vE-CPE Open Modular White Box Architecture for uCPE

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SD-WAN Drives New Requirements for uCPE Flexibility

Box Chaining
*Purpose-built HW with fixed per-function features & I/O*

Service Chaining
*White Box with converged SW services, HW features, and I/O*
Telcos Need Agile uCPEs

**SKU explosion limits applicability of monolithic boxes**

...BUT conventional modular boxes too expensive
Silicom and Intel Open White Box uCPE Architecture: vE-CPE

vE-CPE Is A New, Open Building Block Approach to uCPE Agility, Based on Telco Feedback
Keys to Right-Sizing Modularity for uCPE

Low-Cost Internal Modularity
- Reconfigurable HSIO reduces signal count
- Allow module access to CPU MACs
- Allow PHY only and direct connect modules

LAN/WAN Freedom
- Mix-and-match LAN/WAN
- LAN
  - Ethernet
  - 1G, 2.5G, 10G – Copper/optical
  - Switched or independent
  - 2-8 ports/module
  - Wi-Fi
- WAN
  - xDSL, DOCSIS, GPON
  - LTE
- Enable PHY only and direct connect modules

Secure, Flexible Management
- Enable flexibility in BMC, or even no BMC
- Secure management and SW updates even when connected directly to the Internet
- Dying gasp
- LTE backup
Intel Atom C3000 vE-CPE Compute Module

Availability
- Today: Intel Atom C3000 (Denverton)
- In Development: Next Generation Intel
- In Discussion: ARM64

- Supports all C3000 SKUs 2C to 16C
- Up to 32GB DDR4
  - Dual channel – Mem down + DIMM
- Two LAN/WAN Module Slots
  - 2x LAN (Base-X, KR, SFI – 1, 2.5, 10G)
  - 4x HSIO (PCIe, SATA)
- Front Panel I/O and Management Slot
  - PCIe, UART, USB, SPI, I2C
  - Analog voltage monitor taps
  - Fan, temperature
  - ACPI
- 2x M.2 for LTE and SSD
- 1x mPCIe for Wi-Fi
- x4 PCIe Gen3 Expansion Slot
- 2x SATA host (1x SATADOM)
- Fanless for 2C and 4C
vE-CPE LAN/WAN Modules

Available at Production Launch:
• 4x1GbE (not Switched)
• 4x1GbE (Switched)
• 2x1GbE (Cu/SFP auto detect)
• 8x1GbE (Switched)
• 8x1GbE w/PoE+ (Switched)
• 4x1GbE (2xCu,2xSFP)
• SSD
• VDSL2/ADSL

In Planning:
• 10GbE
• 2.5GbE
• DOCSIS
• GPON
• FXS
vE-CPE Management Modules

Pass-through Module
- Console
- Ethernet management port
- USB

MicroBMC (pfSense based BMC)
- Right-sized BMC for uCPE
- Secure management and SW updates without private secure network
- Dying gasp
- LTE backup

In Discussion:
- IPMI
- OpenBMC
Summary

- vE-CPE developed under close Intel-Silicom collaboration
- vE-CPE is based on Telco feedback for openness and flexibility
- vE-CPE delivers uCPE agility without big modularity cost penalty
- vE-CPE enables LAN/WAN freedom without limits on innovation
- vE-CPE brings secure management targeted to uCPE

Contact Silicom for further information