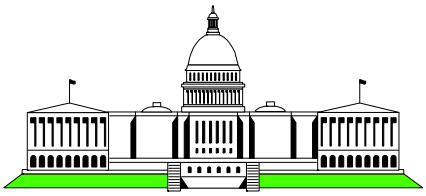
WebSphere Overview



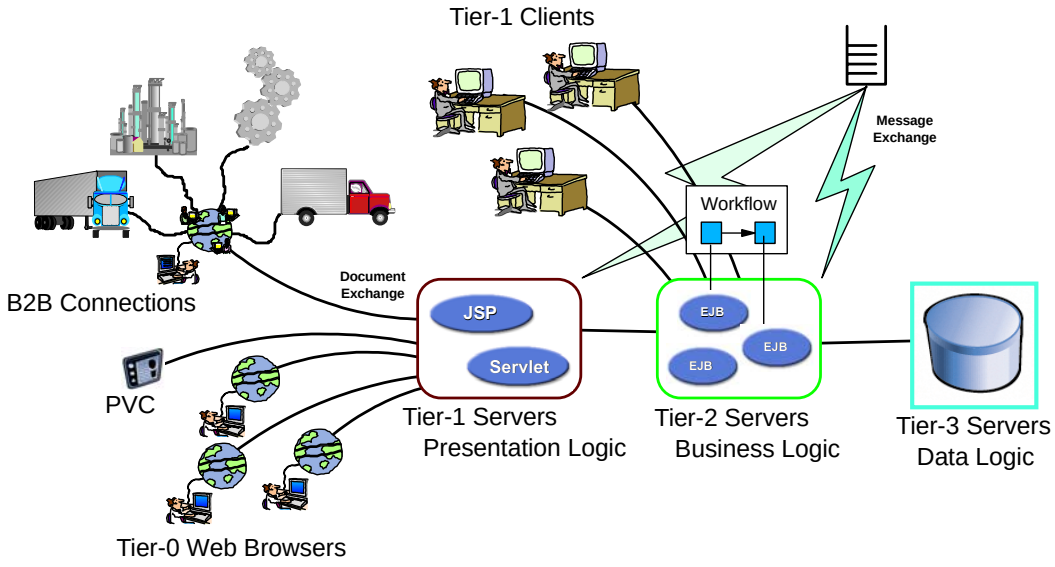
Washington System Center

Agenda

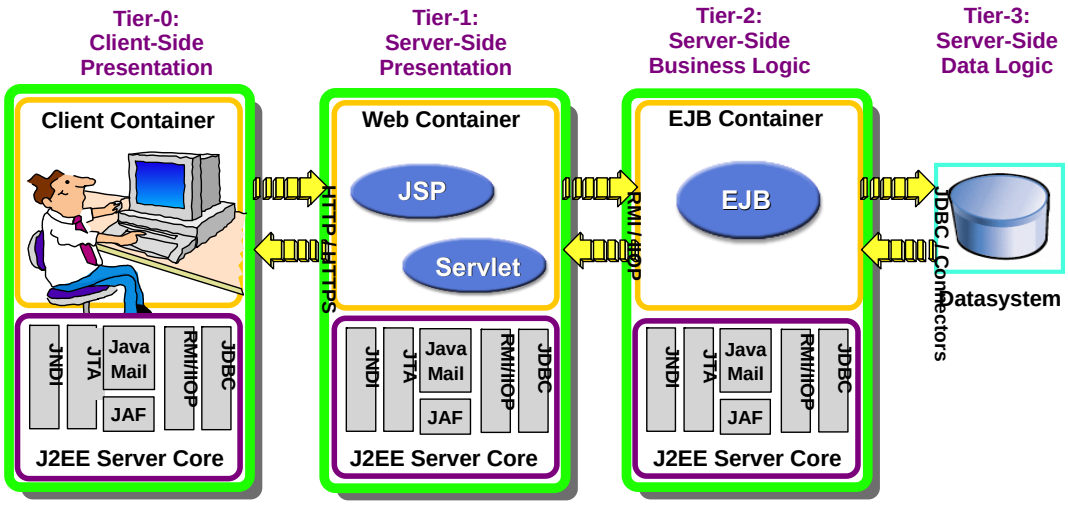
WSC Advanced Technical Support

- Vision and J2EE
- WebSphere Structure and Terminology
- The WebSphere Family Version/Features
- Administrative Control Interface
- Installation
- Summary

Multi-tier Application Environments



J2EE Server Mode



J2EE Technologies

WSC Advanced Technical Support

- Components
  - Software units provided by application developers
    - Servlets, JSPs, EJBs, client components
  - Run inside the container provided by the platform
    - Container offers services and common support
- Services
  - Functions available to the J2EE components
    - JDBC, JTA/JTS, JNDI, ...
    - Implemented by the platform provider (WebSphere)
- Communications
  - Enable communication between components
    - RMI/IIOP, JavaMail, JMS, ...
    - Provided by the container

Version 5.1 Packaging - Overview

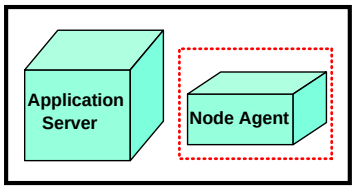
WSC Advanced Technical Support

- Available Packages
  - WebSphere Application Server Express
  - WebSphere Application Server (base)
  - WebSphere Network Deployment (ND)
  - WebSphere Business Integration Software Foundation (WBISF)

Version 5.1 Packaging - Details

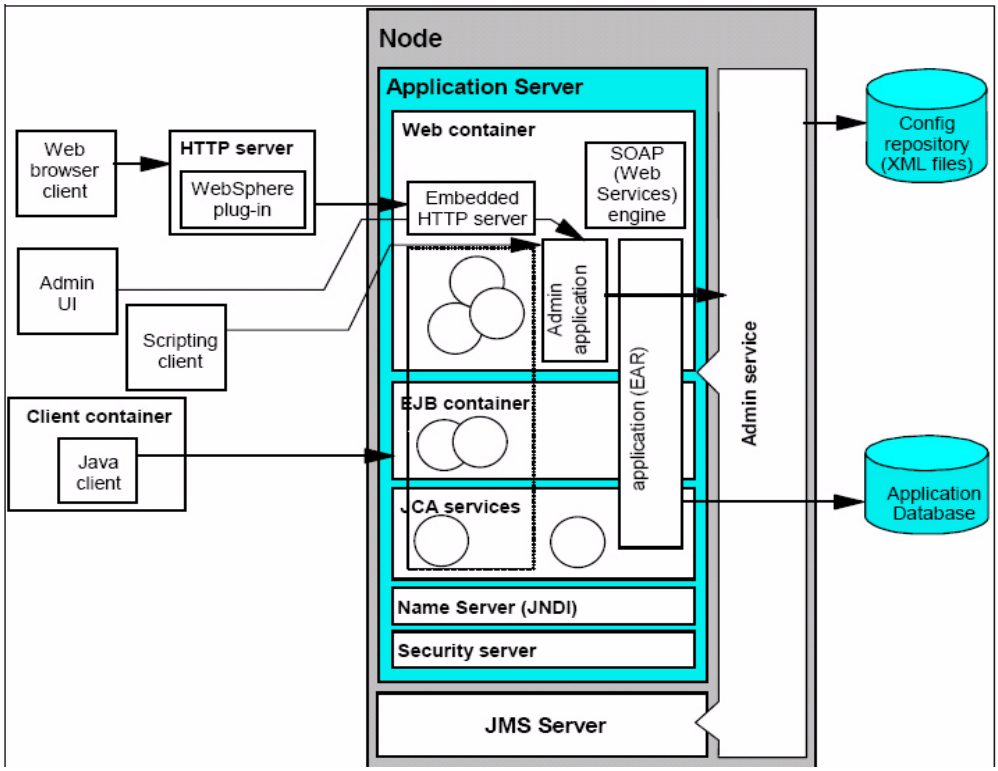
WSC Advanced Technical Support

- WebSphere Application Server (base)
  - Code and license for single server
  - Node Agent
    - not used unless customer upgrades to next level (WebSphere ND)
  - Web Services
  - New standards
    - JAX-RPC Java and XML
  - Performance Monitor Interface (PMI)
  - Tivoli Performance Viewer (Formerly Resource Analyzer)
  - SDK 1.4 support
  - JMS
  - JAVA 2 security model
  - JAAS (Java Authentication and Authorization Services)
  - Integrated Usage with separately available WebSphere Studio
  - CCF migration to J2EE/JCA based connectors
  - See Announcement letter 203-319 - November 23, 2003



