Multimedia framework version 1 proposal

Sections

A. Proposal overview for end user 1
B. System Diagram 2
C. Strategy Route Map 6
D. AV Dropbox file extraction workflow 8

Project ID: **MultInfStr** and **iTunesU**

A. Proposal overview for end user

Audience: all

The framework, version 1, is the first attempt at building an end-to-end solution to publish multimedia materials in University systems. With minimum intervention from the users, the published materials can then be linked from web pages in particular in ActivEdition CMS and Blackboard.

A.1 Purpose

To outline important aspects of the framework to users
To encourage users to use the system, gauge feedback for further improvement
To provide a common approach (terminology, processes etc.) to improve communication

A.2 Summary

- Accept file types: mp3 and mp4 (any resolution)
- Automated upload to predetermined server and folder location depending on routes used
- Automated file transcoding (where available) to pre-determined standards: mp3, mp4 high and low resolution, and flv high and low resolution, and video maintained in their 4:3 or 16:9 sizes
- Automated email notification to uploaders containing amended filename (if applicable) and instruction on how to link this file from web pages

A.3 Details

A.3.1 How does it work?

1. Record your audio/video (using microphone, webcam, camtasia/camstudio etc.) and save as file
2. Upload the file on a web page we specify
3. You will receive email notifications when your file completes processing, with instructions on how to link to the file on your own web page

A.3.2 Intended audience

1. The framework supports four routes depending on intended audience:
    a. *DDT*: moderated by Digital Development Team, file transcoded to standard University formats for public web site, iTuneU, YouTube etc.
    b. *ASSET*: user moderated, encoded to standard ASSET format, and for restricted access areas (ASSET, Blackboard, closed areas of CMS)
    c. *General* (Teaching & Learning / Research): unmoderated, transcoded to standard University formats (including ASSET), with / without streaming, for restricted access areas (ASSET, Blackboard, closed areas of CMS)
    d. *Nonprescribed*: no moderation or transcoding, possibility of streaming or downloading high quality video
2. Each route has a corresponding web page with further details and upload form

A.3.3 What format do I use to record my video?

1. Please save your audio file in wav or mp3, and video file in mp4
2. Please see ASSET's FAQs (link available soon) for tips on producing your video in mp4
3. If your software gives you the option, prepare your video file in either
    a. 640x480 pixels (screen size, resolution), if widescreen: 640x360, or
    b. 320x240 pixels, if widescreen:320x180

A.3.4 How do I link to my file after I upload it?

1. You will receive email notifications containing instructions on how to link to your file on web pages (CMS, BB), in the form:
    a. URL, and/or
    b. HTML embedding code to incorporate a player
2. Your file name may be changed depending on the route used, the email notification will give you exact file name

A.3.5 What are "standard University formats"?

- The formats are used taking into account prevalent industry common practice (refer video services such as iTunes, YouTube, BBC) and integrating them into present systems (CMS, Blackboard) in the University
- For audio, your file will be converted to mp3
- For video, in *DDT* and *General*, your file will be converted to:
    - mp4 640x480 ("high" resolution) or widescreen 640x360,
    - mp4 320x240 ("low") or widescreen 320x180,
    - flv 640x480 or equivalent widescreen and
    - flv 320x240 or equivalent widescreen
- Standard University PCs have default media players that can playback mp3, and mp4/flv files.
- For dissemination by email:
    - Send URL to others (URL will be in email notification sent to you)
- For dissemination on a web page:
    - Use the URL (sent to you in email notification) to enable download for saving and playing back later, or playback using progressive download (depending on client PC configuration)
    - Use HTML embedding code (sent to you in email notification)
        - incorporates JW Player: plays mp3, mp4 and flv
        - incorporates Real player
            - supports live streaming
            - requires Real Player latest version on client PC
            - RP installed as standard University PC configuration but not as default player

A.4 Training and getting help

- The workflow is simple and no training is necessary, though a video tutorial is being planned, and some training sessions may be organised
- The automated emails contain instruction on contacting us for help should there be problems or queries

