

AVN4XX Firmware Release Notes

version 0.6.3

AVN4XX_063: (UB4XX_023, LK4XX_01A, BB4XX_00A, VSI4XX_06C, CFG4XX_051, RFS4XX_051)

1. Fix Video Front end state machines to add proper states for invalid features

AVN4XX_062: (UB4XX_023, LK4XX_01A, BB4XX_00A, VSI4XX_06B, CFG4XX_050, RFS4XX_050)

1. Fix Upgrade and Beta path logic
2. Modify /cfg/oem ownership so oem admin user can modify
3. Add ping to oem admin capabilities
4. Fix Progressive Closed Caption handling
5. Fix adv driver handling of lost video reporting with FK no enabled
6. U-boot change, separate MAC zones for H51 and H46 Platforms

AVN4XX_061: (UB4XX_022, LK4XX_01A, BB4XX_00A, VSI4XX_06A, CFG4XX_04F, RFS4XX_04F)

1. Modify web based upgrade system
 - a. Clean up display of CFG Version
 - b. Move upgrades from www.vsicam.com to www.vsiptv.com
 - c. Organize releases by product rather than just platform
 - d. New directory created /files/AVN4XX/UPGRADE
 - i. Contains versions_xxx.txt per product to describe versions
 - ii. Contains images and md5 sums named by product/function (example: RFS420)
 - iii. Directory is password protected
2. Change format descriptions from hz to Hz
3. Add separate options for 1080p59.94Hz and 1080p60Hz for extra tolerance
4. Also clean up display of 1080p23.98/24Hz option

AVN4XX_060: (UB4XX_022, LK4XX_01A, BB4XX_00A, VSI4XX_069, CFG4XX_04E, RFS4XX_04E)

1. More scrubbing to remove HD text from H46 units
2. Remove View Button (VLC plugin) from plain sight
3. Make top level SUPPORT_ENHANCED_DEF flag control 480p support (disabled)
4. Feature Key Work
 - a. Start working on "Auto Update Mode" with online DB
 - b. Secure "Auto Update" communication
 - c. Also allow running update of key status in Auto DB update

- d. Force Save to Flash with Auto DB update function
- 5. Allow display of non-standard video resolution on the Video Input page
 - a. Useful in the event that the resolution is changed via API to something not standard
- 6. Experiment with forcing IGMP version, seems to work, disabled until decision
- 7. Add default gateway entry in the case of DHCP failure, fix stream starting in that case
- 8. Modify HD encoder struct to support new features
 - a. Add support for Scaling, Arbitrary Video Input, Profile/Level Control and Aspect Ratio
 - b. Modify API version from 1 → 2
 - c. Force rejection of commands with newer/unknown API version (>2)
 - d. Create udp_proxy conversion functions from API v1 to v2
 - e. Modify encoder driver aspect ratio control handling
 - f. Add Support for manual Profile/Level specification (iPad) (disabled)

[AVN4XX_05F2: \(UB4XX_022, LK4XX_01A, BB4XX_00A, VSI4XX_0682, CFG4XX_04D2, RFS4XX_04D2\)](#)

- 1. Add option to allow 16x9 signaling of SD 720x480i content
- 2. need to add support for pal 720x576i
- 3. API Version changed from 1 → 2, need to test handling and create update path

[AVN4XX_05F: \(UB4XX_022, LK4XX_01A, BB4XX_00A, VSI4XX_068, CFG4XX_04D, RFS4XX_04D\)](#)

- 1. Modify u-boot to utilize bigger write buffer on new flash
- 2. Modify u-boot FK handling
- 3. Modify Core Module / Feature Key System handling
 - a. Core determines if hash is valid and therefore if feature is enabled
 - b. Separate available feature keys by platform (UI at least)
 - i. H46 utilizes all 5 current keys, all default disabled
 - ii. H51 ignores 1080p and enables 720p and 1080i by default
 - iii. AVN420 uses only FEC (not yet implemented in SD)
- 4. Fix vmon for H46 Factory Default
- 5. Greg Driver Fixes
 - a. 720P Closed Caption Fix
 - b. Drivers handle supported/keys masks
 - c. Show actual vfmt_actual (even if not supported i.e 480p)
- 6. Web UI honors drivers decisions about video formats supported/keys
 - a. Channel Status page should show actual detected format and notes
 - b. Channel Input Select page will show unlicensed resolutions with a label
 - c. Add color coding to Video Status
- 7. Use fixed width font on feature license key hash display

8. Remove startup file not found error (extfs)
9. Conditionalize browser update/reboot wait times based on Flash Type, newer is faster
10. Test Scaler and arbitrary input functions, working but disabled for now

[AVN4XX_05E: \(UB4XX_021, LK4XX_01A, BB4XX_00A, VSI4XX_067, CFG4XX_04C, RFS4XX_04C\)](#)

1. Merge Greg Branch (H46 HD Dev) to Top of Tree
2. Support AAC, 1080P, and Closed Captions on H46
3. Support CVBS Video input on H51 and H46

GREG BRANCH:

1. Add additional H46 encoder support
 - a. Re-enable AAC audio encode option for H46 units (web UI only, API UI only)
 - b. Add 1080P specific resolution options to web UI
 - c. Fix status reporting of auto and fixed resolutions including 1080P and SD
 - d. Fix AAC audio mode in driver and through core
2. Allow AtoD settings to be configured on a 443 set to HDMI
3. Closed Captions working 608/708 over SDI input HD/SD
4. Remove HW Factory Default functionality until pin move is complete (vmon)
5. Add Composite/CVBS SD Video Input option to AVN441HD
 - a. Collect VBI 608 Closed Captions from ADV and pass to fuji
6. Add configurable CC_Mode field to select CC mode in SDI or Composite Modes
7. Fix Audio Bitrate normalization

[AVN4XX_05D: \(UB4XX_021, LK4XX_019, BB4XX_00A, VSI4XX_066, CFG4XX_04B, RFS4XX_04B\)](#)

1. Add Feature Key Functionality
2. Add Multicast Network Logging in addition to event file log 226.0.0.18:8002
3. Remove httpd.conf when defaulting user data
4. Add Composite/CVBS Video Input capability to AVN441HD

[AVN4XX_05B2: \(UB4XX_020, LK4XX_018, BB4XX_00A, VSI4XX_0642, CFG4XX_0492, RFS4XX_0492\)](#)

1. Modify 32nd and 33rd bit handling and printing options
2. Add sync check stream restarter
3. Modify poll rate (2/second) and debounce (one) rate

[AVN4XX_05B1: \(UB4XX_020, LK4XX_018, BB4XX_00A, VSI4XX_0641, CFG4XX_0491, RFS4XX_0491\)](#)

1. Modify 32nd and 33rd bit handling in qts
2. Modify vfe polling (15/second) and debounce (none) rate

3. Modify 4XXSD core reboot wait time/mode
4. Modify 4XXHD HDMI clocking
5. Modify core debug handling level
6. Modify default ts boot lookup
7. Modify avncp4_mapi to add more tests/features (FD, mpc, mplat, ...)

