

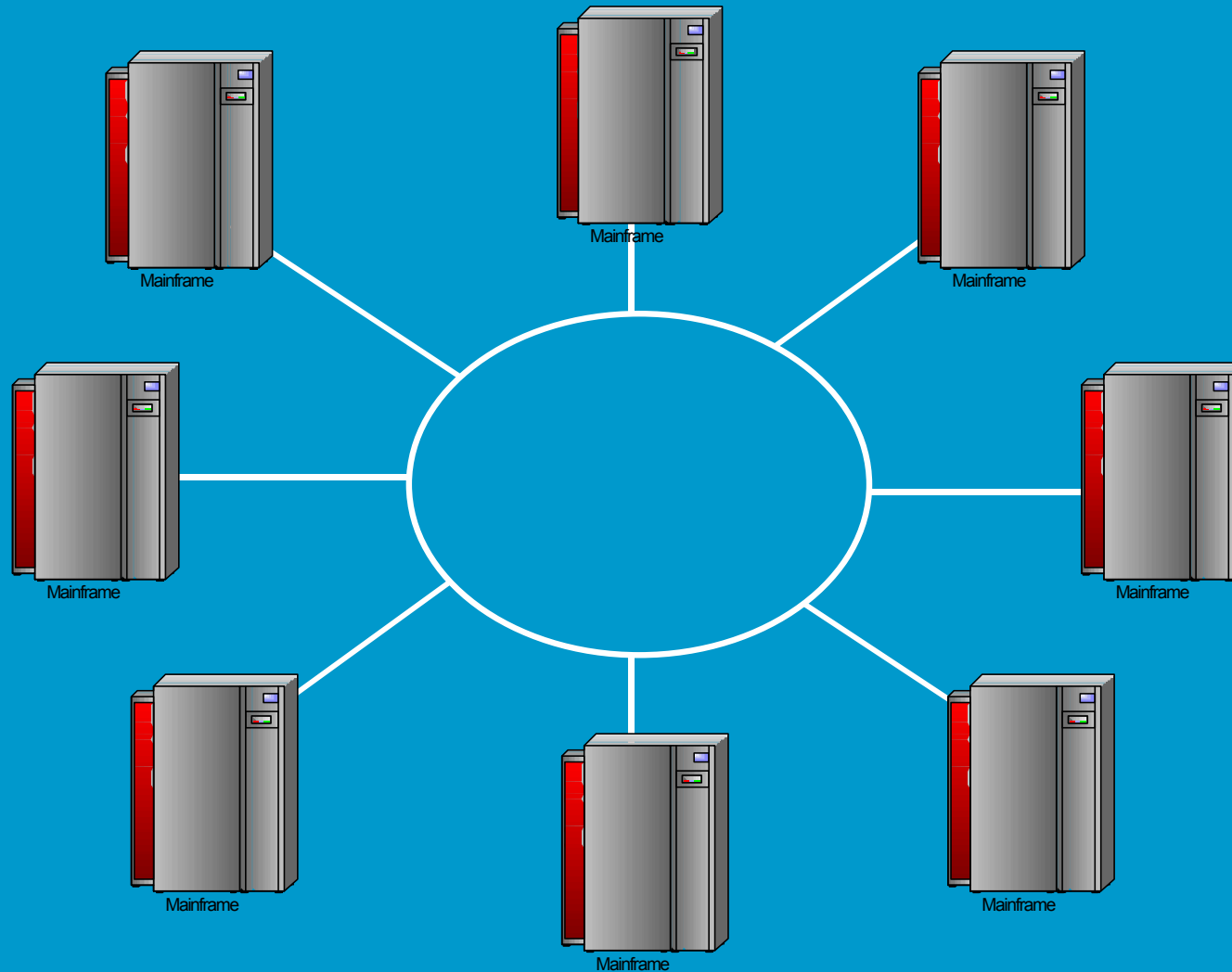
Enterprise Server Consolidation

Part One - Franco Vitale

Background

- Consolidate all data centers into one
- Reduce the number of processors
- Multiple sites in Europe running their own IT operations
- Software and hardware decisions were left with the local site to decide on portfolio
- Software levels varied between MVS 4.3 & OS/390 1.3
- Needed a Y2K compliant level for testing

