IBM ITSO Poughkeepsie
OS/390 in an e-business environment

Multiple Webservers
Multiple Web Content

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Multiple Web Servers

- **In OS/390 it is easy to run multiple webservers concurrently**
- **You may choose to run different versions (like DGW 4.6.1 and 5.0 servers)**
- **There might be one or more Proxy Servers you like to run**
- **If you run a production webserver, you might like to have a mirrored test and/or staging environment**
- **You may choose to set up multiple webservers or multiple web content in one webserver (we call that a web hotel) or both**

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Multiple Web Servers

Different Versions

- **Multiple versions considerations:**
  - ► If you SMP/E install a new version and like to keep the "old" one then we suggest you do the following steps:
    - – Copy your SMP/E envirinment since new versions "delete" old versions
    - – Mount the webserver HFS (/usr/lpp/internet) to a different mountpoint (like /usr/lpp/dgw461) and create a new one for /usr/lpp/internet
    - – Rename the libraries (like IMW.SIMWMOD1 to IMW.DGW461.SIMWMOD1)
  - ► For the old version:
    - – Change the STEPLIB in the procedure
    - – Change the ServerRoot and/or Installpath in httpd.conf
    - – Change all filelocations in httpd.conf that pointed to /usr/lpp/internet
    - – Change the pathnames in httpd.envvars

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Multiple Web Servers

Different Versions

- ● **Multiple versions considerations:**
  - ► Set up your TCP/IP environment
  - ► Create one Virtual IP Address (VIPA) per webserver
    - − This allows you to run all web servers with their well known ports
    - − Needs "BindSpecific"
  - ► If you like to to use just one IP address, you have two choices:
    - − Differentiate the web servers by port numbers
    - − Set up different DNS names and differentiate the webservers by domain names (specify hostname)
  - ► Use the scheme we introduced in the "Quick & Proper" configuration
    - − Create /web/server1   /web/server2   /web/server3   etc.
    - − Change the ServerRoot's and the other necessary definitions accordingly

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Web Hotel

Multiple Web Content in one single server

- **DGW allows to serve multiple "logical" webservers out of one physical.**
  - ► Needs to have multiple IP addresses to reach the server (VIPA)
  - ► Or multiple domain names defined to reach the server (requires HTTP 1.1 compliant browsers)
- **Advantages:**
  - ► The most economic solution in terms of resources
- **Disadvantages**
  - ► Changes to httpd.conf, server restarts, server failures etc. affect all "logical" servers
  - ► Standard logging into one common logfile (needs SplitLog)

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Web Hotel

Multiple Web Content in one single server
Configure httpd.conf

```
#        Mapping rules
#
...
# *** ADD NEW PASS RULES HERE ***
# Pass /*       /usr/lpp/internet/server_root/pub/*
Pass /Server/*      /usr/lpp/internet/server_root/pub/*    9.12.3.4
Pass /*           /web/apple/pub/*                     www.the-apple.com
Pass /*           /web/bean/pub/*                      www.the-bean.com
Pass /*           /web/hotel1/pub/*
```

These IP address or hostname keywords work with all resource mapping configuration directives, for access control and for the welcome files.

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- ► How does it work ?
- ► If you do http://9.12.3.4   you are able to access the server configuration files (by using /Server) and you will get the "hotel" homepage.
- ► If you do/http//www.the-apple.com you will notbe able to do server configuration at all and you will get the "Apple" homepage at /web/apple/pub

Web Hotel

Multiple Web Content in one single server
Server Certificate

- **Before Domino Go Webserver V5**
  - ▶ just one server certificate for the whole server
- **DGW 5.0**
  - ▶ Allows one certificate per IP address
  - ▶ This can be done by specifying the SSLServerCert configuration directive
  - ▶ It doesn't work with hostnames though

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- ▶ Specify SSLServerCert keyname IP-address
- ▶ DGW then looks up the key database (.kdb) for a certificate with the specified keyname

