

Mark5 OS & Software Development

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Objective

- State of Mark5's OS
- Mark5A/B Application Software
 - SDK9
 - Version Info
- Maintenance
- Mark5 Software / Status

State of Mark5's OS

- Latest Debian Distribution
 - New stable release (Jessie - 8.0)
 - 4/19/2015
 - Kernel version 3.16
 - AMD 64 bit , i 386
- Planning on Debian Wheezy
 - AMD 64 bit (under test)
 - April 2015 -> Old Stable
 - SDK9.4
 - Kernel 3.13.5 support
 - Verified that e-VLBI performance issues resolved
 - Mark5B I/O Driver available



State of Mark5's OS

- Many systems are running with Debian Etch
 - OS distribution many systems use is no longer supported
 - Last patch available on Jan 2011
 - Required for real-time e-VLBI
- Last 5B+ systems shipped with Debian Lenny
 - Mark5C OS distribution
 - SDK 9.0
 - Need to upgrade firmware / SDK
 - Install application

State of Mark5's OS

- Why have sites upgraded their OS's
 - Security concerns / maintainability
 - Mark5 is connected to a network
 - Performance improvements
 - Linux kernel network stack improvements
 - Network interface cards (NICs) support
 - » 1 Gbps / 10 Gbps NIC
 - Other subsystems
 - Disk
 - Raid, etc
 - New motherboard support
 - Old distributions do not support chipsets
 - Bug fixes / capabilities Streamstor controller card

Mark5 Application Software

- Mark5A application
 - Converted to support SDK9.2A / 9.3A
 - Mark5A / 5B / 5B+
 - Notes
 - Mark5B and Mark5B+ application
 - DIMinio (case sensitive)
 - » dimino will point to old software if installed
 - Match the latest command set supported
 - Jive5AB
 - Used in many places for geodetic observing

Mark5 Application Software

- Mark5A (cont)
 - e-VLBI bug
 - disk2net bug resolved
 - Mark5B+
 - Mark5B I/O driver updated for Wheezy
 - Need to update software for SDK9.4
 - Used a legacy mode that is no longer supported
 - Has not been supported since SDK7
 - Ouch!

Mark5 Application Software

- What it is:
 - One debian package
 - Mark5A/5B/5B+ application
 - mark5_3.0.0-i386.deb
 - mark5_3.0.0-amd64.deb
 - Same code, post install script creates proper command to start application
 - streamstor_9.4.0-i386.deb
 - streamstor_9.4.0-amd64.deb
 - Installed / maintained through a standard package manager
 - dpkg -i

SDK 9 Upgrade

- Recommended method to updated firmware for Amazon controller cards
 - e.g. `ssflash -u sdk9.X.ssf`
 - 5B+ ok
 - 5C problems
 - I still use `ssflash` with individual bib files on Mark5Cs
 - I have had problems

Mark5 Support

- At last TOW 2013
 - Haystack committed to support Mark5's through September 2015
 - Then it will be best effort support (community)
 - Hardware / Software
 - Older systems (XF2 / V100)
 - Problematic as some parts are no longer available
 - SDK's firmware no longer support controller cards
 - Consider upgrading to more modern systems before this date e.g. Mark6
 - Upgrade should be coordinated with the various observing networks (IVS, EVN, NRAO)
 - to avoid operational bottlenecks due to equipment mismatches.

Mark5 Support (cont)

- For all systems currently using traditional analog backends
 - Convert to a digital backend system (DBBC, RDBE, CDAS, ADS3000, etc) that supports native 10GigE formatted output.
 - Mark 5B/5B+ users
 - Use a FILA10G unit to convert the VSI-H signals (that go into the Mark 5B/B+ system) to VDIF format on 10GigE
 - Contact Gino Tuccari g.tuccari@ira.inaf.it for more information about FILA10G
 - Mark 5A users
 - Find someone with an unused "VSI-H" formatter (which is a modification of the standard Mark 4/VLBA formatter)
 - Create a VSI-H data stream,
 - Option is not compatible with new VGOS systems
 - May not be economically attractive.

SDK Information

SDK Version	Shared Library version number	cc5A/cc5B linked library	Debian Package version
9.4	libwdapi1150	-lwdapi1150	streamstor_9.4.0-amd64.deb
9.3	libwdapi1110	-lwdapi1110	streamstor_9.3.1-i386.deb
9.2	libwdapi1031	-lwdapi1031	streamstor_9.2.1-i386.deb
9.1	libwdapi1021	-lwdapi1021	streamstor_9.1.0-i386 .deb
9.0	libwdapi1011	-lwdapi1011	streamstor_9.0.0-i386 (5c)
8.3beta	libwdapi1001	-lwdapi1001	streamstor_1.2.2-i386 .deb
8.3	libwdapi1001	-lwdapi1001	streamstor_1.2.1-i386.deb
8.2	libwdapi921	-lwdapi921	streamstor_1.1.4-i386.deb
8.1	libwdapi910	-lwdapi910	NA
7.6	libwdapi801	-lwdapi801	NA
6.X	libwdapi521	-lwdapi623	NA

Maintenance

- Recommend signing up for
 - **debian-security-announce mailing list**
 - <http://lists.debian.org/debian-security-announce/>
 - Informs the users about security problems by posting security advisories about “all” Debian packages on this list.
- Alternative
 - Update the package list weekly
 - Upgrade the required packages if any

Mark5 OS and e-VLBI

- Why have we not upgraded to new OS sooner.
 - Real-time eVLBI issues related to Mark5's
 - Jive5AB
 - Discovered by JIVE (Harro Verkouter)
 - At issue CPU usage over PCI bus transfers with small block size
 - Inhibits corner turning feature to maximize channel bandwidth
 - OS (kernel) / SDK9 dependent
 - Good OS: Debian Etch / Lenny
 - Bad OS: Debian Squeeze

Mark5C

- Software
 - Jive5ab supports Mark5C
 - Integrated with the FS
 - DRS is still supported
 - last release is version 0.9.14
 - NRAO and VLBA use DRS
 - Moving to SDK9.4 support and 64 bit kernel
 - Will not be supported by FS

Mark5C (cont)

- Gating data with 5C's
 - Recording starts immediately after command is issued
 - 2 Gbps there is not problem gating using the 5C
 - Note :
 - 50% probability to start on non - Mark5B header
 - scan_check problems
 - 4Gbps delayed response to record=off command
 - Daughter board is at max clocking capacity

Questions ?