Evaluating the Health of your IBM® HTTP Server

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10 November 2012

WebSphere® Support Technical Exchange

ON DEMAND BUSINESS™

Agenda

- **Main Focus – I.H.S. Health check**

  ▸ **Introduction**

  ▸ **User requirements**

  ▸ **Topology**

  ▸ **Site Maintenance**

  ▸ **Certificate Management**

  ▸ **Performance Monitoring**

  ▸ **Load Balancing**

  ▸ **IHSDIAG & Trace Management**

  ▸ **HTTPD Directives and Plugin Properties**

Why Do A Health Check?

- Prevent future system issues.
- Ensure that the system is meeting these requirements:
    - System availability
    - Response time criteria
    - Concurrent users

Understanding IHS

- Based off Apache.

  - ▶ Run command ./apachectl -V or apache -V to determine base Apache version and product fix pack level.

  - ▶ WebSphere fix packs will include Apache security updates.

- Config files / Log files

  - ▶ httpd.conf – webserver

  - ▶ plugin-cfg.xml – WebSphere plugin

  - ▶ Logging directives – customizing, rotate logs

  - ▶ Error.log & Plugin.log

- Supported in front of WebSphere Application Server with WebSphere Plugin
- 3rd party modules

Network Topology
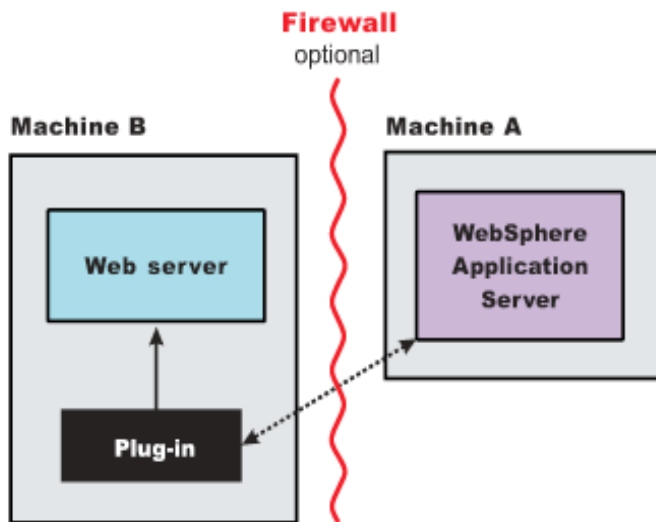
- What's between the client and web server?
- Typically, a load balancer routes requests to web server.
- Web server supported in front of WebSphere Application Server.
- Common for web server and application server to be on separate machines.
- Also likely to have Firewall protection between each machine.
- Topology diagram should be available and up to date.
- Know what ports are in use and should not be blocked.

Fix Packs

- For web server, we are interested in I.H.S, Plugin, and WAS fix pack level.

  - ▶ I.H.S → Shown in error.log and output of ./apachectl -V command:

    - [Tue Dec 06 10:45:40 2011] [notice] IBM_HTTP_Server/7.0.0.19 (Win32) configured -- resuming normal operations

    - Server version: IBM_HTTP_Server/7.0.0.19 (Win32)

  - ▶ Plugin → Shown in plugin.log

    - PLUGIN: Bld version: 7.0.0.19

    - http://www-01.ibm.com/support/docview.wss?uid=swg27013332

  - ▶ WAS JVM → Shown in systemout.log and trace files.

    - WebSphere Platform 7.0.0.19

- Fix pack contents: http://www-01.ibm.com/support/docview.wss?rs=177&uid=swg27006973
- Plugin policy: https://www-304.ibm.com/support/docview.wss?uid=swg21160581

Applying Fixpacks

- Prior to version 8, WebSphere maintenance installed via the IBM Update Installer.
  - http://www-01.ibm.com/support/docview.wss?uid=swg24020212
- Version 8 uses the IBM Installation Manager
  - Update Strategy for v8
    http://www.ibm.com/support/docview.wss?uid=swg27023315
- Procedure to have I.H.S. temporarily mark your application servers down when applying maintenance to the application servers:
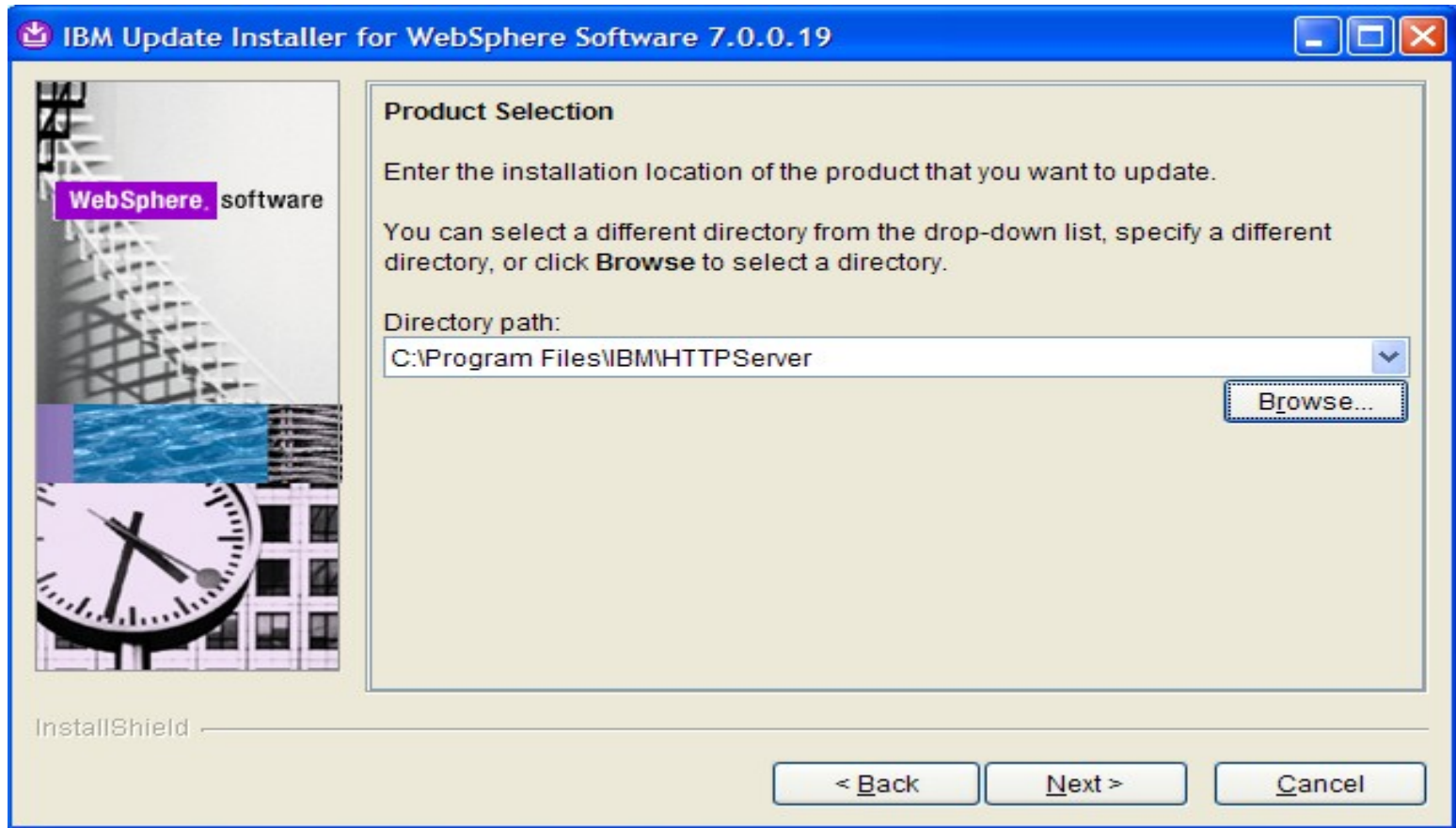 - http://www-01.ibm.com/support/docview.wss?uid=swg21397422

Update Installer

IBM Update Installer for WebSphere Software 7.0.0.19

Welcome to the **IBM Update Installer for WebSphere Software** wizard.

