



**IBM WebSphere
Software**



**WebSphere Application Server
for z/OS and OS/390**

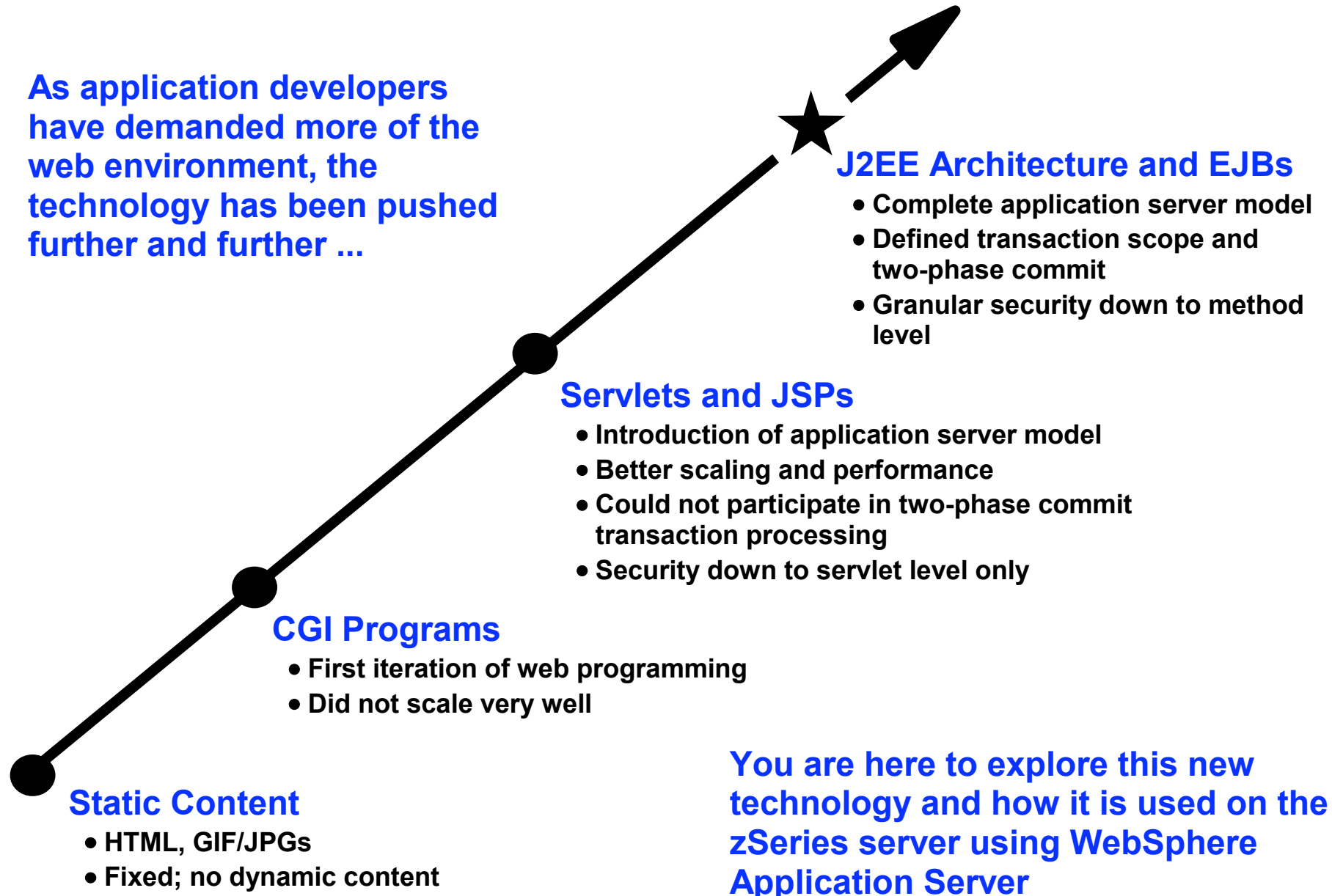
WebSphere Application Server Version 5 for z/OS - Introdução -

Apresentado por
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Pushing the Envelope



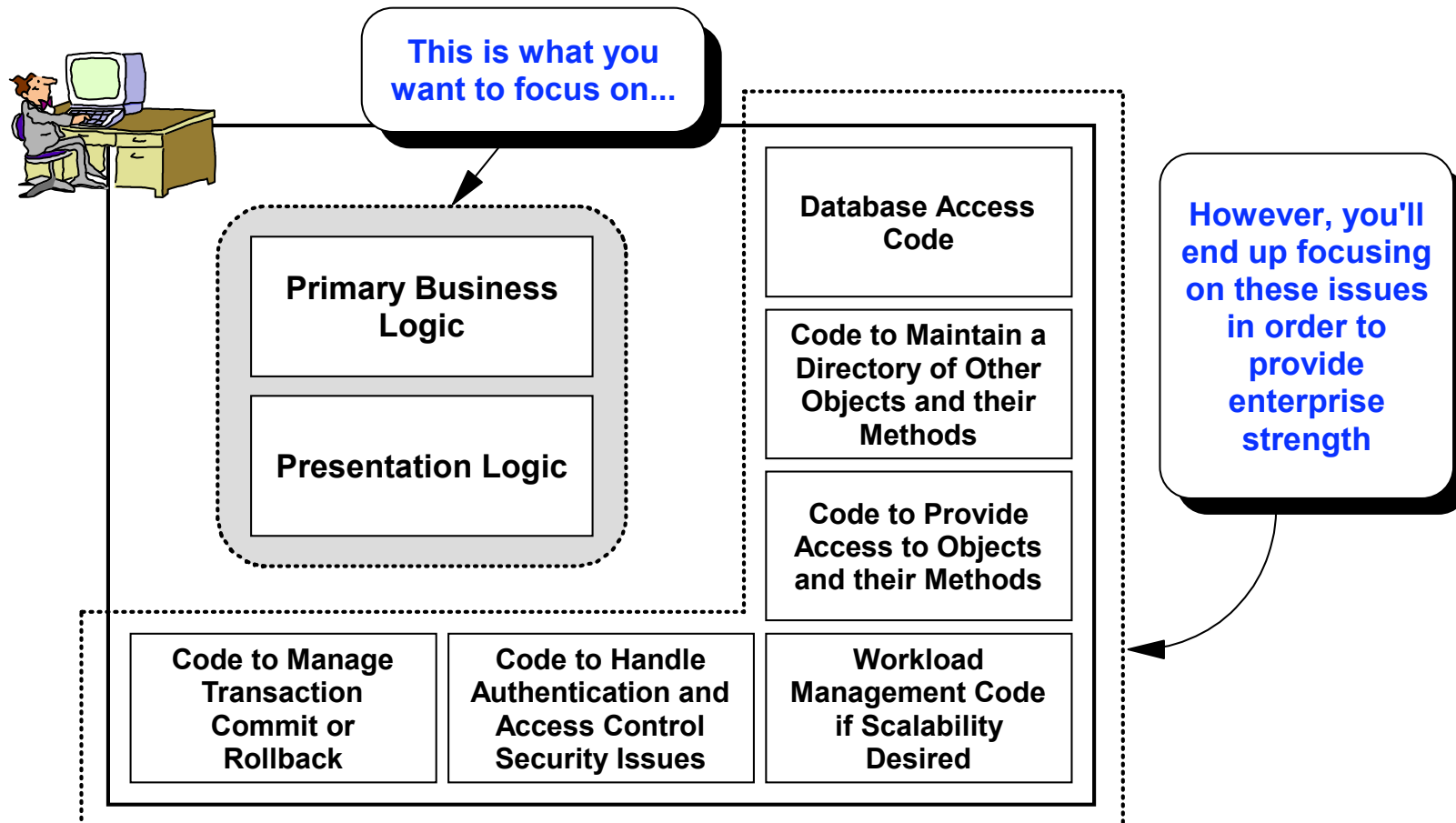
As application developers have demanded more of the web environment, the technology has been pushed further and further ...



The Challenge ...



Your assignment: write a Java application that provides enterprise-strength functionality



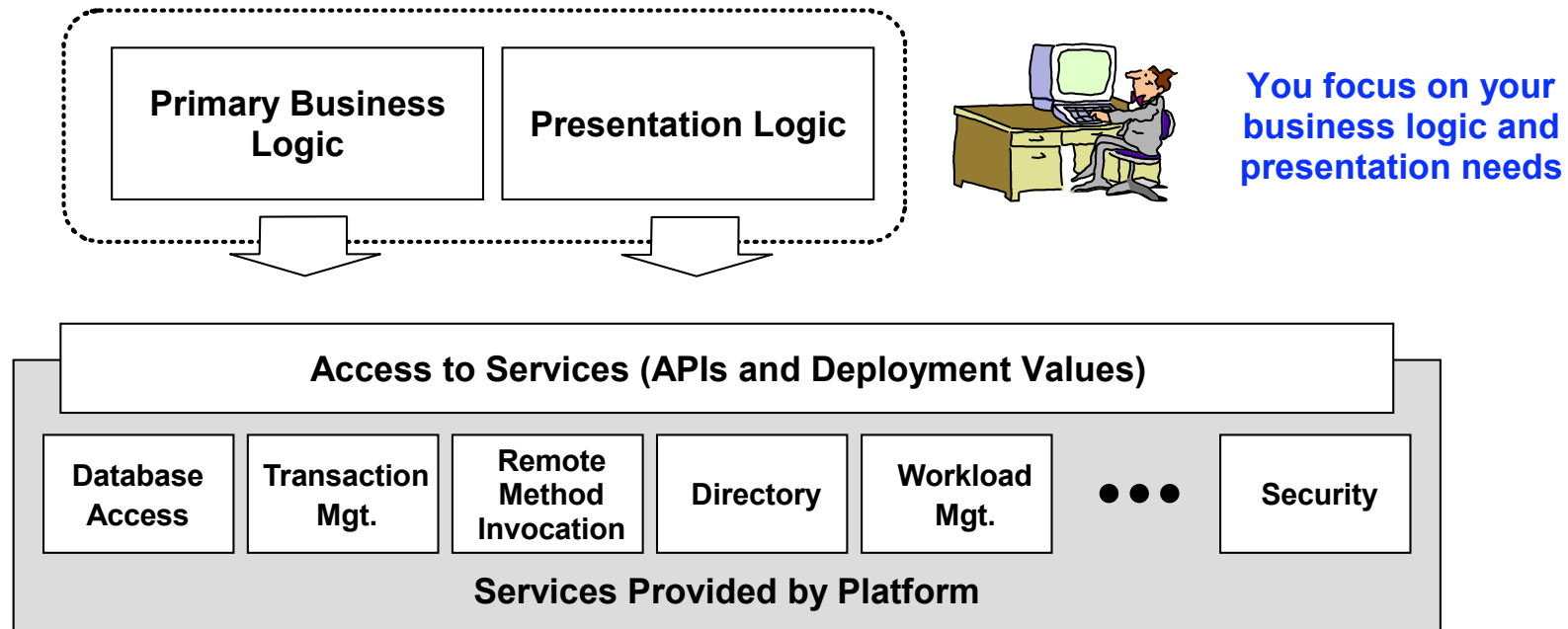
Without the benefit of other software products, this would be a lot of work. The code would probably not port to other platforms, and the code you wrote probably wouldn't be re-used much.

