

Internet Information Services 5.0

**Training Division, NIC
New Delhi**

✍ Understanding the Web Technology

✍ IIS 5.0 Architecture

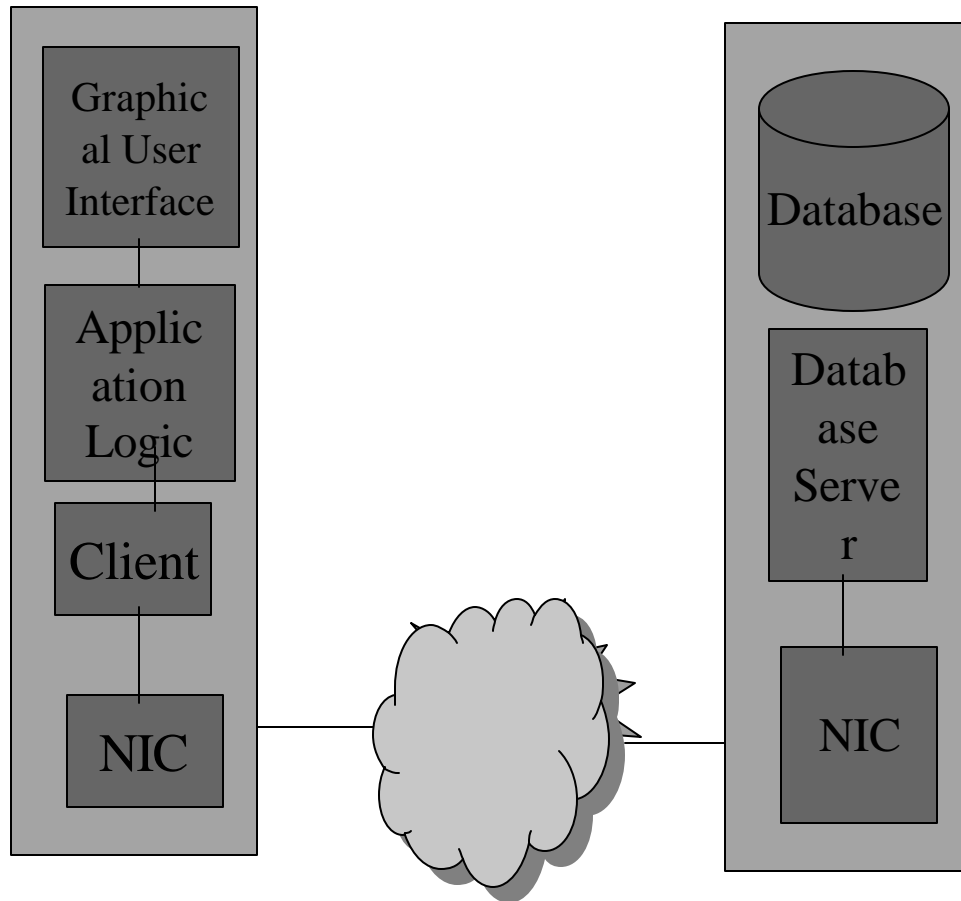
✍ IIS 5.0 Installation

✍ IIS 5.0 Administration

✍ IIS 5.0 Security

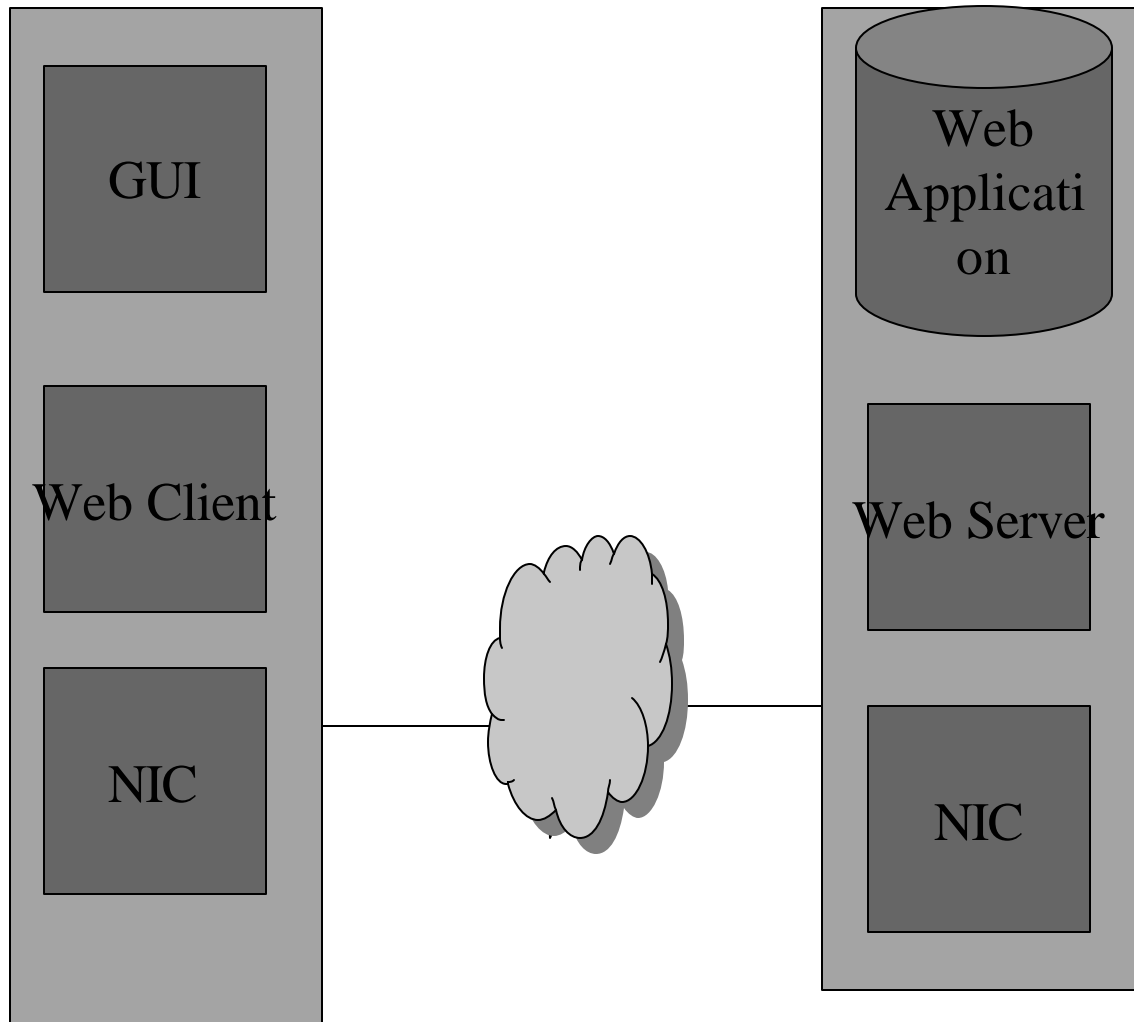
Understanding The Web Technology

Typical Client/Server



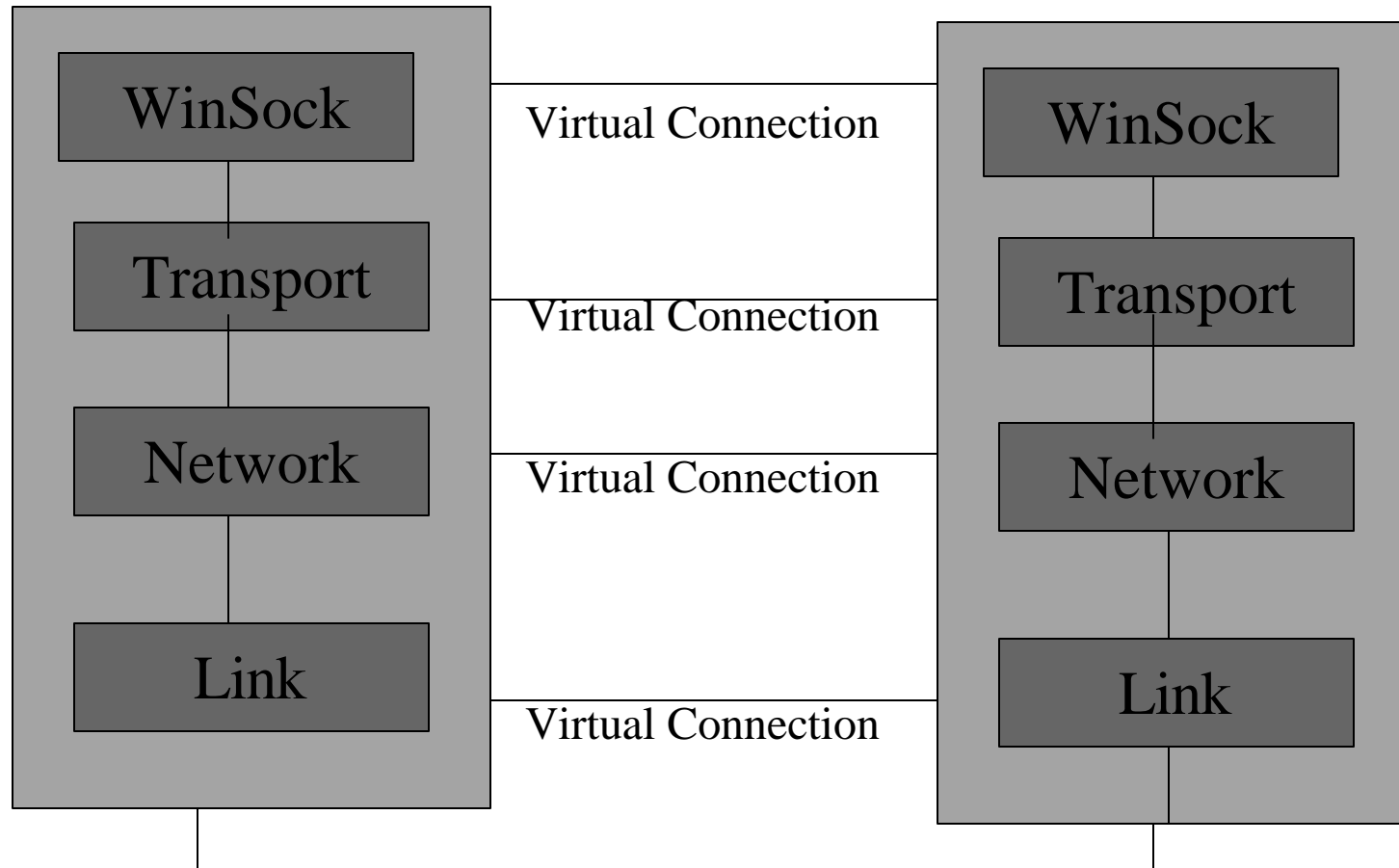
- Client makes a data request to the server.
- Server accepts request for data.
- Server usually connect to a database.
- Application logic at client side.
- Live connection required.

Web Client/Web Server



- Client makes resource request to the web server.
- Server accepts request for resource.
- Application logic at server side.
- Live connection not required between transaction.

IIS Network Components



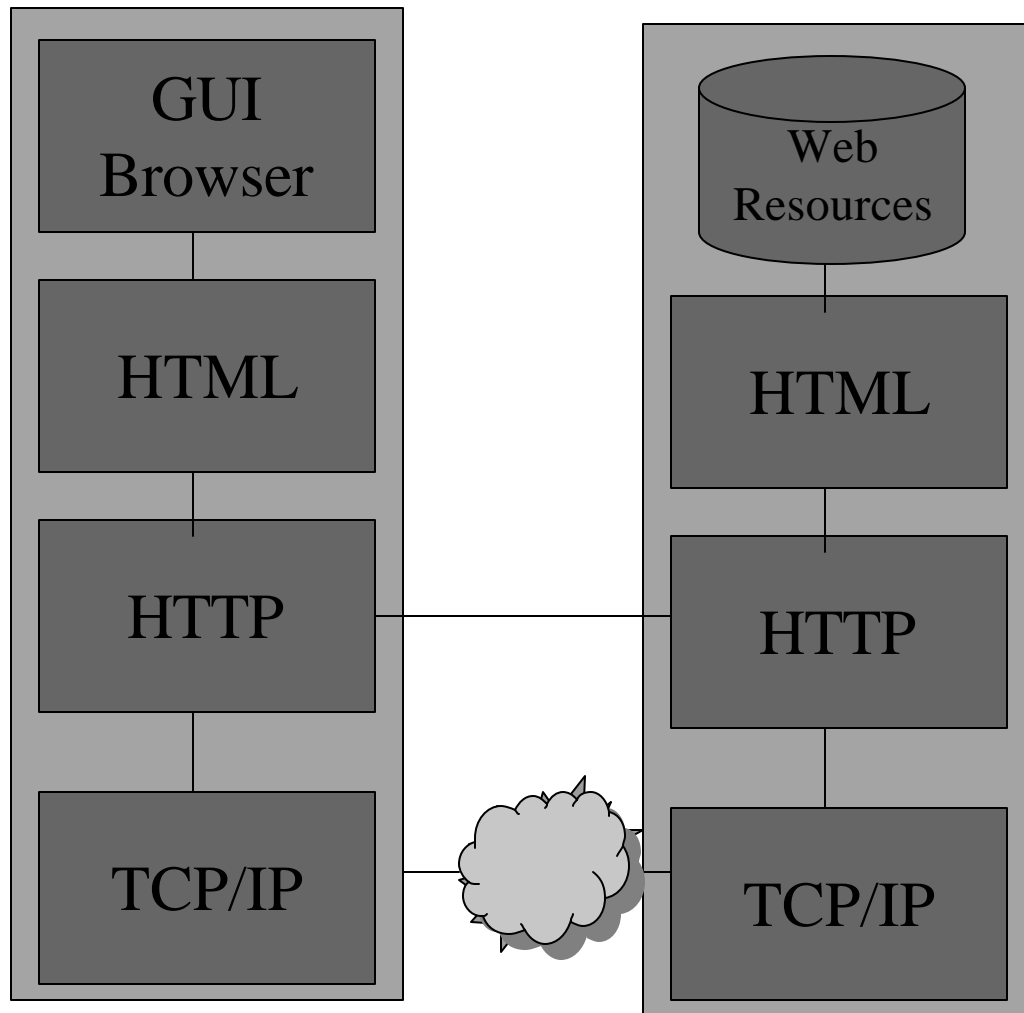
IIS Network Components

- Link Layer
 - Interface the Windows Server O/S to the network.
- Network Layer
 - Manages the Movement of packets around the network.
- Transport layer
 - Manages the flow of data between the client application and Server.
- Application Layer
 - Manages the connection to network and transport layer.

Establishing a Network Connection

- Connection
 - The Web client establish a socket connection to the web server.
- Request
 - The web client sends a recourse request to the web server.
- Response
 - The web server sends a response back to the web client.
