Introduction to FileWave
Modern Systems Management

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What is FileWave?

- Since 1992, FileWave has provided an industry-leading cross-platform client management solution with an easy-to-use console.
- A robust, scalable unified endpoint management solution
- Perfect for the cycle of imaging, deploying, managing, and maintaining your technological assets
FileWave Components

- FileWave Server
- FileWave Admin
- FileWave Client
- Booster
- Imaging Virtual Server
- Engage
Supported Clients

- **Desktop/Laptop Clients**
  - OS X 10.7*, 10.8+ x86 64 (binaries are 64 bit only)
    - For OS X 10.6.8 - use the FileWave 8.1.5 client installer (provides MCX.plist conversion)
    - For OS X 10.5 - use the FileWave 7.1.2 client installer
  - Windows XP*, 7, 8, 8.1, 10, and Windows Server 2008 R2, 2012, and 2012 R2

- **Mobile Clients**
  - iOS 8, 9
  - Android 4.1, 4.2, 4.3 (Jelly Bean), 4.4 (KitKat), 5.0 - 5.1.1 (Lollipop), and 6.0 - 6.0.1 (Marshmallow)
Server Host Requirements

For all, 4GB + RAM, and 100GB+ HDD space, dedicated network interface, fixed IP address, and FQDN (recommended)

- **Mac OS X**
  - 10.10 (server not required) or higher

- **Windows**
  - Win Server* 2008 R2 / 2012 / 2012 R2 or higher

- **Linux**
  - CentOS 5.11, 6.7, 7.2 (binaries are 64-bit only)
Understanding Filesets

• Every item distributed to a FileWave client is contained within a Fileset.
• These are the Fileset types for computers…
Understanding Filesets (cont.)

…and these are the Fileset types for mobile devices.
Scheduling and distributing Filesets is done by Associations between the Fileset and a client or client group.
Understanding Boosters

Instead of forcing your FileWave Server to do all of the work, you can leverage Boosters.
Imaging Virtual Server (IVS)

The Linux virtual machine is a free download for customers.
Multiple IVS Setup

Useful when you have different subnets.
Engage

Engage was developed to provide a mechanism for teachers to interact with students during class.
Engage (cont.)

- A major strength of Engage is the ability to synchronize data from a Student Information System (SIS) using Clever.
  - FileWave customers with a current SIS get Clever support from FileWave for free.
Engage (cont.)

- The teacher interface has three views:
  - Students
  - Content
  - Polls

- Commands a teacher can perform are shown at the bottom of the Student view screen.
The Dashboard

Introduced with FileWave v9, it is a snapshot of the status of the key services and functions.
Dashboard (cont.)

There are seven major sections on the Dashboard:
The Dashboard provides the ability to send status change notifications out via email.
TCP/IP Ports
FileWave Default TCP Listening Port Usage

- https://www.filewave.com/support/kb/article/tcp
- Also in Appendix A.5 of the manual
TCP/IP Ports used with all Components

FILEWAVE USES A PROPRIETARY TCP/IP PROTOCOL AND HTTPS FOR CONNECTIONS BETWEEN ALL COMPONENTS

SERVER
- 20013
- 20014 (SSL)
- 20015
- (Admin) 20016
- (Inventory) 20445
- (Dashboard) 20446

BOOSTER
- 20015
- 2014 (SSL)
- 20443 (HTTPS / Profiles & MDM)
- 20445 (HTTPS / Inventory)

ENGAGE
- 20444
- 443 -> 20445
- <- 20445

IVS
- 20444

CLIENTS
- 20013
- 443

KIOSK
- 20020

ADMINS
- 20010 (CLIENT MONITOR)

20017 (SSL, DEFAULT)
443: fwks.filewave.com / 80:
Apple & Microsoft

443, 80

443

FILEWAVE USES A PROPRIETARY TCP/IP PROTOCOL AND HTTPS FOR CONNECTIONS BETWEEN ALL COMPONENTS

Google Cloud

Apple Push
Ports used with Engage

SERVER

Google Cloud (android.googleapis.com)

2195

Apple Push (17.0.0.0/8)

ENGAGE

ENGAGE

APP

(Admin) 20016
(Inventory) 20445
(Dashboard) 20446
(Observed) 20030

443 ->

< 20445

443
MDM for iOS Ports

MDM

PORT 443
fwks.filewave.com

PORT 2195

APPLE PUSH
Network 17.0.0.0/8

PORT 443

iTunes STORE
Network 17.0.0.0/8

ADMINS

PORT 443

PORT 5223

PORT 20443 (SSL)