The Vision and Result

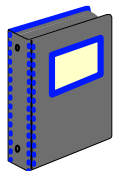


The Vision:

Come up with a standardized specification for a server platform that provides those services needed by an enterprise application. Application developers then code their solution using the services provided by the platform.

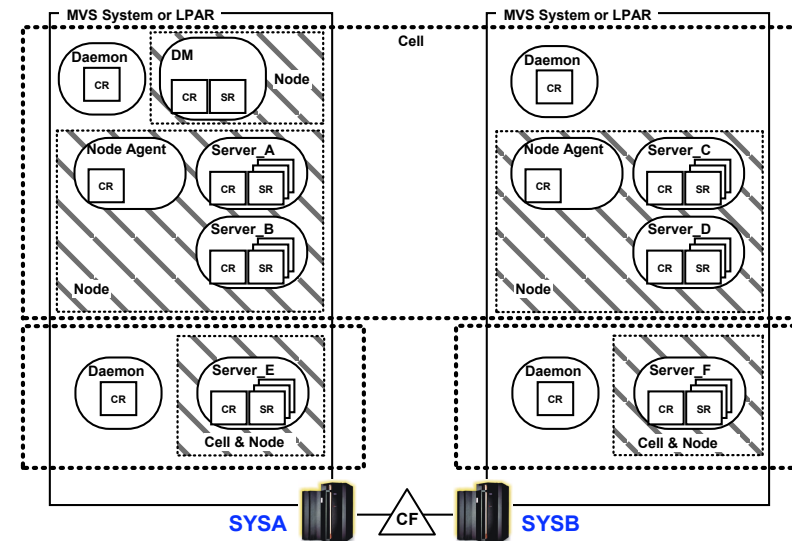
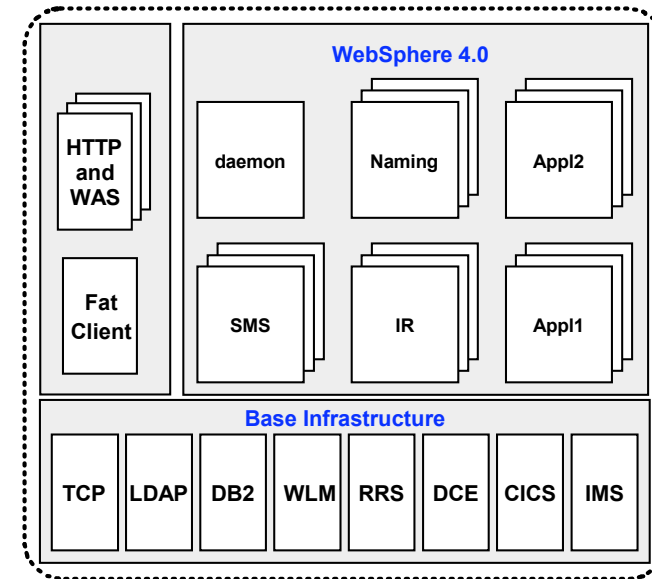
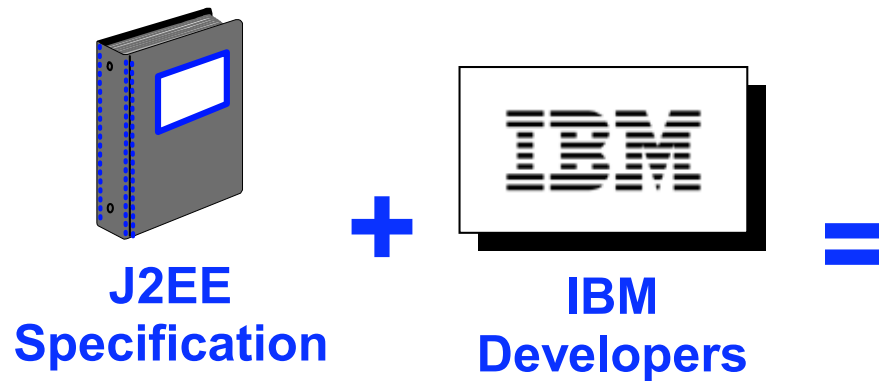


The Result:



Sun, in cooperation with industry leaders including IBM, defined the "Java 2 Enterprise Edition" ("J2EE") specification. This specification defines the functions a J2EE platform must provide, the structure of the application code to take advantage of the platform, and the API used by the application code to invoke the functions.

IBM's Implementation on z/OS



WebSphere Application Server Version 4.01 and 5 for z/OS and OS/390 are IBM's implementation of the J2EE specification for the z/OS platform

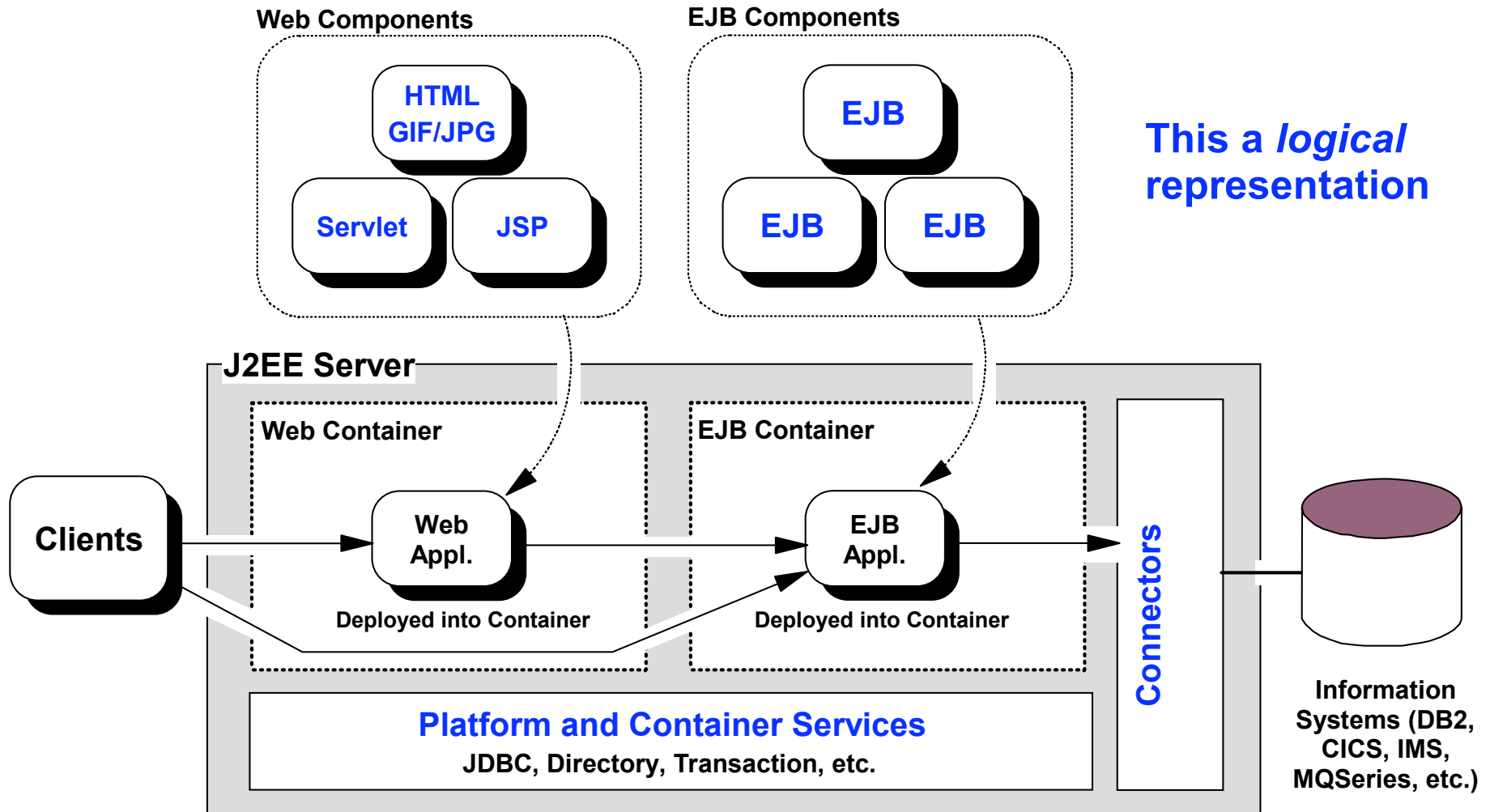
WebSphere Foundation Product Objectives



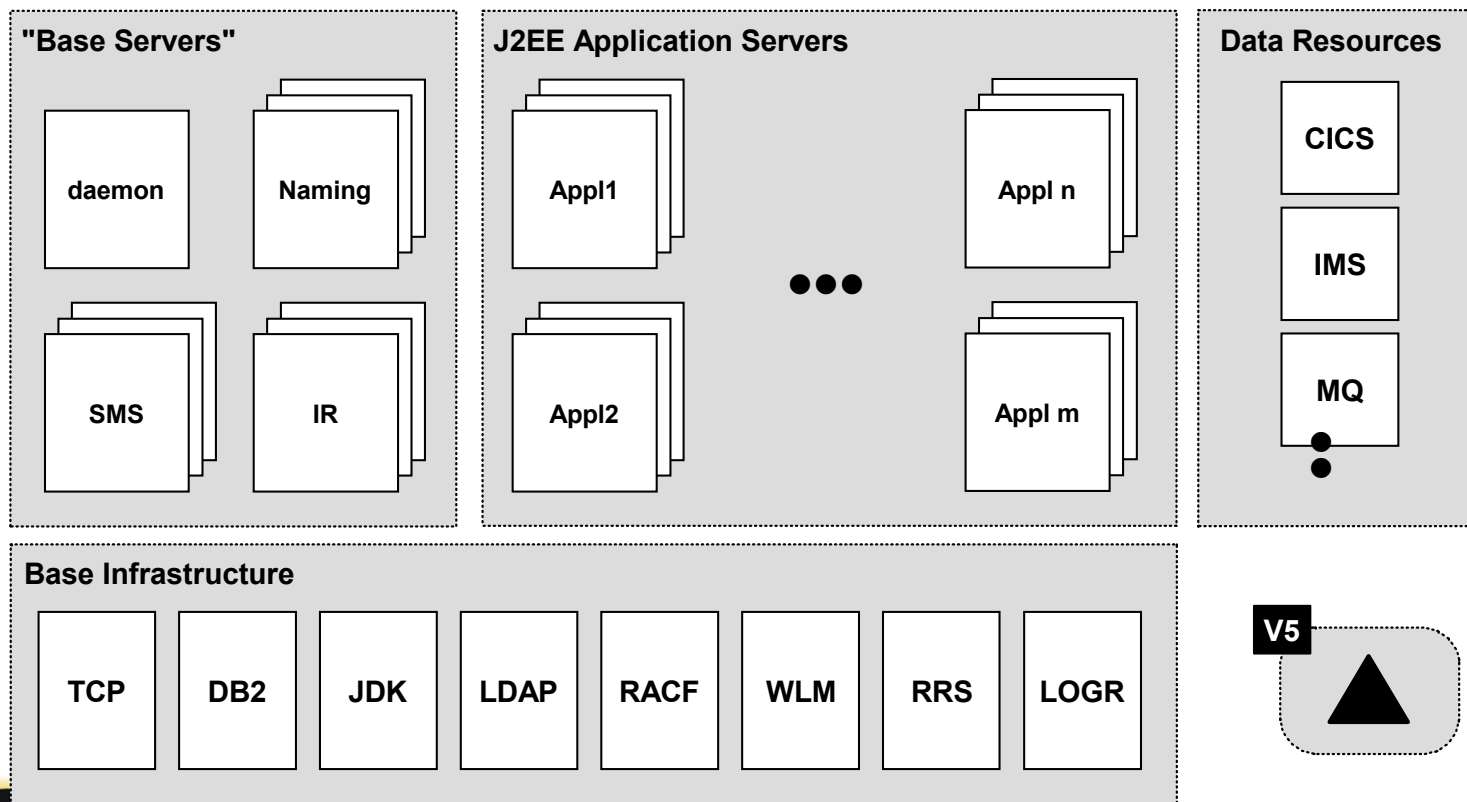
- **Web-up into e-business**
 - **Extend traditional business applications out to Internet, or to Intranet thin-clients**
 - **Business-to-business across the internet**
 - **Distributed on-line transaction processing**
 - **Core business applications using next generation programming model and distributed systems infrastructures (deep OO programming)**
 - **Incremental business-process transformation for mission-critical enterprise applications**
-

