Integrating *swift* on a low-cost CE platform

http://www.p2p-next.eu

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Objectives of Talk

- Our goals for *swift*

- Introduce **NextShare**^{TV}

  - Hardware capabilities
  - Software stack

- Present our experience **integrating and testing** *swift*

- Present some **performance statistics and graphs**

Our goals for *swift*

- **Ubiquitous platform** for scalable content delivery supporting Live & OnDemand usage

- Facilitation of a **sustainable business model** that **maxmises efficiency** of **Open Internet** resources whilst **minimising operating costs**

- **Standards** for codecs, security and metadata that **allow trusted and wide-ranging media ecosystem** to develop

How does CE change things?

- Community of **CE peers** in early stages of life
- United by a common **Open Standard**
- **Interoperability** between multiple vendors
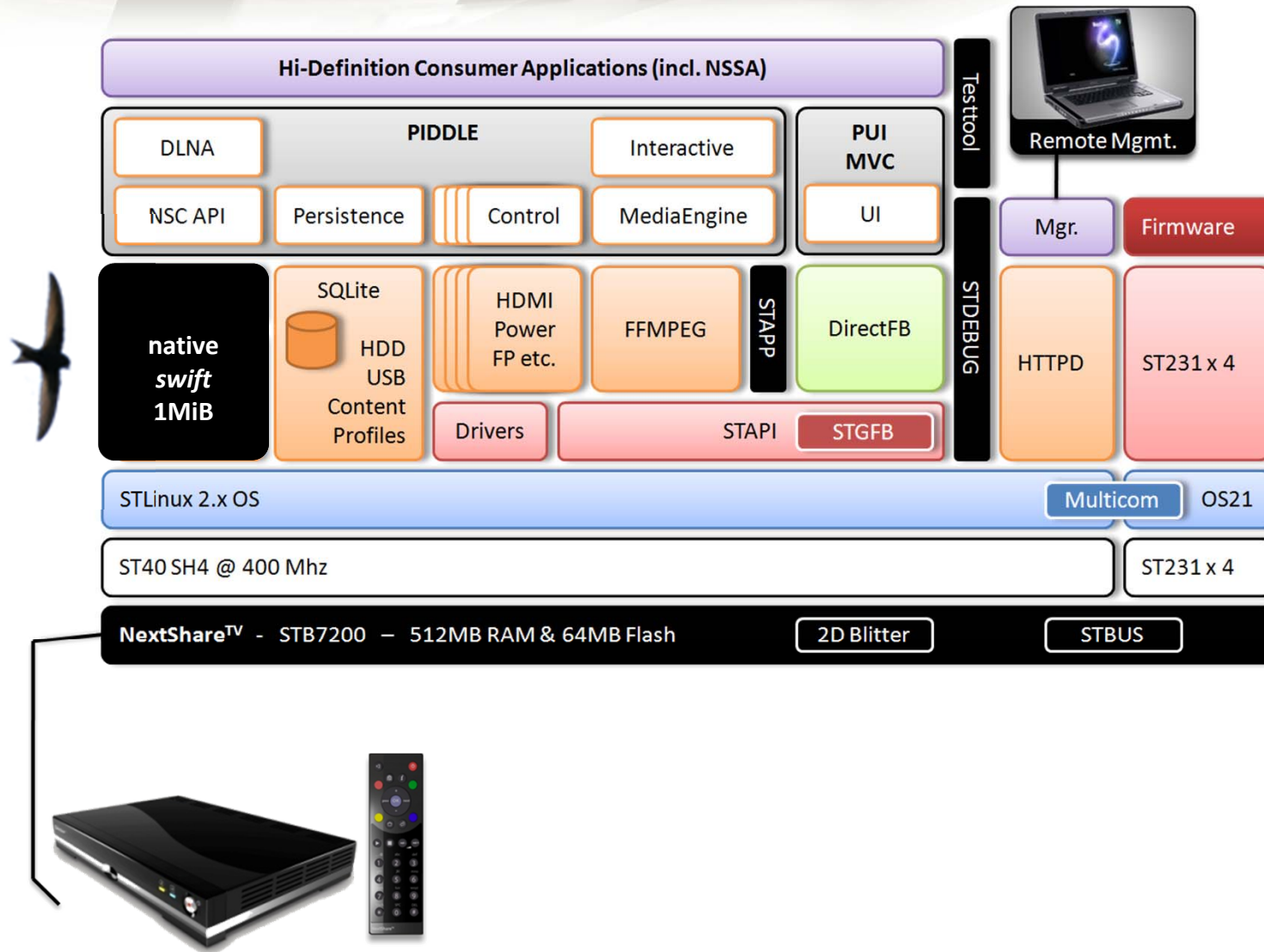- **Ubiquitous** (100s millions of TVs)
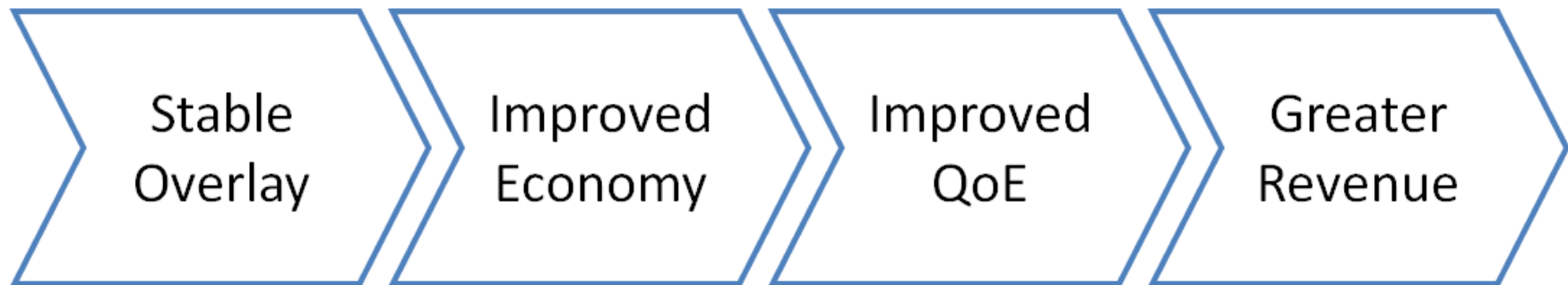
Stable Overlay	Improved Economy	Improved QoE	Greater Revenue