B. System Diagram

Refer: mfsd_01 (detail) mfsdo_01 (overview)
Audience: technical

B.1 Purpose

- Provide an overview of the technical requirements using a system diagram

B.2 Section description

Section	Brief description
Input Routes	Users use one of 4 routes to upload their multimedia file
NetApps / aaws1: output formats	File formats served from two servers
Helix 13	Streaming server to live stream in Real format, or progressive download in flash format
Firewall, authentication, proxy	Access to the materials by viewers is subject to standard University security policies
User interaction	Users play back file using streaming, progressive download or “save file” link for playback later
University standard PC with media players	This is our target platform
Application embedding	

B.3 Notes

Input Routes: Processing

DDT and *General* routes only:

- process input formats: mp3 and mp4,
- output to formats: mp3, mp4 (HI and LO) and flv (HI and LO).
- mp4 and flv, only in the stated resolution (refer Resolution box in system diagram)

Metadata

- *DDT*: handled by CMS
- *General*: “ffmpeg –metadata”

Input Routes: Upload / Processing

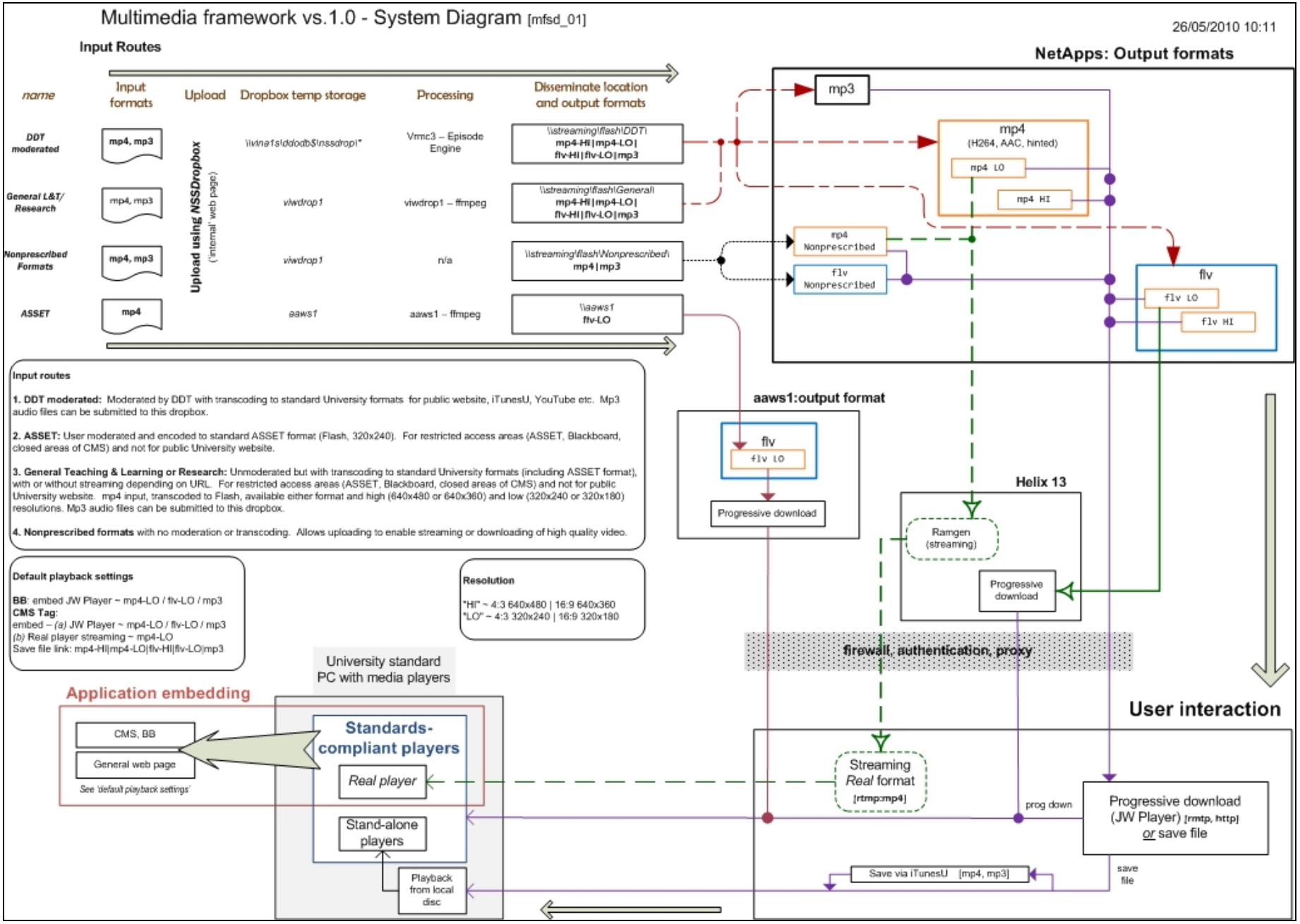
Emails are sent back to user to confirm submission and provide information of how to retrieve (link) media (embedding code template, CMS tag name, URL)