- Disconnection
 - The web server signals the end of the transaction by closing the socket connection.

Understanding HTTP



- HTTP uses the client/server model.
- Used to deliver all type of files and data.
- Request takes place through TCP/IP sockets.
- Browser is and HTTP client.
- Standard port for HTTP services to listen on is 80.

Uniform Resource Locator (URL)

Is an abstract identification that locates a resource on a web server.

- Protocol
 - Specifies the internet protocol to access a resource.
- Network Endpoint
 - Internet address of IIS and protocol Endpoint.
- Resource Location
 - Path information to locate a resource on IIS.

{service}://{host}[:port]/[path/...][file name]

Structure of HTTP

- Client open a connection and send a request.
- Server return a response message.
- After delivering the response, server closes the connection.
- Format of the message.
 - An initial line.
 - Differ for request and response.
 - Zero or more header line.
 - A blank line.
 - Message body.

Structure of HTTP

- Initial Request Line.
 - GET /path/to/file/index.html HTTP/1.1
- Initial Response Line.
 - HTTP /1.1 200 O.K.
 - Or
 - HTTP /1.1 404 Not Found
- Status code
 - 1xx indicate an informational message only.
 - 2xx indicate success of some kind
 - 3xx redirect the client to another URL
 - 4xx indicate an error on the client's part
 - 5xx indicate an error on the server's part