This wizard installs or uninstalls maintenance packages, including interim fixes, fix packs, and refresh packs. The following products are supported:

- IBM WebSphere Application Server Version 6.0.2.21 or higher
- IBM WebSphere Application Server Network Deployment Version 6.0.2.21 or higher
- IBM WebSphere Application Server - Express Version 6.0.2.21 or higher
- IBM Application Client for WebSphere Application Server Version 6.1.0.0 or higher
- Web Server Plug-ins for WebSphere Application Server Version 6 or higher
- IBM WebSphere Application Server V6.1 Feature Pack for Web Services
- IBM WebSphere Application Server V6.1 Feature Pack for EJB 3.0
- IBM WebSphere eXtreme Scale Version 7.0 or higher
- WebSphere Virtual Enterprise 6.1 or higher
- IBM HTTP Server Version 6 or higher

InstallShield
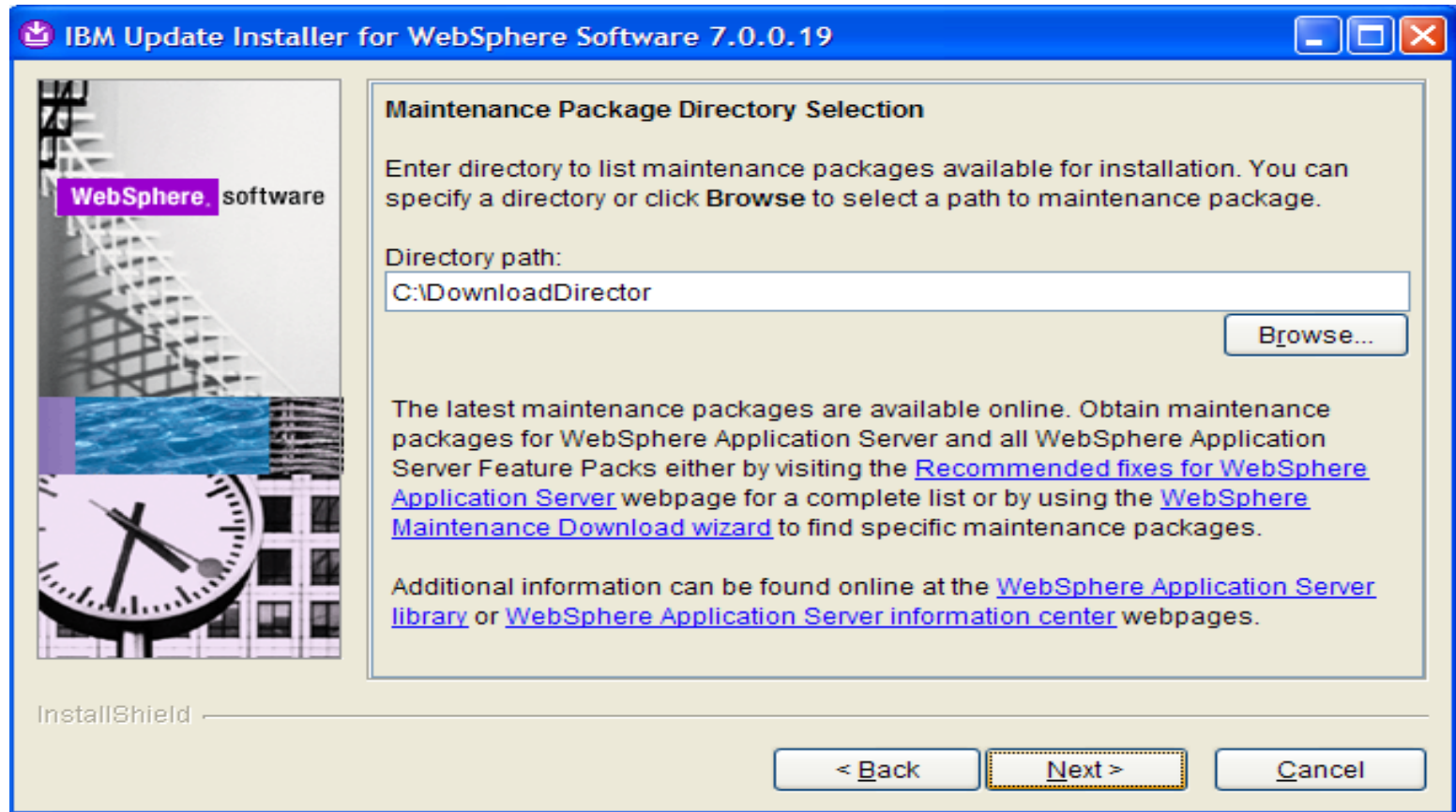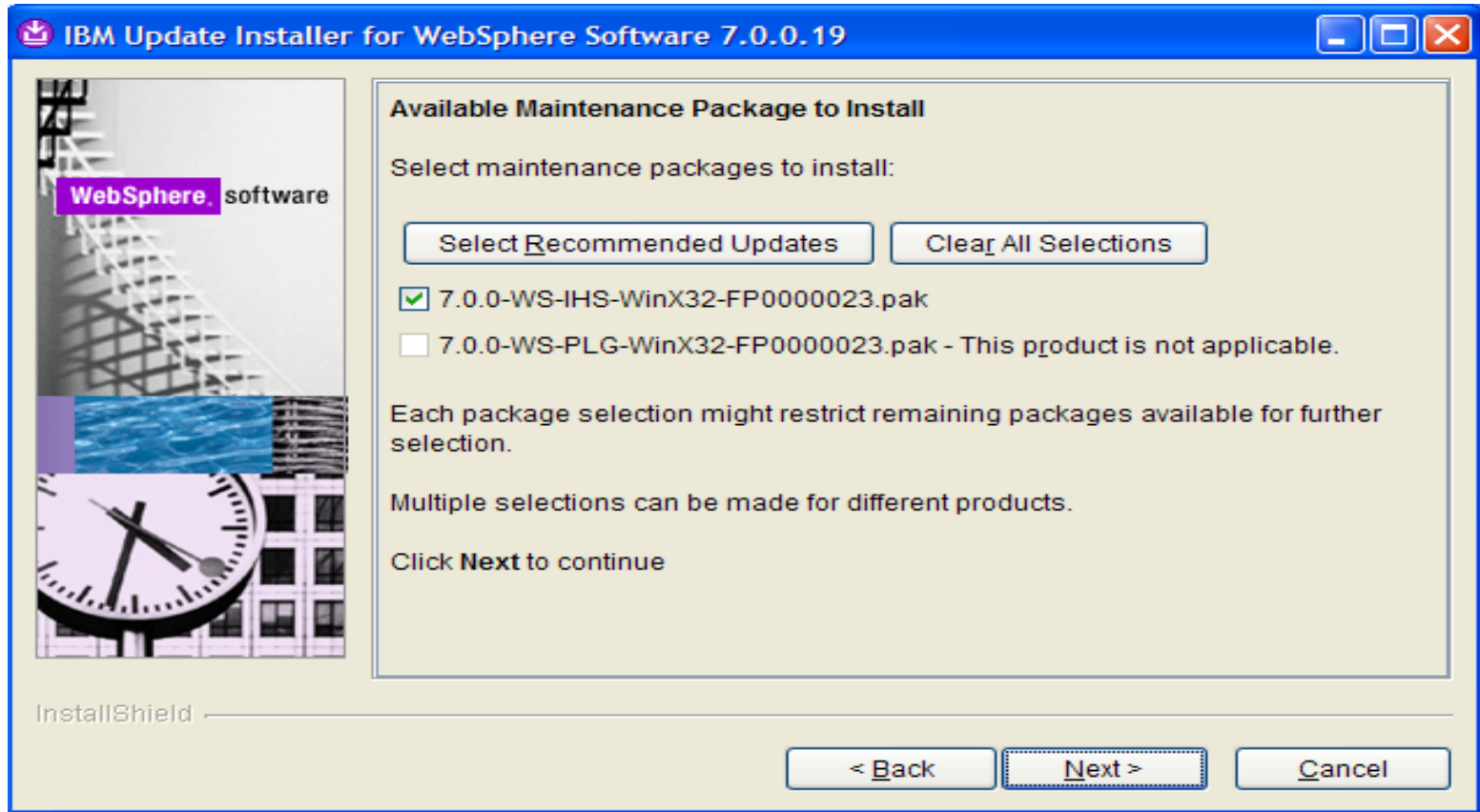
< Back   Next >   Cancel
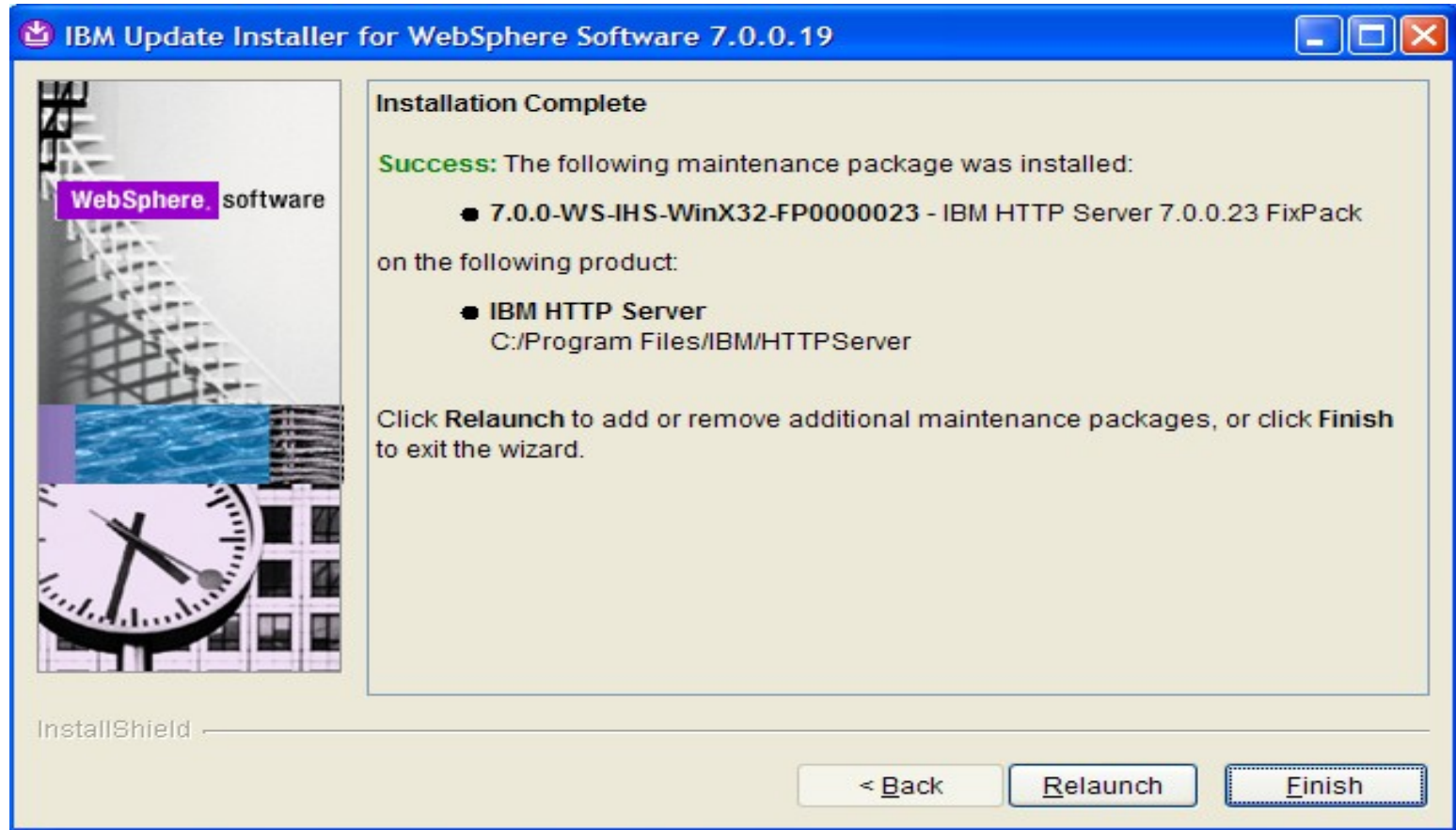
Update Installer – Target Selection
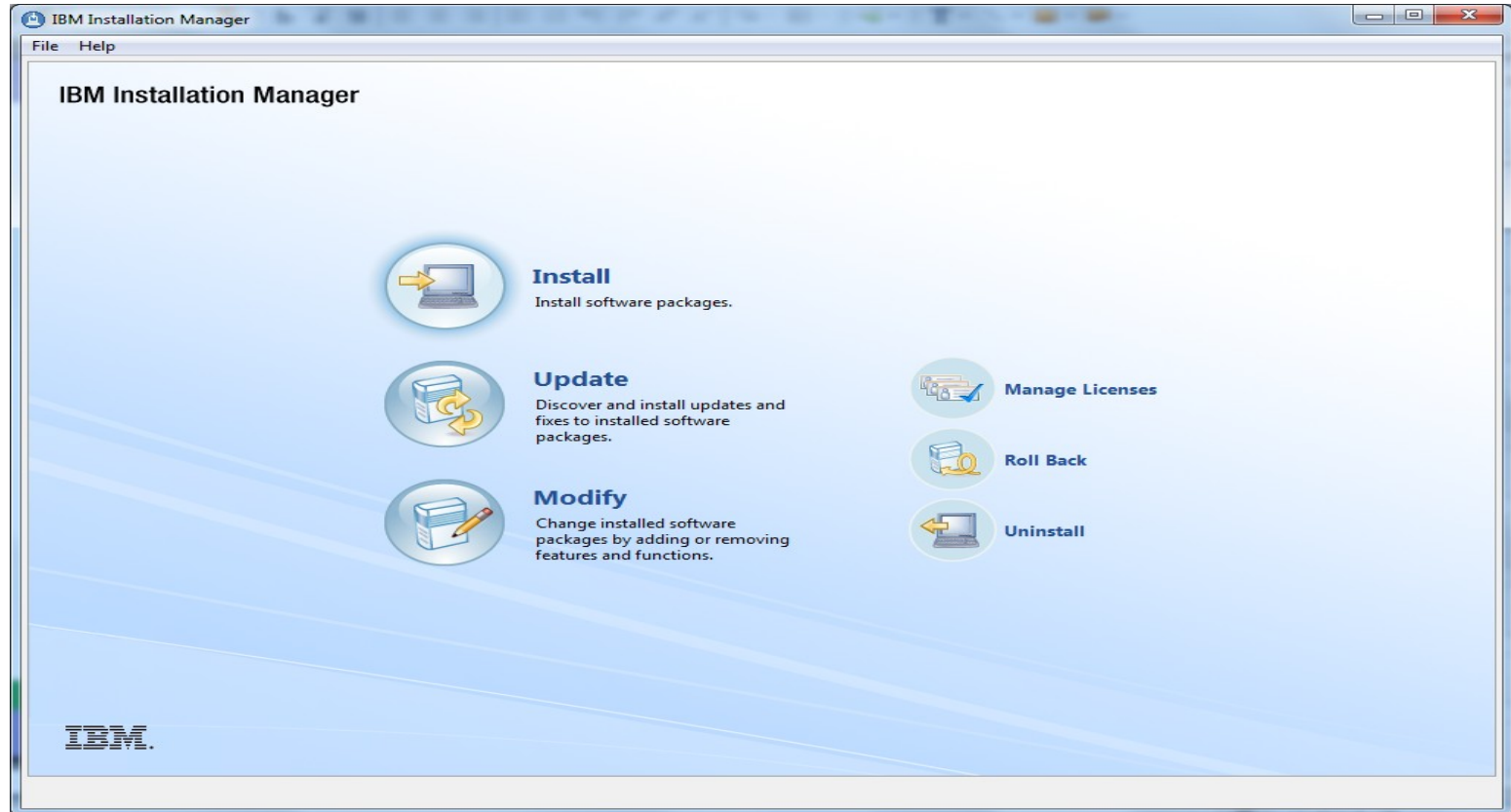
Update Installer – Source Location

