base. This should eliminate the potential for having to rewrite the software to provide scalability. In addition, iPlanet's support for JSP, Java servlets, J2EE, and it's vendor neutral support of EJB application servers does not limit possible future directions and choices.

This section covers the following topics for Component Option One:

- Web Browser
- Web Server
- CRM Messaging Server [Optional]
- Hardware



## Web Browser

This section lists the web browser features for Component Option One.

- Microsoft Internet Explore 4.x, 5.x or Netscape Communicator 4.x, 5.x
- Microsoft Media Player
- Real Player
- Flash plug-in
- Shockwave plug-in
- QuickTime
- IPIX
- Client side Cookies
- JavaScript
- HTTPS

## Web Server

This section lists the web server features for Component Option One.

- iPlanet Web Server v4.1
  - [http://www.iplanet.com/products/infrastructure/web\\_servers/iws/index.html](http://www.iplanet.com/products/infrastructure/web_servers/iws/index.html)
- Custom components built on SendMail and a relational database
  - Solaris 2.6, 7, 8
  - Win NT 4.0 SP5 or greater



## CRM Messaging Server [Optional]

This section lists the CRM messaging server features for Component Option One.

- Internet Information Server
  - SOAP and XML support
- Win NT 4.0 SP5 or greater

## Hardware

Component Option One has a wide range of suitable Servers and Operating Systems for the Web Server including:

- Sun's Enterprise 450 system with Solaris 2.7
- Dell's PowerEdge 2450 with Windows NT 4.0, Caldera with Linux or Redhat Linux
- IBM's Netfinity 5000 with Windows NT 4.0, Caldera with Linux or Redhat Linux

### Sun Enterprise 450 system

- With Solaris 2.7
- <http://www.sun.com/servers/workgroup/450>
- Supports up to four UltraSPARCTM-II processors: 400-MHz or 480-MHz
- 400-MHz or 480-MHz UltraSPARCTM-II has 4-MB Ecache memory
- ECC protection for memory and datapaths
- More than 360-GB internal storage capacity, hot swap disk drives, RAID 0, 1, 0+1, and 5
- 6 separate PCI buses providing more than 1-GB/sec I/O throughput
- Internal 10x DVD-ROM
- Two standard redundant hot swap 560W power supplies (3 possible redundant hot swap)
- Four levels of diagnostics, and high-availability cluster configuration options



## Dell PowerEdge 2450

- With Windows NT 4.0, Caldera with Linux or Rethat Linux
- [http://www.dell.com/us/en/biz/products/spec\\_pedge\\_wrkgp\\_2450\\_servers.htm](http://www.dell.com/us/en/biz/products/spec_pedge_wrkgp_2450_servers.htm)
- Supports up to two Intel® Pentium® III processors at 733MHz, 866MHz, and 933MHz
- 128MB - 2GB 133MHz ECC SDRAM memory
- 9 to 36GB internal storage, RAID 0, 1, and 5
- Dual-peer PCI architecture, 133MHz front side bus
- Optional, hot plug, redundant power supplies

## IBM Netfinity 5000

- With Windows NT 4.0, Caldera with Linux or Rethat Linux
- <http://www.pc.ibm.com/us/netfinity/5000.html>
- Supports up to two Intel® Pentium® III processors, with up to 512KB Level 2 cache
- Up to 2GB ECC SDRAM memory
- Integrated Netfinity Advanced System Management processor
- Innovative Light-Path Diagnostics
- Hot-plug hard disk drive bays
- Standard redundant power
- Optional redundant power supply
- Predictive Failure Analysis support on hard disk drives, CPU, VRMs, cooling fans, power supplies and memory

As web traffic increases and the volume reaches a point where it is necessary for the solution to scale beyond the initial implementation, a second Server will be added. A load balancer would be deployed between the Web hosting facilities firewall and the two Servers. If the Sun Enterprise 450 is the selected Web Server then the number of CPUs can be increased from 2 to 3 to 4 before a second Server is required.



## ***Component Option Two***

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Component Option Two presents a strong platform for building high traffic web sites with a high level functionality. The Microsoft application framework's strength is its strong integration with present Microsoft technologies and the migration path to future Microsoft technologies. This integration capability is provided at the expense of support for other vendors, products and platforms. Tight integration with Microsoft technologies enables faster adoption of new Microsoft technologies but greatly limits adoption and integration of non-Microsoft technologies. Internet Information Server provides a business platform that will only operate in a Microsoft Windows NT environment.

This section covers the following topics for Component Option Two:

- Web Browser
- Web Server
- CRM Messaging Server [Optional]
- Hardware

### **Web Browser**

This section lists the web browser features for Component Option Two.

- Microsoft Internet Explore or Netscape Communicator
- Microsoft Media Player
- Real Player
- Flash plug-in
- Shockwave plug-in
- QuickTime
- IPIX
- Client side Cookies
- JavaScript
- HTTPS



## Web Server

This section lists the web server features for Component Option Two.

- Internet Information Server
  - <http://www.microsoft.com/windows2000/guide/server/features/appsvcs.asp>
- Custom built components build on SendMail and a relational database
  - Win NT 4.0 SP5 or greater

## CRM Messaging Server [Optional]

This section lists the CRM messaging server features for Component Option Two.