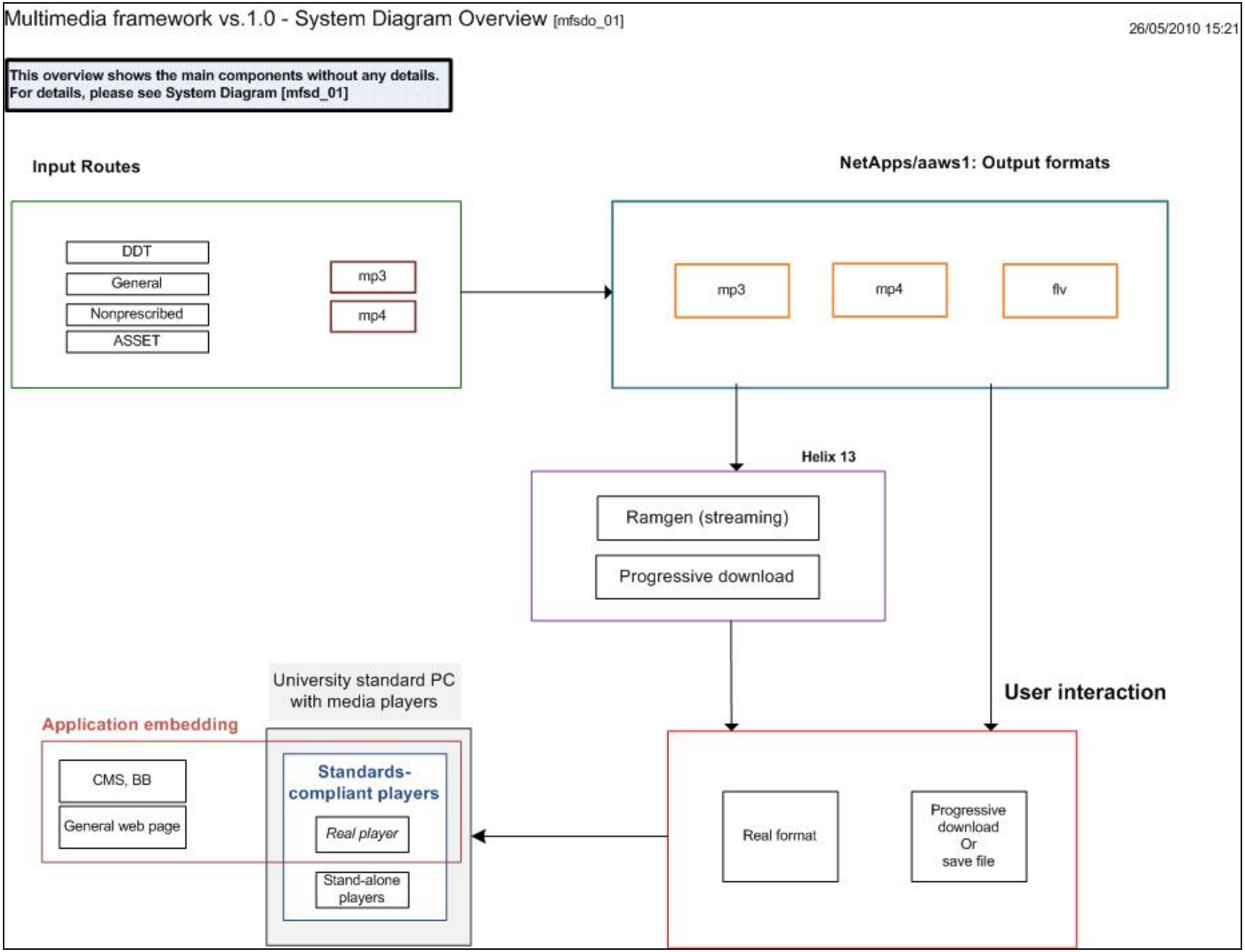
Input Routes: Upload and Disseminate location

