

The background features a dark, textured surface with a glowing blue and purple sphere in the center. A white Apple logo is positioned at the top of the sphere. The text "Worldwide Developers Conference" is overlaid on the image. "Worldwide" and "Conference" are in a gold, serif font, while "Developers" is in a white, serif font enclosed in a white rectangular box. The overall aesthetic is futuristic and tech-oriented.

Worldwide

Developers

Conference



Writing Web Server Tools

Chuck Shotton

**StarNine
Technologies, Inc.**

Session Overview

- **W*API Essentials**
 - A quick look at what it is and how it works
- **W*API Applications**
 - What's it good for?
- **Inside a plug-in**
 - What makes it tick?
- **W*API Resources**
 - How to get started yourself



W*API Essentials

*What is W*API?*

- **High performance extensions to the WebSTAR family of servers**
- **Same interface is supported by most popular Mac Web servers**
 - Apple, Microsoft, Tenon, Sonic Systems, Quid Pro Quo, etc.
- **Cross-platform support for ISAPI compatible servers**
- **Easy way to build custom Web applications**



Plug-in Parts

Web Server

Server-Specific
W*API Glue

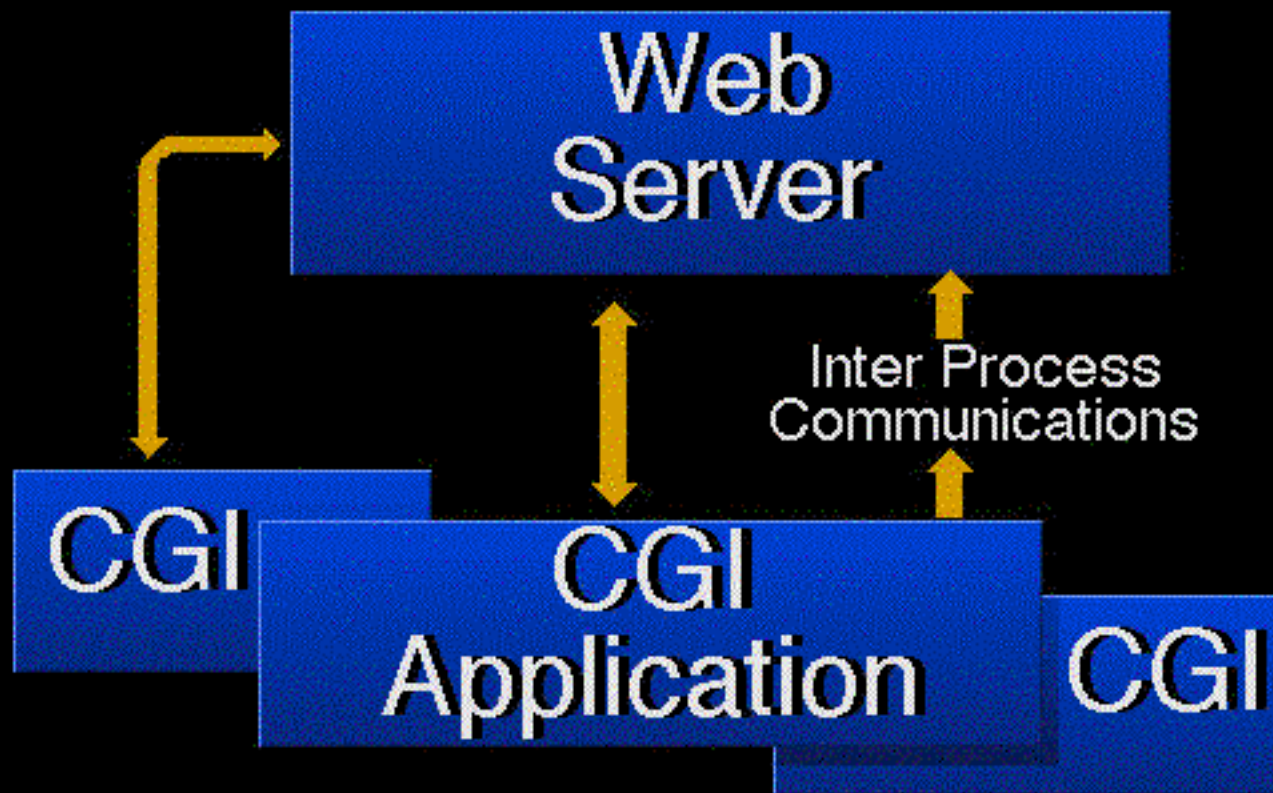
Runtime
Interface

W*API Plug-in
Code

Compile
Time
Interface



Mac CGI Model



Plug-in Model

Web Server

Plug-in

Plug-in

Plug-in

Dynamic
Linking



Features and Advantages

- Replacement for CGI applications
- Faster and simpler than stand-alone apps
- Superset of other APIs
- Rich set of services



Interface to Web Servers

- **Uses Code Fragment Manager (or Code Resources)**
- **Supports callbacks to server**
- **All CGI functions plus extra plug-in features**
- **Shared global space, no AppleEvent overhead**
- **Access to private resources**



How Is W*API Cross-Platform?