- Internet Information Server
  - SOAP and XML support Win NT 4.0 SP5 or greater

## Hardware

This Component Option allows a wide range of suitable Servers on the Windows Operating System for the Web Server including:

- Dell's PowerEdge 2450 with Windows NT 4.0
- IBM's Netfinity 5000 with Windows NT 4.0

### Dell PowerEdge 2450 with Windows NT 4.0

- [http://www.dell.com/us/en/biz/products/spec\\_pedge\\_wrkgp\\_2450\\_servers.htm](http://www.dell.com/us/en/biz/products/spec_pedge_wrkgp_2450_servers.htm)
- Supports up to two Intel® Pentium® III processors at 733MHz, 866MHz, and 933MHz
- 128MB - 2GB 133MHz ECC SDRAM memory
- 9 to 36GB internal storage, RAID 0, 1, and 5
- Dual-peer PCI architecture, 133MHz front side bus
- Optional, hot plug, redundant power supplies



## IBM Netfinity 5000 with Windows NT 4.0

- <http://www.pc.ibm.com/us/netfinity/5000.html>
- Supports up to two Intel® Pentium® III processors, with up to 512KB Level 2 cache
- Up to 2GB ECC SDRAM memory
- Integrated Netfinity Advanced System Management processor
- Innovative Light-Path Diagnostics
- Hot-plug hard disk drive bays
- Standard redundant power
- Optional redundant power supply
- Predictive Failure Analysis support on hard disk drives, CPU, VRMs, cooling fans, power supplies and memory

As web traffic increases and the volume reaches a point where it is necessary for the solution to scale beyond the initial implementation, a second Server will be added. A load balancer would be deployed between the Web hosting facilities firewall and the two Servers.



## Recommended Configuration

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This section explains Digital Boardwalk's recommended configurations and covers these topics:

- Recommended Network Configuration
- Recommended Component Configuration

### *Recommended Network Configuration*

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Digital Boardwalk considers network configuration option 1 as a short-term solution that is cost effective and coincides with Phase 1 of the implementation strategy. However, Digital Boardwalk recommends network configuration 2 as the best long-term solution. Splitting up the server hosting facility will impact network performance and increase hardware costs (i.e. firewalls, routers) and require the development of the CRM Messaging server. By locating all servers at the same physical hosting facility the database requirements of the Messaging and Collaboration Server implementation can be supplied by the same Microsoft SQL Server instance that is supplying the database platform for Clientele. If multiple hosting facilities are required, Digital Boardwalk recommends network option 3 to minimize the impact on network performance, maintenance, and administration. Option 4 is a valid cost effective alternative to Option 3. However, the cost savings of not leasing a dedicated line are offset by the dependence on multiple unknown 3rd party networks that make up the Internet.

Digital Boardwalk strongly recommends against network configuration option 5 due to the inherent disadvantages outlined in this document.



### *Recommended Component Configuration*

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Digital Boardwalk recommends component configuration option 1. Due to the limited number of predicted web visits, it is Digital Boardwalks recommendation that the iPlanet Web Server reside on the Dell PowerEdge 2450 server with two CPUs, and the second hot swappable power supply, RAID configuration residing on Windows NT. Growth in the web site's traffic and/or increased enterprise level functionality may require it to be migrated to a Sun Enterprise 450 Solaris platform at some point in the future.

If CIS foresees an immediate need to support substantially higher volumes of traffic than the Launch and Year One predictions included in this document or an increase in functionality offered via the web site then it is Digital Boardwalks recommendation to start with the Sun Enterprise 450 with two of the four possible CPUs installed and not try to grow into this higher end system.



## Application Architecture

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The client's Marketing web site presents a number of challenges related to communication, specifically where there is communication and presentation with the Web visitor or communication and integration with 3rd party applications.

### *CRM Integration*

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The CRM package selected by the client is Clientele 7 by Epicor Software. Clientele's technical support personnel have indicated that the only supported integration path with Clientele is through direct access to the Clientele database. The Clientele application uses Microsoft SQL Server as its database.

This section covers the following topics:

- Clientele Database Schema
- Clientele Org Table
- The Clientele Person Table
- Clientele Opportunity Table
- Clientele Call Table
- Clientele zSysUser Table
- Contact Sales Questionnaire
- Support Forum

#### Clientele Database Schema

Access to the Clientele database regardless of whether the request comes from the Web Server or directly will be limited to a sub-set of the Clientele tables. Other tables may require accessing when reporting is finalized or because the set of known tables to be accessed have presently unknown supporting tables.

For a complete Clientele Database schema see the "Clientele Customization Guide".



### Implementation strategy Phase 1 concerns

The implementation strategy calls for a Phase 1 release that will not include any direct integration with Clientele. A simple implementation of the Request Broker Object will be created that interacts with CIS's CRM processes by sending an informative email to a sales contact email address. The CIS sales organization will then manually respond to the email.

### CRM Abstract Layer

To shield the Marketing web site's code base from changes to Clientele's database schema or CIS migrating to a new CRM package, a set of interface objects will be created to broker requests to Clientele. If one of the above events occurs only the request broker Objects will require modification as opposed to the required modifications for a range of components throughout the code base which would be necessary if the system were built without the request broker Objects. The public interfaces of the request broker Object will not be designed to use Clientele objects, record structures, or functionality. The private implementation however, will be highly dependent on Clientele objects, record structures, and functionality. The request broking Objects will use a JDBC connection to access the Clientele database. In the case that Network option 4 is implemented the request broker Object will use SOAP and ODBC to access the Clientele database.

### Guiding of Requests for Contact

The guiding of requests for sales contact (i.e. Opportunities) and the guiding of requests for support contact (i.e. Calls) to an appropriate Sales or Support person will be handled solely by the Clientele package. The Conductor module of the Clientele package can be configured to perform this guiding of requests for CIS contact.

### Primary and Foreign Keys

The Clientele database schema requires all foreign key columns to be non-null. The Clientele business rules allow for empty or unknown entity relations. To conform this requirement a value of "0" is used instead of a null in foreign columns that do not have a related record in the related table. To maintain referential integrity empty records with a primary key of "0" are created by Clientele. These empty records must not be deleted, since the Clientele system and the client's Marketing Web site will use these records heavily.



## Additional Columns

The client's Marketing web site will require the addition of a number of columns to Clientele tables. These new columns are described below with the table that they will be added to. There are two methods of appending columns to tables over which you have no control, which is the case with the Clientele tables:

- Option 1 — Directly add the column to the table. This is the simplest method in the short-term, however this method greatly complicates any upgrade or migration of the Clientele system.
- Option 2 — Create a shadow table; this table has a primary key equal to and related to the primary key of the Clientele table. Additional columns are then added to the shadow table not the original table. Clientele is not aware of the shadow tables and their columns and therefore run correctly, upgrade and migration processes will correctly change the original schema leaving the shadow tables intact to be migrated independently. The drawback to option 2 is a slightly more complicated database query for systems needing to access both Clientele tables and the shadow tables.