- **Merge the world of web-based computing with core enterprise computing ...**
 - **To enable Customers to exploit emerging and rapidly expanding business opportunities ...**
 - **Across a range of platforms and scale ...**
 - **At the lowest cost of ownership ...**
 - **With a consistent and synergistic end-to-end experience for information computing.**
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Basics of J2EE Architecture

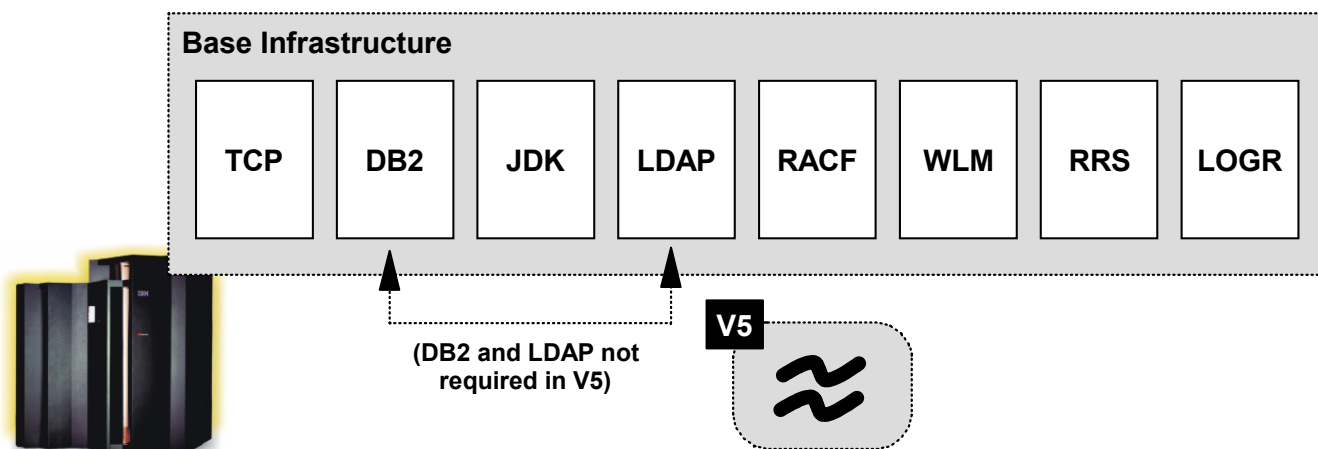


Overview of WebSphere V4 for z/OS



A system consisting of four base servers, some number of application servers, a long list of pre-requisites and some number of data resources.

Version 4 Prerequisites



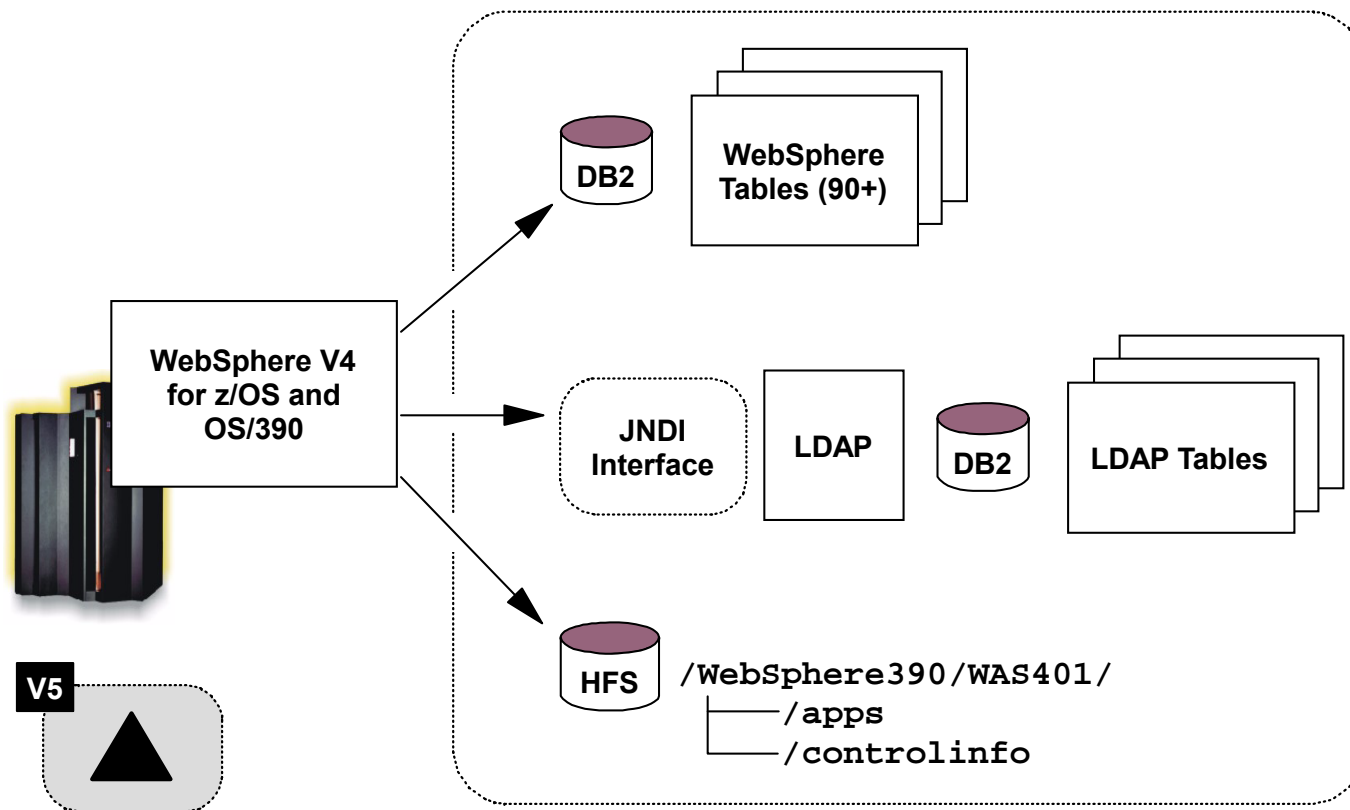
Hardware:

- Supports OS/390 V2R8 and above (zSeries, Multiprise, 9672 G2 and up)
- Strongly recommend IEEE floating point hardware (G5 or later)

Software:

- TCP/IP - network connectivity
- DB2 V7.1 - where WebSphere stores configuration information
- JDK 1.3 or above - provides Java runtime environment
- LDAP - used to store JNDI name information
- RACF (or SAF equivalent) - needed to authorize servers and provider userids
- WLM Goal Mode - used to start additional server regions (more on this)
- RRS - required for two phase commit processing and rollback
- LOGR - required for merged logstreams (WebSphere, RRS, RRSAF to DB2, CICS, etc.)

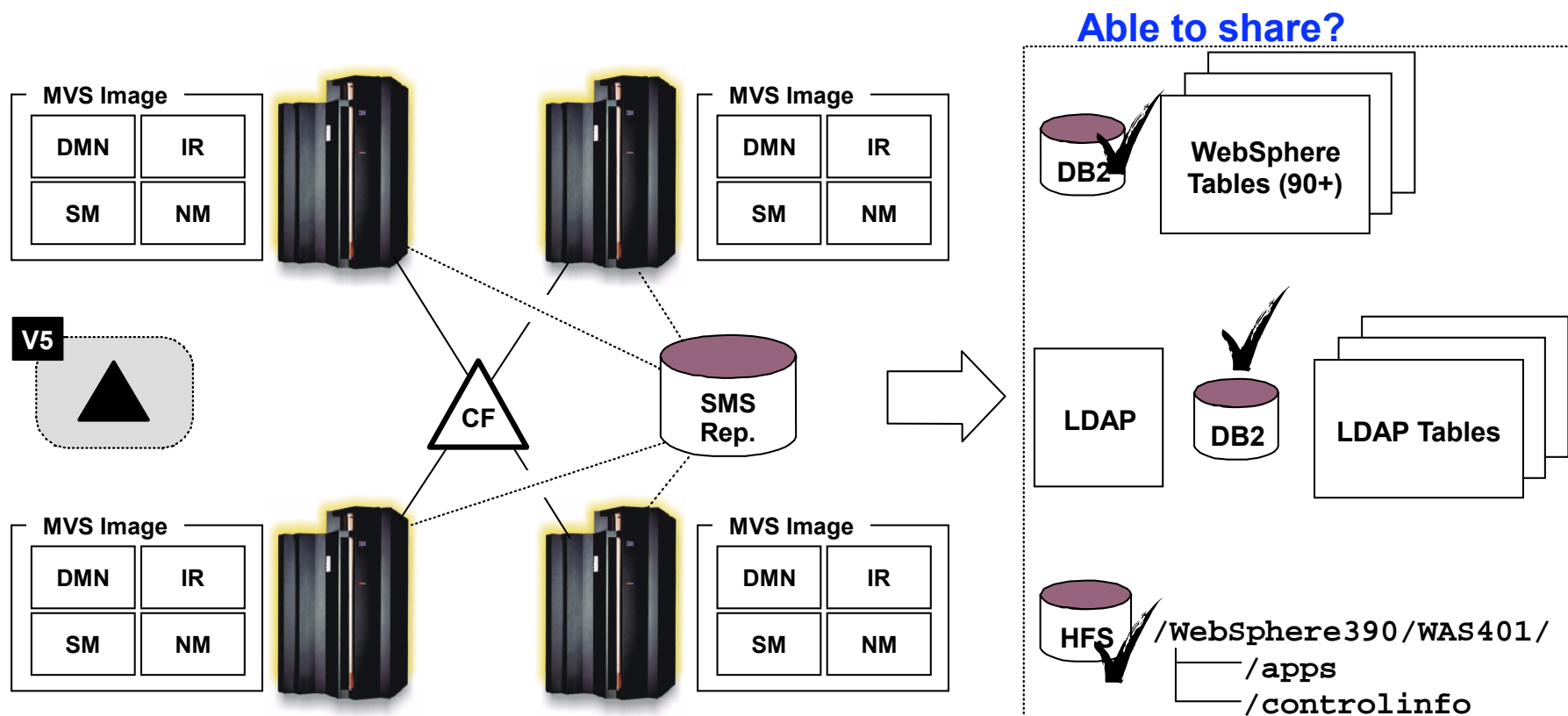
Where Version 4 Stored Information



Call this the "SMS Respository"

This is important to understand because it helps to show how WebSphere V4 for z/OS is structured in a Sysplex environment ...