HTTP Example

To retrieve a file at the URL <http://www.nic.in>

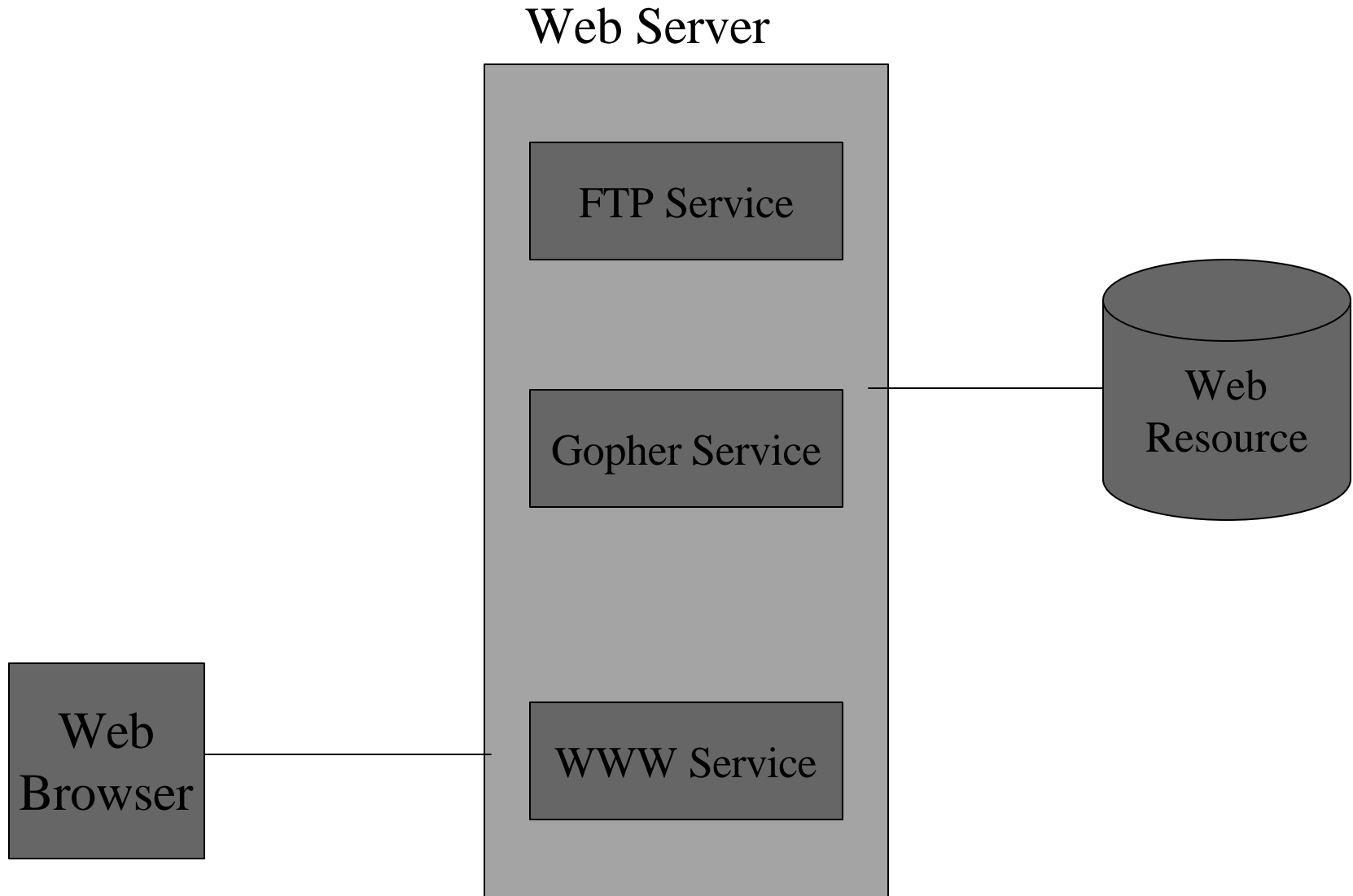
- Client sent
 - GET www.nic.in HTTP 1.1
 - From: rajendra@alpha.nic.in
 - User agent: HTTP /1.0
- Server sent
 - HTTP/1.0 200 O.K.
 - Date:
 - Content- type:text/html/MIME
 - Content-length:1354 bytes
 - <html>
 - <body>
 -
 - </html>
 - </body>

IIS 5.0. Architecture....

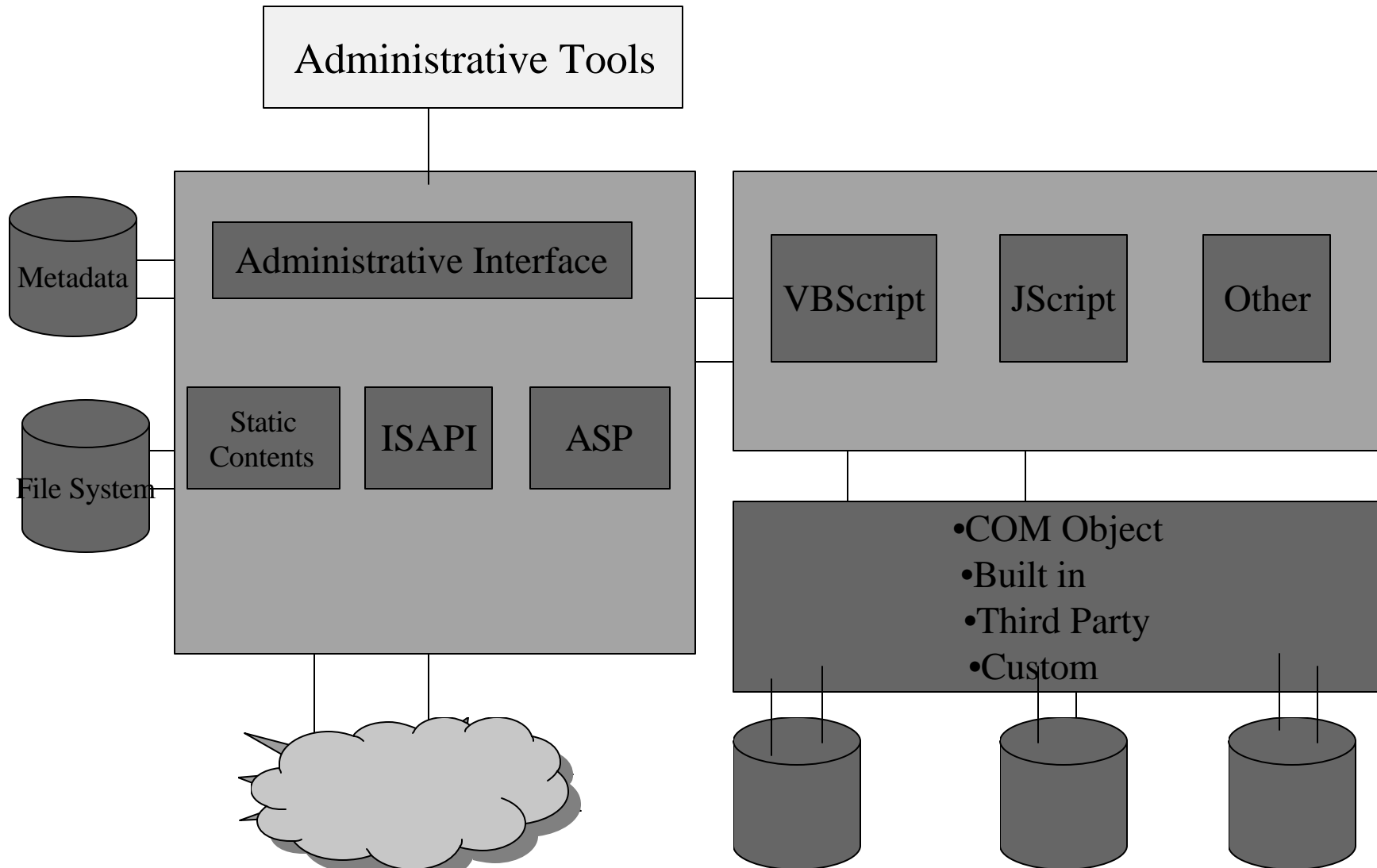
IIS Architecture

- Tightly integrated with the windows 2000 server O/S
 - User Manager
 - Performance Monitor
 - Event viewers
- Is a set of several system services that uses the most common protocol like:
 - HTTP, FTP, NNTP, SMTP
- Offers standard API for extending and customizing the servers capabilities.
 - CGI, ISAPI,ASP
 - ISAPI is based on win32 DLL architecture.