Digital Boardwalk recommends the use of shadow tables when directly accessing to a 3rd party package database.



### Clientele Org Table

The Clientele Org table is used to store information about CIS clients. A subset of the columns in the Org table will be used; these columns consist of the following:

| Column Name | Notes   |
|-------------|---|
| Org_ID      | Generated Primary Key                                 |
| AddDate     | Set to the Date of Insertion                          |
| AddUser     | Set to "UserName" from the system's "zSysUser" record |
| ChangeDate  | Set to the Date of Change                             |
| ChangeUser  | Set to "UserName" from the system's "zSysUser" record |
| Address1    |   |
| Address2    |   |
| City        |   |
| State       |   |
| Zip         |   |
| Country     |   |
| PriPhone    |   |
| FaxPhone    |   |
| Industry    |   |
| EmployeeCnt |   |
| Industry    |   |
| IsCustomer  |   |

Clientele may require the population of other columns within the "Org" table; these columns will be populated with default values. Clientele technical support and CIS's Clientele administrator will supply this meta-data. Clientele may require the population of supporting tables; these tables will be populated with default values. Clientele technical support and CIS's Clientele administrator will supply this meta-data.



## The Clientele Person Table

The Clientele Person table is used to store information about employees and/or associates of a CIS client. The client’s Marketing Web Site will use the “Person” table to authenticate CIS clients via the Email Address and Password columns. For this reason the Password column will have to be added to the Clientele database. The contents of the Password column will be encrypted using Java’s RSA encryption capabilities. A sub-set of the columns in the “Person” table will be used; these columns consist of the following:

| Column Name  | Notes   |
|--------------|---|
| Per_ID       | Generated Primary Key                                 |
| Org_ID       | The ID of the Person’s Organization                   |
| AddDate      | Set to the Date of Insertion                          |
| AddUser      | Set to “UserName” from the system’s “zSysUser” record |
| ChangeDate   | Set to the Date of Change                             |
| ChangeUser   | Set to “UserName” from the system’s “zSysUser” record |
| Address1     |   |
| Address2     |   |
| City         |   |
| State        |   |
| Zip          |   |
| Country      |   |
| EmailAddress | Used in visitor authentication                        |
| PriPhone     |   |
| FaxPhone     |   |
| Comments     |   |
| Password     | To be added to the Clientele Schema                   |

Clientele may require the population of other columns within the “Person” table; these columns will be populated with default values. Clientele technical support and CIS’s Clientele administrator will supply this meta-data. Clientele may require the population of supporting tables; these tables will be populated with default values. Clientele technical support and CIS’s Clientele administrator will supply this meta-data.



### Clientele Opportunity Table

The Clientele “Opportunity” table is used to store information about a future CIS opportunity. These opportunities will be derived from the “Contact Sales” section of the Web site. A sub-set of the columns in the “Opportunity” table will be used; these columns consist of the following:

| Column Name    | Notes   |
|----------------|---|
| Opportunity_ID | Generated Primary Key                                 |
| Per_ID         | The ID of the Person requesting the Sales contact     |
| AddDate        | Set to the Date of Insertion                          |
| AddUser        | Set to “UserName” from the system’s “zSysUser” record |
| ChangeDate     | Set to the Date of Change                             |
| ChangeUser     | Set to “UserName” from the system’s “zSysUser” record |
| Summary        |   |

Clientele may require the population of other columns within the “Opportunity” table; these columns will be populated with default values. Clientele technical support and CIS’s Clientele administrator will supply this meta-data. Clientele may require the population of supporting tables; these tables will be populated with default values. Clientele technical support and CIS’s Clientele administrator will also supply this meta-data.

See the section of this document entitled “Contact Sales Questionnaire” for information on how the “Opportunity” table will be used to capture sales contact questionnaire information.



### Clientele Call Table

The Clientele “Call” table is used to store information about interactions between a CIS client and CIS. Request for support contact coming from the “Client Support” section of the Web site will result in a record being created in the “Call” table. A sub-set of the columns in the “Call” table will be used; these columns consist of the following:

| Column Name | Notes   |
|-------------|---|
| Call_ID     | Generated Primary Key                                 |
| Per_ID      | The ID of the Person requesting support               |
| Org_ID      | The ID of the Person’s Organization                   |
| ChangeDate  | Set to the Date of Change                             |
| ChangeUser  | Set to “UserName” from the system’s “zSysUser” record |
| OpenBy      |   |
| CallType    |   |
| Status      |   |
| Summary     |   |

Clientele may require the population of other columns within the “Call” table; these columns will be populated with default values. Clientele technical support and CIS’s Clientele administrator will supply this meta-data. Clientele may require the population of supporting tables; these tables will be populated with default values. Clientele technical support and CIS’s Clientele administrator will also supply this meta-data.

### Clientele zSysUser Table

The Clientele “zSysUser” table is used to store information about all users of the Clientele system. The client’s Marketing Web Site will be accessing and manipulating the client records within the Clientele database and therefore requires a record in the “zSysUser” table. For audit columns in other tables the “UserName” value is to be used not the “User\_ID”, from the System user record in “zSysUser”. The record in the “zSysUser” table will be created in the same manner that all users are created. The client’s Marketing Web Site will use the “zSysUser” table to authentic CIS Staff and Partners via the UserName and Password columns. For this reason the Password column will have to be added to the Clientele database. A sub-set of the columns in the “zSysUser” table will be used; these columns consist of the following:

| Column Name | Notes                               |
|-------------|-------------------------------------|
| User_ID     | Generated Primary Key               |
| UserName    |                                     |
| Password    | To be added to the Clientele Schema |



### Contact Sales Questionnaire

When a sales contact is requested a number of questions are asked, this information will be captured and stored in supporting columns on the “Opportunity” table or more preferably in the “QuestionAnswer” table. This second option is preferred because Clientele can then manage all questionnaires giving CIS a better understanding of its clients. The use of the “QuestionAnswer” table will depend heavily on how CIS sets up and administrates their Clientele system. This introduces system coupling and risk; this risk comes from the Web Master or the Clientele Administrator changing their respective questionnaire without coordinating with the other. To remove this coupling an abstraction layer will be required. The “CRM Integration” section describes an abstraction layer in the form of a Request Broker Object that would also act as an abstraction layer for the Sales Questionnaire.