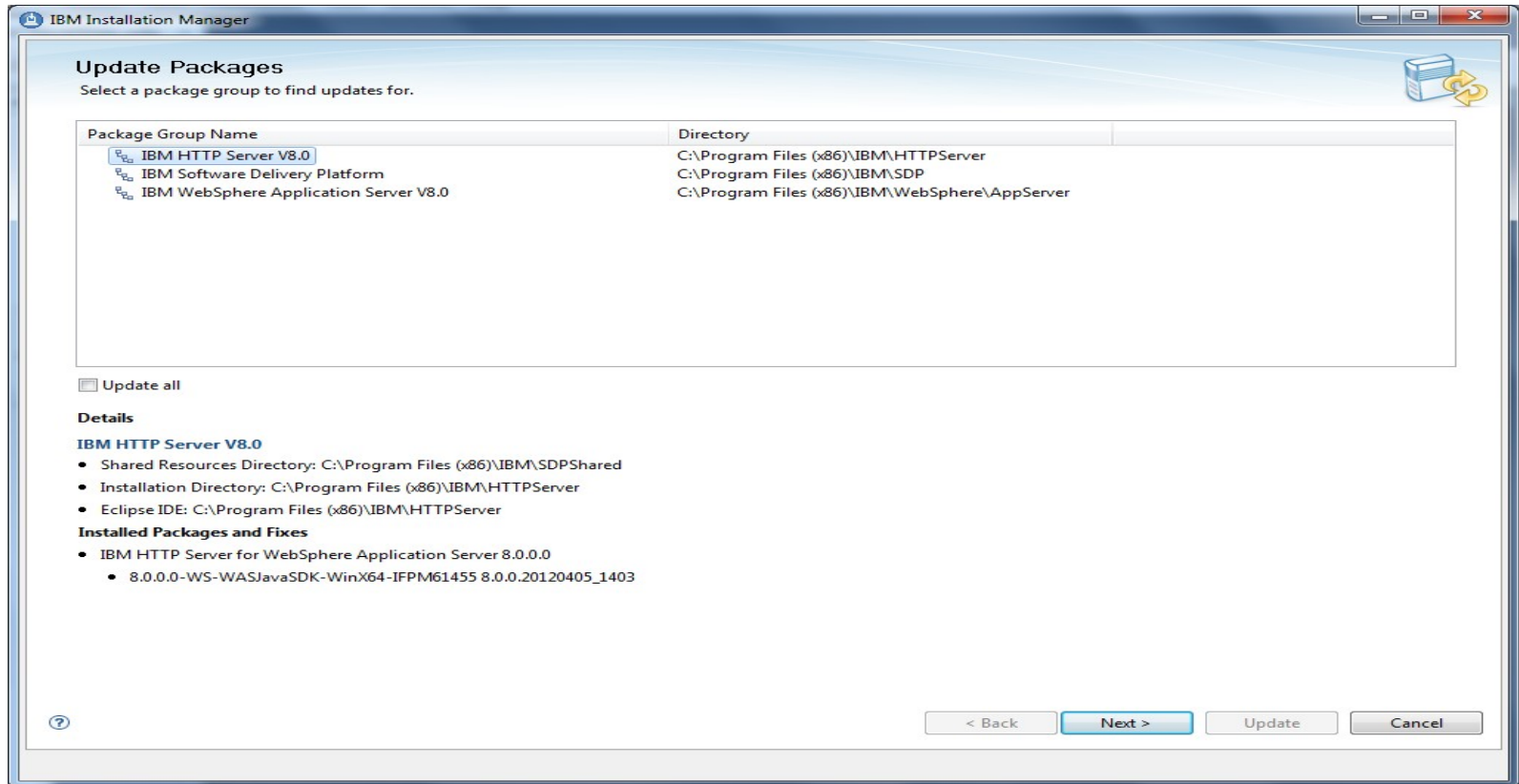# Update Installer – Source Selection

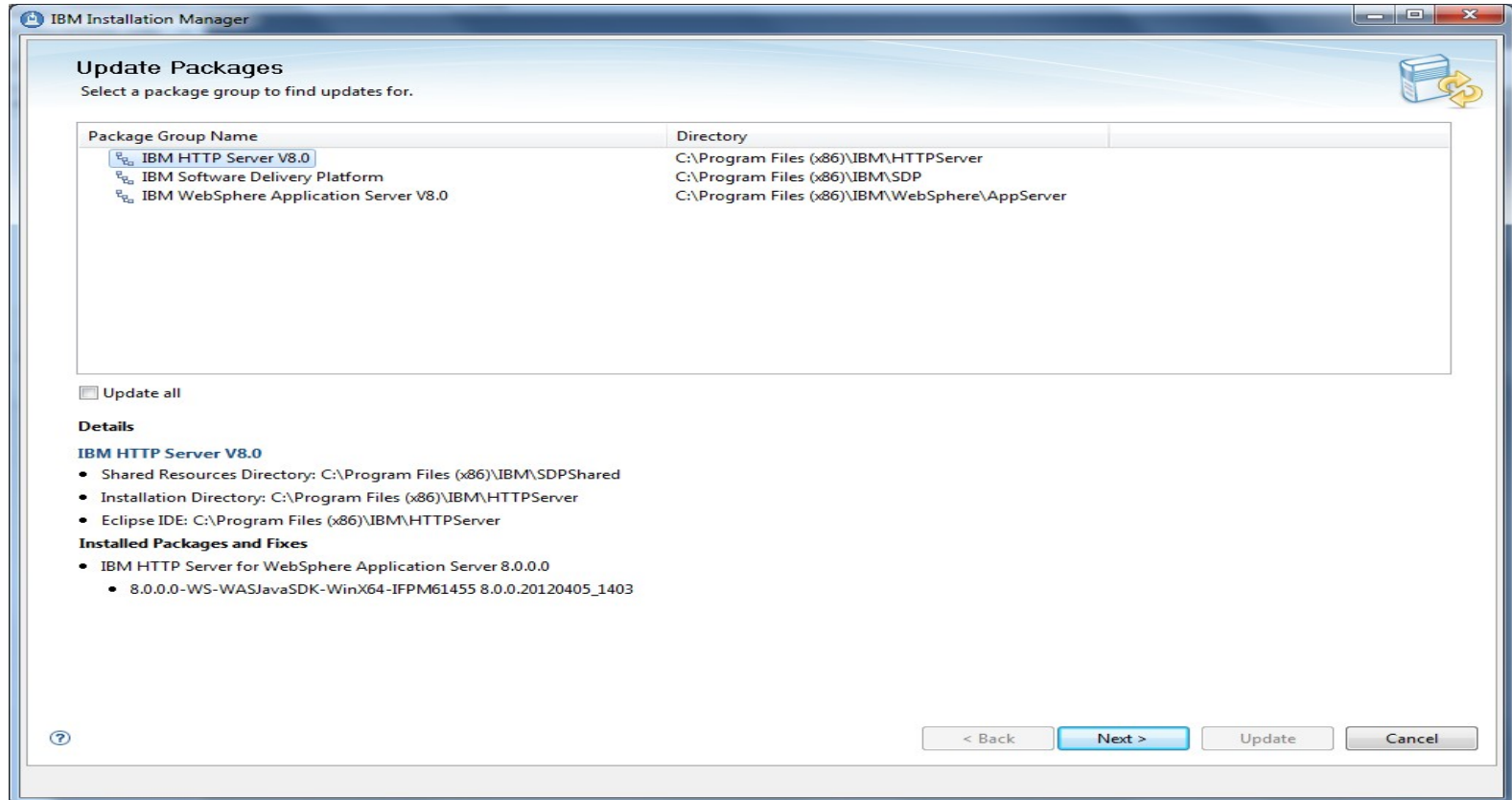# Update Installer - Completion

