

z/TPF EE V1.1

z/TPFDF V1.1

TPF Toolkit for WebSphere® Studio V3

TPF Operations Server V1.2



IBM Software Group

TPF Users Group Spring 2006

An Update on the Apache HTTP Server

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Venue: Open Source Subcommittee

AIM Enterprise Platform Software

IBM z/Transaction Processing Facility Enterprise Edition 1.1.0

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Overview

- Past
 - Apache's origins and how it found its way to TPF
- Present
 - Starting and stopping Apache
 - New restart feature in Apache 1.3.35
 - Fixes in Apache 1.3.35
 - Limited SSL support (TPF4.1 only)
- Future
 - Apache 2.x

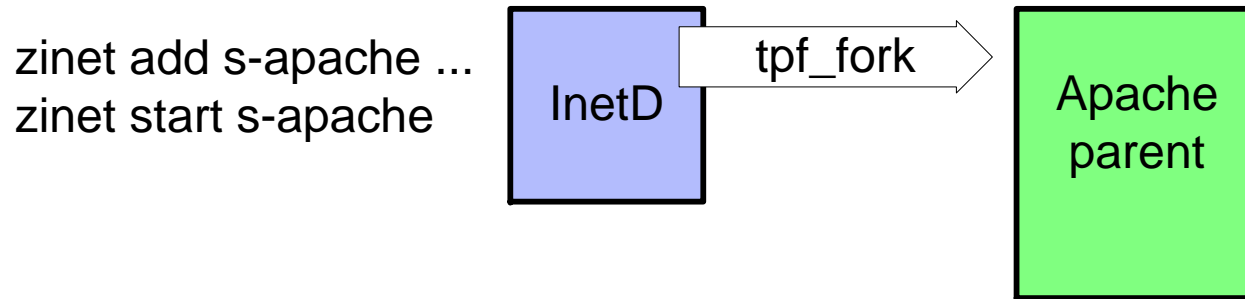
Apache's Origins

- 1990: Birth of the World Wide Web
- 1991: CERN HTTPd (server) written and publicly available
- 1993: NCSA HTTPd written as a smaller, simpler alternative
- 1995: Apache created by a small group of webmasters and developers using the stalled NCSA HTTPd as the base
- 4/1995: First official public release by this "Apache Group"
- 12/1995: Code overhauled and redesigned for Apache 1.0
- 1996: Apache overtakes NCSA HTTPd as most used server
- 1999: Apache Software Foundation created to provide support for dozens of Open Source projects

... and the Path to TPF

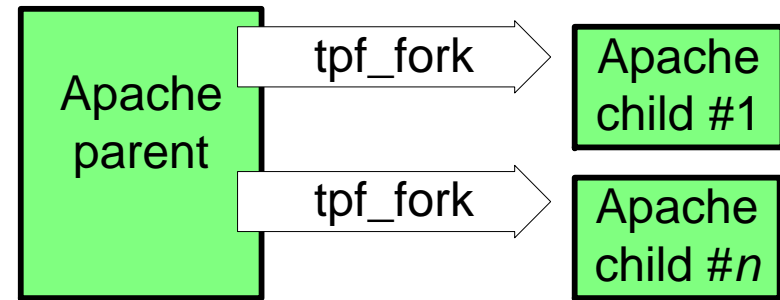
- 1997: The Lab starts work on porting Apache to TPF
- 11/1998: 1st TPF changes are incorporated into Apache and later released as part of Apache version 1.3.4
- 12/1998: Necessary infrastructure added to TPF starting with PUT9
- 6/1999: Additional TPF infrastructure added with PUT10 allows dynamic content (CGIs) and other features
- ongoing: Many TPF and Apache changes as more of the web server's features are supported on TPF
- 11/2004: Apache 1.3.33 released, 1st version ported to z/TPF
- 5/2006: Apache 1.3.35 released, includes graceful restart for TPF
Download it from <http://httpd.apache.org/>