[AVN4XX_05C: \(UB4XX_020, LK4XX_018, BB4XX_00A, VSI4XX_065, CFG4XX_04A, RFS4XX_04A\)](#)

1. Fix GIFNOC reporting of FrameB Picture Mode
 - a. Add Aux Destinations to GIFNOC
 - b. Add Force_WS_AR to GIFNOC
2. Fix SDI brightness, contrast, etc control
3. Fix SAP save while running error
 - a. Also work on SAP start/stop consistency
4. Change default picture format from Frame to Field (now that VLC works)
5. Check for zero size index/logo file when testing OEM changes
6. Allow Generic OEMs to customize appearance, and make stick across updates
 - a. Top of page logo can be downloaded through the upgrade pages
 - b. Company web link and help web link controlled by text file
 - c. Company Name and Product Name controlled by text file
 - d. Make oem admin user owner of all /cfg/oem area including text files
7. Replace Start/Stop buttons with checkbox for Stream Enable
 - a. Top Level #define to switch between Start/Stop and Stream Enable checkbox
 - b. All Web GUI actions blocked by Stream Enable bit, no longer Streaming bit
 - c. Web GUI View button access is controlled by Streaming bit

[AVN4XX_05B: \(UB4XX_020, LK4XX_018, BB4XX_00A, VSI4XX_064, CFG4XX_049, RFS4XX_049\)](#)

1. Turn off PCR and Video PID Sharing in AVN420

[AVN4XX_05A: \(UB4XX_020, LK4XX_018, BB4XX_00A, VSI4XX_063, CFG4XX_048, RFS4XX_048\)](#)

1. Fix Video Format Supported Mask causing crash after input change on standard H51 boards
2. Change Mpeg Audio Stream Type from 0x03 → 0x04 (MP1L2 → MP2L2) disabled
3. Add hooks for SDT Table insertion in AVN420 (EchoStar compliance) disabled
4. Fix status reporting of auto and fixed resolutions on status and input pages

[AVN4XX_059: \(UB4XX_020, LK4XX_018, BB4XX_00A, VSI4XX_062, CFG4XX_047, RFS4XX_047\)](#)

1. Disable ProMpeg FEC from release candidate build
2. Add feature to force aspect ratio to wide screen 16:9 in AVN420
 - a. Modified avncp4_encoder structure and handling Rev API?

- b. Modified mobi_drv to use vinar in script only when enabled
 - c. Modified Web GUI to allow setting of the feature
 - d. Modified Core to accept the setting of the feature
 - e. Enabled/Disabled by #define in avncp4.h
 - f. Add to help info
3. Add User Level Control information to Help page, and add a link
 4. Update default Time Server location, old one seems to not work anymore
 5. Fix HD System Kicker Crash
 6. Separated avncp4_api.h include file into 2 parts
 - a. avncp4_api.h still exists and is to be treated as open and public
 - b. avncp4_api_in.h contains confidential info we do not want to leave the building
 7. Modify lowest level API call QDEVICE to allow unauthenticated access
 8. Allow multicast Discovery and setting of IP address for "strange" networks
 9. Modify handling of SD Encoder resolutions through API, use pixel values rather than indexes
 10. Add uboot version check along with kernel version check to make sure field FW is all current
 11. Add rfs_clean(int platform) function to allow removal on non-platform files to create extra FS space
 - a. This is mainly for oems so occurs at each Generic OEM subpcode boot
 - b. Also removes for all products when this RFS is installed, but next RFS update might bring them back
 12. Add Initial support for H46 Encoder Chip
 - a. Create new Platform PLATFORM_AVN4XXHDb 0x3 for new H46 version boards
 - b. New additional firmware version for encoder to be stored in RFS
 - c. Make switches based on Platform to allow feature diffs between H46 and H51
 - d. Device status page shows Platform distinction after Product Code
 - e. Add 1080p recognition to web pages for H46
 - f. Disabled in Tag, work in Progress
 13. New U-Boot required to allow new Platform option

[AVN4XX_058: \(UB4XX_01F, LK4XX_018, BB4XX_00A, VSI4XX_061, CFG4XX_046, RFS4XX_046\)](#)

1. Make OEM modifications
 - a. Create /oem location in main fs to store oem value added code and data
 - b. Create system start link pointing into /oem/oem_go for initialization
 - c. Create Web based method to populate /oem directory (need to add for API)
 - d. Allow oemadmin user to mount NFS directories to /oem/mnt (BusyBox change)
 - i. /oem/mnt created by system, must be used for mount location
 - e. Create symlink through embedded browser to allow access to /oem content
 - f. Allow Aux2 destination to be a remote mounted NFS location rather than a network socket
 - i. SD is working well now

- ii. HD seems to cause FIFO Overflows and then chaos
- 2. Start version controlled API work with feedback mechanism
 - a. Modify auth struct to include API revision and platform
 - b. Define new error struct to be returned on any non OK return
 - i. Consists of number code and description string
 - c. API Client will announce API compliance version to AVN
 - i. If match then command goes as expected
 - ii. If client < AVN && client > 0 then AVN converts old to new then new to old, ignores new
 - iii. If client < AVN && client = 0 then AVN responds with API version error
 - iv. If client > AVN then AVN responds with API version error
- 3. Fix User Level bugs
- 4. Remove 1/4SIF Video Resolution option from AVN420, codec cannot support
- 5. Fix VLC plugin code to support new fixed resolutions in AVN420
- 6. Fix web based video size options in AVN420 for clarity

[AVN4XX_057: \(UB4XX_01F, LK4XX_018, BB4XX_009, VSI4XX_060, CFG4XX_045, RFS4XX_045\)](#)

- 1. Make FEC interoperable with Sencore MRD
 - a. Support Configurable Real Time ProMpeg COP3 1D and 2D LxD
 - b. $1 \leq L \leq 10$
 - i. For 2D FEC: $L \geq 4$
 - c. $4 \leq D \leq 10$
 - d. Packet Loss Simulation Mode control M/N
 - i. Bound skip count M 0:L
 - ii. Bound range count N L+1:50000
 - e. Added to Web UI for control and status
 - f. Only works with TS_RTP Streaming Mode
 - g. Added help links and info
 - h. Needs testing and tuning (aux streams? max bitrates? Error checking?)
- 2. Make SD Driver Clients send core messages atomically (qts, mobi_drv)
- 3. Fix stale web page status after Start and Stop commands
- 4. Fix mislabeled AVN441HD on login web page
- 5. Fix mislabeled AVN420 Auto input/format strings
- 6. Fix API updating with mismatch kernel to allow kernel update
- 7. Create Help for Stream QOS
- 8. Input format checking fix
- 9. Add range info to help for Stream TTL and Kicker
- 10. Fix Bug in API UDP Proxy introduced with new User Mgmt