IIS Services



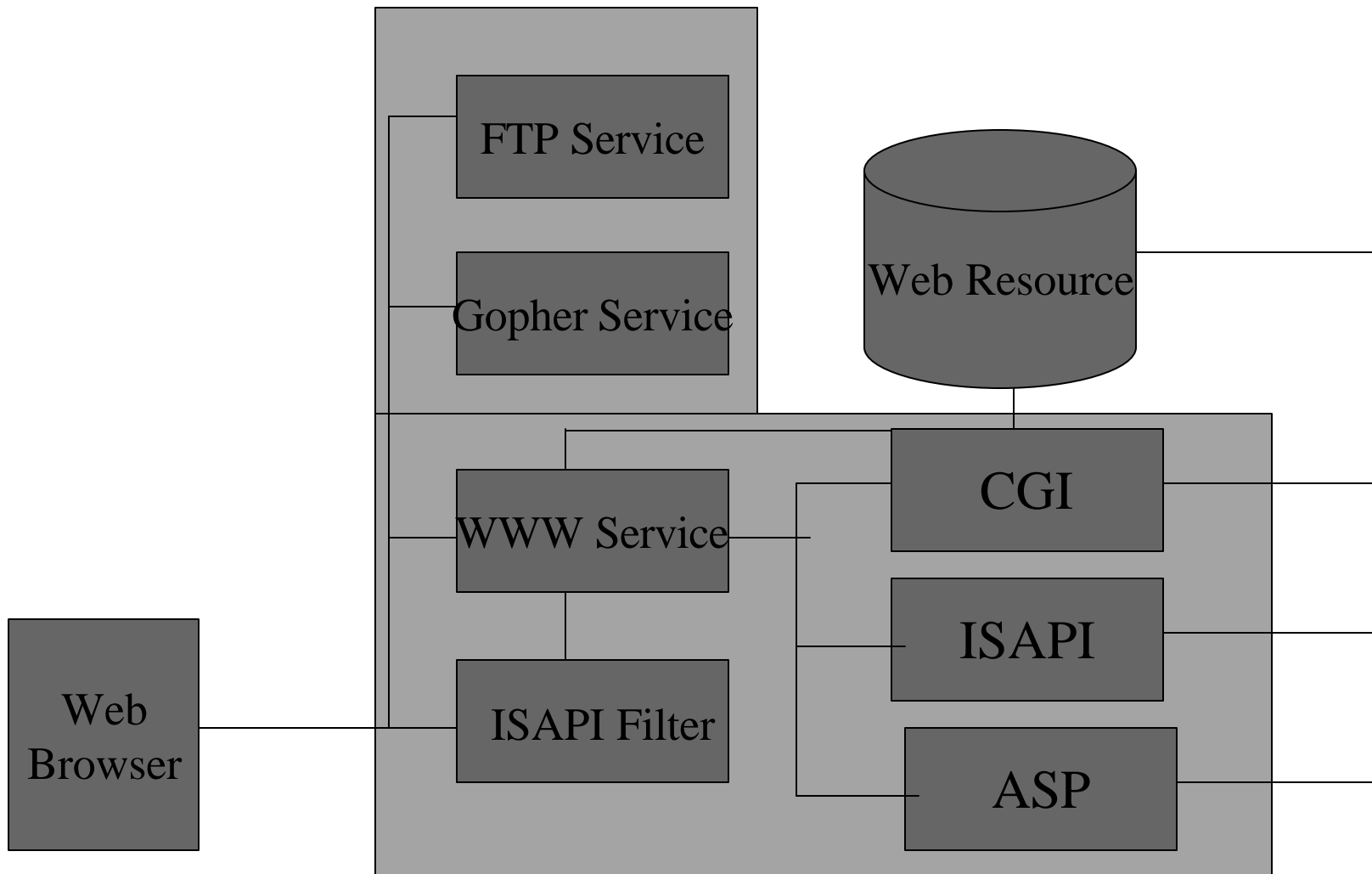
IIS 5.0 Architecture



IIS 5.0 Architecture

- Standard internal services resides in a process called “inetinfo.exe”.
- This process contain the shared thread pool,cache and logging service of iis 5.0.
- Borrows existing windows 2000 service tools for user-account administration, system-monitor, event-viewer and MMC.

Understanding Dynamic Application



CGI, ISAPI and ASP

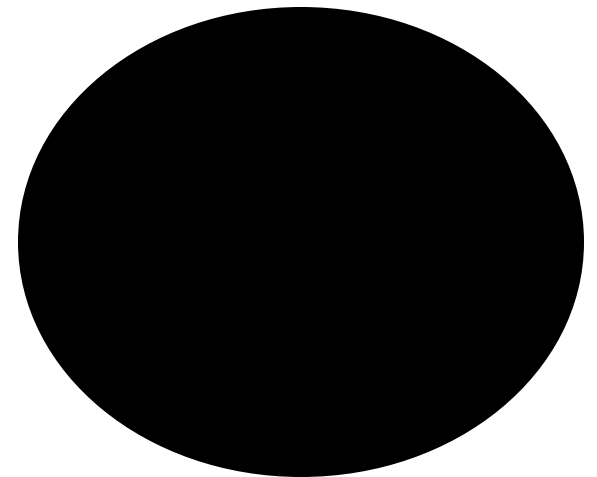
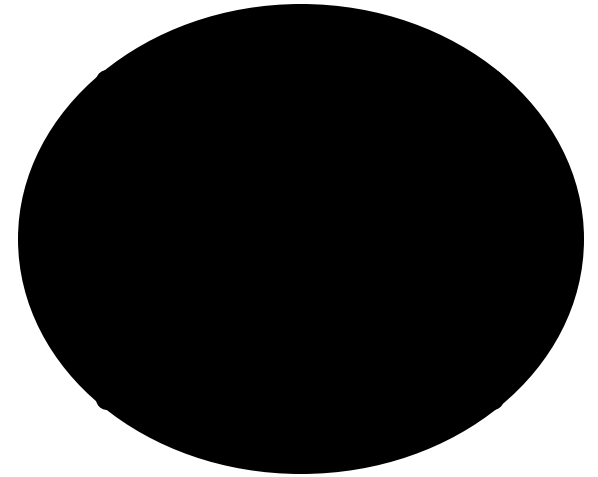
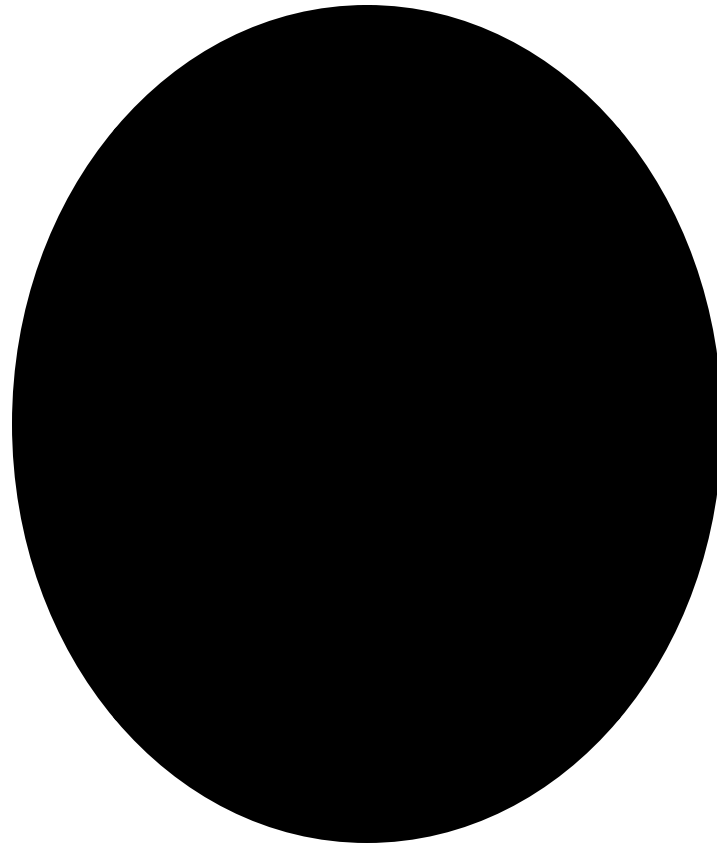
- CGI
 - It require a new win32 process for each HTTP request.
 - Win32 process creation and destruction is relatively expensive process.
- ISAPI
 - Is based on the win32 DLL architecture.
 - It creates ISAPI-compliant DLL into its process and call a well-known entry point to satisfy the HTTP request.
 - It is difficult to implement.
- ASP
 - Is based on ISAPI architecture.
 - It cal contain both HTML and script language.
 - Offer the best solution for high productivity and exceptional performance.

Web Application Manager (WAM)

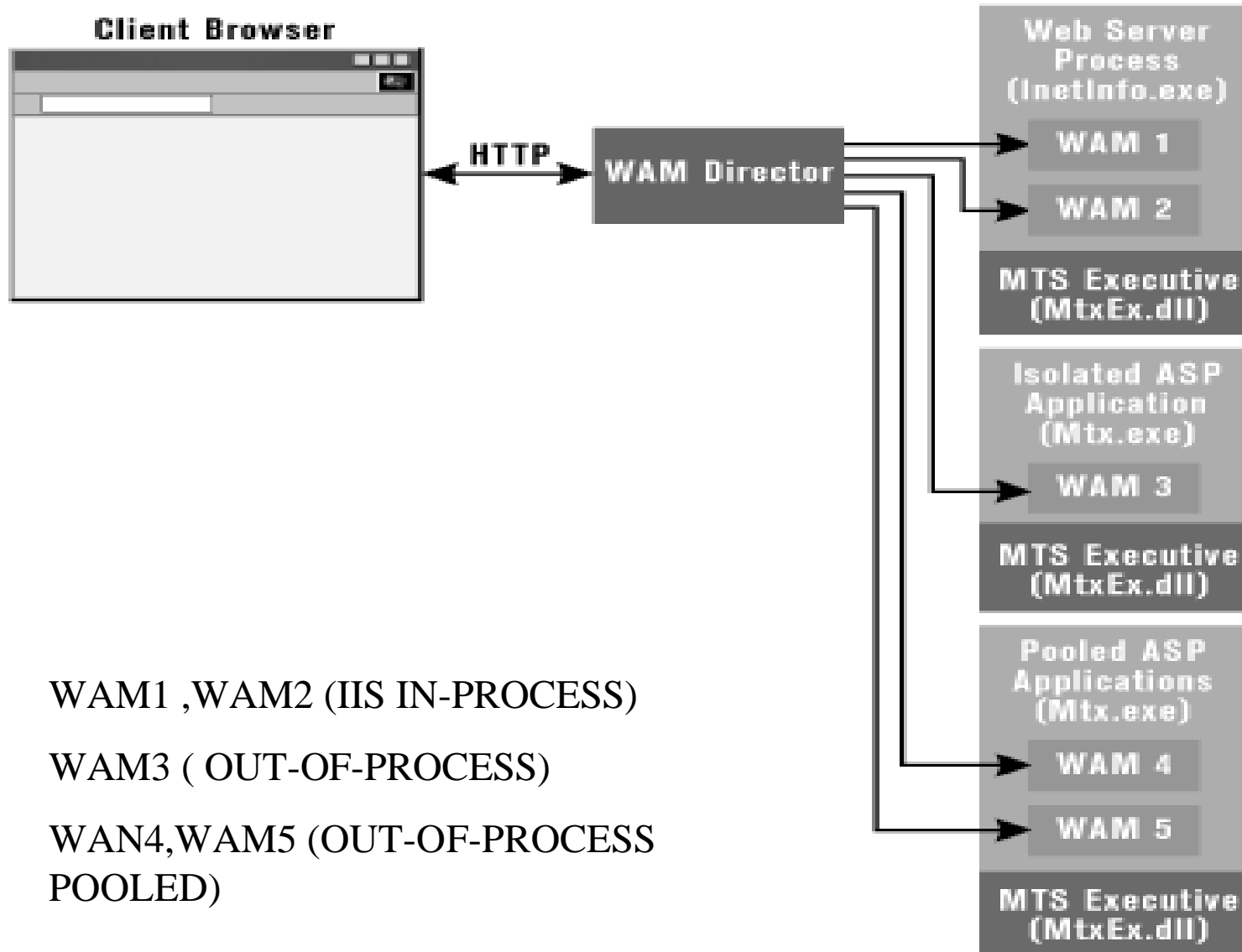
- ISAPI and ASP were based on in-process execution.
- Single fault in ISAPI DLL was capable to bring down all web sites hosted on the server.
- New IIS architecture is based on a new components called “WAM”
- WAM is a simple COM wrapper around existing ISAPI functionality.
- Each IIS application has an associated WAM object responsible for its ISAPI function.

