Intel NUC

► CPU/GPU are Intel architecture so wide software support
► Models range in capabilities but typically higher power and cost than ARM devices (e.g., Raspberry Pi):
  ■ N3050 Celeron Dual Core with 4GB DDR2 RAM to i7 Quad Core with 16 GB RAM
  ■ $200 - $600

► NUCs are suitable for all deployments but are significantly more expensive than alternatives like the Raspberry PI:
  ■ Use as a server (VC managing multiple VOLTTRON nodes)
  ■ large deployment is usually
Raspberry Pi 3

► SoC: Broadcom BCM2837 (roughly 50% faster than the Pi 2)

► CPU: 1.2 GHZ quad-core ARM Cortex A53 (ARMv8 Instruction Set)

► GPU: Broadcom VideoCore IV @ 400 MHz.

► Memory: 1 GB LPDDR2-900 SDRAM.

► USB ports: 4

► Network: 10/100 MBPS Ethernet, 802.11n Wireless LAN, Bluetooth 4.0.

Kits including 2.5 A power supply, enclosure, and micro SD card ~ $75 dollars
ODROID-XU4

► CPU: Samsung Exynos5422 Cortex™-A15 2Ghz and Cortex™-A7 Octa core

► GPU: Mali-T628 MP6(OpenGL ES 3.1/2.0/1.1 and OpenCL 1.2 Full profile)

► Storage: eMMC5.0 HS400 Flash Storage

► Memory: 2GB LPDDR3 RAM PoP stacked

► USB ports: 2 x USB 3.0 Host, 1 x USB 2.0 Host

► Network: Gigabit Ethernet (no wifi)

Kits including 4 A power supply, enclosure, and eMMC ~ $95 dollars
ODROID-C2

- SoC: Amlogic S905 SoC
- CPU: Amlogic ARM® Cortex®-A53(ARMv8) 1.5Ghz quad core CPUs
- GPU: Mali™-450 GPU (3 Pixel-processors + 2 Vertex shader processors)
- Storage: eMMC5.0 HS400 Flash Storage
- Memory: 2GB DDR3 SDRAM
- USB ports: USB 2.0 Host x 4
- Network: Gigabit Ethernet (no wifi)

Kits including 2 A power supply, enclosure, and eMMC ~ $75 dollars
ODROID-C2

▶ CPU: A83T ARM Cortex-A7 octa-core

▶ GPU: PowerVR SGX544MP1 · Comply with OpenGL ES 2.0, OpenCL 1.x

▶ Storage: MicroSD Card, SATA(up to 2TB USB-to-SATA; GL830), eMMC(8GB onboard)

▶ Memory: 2GB LPDDR3 (shared with GPU)

▶ USB ports: USB 2.0 Host x 2

▶ Network: 10/100/1000Mbps Ethernet (Realtek RTL8211E/D), 802.11 b/g/n (AP6212)

Including 2.5 A power supply, enclosure (using 8GB onboard eMMC) ~ $100
Intel MinnowBoard Turbot (Dual Core)

- CPU: Dual Core Intel Atom® Processor E3826 (2 x 1.46 GHz, 1MB cache)
- GPU: Intel HD Graphics
- Storage: 1x SATA2, 1x MicroSD
- Memory: 2GB DDR3L 1067MT/s, on board
- USB ports: 1x USB 2.0 host, 1x USB 3.0 host
- Network: 1x 1Gb Ethernet RJ45

Kits including 2 A power supply, enclosure, and NO SD card ~ $175 dollars

Quad core CPU board $225
BeagleBone (White)

- CPU: Single core AM3358 ARM Cortex-A8 720MHz
- Storage: 1x MicroSD
- Memory: 256MB DDR2
- USB ports: 1x USB 2.0 host
- Network: 10/100 MB, RJ45

Kits including power and SD card ~ $90dollars
## Message Bus Driver Performance

<table>
<thead>
<tr>
<th>Machine</th>
<th>Device Count/Point Count</th>
<th>Average Time to Scrape and Publish (seconds)</th>
<th>Standard Deviation (seconds)</th>
<th>Historian</th>
<th>Driver</th>
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# Message Bus, Driver, Historian Performance

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<th>Machine</th>
<th>Device Count/Point Count</th>
<th>Average Time to Scrape and Publish</th>
<th>Standard Deviation</th>
<th>Historian</th>
<th>Driver</th>
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Discussion