- a. Wait and make sure auth data is returned and checked before moving on to work with actual command
 - b. Auth data was sticking in pipe and confusing command interpreter code
11. Fix RTSP streaming in AVN420
- a. Fix RTSP Announce with Darwin Servers
 - b. Disable SAP while RTSP mode is enabled
 - c. Need to make SAP work local and announced with RTSP

[AVN4XX_056: \(UB4XX_01F, LK4XX_018, BB4XX_009, VSI4XX_05F, CFG4XX_044, RFS4XX_044\)](#)

1. Add more work to FEC implementation (disabled for now)
2. Sub-Pcoded units may not have initial Web login page, FIXED
3. FIX RTSP ANNOUNCE Bugs qboxstreamer (Live555)
 - a. initial OPTIONS string was wrong
 - b. Add Basic Authentication support, now support None, Basic, and Digest
4. Fix repeated sap task launching in HD products
5. MERGE in GB5 Branch, SD resident driver model with Auto support

[AVN4XX_055: \(UB4XX_01F, LK4XX_018, BB4XX_009, VSI4XX_05E, CFG4XX_043, RFS4XX_043\)](#)

1. Fix repeated SAP launches on quick restarts such as quick video loss or system kicker
2. Fix repeated start/stop crash, now can start/stop well over 42 times
3. Fix Web Page Update/Save Bug
4. Fix qhal kernel module in AVN420 to make increment/decrement usage valid and allow module removal
5. Fix AVN420→Wowza→iPhone crash, extend 33rd bit of precision to TS CTS and PCR
6. Disabled SAP by default

[AVN4XX_054_GREG: \(UB4XX_01E, LK4XX_018, BB4XX_009, VSI4XX_05D_GREG, CFG4XX_042, RFS4XX_042_GREG\)](#)

1. Add Auto input and Auto format to AVN420
2. Make system integrity equivalent for AVN420
3. Disable complete HDVFE Reset, fix SDI Video with Analog Audio
4. Fix repeated SAP launches on quick restarts such as quick video loss or system kicker
5. Change to Enumerated resolutions 1-6 = D1-1/4SIF
 - a. Macro defined to extract pixels from stored core val
 - b. Values 1-6 are enumerations. Values greater than 16 are pixel values
 - c. Web only allows enums for now, API will allow custom pixel vals
 - d. Modified in VFE input page and Channel Status page

[AVN4XX_054: \(UB4XX_01E, LK4XX_018, BB4XX_009, VSI4XX_05D, CFG4XX_042, RFS4XX_042\)](#)

1. Fix time reporting in avncp4_mapi ID_STATS Query

2. Disable complete HDVFE Reset, fix SDI Video with Analog Audio
3. Turn Driver Debugs back on
4. Fix TimeServer Set Problem when DHCP is enabled
5. Add support for QOS control over Primary Transport Streams SD and HD
 - a. Also need to add support for Aux Streams
6. Add Initial hooks and test code for SMPTE2022 FEC (disabled)
7. Implement GIFNOC stage#1, allow for customer delivery of configured settings
8. Remove #define ALLOW_MCAST_RTSP, always on moving forward
9. KERNEL: modify cfi driver to support Numonyx P33 Flash replacement
10. UBoot: modify cfi driver to support Numonyx P33 Flash replacement

[AVN4XX_053: \(UB4XX_01D, LK4XX_017, BB4XX_009, VSI4XX_05C, CFG4XX_041, RFS4XX_041\)](#)

1. Fix Slot ID reporting on AVN443HD
2. Improve embedded web content creation speed and delivery
 - a. Conditionalize www creation debug
 - b. Disable all debug on release candidates
3. Fix specific product identification string in dynamically created login page
4. Fix admin user being set to invalid after updating password
5. Add ID_STATS check to avncp4_mapi, fix send_generic_cmd() replies
6. Add code for NFS file dumping (TS and MP4) disabled
7. Change JavaScript Bitrate check HD, allow below minimum (1Mbps)

[AVN4XX_052: \(UB4XX_01D, LK4XX_017, BB4XX_009, VSI4XX_05B, CFG4XX_040, RFS4XX_040\)](#)

1. Fix RTSP fragmentation packetization
 - a. Unset marker bit on first chunk of multi-chunk fragment
 - b. Seems to fix RTSP → Wowza → Iphone Streaming
 - c. Seems to fix RTSP → Wowza → Flash Streaming
2. Allow RTSP Announce Destination to be Hostname or dotted Quad IPv4 Address
 - a. Determine which method the user wants based on web input
 - b. Modify CPD structure to add a new 64 Byte character field (cdn_hostname)
 - c. Store hostname in cdn_hostname or IP directly in cdn_addr
 - d. Core checks for valid cdn_hostname and performs nslookup at stream start if found
 - e. Web Generation Code checks for valid cdn_hostname and returns Hostname or IP to web field
 - f. JavaScript pattern matching makes sure that user input is valid for either format
 - g. Valid DNS and Internet Access are required to use Hostname
 - h. Default setting is empty cdn_hostname and 0.0.0.0 IP
 - i. New Config and Methods, small install base, CPD config reset forced

3. Allow Transport Stream Destinations to be Hostnames or dotted Quad IPv4 Address
 - a. Determine which method the user wants based on web input
 - b. Modify stream structure to add three new 64 Byte character fields (Main, Aux1, Aux2)
 - c. Core checks for valid destHost and performs nslookup at stream start if found
 - d. Web Generation Code checks for valid destHost and returns HostName or IP to web field
 - e. JavaScript pattern matching makes sure that user input is valid for either format
 - f. Valid DNS and Internet Access are required to use Hostname
 - g. Default setting is empty destHosts but IP set
 - h. Configuration conversion function should maintain old stream values across struct change update
4. User Configuration Levels implemented and enabled
 - a. Create dynamic login and logout pages (SPC specific)
 - i. New login/logout pages must be used with Configurable User Management
 - ii. Force update/creation of new login page when Kernel/RFS mismatch detected during upgrade
 - iii. No longer allow OEM "custom login upgrade" since it is now created dynamically
 - iv. Pre-existing OEM units should upgrade properly
 - v. Newly turned OEM units should automatically get/create facad
 - b. Create base httpd.conf dynamically every bootup
 - c. Add hooks for controlling console access (not yet implemented)
 - i. Only admin user(s) allowed Console access
 - ii. add_user causes add_console_user if new user is admin
 - iii. update_user causes delete_console_user if was admin but now is not
 - iv. update_user causes add_console_user if was not admin but now is
 - v. update_user causes delete_console_user/add_console_user on password change
 - d. Authentication Models
 - i. Browser authentication based on md5 digest authentication (web server)
 1. after valid login, CGI code submits username to core for level check user_check_www()
 2. level determines what pages are accessible/controllable (level 1)
 3. level also passed to internal CORE queries for check (level 2)
 - ii. API authenticates by passing username/password to proxy agent with cmd
 1. proxy agent checks level through core with check_user_api() then strips user/pass and sends user_level as part of flags1 with original cmd data to CORE
 2. ADMIN Users: NETWORK, ID, UPDATE, SYSINFO, FACTDEF, USERS
 3. CHANNEL Users: VFE, AFE, STREAM, ENCODER, SAP, CPD
 4. START/STOP Users: Start Stream, Stop Stream, Channel Queries
 - iii. Console/Telnet access is based on linux users system and /etc/passwd
 1. only admin user(s) have console access
 2. still limited menu functions available in current console