Starting Apache



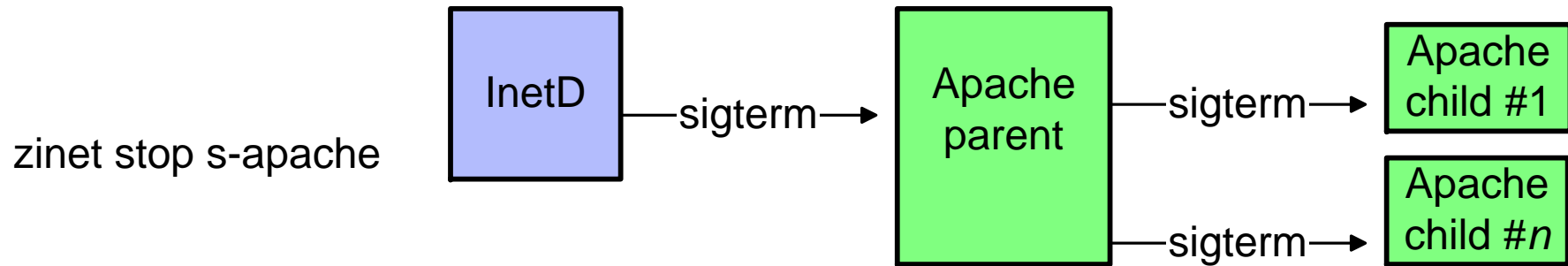
- Apache is always started with TPF's InetD (Internet Daemon)
- `zinet add s-apache model-daemon pgm-pppp ...`
- "zinet start s-apache" causes InetD to create the Apache parent with the `tpf_fork` function

Starting Apache continued



- Apache parent creates children with `tpf_fork`
- The parent and its children base their behavior on directives in the run-time configuration file (`httpd.conf`)
- These children listen to port 80 and process requests using newly created sockets

Stopping Apache

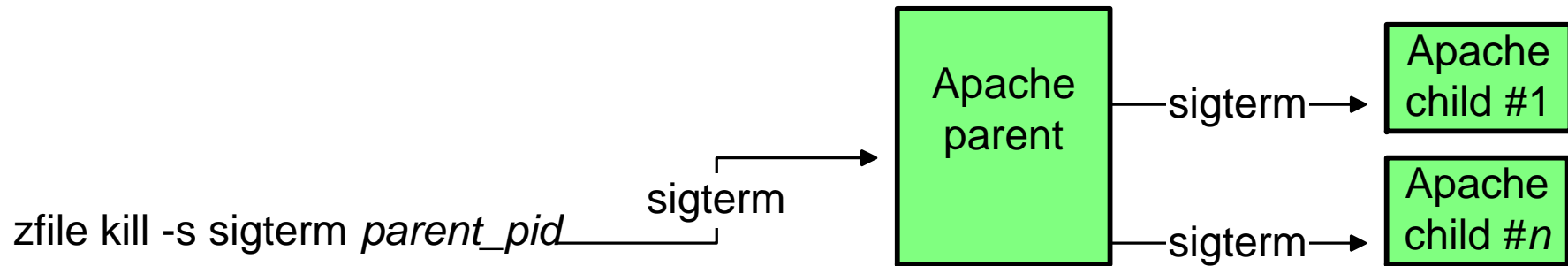


- "zinet stop s-apache" causes InetD to send a sigterm signal to the Apache parent it created
- The Apache parent sends sigterm's to its children and closes port 80
- The children stop what they're doing and exit
- When all of the children have exited, or the parent gets impatient, the parent exits

Automatic Restarts

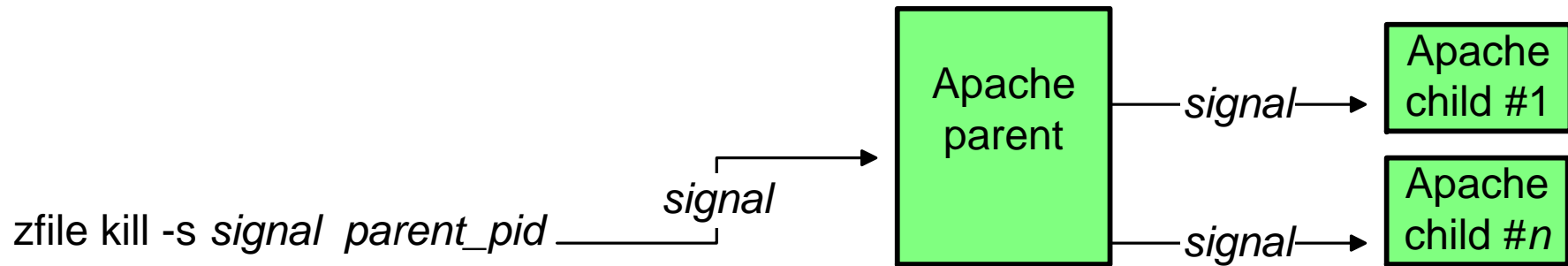
- InetD creates a new Apache parent if the existing parent exits for any reason
- InetD recycles itself if the program activation number changes, in effect restarting Apache
- The Apache parent will shut down on its own under some circumstances, causing InetD to restart Apache:
 - The zinet entry for Apache is marked inactive
 - The creating InetD process has exited
 - A child returns a server-wide fatal error, such as port 80 being unreadable