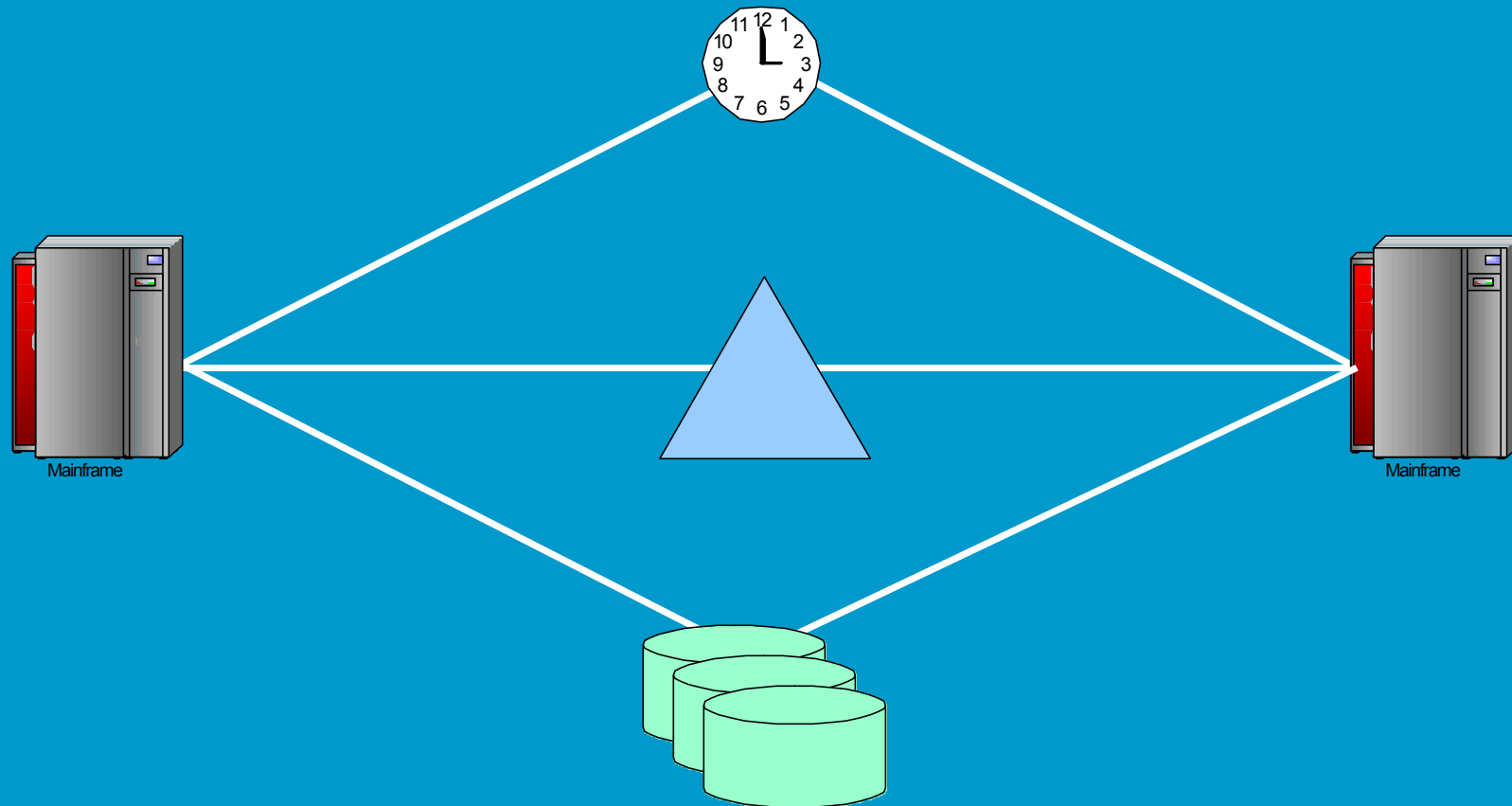
Original Server Configuration



Objective

- Common level for all system software
- Ensure that all software is Y2K compliant
- Provide Y2K testing environments
- Design a common process to allow a minimal roll-out of system software to all clients
- Reduce system support requirements
- Ensure environment are Parallel Sysplex ready