- “Glue” layers link plug-in to multiple servers
- Many ANSI-compatible plug-ins only require relinking
- Support for ISAPI and NSAPI glue



Mac Web Server Interface

WebSTAR Server

Code
Fragment
Manager

W*API
Glue

Runtime
Interface

W*API

W*API Plug-in
Code

Compile
Time
Interface



ISAPI Server Interface

Microsoft Server

DLL

ISAPI Glue

ISAPI

W*API Plug-in
Code

W*API

Compile
Time
Interface

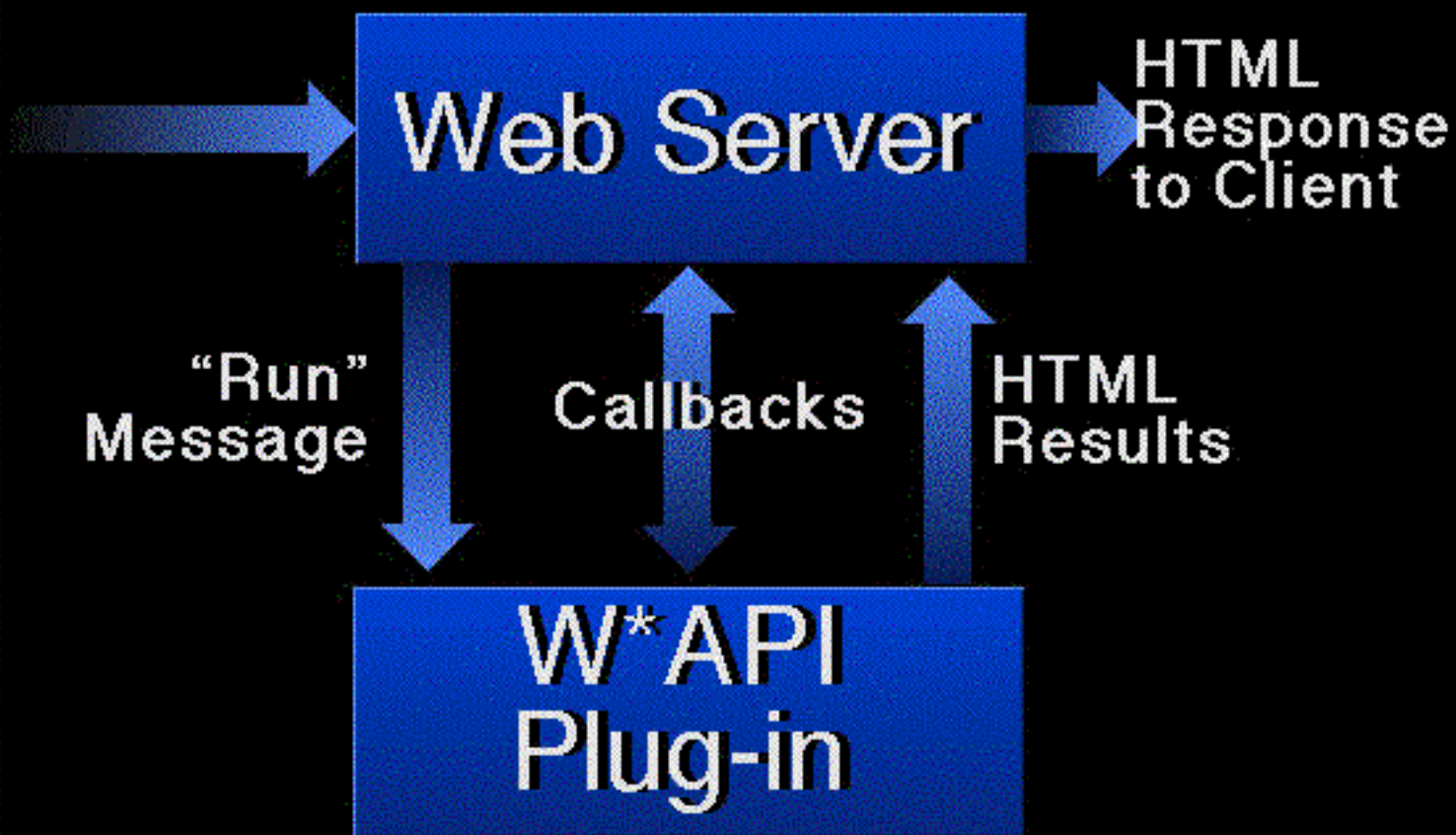


How Does W*API Work?