- e. User Access Levels
 - i. All valid users have access to Main CHANNEL Status Page and ADVANCED section
 - ii. Allow Only Admin User(s) access to all CHANNEL, DEVICE, and ADMINISTRATION sections
 - iii. Allow Channel User(s) access to all CHANNEL functions
 - iv. Allow Start/Stop User (s) to Start, Stop, and View Stream as only non view actions
- f. Do not allow main admin user delete or change level only password change
 - i. Need to make sure there is always a way to get back to admin functions
- 5. Factory default effect on Userbase
 - a. Standard factory_default (Web, Console, API basic) keep userbase in tact
 - b. Complete factory_default (API total, HW switch) default userbase admin/admin
- 6. Fix HD Default Stream Destination if device IP not set, 225.1.2.3 (SD fixed in previous release, HD missed then)
- 7. new HDVFE Mode, complete reset on restart

[AVN4XX_051: \(UB4XX_01D, LK4XX_017, BB4XX_009, VSI4XX_05A, CFG4XX_03F, RFS4XX_03F\)](#)

- 1. MERGE AVN4XX_050 and AVN4XX_04D_I2CFIX_BT2
 - a. Implement new i2c driver usage model through Kernel and Userspace (LK4XX_017 required)
 - b. Bring in HSDI updates for stats, error masking, and loop through mode
- 2. New core check to catch Kernel/RFS mismatch and one click upgrade fix through browser (new BETA area)

[AVN4XX_050: \(UB4XX_01D, LK4XX_016, BB4XX_009, VSI4XX_059, CFG4XX_03E, RFS4XX_03E\)](#)

- 1. Complete User Interface Controls (Disabled)
 - a. Add/View/Delete/Edit Users through Web Interface
 - b. Allow web access only to valid users through httpd.conf
 - i. Created at bootup
 - ii. Dynamically modified with User add/delete/edit
 - iii. Secured using MD5 digest authentication
 - c. Allow API access with core lookup USER_CHECK()
 - i. Consider proxy caching Current/Valid User(s) in Future
 - d. Initial Level experiment, needs further discussion/refinement
 - e. Error Checking
 - i. MAX_SYSTEM_USERS set to 16
 - 1. Core check Table Size in handle_user_cmd() before add_user()
 - 2. Browser check disables "Add Button" if Table Size is full
 - ii. Core Check and disallow empty username before add_user()
 - iii. Core Check duplicate username before add_user()
 - f. Still to be done
 - i. Need to integrate with console login (passwd like httpd.conf)

- ii. Need to define Levels (admin, user, guest)
- iii. Need to determine SPC update path (graphics and login)
- 2. Fix Aux Streaming in HD, set Aux Streams ttl same as Primary
- 3. Fix Format setting to 480i
- 4. Fix HD set to RTSP mode
- 5. Fix HD Stream Mode set
- 6. Fix Balanced Audio Mode and Volume Display Bug

[AVN4XX_04F: \(UB4XX_01D, LK4XX_016, BB4XX_009, VSI4XX_058, CFG4XX_03D, RFS4XX_03D\)](#)

- 1. Add new User Interface controls for RTSP Announce
 - a. RTSP Stream Mode has new options in Browser Config Page
 - b. Specify Announce destination and credentials
 - c. Add new Help contents to describe new options
 - d. Remove cdnconfig.cgi page
 - e. Unit is capable of simultaneous local Multicast and TCP Announce of RTSP stream
- 2. Change order of Stream Mode options in select box for AVN420, move RTSP to bottom
- 3. Closed Caption insertion investigation in AVN420 was successful, extraction is issue, disabled

[AVN4XX_04E: \(UB4XX_01D, LK4XX_016, BB4XX_009, VSI4XX_057, CFG4XX_03C, RFS4XX_03C\)](#)

- 1. Add TCP tunneled Announce RTSP mode to Live555 Library and wrapper application (SD)
 - a. TCP only for now
 - b. Supports both Darwin Streaming Server and Wowza Media Server
 - c. Configured through cdnconfig.cgi for now
- 2. Modify RTSP stream url to add .sdp extention (channel → channel.sdp) (SD)
- 3. Fix SD Factory Default critical hang bug (SD)
- 4. Add HD Aux Stream Functionality (needs bounds testing, ~2x18 or ~3x12) (HD)
- 5. Condense runtime RFS by gzipping mobiapp and gunzipping at bootup to /tmp (SD)
- 6. Update Encoder bitrate defaults to total=7,200 and video=6,120 (HD)
- 7. Update Default TS Multicast Address from 225.0.0.0 to 225.1.2.3 (all)
- 8. Enable configurable Time Server code (all)
- 9. Add code for configurable User Base (disabled) (all)

[AVN4XX_04D: \(UB4XX_01C, LK4XX_016, BB4XX_008, VSI4XX_056, CFG4XX_03B, RFS4XX_03B\)](#)

- 1. Fix pinkish video sometimes seen over HDMI connections (HD)
 - a. Disabled DPP_CSC digital pre-processor color space converter
 - b. Changed i2c reg:0x40,0x67 from 0x98 → 0x90
- 2. Add JavaScript Form Validation to Web Browser/Server update path (all)

- a. Work done by browser before being allowed to submit back to the server
 - b. Check stream destinations on Stream Setup Page
 - c. Check number ranges on Encoder Setup Page
 - d. Check IP addresses on Network Setup Page
 - e. Still disable action buttons on action with Form Checking
3. Add Configurable Time Server and UTC Offset Fields (all)
 - a. #define SUPPORT_CONF_TIMESERVER in avncp4_api.h (disabled)
 - b. Network structure added new 32bit field and reclaimed an unused Byte
 - c. Add Config and Status display the web interface for new fields
 - d. Add new API call to "Sync Network Time" so it can occur by user request rather than only once at bootup
 - e. Allow Core to maintain old Network Values and default TimeServer when config size change is detected
 4. Add more Stream detail to HD Channel Status page to make it more like the SD info
 5. Fix System Kicker console time display to show ticks til reset rather than total ticks
 - a. Add #define SYSTEM_KICKER_DELAY (disabled)
 - b. For testing stream restart/reconnects with Wowza (works well)
 6. Attempt to fix AAC RTSP long term streaming through Qboxstreamer module and Live555
 - a. change profile-level-id in sdp description 1 → 15
 - b. add object MIME type identifier to sdp description objectType=2
 - c. remove range line from sdp description
 - d. Disable audio cbr while in RTSP mode
 7. Attempt to add MD5 Digest authentication to apache to move forward in User management/control
 - a. Also enable reloading of httpd config through sighup
 - b. Also enable inetd time and daytime servers
 - c. These changes are all in the Busybox Source Tree