Final Server Configuration



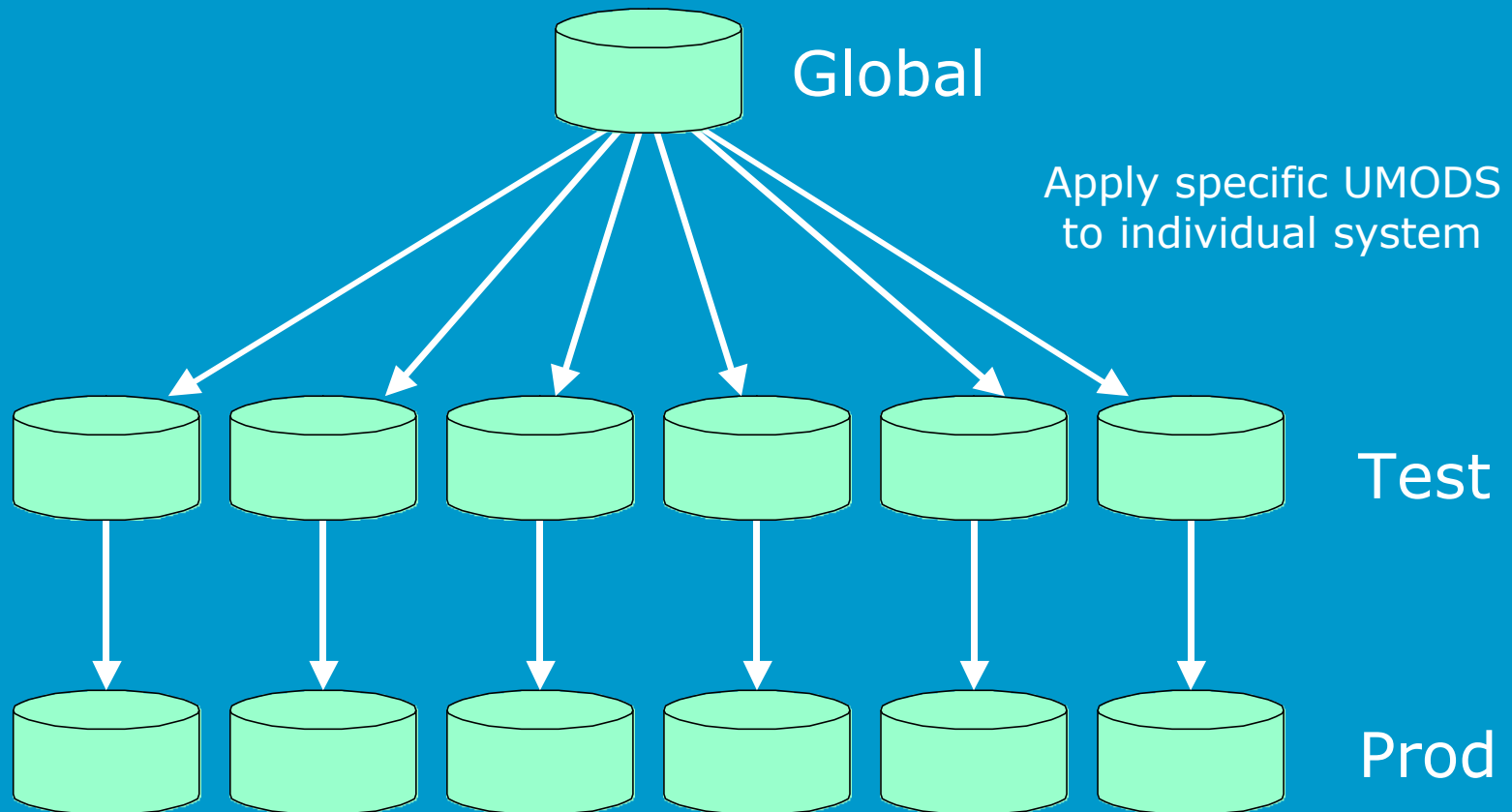
Pre Server Consolidation Work

- Plan required capacity for each new system
- Investigate toleration and implications
- Identify Software & Hardware portfolios
 - Is there any unique software
 - What are the levels of the software
 - Identify the differences
 - Identify exits and usermods and find the source
 - Are they maintained by SMP/E
 - What purpose do they serve
 - Do you use the same exit