Manual Restarts



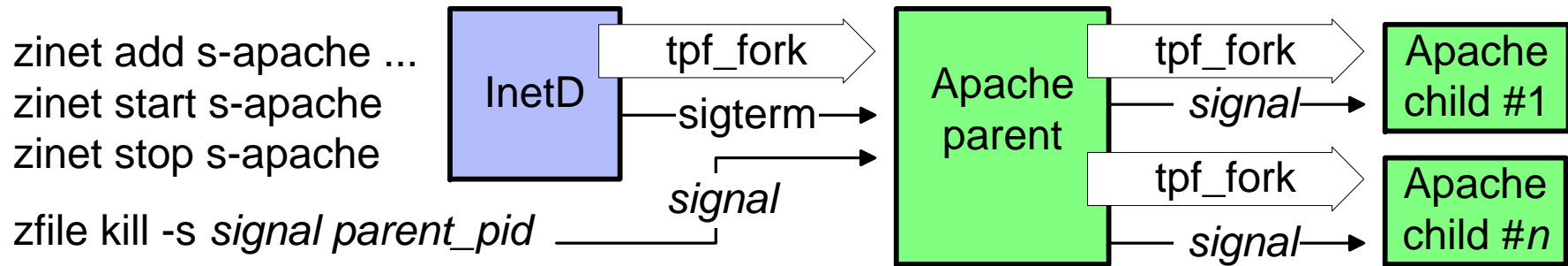
- Manually restart Apache to pick up a new configuration file:
 - Use InetD commands: `zinet stop/start s-apache` as previously shown
= or =
 - Send a shutdown signal directly to Apache, causing InetD to start a new Apache parent to replace the one that exited: `zfile kill -s sigterm parent_pid`

True Restart



- Restart is available for TPF starting with Apache 1.3.35: The Apache parent tells its children to exit then re-reads the configuration file and creates new children
- `zfile kill -s sighup parent_pid` (restart now)
Children close their sockets and exit, even if they were processing a request
- `zfile kill -s sigusr1 parent_pid` (graceful restart)
Children finish their requests before they exit, so traffic isn't disrupted

Full Start/Stop/Restart Chart



The kill commands and processing used to restart Apache on TPF4.1 & z/TPF now match that of Unix platforms and are fully documented on the Apache website:

<http://httpd.apache.org/docs/1.3/stopping.html>

Apache 1.3.35 Fixes (TPF4.1 & z/TPF)

- The MaxRequestsPerChild directive now uses a more accurate request counter
- TimeOut and KeepAliveTimeout are now supported
- Upon normal exit, children now close their sockets instead of leaving them "established"
- Port 80 is now closed when the Apache parent exits to prevent bind errors for the new parent

Limited SSL Support

- Backlevel Apache 1.3.26 with mod_ssl available on "Downloads for TPF Family Products" page (www.ibm.com/software/tpf/download/tools.htm)
- Supported on TPF4.1 only
- Single child only, due to technical restrictions
- Statement of direction:
Plan to make a more current, multi-threaded version of mod_ssl available on z/TPF

Apache 2.x

- Apache 2 is a new server - completely redesigned with a new code base and new features
- Apache 1.3 is fully maintained but major new features go into Apache 2 only
- Fork *or* thread model... Or hybrid of both
- Investigating port of Apache 2 to z/TPF

Q&A

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