WebEx Connect Platform

Brief Overview

April, 2008

Introduction

The WebEx Connect platform enables collaborative applications to be composited with business software in ways not previously possible. Due to a rich-presence environment, unique event model and Application Framework architecture sitting atop a very large platform, WebEx Connect offers businesses a powerful vehicle to improve productivity. WebEx Connect is the only SaaS integration platform that has been built from the ground up for collaborative software applications.

The WebEx Connect collaboration services and client are the latest offering from WebEx, building upon and complementing traditional web-meeting services for real-time collaboration and communication. Details of the traditional web-meeting service architecture and developer tools are described elsewhere. The main focus of this paper is to provide a brief functional and architectural overview of the WebEx Connect platform, its components, and the ways in which customers and partners can benefit by moving their business collaboration onto Connect.

Collaborative Network Applications

The WebEx Connect client, built on the concept of Spaces, brings people, process and data together in an easy to use context. Interacting with the Connect grid, the client supports a wide array of applications from WebEx and its partners. Beneath it all is the MediaTone network that insures reliable delivery of these applications to anyone, anytime anywhere on the globe. Once knowledge workers take advantage, companies will be able to reduce cycle times, increase sales and find efficiencies throughout their business processes.

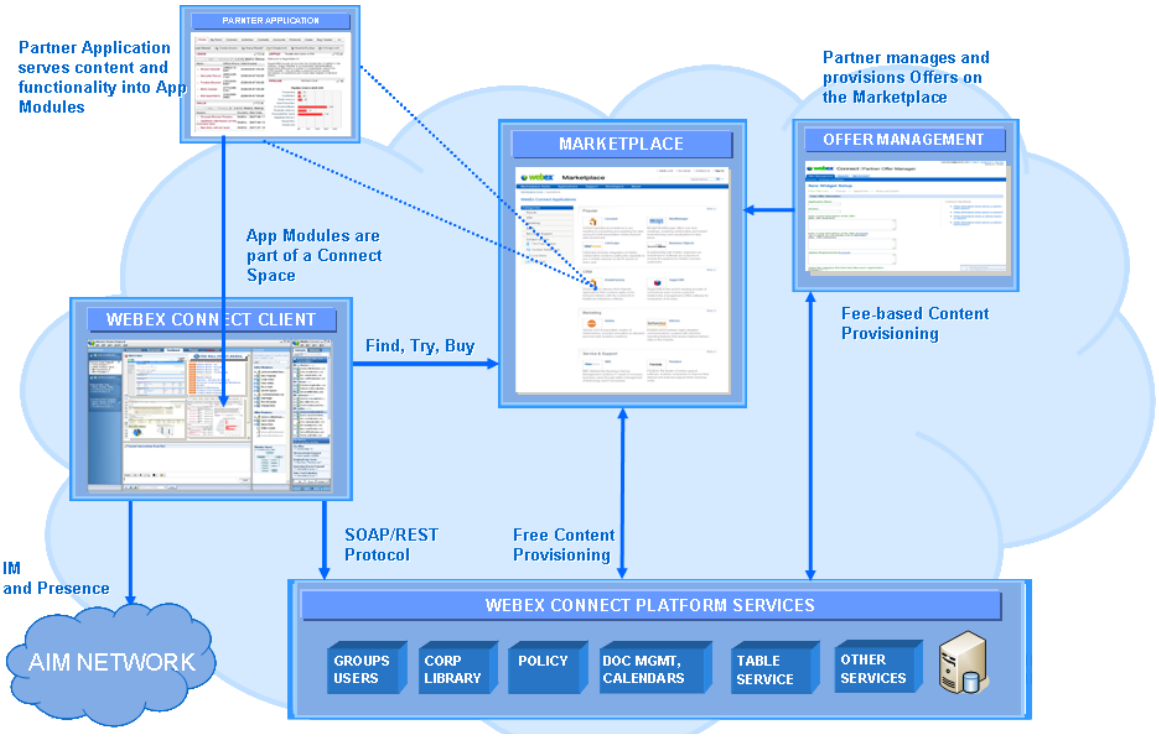
Adroit developers and product visionaries have an open field to innovate in totally unique ways on the Connect platform and to feed off of others sharing their ideas on the developer community. It all starts with the capabilities that are that are available to you from the Connect Platform Services, Application Framework specification, organizational and event models and the concept of Spaces where users get business done.