Pioneer

NextShare™

NextShare^{TV} – the device

Software Stack
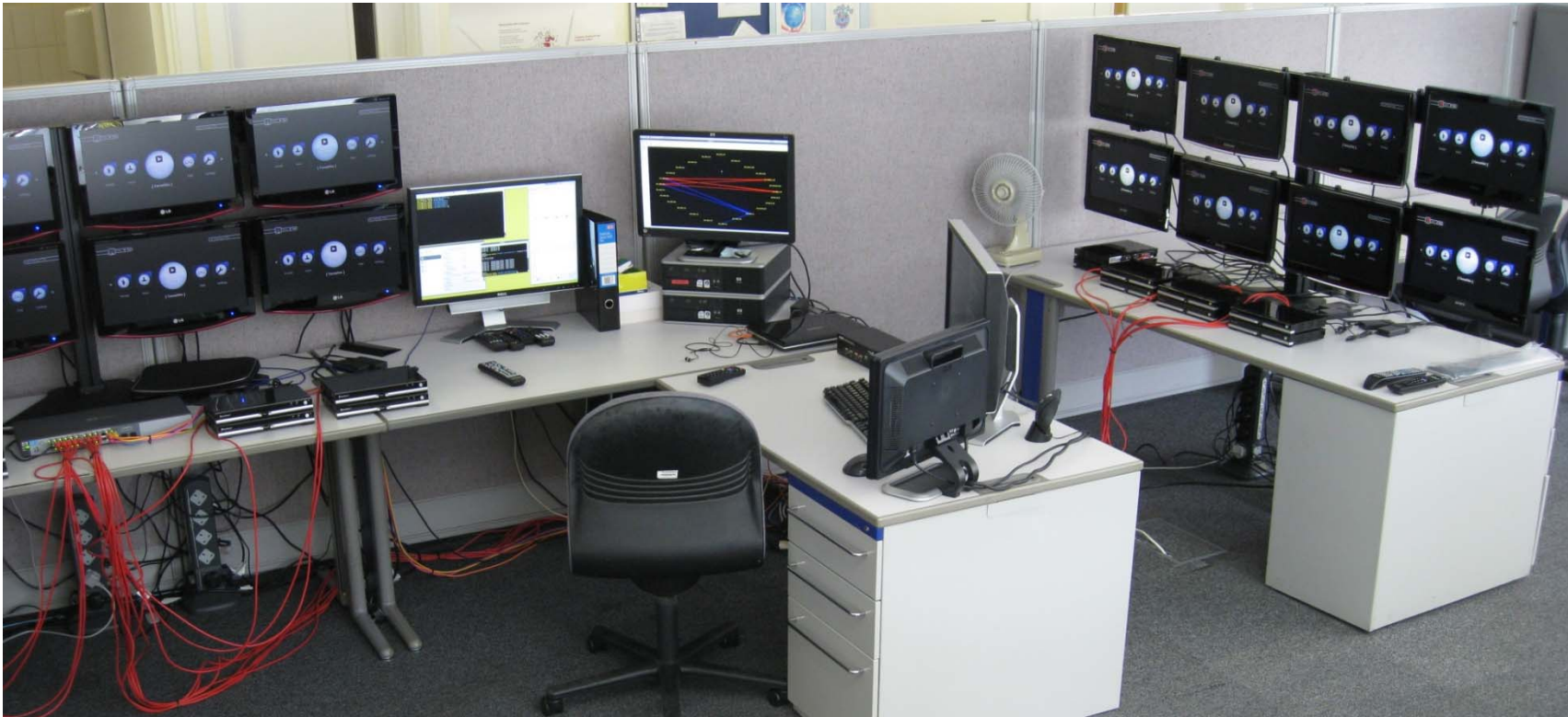
Integrating *swift* services