Version 4 in Sysplex Environment

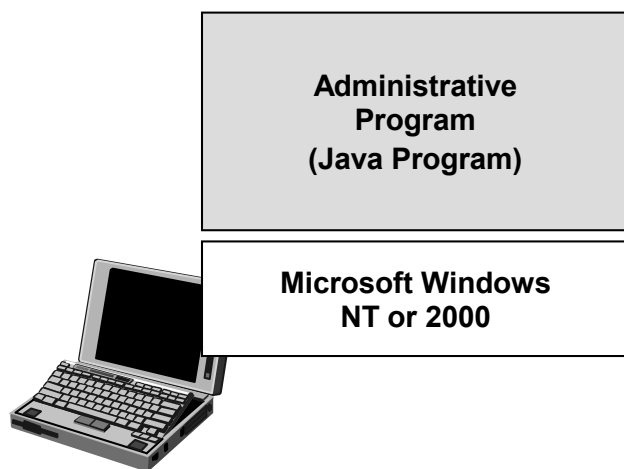
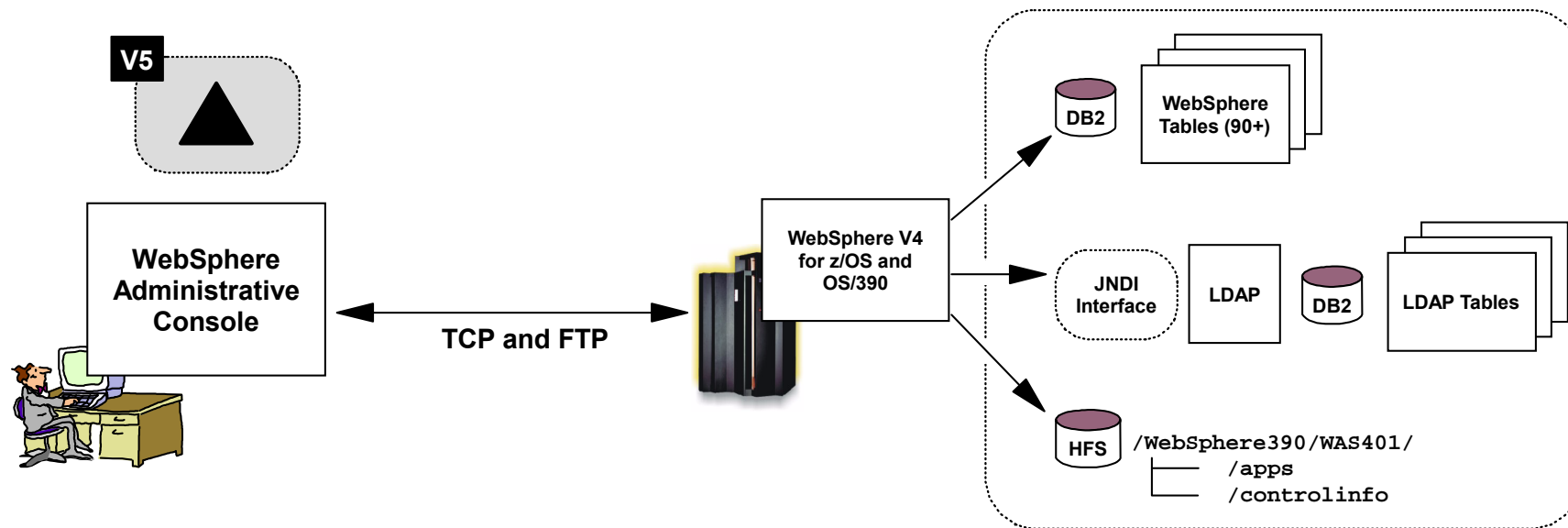


Each system in the Sysplex would have at a minimum the four base servers

They are configured to share the "SMS repository"

This is called a "Node". (This terminology changes with V5, so be careful)

Version 4 Administrative Console

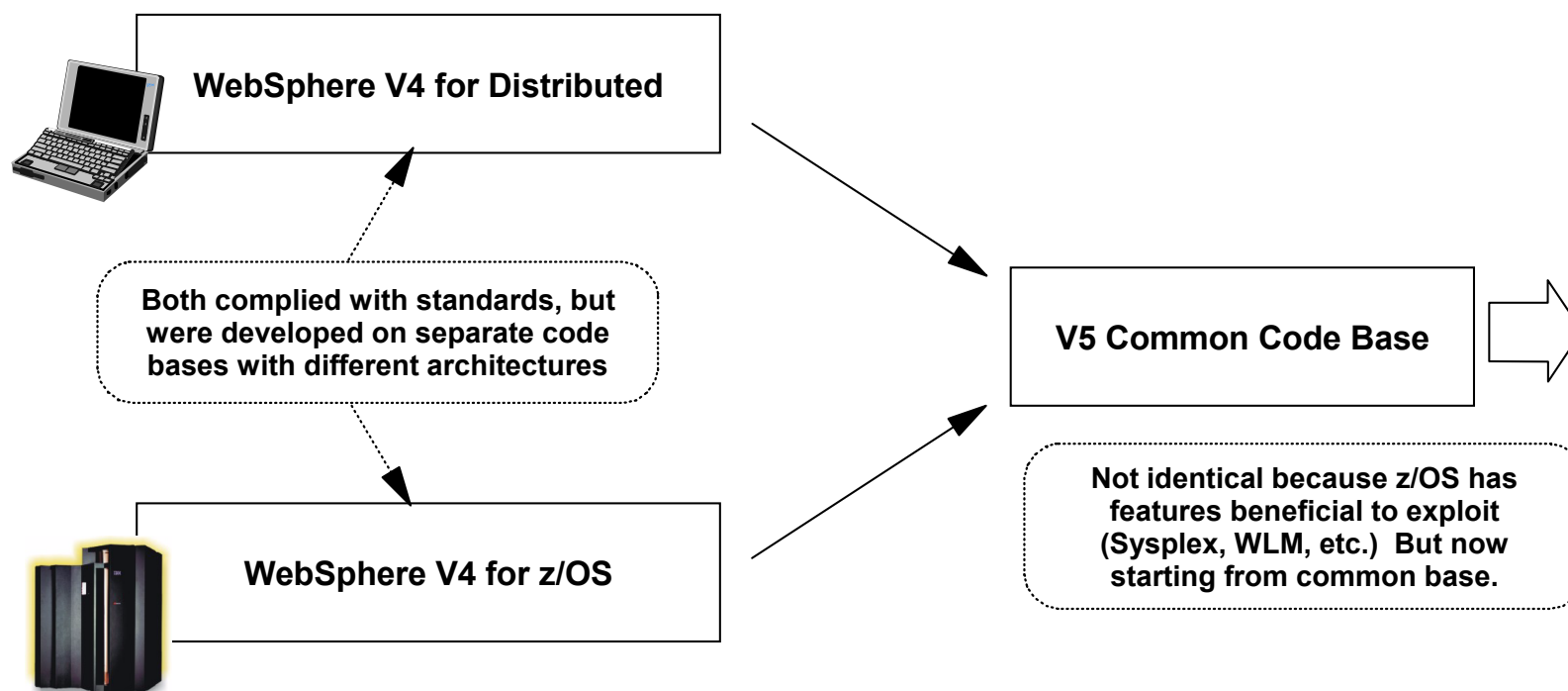


Graphical program that runs on workstation

Interacts with Systems Management

SMS executes based on mouse clicks at console

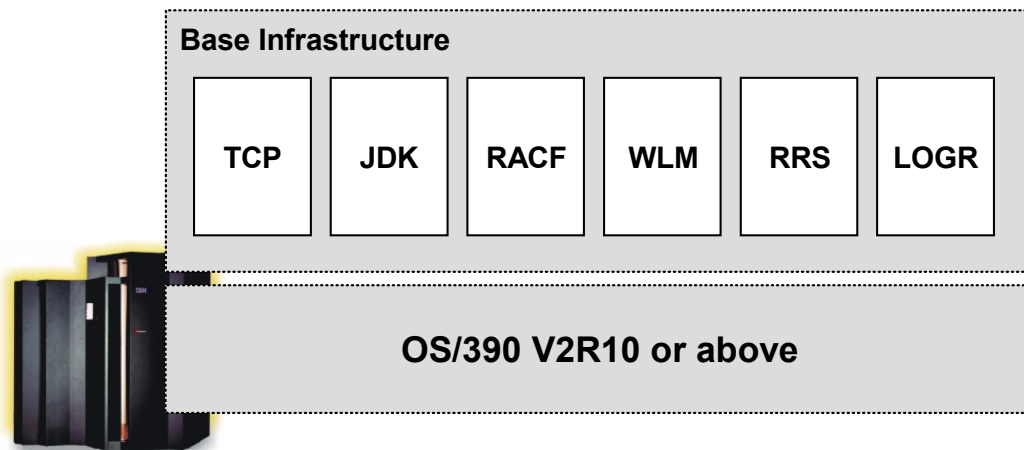
Convergence of Platform WebSpheres



Advantages:

- Common look-and-feel
- Common set of terminology (a problem with V4: different terms used)
- Easier to maintain common features
- Less lag time between distributed release and z/OS release
- Less chance of application problems going from one platform to another

Version 5 Prerequisites



What about LDAP and DB2? WebSphere doesn't require them. You may use them for other purposes, of course.