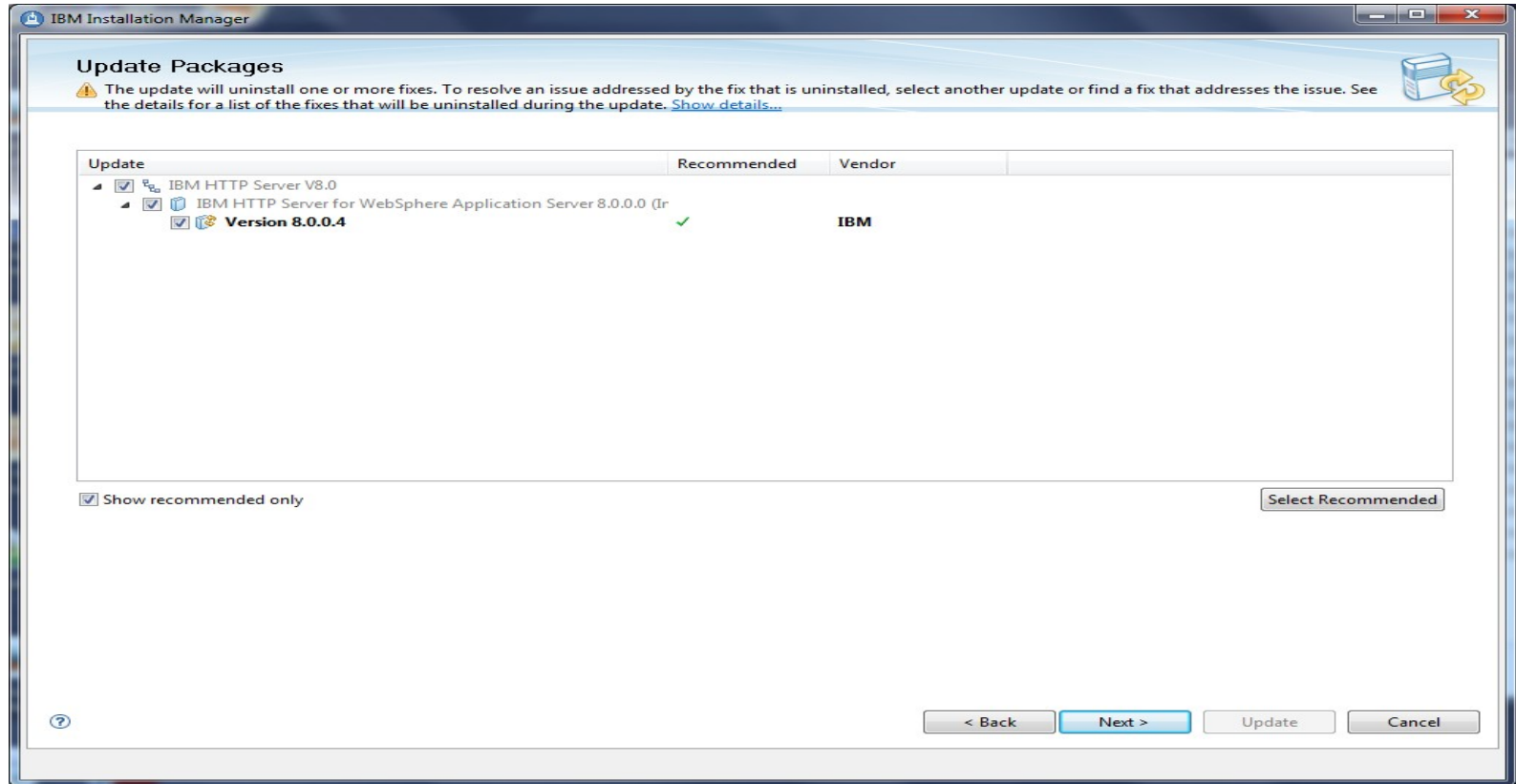# Installation Manager

Installation Manager - Update
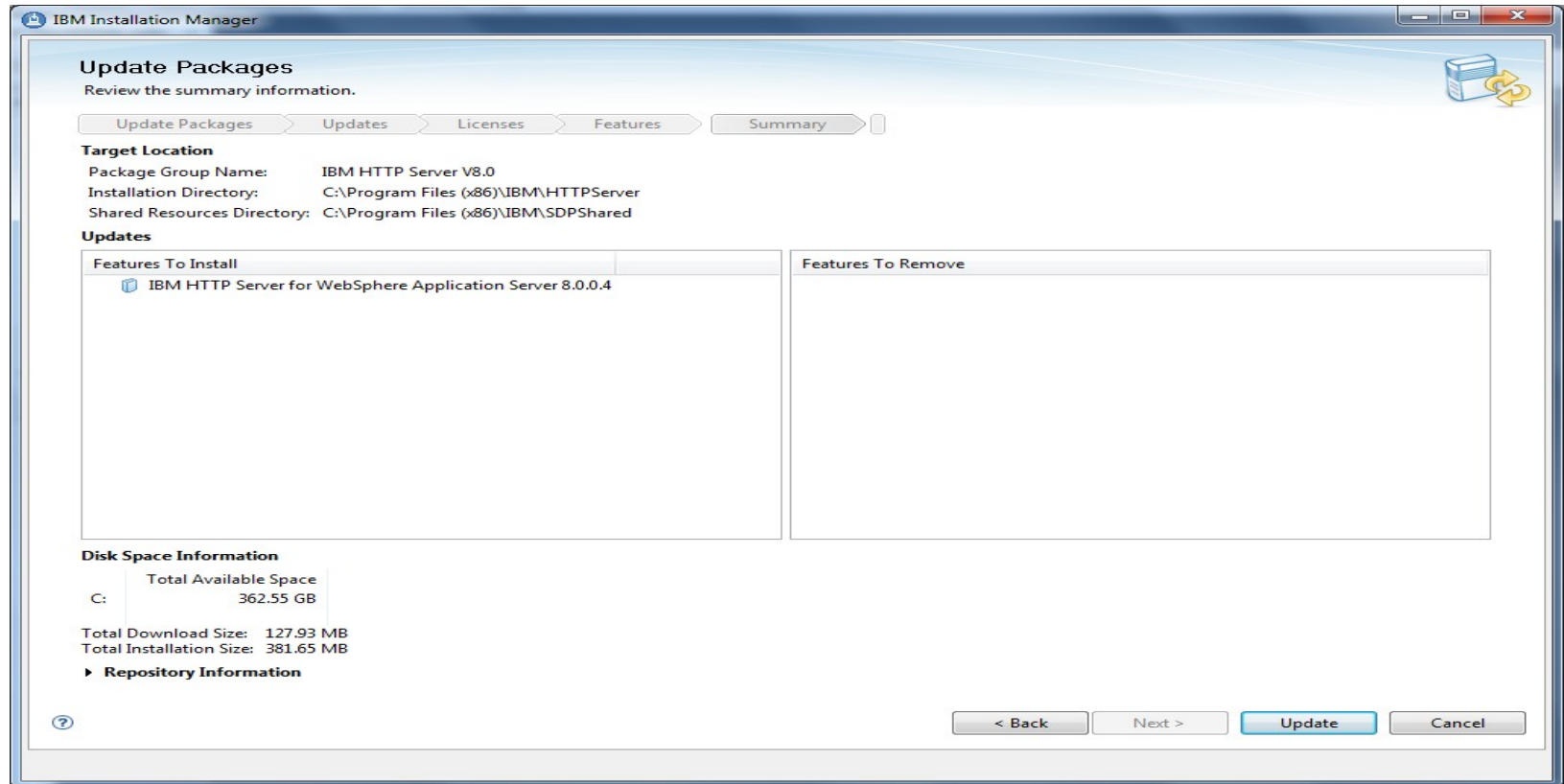
Installation Manager – Select Pkg