PORT 20445
20446
20016

PORT 443

PORT 443

PORT 443
Installing FileWave Server
Locate the Installer

Installer sets include the software for the FileWave Client, Admin, Server, and Booster.
Installing on Linux

- Download the latest FileWave binaries for Linux from the FileWave support site.
- Copy the .zip file directly to your Linux Server inside the root folder /root/
- Login with SSH to the Server (on windows use putty, on OS X use Terminal) make sure you login as root, then run the following commands:
  - cd /root/
  - unzip uploadedfile-filewave-binaries.zip
  - yum install -nogpgcheck fwxserver-8.1.XXXXX.rpm
  - yum install -nogpgcheck fw-mdm-server-8.1XXXXX.rpm
  - If there are any questions, answer them with yes or accept
Installing FileWave Admin
Admin Workstation Requirements

- OS X 10.10 - 10.11
  - Intel only, 2GB+ RAM, and 100GB+ HDD space
- Windows 7, 8.1, 10
  - 2GB+ RAM, 100MG+ HDD space
Installation of Admin

- Download and open the FileWave.pkg/.msi
- Select the Admin Installer and double-click or open it

Note: The default admin account is "fwadmin" and the default password is "filewave".
Installing FileWave Client
Locate the Installer

Installer sets include the software for the FileWave Client, Admin, Server, and Booster.
Data Required for Configuration

- **Installation Settings**
  - Server IP address / port (default is 20015)

- **If using a Booster**
  - Booster IP Address / Port -
    - Enter the TCP port number for the client to communicate with the booster (recommend using 20013 or 20014).
Prerequisite Determinations

- **Use Computer Name for Client Name**
  - This box allows you to use the device’s computer name as its FileWave client name.

- **Client Name**
  - Enter a valid name based on any criteria you have for your deployment.
  - Recommend that you don’t use special characters in the client name. Dashes, underscores, and slashes are OK.

- **Client Password / Confirm...**
  - Enter a password for the FileWave Admin to connect to the client preferences.*
Customized FileWave Installer

- A customized client installer is available through the FileWave website:
  - For OS X
    - http://www.filewave.com/support/custom-pkg
  - For Windows
    - http://www.filewave.com/support/custom-msi
Enrolling Computers
How Server Learns About Client Computers

When a computer has had the FileWave Client software installed & configured, it automatically contacts the FileWave Server designated in the installation settings.
How Server Learns About Clients (cont.)

- The FileWave Server gets notified of all newly installed systems and provides the Admin with the ability to add the new devices to the Clients list.

- In the **Clients** pane in the main FileWave Admin window, you can select **New Client** from the toolbar.
How Server Learns About Clients (cont.)

The resulting dialog box lets you choose between four different types of client entries.
How Server Learns About Clients (cont.)

- **Checked-in Clients**
  - Displays all FileWave clients that have checked in with the Server, but are waiting to be added to the FileWave Clients pane (list of clients).

- **Enrolled Mobile Devices**
  - Mobile devices that enrolled by the assigned user or as part of a restoration using Apple Configurator with an image that contained the enrollment profile.
How Server Learns About Clients (cont.)

• Text File
  - You can import a tab-delimited text file with entries containing device name and a comment on each line.
  - Example: Lab-iPad-07 <tab> For cart #3 <tab> [S/N or MAC] <rtn>

• Enter Name
  - You can manually enter the device name and a comment in this dialog.
Enrolling iOS Devices
Mobile Device Management

• The two items that a mobile device must have installed in order to be administered by FileWave:
  − FileWave certificate*
  − MDM profile
Enrolling iOS Devices

The URL that a user can use to manually enroll an iOS device can be found in FileWave Admin under Assistants dropdown menu, Enroll iOS Device.
Enrolling iOS Devices (cont.)

- If using LDAP authentication, then users can authenticate as themselves.*
  - https://www.filewave.com/support/kb/article/enroll-ldap

- If not using LDAP, you need to create at least one account that users can authenticate against using the following command in Terminal.app on the Server:
  - sudo fwcontrol mdm adduser <user_name>
Enrolling iOS Devices (cont.)

- The user is presented with a dialog to install an MDM server certificate, then enroll the device.
- The second step is when the user will be asked to authenticate.
Enrolling iOS Devices (cont.)

Once the user has completed these two steps, the device will display the new profiles that have been installed.
Enrolling iOS Devices (cont.)

- If the user’s device is not yet a FileWave client, it will need to be captured in FileWave Admin.
  - Go to the Clients pane, select New Client from the toolbar.