Users have no control over the destination folder in streaming server
Filename will be in the form <my filename>-<dropbox claim code>-<video size/coding type>.<extension>
All files available as download via CMS tag, URL and code template

Helix 13: Ramgen (streaming)

At the moment, we only stream mp4-LO version (can change to mp4-HI if necessary)
Helix 13 progressive download only handles flv


Multimedia framework vs.1.0 - System Diagram [mfsd_01]
26/05/2010 10:11
Input Routes
name
Input formats
Upload
Dropbox temp storage
Processing
Disseminate location and output formats
DDT moderated
mp4, mp3
\\v\na1s\ddodb$\nssdropi*
Vrmc3 – Episode Engine
\\streaming\flash\DDT\
mp4-HI|mp4-LO|
flv-HI|flv-LO|mp3
General L&T/ Research
mp4, mp3
viwdrop1
viwdrop1 – ffmpeg
\\streaming\flash\General\
mp4-HI|mp4-LO|
flv-HI|flv-LO|mp3
Nonprescribed Formats
mp4, mp3
viwdrop1
n/a
\\streaming\flash\Nonprescribed\
mp4|mp3
ASSET
mp4
aaws1
aaws1 – ffmpeg
\\aaws1
flv-LO
Upload using NSSDropbox
('internal' web page)
NetApps: Output formats
mp3
mp4
(H264, AAC, hinted)
mp4 LO
mp4 HI
mp4 Nonprescribed
flv Nonprescribed
flv
flv LO
flv HI
Input routes
1. DDT moderated: Moderated by DDT with transcoding to standard University formats for public website, iTunesU, YouTube etc. Mp3 audio files can be submitted to this dropbox.
2. ASSET: User moderated and encoded to standard ASSET format (Flash, 320x240). For restricted access areas (ASSET, Blackboard, closed areas of CMS) and not for public University website.
3. General Teaching & Learning or Research: Unmoderated but with transcoding to standard University formats (including ASSET format), with or without streaming depending on URL. For restricted access areas (ASSET, Blackboard, closed areas of CMS) and not for public University website. mp4 input, transcoded to Flash, available either format and high (640x480 or 640x360) and low (320x240 or 320x180) resolutions. Mp3 audio files can be submitted to this dropbox.
4. Nonprescribed formats with no moderation or transcoding. Allows uploading to enable streaming or downloading of high quality video.
aaws1:output format
flv
flv LO
Progressive download
Helix 13
Ramgen (streaming)
Progressive download
Default playback settings
BB: embed JW Player ~ mp4-LO / flv-LO / mp3
CMS Tag:
embed – (a) JW Player ~ mp4-LO / flv-LO / mp3
(b) Real player streaming ~ mp4-LO
Save file link: mp4-HI|mp4-LO|flv-HI|flv-LO|mp3
Resolution
"HI" ~ 4:3 640x480 | 16:9 640x360
"LO" ~ 4:3 320x240 | 16:9 320x180
firewall, authentication, proxy
University standard PC with media players
Application embedding
CMS, BB
General web page
See 'default playback settings'
Standards-compliant players
Real player
Stand-alone players
Playback from local disc
User interaction
Streaming Real format [rtmp:mp4]
prog down
Progressive download (JW Player) [rmtp, http] or save file
Save via iTunesU [mp4, mp3]
save file


Multimedia framework vs.1.0 - System Diagram Overview [mfsdo_01]
26/05/2010 15:21
This overview shows the main components without any details.
For details, please see System Diagram [mfsd_01]
Input Routes
DDT
General
Nonprescribed
ASSET
mp3
mp4
NetApps/aaws1: Output formats
mp3
mp4
flv
Helix 13
Ramgen (streaming)
Progressive download
University standard PC with media players
Application embedding
CMS, BB
General web page
Standards-compliant players
Real player
Stand-alone players
User interaction
Real format
Progressive download Or save file