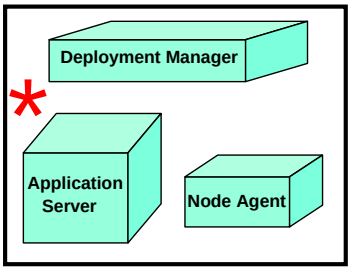
Version 5.1 Packaging - Base Schematic

WSC Advanced Technical Support

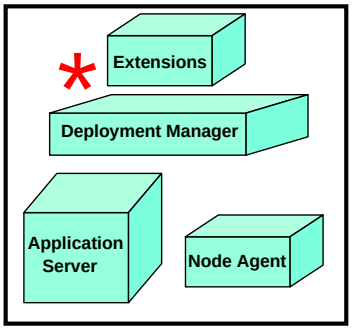


Version 5 Packaging - Details

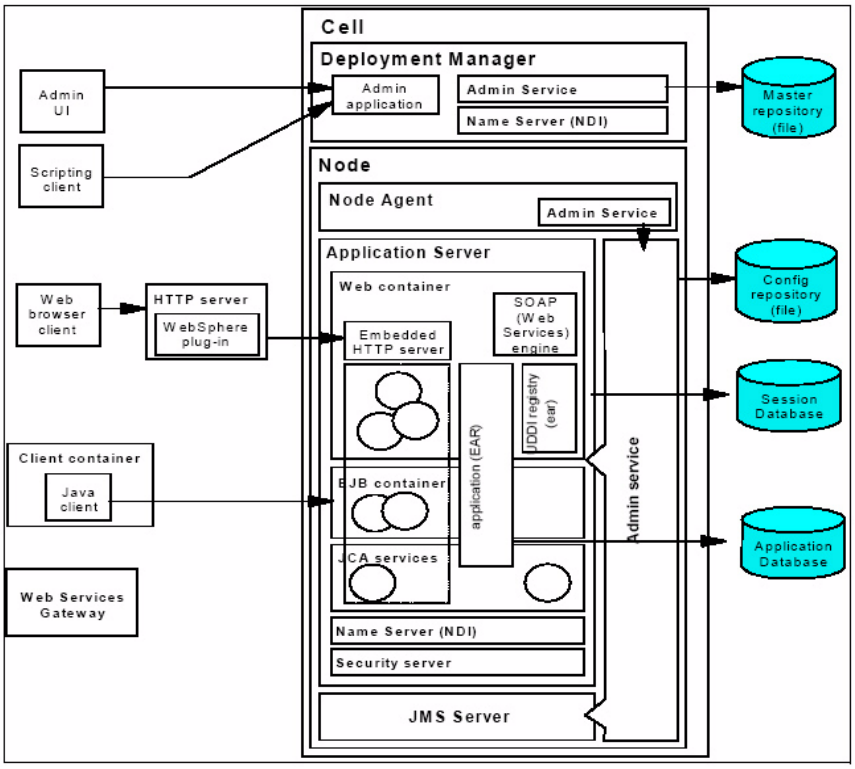
- **WebSphere Application Server Network Deployment**
  - Base Server
  - Node Agent
  - Deployment Manager
  - Includes support for DB2 and other databases
- Web Services Gateway
- Private UDDI Directory
- see announcement letter 204-319 - Nov 23, 2003



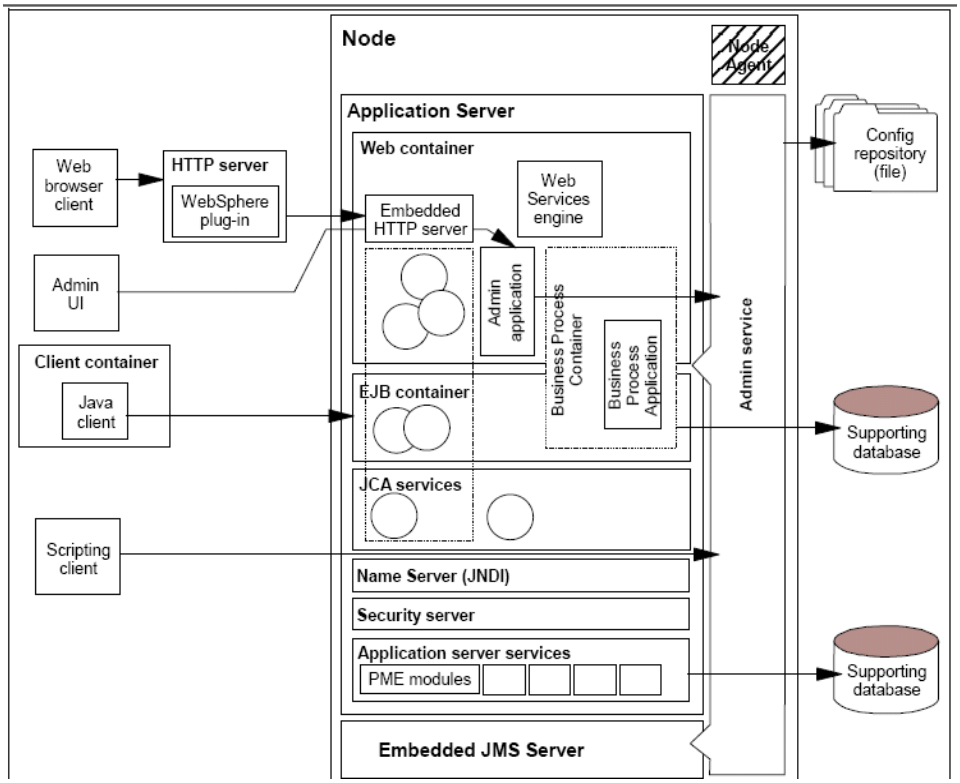
- **WebSphere Business Integration Server Foundation (WBISF)**
  - Support for high end functions
    BPEL - Business Process Execution language *(for web services)*
    Business rules and adapters
  - Includes WebSphere base, and ND server functionality
  - DB2, WebSphere MQ, Event Broker *(limited license usage)*
  - see announcement letter 204-058 - April 6, 2004