[AVN4XX_04C](#): ([UB4XX_01C](#), [LK4XX_016](#), [BB4XX_007](#), [VSI4XX_055](#), [CFG4XX_03A](#), [RFS4XX_03A](#))

1. MAJOR TOT Merge, bring over HD fixes from MGB4 Branch/Tag Kernel and RFS
 - a. New Resident Driver model
 - b. Updated pqidma driver interprocess communication
2. Fix VLC plugin launch in MSIE in RTSP mode
3. Remove "Embedded HDMI" as an audio input option for AVN420
4. Fix RTSP stream quality reliability, remove encoder vcbr setting
5. Fix Irregular Audio Bitrate setting crashing HD encoder
 - a. Only allow bitrates divisible by 16 or 56,000
 - b. could still have problems @ 144,176,208,240,272,288,304,336,352,368 kbps
 - c. Also set Mono/Stereo properly based on HD encoder datasheet per audio bitrate
6. Disable AAC Audio Encoding Option in HD encoders (for now)

[AVN4XX_04B: \(UB4XX_01C, LK4XX_015, BB4XX_007, VSI4XX_054, CFG4XX_039, RFS4XX_039\)](#)

1. Fix AVN420 \leftrightarrow Wowza RTSP interoperability
 - a. Modify profile-level-id extraction in mobi Live555 lib wrapper code
 - b. Old mode was advertising invalid profile/constraints/level in .sdp file
 - c. This was likely a bug in many RTSP environments, re-testing should follow
2. Modify SD encoding properties
 - a. Disable encoder cbr setting on video ES
 - b. Enable SEIPT in TS mode, disable in RTSP mode
 - c. Work on using same PID for PCR and Video (disabled)
3. Create Transport Stream over RTP capabilities for SD and HD 4XX Products
 - a. New Stream Type option under Stream Config Page
 - b. RTP Stream is TS Stream encapsulated in RTP Headers
 - c. First Interoperability test (STB / VLC) successful
 - d. Modify SAP task to properly inform clients of the Streaming Mode
4. Modify HD Audio Encoding options to allow analog audio with HDMI video
 - a. Requires new communication between CORE and vfe_drv/uda_drv/UI
 - b. Attempt to automatically save previous audio defaults, while moving to new method
 - c. Support AVN422 and AVN441HD so far
 - d. Need AVN422 to verify AVN422
5. Initial attempt to allow SDI video with analog audio as well (not tested)
 - a. Need AVN443HD SDI Source to implement and verify for AVN443HD
6. Fix HD Auto Format detect label, remove Invalid
7. Disable all webpage actions once a button is pressed
8. Fix "Stream at Bootup" labeling again

[AVN4XX_04A: \(UB4XX_01C, LK4XX_015, BB4XX_007, VSI4XX_053, CFG4XX_038, RFS4XX_038\)](#)

1. Added RTP encapsulated TS code for both SD and HD products
 - a. Currently disabled while still under test
2. Fix Branding
 - a. Modify appearance of Login Pages
 - b. Update SAP defaults, Author and Copyright
 - c. Update Web Page Titles
3. Strengthened validity check of update files and md5 check files

[AVN4XX_049: \(UB4XX_01C, LK4XX_015, BB4XX_007, VSI4XX_052, CFG4XX_037, RFS4XX_037\)](#)

1. Fix PAL encoding capability in Transport Stream Mode

2. Change QTS $\leftarrow \rightarrow$ Core comm model, send entire Channel struct
3. Make RTSP streams repeatable after TS has been used, NTSC and PAL
4. Fix QT plugin page to allow proper size of desired display, IE and Firefox
5. Reduce Log activity in Spoofer session checking
6. Enable Sub Product Code for all AVN4XX products
 - a. Allow control over button color as well
7. Change reply status on start/stop API call when already started/stopped
8. Fix Preamp and Volume values when displayed/modified thru browser or API
9. Change md5 checkpoint during upgrade to match a longer string, less chance for error
10. Modify cdn spoofer to test with Wowza Media Server, changes disabled
11. Fix PCode mis-programming capability when setting over the API
12. Turn off VES SEI PT messages for better QT compatibility in the AVN420 RTSP mode
13. Automatically reset ID and SAP defaults when a configured unit changes subpcodes via the API

AVN4XX_048: (UB4XX_01C, LK4XX_015, BB4XX_007, VSI4XX_051, CFG4XX_036, RFS4XX_036)

1. Fix API wget ACK return based on success or failure of actual downloads
2. Remove 2mbps cap when Aux Streams are enabled (allow full 4mbps x3)
3. Create top level state machine for CDN Spoofer process
 - a. Parse args and jump into state machine
 - b. Create and start session
 - c. Check session via separate socket with Describe queries
 - d. If session appears to be bad, send teardown to both sides
 - e. Go back to step b
4. Fix API wget ACK check in avncp4_mapi client
5. Add ability to set pcodes and factory default AVN2XX units via avncp4_mapi

AVN4XX_047: (UB4XX_01C, LK4XX_015, BB4XX_007, VSI4XX_050, CFG4XX_035, RFS4XX_035)

1. Fix Aux Streams with new TS in AVN4XX SD
2. Change interpretation of Video Scene Change setting (looks like documentation error)
3. Fix Bitrate Calculation in TS Streamer and improve IPC with the core
4. Check for lost frames from the encoder, adjust PCRs when detected
5. Move 4XX SD encoder driver task to Real Time Scheduler in TS mode
6. Attempt to fix RTSP stop and restart at higher bitrates (> 1.5 mbps)
7. Add API WGET Update functionality to the core AVN4XX system
8. Add API WGET Update Client side test code to avncp4_mapi

AVN4XX_046: (UB4XX_01C, LK4XX_015, BB4XX_007, VSI4XX_04F, CFG4XX_034, RFS4XX_034)

1. Rework Transport Stream Task
 - a. Create CBR using null packets and valid PCR spacing and stamps
 - b. Create forked task to handle backend streaming and perform rate shaping
 - c. Enable encoder inclusion of SPS per IDR frame, no more hold and insert
2. Modify Encoder settings for better performance
 - a. Maintain encmode low for (100kbps <= x < 1.5mbps)
 - b. Enable encmode med for (1.5mbps <= x < 3.5mbps)
 - c. Enable encmode high for (3.5mbps <= x < 4.0mbps)
 - d. Modify vrcbuffer settings to allow higher quality at higher bitrates
3. Change Boot Streaming Label to match

AVN4XX_045: (UB4XX_01C, LK4XX_015, BB4XX_007, VSI4XX_04E, CFG4XX_033, RFS4XX_033)

1. Fix System kicker in HD Products
2. Fix Video Uptime Stat in HD Products
3. Fix Contrast/Saturation upper bounds
4. Fix Brightness/Hue upper and lower bounds

AVN4XX_044: (UB4XX_01C, LK4XX_015, BB4XX_007, VSI4XX_04D, CFG4XX_032, RFS4XX_032)