### Support Forum

The Support Forum is a simple threaded discussion group that will be built upon a simple relational database located on the Web Database Server. The Support Forum allows a user to post a question or message and have others post additions, comments or replies to the initial message. Each original message and reply will be stored in the OSFThread table. Original messages will have a Thread\_ID but will not have a ParentThread\_ID, while replies will contain the ID of the message they are replying to in the ParentThread\_ID column. The ParentThread\_ID of the reply message does not have to be an original message but can be a reply to another reply; the resulting tree structure should conform to the directed acyclic graph structure.

The following diagram depicts the Support Forum Database Schema.

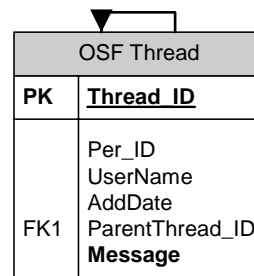


Figure 8 Support Forum Database Schema



## Appendix I: Data Dictionary

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This appendix contains tables stating the data needed for the following pages:

- Support Contact Data
- Incident Report Data
- Sales Contact Data
- Stream-o-Gram Data
- Video Encoding Data

### *Support Contact Data*

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| Field Name                 | Type | Required |
|----------------------------|------|----------|
| Issue Narrative or comment | Text | Y        |
| Contact me via             | Text | Y        |

### *Incident Report Data*

---

| Field Name   | Type | Required |
|--|------|----------|
| Date   | Date | Y        |
| Incident Number <ul style="list-style-type: none"> <li>• Set by the system, not by the client</li> <li>• Read-only</li> </ul>        | Text | Y        |
| Issue Narrative  | Text | Y        |
| Incident Status <ul style="list-style-type: none"> <li>• Set to a fixed predefined value (i.e. Open)</li> <li>• Read-only</li> </ul> | Text | Y        |



### *Sales Contact Data*

| Field Name                           | Type                  | Required                                    |
|--------------------------------------|-----------------------|---|
| Name                                 | Text                  | Y   |
| Phone                                | Text                  | One of Phone, Fax, or email must be entered |
| Fax                                  | Text                  | One of Phone, Fax, or email must be entered |
| Email                                | Text                  | One of Phone, Fax, or email must be entered |
| Address 1                            | Text                  | N   |
| Address 2                            | Text                  | N   |
| City                                 | Text                  | N   |
| State/Province/County                | Text                  | N   |
| Postal Code/Zip                      | Text                  | N   |
| Country                              | Single selection List | N   |
| Company Name                         | Text                  | N   |
| Company Website                      | Text                  | N   |
| Number of Employees                  | Single selection List | N   |
| Industry                             | Single selection List | N   |
| How did you hear about us?           | List of checkboxes    | N   |
| I am interested in?                  | List of checkboxes    | N   |
| How did you hear about us?           | Single selection List | N   |
| How do you use video in your company | List of checkboxes    | N   |
| How do you have a current project?   | Y/N                   | N   |
| Is the project Budgeted?             | Y/N                   | N   |
| How many hours of video do you have? | List of ranges        | N   |
| Comments                             | Text                  | N   |



### *Stream-o-Gram Data*

| Field Name                 | Type                  | Required |
|----------------------------|-----------------------|----------|
| Greeting type              | Single selection List | Y        |
| Sender's Name              | Text                  | Y        |
| Recipient's Name           | Text                  | Y        |
| Recipient's e-mail address | Text                  | Y        |
| Sender's e-mail address    | Text                  | N        |
| Message                    | Text                  | N        |

### *Video Encoding Data*

| Field Name          | Type                  | Required |
|---------------------|-----------------------|----------|
| Video source format | Single selection List | Y        |
| Video target format | Single selection List | Y        |
| Quantity            | Text                  | Y        |
| Description         | Text                  | N        |
| Video source format | Single selection List | Y        |
| Video target format | Single selection List | Y        |



## Appendix II: Security Access Roles

For details on what users have access to a specific area of the system please see the section outlining the functionality for the specific area.

| Role             | User type                         | Authentication Required | Actor            |
|------------------|-----------------------------------|-------------------------|------------------|
| Viewer           | Any visitor prior to login        | None                    | Visitor          |
| Client           | CIS Clients                       | User ID and Password    | Client           |
| Reporting Client | CIS Clients with Reporting Access | User ID and Password    | Reporting Client |
| Staff            | CIS Staff                         | User ID and Password    | CIS Staff        |
| Partner          | CIS Franchise Partners            | User ID and Password    | Partner          |
| Support Staff    | CIS Client support staff          | User ID and Password    | CIS Staff        |
| System Admin     | Web Site Administrator            | User ID and Password    | CIS Staff        |

*Note: In the table above the Actor column refers to the actors defined in Appendix III: Use Cases.*