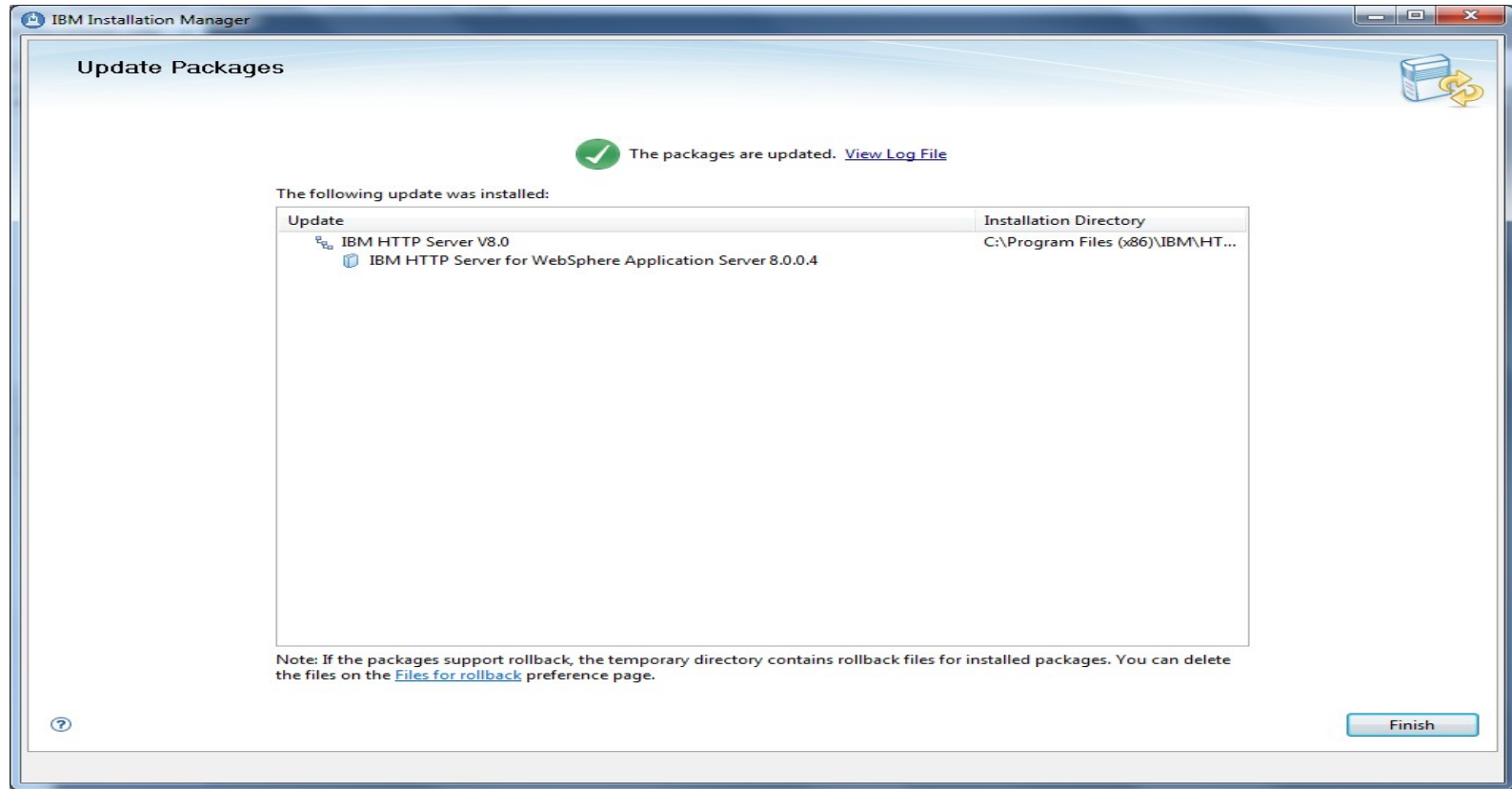# Installation Manager – Confirm Pkg

Installation Manager – Summary

Installation Manager - Completion

Software Vulnerabilities

- Because IBM HTTP Server is based on the Apache HTTP Server, known software vulnerabilities which exist in native Apache, may trigger security warnings in some vulnerability scanning programs.

- These vulnerabilities are tracked using Common Vulnerabilities and Exposures (CVE) Ids

- See technote "Researching Known Vulnerabilities Resulting from a Scan for IBM HTTP Server", http://www-01.ibm.com/support/docview.wss?uid=swg21358695

- Apachectl -V command to get list of included CVEs

Inspecting Logs

- Default I.H.S LogLevel is warn, and error for Plugin.
- Set to debug (I.H.S) or trace (plugin) for more detail.
- I.H.S error messages (error.log) are described at http://publib.boulder.ibm.com/httpserv/ihsdiag/errorlog.html
- Plugin error messages (plugin.log) are described at https://www-304.ibm.com/support/docview.wss?uid=swg21381320
- Check access.log for unexpected http responses.

Access.log file

- **CustomLog Directive**
  - ▶ Identifies location of the access log and which format directive to use.
  - ▶ Contents can be piped to another process to support log rotation.
- **LogFormat Directive**
  - ▶ Identifies the information that will be written to the log file.
- http://httpd.apache.org/docs/current/mod/mod_log_config.html

Access.log HTTP Status Codes

- Status codes.

  ▶ 1xx – Informational

  ▶ 2xx – Sucessful

  ▶ 3xx – Redirection

  ▶ 4xx – Client error

  ▶ 5xx – Server error

- Common status codes

  ▶ 500 – server encountered an error

  ▶ 404 – file not found

- Webcast replay: HTTP Protocol - Understanding Common Status Code

Example entry in Access.log

- Here's a sample entry found in the access.log file generated using the common LogFormat

  LogFormat "%h %l %u %t \"%r\" %>s %b" common

  127.0.0.1 - - [26/Sep/2011:10:35:38 -0400] "GET / HTTP/1.1" 304 -

- Refer to http://httpd.apache.org/docs/current/mod/mod_log_config.html for full list of valid parameters.