1. Fix update not rebooting with boot streaming enabled
2. Make custom updates verbose to console like latest updates
3. Fix writing update files to /cfg partition (can cause problems, want /tmp)
4. AVN420 RTSP reflection improvements
 - a. Automatic Announce, RTSP Announce, Automatic Unicast working now
 - b. Manual FTP reflections allow for filename control
 - c. Multicast RTSP still working
 - d. Standard RTSP still working
5. Production u-boot UB4XX_01C_prod created to save time and hassle with new units
 - a. MAC address calculated with SLOT id for minimal uniqueness
6. UB4XX_01C renamed writcfg, erase ENV on u-boot update
7. Added oemadmin user to RFS

AVN4XX_043: (UB4XX_01B, LK4XX_015, BB4XX_007, VSI4XX_04C, CFG4XX_031, RFS4XX_031)

1. Fix AVN420 after last build...
2. Fix AVN420 HD detection status when in MPP1700 or MPP200
3. Fix AVN420 Boot Streaming
4. Fix OEM special file removal with RFS updates, move to CFG partition
5. Fix OEM and standard index.html links

6. Add hooks for SDI Driver addition
7. Fix binary display of index page from improper addressing
8. change cdnStart logfile to cdnStart.txt and make accessible through browser
9. AVN420 Automatic Unicast (RTSP Announce) 98% working, doesn't stay up
10. Fix VCLK settings in HD platforms

[AVN4XX_042: \(UB4XX_01B, LK4XX_015, BB4XX_007, VSI4XX_04B, CFG4XX_030, RFS4XX_030\)](#)

1. Fix Boot-streaming for HD with new driver model
2. Fix HD start stream check

[AVN4XX_041: \(UB4XX_01A, LK4XX_015, BB4XX_007, VSI4XX_04A, CFG4XX_02F, RFS4XX_02F\)](#)

1. Major front-end↔core rework
 - a. Advxxxxa_drv is no memory resident
 - b. Communicate with core across pipes
 - c. Alert core when underlying video changes occur
 - d. Receive user updates about config thru core
 - e. Add /opt/vsi/AVNCP4_VFE pipe to fs
2. Enable HDMI Auto format detection
3. make RTSP Announce work with a DSS utilizing MD5 digest authentication

[AVN4XX_040: \(UB420_01A, LK420_015, BB420_007, VSI420_049, CFG420_02E, RFS420_02E\)](#)

1. Add Sub Product Code (u-boot, rfs)
2. Add oem directory to CFG partition for self modifying oem customers
3. Add chk_events.sh for attempt to handle log buffer size
4. Modify Streaming Buffer sizes (shrink)
5. Add user driver hooks to i2c module
6. Add check to reduce overhead in video checks while streaming
7. Turn on Standard Definition in HD Platform
8. Allow low bitrates for SD testing
9. speed up vmon while not streaming

[AVN4XX_03F: \(UB420_019, LK420_014, BB420_007, VSI420_048, CFG420_02D, RFS420_02D\)](#)

1. Add controls for Brightness, Contrast, Saturation, and Hue
2. Clean up HDMI video detection state machine
3. Turn off HDMI HPD when core reboots to avoid confusing HDMI source device
4. Add restart conditions and stats for VFE_sync_loss, ENC_fifo_overflow, and ENC_errors
5. Remove Upgrade CFG option to avoid problems
6. Clean up Advanced/Stats page for HD products

7. Add VA→PA adtrans capability to zappa/trey syscall
8. Add PortB, PortD, and PortE controls to zappa/trey syscall
9. Add verify step to console IP Wizard

[AVN420_03E: \(UB420_018, LK420_013, BB420_007, VSI420_047, CFG420_02C, RFS420_02C\)](#)

1. Fix API update capability and performance
2. Fix AVN420 main web page display error
3. Fix Factory Default while streaming crash error
4. Fix DHCP DNS configuration, allow updates while in DHCP mode
5. Fix API reply bug after factory default

[AVN420_03D: \(UB420_017, LK420_013, BB420_007, VSI420_046, CFG420_02B, RFS420_02B\)](#)

1. Fix HD Video glitching caused by heavy system load
 - a. User-space sending process could have more than one buffer to process in a single run but was not checking for such a condition. This resulted in missing buffers (chunks of stream data) during system busy times.
 - b. This has been corrected by checking the number of buffers handled by the return of the kernel driver, and processing them all in a loop rather than assuming a single buffer and returning execution.
2. Fix Event Log redundancies and add hook to use circular buffer in future
3. Report proper resolutions and inputs in Event Log
4. Fix HDMI Negotiation and Video Detection

[AVN420_03C: \(UB420_017, LK420_013, BB420_007, VSI420_045, CFG420_02A, RFS420_02A\)](#)

1. Update encoder IC firmware for HD Encoder Component
2. Compress encoder IC and store in rootfs with symbolic link
3. Core must decompress encoder IC and place where link points (/tmp)

[AVN420_03B: \(UB420_017, LK420_013, BB420_007, VSI420_044, CFG420_029, RFS420_029\)](#)

1. Expand Supported Video Formats for HD Platforms:
 - a. Support 59.94/60/50 Hertz Systems
 - b. Support HD 1080p@24 fps along with 1080i and 720p
 - c. Support SD 720x480 (NTSC) and 720x576 (PAL)
2. Update EDID advertisements based on config in HDMI mode
3. Fix internal clocking configuration to match incoming video
4. Add Component RGB and YPbPr options to input list
5. Enable auto-detection between 59.94 and 60 Hertz systems
6. Fix Bootup hdvfe driver call path

7. Lockdown Console for all but the Network Wizard
8. Clean up AUTH model for incoming UDP API requests
9. Create Core driven VFE_RESET to allow vmon to trigger calls with proper context

[AVN420_03A: \(UB420_017, LK420_013, BB420_007, VSI420_043, CFG420_028, RFS420_028\)](#)

1. Enable Configurable option to allow RTSP Multicast Streams on the AVN420
2. Auto Spoof/Start RTSP Stream in Multicast Mode and generate dynamic mcast.sdp
3. Modify http server to treat .sdp as application/sdp, added httpd.conf to RFS
4. Add plugin links for RTSP QuickTime plugins Unicast and Multicast
5. Fix VLC Plugin for AVN4XXHD Products
6. Fix PMT increment issue when MPEG Audio is selected
7. Fix VMON Stream Restart when HD Encoder Error is detected
8. Fix Initial Discover Handling
9. Fix Video Status Reporting on Web Page and Video LED Status
10. Disable View Button when 1080i Format is selected (VLC can't handle it)

[AVN420_039: \(UB420_017, LK420_013, BB420_007, VSI420_042, CFG420_027, RFS420_027\)](#)

1. Fix RFS – CFG system change conflicts, clean/update img and md5 links in /cfg area
2. Modify Image and Tag Names to 4XX instead of 420 for all
3. Fix HDMI Video Reporting (no video) check Resolution after Sync
4. Modify HDMI EDID table
5. Modify /cfg partition for new update image name scheme 420 → 4XX
6. Separate HD and SD Release/Update version control
7. Fix mislabeled buttons Output and Decode
8. Fix sub-version reporting, ignore previous saved sv data