Version 5.1 Packaging - ND Schematic

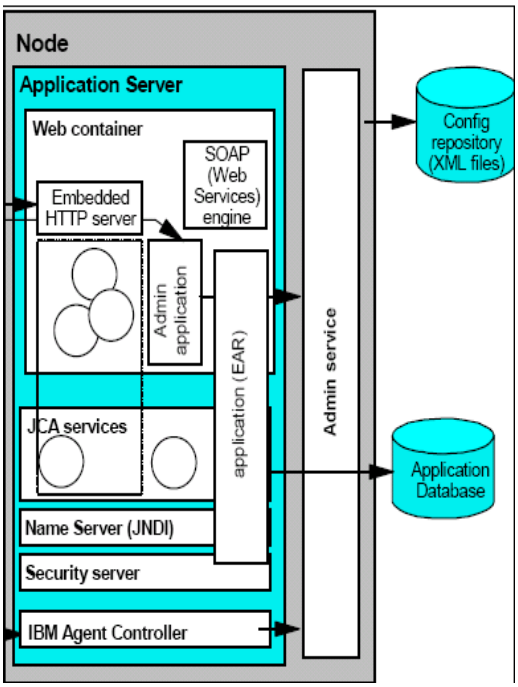


Version 5.1 Packaging - WBISF Schematic



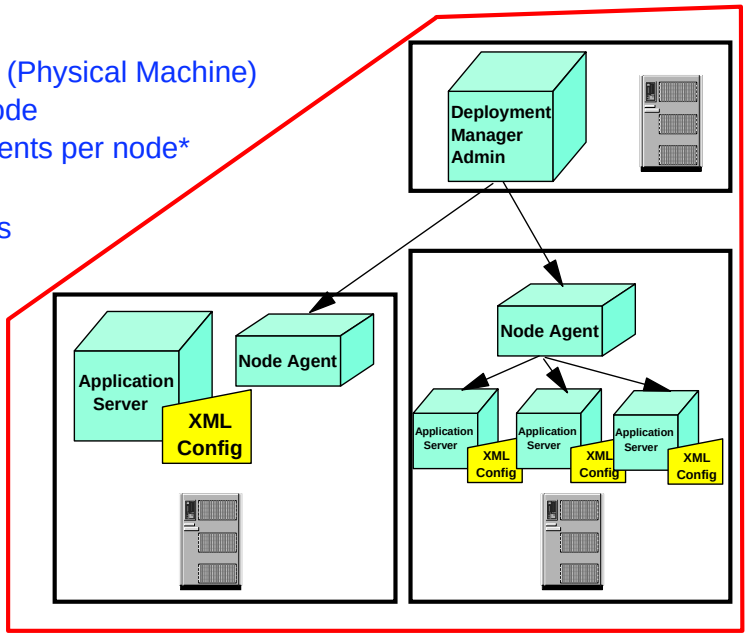
Version 5 Packaging - Detail

- WebSphere Application Server - Express
  - Light weight version of base server
  - Cloudscape
  - WebSphere Site Developer (flavor of WebSphere Studio)
  - Windows, Linux, Unix, iSeries
  - See announcement letter 203-339 - December 16,2003



Big Picture - WebSphere V5 Model

- Managed Process or Server with each server having own JVM
  - Application Servers
  - JMS Server
- Node Agent
  - Resides on single node (Physical Machine)
  - Manages Servers on node
  - potential for multiple agents per node*
- Deployment Manager
  - Manages multiple nodes
- Cell
  - Network of nodes with logical view of administration

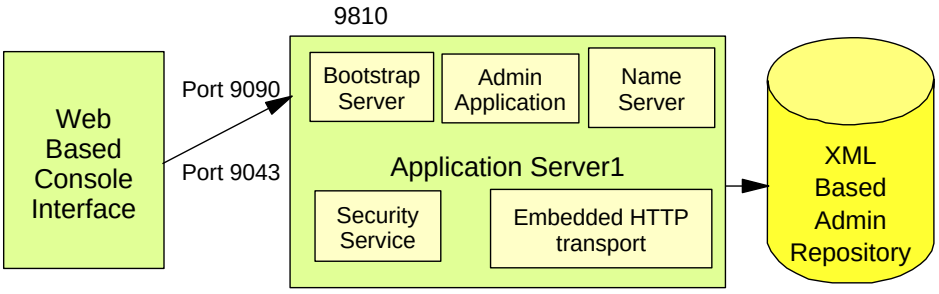


WebSphere Support Requirements-general

- V5.1
  - Configuration information in flat file (XML) - no DB requirement
  - Supports SDK 1.3.1
  - Requires SDK 1.4.1 (supplied)
  - SLES8 - (UnitedLinux v1.0)
  - 512MB - 756MB minimum

Admin Control Interface Layout

- Admin console browser based
  - implemented through an enterprise application (adminconsole.ear)
- Some tools still use X-Windows
  - Tivoli Performance Viewer *(formerly resource analyzer)*
- Federated Name space - combination of JNDI and CosNaming



Major Concepts & Administrative Tasks

- Deploying assembled applications (ears, wars)
- Controlling access to applications, Servers and Resources
- Performing daily administrative operations
- Analyzing usage statistics and performance
- Optimizing performance by distributing applications over multiple nodes and machines (ND)
- Troubleshooting

Terminology

- Node
  - A physical machine in a topology consisting of one or more Application Servers
- Cell
  - A node and one or more Application Servers

Web Plugin & functionality

- Pass requests coming in to the web server
- must be generated after the install of the application server
- regenerated when changed

- Session Management
  - cookies
  - URL rewrite
- Session Affinity
- Persistent session

```
<?xml version="1.0" ?>
- <Config ASDisableNagle="false" IISDisableNagle="false" IgnoreDNSFailures="false" RefreshIr
    AcceptAllContent="false">
    <Log LogLevel="Error" Name="/opt/WebSphere/AppServer/logs/http_plugin.log" />
    <Property Name="ESIEnable" Value="true" />
    <Property Name="ESIMaxCacheSize" Value="1024" />
    <Property Name="ESIInvalidationMonitor" Value="false" />
  - <VirtualHostGroup Name="default_host">
      <VirtualHost Name="*:9080" />
      <VirtualHost Name="*:80" />
      <VirtualHost Name="*:9443" />
    </VirtualHostGroup>
  - <ServerCluster Name="server1_Cluster" CloneSeparatorChange="false" LoadBalance="R
      RemoveSpecialHeaders="true" RetryInterval="60">
    - <Server Name="server1" ConnectTimeout="0" ExtendedHandshake="false" LoadBalance
        WaitForContinue="false">
        <Transport Hostname="localhost" Port="9080" Protocol="http" />
      - <Transport Hostname="localhost" Port="9443" Protocol="https">
          <Property name="keyring" value="/opt/WebSphere/AppServer/etc/plugin-key
          <Property name="stashfile" value="/opt/WebSphere/AppServer/etc/plugin-ke
        </Transport>
      </Server>
    </ServerCluster>
  - <UriGroup Name="server1_Cluster_URIs">
      <Uri Name="/snoop/*" />
      <Uri Name="/snoop" />
      <Uri Name="/hello" />
      <Uri Name="/hitcount" />
      <Uri Name="*.jsp" />
      <Uri Name="*.jsv" />
      <Uri Name="*.jsw" />
      <Uri Name="/j_security_check" />
```

Directory Layout - Executables

- Root Install Directory
  - /opt/WebSphere/AppServer
- Executables are located at
  - /opt/WebSphere/AppServer/bin
  - startServer.sh - to start default server - include admin. application
  - wsadmin.sh - for command line admin. interface
  - 9090/admin - for browser based admin. interface

Directory Layout - logs and SDK

- Logs
  - Multiple sets of logs are generated and may be consulted for status history information
  - Requires some sort of housekeeping schedule to remove/clean-up logs
  - Some log segregation (based on application server) can be achieved
  - All logs located at
    - /opt//WebSphere/AppServer/logs/server? (default naming)
    - /opt/WebSphere/Appserver/logs/server_name
- SDK
  - executables located at /opt/WebSphere/AppServer/java
  - non-switchable

```
'AppServer/logs/server1 # ls -l

  root         4096 Aug  4 12:29 .
  root         4096 Aug  4 14:04 ..
  root       751232 Aug  4 12:29 SystemErr.log
  root      1048495 Aug  4 12:29 SystemErr_04.08.04_12.29.36.log
  root        63285 Aug  4 13:57 SystemOut.log
  root            0 Aug  4 11:06 native_stderr.log
  root            0 Aug  4 11:06 native_stdout.log
  root            4 Aug  4 11:09 server1.pid
  root         2219 Aug  4 11:09 startServer.log
'AppServer/logs/server1 #
```