How Apps Crash IIS 4.0

Web Service Failure!!!!



ISAPI and IIS Process



WAM1 ,WAM2 (IIS IN-PROCESS)

WAM3 (OUT-OF-PROCESS)

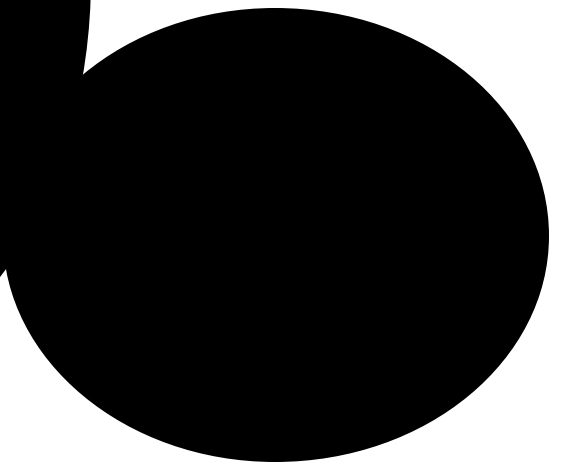
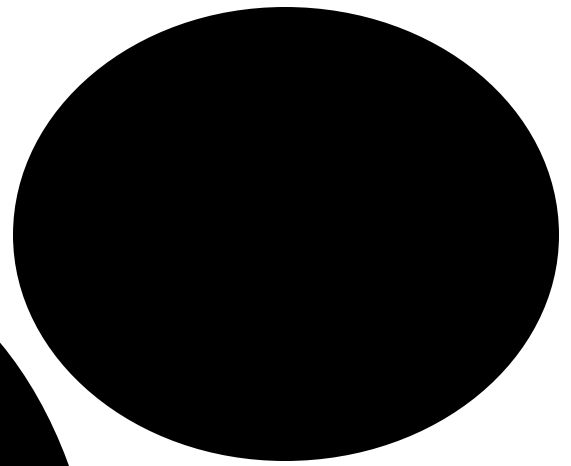
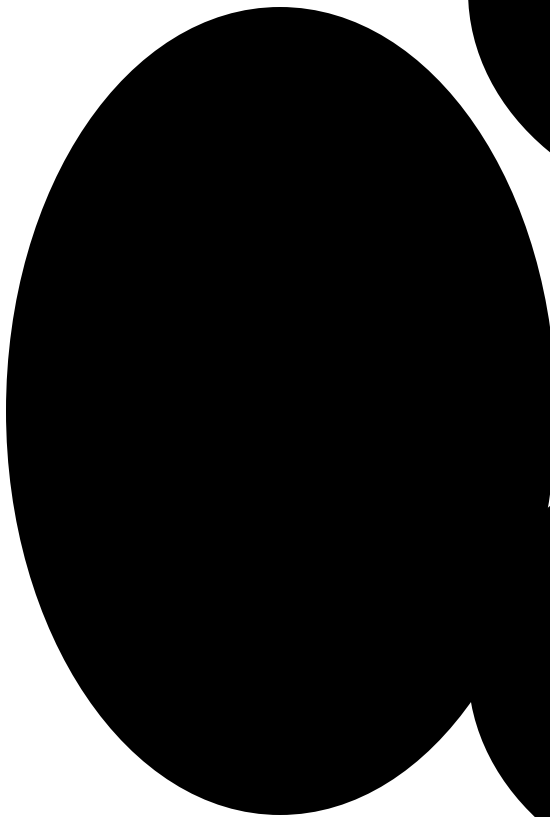
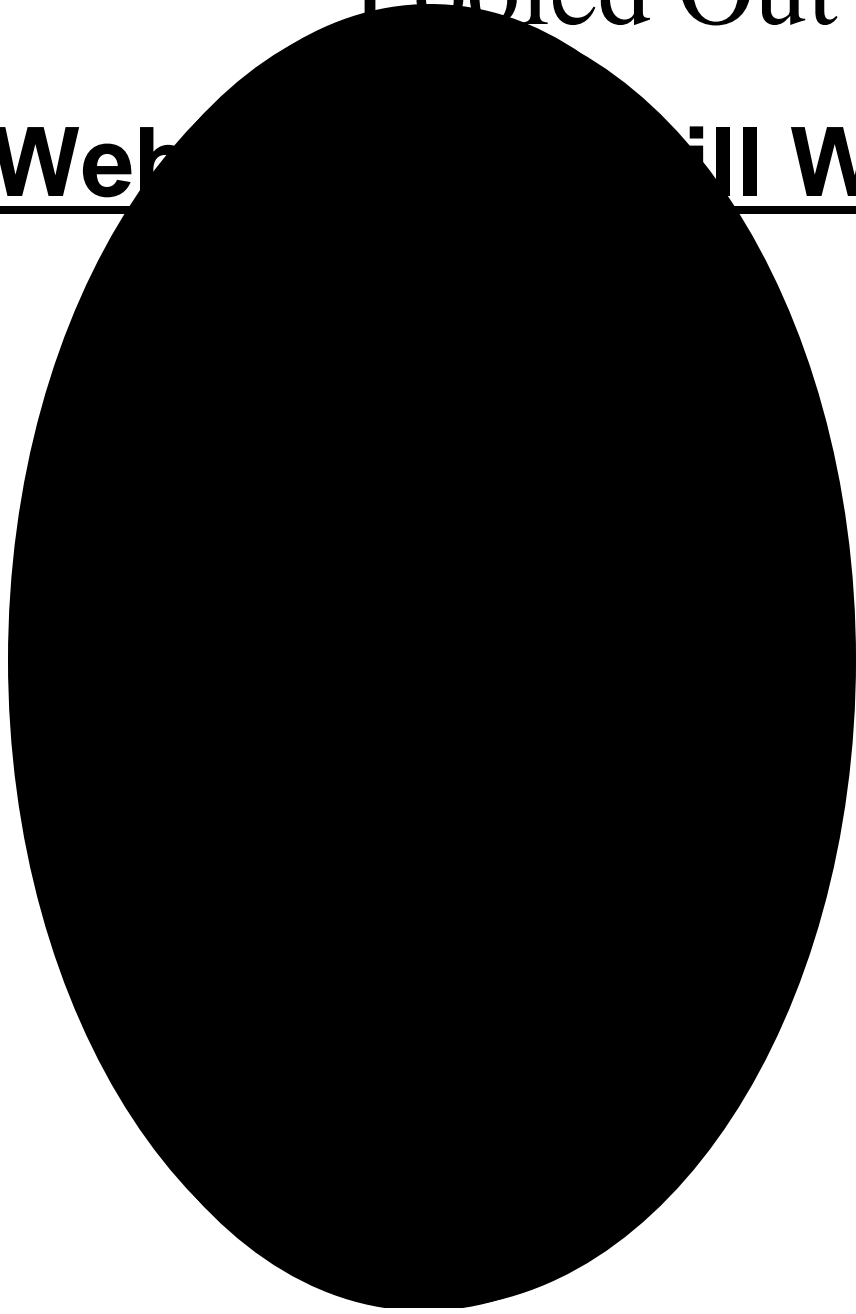
WAN4,WAM5 (OUT-OF-PROCESS
POOLED)