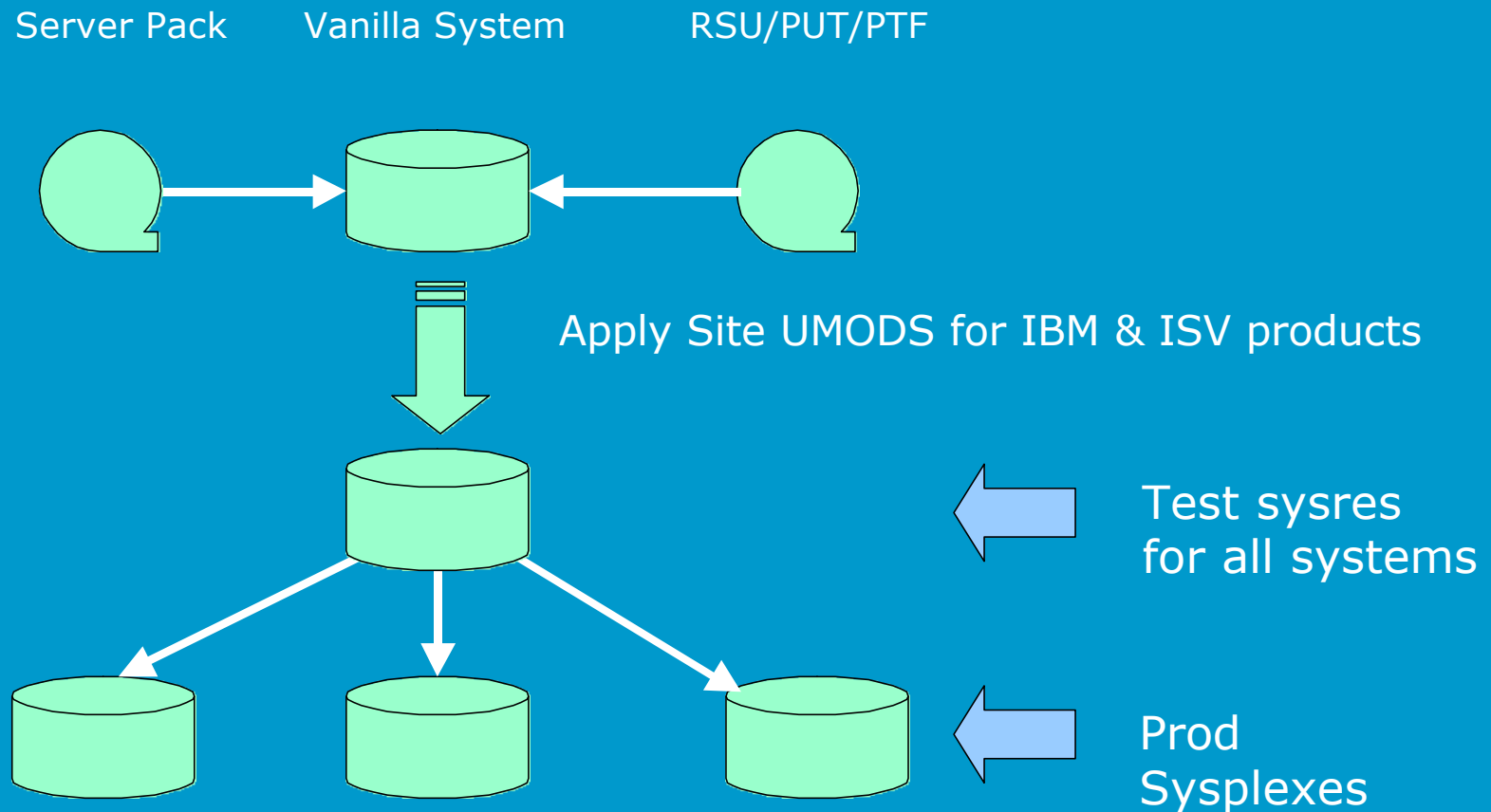
Pre Server Consolidation Work Cont.

- System maintenance documentation
 - IPL Procedures
 - Disaster Recovery
 - Software maintenance procedures
 - Software change procedures
 - If none exists
 - Don't panic yet...document your findings
- What is the software maintenance methodology
 - How does this fit with your plans?