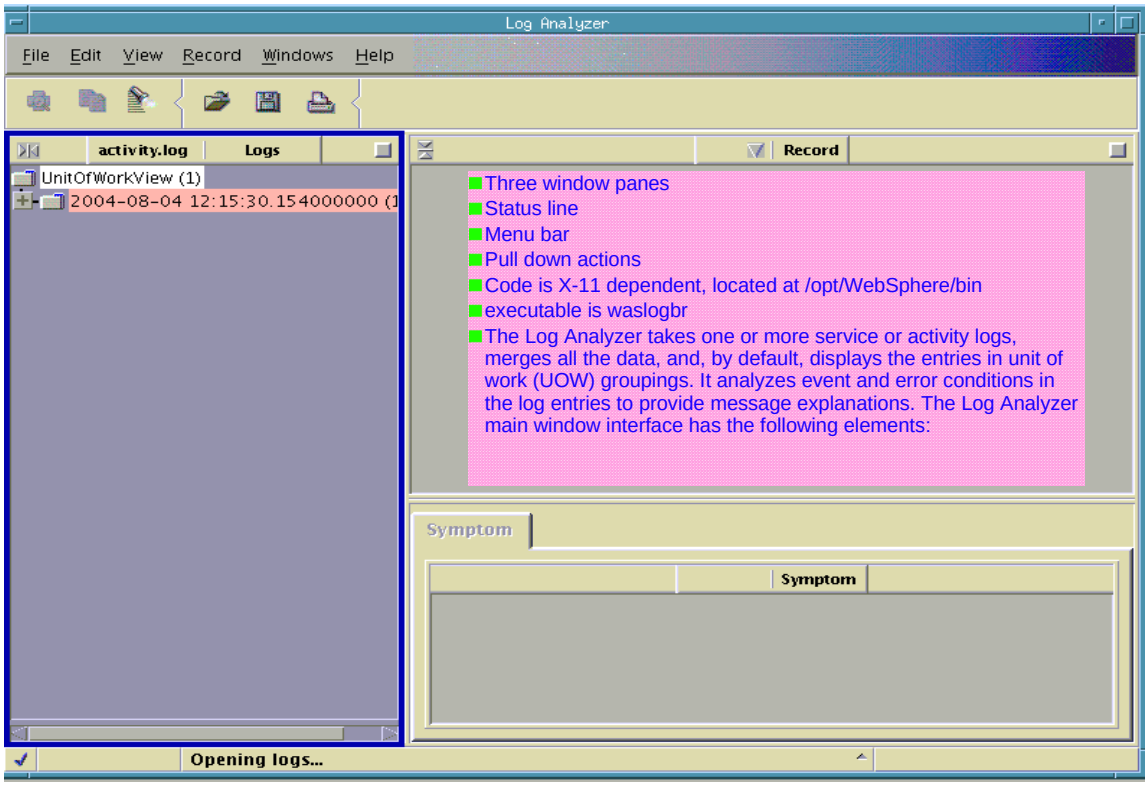
More on Logs

- Installation log
  - initially located at /tmp/log.txt The installation program copies the file from the temporary directory to the install_dir/logs/log.txt location at the end of the installation.
  - If installation fails and the install_dir/logs/log.txt has only this one entry search the logs.txt file in the temporary directory for clues to the installation failure.
- JVM logs
  - are written as plain text files. Therefore there are no special requirements to view these logs.
  - located in the installation_directory/logs/applicationServerName directory, and by default are named SystemOut.log and SystemErr.log
  - Typically, the SystemOut log is used to monitor the health of the running application server. The SystemOut log can be used for problem determination.
  - The SystemErr log contains exception stack trace information that is useful when performing problem analysis.
- Turn on tracing if the installation logs do not contain enough information to determine the cause of the problem.
- Route the stdout and stderr logs to the console window
  - > install -is:javaconsole

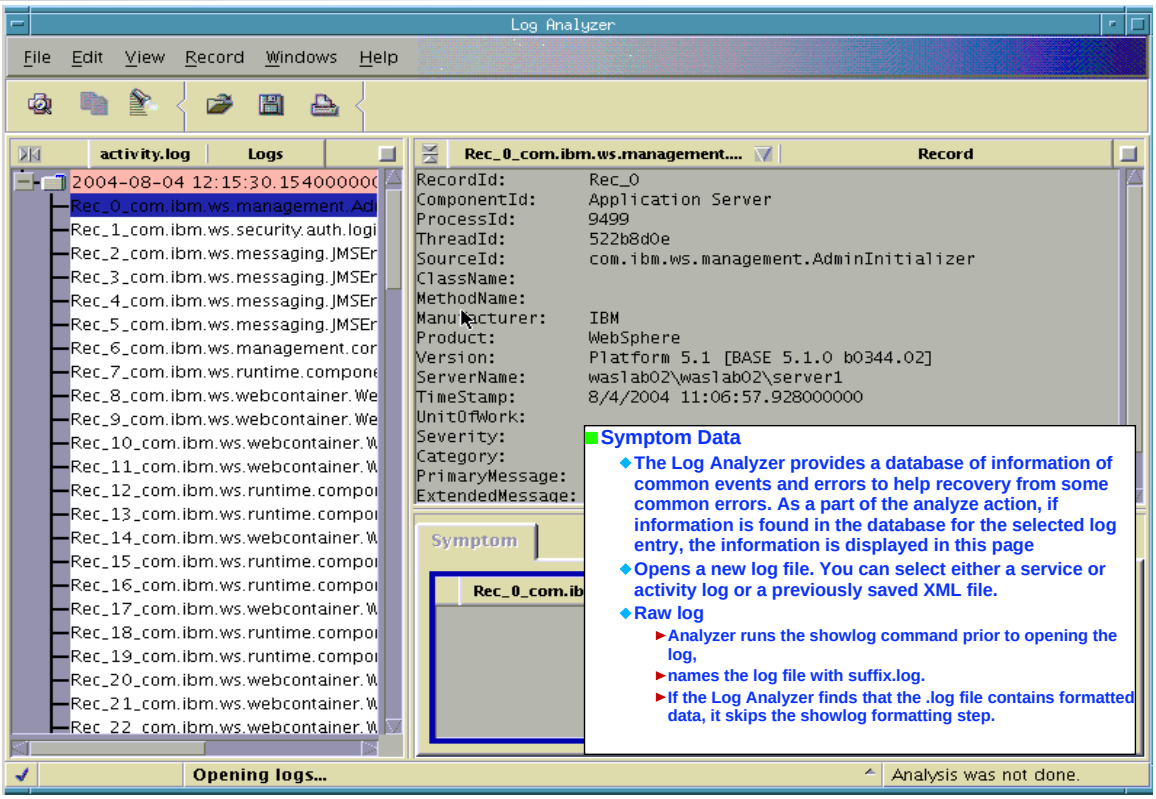
Logs - detail info

- By default, the stdout and stderr streams are redirected to log files at application server startup, which contain text written to the stdout and stderr streams by native modules (.dlls, .exes, UNIX libraries, and other modules).
  - these files are stored as installation_root/logs/applicationServerName native_stderr.log and native_stdout.log
- The IBM service log - *named activity.log*
  - contains both the WebSphere Application Server messages that are written to the System.out stream and some special messages that contain extended service information that is normally not of interest, but can be important when analyzing problems.
  - There is one service log for all WebSphere Application Server JVMs on a node, including all application servers. The IBM Service log is maintained in a binary format
  - Never directly edit the service log, doing so will corrupt the log.
  - Use Service log and the advanced capabilities of the Log Analyzer for initial problem analysis and time sequencing of events

The Log Analyzer/browser



The Log Analyzer - cont.



Other log Utilities

- In cases where transferring the file (due to size) is impractical or inconvenient, use the alternate viewing tool, **showlog,** to view the service/activity log file
  - Change directory to bin directory of the install_root.
  - Run the showlog tool with no parameters to display usage instructions
  - ./showlog | grep error | less
  - Showlog Script

Tracing fundamentals

- EventType
  - A one character field that indicates the type of the trace event. Trace types are in lower case. Possible values include:
  - > a trace entry of type method entry.
  - < a trace entry of type method exit.
  - e a trace entry of type event.
  - d a trace entry of type debug.
  - m a trace entry of type dump.
  - u a trace entry of type unconditional.
  - Z a placeholder to indicate that the trace type was not recognized.
- Start the administrative console.
  - Click Troubleshooting > Logging and Tracing in the console navigation tree, then click server > Diagnostic Trace
  - If the server is running, select the Runtime tab.
  - For a running server, check the Save trace check box to write your changes back to the server configuration.
  - If Save trace is not selected, the changes you make will apply only for the life of the server process that is currently running.