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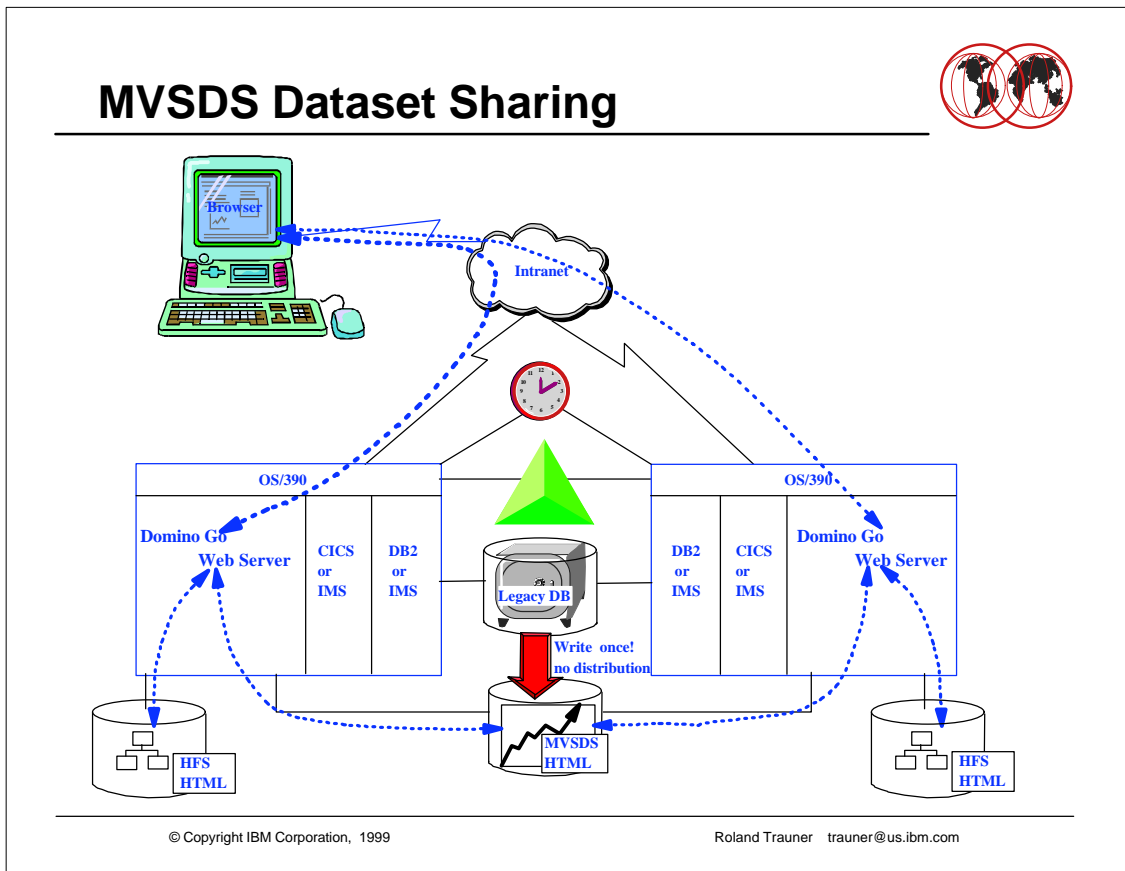# Accessing MVS Datasets
MVSDS

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Accessing MVS Data Sets

- **DGW has the ability to retrieve Web content stored in MVS PO or PS data sets**
- **MVSDS GWAPI delivered with DGW**
- **Advantages:**
  - ▶ Direct access to standard MVS data sets
  - ▶ MVS type data set sharing and concatinating
- **Disadvantages**
  - ▶ EBCDIC data only ???
    - − Good question - is it really EBCDIC only? Of course the MVS dataset is EBCDIC, but can't I put ASCII data into? Need to verify.

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MVSDS Dataset Sharing

Browser

Intranet

OS/390

Domino Go
Web Server

CICS or IMS

DB2 or IMS

Legacy DB

Write once!
no distribution

DB2 or IMS

CICS or IMS

Domino Go
Web Server

HFS HTML

MVSDS HTML

HFS HTML

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Accessing MVS Data Sets

Configuration

MVSDS has it's own configuration file to define the MVS datasets it needs to load:

```
/web/apple/mvsds.conf
#
# example load directives (comments)
#

#load 'WEBSRV.HTML.ENU.PAGES' # Fully Qualified Dataset name
#load IMAGES.GIF.TREES         # Partially Qualified Dataset Name
#load 'WEBSRV.WAV.SOUNDS'      # Fully Qualified Dataset name
#load DD:SALES(JANUARY)        # DDN
load 'SYS1.PARMLIB(BPXPRM00)'
```

Define data sets or DD statements. DD statements need to be defined in the webserver procedure.

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Accessing MVS Data Sets

Configuration

MVSDS GWAPI is called by defining a `Service` statement in httpd.conf.

This statement also defines the keyword to call the service.

```
Service /MVSDS*  /usr/lpp/internet/bin/mbsds.so:mvsdsGet*
ServerInit /usr/lpp/internet/bin/mvsds.so:mvsdsInit /web/apple/mvsds.conf
ServerTerm /usr/lpp/internet/bin/mvsds.so:mvsdsTerm
```

We used MVSDS as the keyword to call the service. You may choose whatever you prefer.

Usage:

`http://www.the-apple.com/MVSDS/'SYS1.PARMLIB(BPXPRM00)'`

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Accessing MVS Data Sets

MIME Type Considerations

- **The webserver determines the MIME type of a MVSDS file out of the dataset name.**

  - In case of SYS1.PARMLIB, it looks out for SYS1 and PARMLIB as MIME types. Since usually neighter SYS1 nor PARMLIB is defined it uses the default MIME type (`text/plain`) which displays the file as an ordinary text file.

  - If you want to serve a html page or a gif image out of a MVS data set, be sure to name the data set `something.HTML` or `something.GIF`, or define a special MIME type for it.

  - You may also use MVSDS to create an easy tool to download MVS data to the PC. In this case define a MIME type of `text/download` in the web server MIME table and a *"helper application"* at your browser to save the file.