## Appendix III: Use Cases

Client: The client

Date: 09/07/00

Project: Marketing Web Site

Version: 1.0

| Reference Number | Use Case Name                | Actor   | Brief  |
|------------------|------------------------------|---------|--|
| UC 1             | Login                        | Visitor | User wishes to access a secure area of the CIS web site. User is prompted for User ID and Password. The User ID is displayed when entered. Asterisks are displayed in the place of characters when the Password is entered. User ID and password are authenticated by the system and user is passed on to the desired secure area.   |
| UC 2             | Request Encoding             | Visitor | User wishes to have a video encoded by CIS. The system presents the user with a form to be filled out. The system assigns a unique order number to the request. The system records the given information and the unique order number in an email that is sent to the selected encoding center's email address.   |
| UC 3             | Contact Sales                | Visitor | User wishes to contact a sales person. The system presents the user with a form that they fill out. This form is returned to the web server, the web server creates an email based on the information collected by the form and sends it to the Sales Support email account. The web server sends an email to the user informing the user of that Sales Support will be responding.      |
| UC 4             | Contact Support              | Client  | User wishes to contact a support person. The system presents the user with a form that they fill out. This form is returned to the web server, the web server creates an email based on the information collected by the form and sends it to the client Support's email account. The web server sends an email to the user informing the user of the client Support will be responding. |
| UC 5             | View Discussion Thread       | Client  | User wishes to view the details of a discussion thread, user must be logged in. The system presents the User with a list of Discussion threads to view.  |
| UC 6             | Create Discussion Thread     | Client  | User wishes to create a new discussion thread by creating a discussion question, user must be logged in.   |
| UC 7             | Respond to Discussion Thread | Client  | User wishes to respond to a question posed in a discussion thread, user must be logged in.   |
| UC 8             | View Order Report            | Client  | User wishes to view an Order Status Report, user must be logged in. The system presents the user with a form to be filled out that will define the order report's result. The definition of the Report and the form will be defined at a later date.   |



| Reference Number | Use Case Name         | Actor              | Brief   |
|------------------|-----------------------|--------------------|---|
| UC 9             | View RMA Report       | Client             | User wishes to view a RMA Report, user must be logged in. The system presents the user with a form to be filled out that will define the RMA report's result. The definition of the Report and the form will be defined at a later date.                    |
| UC 10            | View Incident Report  | Client             | User wishes to view a Support Incident Report, user must be logged in. The system presents the user with a form to be filled out that will define the incident report's result. The definition of the Report and the form will be defined at a later date.  |
| UC 11            | View Marketing Report | Reporting Client   | User wishes to view a client Report, user must be logged in. The system presents the user with a form to be filled out that will define the Marketing report's result. The definition of the Report and the form will be defined at a later date.           |
| UC 12            | Enter Extranet        | CIS Staff, Partner | User wishes to enter the Extranet area, user must be logged in. If user has access then web server presents a menu of services to choose from. The menu only shows items that can be viewed by the user. Many items on the menu will be downloadable files. |

| Reference Number | Actor            | Super Actor | Brief   |
|------------------|------------------|-------------|---|
| A 1              | Visitor          |             | A User that has limited access to all public areas of the CIS Marketing Web Site. This User is not able to logon to the site.                     |
| A 2              | Client           | Visitor     | A User that has access to all public areas and client areas of the CIS Marketing Web Site. This User has the ability to logon to the site.        |
| A 3              | Reporting Client | Client      | A User that has been given access to the Marketing Reports section of the CIS Marketing Web site. This User has the ability to logon to the site. |
| A 4              | CIS Staff        | Visitor     | A User that is an employee of the client. This User has the ability to logon to the site.   |
| A 5              | Partner          | Visitor     | A User that has access to all public areas of the CIS Marketing Web Site and the Extranet. This user has the ability to logon to the site.        |



*Use Case Detail*

|                                   |   |   |
|-----------------------------------|---|---|
| Package Name / Number             | Order Video Encoding  | UC 2  |
| Owner/Version                     | Digital Boardwalk   |   |
| Functional Requirements Reference |   |   |
| Description                       | User wishes to place an order for a tape encoded by CIS.  |   |
| Use Cases Utilized                | None  | None  |
| Actors                            | Visitor   |   |
| Pre-Conditions                    |   |   |
| Post-Conditions                   |   |   |
| Invariants                        |   |   |
| Main Flow                         | None  |   |
|                                   | <u>Actor Action</u>   | <u>System Response</u>  |
|                                   |   | <u>Func. Spec. Ref. / UC #</u>  |
|                                   | 1. User elects to order encoding  | 2. System presents user with a list of encoding stations (Location)   |
|                                   | 3. User selects an encoding station (Location)  | 4. System presents user with the per unit price (including currency) for encoding<br>5. System presents user with order form (see order form details below)   |
|                                   | 6. User completes form  | 7. System validates form<br>8. System determines price for the order. System request User confirmation of the order   |
|                                   | 9. User confirms the order  | 10. System presents user with a list of encoding stations (Location)<br>11. System informs user that the order will be confirmed by email and that the confirmation email will give instructions for sending the videotape(s) to CIS for encoding |
| Alternate Flow                    |   |   |
| Flow A                            | 9a. User rejects order  | 10a. System removes any record of the transaction   |
| Flow B                            |   |   |
| Business Rules                    |   |   |
| Error Conditions / Exceptions     |   |   |
| Assumptions                       |   |   |
| Questions                         | Should credit card information be captured in the form or at the point when the encoding station will be billed the credit card? The result being the method of transmitting the order information to the encoding station. |   |
| Comments                          |   |   |



## *Manual Process*

---

This section describes the manual process that occurs after the successful completion of this Use Case

1. The client's sales team will send an email confirmation within a specified timeframe. The email will instruct the user to print the email and send it with the videotape(s) to the encoding station. An order number is created at this time and included on the email.
2. User receives email and sends CIS the videotape(s) and printed copy of the email to the encoding station.
3. The encoding station successfully bills the user's credit card.
4. The encoding station encodes the videotape(s).
5. The encoding station returns the videotape(s) and the encoded media to the user.



## Appendix IV: Functionality Matrix

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The purpose of the Functionality Matrix is to define the functional requirements of the web site at a high level and to ensure that all areas of functionality have been identified. The matrix also provides a mechanism for assigning the priority of the functionality in relation to other functionality through a numeric priority. The lowest number (i.e. 1) indicates the highest priority functionality. In addition, the person or persons who “own” the functionality (i.e. are responsible for defining the requirements and have decision-making responsibility for the functionality) are identified for each area.