Error.log file

- ErrorLog Directive

  ▶ Identifies location of the access log and which format directive to use.

  ▶ Contents can be piped to another process to support log rotation.

  ▶ Use LogLevel directive to control the amount of information written to file.

- http://publib.boulder.ibm.com/httpserv/manual70/mod/core.html#errorlog
- Messages documented at http://publib.boulder.ibm.com/httpserv/ihsdiag/errorlog.html

Plugin.log file

- Location identified by Name attribute in <Log> stanza of plugin-cfg.xml.

- LogLevel="Trace" to get detailed trace data. For load balancing, set LogLevel="Stats".

- Messages documented at https://www-304.ibm.com/support/docview.wss?uid=swg21381320

Managing Log Files

- ## Don't let plugin get too big (2GB)

  - This can prevent web server from starting.

  - Typical editors don't respond well with large files.

- ## Log Rotation

  - error.log and access.log can be tailored to control size. Examples at http://publib.boulder.ibm.com/httpserv/ihsdiag/rotatelogs.html

- ## Ensure detailed tracing is turned off when not needed.

- ## Use LogFormat to control information written to access.log

Renewing Certificates

- I.H.S uses SSL certificates to secure communications between clients and the web server.

- Both personal and signer certificates will expire and need to be renewed if still in use.

- I.H.S does not provide a utility program that monitors the certificate expiration date.

- The IKEYMAN utility is used to renew certificates.

  - https://www-304.ibm.com/support/docview.wss?uid=swg21045925

Viewing Certificate in IKEYMAN
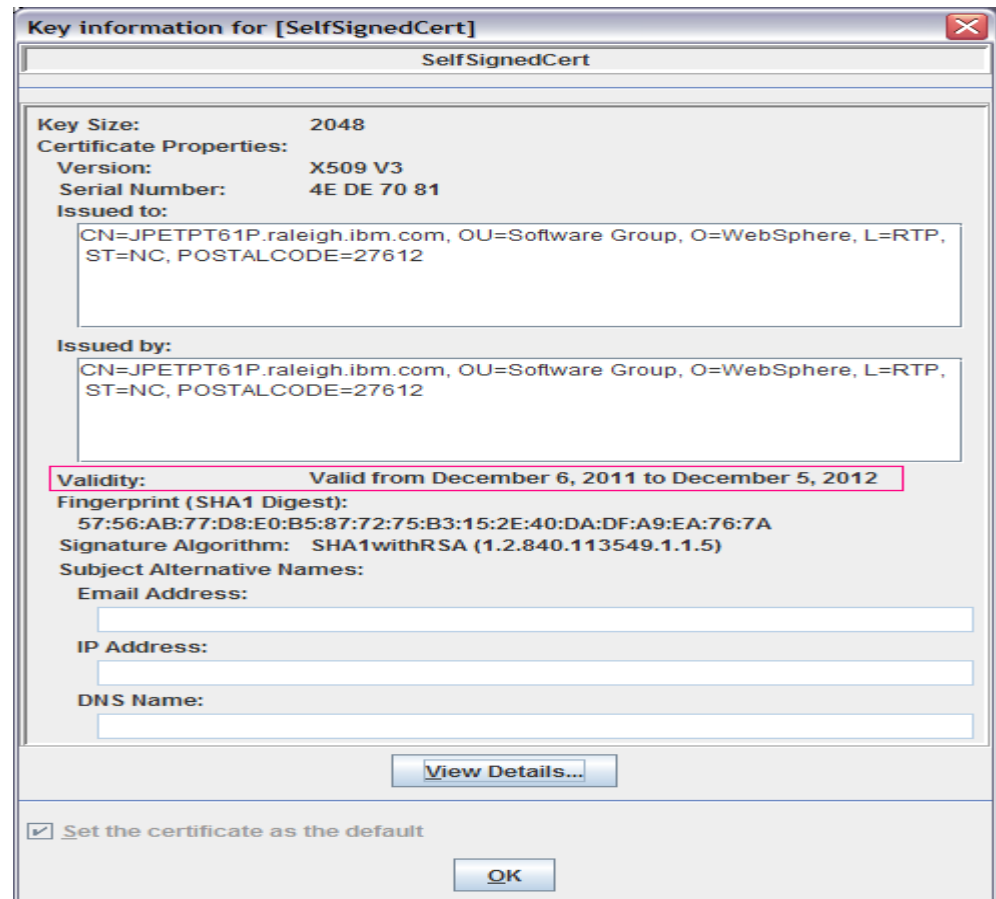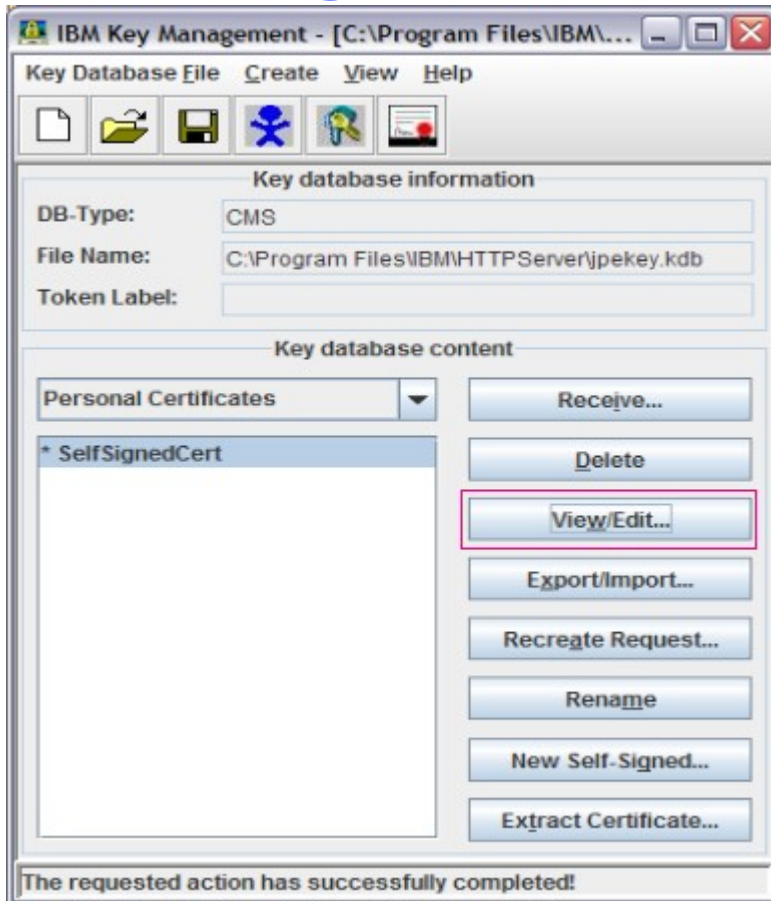
KDB Password Expiration