Enhancements and New Process Management Options in IIS 5.0

- Out of process no longer a big performance penalty
- Only one good reason to run apps in process
- A new option, pooled out of process allows IIS 5.0 to scale

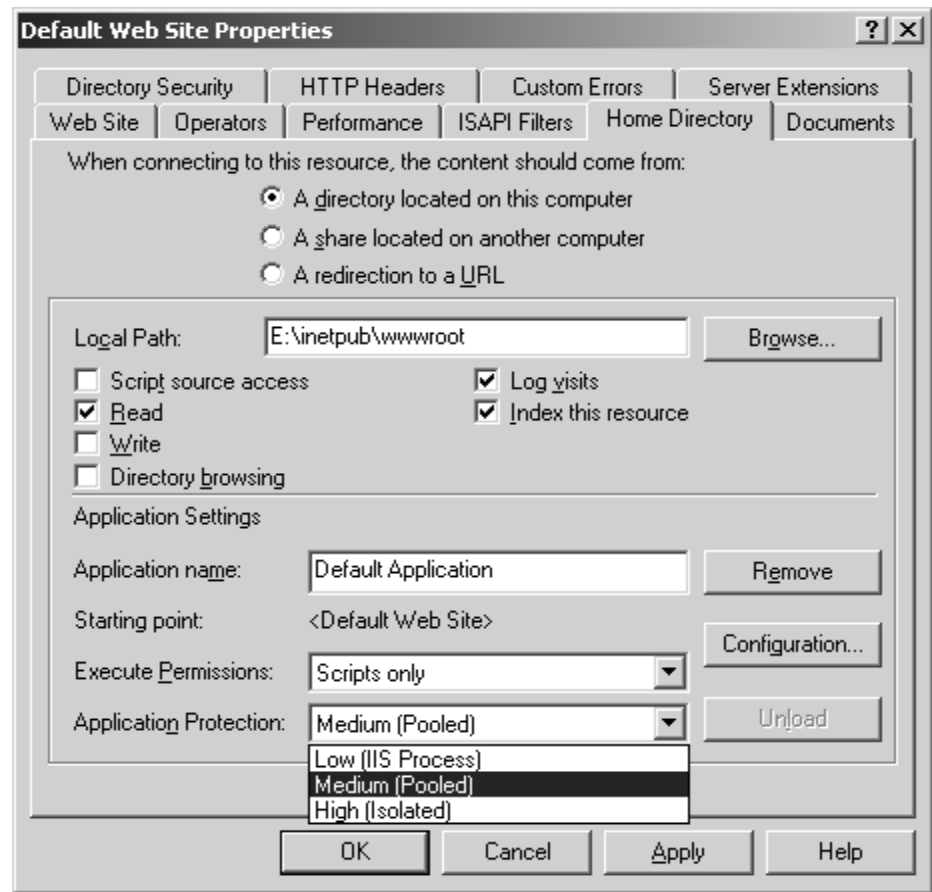
Pooled Out Of Process

Web will Working!!!

