WebArrow: System Overview and Architecture

Namzak Labs White Paper, 2003-02

Overview

This white paper presents an introduction to, and architectural overview of Namzak Labs' ***WebArrow***—a system for web-based collaboration. The white paper presents a discussion of ***WebArrow's*** product architecture, the basis of our two flagship products: ***WebArrow/Conference*** and ***WebArrow/Center***. Through the discussion of its architecture we will highlight ***WebArrow's*** superior quality attributes: security, performance, usability, and robustness.

namzaklabs

CONTENTS

1 VISION AND MISSION

Namzak Labs Inc. has developed ***WebArrow:*** an easy to use, easy to set up, real time, high performance, fully interactive, full services collaboration tool. ***WebArrow*** provides the next generation of software for remote collaboration over the Web. ***WebArrow*** was developed to be the highest quality collaboration tool in the market.

High quality is achieved through:

- unparalleled industry-leading security from start to finish to protect your privacy,
- ease of use - we provide a “dial-tone” quality service—as intuitive and easy to use as the telephone,
- ease of set-up and installation - a “one-touch” installation that constantly monitors and adjusts itself,
- robustness - frequently repairing services before the users even realized that there was a problem,
- and overall high performance – so high, in fact, that users frequently forget that they are collaborating remotely

…all embodied within a full range of collaborative services.

Namzak Labs has developed a complete suite of collaboration services capable of satisfying the government, business, and consumer markets.

2 THE PROBLEM

While bits and pieces of the Web-based collaboration solution exist on the software market currently, they suffer several related problems:

- they are largely traditional monolithic applications built to be standalone;
- they are unsuitable for fast web download and installation and setup by inexperienced users;
- they have given little thought and provide few hooks for tailoring or integration;
- they are often not truly suitable for internet-based collaboration, because they assume the high bandwidth of dedicated communication lines or local-area networks and the high performance of dedicated servers, rather than the high variability that is found on the internet;
- and they do not deal gracefully with security issues such as encryption and firewalls.

Thus, in the real world these solutions are clumsy, perform poorly, given inadequate security, and are difficult to tailor and integrate. ***WebArrow***, on the other hand, was designed from the ground up to address all these problems head on. This is achieved via its unique architecture.

3 ARCHITECTURE

WebArrow was built to address the problems that have traditionally plagued web-based collaboration. It is built upon a unique componentized, secure, highly scalable "product-line" architecture. In particular ***WebArrow's*** architecture was designed to be:

- configurable - it can be used for 1:1, 1:n, or m:n communication, to support distance education, call centers, webinars, and business meetings
- flexible - it can be configured in any topology, with no requirement for centralized control
- high performance - our screen-sharing is 30% faster than the leading standalone screen-sharing application
- scalable - because it can be configured in arbitrary topologies, it can scale to hundreds of simultaneous users
- highly available - the architecture contains sophisticated mechanisms for avoiding failures, detecting failures, and recovering from failures, all transparently to the end user
- secure - it includes state-of-the-art encryption, passwording, and management of firewalls, all without any human-perceptible performance penalty

WebArrow provides real time, interactive tools for the five key remote collaboration services: Desktop Sharing, Voice over IP, File Sharing, Chat, and Desktop Annotation. The core architecture incorporates infrastructure for licensing, logging/billing, security, privacy, and session management. From this core technology, Namzak has built ***WebArrow/Sharing,*** the collaboration engine underlying our products: ***WebArrow/Conference*** (for Web Conferencing collaboration), and ***WebArrow/Center*** (for 1:1 collaboration in a Call Center or Help Desk environment).

The system architecture is depicted in Figure 1 below.