- Then select Enrolled Mobile Devices and you will get the list of all mobile devices that have:
  - Performed a manual URL enrollment;
  - Been activated by DEP; or,
  - Have been activated by Apple Configurator.
Using Apple Configurator

The GUI in the Enroll iOS Device Assistant makes it easy to get what you need to put into Apple Configurator 2.
How things work under-the-hood
Basic Principles

• The FileWave Client is intelligent
• The FileWave Client does all the work
• The FileWave Client verifies its defined state when checking in with the FW Server or Booster
User Manifest

• The User Manifest contains the description/declaration of the managed/desired state of the client

• "This is how things should be"

• FileWave Client downloads User Manifest after Model update / the very first time it connects

• User Manifest files are very small ( < 10KB )
User Manifest Contents

**Header info**
- ID of the Client
- Number of FileSets
- Additional information

**List of information for every Fileset associated**
- ID of the FileSets
- Version of the FileSets
- Time-Attributes for the FileSets / Kiosk Flag

<table>
<thead>
<tr>
<th>FilesetName</th>
<th>FilesetId</th>
<th>FilesetVersion</th>
<th>DownloadTime</th>
<th>Activate Time</th>
<th>Deactivate Time</th>
<th>Delete Time</th>
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</table>
Fileset Container

- The Fileset Container contains information about the contents of a Fileset
  - For example, "This is what Photoshop is supposed to look like on the filesystem"

- FileWave Client downloads Fileset Containers according to the User Manifest

- Named “FilesetXXXXXvY” where XXXXX is the Fileset ID and Y is the Fileset version

- Fileset Containers can be downloaded from a Booster or the FileWave Server

- Relatively small in size (<5 MB in most cases)
Fileset Container (cont.)

**Header info**
- Number of files and folders in Fileset
- ID of Fileset
- Version of Fileset
- Checksum information
- Fileset Requirements (OS & OS Version, RAM, CPU / Architecture)
- Profile or Policy Payload
- Kiosk Information (Icon, Description, Rating, Category, etc.)

**List of Fileset Contents**
- File/Folder Name
- File/Folder Location
- File/Folder Metadata (Access Rights, Flags, ACLs, Symlink, etc.)
- File Checksum
- File Size
### Fileset Container Example

<table>
<thead>
<tr>
<th>Fileset Container</th>
<th>/private/var/FileWave/Fileset2076562v205</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fileset ContainerID</td>
<td>2076562</td>
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<tr>
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<tr>
<td>Files</td>
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<td>Folders</td>
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<tr>
<td>Platform</td>
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<td>Properties</td>
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#### Fileset Container Details

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<th>Index</th>
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<th>TargetID</th>
<th>CreationDate</th>
<th>ModDate</th>
<th>DForkSize</th>
<th>RForkSize</th>
<th>Checksum</th>
<th>Owners</th>
<th>Group</th>
<th>Mode</th>
<th>Atts</th>
<th>Flags</th>
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</tr>
</tbody>
</table>
The Catalog File

- The Catalog file contains information about the status of the Client
- "This is what I remember about my managed state and Filesets"
- The Catalog is never downloaded, it is created by the client itself
- Named the Catalog
- Relatively small in size (<1 MB in most cases)
Catalog Contents

Header info
• ID and Model Number of the Client
• Number of FileSets

List of all associated FileSets
• ID and Version of the FileSets
• Status of the FileSets
• Time-Attributes for the FileSets

List of Worklist entries
FileWave Client Default Behavior

The Client checks for a new Server Model and if necessary downloads the new User Manifest.
The Client compares the User Manifest with the Catalog.

- Catalog: The current state of the client
- User Manifest: The defined state for the client 
- Client: Comparing the states
Catalog - User Manifest Comparison

If Fileset is in the User Manifest, but not in the Catalog -> this is a new Fileset

- Client creates two new work list entries:
  - Download Fileset
  - Activate Fileset

Client creates Action List and adds Fileset

1. Download Fileset
2. Activate Fileset
If Fileset is in the Catalog, but not in the User Manifest -> this Fileset needs to be removed

• Client creates two new work list entries:
  – Deactivate Fileset
  – Delete Fileset
If the Fileset is in the Catalog, but the User Manifest has a newer Version -> this Fileset needs to be updated

- Client creates one new work list entry:
  - Update Fileset

```
Client creates Action List and adds Fileset

1. Update Fileset
```
Leaders in Multi-Platform Management
Questions ???