Original System Maintenance Method



Final System Maintenance Method



System Software considerations

- When consolidating systems consider what exits and usermods are in place, both in the current environment and the server that is to be consolidated
- What needs to be done to ensure that system parameters are maintained
- Are there many external program that may be affected by the consolidation

Exits & Usermods

- Exits controlled one of two ways:
 - Turned off/on via PARMLIB control
 - JES exits via initialisation parms by using specific suffix for each system
 - Stub program to check system id then call correct version of program
 - IEFUSI, IEFUJI, IEFACTRT etc

PARMLIB

- Master Catalog shared or unique?
 - Can you consolidate the new system into your current naming conventions
 - Investigate the use of dataset name aliases for application transparency
 - Eliminate datasets not required in master catalog

PARMLIB

- LINKLIST, LPALIB & IEASSN
 - Concatenate Members
 - One that contains only MVS base required libraries
 - One that contains all other products, that are not required to IPL system.
 - These can be in a UCAT as long as the VOL(xxxxxx) parameter is used.

PARMLIB

- IEASVC
 - Check that products do not use the same SVC numbers.
 - Not all in SVC parmlib member
 - Check products which dynamically update the SVC table
 - CA Products (TLMS,CA,Datacom)
 - BMC Products (Control-T)
 - Beta Systems (Beta93)
 - etc
 - Endeavor to change SVC's so that use the same number on all systems.

PARMLIB

- LOAD
 - Consolidate all LOAD members into one.
 - Use the HWNAME & LPARDEF to allow this.
 - Update HCD to reflect names used for HWNAME & LPARDEF

PARMLIB

- IEASYM
 - Consolidate all IEASYM members into one.
 - Initially use LOCAL SYSDEF to ensure no mishaps with overrides
 - As systems are consolidated with parameters move them to become GLOBAL SYSDEF
 - Aim where possible to have the majority of parameters in the global list. It becomes easier to manage

PARMLIB

- IEASYSxx
 - Check items like PAGE dataset sizes.
 - CSA/ECSA SQA/ESQA Sizes
 - System names
 - Use Unique names for LOGREC until you can implement LOGSTREAM for a SYSPLEX.

PARMLIB

- CONSOL
 - Check that you do not have any conflicts with names for consoles.
 - Certain ISV products can use console names or CNxx to send messages to console.
 - Products may be using subsystem consoles
 - Consoles in a PLEX are limited to 99. This can be a problem.

Summary

- Make sure you allow ample time for planning and testing
- Define standards that allow systems to be consolidated into current environment
- This is not a quick process, it can take a significant amount of time to achieve

Enterprise Server Consolidation

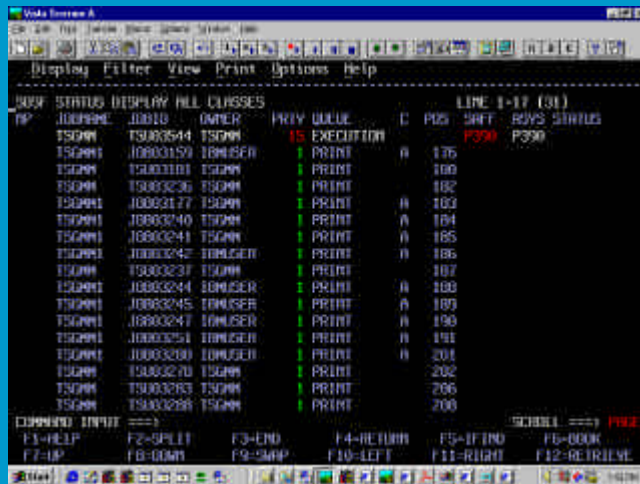
Part Two - Mike McNamee

Consolidate by exploiting UNIX Services

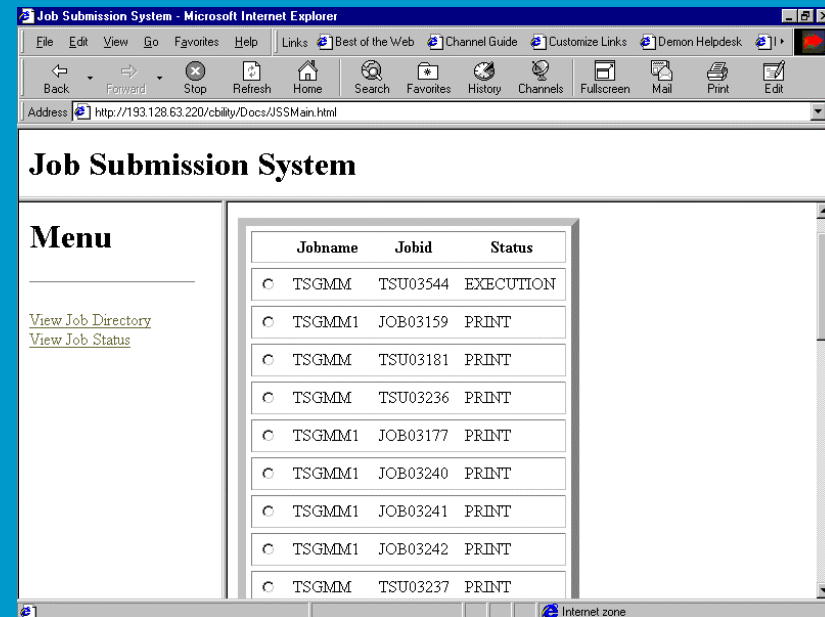
- Use newer technologies to enhance existing systems
- Consolidate other Servers onto OS/390
 - Applications
 - Web Servers