[AVN420_038: \(UB420_017, LK420_013, BB420_007, VSI420_041, CFG420_026, RFS420_026\)](#)

1. Fix RFS_025 / Kernel_012 mismatch that kills core, allow new RFS to update kernel
2. Remove ability to set Total and Video Bitrates, now just set Total
3. Modify U-Boot update procedure
 - b. Force/allow u-boot update during production
 - c. Move update smarts out of u-boot environment area (greater flexibility)
 - d. Make update run in 2 parts, if part 1 fails, no blocks should get erased
 - e. Allow boot press key to get by a locked down u-boot
4. Modify avncp4_api authentication model, all commands send/require Auth
5. Added 4 new sub version ids to ID structure

6. Make Audio settings updatable while running
7. Fixed internal audio settings when Video Input changes are made and at startup
8. Re-Fixed login timeout change from 60 to 5 seconds
9. Normalize stream destination to address configured via Network Config Wizard
10. Allow audio to switch back and forth between HDMI and i2s to follow Video Inputs
11. Only allow Stream start if valid video is currently detected, apply to boot stream as well

[AVN420_037: \(UB420_016, LK420_012, BB420_007, VSI420_040, CFG420_025, RFS420_025\)](#)

1. Fix Upgrade through web browser, make reboot actually happen
2. Add basic support for 1080i at 50 Hertz, disabled for now
3. Turn up VFE Clock Drive Strength
4. Add in support for actual HD Product Codes, fade away from HD_BU
5. Make encoder start up load firmware and run in one shot, rather than load firmware at bootup and encode when stream starts
6. Add poll_hd_encoder to VMON to detect HD encoder XError and attempt to correct
7. Fix API Firmware update throughput
8. Fix API SYS Info update capability
9. Implement numerous client API functions for testing avncp4_mapi
10. Implement stream restart through high level restart
11. Update Stream Restart functionality, allow multiple levels (high, low)
12. Fix Reset Default buttons from Web Browser

[AVN420_036: \(UB420_015, LK420_011, BB420_007, VSI420_03F, CFG420_024, RFS420_024\)](#)

1. Fix Upgrade Capability from 026 → 036 by not running certain services when a mismatch exists between Root File System / Linux Kernel / and U-Boot
This should allow system to run well enough to complete update steps once started
2. HD Remove memcpy from streaming data path (use shared memory instead)
3. HD Fix RFS Corruption
4. HD Shrink IDMA system buffer size in half, but increase from 32 to 48
5. Fix VMON LED reporting
6. Fix HD Boot Streaming
7. Fix UDP API mishandling the first socket recv
8. Fix UDP API Authorization handling
9. Move VMON task from system daemon to core service
10. Verify ability to send Multicast RTSP (not enabled yet)

[AVN420_035: \(UB420_014, LK420_010, BB420_007, VSI420_03E, CFG420_023, RFS420_023\)](#)

1. U-Boot: modify HD Encoder read/write timing (needs trey version 3.1)
2. Fix SAP broadcasts in both SD and HD products
3. Fix Aux Stream Port setting through Console
4. Add Active Video Status to Main Status Page
5. Fix All Start/Stop Buttons through Browser Pages
6. Make AVN4XX Login Page generic for all products
7. Modify order of components on Browser Update Page
8. Update Active Timer displays (H:M:S) on statistics page
9. Fix HD in MPP200 Video LED functionality
10. Make HDMI Hot Plug Detection conditional upon HDMI input being selected
11. Modify HD Front End Output power drive strength (turn back down)

[AVN420_034](#): ([UB420_013](#), [LK420_010](#), [BB420_007](#), [VSI420_03D](#), [CFG420_022](#), [RFS420_022](#))

1. Fix HD Audio issue: program max part and change enc reg 01802 → 0x0000
2. Allow changing of HD Video Format through Browser Interface
3. Enable HD VFE checking (i2c) and Video LED control
4. Implement VFE input format auto-detect mode for HD products
5. Remove SD bringup test application to save space on RFS (libs next)
6. Add API Firmware Update hooks for latest and custom upgrades
7. Add API hooks for collecting statistics (VFE, Thermal)
8. Fix Status display pages in the Console
9. Add SAP control to Console
10. Add Aux Stream control to Stream section of Console
11. Fix Video Brightness range through console now 0-255
12. Add System Kicker control to the Console
13. Modify SAP defaults to include HD in name of HD products
14. Add initial Console support for HD products
15. Implement SAP for HD products
16. Implement Thermal Sensor reading/stats through VMON and Core
17. Implement Advanced Statistics display/clear via Browser
18. Implement Event Log page under Admin for both SD and HD products
19. Change HD IDMA BAR/OR to 32 bits
20. Change Kernel IDMA driver to use 32 bit transfers
21. Change HD Encoder to send data Parallel not Serial for new boards
22. Allow HDMI input through web browser
23. Add EDID programming to HDMI receiver
24. Add HDMI hotplug support (up/down)

25. Verify basic HDMI functionality (video and audio working)

AVN420_033: (UB420_012, LK420_00E, BB420_007, VSI420_03C, CFG420_021, RFS420_021)

1. Change VMon to dynamically detect Platform and Chassis
2. Add new Browser Channel control pages for HD platform control
3. Add Major rework to HD control task:
 - a. Boot and Load codec firmware at Core Startup
 - b. Stream Start starts task, stays alive until stream stop
 - c. Resets to Idle state between launchings
4. Add check to HD Streamer application to know when to shut down
5. Fix DHCP control through web page
6. Add function for constant dhcp validity checking
7. Console Fixes:
 - a. Fix Network control/config including DHCP toggle
 - b. Fix extra chars created in modifying ID info
 - c. Add Note to Console channel menus that Stream must be stopped
 - d. Also don't allow changes if not stopped
 - e. Fix Console Menu to always get current data on re-display

AVN420_032: (UB420_012, LK420_00F, BB420_007, VSI420_03B, CFG420_020, RFS420_020)

1. Fix Mpeg Audio encoding to allow stereo in addition to mono
2. Change logging model in avncp4_udp_proxy to match the new core style
3. Add UDP API call for Check_Authorization
4. Change the way responses are generated when UDP API Auth Fails (don't involve core)
5. Make vmon blinking dynamic based on product code and chassis
6. Fix print display in avn420_led user function
7. Re-enable vfe check through core
8. Remove avncp4_udp_client (replaced by avncp4_console_client)
9. MOBI UPDATE:
 - a. Attempt to merge encoder firmware up to RD4.3.1
 - b. Skipping the kernel driver to move ahead for now
 - c. Appears to fix MPEG Stereo Audio
10. Kernel Changes:
 - a. Change avn420_led syscall to cover AVN4XXHD config as well
 - b. Try to maintain AVN4XXHD slot gpios as outputs through idma1_init

AVN420_031: (UB420_012, LK420_00E, BB420_007, VSI420_03A, CFG420_01F, RFS420_01F)