### *Process*

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The Digital Boardwalk process for this Functionality Matrix is as follows.

1. Digital Boardwalk creates the first draft of the Functionality Matrix.
2. Digital Boardwalk submits the first draft to the client for review.
3. The client reviews the first draft.
4. The client identifies any functionality that is missing, incompletely specified, or stated incorrectly.
5. The client assigns a numeric priority to indicate the highest priorities for the first release of the system.
6. The client indicates the person with overall responsibility for the requirements for each of the functional areas.
7. Digital Boardwalk incorporates the feedback from the customer and issues the final version of the matrix.



## Functionality Matrix

| Functionality                        | Vision   | Priority | UK Owner     | US Owner |
|--------------------------------------|--|----------|--------------|----------|
| About CIS                            | User to view client information  | 1        | P. O’Ferrall | K. Bienz |
| Region and Language sensitivity      | User to view the Marketing Site in the appropriate language and with the appropriate regional service offerings.     | 2        | P. O’Ferrall | K. Bienz |
| Contact CIS                          | User to contact a group within client information  | 3        | P. O’Ferrall | K. Bienz |
| Services                             | Users to view the client’s service offerings, including both standard and ASP.                                       | 4        | P. O’Ferrall | K. Bienz |
| Demonstrations                       | User to view demonstrations of streaming media technologies.   | 5        | P. O’Ferrall | K. Bienz |
| Client Support Information           | Users can view information regarding what client support are offered by CIS  | 6        | N. Pywell    | K. Bienz |
| Client Support                       | Users can request client support from and engage in two-way interactive communication with CIS client support staff. | 7        | N. Pywell    | K. Bienz |
| E-Commerce                           | Users can order the encoding of videotapes. The Videotapes and encoded files are returned to the user.               | 8        | P. O’Ferrall | K. Bienz |
| Extranet                             | File repository for both authorized Partners/Staff.  | 9        | P. O’Ferrall | K. Bienz |
| Order Tracking                       | Users to view the progress and status of an e-commerce order.  | 10       | P. O’Ferrall | K. Bienz |
| Calendar                             | Users to view CIS marketing/training events.   | 11       | P. O’Ferrall | K. Bienz |
| Newsletters                          | Users to view CIS marketing and general interest newsletters.  | 12       | P. O’Ferrall | K. Bienz |
| White Papers                         | Users to view CIS technical and marketing information.   | 13       | P. O’Ferrall | K. Bienz |
| Client Showcase                      | User to view client showcase information   | 14       | P. O’Ferrall | K. Bienz |
| RMA Tracking                         | Users to view the progress and status of a RMA.  | 15       | P. O’Ferrall | K. Bienz |
| Reporting                            | Users to view streaming media statistics.  | 16       | N. Pywell    | K. Bienz |
| Streaming Operations Center (S.O.C.) | Users to view a marketing presentation of the Streaming Operations Center.   | 17       | P. O’Ferrall | K. Bienz |
| Corporate Gimmick                    | Users to download a handy application from the web site. Stream-o-gram   | 18       | P. O’Ferrall | K. Bienz |
| Related Links                        | Users to view related web site.  | 19       | P. O’Ferrall | K. Bienz |
| Community                            | Users to view community related information.   | 20       | P. O’Ferrall | K. Bienz |
|                                      |  | 21       | P. O’Ferrall | K. Bienz |





## Appendix V: Site Map

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The purpose of the site map below is to allow the reader to walk through the web site using this document and understand how the web site will function. In the site map below each major area is given one diagram. There are 13 diagrams in all. Each box in a diagram represents one single web page. The numbers in the boxes are to cross-reference the diagrams with the sections of the Functional Specification. While this site map may not represent the exact structure and navigation of the web site in its final form it should be accurate with only a few disparities due to the fact that some of the structure will be driven by available content.

For simplicity the site is divided into the following maps:

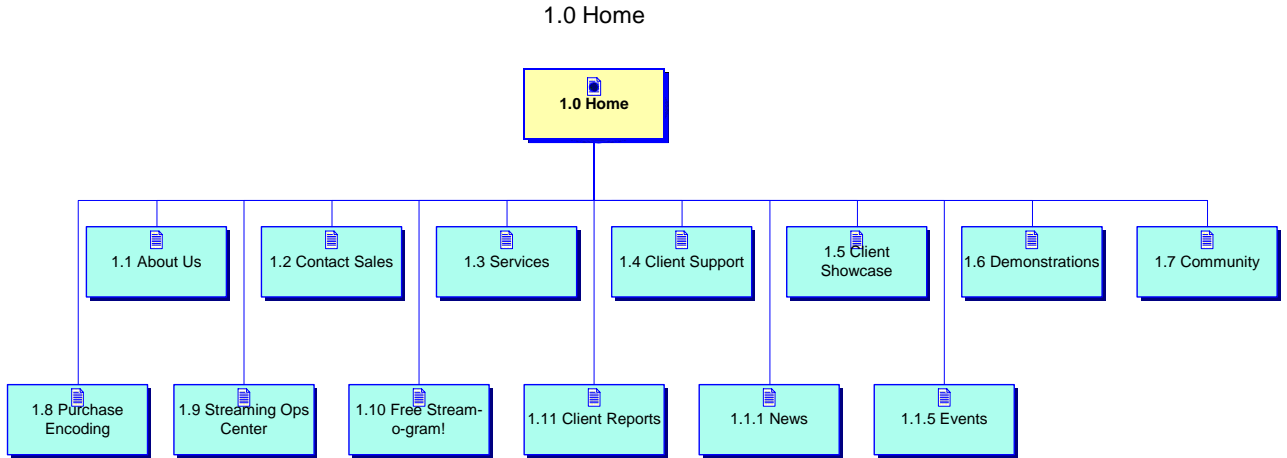
- Home Map (1.0)
- About Us Page Map (1.1)
- Contact Sales Page Map (1.2)
- Services Page Map (1.3)
- Client Support Page Map (1.4)
- Client Showcase Page Map (1.5)
- Demonstrations Page Map (1.6)
- Community Page Map (1.7)
- Purchase Encoding Page Map (1.8)
- Streaming Operations Center Page Map (1.9)
- Free Stream-o-Gram! Page Map (1.10)
- Client Reports Page Map (1.11)
- Extranet Page Map (1.12)

The page maps below are not meant to be meaningful without the accompanying Functional Specification. In addition, while some diagrams may appear to have little meaning because they consist of only one web page they were included for the sake of consistency.