Notice

This is a preview of the Connect platform and all contents, specifications, and details are subject to change.

Architecture Overview

The WebEx Connect architecture consists of several components that provide the entire platform and user experience. These work in conjunction to enable partner integrations, and allow organizations and end-users to customize their work environment. The following illustration shows the major components of the Connect Ecosystem. Seen in the diagram is the WebEx Connect Platform Service layer (back-end), the Connect Client, and the Connect Marketplace, and associated facilities for partners to manage their offers on the Marketplace. It also illustrates a partner application serving application functionality to a Connect client through application integration. The remainder of this paper provides an overview of each of these components, their roles and features, and their interactions with customers and partners.



Connect Platform Services

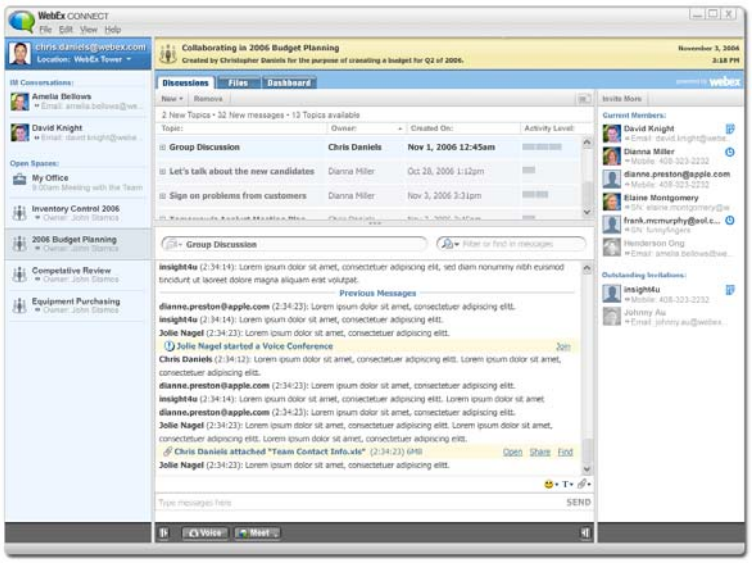
Connect back-end services are provided via a SOAP (Simple Object Access Protocol)/WSDL(Web Service Definition Language) and REST (Representational State Transfer) protocol that enable the Connect Client and installed Application Modules to interact with the Connect platform. Details of this service are provided other papers and reference documentation.

Connect Client

The Connect Client consists of three incarnations: a "thick, rich" client, initially provided in version 1.0, a Web Client, and in the future, a Mobile Client. All clients will have similar capabilities from and end-user point of view, and partner widgets developed against any client will be portable and operable in the other client delivery platforms.

Spaces and Widgets

The physical construct of *Spaces* provide the central means of collaboration, for projects, teams, and in particular, effective, secure cross-company collaboration. By incorporating the Connect Policy Model, Spaces allow organizations to tightly control the types and means of collaboration and communication modalities that occur across company boundaries.



The WebEx Connect platform incorporates an Application Framework that is central to the value of utilizing Spaces for collaboration for particular project goals. Application Modules are the key mechanism for 3rd parties to integrate their various offerings into the Connect Platform, and provide value to the Connect community.