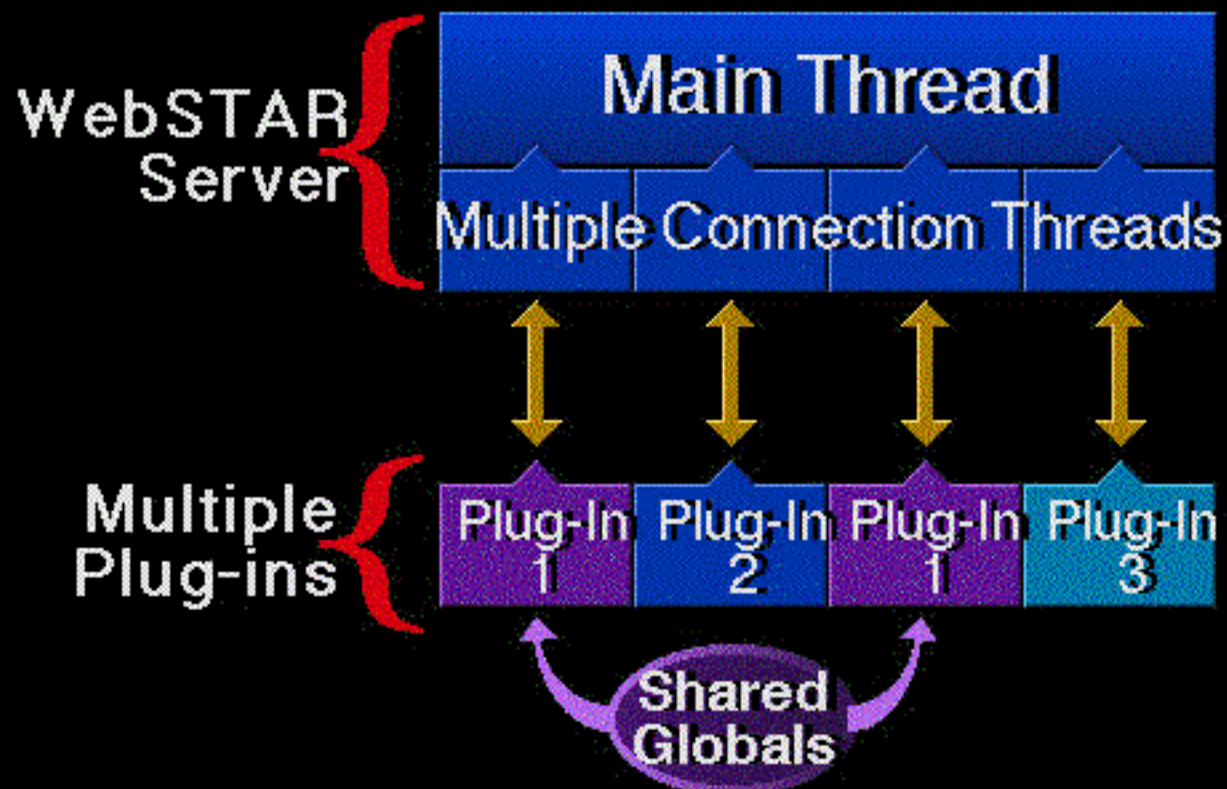
- Think of plug-ins as “snap-in” subroutines for the server
- Each plug-in receives messages through its main entry point
- The plug-in makes callbacks to perform its basic functions



Calling a Plug-in



Calling in Parallel



Server Threads and Roles

- **Main**
 - Register, Init, Emergency, State Changed, Shutdown messages
- **Idle**
 - Idle messages
- **Connection**
 - Run messages (multiple roles)
 - CGI, Pre-/Postprocessor, Error, Index, No Access
- **Filter and Access Control**



W*API Parameter Block

```
typedef union {
    WSAPI_InitPB init;
    WSAPI_ShutdownPB shutdown;
    WSAPI_IdlePB idle;
    WSAPI_RunPB run;
    WSAPI_EmergencyPB emergency;
    WSAPI_StateChangedPB stateChanged;
    WSAPI_AccessControlPB accessControl;
    WSAPI_FilterPB filter;
} WSAPI_PB_Union;
```

```
typedef struct {
    long api_version;
    void *api_data;    //private data
    WSAPI_Command command;
    WSAPI_PB_Union param;
} WSAPI_CommandPB, *WSAPI_CommandPBPtr;
```



W*API Services

- **Memory Management**
 - Pointer and handle allocation and deallocation
- **Getting and setting server parameters**
 - Parameter management, descriptor management, server settings
- **Initialization and registration**
 - Registering actions and suffixes



W*API Services

- **Security and process management**
 - Validating user access, yielding time, requesting idle time
- **HTTP Communications**
 - Send, receive, and status of HTTP client connections
- **Generic TCP/IP**
 - Open, close, read, write, status for generic TCP/IP connections



W*API Services

- **Interprocess Communications**
 - Send and receive custom AppleEvents
- **Logging and messaging**
 - Status messages and custom log entries



New W*API 1.2 Features

- **Listening for incoming connections**
 - Any TCP/IP based server protocol can now be implemented as a W*API plug-in
- **Plug-in owned windows**
 - Plug-ins can communicate directly with users
 - All normal UI events are passed to plug-ins when appropriate



W*API Applications

- Usual CGI replacements
- Interactive, multi-user applications
- Alternate protocol implementations
- Personal server agents
 - Universal In Box





Demo

W*API Resources

- **Freely available from StarNine**
- **W*API 1.2 will be a MIDAS standard**
- **SDK on-line at <ftp.starnine.com>**
- **www.biap.com has most current W*API info**
 - <http://www.biap.com/datapig/wsapi/>
- **The Webstar—dev mailing list**
 - <http://www.starnine.com/support/maillinglists/>



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