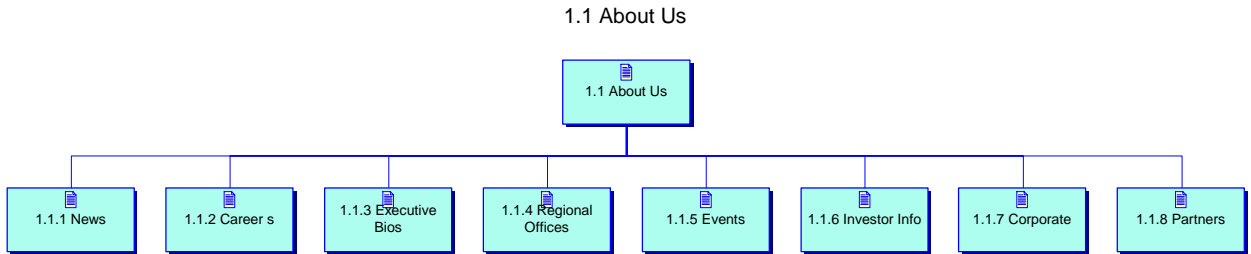
### Home Page Map (1.0)

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### About Us Map Page (1.1)

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### Contact Sales Page Map (1.2)

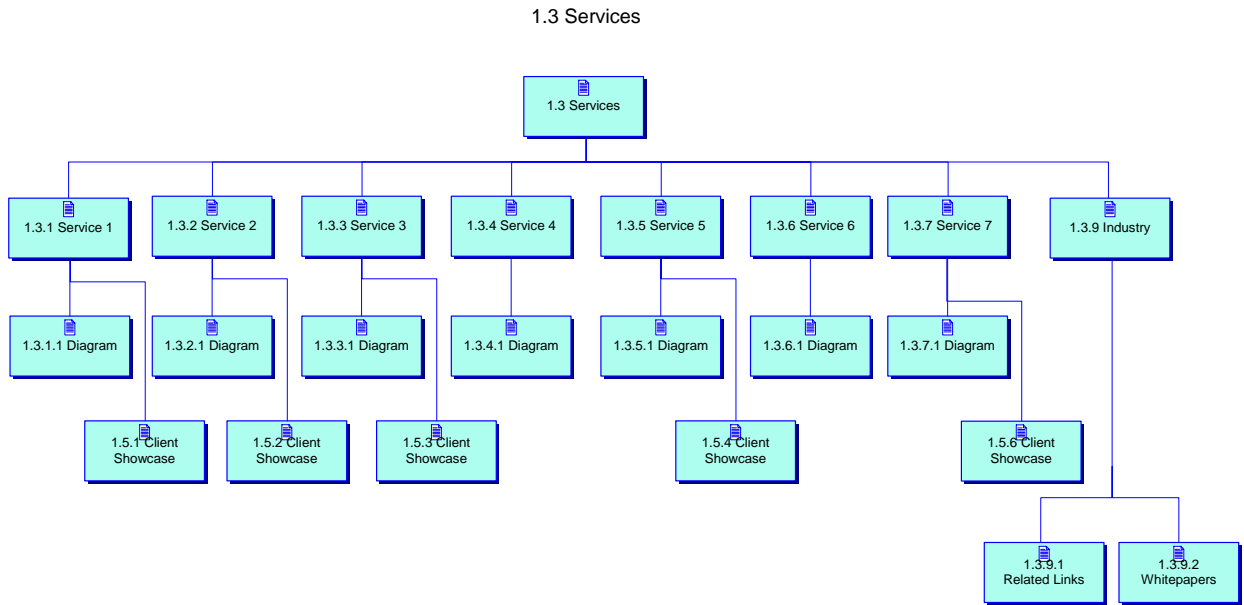
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1.2 Contact Sales