AOL AIM Instant Messaging

The WebEx Connect Client, and overall Connect platform, are predicated on a rich presence platform and instant-messaging model provided by AIM. Connect users become part of the AIM "cloud", allowing them to interact with 40+ million users world-wide, both on the Connect platform and a variety of AOL platforms. WebEx integration with AIM stems from our history of integrating the AIM Pro client and business IM processes to insure end-to-end secure communications, including advanced auditing and compliance management features. WebEx Connect adds to this legacy with a strong organizational and policy model to further insure that cross-company communications and content are securely shared and controlled within collaboration Spaces.

Persistent Chat

At the core of each Space is instant team communication. The tool used to facilitate this team communication is called a persistent discussion topic. Persistent chat rooms enable effective dialogue in the context of a project or team environment. They allow a team to build a comprehensive history of all team/project related discussions that can be searched through and filtered. Discussion topics are the ideal communication tool for secure cross-company communication. Persistent discussion topics can easily be escalated to other forms of communication and collaboration (such as audio conferences or WebEx Meetings).

WebEx Connect Marketplace

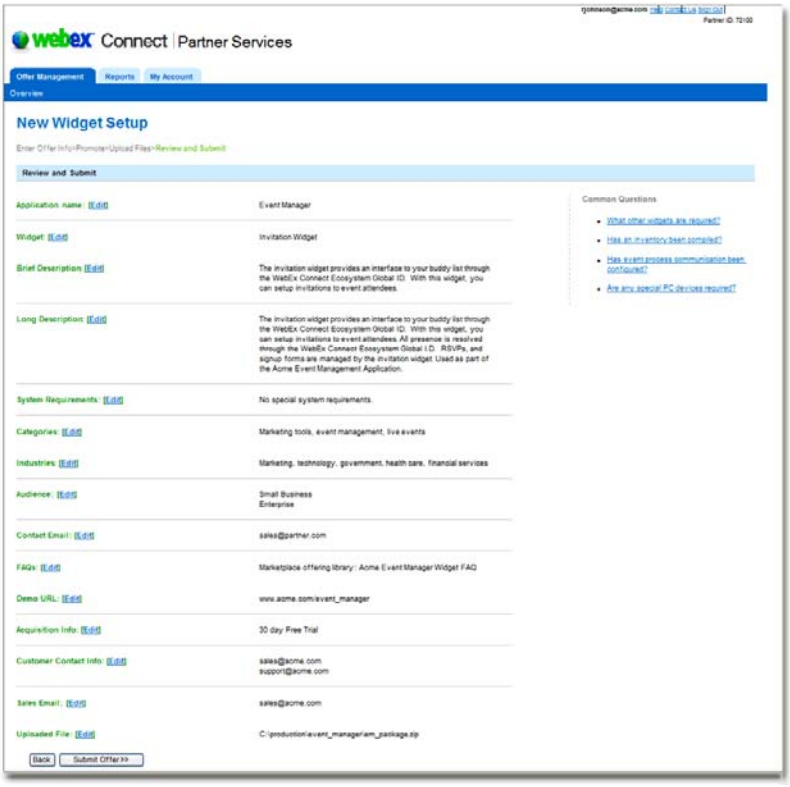
The WebEx Connect Marketplace is a central location and ecosystem for partners and WebEx to provide value-added solutions, offerings, and services to the Connect Community. It is not just a "store" where folks can "shop" for solutions, but rather a persistent destination of continued interaction, information exchange, and sharing. It is also a personalized experience using the Connect Identity to create a unique view onto offerings that make sense for the user, based on their profile, things they have, and things they might want.

For customers, it is the primary means to discover, try, and buy solutions that will enhance and leverage their usage of the WebEx Connect platform. For Partners, it is the primary means of connecting with the vast WebEx user base to offer, manage, and deliver solutions. The marketplace also provides entry into the Connect developer community via the Connect partner profile as a developer/partner.