Hardware:

- Supports OS/390 V2R10 and above

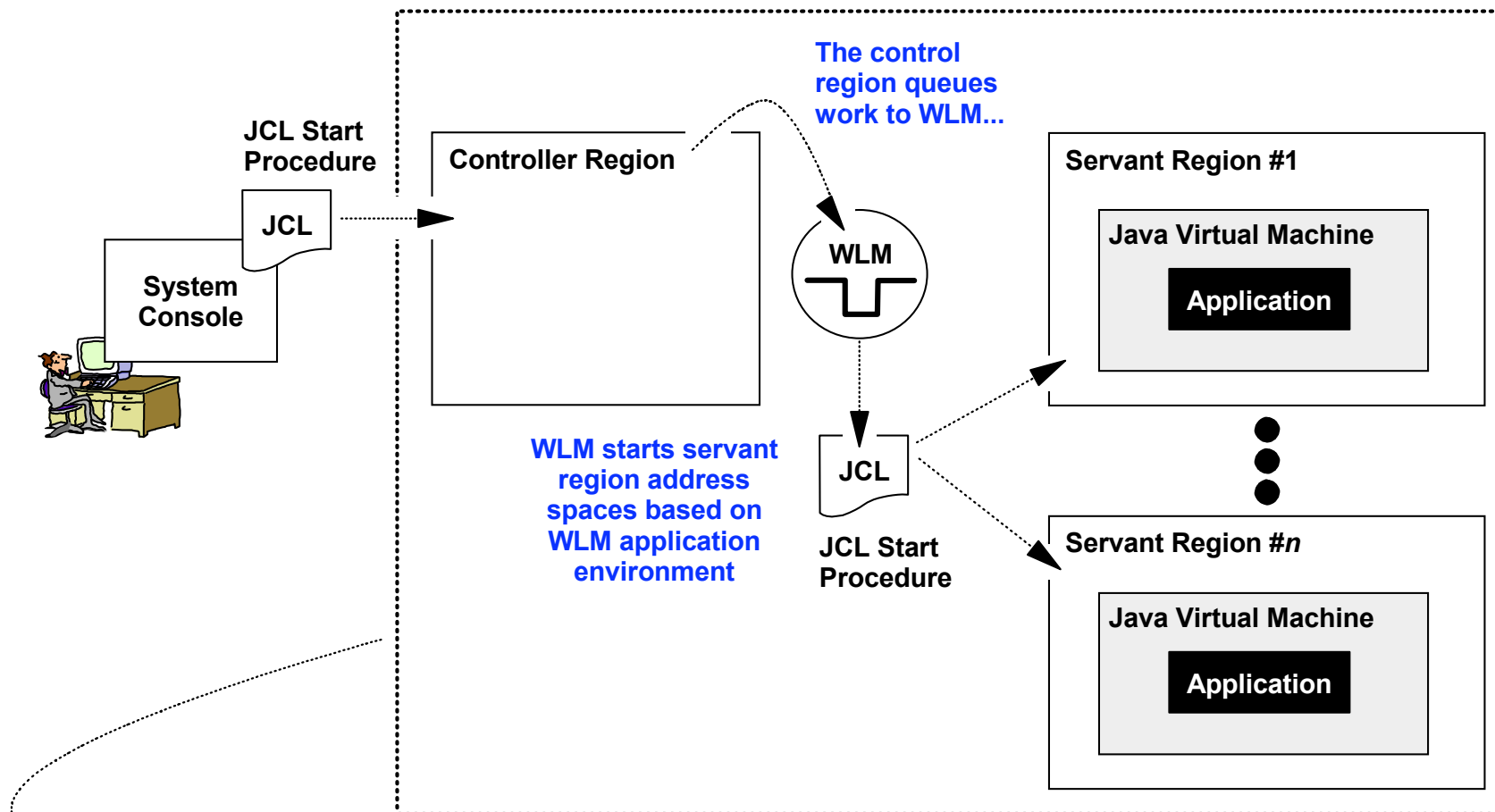
Software:

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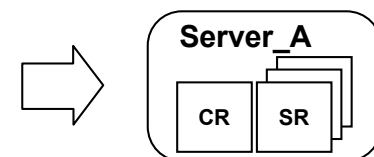
Controllers and Servants



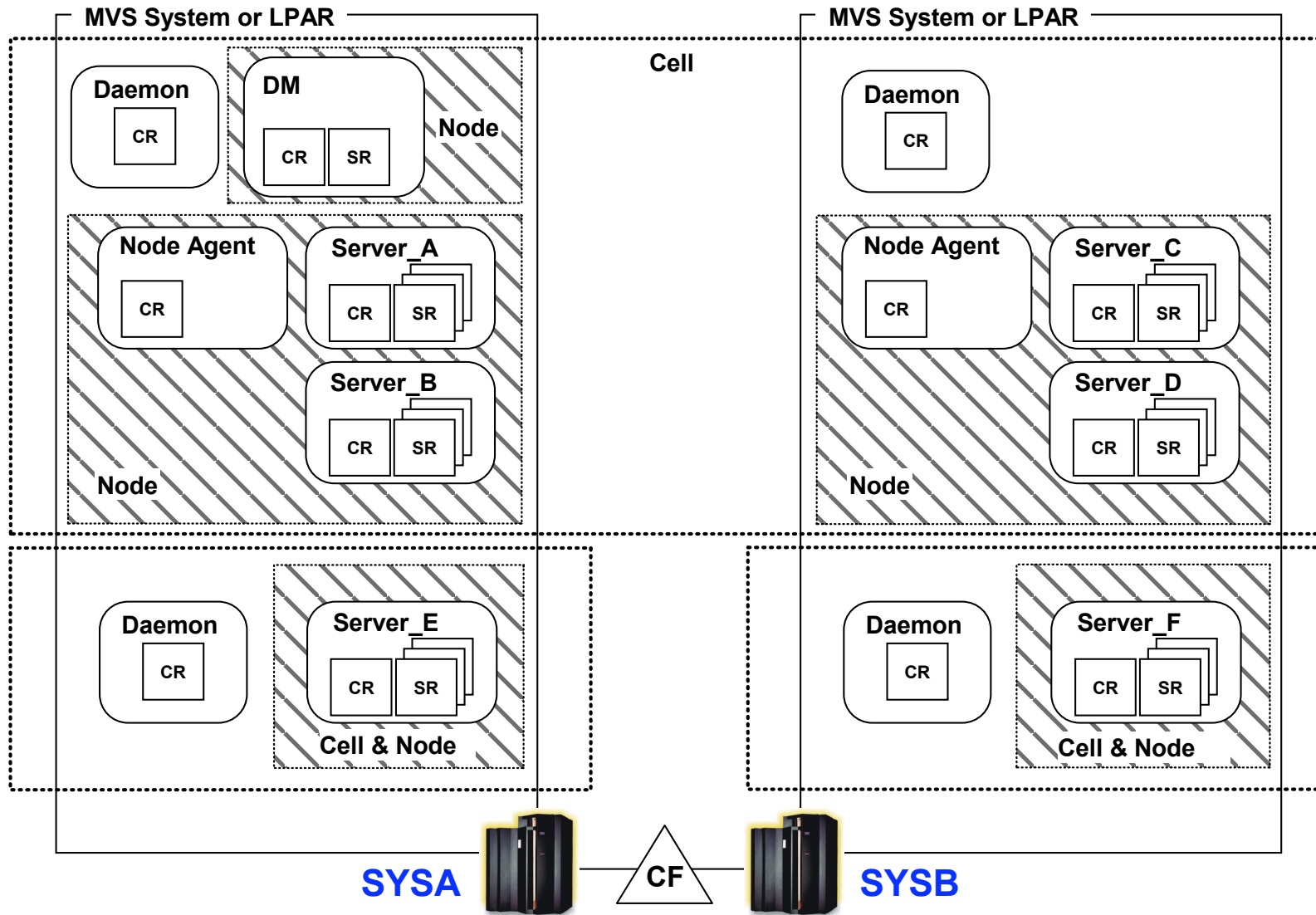
The address space in which the JVM resides is called a "Servant." Multiple servants may be started by WLM, based on work queued by a "Controller" region:



This structure is known as a "Server" We will use this symbol to represent a server:



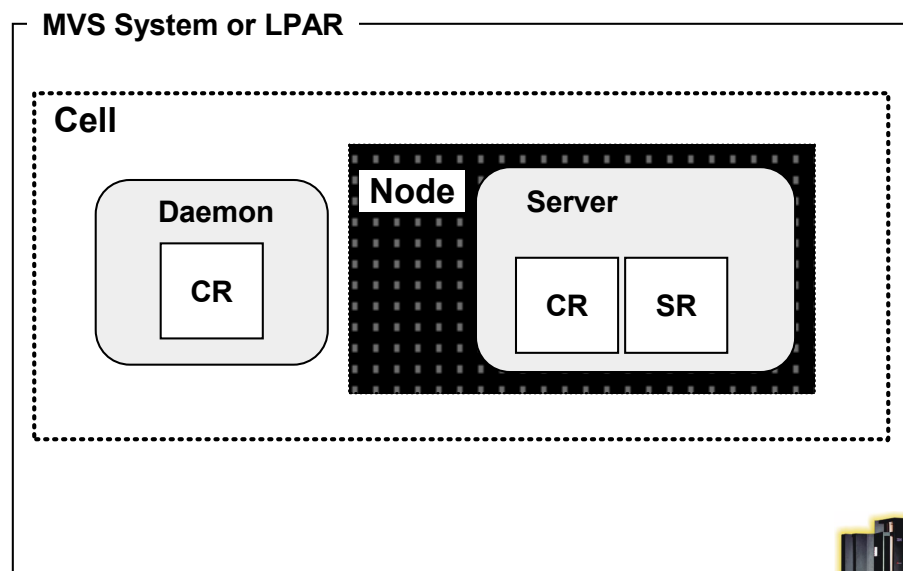
High-Level Peek at Version 5



V5 "Base Application Server Node"



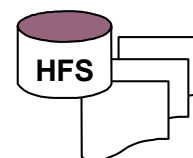
This is the likely starting point after installing WebSphere for z/OS Version 5



The "Base Application Server Node" is comprised of:

- One or more servers
- A "Daemon" server
- A "Node"
- A "Cell"

All of the configuration files and definitions are kept in the HFS



Files (XML, properties and applications) held in the HFS structure

Daemon

A single CR server. One is required per cell per system or LPAR.

Not critical to fully understand yet. Just accept that a Base Application Server requires one.