Enhance existing systems

- Most programs are available under the Web Server. This includes REXX programs



A screenshot of a TSO terminal window displaying a list of jobs. The window title is 'Voda Terminal A'. The main content is a table with columns: JOB, STATUS, DISPLAY, ALL, CLASSES, JOBNAME, JOBID, OWNER, PRIV, DQUE, C, POS, SHFT, ADYS, STATUS. The first row shows a job in 'EXECUTION' status. Other rows show jobs in 'PRINT' status. At the bottom, there are function key definitions: F1-HELP, F2-DELETE, F3-END, F4-RETURN, F5-IFIND, F6-BOOK, F7-UP, F8-DOWN, F9-PAAP, F10-LEFT, F11-RIGHT, F12-RETRIEVE.



A screenshot of a Microsoft Internet Explorer browser window displaying the 'Job Submission System' web interface. The browser address bar shows 'http://193.128.63.220/cbilly/Docs/JSSMain.html'. The page title is 'Job Submission System'. On the left, there is a 'Menu' section with links for 'View Job Directory' and 'View Job Status'. On the right, there is a table listing jobs with columns for Jobname, Jobid, and Status.

Jobname	Jobid	Status
TSGMM	TSU03544	EXECUTION
TSGMM1	JOB03159	PRINT
TSGMM	TSU03181	PRINT
TSGMM	TSU03236	PRINT
TSGMM1	JOB03177	PRINT
TSGMM	JOB03240	PRINT
TSGMM1	JOB03241	PRINT
TSGMM	JOB03242	PRINT
TSGMM	JOB03237	PRINT
TSGMM1	JOB03244	PRINT
TSGMM	JOB03245	PRINT
TSGMM1	JOB03247	PRINT
TSGMM	JOB03251	PRINT
TSGMM1	JOB03260	PRINT
TSGMM	TSU03270	PRINT
TSGMM	TSU03283	PRINT
TSGMM	TSU03286	PRINT

- Consolidate TSO address spaces by running programs under the Web Server

Sample Case

- End users use TSO to submit report writer jobs and SDSF to view output
 - 100 Users = 100 Address spaces
- With REXX based CGI programs users use Web Browser to submit jobs and view output with complete RACF security
 - 1 Web server required = 1 Address Space
- Thin client only required = Web Browser

Sample Resources

- Sample code and tools for UNIX Services is available at :
 - <http://www1.s390.ibm.com/oe/bpxa1toy.html>
- Sample Web Job Submit and SDSF application available from presenter

Consolidate other Servers onto OS/390

- OS/390 Has some recognized strengths :

... "I have a lot of respect for mainframe hardware and software. You never get a hardware error and when you get a software error there is a clear cause that you can determine and correct on your own, most of the time. And you cant crash a mainframe" ...

Letter in Doctor Dobbs Journal Nov 1999 complaining about MicroSoft Software (IIS)