The Collector and IBM

- Gathering information with the Collector tool
  - The collector tool gathers information about your WebSphere Application Server installation and packages it in a Java archive (JAR) file that you can send to IBM Customer Support to assist in determining and analyzing your problem. Information in the JAR file includes logs, property files, configuration files, operating system and Java data, and the presence and level of each software prerequisite.
  - Beginning with Version 5.0.2, there are two ways to run the collector tool. The collector tool can be executed to collect summary data or to traverse the system to gather relevant files and command results.
  - The collector tool produces a Java archive (JAR) file of information needed to determine and solve a problem. The collector summary option produces a lightweight collection of version and other information that is useful when first reporting the problem to IBM Support.
  - There are two phases of using the collector tool.
    - The first phase runs the collector tool on your WebSphere Application Server product and produces a Java archive (JAR) file . The IBM Support team performs the second phase, which is analyzing the Java archive (JAR) file that the collector program produces.
  - The collector program runs to completion as it creates the JAR file, despite any errors that it might find. Errors might include missing files or commands. The collector tool collects as much data in the JAR file as possible.

The Collector and a Dump Tool

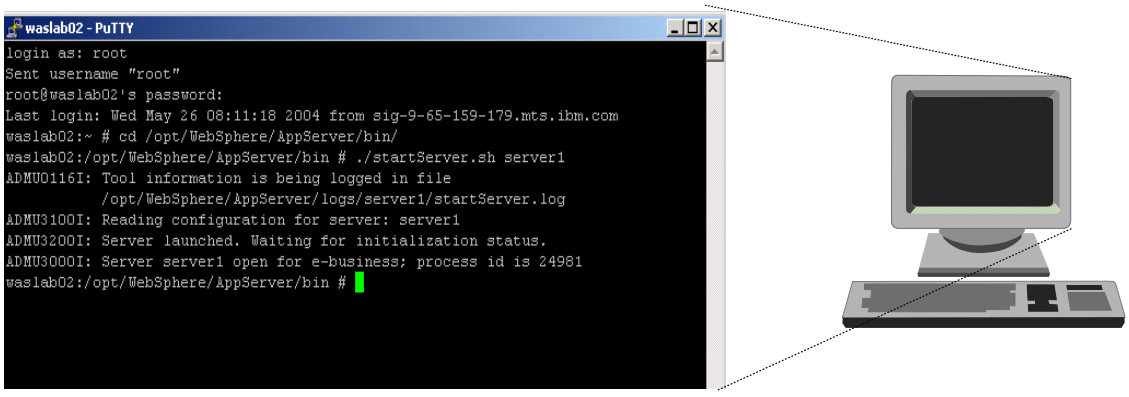
WSC Advanced Technical Support

- Collector summary
  - WebSphere Application Server products include an enhancement to the collector tool beginning with Version 5.0.2, known as the collector summary option.
  - The collector summary option helps you communicate with WebSphere Application Server technical staff at IBM Support. Run the collector tool with the -Summary option to produce a lightweight text file and console version of some of the information in the Java archive (JAR) file that the tool produces without the -Summary parameter. You can use the collector summary option to retrieve basic configuration and prerequisite software level information when starting a conversation with IBM Support.
- dumpNameSpace tool
  - Another useful tool
  - You can use the dumpNameSpace tool to dump the contents of a name space accessed through a name server. When you invoke the dumpNameSpace tool, the naming service must be active If you run the dumpNameSpace tool with security enabled, a login prompt is displayed

Starting the Admin application

WSC Advanced Technical Support

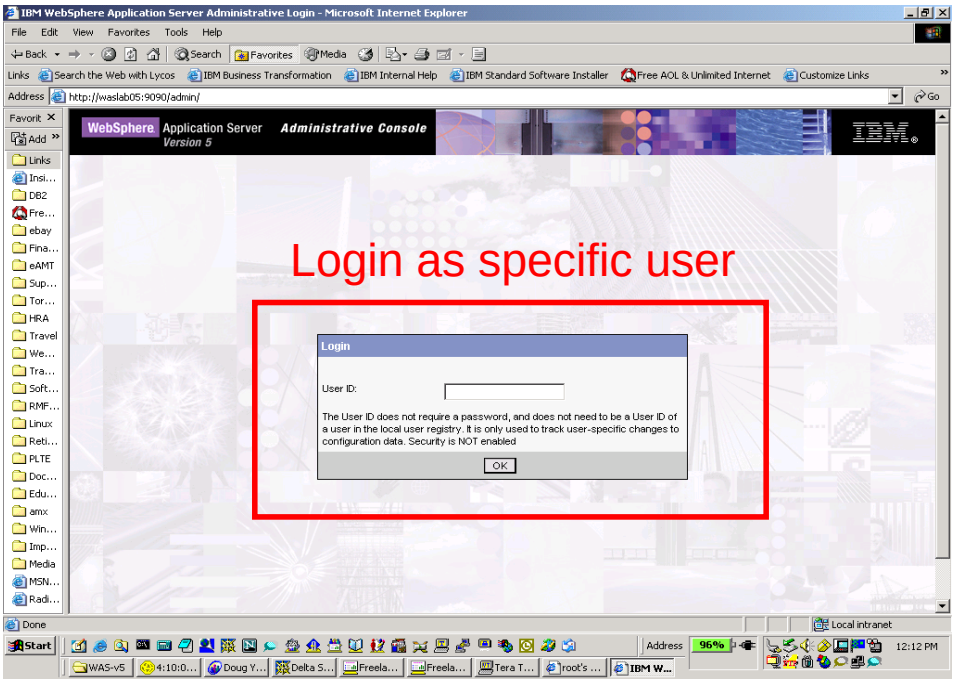
- Login as root
- The administration server is part of the default server (server1)
- Change to the executables directory
  - cd /opt/WebSphere/AppServer/bin
  - Execute the server startup script
    - ./startServer.sh server1
    - Can be run in background using &, or can run in the existing ssh session
      - messages will be displayed on terminal
    - Can check the logs in /opt/WebSphere/AppServer/logs/server1