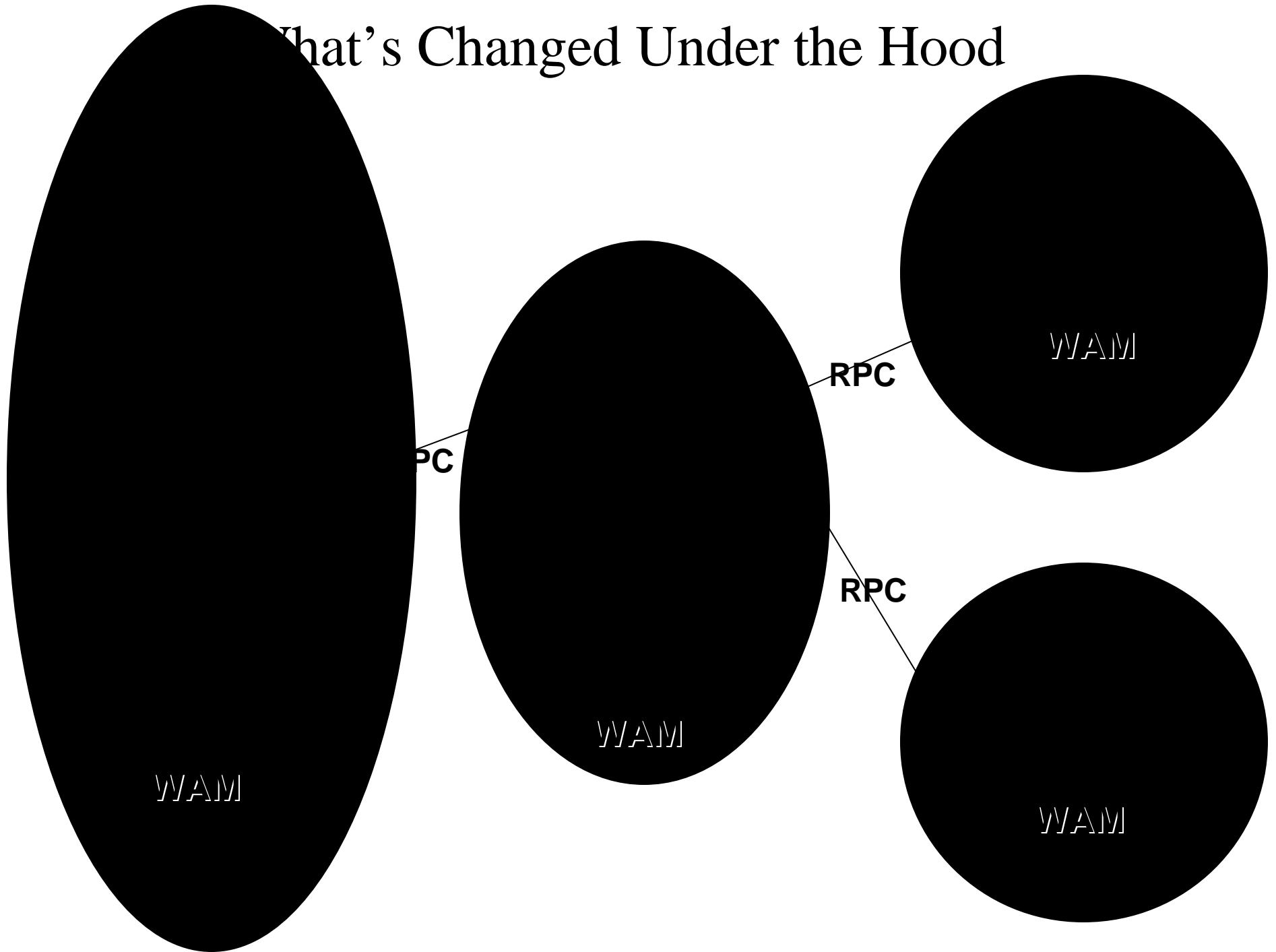


Configuring Process Management in IIS 5.0

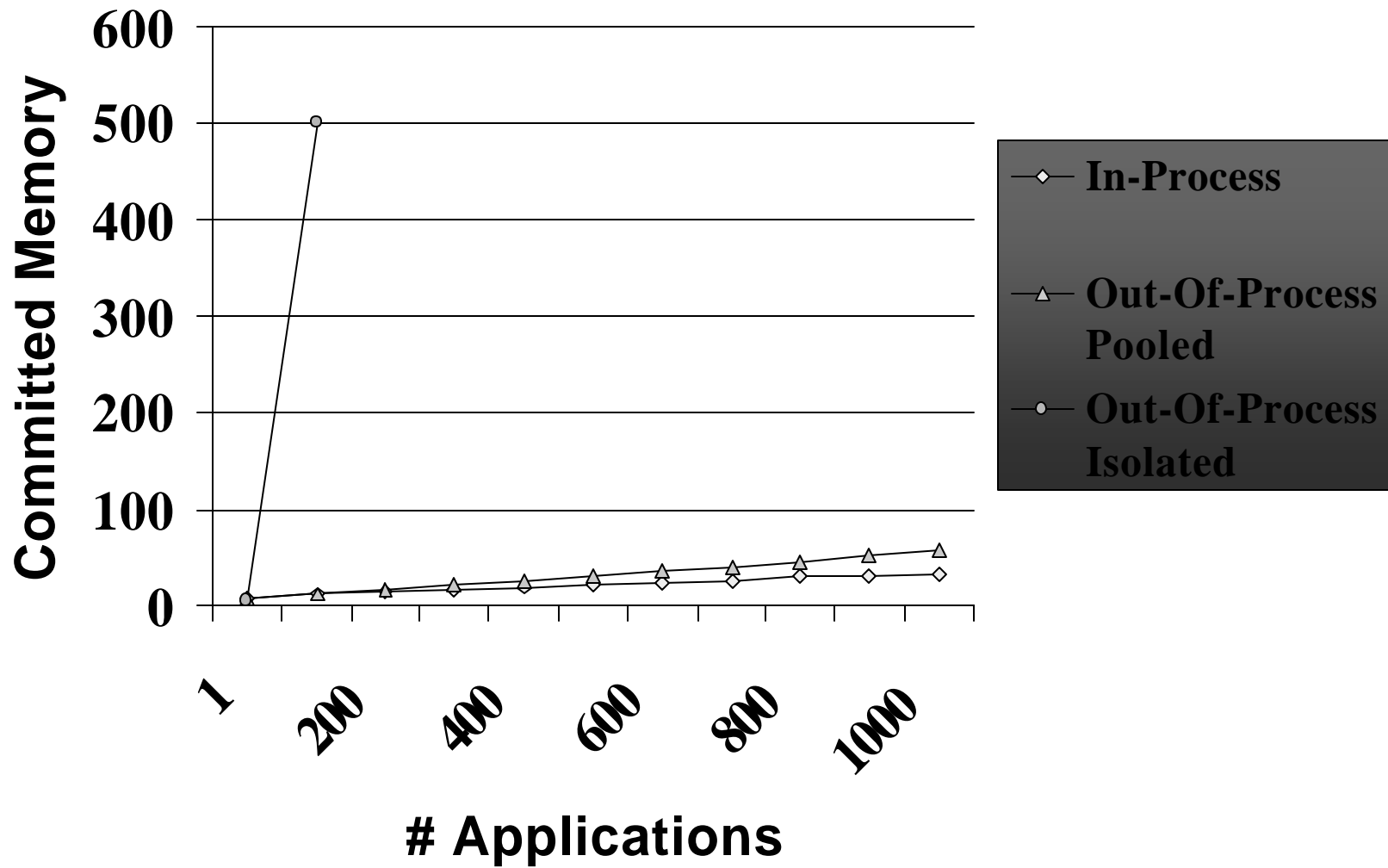
- In process
- Out of process
- Pooled out of process



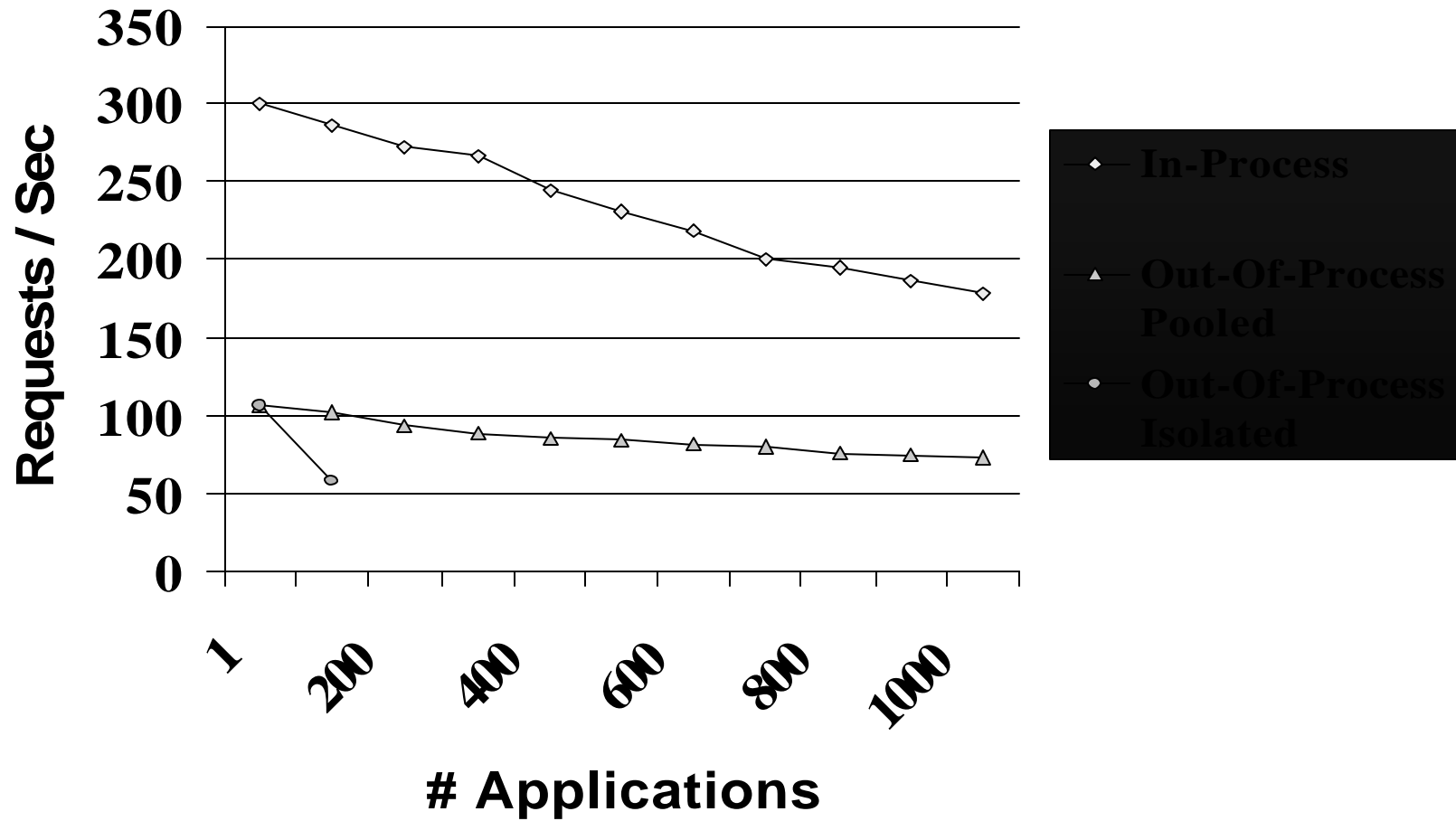
What's Changed Under the Hood



Memory Consumption



Performance



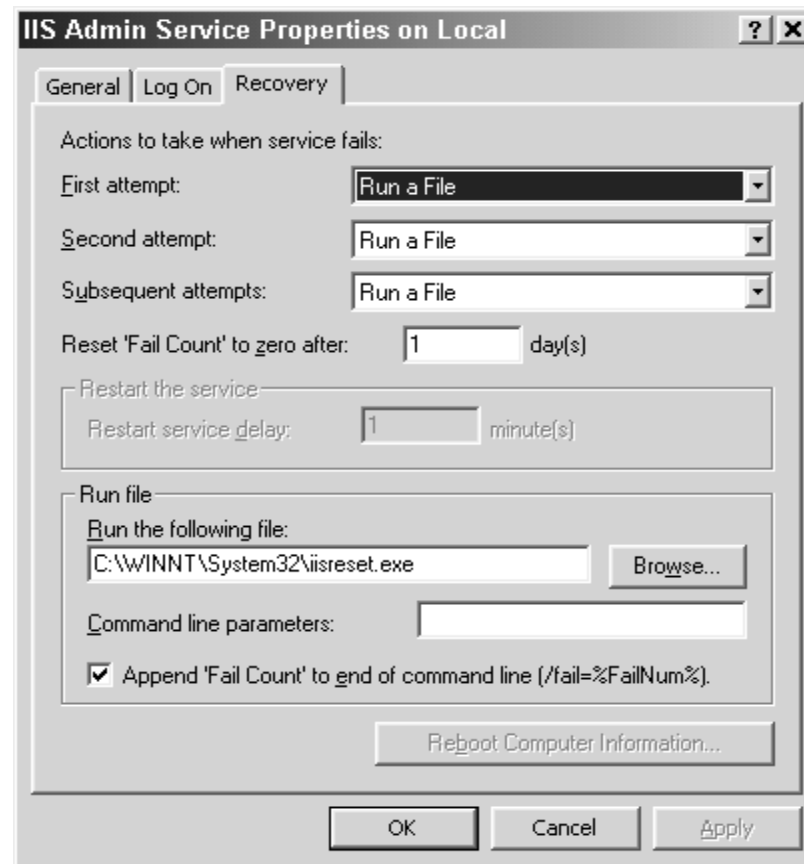
What Options Do You Have If The Web Server Crashes?

- Issues with IIS 4.0
 - Stopping all services in INETINFO not intuitive
 - No consistent way to force a shutdown remotely
 - Graceful shutdown takes too long
 - Killing IIS not obvious to admins (not in GUI, have to use Resource Kit)
 - IIS doesn't recover automatically from crashes

New Restart Options In IIS 5.0

- **Reliable Restart: IIS automatically recovers**
 - Restarts IIS if INETINFO crashes
 - Graceful shutdown is faster in all cases
 - Graceful shutdown is tried first, then kill!
- **Multiple configuration Options**
 - MMC (GUI) support for novice admins
 - Command line support for experts, scheduled restarts etc.
 - Secure remote restart

How To Configure Reliable Restart In IIS 5.0



Defaults, Tips, and Tricks

- Defaults to automatic restart
- Run nothing in process
- Run most applications in pool
- If your application is mission critical, run it out of process
- Add IISRESET to scripts executed by monitoring software

IIS 5.0 Installation.....