Partner Services

For Partners, the primary interface to the Connect Marketplace is the Partner Services administration user interface – an authenticated access based on your Connect profile as a Connect Partner. From this administration interface, partners can:

- Submit offerings for approval to the Marketplace
- Manage their existing offerings, including updates and removals
- Provision customers who have purchased the Partner offering for their organization or personal use



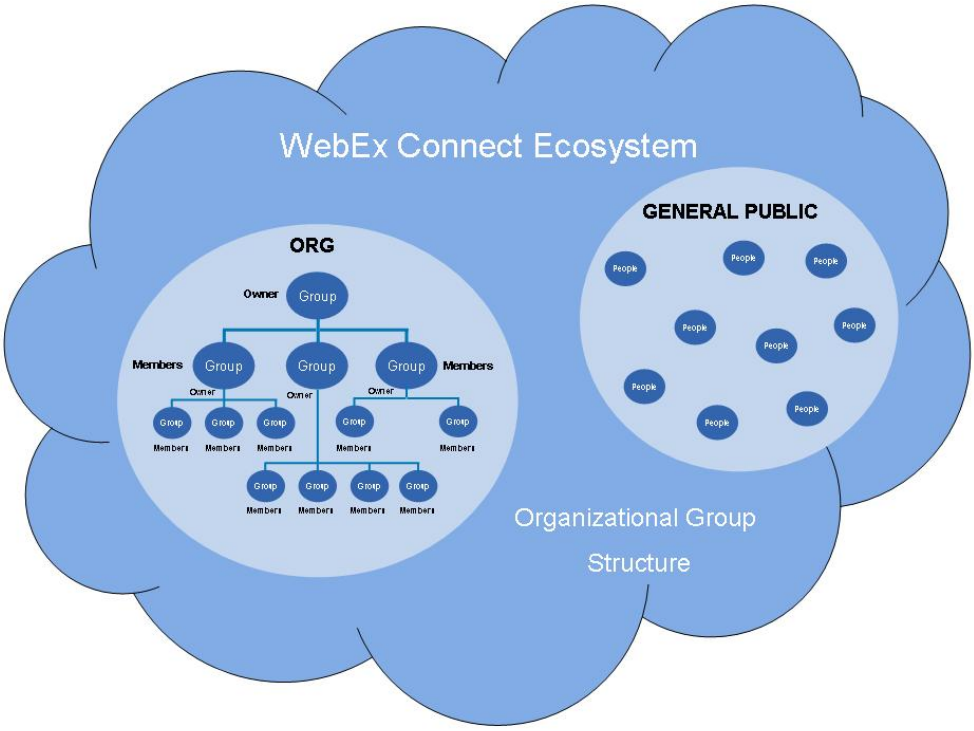
Organization Model

A foundation of the WebEx Connect platform is the Organizational Model, encompassing Organizations, Groups, Users, and Roles. This model, supported by Connect Platform Services, allows Connect to provide a strong object model that supports organizational management and security as well as cross-organizational collaboration security.

Organizations

The Organizational Model provides a way to accomplish several things that enterprise customers need for collaboration in the Connect network.

- Provides a "home" in the Connect network for the enterprise: the Organization
- Provides a Group concept to help administrators map their internal organizational structure to their Organization in Connect
- Allows for comprehensive Policy and Role management by the Organization Admin



Groups

Groups are sets of People within the Organization, and also are sets of people working on projects or business processes that may cross company boundaries. Roles are assigned to people or members of Groups, with privileges that allow the Org admin to enforce corporate policies with respect to internal and external communications. A group structure can (but not necessarily) reflect the reporting and organizational structure of an enterprise. Other group structures, manifested as Connect "Spaces", are cross-functional (or "matrixed") entities that permit businesses to conduct projects, and provide access controls to content associated with the project.

Groups take on two distinct types:

- **Organizational Groups**: "Groups"…these structures are able, and intended, to help a company map their corporate Org structure (reporting structure) into the Connect model. These Groups might be imported into Connect from LDAP or Active Directory via a .CSV import mechanism, or can be established manually.
- **Cross Functional Groups**: "Spaces"…these structures are more ad-hoc, sometimes ephemeral, and are created to manage cross functional teams (both inside and outside the Org) for a project. A Space is really a container for content and App Modules with an special Group living behind as a "shadow" entity to manage the people and policies. Buddy Groups are similar, and also have a "shadow" Group behind them.