Administration Control Interface

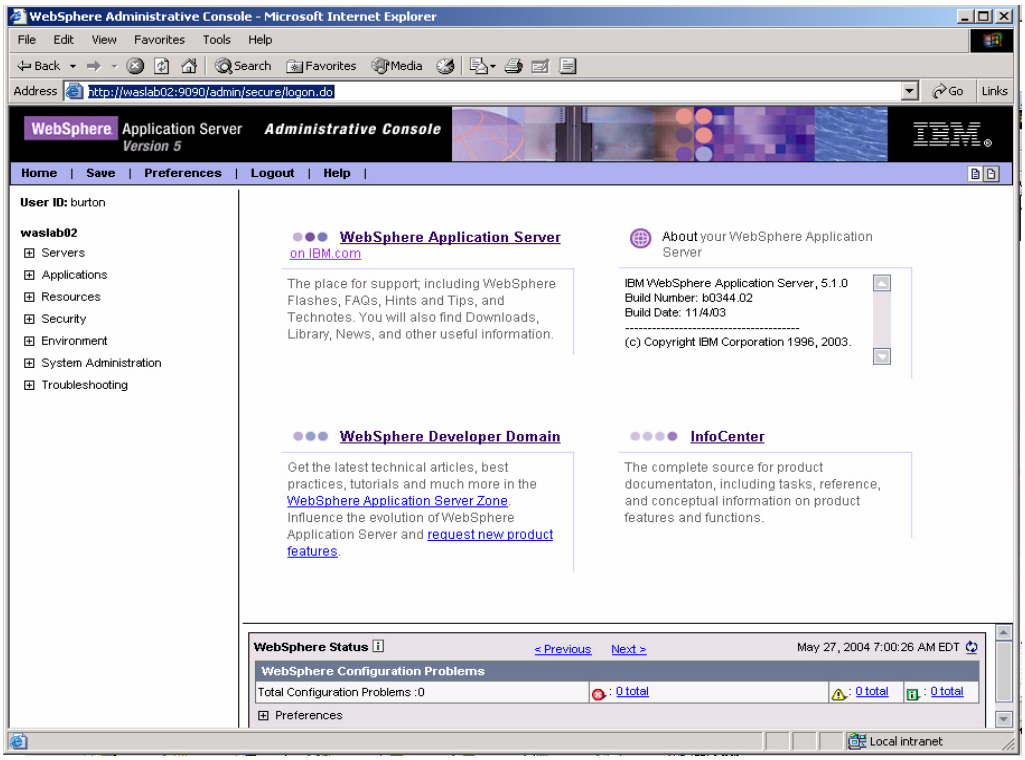
WSC Advanced Technical Support

- Web Based: url is http://waslab02:9090/admin

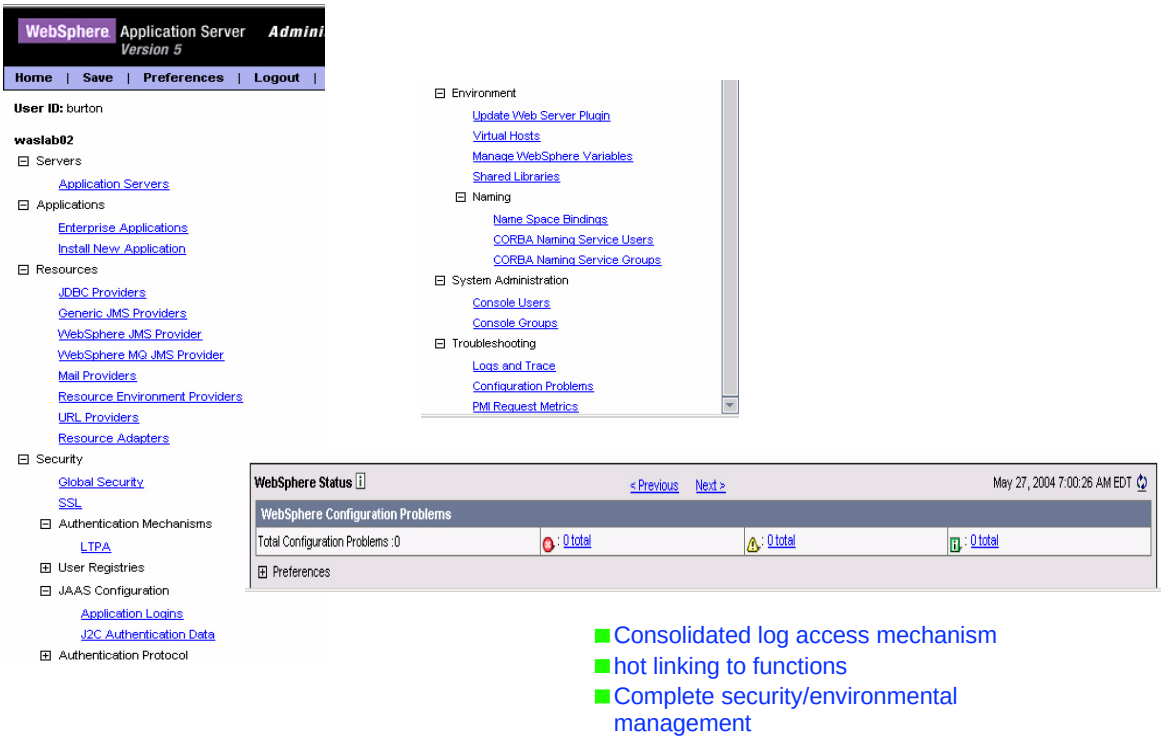


Administration Control Interface

WSC Advanced Technical Support



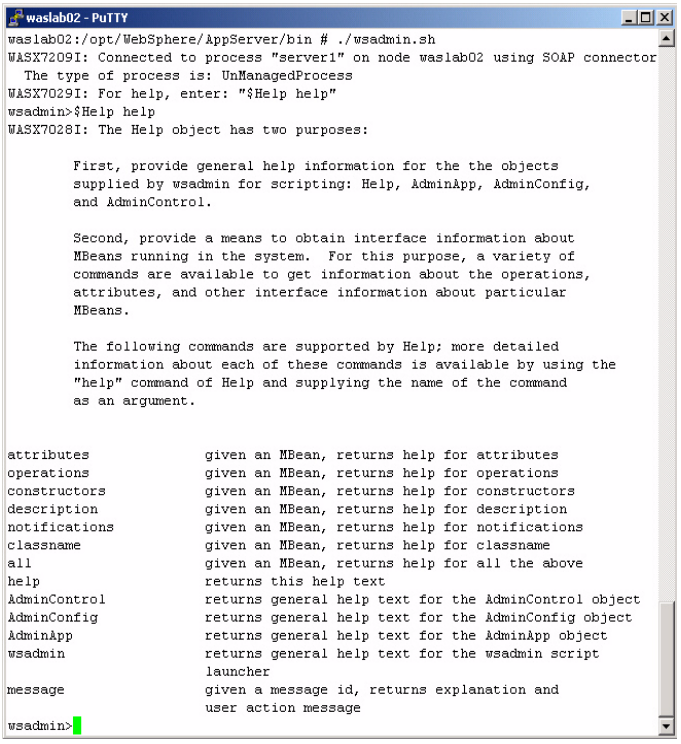
A Closer Inspection



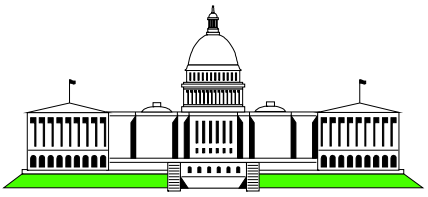
- Consolidated log access mechanism
- hot linking to functions
- Complete security/environmental management

Command Line interface - WsAdmin.sh

- Interactive or feed-a-file input
- Run from ssh, **rlogin** or telnet
- Useful for bulk deployment of applications
- permits scripting of routine administration tasks
- currently supports
  - Basic Scripting Framework (BSF)
  - JACL - Java Command Language
  - Jython
  - Tcl



Installation on Linux for zSeries



Washington System Center

Install WAS 5.1

WSC
Advanced
Technical Support

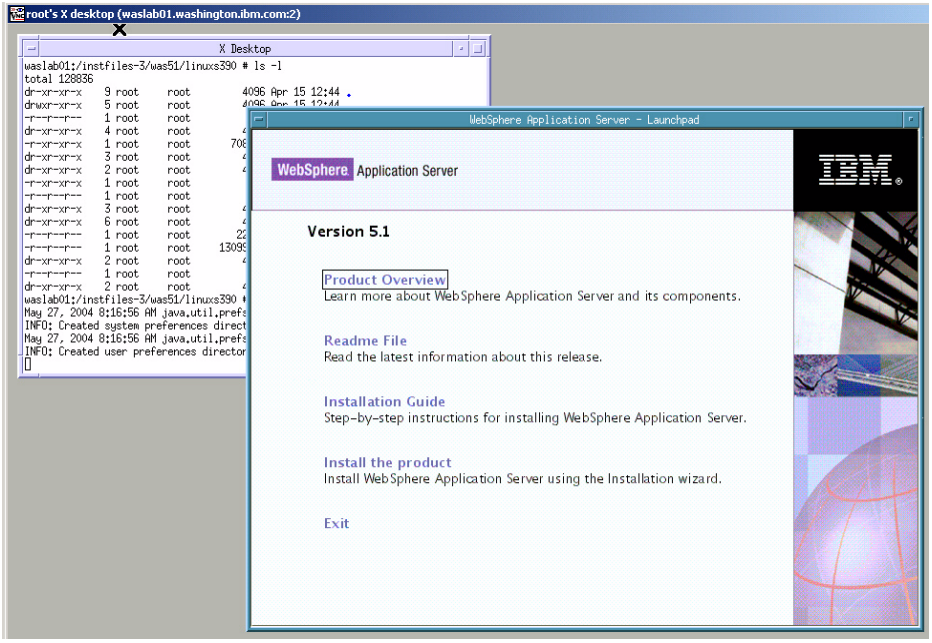
- GUI - Must be installed from an X-Windows session
  - Native - true X-Windows hardware client
  - Exceed
    - Emulator
    - Very slow
  - Browser running VNC/TVNC applet
  - VNCVIEWER -
    - best option if not running locally
    - screen resolution very good
- Silent install
  - All responses will be read from a scripted response file
  - customization of the response file for site specifics will be required
    - file to customize is responsefile.txt

waslab02 - PuTTY

```
# WebSphere Application Server Install Location
#
# Please specify the destination directory for the WebSphere Application
# Server installation.   You will need to change this for UNIX
# platforms. As an example for AIX, the value may be
# "/usr/WebSphere/AppServer"
# ********************************************

-P wasBean.installLocation="C:\Program Files\WebSphere\AppServer"


# ********************************************
# IBM HTTP Server Install Location
#
# Please specify the destination directory for the IBM HTTP Server
# installation.  This value will need to be completed if you
# choose to install IBM HTTP Server.  If you choose to not install IBM
# HTTP Server, then this value is not required.  You will need to change
# the default value below for UNIX platforms.  As an example for AIX, the
# value may be "/usr/IBMHTTPServer"
# ********************************************

-P ihsFeatureBean.installLocation="C:\Program Files\IBMHTTPServer"


# ********************************************
# Below are the features that you may choose to install.
# Set the following values to "true" or "false," depending upon whether
# you want to install the following features or not.
#
# NOTE: The default settings for features in this response file
#       detail the defaults for a typical installation.
# ********************************************


# ********************************************
# Install Server
# ********************************************
```