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Accessing MVS Data Sets

httpd.conf MIME Type Configuration Example

```
AddType .PARMLIB    text/plain        ebcdic 1.0  # MVSDS
AddType .WEBPAGE    text/html         ebcdic 1.0  # MVS HTMLS
AddType .PICGIF     image/gif         binary 1.0  # MVS GIF Pics
AddType .DUMP       text/download     ebcdic 1.0  # MVS Download


Add a helper application to Netscape Communicator:
Select                 Edit --> Preference
Select                 Navigator --> Applications
Click on               New Type
Enter a description:   #Download
File Extension:        DUMP
Mime type:             text/download
Application to use:    choose the Save option
```

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Accessing MVS Data Sets

Security

- **UserID PUBLIC is the standard (anonymous) Web UserID**
  - ► RACF checks the access of PUBLIC
  - ► Check the installation if UACC READ is really suitable for *"WORLDACC"* in case of an external webserver.
  - ► ~~User can only access MVS datasets "loaded" in mvsds.conf~~
    - – Unfortunately not true. mvsds.conf is used for preloading the datasets only.
- **More Security**
  - ► Define a PROTECT statement to require authentication

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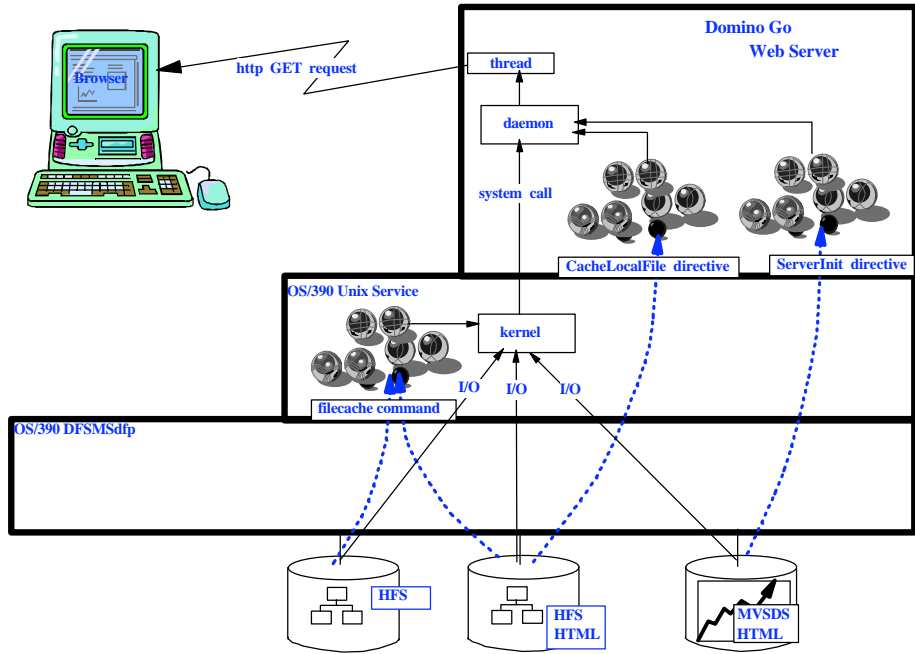
File Caching

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File Caching

- **Very effective method to gain performance**
  - ► Freqently accessed static web pages should always be cached
- **Three Methods:**
  - ► DGW caching HFS files
  - ► DGW caching MVS data sets
  - ► OS/390 UNIX System Services caching HFS files

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File Caching

Domino Go
Web Server

thread

Browser

http GET request

daemon

system call

CacheLocalFile directive

ServerInit directive

OS/390 Unix Service

kernel

filecache command

I/O   **I/O**   **I/O**

OS/390 DFSMSdfp

HFS

HFS HTML

MVSDS HTML

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File Caching

DGW caching HFS files

- **CacheLocalFile configuration directive**
  - ► Wildcards are supported
  - ► web server -vv trace indicates if there was a hit
    - `-cache_local. hit for file '/web/apple/pub/index.html'`
    - `-RAM cache task for /web/apple/pub/index.html is 4.`
    - `-Loading file "/web/apple/pub/index.html" from RAM cache.`
  - ► Cache size controlled by *CacheLocalMaxBytes* and *CacheLocalMaxFiles*
    - – They can be set to 0 meaning no limit
  - ► web server -vv trace indicates if the cache is full
    - `-cache_local. cache full!`

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File Caching

DGW caching MVS files

- **MVSDS function preloads MVS data sets**
  - ► ServerInit function pre-loads all data sets referred by mvsds.conf
  - ► ServerTerm takes care of the unload in case of server termination

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File Caching

UNIX System Services caching HFS files

- **New command since OS/390 R4**
  - ► filecache
  - ► caches HFS files in kernel cache area
- **Command needs superuser authority**
  - ► /usr/sbin/filecache -a /web/apple/pub/images/*
  - ► Wildcards are accepted
  - ► If you modify files cached with the filecache command, the cached version becomes invalid and the disk version will be accessed

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