Policy Model

The Connect Policy model is designed to be flexible and comprehensive so that organizations can tightly control network and content access, both within and across corporate boundaries. However, it is also designed to be easy to use for basic use cases, with a default out-of-the-box structure that will fit most needs. It is up to the Org Admin as to what level of detail and granularity to extend and refine the Roles and Privileges based on the specific needs of the organization.

The Policy model is centered around two main concepts:

- **Roles:** Roles are assigned to Groups as well as individuals. If a user does not have a specific Role(s) assigned, they default to the member Role of their Group affiliation. Users can belong to more than one Group, and can have more than one Role assigned. In this case, their Privilege set in any given access situation is the union (logical "or") of all their granted Privileges. That is, if any Role grants a certain Privilege, then that user gets it.
- **Privileges:** Privileges are specific grants of a permission to allow the Privilege holder to perform a certain action. Privileges are attached to Roles.

Privilege Categories

There are two main categories of Privileges, with some sub-categories:

- **Corporate Policies:** These Privileges are specific to controlling network communication and collaboration capabilities, such as, what can I do inside my firewall vs. outside. An additional subset of Corporate Policies that govern administrative rights.
- **Access Controls:** These Privileges govern access to content, including things like documents in Spaces, as well as the Spaces themselves.

Roles

Roles grant specific privileges to individuals assigned to a given Role(s). Individuals can have more than one Role (such as a Group Admin can also be a Space Owner, or a Group Member of a completely different Group).

Roles are assigned to:

- Groups: every member of the Group gets that Role
- Individuals: only that individual is given that Role. This type of assignment is optional.

Corporate Policies

Corporate Policies are distinct in that the evaluation of these can only consider Privileges derived from Roles for which the given Person is assigned based on their Organizational assignments – not because they happen to be a member of a Space of another company. This prevents a given user from getting

permission for an action that is unauthorized by their particular organization based on their membership in an external Space.

Access Controls

Access Controls govern access to content-bearing objects. These object types include:

- Spaces
- Tab and Application Access
- Profiles Content
- Tasks, etc., other things contained in Spaces

Collaboration Spaces

The concept of Spaces is a central innovation of the Connect platform. They provide the basis for both asynchronous and real-time collaboration, project management, document management, and policies for access controls to content. It is anticipated that as business activities progress, individuals in the Org will create Spaces for specific projects. When the project is complete, it can be deleted if desired. Some Spaces will be general purpose and persistent over time.

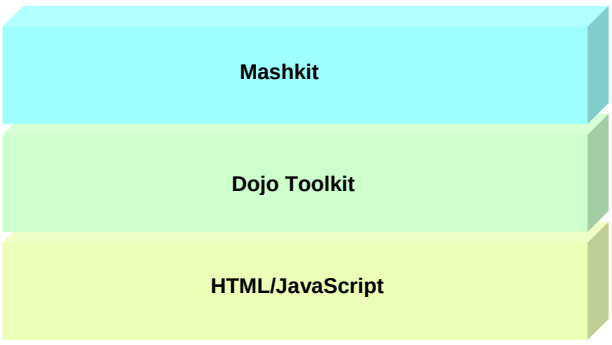
Application Modules

App Modules are large or small software services that install like a plug-in into a browser or application over the Internet. Simple Apps providing functions such as clocks, weather and stock feeds have been in use for some time. WebEx Connect brings the concept of Web 2.0 style widgets into the business application arena, including interfaces to traditional enterprise applications such as ERP, SFA, and CRM. WebEx Connect App Modules redefine the use and scope of what widgets can do and with a very high level of interoperability amongst applications sourcing and consuming services over the web.