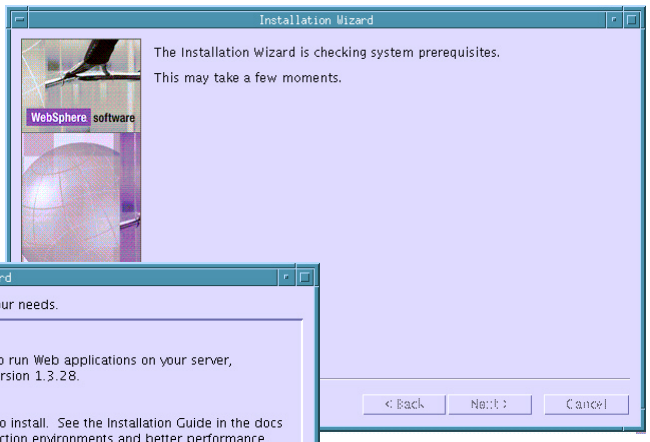
Install WAS 5.1 - Parameter gathering

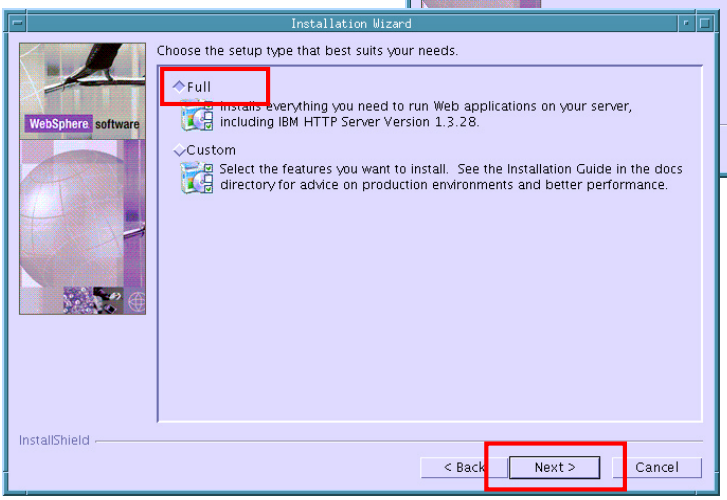
- Startup Installation Windows
- select 'Install the product



Prereq Search and Install Type

- Select type of install
  - Typical
    - Installs all required products
  - Custom
    - Pick and choose

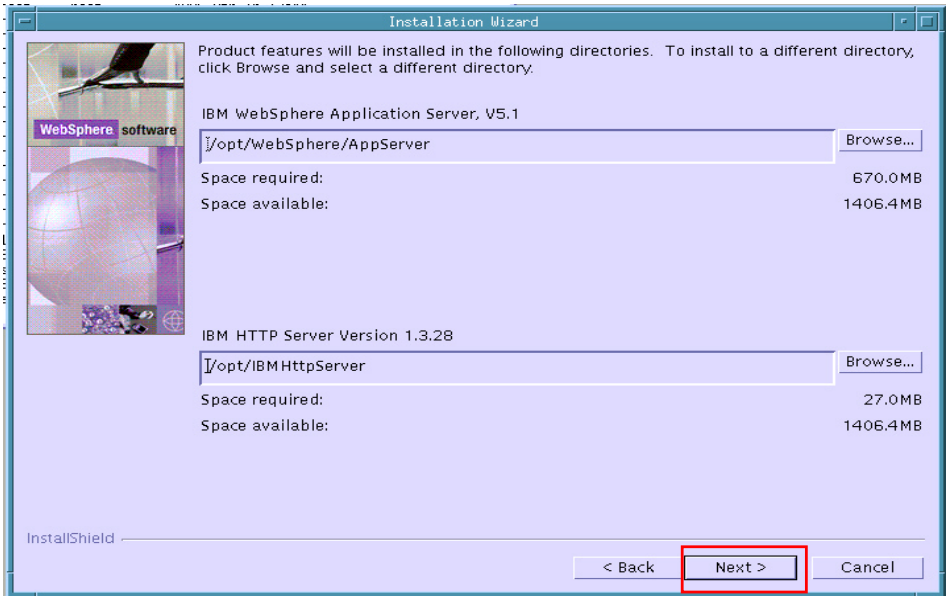




Code Locations

WSC Advanced Technical Support

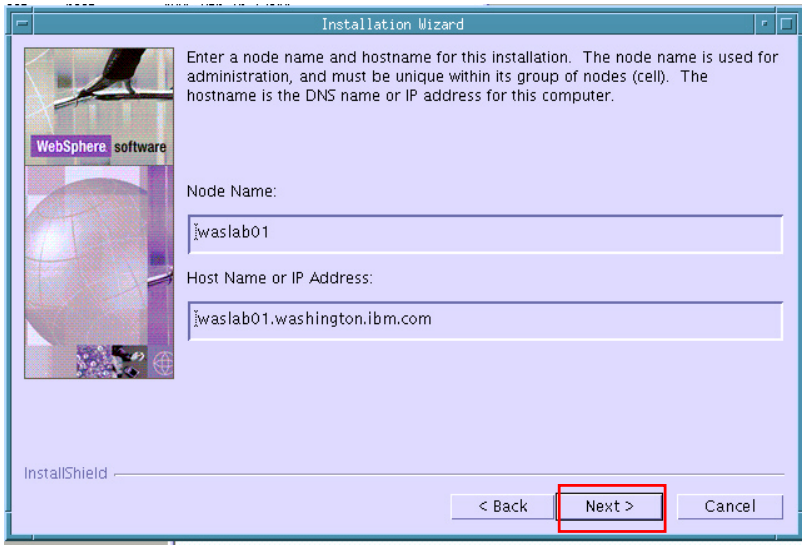
- Destination Directories for WebSphere and HTTP Server
- Take defaults