Atom based feed-of-feeds consisting featured content and services
e.g.
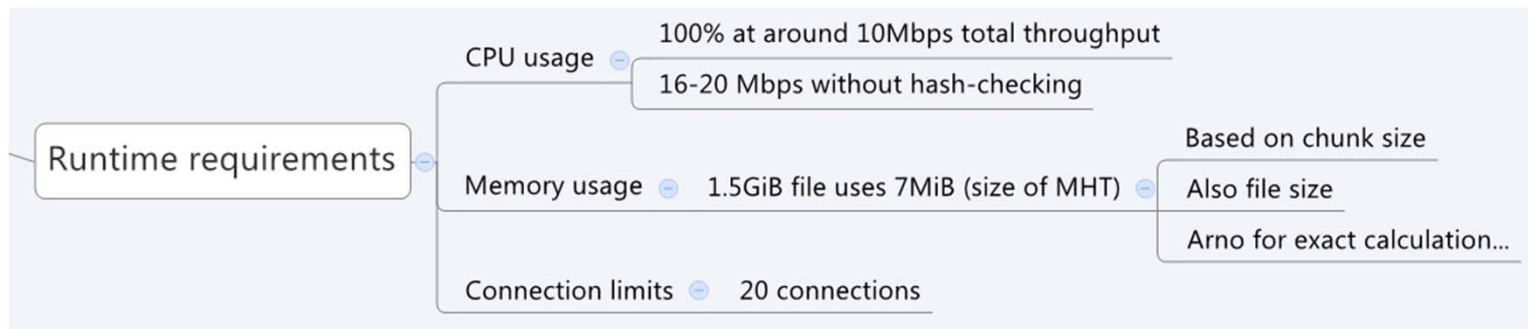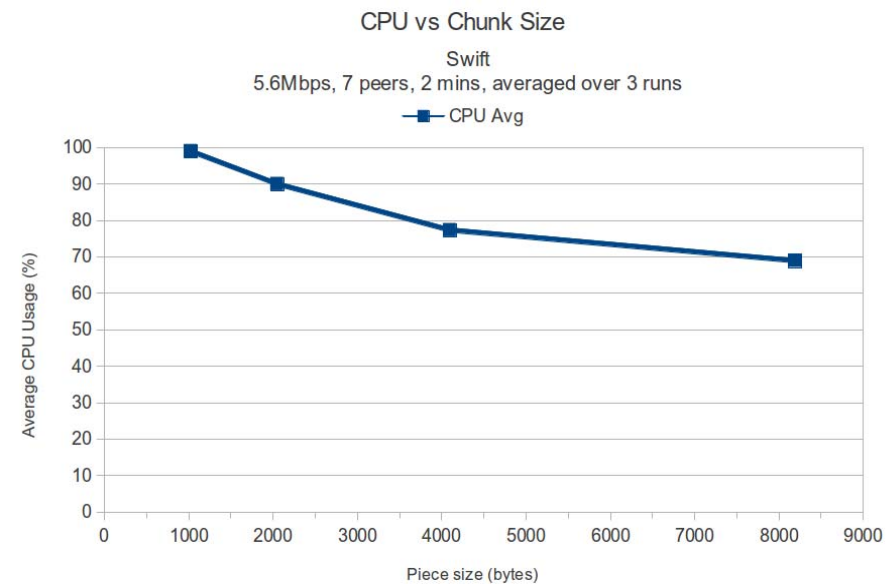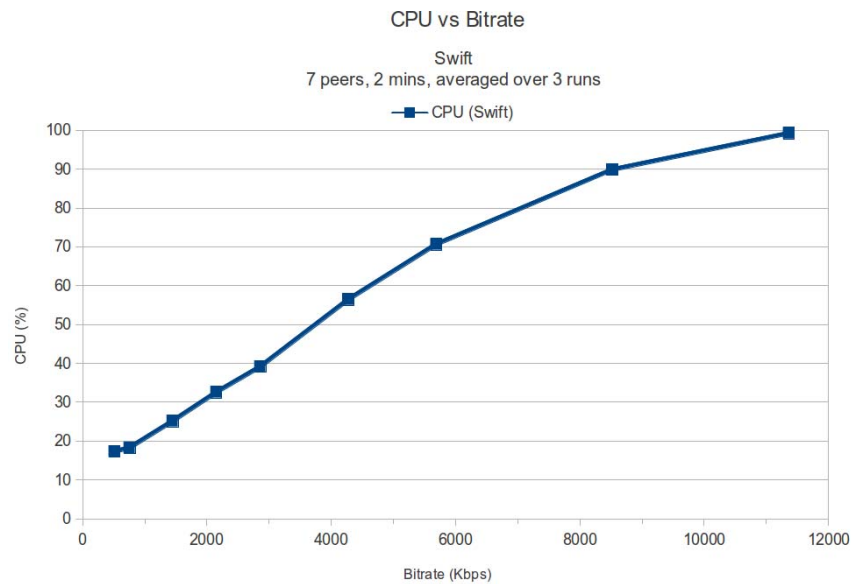tswift://swifttracker.lancs.ac.uk:7777/21b8fef28ba88c9db97063da8fc0302ed2bba1d9$8192@2485