Application Module Structure

Apps in Connect are essentially "wrappers" around application functionality that is presented in Connect Spaces. They can be as simple as an RSS feed, or as complex as a CRM or ERP content and database agent. Further, multiple modules can cooperate with each other inside a Space via the Connect Application Framework. The Connect Application Framework is built upon the Dojo 1.x open-source framework as illustrated. Connect wraps the Dojo namespace into Connect-specific object and method names to insure backward compatibility.

The core model of the Application Construct is based on the tried-and-true MVC programming model (Model, View, Controller). In this case, the model is referred to as the "Store" (multiple types), the View is basically the View, and the Controller is an event and trigger model called "Wires".



Modules can be constructed to be general purpose, and configured in a per-instance basis (for usage in a particular Space) via parameters. For example, a CRM widget would need to know which Account ID and Opportunity ID it should access for the purposes of the given project. This metadata is configured once by the Space creator, and is persistent, and automatically invoked by the Module for each user accessing the Space.

Application Modules are hierarchical in nature, with parent-child relationships. This allows general-purpose modules to be constructed and re-used across multiple application constructs.

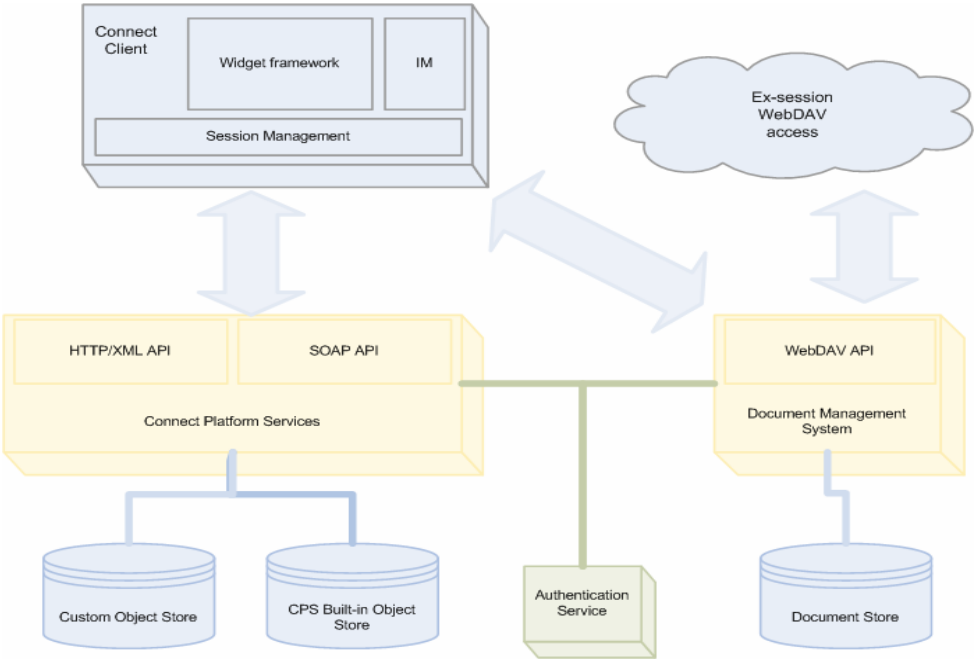
WebEx Connect Platform Services

The WebEx Connect collaboration platform consists of both a client presence and a remote server presence.

The client presence is the component that is visually (and possibly aurally) apparent to the end-user. Briefly said, it is the UI component and much of the logic processing in WebEx Connect is taking place in the client. People presence in the platform is provided through the client integration with AIM.

The server presence is not visually apparent and, in the most part, is known only to the software running in the client. However, the server presence handles important functions such as authentication, categorization, access control, extensibility, and storage. The Connect Platform Service layer provides this presence and these services.

All of the functionality exposed by the Connect Platform Service layer is available through a web-services API, discussed in more detail in the reference documentation.



Development Process

Every Connect client is automatically enabled for development. The client is pre-provisioned and pre-configured with a "developer Sandbox" automatically. The Sandbox is a special kind of Space that has only one member (the developer) and is configured with a set of Tabs that provide tools to assist in the development process.