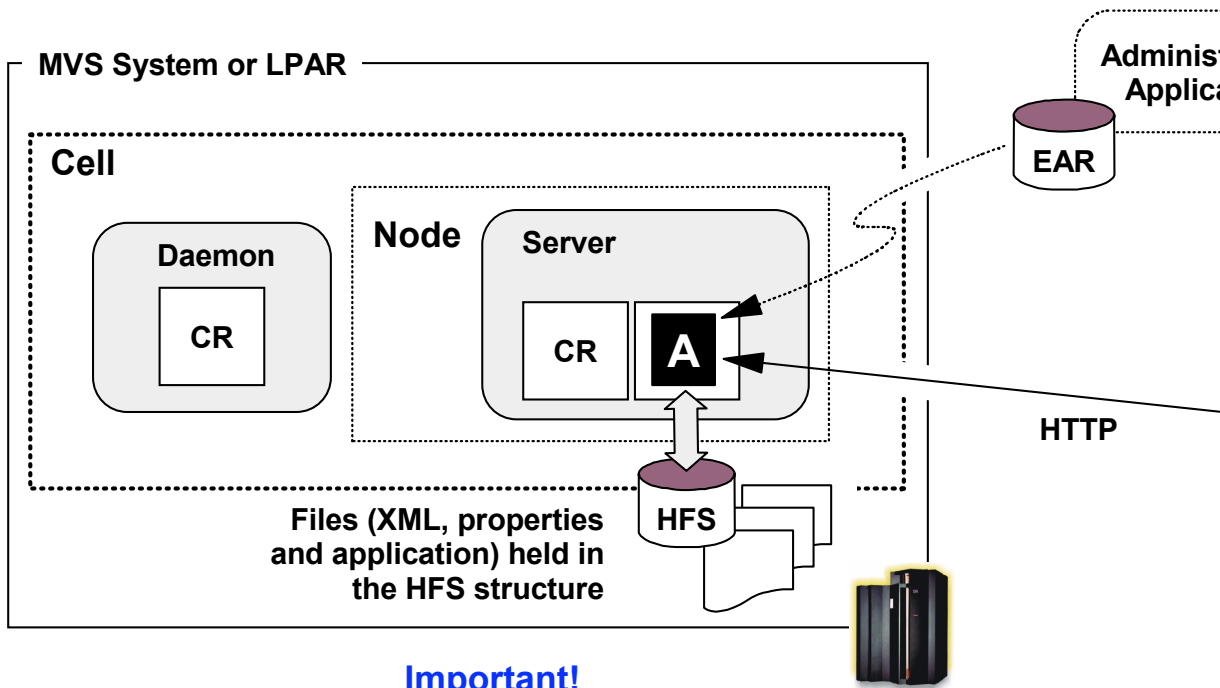
Cells and Nodes

Cell: the boundary of the administrative domain.

Node: a collection of servers grouped together for the purposes of administration.

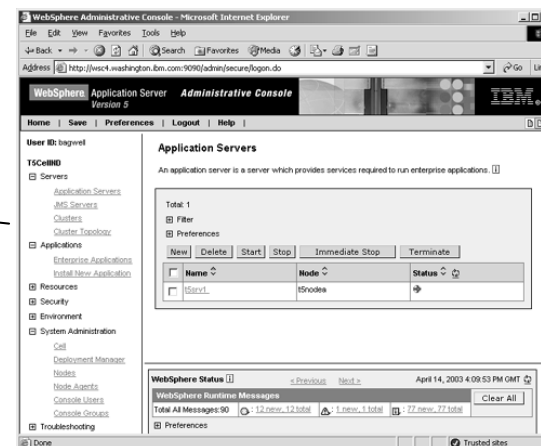
The Cell and Node doesn't make much sense yet. (See notes below for more detail.) For now, understand that a Base App Server Node has one node and one cell. The cell/node structure can be found in the HFS underlying the Base App Server...

Administering the Base App Server Node



Collection of:

- Servlets
- JSPs
- HTML pages
- GIF/JPG images



Important!



The administrative application requires that only one "servant" (server region) is spawned. This is due to sharing and locking issues.



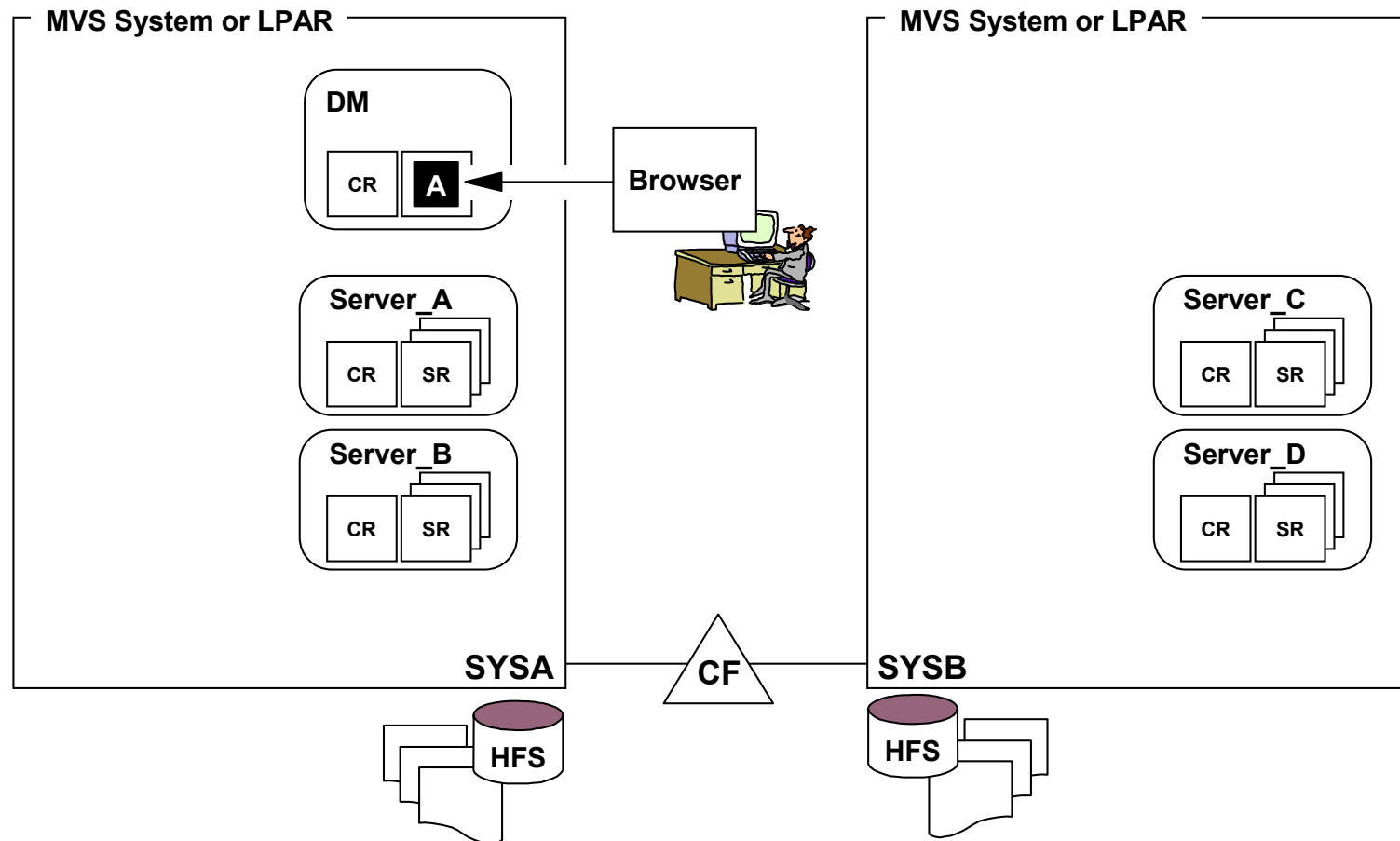
Standard Browser

Administrative application installed using batch process. Thereafter, applications installed using graphical interface of administrative program

Introducing the Deployment Manager



The Deployment Manager is a special kind of application server instance. The administrative application runs in the Deployment Manager:



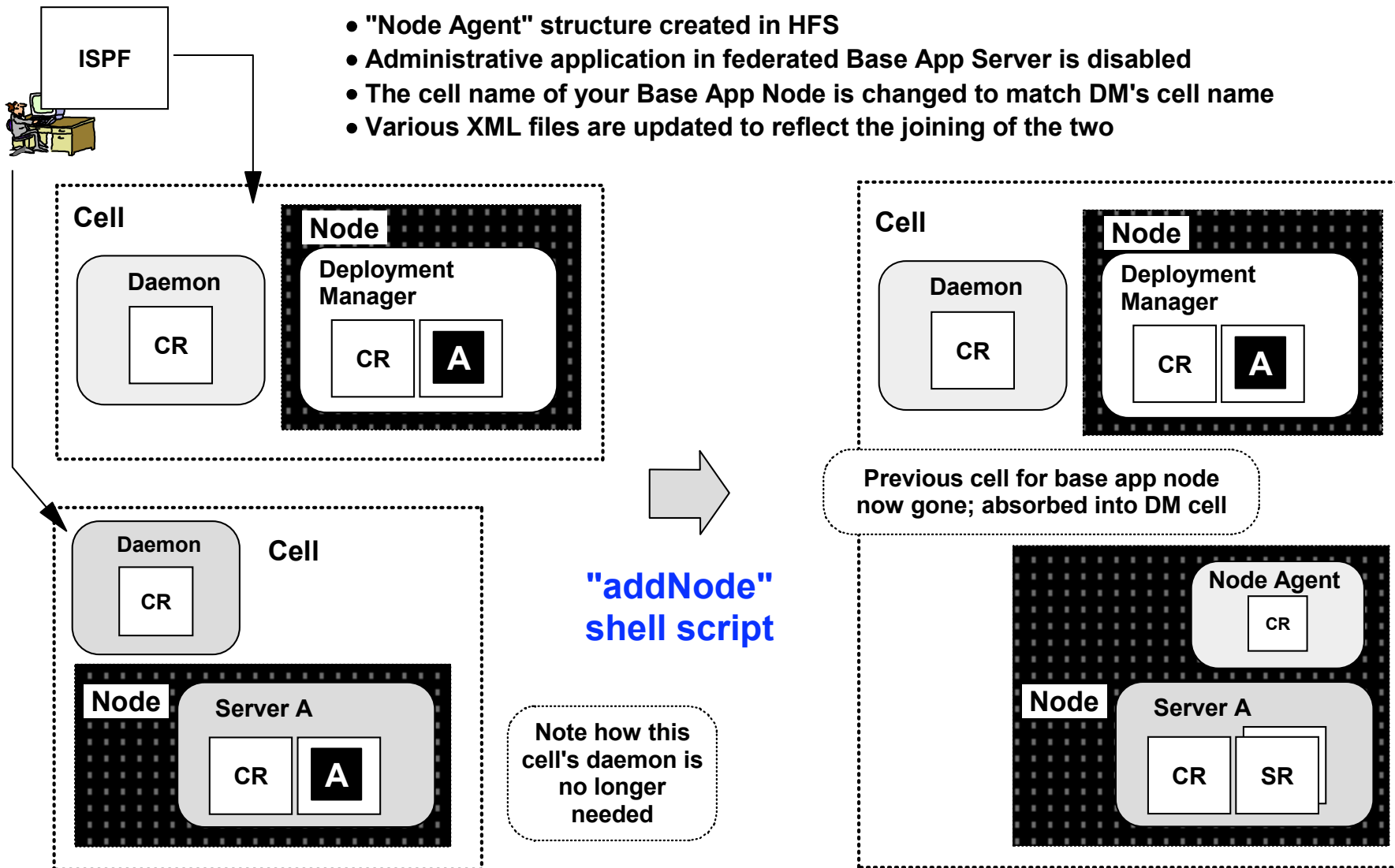
Before the Deployment Manager can manage application servers, those application servers need to be grouped into something called "Nodes" ...