Easiest Candidates for consolidation

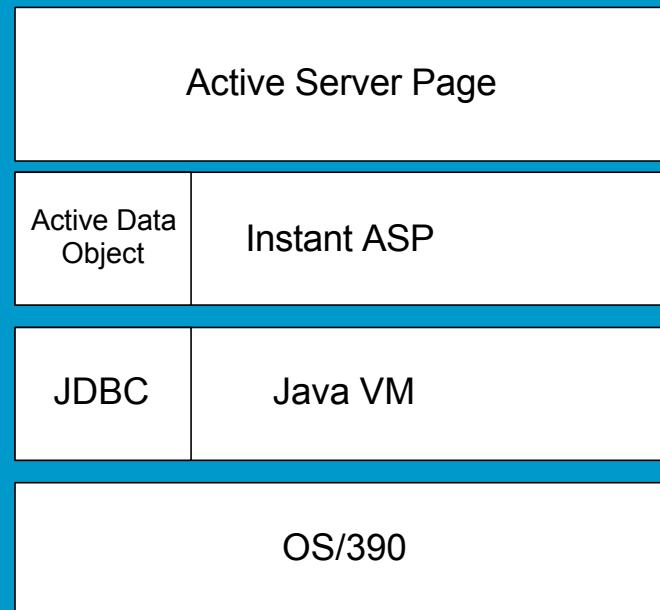
- Web Servers (e-business)
- Vanilla UNIX applications
- ANSI C/C++ compliant applications

Web Servers

- Unix Services make it easy to port UNIX (Apache) Web sites :
 - Web pages work unchanged
 - Scripts work unchanged
 - File naming conventions similar

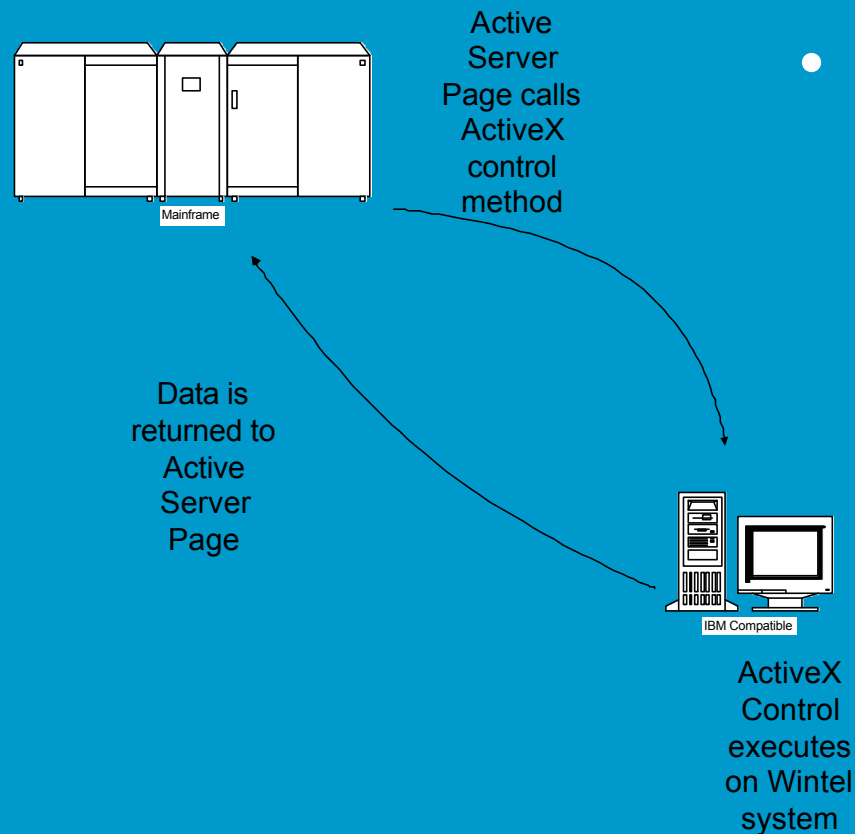
Web Servers

- NT (IIS) Web Servers are a different Story
 - MicroSoft Active Server Pages is a propriety technology



- Instant ASP from Halcyon Software provides ASP using a Java Servlet. This allows OS/390 to use ASP

Web Servers



- Beware of Server Side ActiveX controls. These controls are only executable on Wintel platform

R-Jax from Halcyon allows Java applets on any platform to access ActiveX controls by encapsulating them with a Java Bean on a 'Donor' system

UNIX & C/C++ Applications

- Most well written C/C++ and UNIX applications port very quickly to OS/390
 - Beware of references in code to ANSI characters
 - Beware of programs that assume the size of data types
 - Beware of porting C/C++ programs that use I/O on standard OS/390 file types.

C/C++ uses stream (byte-by-byte) I/O and OS/390 uses records - can cause some problems so test well.

UNIX & C/C++ Applications

- For information on porting
 - <http://www.s390.ibm.com/oe/bpxa1por.html>

Questions

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Contact Information

- If you have more questions later please feel free to contact either of us :
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 - Mike McNamee email : mikem@e3sciences.com