PDD's system testing & QA framework

- 16 x STB + virtualised NextShare^{PC} peers + ingest peer

- In-depth packet capture and analysis / Real-time analysis

CPU Usage (%)

CPU vs Bitrate
Swift
7 peers, 2 mins, averaged over 3 runs

─■─ CPU (Swift)

CPU (%) vs Bitrate (Kbps)

CPU vs Chunk Size
Swift
5.6Mbps, 7 peers, 2 mins, averaged over 3 runs

─■─ CPU Avg

Average CPU Usage (%) vs Piece size (bytes)

Runtime requirements

- CPU usage
  - 100% at around 10Mbps total throughput
  - 16-20 Mbps without hash-checking
- Memory usage — 1.5GiB file uses 7MiB (size of MHT)
  - Based on chunk size
  - Also file size
  - Arno for exact calculation...
- Connection limits — 20 connections
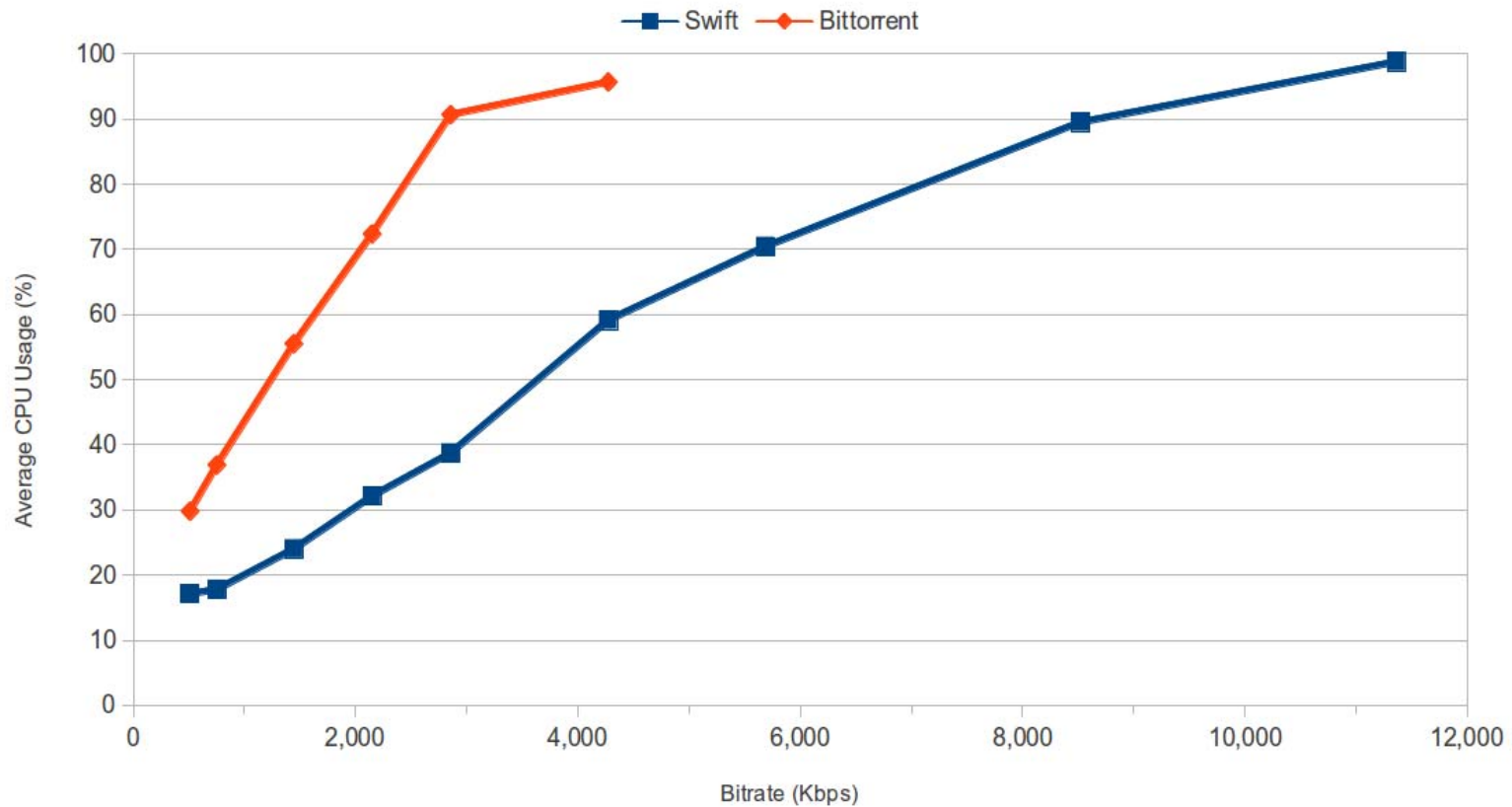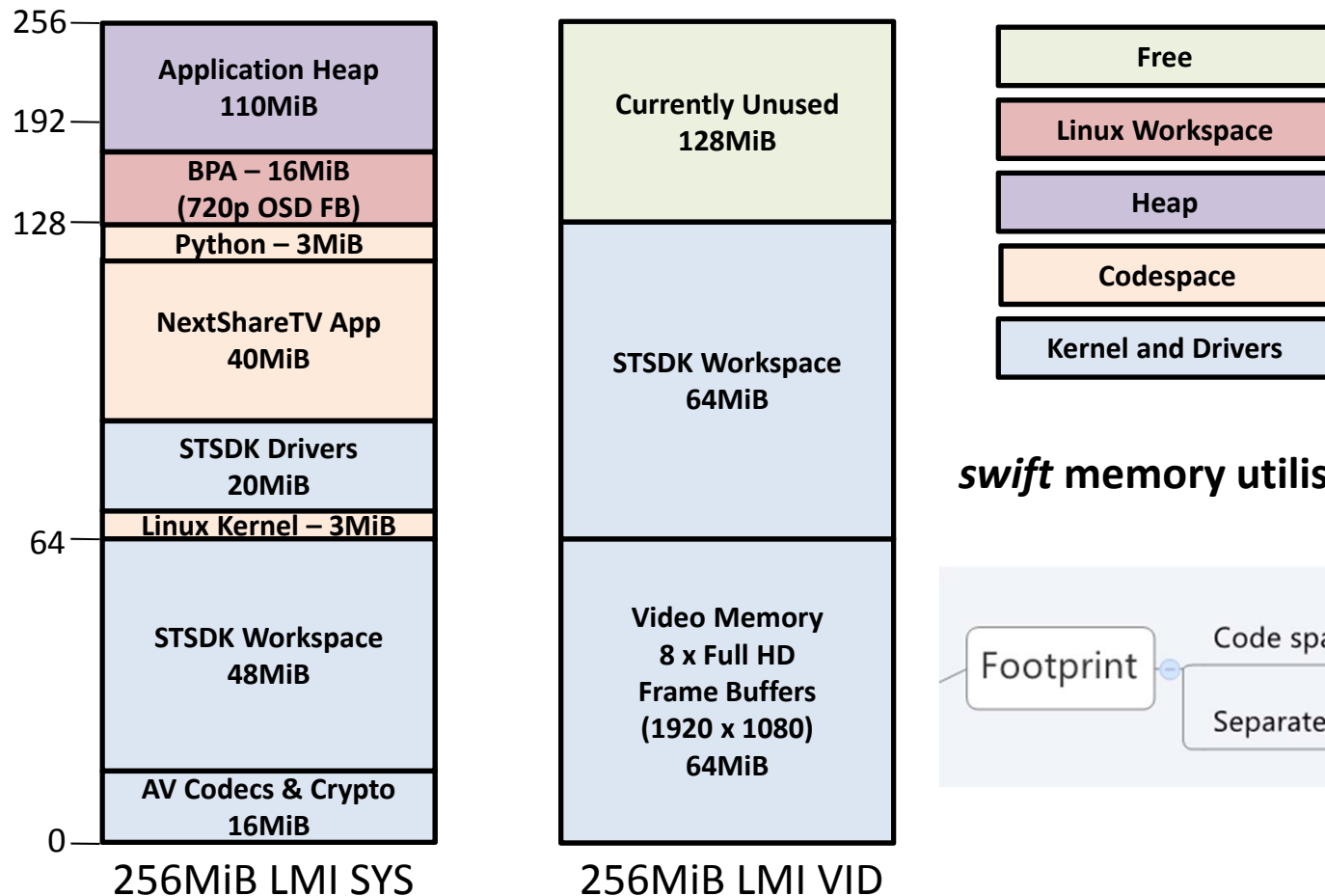
swift vs BT on NextShare^TV