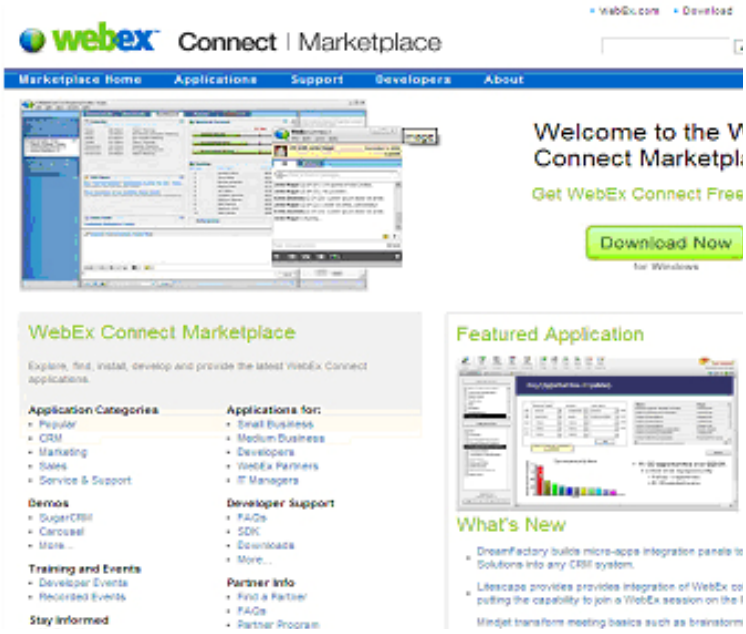
From here, a developer can create App Modules by editing the necessary XHTML/XML definitions, incorporating any desired Javascript libraries, etc. on their local file system. In the Sandbox, the function for adding content (which normally browses libraries to select Modules) also allows the ability to browse the file system, select a Module definition under development, and place it in the Sandbox (on any Tab). The Module can then be tested, etc.

Once an App Module is complete, it can be uploaded into the developer's Personal Library, or sent to an administrator to upload it into a Corporate Library for distribution within their Company. For Partner

developers, the App Module definition (and other required files) can be submitted to the WebEx Connect Marketplace for approval and publishing to the Connect Community at large.

WebEx Connect Marketplace

The WebEx Connect effort delivers benefits to end users through a collection of applications (Widgets) which are obtained via the Marketplace. This is accessible either from within the WebEx Connect Client itself, or as a stand-alone site via WebEx.com. The Marketplace is an eCommerce enabled community, destination, and on-going conversation between Partners, Customers, Potential Customers, and Developers. As an extension of the WebEx Connect Client, it facilitates the listing, discovery, purchase and support of Widgets, Templates, and Applications.



Connect Developer Community

The WebEx Connect Developer Community is accessible from the WebEx Connect client and also via the Marketplace. Fully authenticated through the WebEx Connect ecosystem, the community provides access to the APIs, SDKs, and documentation needed to create App Modules and applications. From the Developer Community:

- All WebEx Connect users may access the Developer Community, leveraging the WebEx Connect platform to design composite applications.
- Developers may test the Connect apps and modules they create using the built-in “sandbox” environment of the client, obtained on the community.
- Developers may participate in several forums with their peers and share know-how, tips and advice while they are creating new apps.
- Blog posts, event calendars and a content repository are part of the WebEx Connect Developer Community

Conclusion

WebEx Connect is ideally architected for SaaS Web 2.0 applications. The Connect platform and services are well documented within this piece and with several tools and supporting documentation made available to developers. From the presence-rich end-user client to the Connect Marketplace and developer community, there is a robust, SOA infrastructure enabling a grid of users, services and application providers to thrive within a global ecosystem. As a developer, you hold the keys to these mashups. Your Application Modules provide the components of a new generation of collaborative composite applications. WebEx will make sure you are successful in reaching the 450 million potential users out there. Feel free to develop away.