"Federating" a Base App Node into Cell

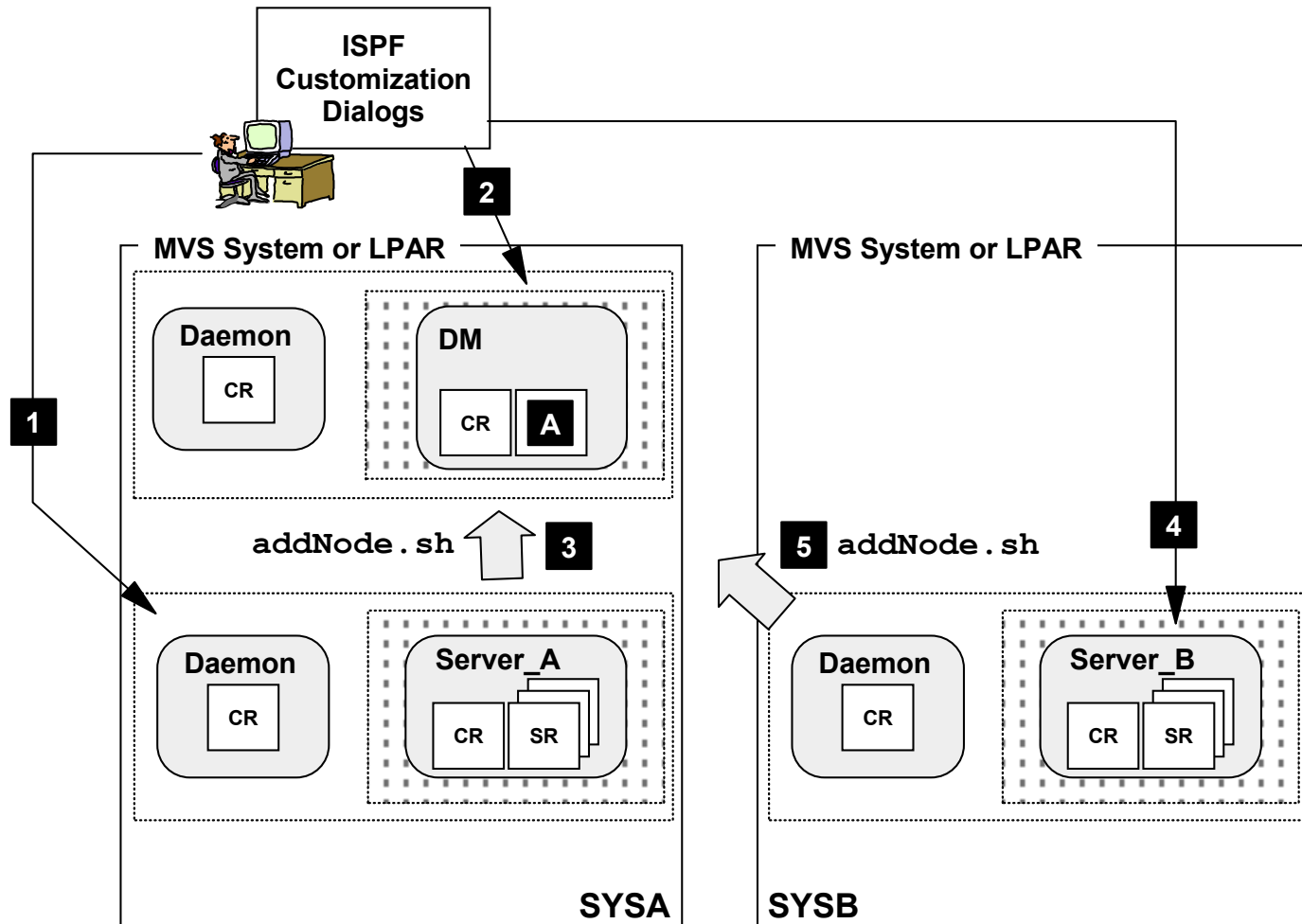


Base App Nodes may be "federated" (joined) into a Deployment Manager cell with the "addNode" shell script. Several key things happen:

- "Node Agent" structure created in HFS
- Administrative application in federated Base App Server is disabled
- The cell name of your Base App Node is changed to match DM's cell name
- Various XML files are updated to reflect the joining of the two

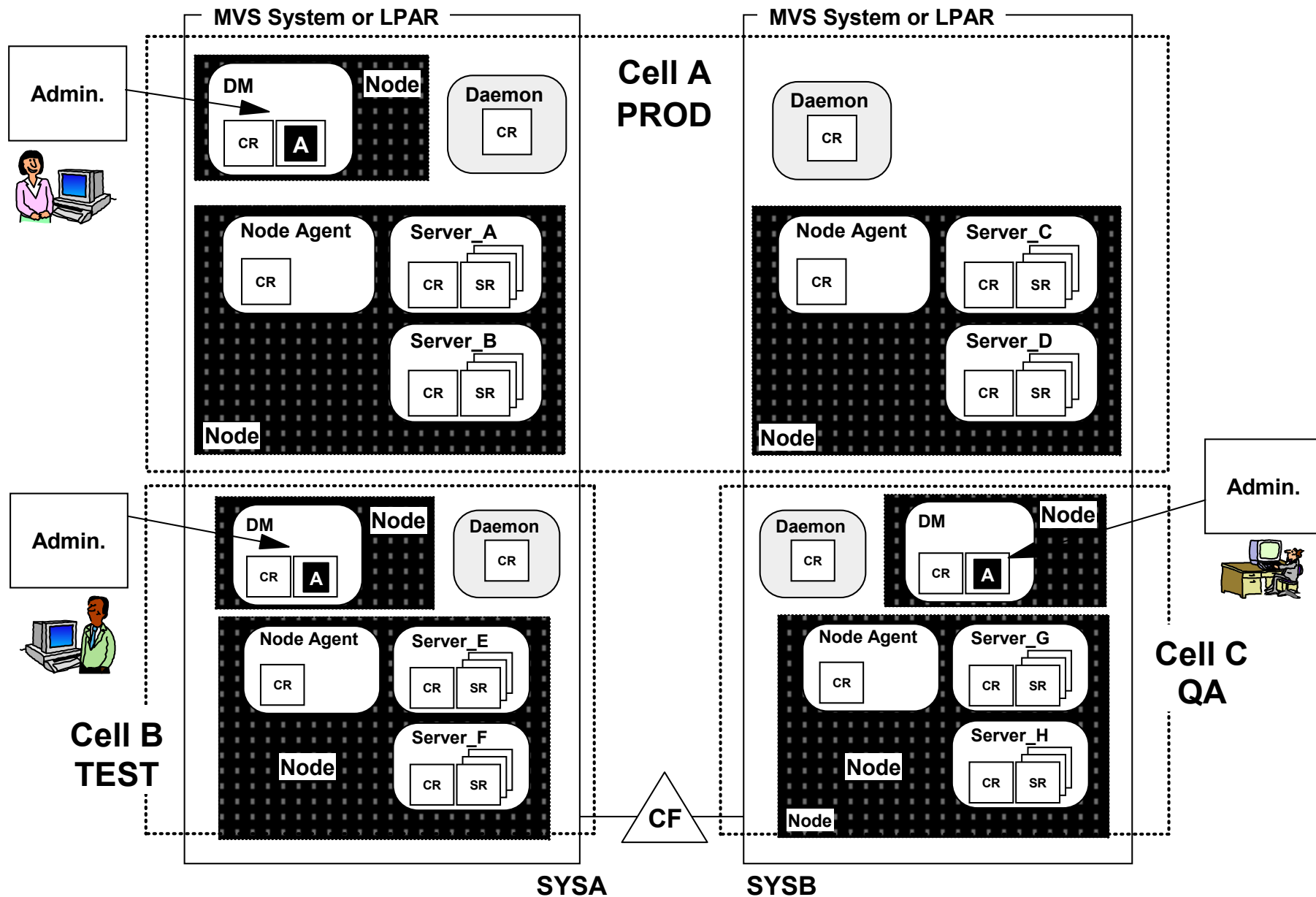


How to Construct Multi-Node Cell



The construction of a multi-node DM cell involves using the ISPF customization dialog to build the DM and Base Application Servers, then federating the Base App Servers into the DM Cell. Result? One DM Cell with multiple nodes.

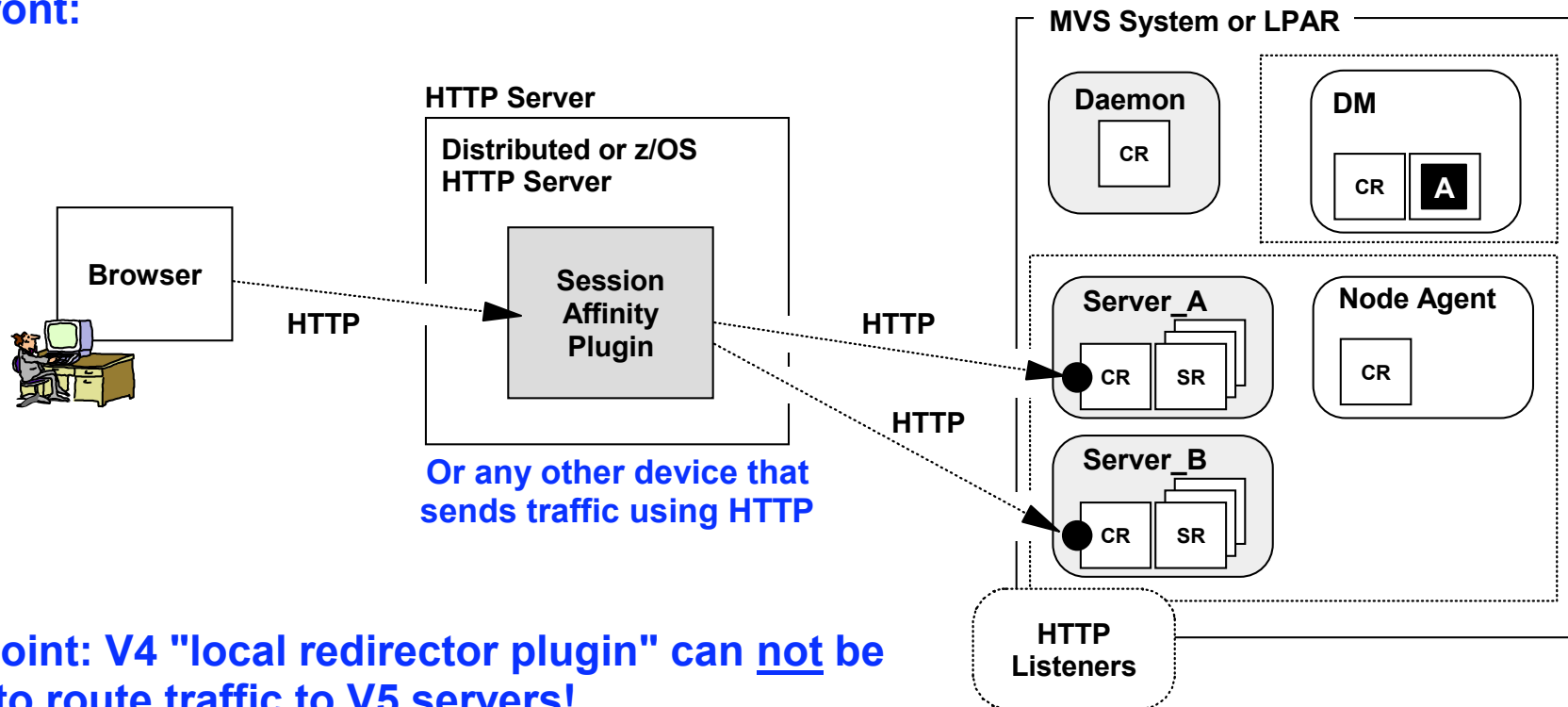
Multiple Cells Per Sysplex? Yes!