CPU vs Bitrate

Comparison of Swift and Bittorrent
7 peers, 2 mins, averaged over 3 runs

NextShare^{TV} Memory Map

256 — Application Heap 110MiB

192 —

BPA – 16MiB (720p OSD FB)

128 — Python – 3MiB

NextShareTV App 40MiB

STSDK Drivers 20MiB

Linux Kernel – 3MiB

64 —

STSDK Workspace 48MiB

AV Codecs & Crypto 16MiB

0 —

256MiB LMI SYS

Currently Unused 128MiB

STSDK Workspace 64MiB

Video Memory
8 x Full HD
Frame Buffers
(1920 x 1080)
64MiB

256MiB LMI VID

- Free
- Linux Workspace
- Heap
- Codespace
- Kernel and Drivers

swift memory utilisation

Footprint — Code space — 1MiB — 3KiB data / 78KiB bss

Separate process
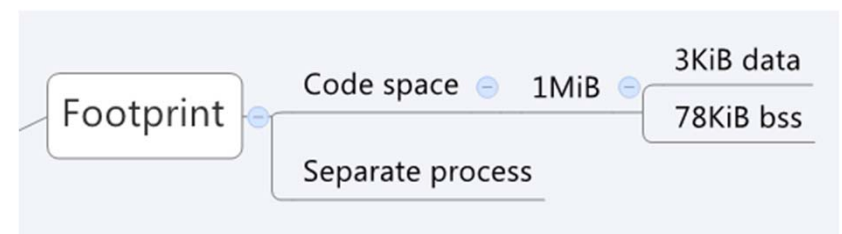
Thanks for listening

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