C. Strategy Route Map

Refer: mfsrm_01
Audience: partners, management

C.1 Purpose

- Identify types of stakeholders
- Establish a strategy to keep a focus on the multimedia framework over time to:
    - manage feedback
    - manage how to introduce variations to framework
    - manage potential impact to/from other web technologies
- Identify primary applications

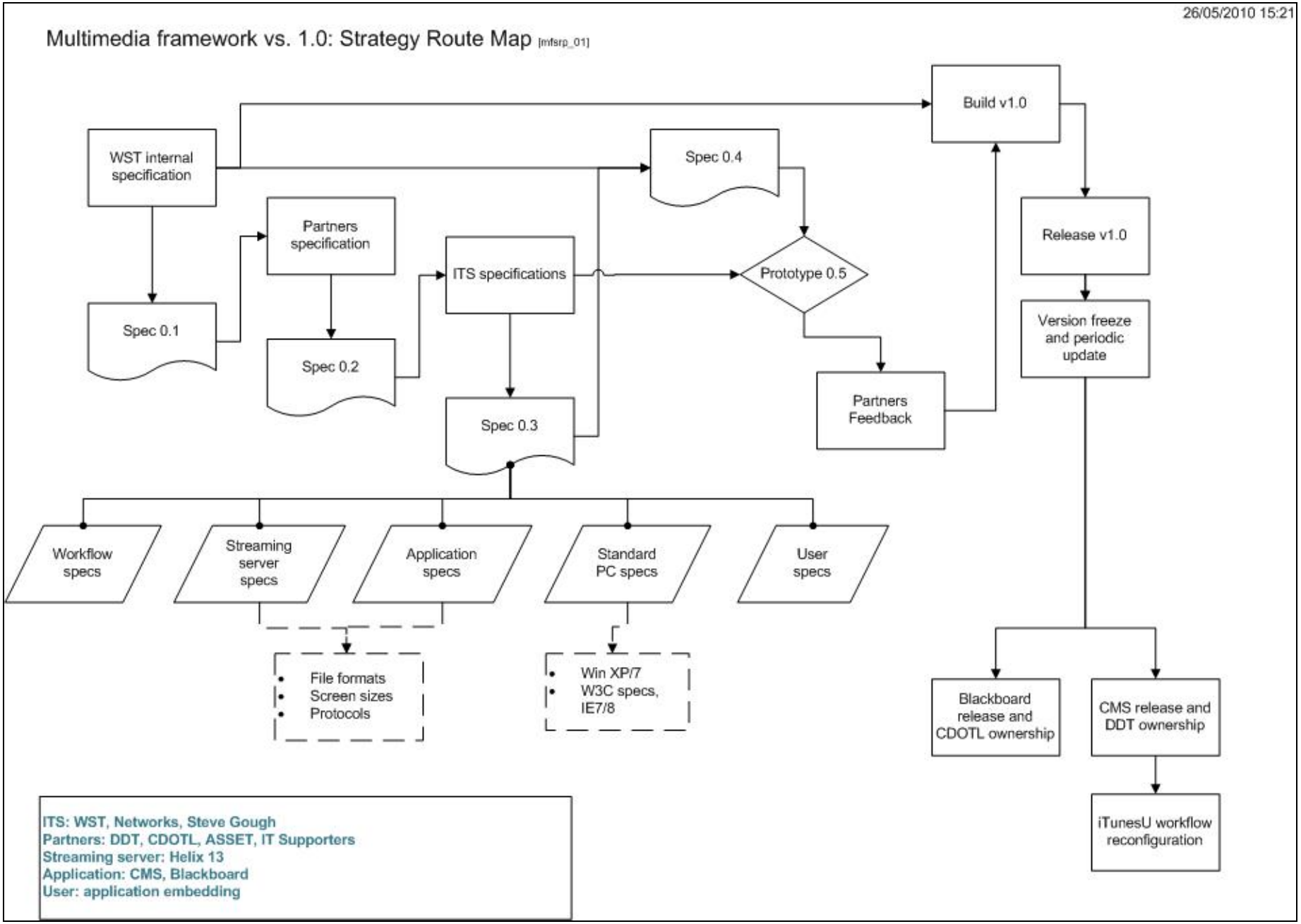
C.2 Notes

- **Version 1**

    - Involved partners in a consultation process
    - Several processes overlapped or ran in parallel
    - Further technical details in Systems Diagram

- Implementation is done following a ‘frozen’ specification

- Future version changes will take into account feedback from stakeholders, technical changes due to server upgrades, as well as industry factors such as prevalent standards and media players, web browsers, mobile devices etc.