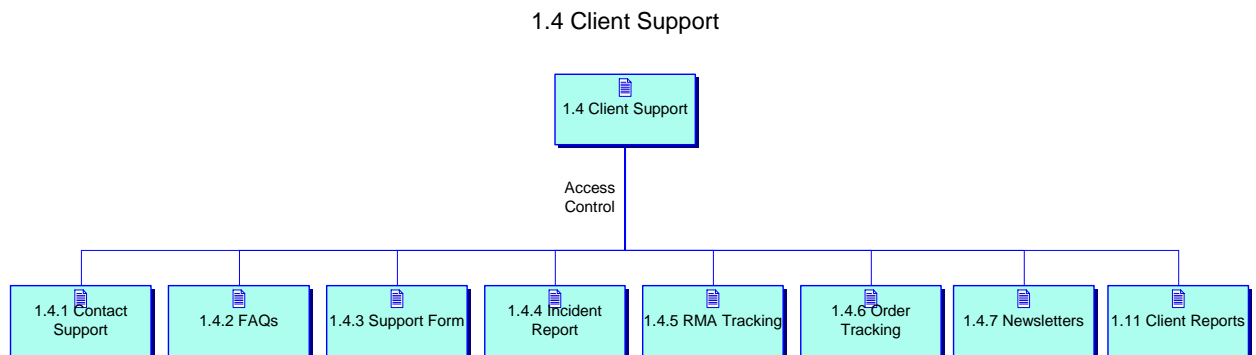




### Services Page Map (1.3)



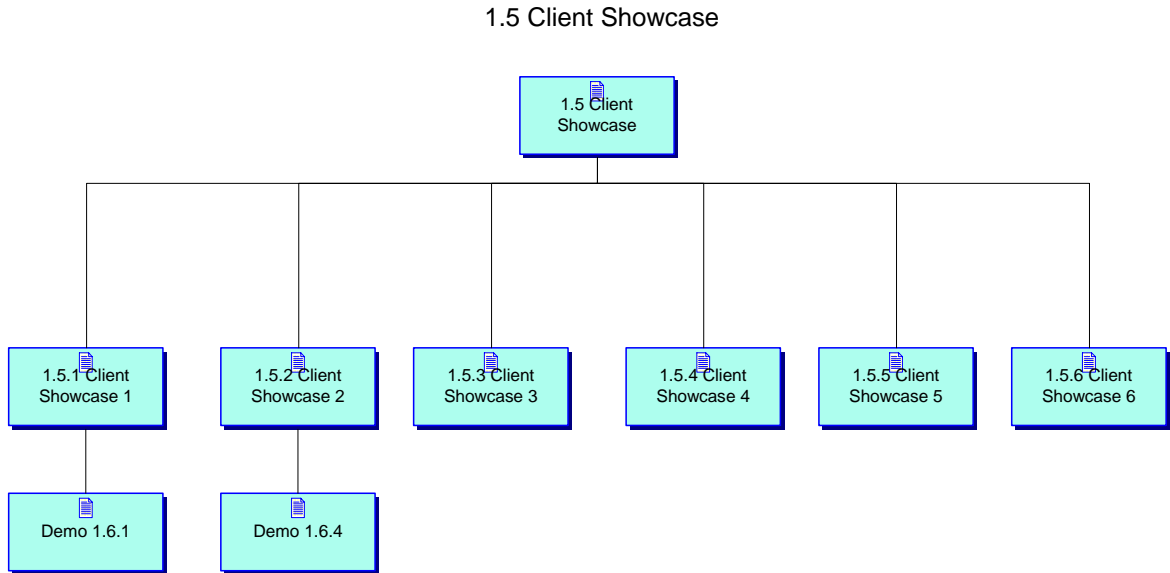
### Client Support Page Map (1.4)





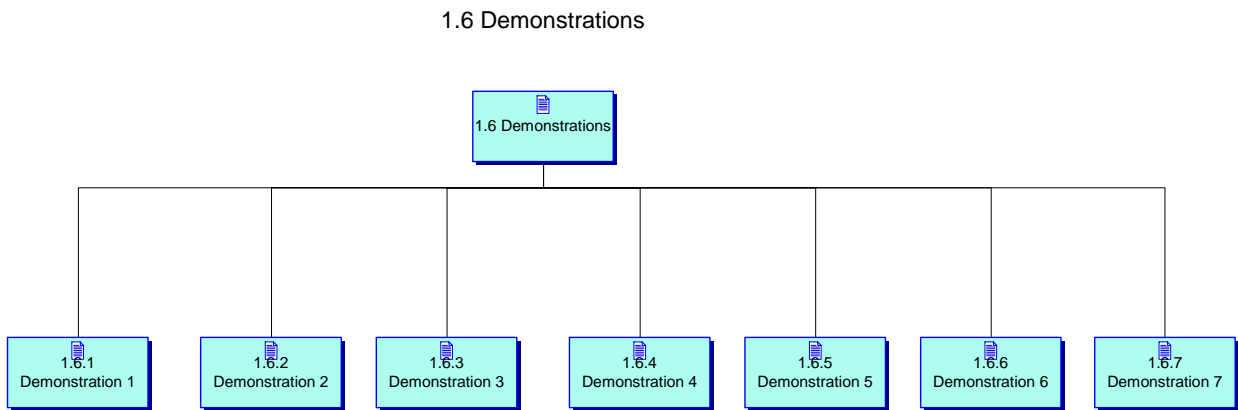
## Client Showcase Page Map (1.5)

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## Demonstrations Page Map (1.6)

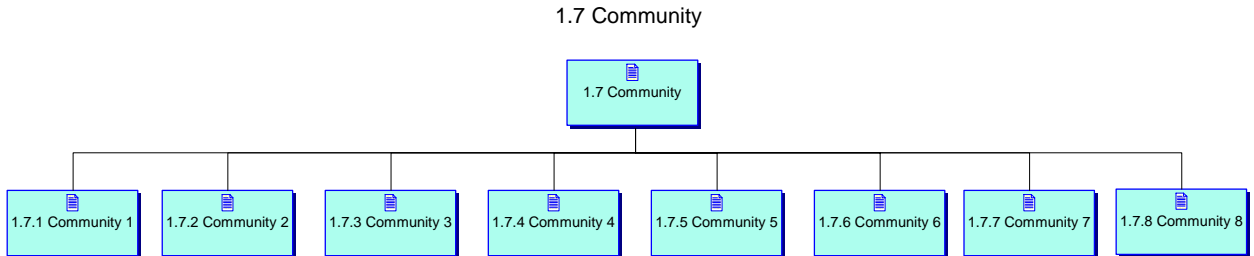
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### Community Page Map (1.7)

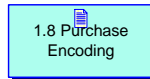
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### Purchase Encoding (1.8)

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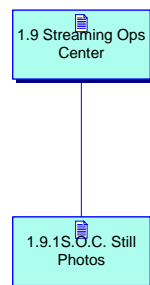
1.8 Purchase Encoding



### Streaming Operations Center (1.9)

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1.9 Streaming Ops Center





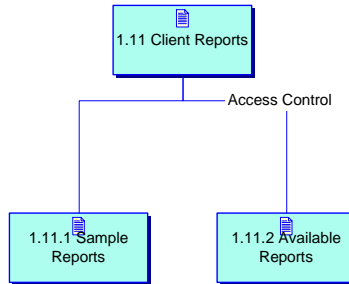
## Free Stream-o-Gram! (1.10)

### 1.10 Free Stream-o-gram!



## Client Reports (1.11)

### 1.11 Client Reports



## Extranet (1.12)

### 1.12 Extranet