1. Kernel Changes
 - a. Fix Multicast Filtering in Ethernet Driver
 - b. Remove boot up debugging prints
 - c. Remove cpld alarm light blink
2. User Space Changes:
 - a. Add avncp4 control address to multicast filtering list
 - b. Add code for allowing SYSINFO updates (still in progress)
 - c. Clean up new core logging system

[AVN420_030: \(UB420_012, LK420_00D, BB420_007, VSI420_039, CFG420_01E, RFS420_01E\)](#)

1. Back to AVN420 Default behavior (not AMD)

[AMD420_030: \(UBAMD_012, LK420_00D, BB420_007, VSI420_039, CFG420_01E, RFS420_01E\)](#)

1. Specific UBAMD created for updating AVN420 units to VIDi4 units

[AVN420_02F: \(UB420_011, LK420_00D, BB420_007, VSI420_039, CFG420_01E, RFS420_01E\)](#)

1. Added new core_debug function to handle all prints/messages from the core
2. Changed AVNCP4_CORE: messages to be product specific, else generic
3. Changed name of avncp4 core service daemon, aliased to controld
4. Removed references to AVN420 and qhal in encoder chip driver code

[AVN420_02E: \(UB420_011, LK420_00D, BB420_007, VSI420_038, CFG420_01D, RFS420_01D\)](#)

1. Removed AVN420 product code name from sub products on console/telnet display
2. Cleaned up version checking on browser update page
3. Fix volume reporting/setting through console interface
4. Added ability to communicate through mobiapp socket from browser interface (disabled)

[AVN420_02D: \(UB420_011, LK420_00D, BB420_007, VSI420_037, CFG420_01C, RFS420_01C\)](#)

1. Fixed ability to set the Stream Bitrate to something other than 2000kpbs
2. Fixed CDN Configuration Page

[AVN420_02C: \(UB420_011, LK420_00D, BB420_007, VSI420_036, CFG420_01B, RFS420_01B\)](#)

1. U-Boot modified:
 - a. Add back-writing of sub-pcode based on AVN420 PCode as well
2. Userspace modified:
 - a. Perform actual u-boot version check, rather than using educated guess
 - b. Fix version display

3. Update Procedure, must be RFS then Linux Kernel, then U-boot (then default ID settings and save)

AVN420_02B: (UB420_010, LK420_00D, BB420_007, VSI420_035, CFG420_01A, RFS420_01A)

1. U-Boot modified:
 - a. Sub Pcode added, back writing of Platform ID based on PCode added as well
 - b. Cleaned up AVN/VSI references on Sub Product Coded Units
2. Kernel modified:
 - c. Removed kernel state change prints from i2c driver
3. Userspace modified:
 - d. Dynamic control added to UI's and core to allow Sub Product Branding
 - e. AMD oem product ready for initial display and test
 - f. Allow Sub-Products to do some specific configuration, auto and manual
 - g. Special Files for sub-products stored on www.vsicam.com (image and login page for now)

AVN420_02A: (UB420_00F, LK420_00C, BB420_007, VSI420_034, CFG420_019, RFS420_019)

1. U-Boot modified:
 - a. control Platform, Pcode, Serial Number, and holder for Sub Pcode
 - b. Dynamic Memory Map based on Platform ID
2. Kernel modified:
 - a. I2c driver model cleanup
 - b. Idma1 driver module added for AVN4XXHD
 - c. Move memory mapping from kernel to userspace
3. Userspace modified:
 - a. Move AVN4XX encoder device memory area
 - b. Change AVN4XX encoder device name to encoder4XX
 - c. Create AVN4XXHD encoder device named encoder4XXHD
 - d. Create proper cpld labels based on platform 4XX=zappa, 4XXHD=trey
 - e. Attempt merging of Web Access Code
 - i. AVN4XX should still work normally
 - ii. AVN4XXHD should have some basic functionality (start)
 - f. Create AVN4XXHD proto model
 - iii. Create new VFE for HD input, new driver and core path
 - iv. Create new encoder for HD, new driver and core path
 - v. Add new images to RFS (pqidma1.o and fuji.bin)

AVN420_029: (UB420_00E, LK420_00B, BB420_007, VSI420_033, CFG420_018, RFS420_018)

1. Fix rtsp server to properly serve NTSC/PAL and AAC/MPG and A/V

2. Fix cdnstart to allow WebCast of NTSC/PAL and AAC/MPG and A/V
 - a. Allow cdn webcast unit to work with local Darwin (Darwin setup required)
3. Fix hard coded 90000 → 48000 sample rate is rtsp server (Hansun STB rtsp interop)
4. Clean up flags for setting process priority, debugging, and features through the core
5. Fix UDP API for set commands

AVN420_028: (UB420_00E, LK420_00B, BB420_007, VSI420_032, CFG420_017, RFS420_017)

1. Turn off Console Debug of Core Communication
2. Crop Top 2 Lines of Video Input/Output

AVN420_027: (UB420_00E, LK420_00B, BB420_007, VSI420_031, CFG420_016, RFS420_016)

1. Fix Factory Default through Web Browser, respect No/Cancel
2. Modify Factory Default to respect CDN Lockdown config
3. Add Aux Streams back into code base
4. Modify debug modes/flags for development testing
5. Add Streamer Agent/Pipe for core communication
6. Conditionally start RTSP with appropriate AV settings
7. Start multicast API client implementation/verification
8. Clean up Transport Stream Out Interface
 - b. Increase TS PSI and PCR send rates
 - c. Add flag to allow/attempt CBR TS with Null Padding (off)
9. Add flag to allow Access Unit Delimiters before each picture (off)

AVN420_026: (UB420_00E, LK420_00B, BB420_007, VSI420_030, CFG420_015, RFS420_015)

1. Add upgrade capability to Web Browser
 - d. Current/Latest Version Check
 - e. Upgrade Latest
 - f. Upgrade Custom
2. Fix CDN Units reverting to TS Mode
 - g. Reset Defaults from Stream Page will honor a cdn_lockdown

AVN420_025: (UB420_00E, LK420_00B, BB420_007, VSI420_02F, CFG420_014, RFS420_014)

1. Allow Configured DHCP State
 - a. Modify ip_wizard in console to allow DHCP
 - b. Allow for alternate config in case DHCP fails
 - c. Allow setting of DHCP via Web Browser
 - d. Remove DHCP Debug prints from busybox

2. Fix SAP Announcements with VLC
 - a. Allow SAP Configuration via Web Browser
3. Update Audio Defaults

AVN420_024: (UB420_00E, LK420_00B, BB420_006, VSI420_02E, CFG420_013, RFS420_013)

1. Fix CDN Functionality
 - a. Make Special Management page for CDN Config
 - b. Allow for CDN Lockdown to limit end user changes
 - c. Allow automatic uploads of SDP descriptions
2. Break out Web Code Functionality, create wwwlib.a
3. Create hooks for creating Stream Files on External Storage
 - a. Move common code to common.c and create lib