IIS Installation

- During setup processes.
 - Easy, not required to configure the site that time.
- After setup has completed.
 - Check the following settings before you install the MS IIS.
 - Being logged on as an Administrator.
 - Checking to see that TCP/IP is installed.
 - Having a static IP address.
 - Having a Domain Name.

IIS Installation

- Control panel, launch Add/Remove programme.
- Click the Add/Remove icon.
- Click next to continue.
- Select IIS by checking the check box.
- Installing sub-components.
 - Documentation.
 - FTP server.
 - Support from front page.
 - IIS service snap-in.
 - IIS (HTML)
 - Etc....

Testing the Installation

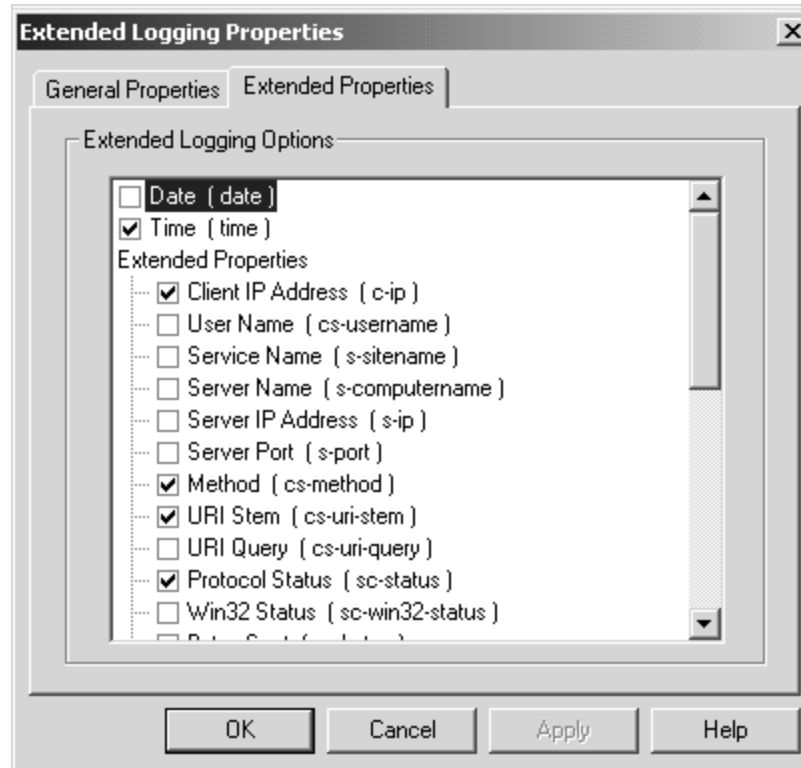
- From server
 - <http://localhost>
- From client
 - <http://server-name>

IIS 5.0 Administration....

How To Make IIS 5.0 Work Smarter and More Reliably For You

- Logging in IIS 5.0
 - How to turn it on
 - What to log
 - Where to find the logs
 - What to look at

How To Enable IIS Logging, And Retrieve The Data



Optimizing Your Web Server

- Application Accounting: A New Option
 - Thread Gating: Giving threads to the applications that need them
 - Process Throttling: CPU Quotas to keep applications from hogging resources

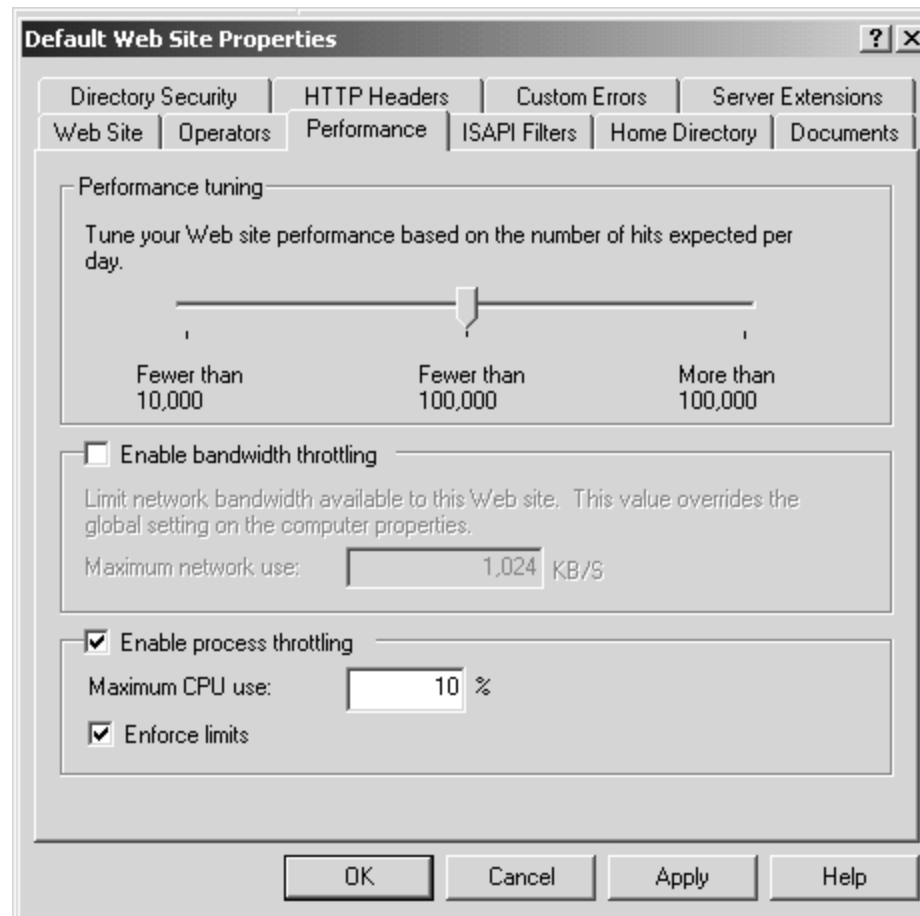
Thread Gating

- Takes idle threads from an application that isn't using them and gives them to an app that needs them.
- Done automatically by IIS based on a variety of factors

Process Throttling

- Keeps CGI and Out Of Process apps from hogging resources
- Helpful on multi-site servers
- Three phases
 - 100 % Log Event
 - 150% Reduce Thread Priority
 - 200% Stop all Out of Process Apps
- Enabled at the Web Site level
- In Process and Pools not affected

How To Optimize IIS 5.0 For Reliability Using Application Accounting



Windows 2000 File System Connection

- Home directories for FTP, Gopher, and WWW services
 - A home directory is the default URL path field for a services.
 - Also called the Home page.
- Virtual Directories for FTP, Gopher, and WWW services
 - Reference files instead of using fully qualified path name.

Understanding Performance Monitor

- Cache performance
 - Total No. of times a requested resource was found in cache memory.
 - Total cache misses
 - Cache memory usage
- Asynchronous Input/Output performance
 - Total No. of requests.
 - Total No. of blocked requests.
 - Number of request blocked by bandwidth throttling.

Defaults, Tips, and Tricks

- Turn on process accounting logs
- Remember the limitations of Process Throttling
 - Enabled at Site level
 - Only Out of Process can be throttled
 - %CPU usage over time can be tricky
- Review logs regularly – find problems before impact you

IIS 5.0 Security.....

Understanding IIS 5.0 Security

- Access Control – Provide access control to critical business data.
 - Support for integrated windows authentication.
 - IP address grant/deny restriction.
 - Restriction on virtual servers and directories.
 - Support for the windows 2000 file system NTFS.
 - Client and server digital certificate.

Understanding IIS 5.0 Security

- **Authentication**
 - Allows initial access to an operating system.
- **Authorization**
 - Is determined by verifying that the authenticated user has access to the resource.
- **Privacy**
 - Is the prevention of message to anyone other than the intended recipients.
- **Integrity**
 - Refers to the ability to protect data from being deleted or changed without the permission of its owners.
- **Availability**
 - It applies to the flow of data and the accessibility.
- **Auditing**
 - Refers to maintaining a secure list of all the events on your system.

Understanding IIS 5.0 Security

- User authentication and authorization
 - IIS 5.0 security is integrated with active directory, only valid windows 2000 user can access the system.
 - Account management.
 - Settings for time-of-day restriction.
- Anonymous Access
 - Can only access files and application for which permission has been granted.

Understanding IIS 5.0 Security

- User Name and password
 - Access to files and application can be restricted to specific users or groups.
 - Can be configured to require basic HTTP authentication.
- Secure Windows Integration
 - Windows NT challenge/Response authentication.
 - User is not asked for a user name and password for each HTTP request.