26/05/2010 15:21
Multimedia framework vs. 1.0: Strategy Route Map [mfsrp_01]
Build v1.0
WST internal specification
Spec 0.4
Partners specification
Release v1.0
ITS specifications
Prototype 0.5
Spec 0.1
Version freeze and periodic update
Spec 0.2
Partners Feedback
Spec 0.3
Workflow specs
Streaming server specs
Application specs
Standard PC specs
User specs
File formats
Screen sizes
Protocols
Win XP/7
W3C specs, IE7/8
Blackboard release and CDOTL ownership
CMS release and DDT ownership
iTunesU workflow reconfiguration
ITS: WST, Networks, Steve Gough
Partners: DDT, CDOTL, ASSET, IT Supporters
Streaming server: Helix 13
Application: CMS, Blackboard
User: application embedding

D. AV Dropbox file extraction workflow

Refer: few_01
Audience: Technical

D.1 Purpose

- To detail requirements in extracting uploaded file
- To aid in modifications and future variations

D.2 Notes

D.2.1 Exim filter – integration with Dropbox

- Each input route has its own web submission page that also specifies the email subject sent to the dropbox recipient *
- Exim filter moves the email to the respective folder

D.2.2 Fetchmail, perl

- Monitors new mail in a specific email folder and then calls corresponding perl script for further processing
- Non-prescribed: pre-fix file with username

D.2.3 1st drop

- 1st storage area for dropbox
- Send email E1

D.2.4 2nd drop

- 2nd storage area for transcoding engine to pick up files
    - *DDT*: monitored for transcoding by vrmc3: Episode Engine
    - *General*, *ASSET*: monitored for transcoding, respectively, by viwdrop1/aaws1: ffmpeg
- *Nonprescribed*: No transcoding

D.2.5 Destination / disseminate

- Transcoded files are saved to pre-defined server:folder for dissemination
- Files that require no transcoding (Nonpresscribed) are copied to pre-defined server:folder for dissemination

*Dropbox recipient (vis08w / vis09a)

AV Dropbox file extraction workflow [few_01]

26/05/2010 15:46

route	email subject (for filter) exim filter	email folder	fetchmail	perl	1st drop storage	1st drop email	2nd drop storage	2nd drop email	Destination / disseminate
DDT moderated	UoR AV DDT	DDT	fetchmail-DDT	DDT-fetch.pl	D30	E1	D1\DDT	E2	D30 DDT manual email: E4 E5
Nonprescribed formats	UoR AV Nonprescribed	Nonprescribed	fetchmail-Nonprescribed *prefix username*	Nonprescribed-fetch.pl	D30		n/a *(no processing)*	E3	D31\Nonprescribed *<username>-filename.ext*
ASSET				— refer Karsten —					
General Teaching & Learning or Research	UoR AV General	General	fetchmail-General *prefix username*	General-fetch.pl	D30	E1	D1\General	E2?	D31\General *<username>-filename.ext*

Storage areas	D1	\\vina1s\ddodb$\nssdrop\download
	D30	\\vina1s\ddodb$\nssdrop\data
	D31	\\streaming\content\flash\

Emails	sent at	sent from	content type	Email header	
E1	dropbox submission acknowledge	lib/NSSDropoff	general	*DropboxName*	File received: *<filename>*
E2	transcoding	perl	specific. For DDT to retrieve media files	*DropboxName*	File transcoding: *<filename>*
E3	copy to destination	perl	specific. Some instructions for users to do their own URLs and	*DropboxName*	File uploaded: *<filename>*
E4	DDT contacts HOD/user to do review	(DDT manual send)	Manual edit, copy some content from E2	DDT decides	
E5	DDT has published finished media, contact user to confirm with information	(DDT manual send)	Manual edit, copy some content from E2	DDT decides	

DropboxName (specified in preferences.php): "UoR AV dropbox"

Exim filter	moves dropbox email (to owner) to relevant folder
fetchmail	processes new emails in specific folder hardcoded in file
perl	reads email to extract uploaded file, and sends email E2 to user and/or DDT