Node and Hostname

WSC Advanced Technical Support

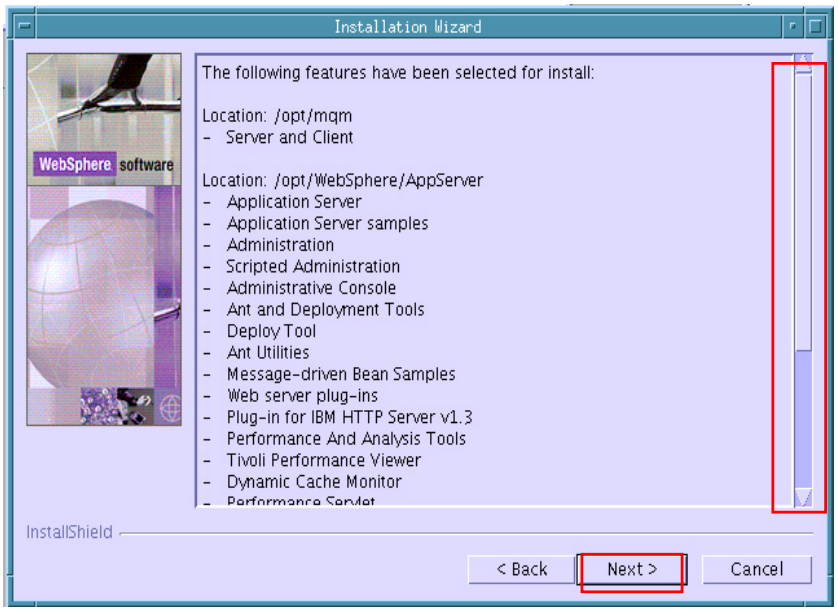
- Take defaults



Pre-Installation Summary

WSC Advanced Technical Support

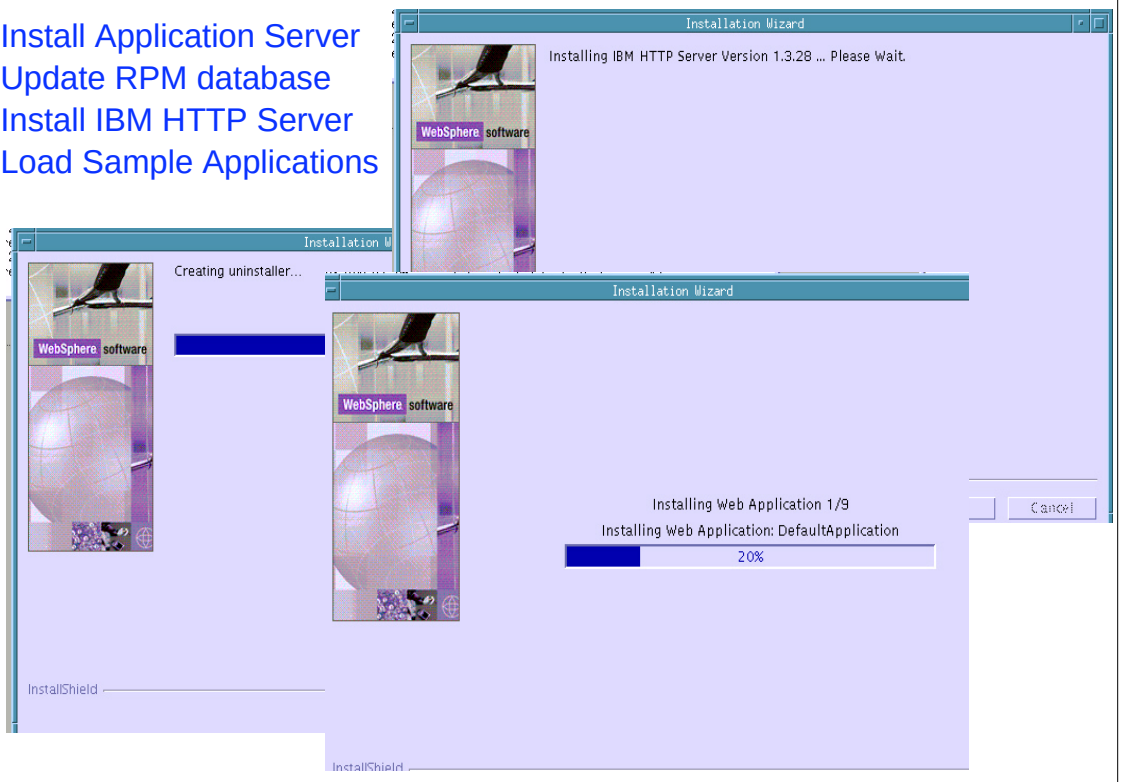
- View Selections



Installation Runs

WSC Advanced Technical Support

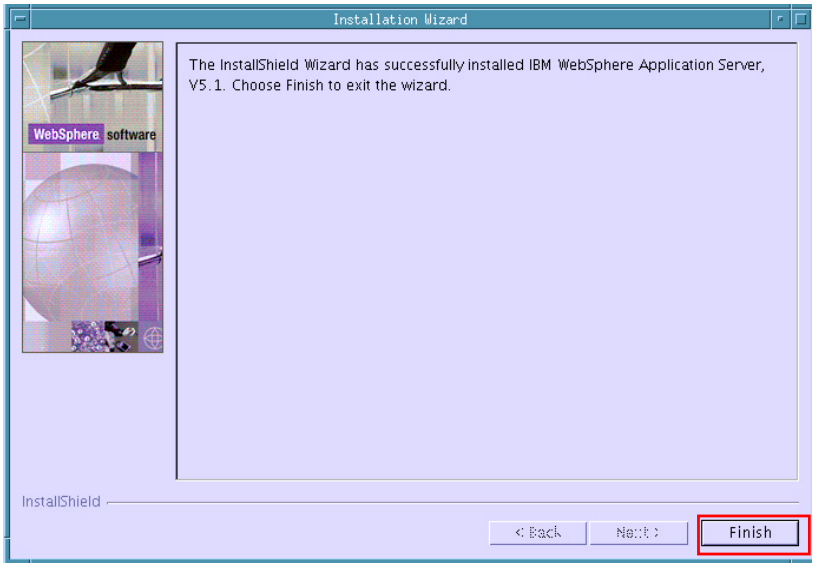
- Install Application Server
- Update RPM database
- Install IBM HTTP Server
- Load Sample Applications



Installation Completed Successfully

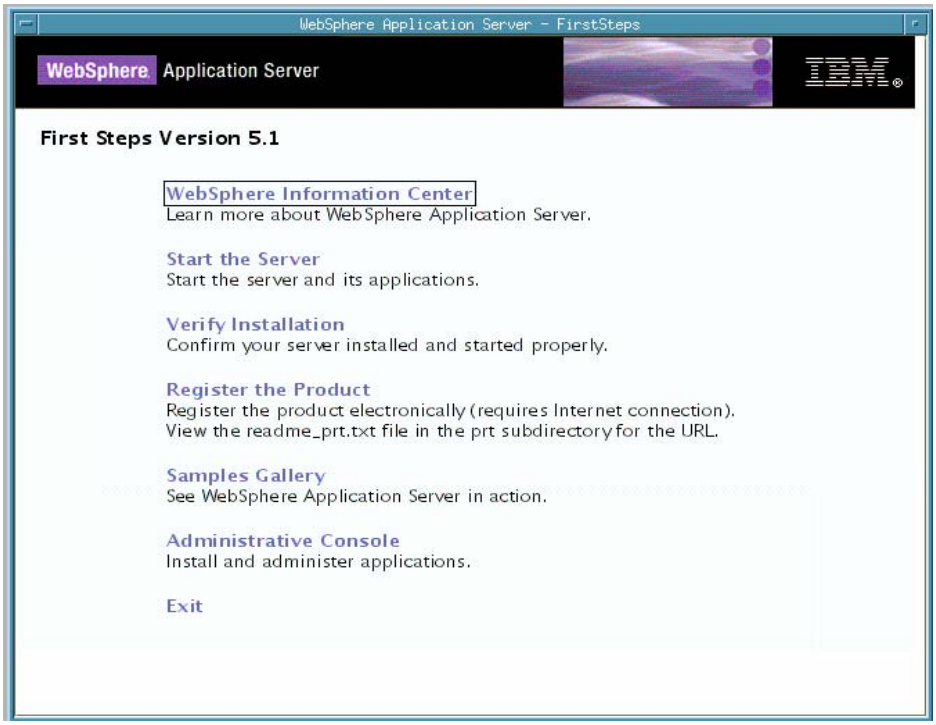
WSC Advanced Technical Support

- Successful Installation - Finished



First Steps

WSC Advanced Technical Support



Summary

- WebSphere family
  - Partnering momentum
  - Industry best of breed
- WebSphere focus
  - J2EE 1.3
  - staging for J2EE 1.4 with SDK 1.4 support
- Product packaging based on function complexity
  - To suit deployment and development needs
- J2EE Role based deployment
  - ears/wars
- Administrative Control Interface
  - Web Based or Linux command line

References

- WebSphere Information center
  - major doc. delivered in softcopy
  - Numerous links from the admin.console page to IBM "latest" information
- Numerous RedBooks
  - 200 + Publications
  - Redbook paper - WebSphere V5 Architecture
  - SG24-6195-00 - IBM WAS V5.0 System Management and Configuration
  - SG24-6963-01 - WebSphere Product Family Overview and Architecture
  - www.redbooks.ibm.com