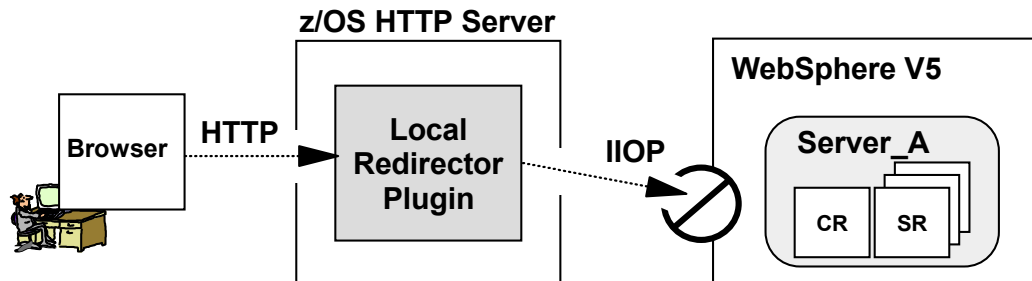
Accessing Your Applications



Each application server has its own HTTP listener. In Version 4 we called it the "Transport Handler." The most common design will have some kind of "re-router" out front:



Key Point: V4 "local redirector plugin" can not be used to route traffic to V5 servers!

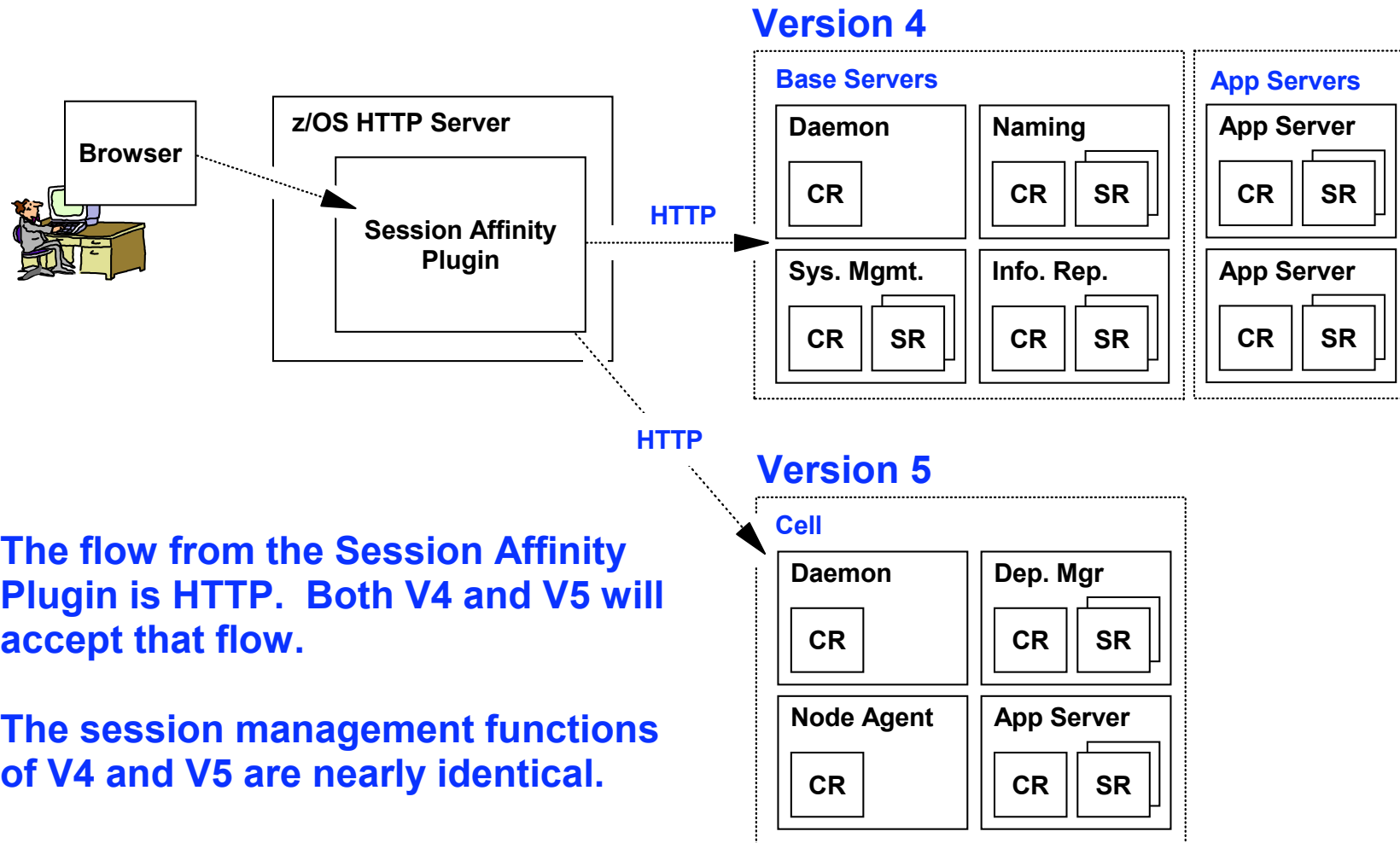


In this way, WebSphere for z/OS is really no different from distributed WebSphere

Session Affinity Plugin



The "Session Affinity Plugin" was initially supplied only on the distributed platform, but now is available to run in z/OS HTTP Server as well:



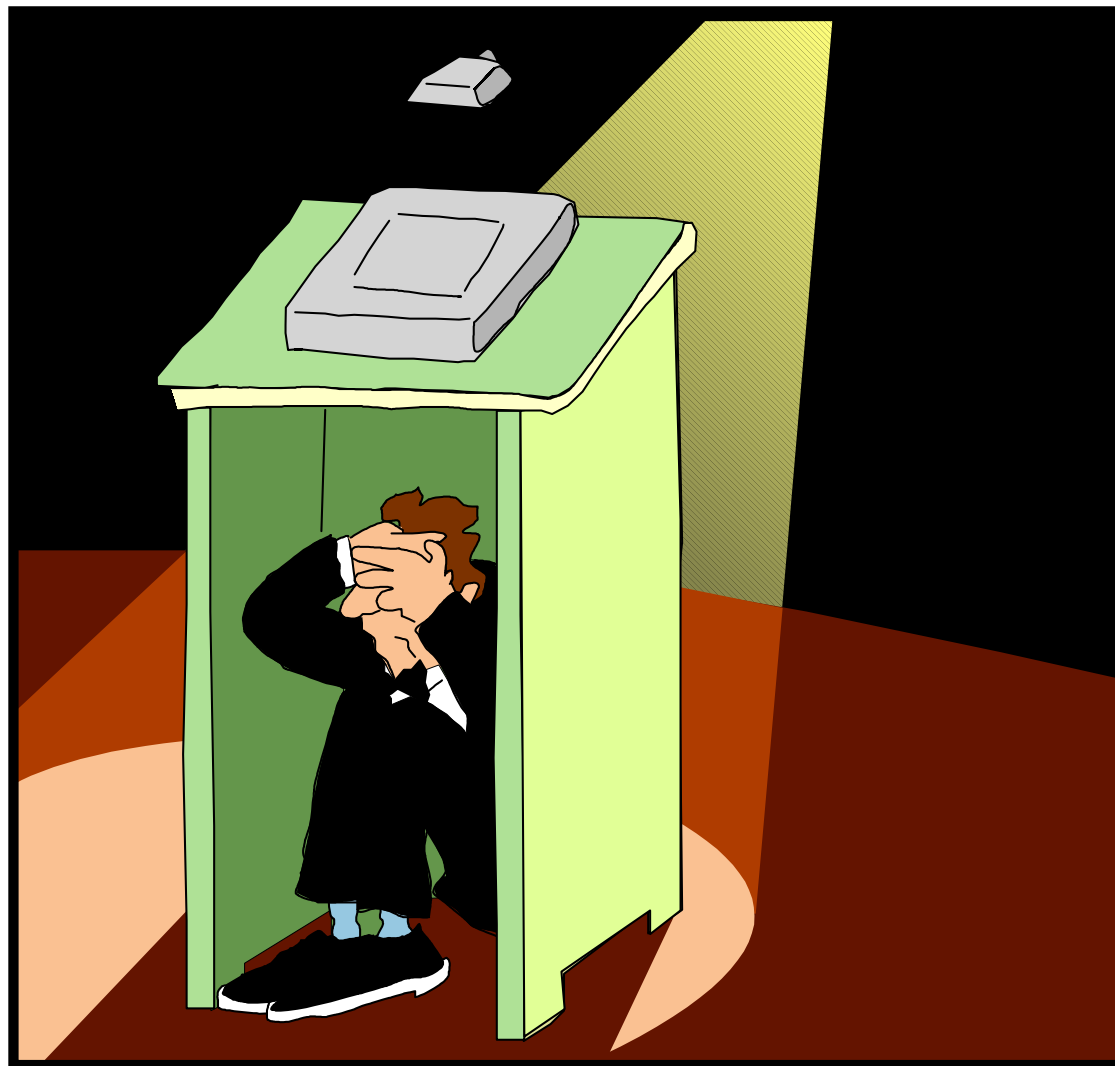
The flow from the Session Affinity Plugin is HTTP. Both V4 and V5 will accept that flow.

The session management functions of V4 and V5 are nearly identical.

You can do what's pictured here.

- **Performance Monitoring (diagnosis of performance problems)**
 - ▶ **WebSphere Studio Application Monitor**
 - Provides instrumentation data for WebSphere Applications
 - Does not require modification of the application
 - Gets information from runtime via SMF and JVMPI
 - Low overhead
 - ▶ **Wyle Introscope**
 - Provides instrumentation data for WebSphere Applications
 - "Power Pack" allows performance data to be gather without modification of application
 - Applications can be instrumented for detailed data gathering
 - Low overhead
 - **Application Monitoring (monitor application and take action when out of norm)**
 - ▶ **Tivoli Monitoring for Web Infrastructure for z/OS**
 - Monitoring information similar to WSAM, plus additional information
 - Able to raise events that allow other Tivoli components to take appropriate action
-

Questions?



- **WebSphere Application Server site**
 - ▶ http://www-3.ibm.com/software/webservers/appserv/zos_os390/
 - WebSphere Best Practices Zone
 - Library
- **Redbooks**
 - ▶ <http://www.redbooks.ibm.com>