- In addition to the certificate, the keystore (.kdb) the certificate is stored in may have a password that is set to expire.
- Prompted to set password during keystore creation.
- Newer versions of IKEYMAN allow you to check the password expiration date.
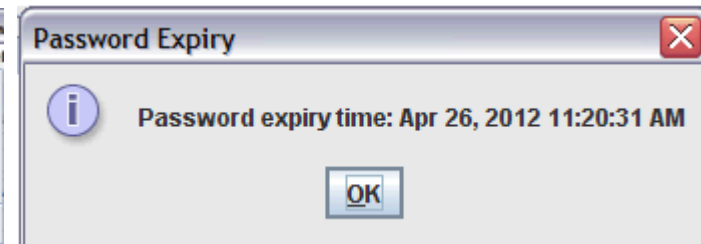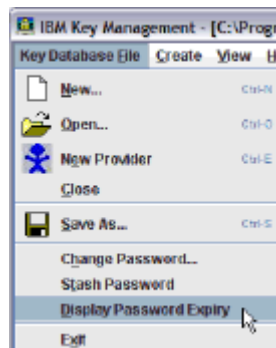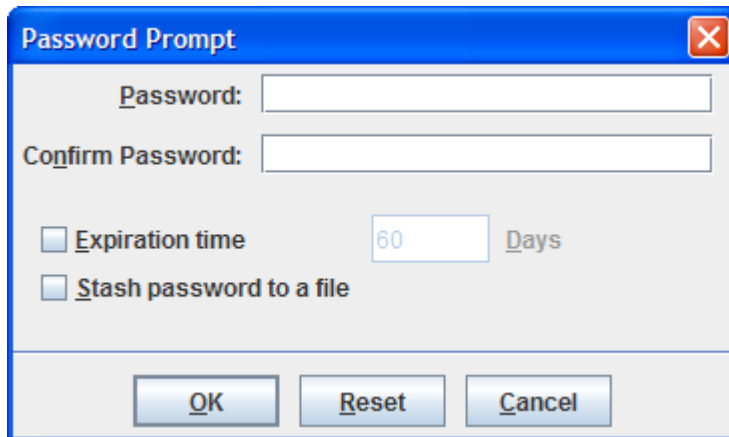
Command Interface to Keystore

- I.H.S includes the GSK7CAPICMD tool.
- Can be used to manage keys, certificates and certificate requests within the I.H.S keystores.
- -expiry option provides the keystore expiration date

  ▶ gsk7capicmd -keydb -expiry -db key.kdb -pw <pwd> –details

- –details option lists the detailed information for a specific certificate

  ▶ gsk7capicmd -cert -details -db key.kdb -pw <pwd> -label <label>

Concurrent Processing

- Default httpd.conf settings may not meet the expected load for the I.H.S web server
- IBM HTTP Server Performance Tuning
  - ▶ http://publib.boulder.ibm.com/httpserv/ihsdiag/ihs_performance.html
- IBM Services can assist in configuring the server for performance.
  - ▶ http://www.ibm.com/developerworks/websphere/services/

Server Status - mod_status

- Provides current status of I.H.S web server, using url http://servername/server-status or http://localhost/server-status/?showmodule

Srv	PID	Acc	M	Module	CPU	SS	Req	Conn	Child	Slot	Client	VHost	Request
0-0	4461	0/136/136	_		0.11	0	0	0.0	2.33	2.33	127.0.0.1	localhost.localdomain	GET /snoop/ HTTP/1.1
0-0	4461	0/135/135	W	mod_was_ap20_http.c	0.03	3	0	0.0	2.31	2.31	127.0.0.1	localhost.localdomain	GET /snoop/ HTTP/1.1
0-0	4461	0/135/135	W	mod_was_ap20_http.c	0.15	3	0	0.0	2.31	2.31	127.0.0.1	localhost.localdomain	GET /snoop/ HTTP/1.1
0-0	4461	0/136/136	_		0.11	0	0	0.0	2.34	2.34	127.0.0.1	localhost.localdomain	GET /snoop/ HTTP/1.1
0-0	4461	0/134/134	_		0.15	0	0	0.0	2.31	2.31	127.0.0.1	localhost.localdomain	GET /snoop/ HTTP/1.1
0-0	4461	0/135/135	_		0.12	0	0	0.0	2.33	2.33	127.0.0.1	localhost.localdomain	GET /snoop/ HTTP/1.1
0-0	4461	0/133/133	W	mod_was_ap20_http.c	0.10	3	0	0.0	2.29	2.29	127.0.0.1	localhost.localdomain	GET /snoop/ HTTP/1.1
0-0	4461	0/135/135	W	mod_was_ap20_http.c	0.09	3	0	0.0	2.33	2.33	127.0.0.1	localhost.localdomain	GET /snoop/ HTTP/1.1

- Focus on SS (seconds since start of request) and module columns to find long running or hanging requests.

MPM Stats - mod_mpmstats

- Gives a snapshot status view of I.H.S threads.
- Specify interval time in httpd.conf file to take snapshot.
- Tells how many threads are busy, and what state they are in: ready, read, write, close, keep alive, logging, or dns lookup.
- Can include active modules in output.
- Output written to error log.

  - [Thu Aug 19 14:01:00 2004] [notice] mpmstats: rdy 712 bsy 312 rd 121 wr 173 ka 0 log 0 dns 0 cls 18
  - [Thu Aug 19 14:02:30 2004] [notice] mpmstats: rdy 809 bsy 215 rd 131 wr 44 ka 0 log 0 dns 0 cls 40

Measuring Response Time

- LogFormat directive contains format parameter which will include response time for each http request.

  ▶ %T (Time in seconds)

  ▶ %D (Time in milliseconds)

- Technote "IBM HTTP Server performance measurements" https://www-304.ibm.com/support/docview.wss?uid=swg21570830

Load Balancing

- Plugin is responsible for load balancing.
- Defined per ServerCluster.

  ▸ Weighted round robin versus random.

- Plugin will mark server down if:

  ▸ Cannot connect to server (ConnectTimeout)

  ▸ ServerIOTimeout triggers and value is negative

- Plugin log shows message "ws_server: serverSetFailoverStatus: Marking %s down "
- "Understanding IBM HTTP Server plug-in Load Balancing in a clustered environment" https://www-304.ibm.com/support/docview.wss?uid=swg21219567

Load Balancing Stats

- LogLevel="Stats" will provide load balancing statistics for each plugin process.
- Number of plugin processes is tied to httpd.conf directive
  - ▶ [Mon Oct 3 10:55:13 2011] 00001656 eafa1b90 - STATS: ws_server: serverSetFailoverStatus: Server Server1 : pendingRequests 0 failedRequests 0 affinityRequests 31 totalRequests 47.

IHSDIAG Utility

- I.H.S data collector used when encountering product hangs, crashes, high CPU problems, and startup failures.
- Provides scripts to invoke system tools.
- Periodically updated to help identify known issues.
  - ▸ Keep current to stay on top of known issues.
- Recommended to install and have ready to run before encountering a problem.
  - ▸ java -jar /path/to/ServerDoc.jar CheckPlatform
- http://www-01.ibm.com/support/docview.wss?uid=swg24008409

Summary

- This presentation's goal is to provide I.H.S web administrators information on how to check their system to ensure that it is performing within the set expectations.
- Additional resources

  ▸ I.H.S common questions and answers: http://publib.boulder.ibm.com/httpserv/ihsdiag/questions.html

  ▸ I.H.S IBM DeveloperWorks forum: http://www.ibm.com/developerworks/forums/forum.jspa?forumID=287

Additional WebSphere Product Resources

- Learn about upcoming WebSphere Support Technical Exchange webcasts, and access previously recorded presentations at:
http://www.ibm.com/software/websphere/support/supp_tech.html

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http://www.ibm.com/developerworks/websphere/community/

- Join the Global WebSphere Community:
http://www.websphereusergroup.org

- Access key product show-me demos and tutorials by visiting IBM® Education Assistant:
http://www.ibm.com/software/info/education/assistant

- View a webcast replay with step-by-step instructions for using the Service Request (SR) tool for submitting problems electronically:
http://www.ibm.com/software/websphere/support/d2w.html

- Sign up to receive weekly technical My Notifications emails:
http://www.ibm.com/software/support/einfo.html

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