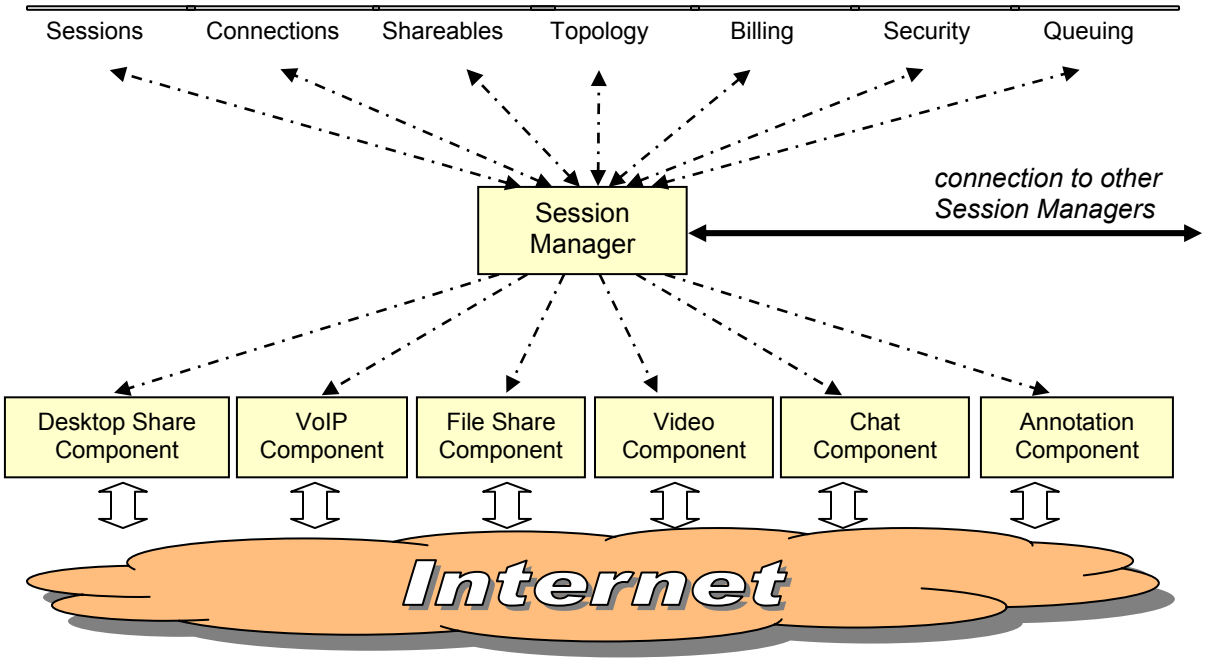

Figure 1: ***WebArrow*** Software Architecture

WebArrow is organized around the concept of a "shareable": a resource that can be shared among people across the internet. Voice over IP (VoIP) or video can be shared. Desktops can be shared. Web pages and files can be shared. Applications can be shared. And so forth.

For every shareable there are a number of ubiquitous concerns which are addressed by architectural services: managing sessions, connections, and users; providing appropriate security and licensing; providing appropriate performance; monitoring, queuing, billing, etc. Shareables are all able to be scripted, so that they can be easily tailored and integrated. Furthermore, shareables are all downloadable over the Web, which means that they can easily be updated "on the fly". Shareables can run standalone or within a web browser.

At run-time all shareables are controlled by the Session Manager. The session manager is the heart of the architecture, controlling the dynamics of a collaboration: starting and stopping shareables, deciding if and when to download components, communicating with other session managers, and managing all other services (security, queuing, logging, billing, web-page pushing, licensing, etc.). The session manager thus permits a number of key features:

- it can stage the download of components, so that a user can do useful work even while parts of the system are still downloading (and these components are

- it dynamically controls the behavior of other system components. So, for example, a collaboration might begin with chat, progress to include voice over IP, progress further to include desktop sharing, end the chat, start a file transfer, progress further to include annotations, change the endpoint that is desktop sharing, and so forth. The potential combinations and styles of interactions are limitless.

In this way we can create custom collaboration solutions that are efficiently downloaded to a customer's computer, on demand.

Based upon the ***WebArrow*** architecture, Namzak Labs Inc. has created: ***WebArrow/Sharing***, a facility that allows individuals to collaborate across the internet. Building on top of ***WebArrow/Sharing*** are our two flagship products: ***WebArrow/Conference*** and ***WebArrow/Center***, an application supporting web-based call centers. Customized versions of these applications can be developed in a matter of a small number of weeks, proving the power of our product-line approach to software. For example, a web-based call center interface is shown below in Figure 1:

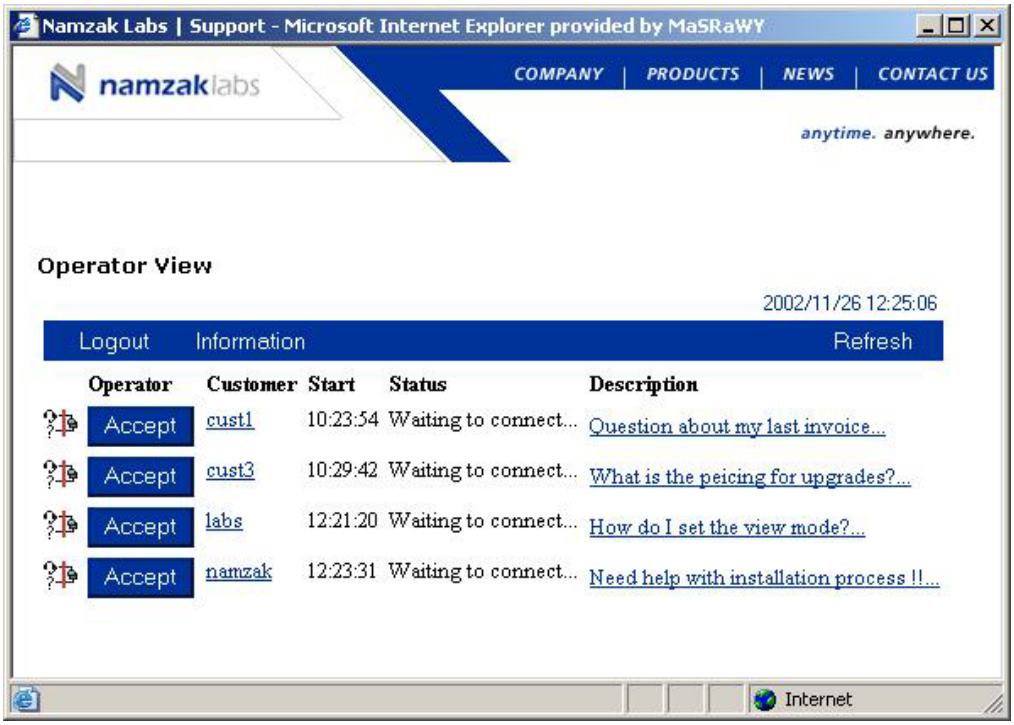

Figure 1: A WebArrow/Center Implementation: Operator's View

4 WEBARROW'S QUALITIES

4.1 Performance

WebArrow's architecture provides for unparalleled performance stability and scalability. To start with, ***WebArrow's*** shareables are individually high performance. In addition, each shareable has sophisticated algorithms built in to gracefully handle changing network bandwidth conditions.

Finally, ***WebArrow***'s "endpoint" concept allows for a flexible, generic abstraction of a sharable that can be connected in a wide variety of ways. So, for example, one ***WebArrow*** server can act as a "repeater", taking in the signal from a ***WebArrow*** server and broadcasting it to a host of others. Such repeater servers can be hierarchically associated, allowing for arbitrary scalability! This level of scalability is unheard of in the products of the competition, which typically have a fixed maximum of connections that they can participate in.

4.2 Robustness

WebArrow has been designed to run robustly in the unstable world of the Internet. Internet-deployed tools have to contend with bugs in the underlying operating system and web browser, as well as intermittent failures in the Internet itself.

WebArrow has been architected to monitor failures in the underlying software and networking platform. In many cases, WebArrow is able to detect failures in the underlying platform and repair them transparently to the user. In cases where repair is impossible (for example, due to network failure), ***WebArrow*** gracefully degrades the failed service, allowing other services to continue. In multiparty sessions, if one participant's computer or network fails, the other participants are able to continue without interruption.

4.3 Usability

WebArrow has been designed to be highly usable—a "dial tone" type of service that requires no training and no prior experience. Our products undergo extensive usability testing before release, and provide an intuitive, user-friendly environment.

A typical user interface is shown below, in Figure 2. Each user is identified, and all the sharables that they are using are shown beside their name. Any shareable may be started or stopped, simply by the click of a button. And each sharable monitors and constantly adjusts its own behavior, so that users are free to do what they really want to do—collaborate!

Figure 2: WebArrow/Conference's GUI

4.4 Security

Finally, and perhaps most importantly in these days of internet worms and cyber-hackers ***WebArrow*** provides state-of-the-art security, and does so with no performance penalty. All of ***WebArrow's*** data connections are encoded with a 192-bit encryption algorithm, guaranteeing that your private conversations remain private. Our competitors provide little or no security, at best providing 128-bit SSL encryption which is known to be extremely slow. And they charge extra for it.

The web-based portion of our system uses 128-bit encryption, and all interactions with the system are password protected. In addition, our software respects and works with your corporate firewall, never compromising your security and privacy.

5 CONCLUSIONS

To reiterate, WebArrow provides a number of distinct advantages to anyone looking for a remote collaboration solution::

- industry-leading security provisions
- automatic management of firewalls and proxies
- a superior user interface, resulting from extensive usability testing
- automatic software download, installation and updates delivered via the Web
- scalability to arbitrarily large installations
- tolerance of faults in hardware, software and network
- a flexible licensing model that allows for a wide range of product deployments and billing models
- support for third-party branding and customization
- internationalization support for multiple languages (initially English and Japanese)

The ***WebArrow*** architecture is an unparalleled platform upon which to build Web-based remote collaboration applications. And we have created these applications that can help your business, *today*.

For additional technical information, please contact: info@namzak.com.

If your organization has a need for remote collaboration tools, please contact: sales@namzak.com.