PREMIER uCPE Platform

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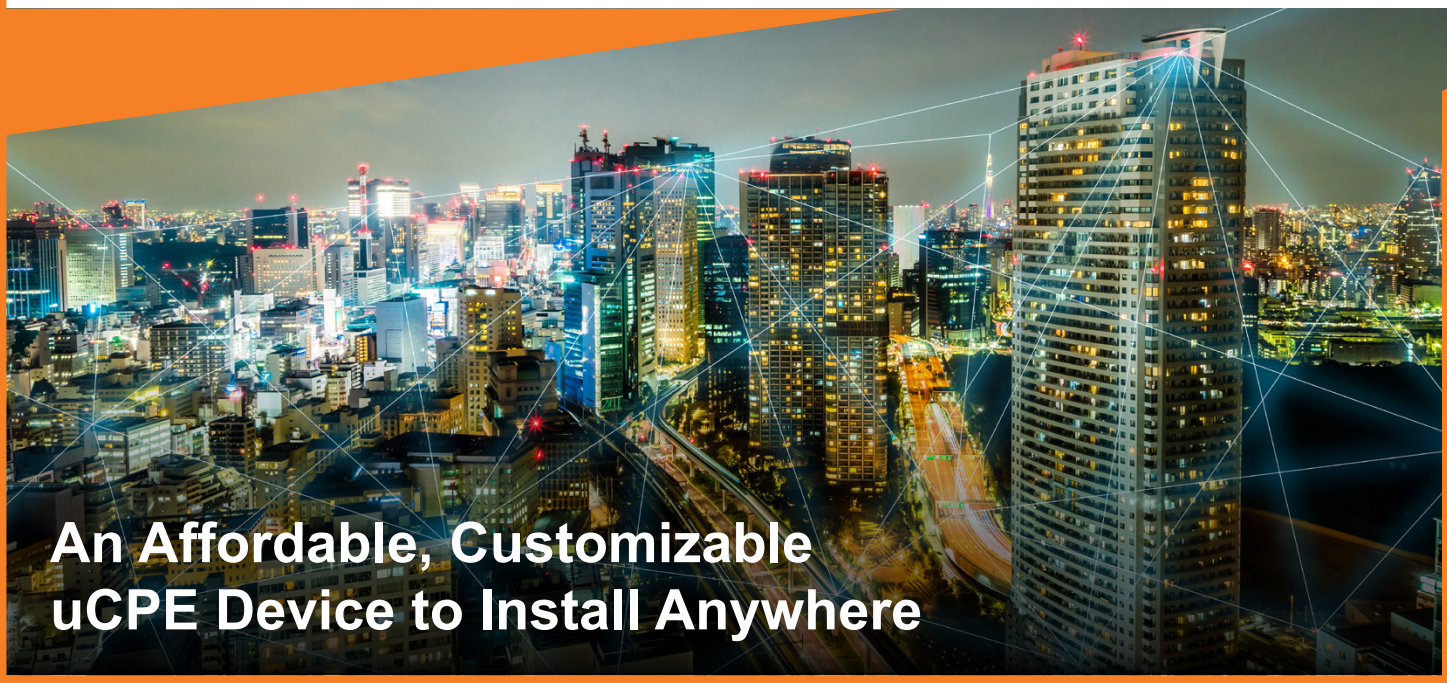
Communication products to depend on.℠



An Affordable, Customizable uCPE Device to Install Anywhere

KGPCo's PREMIER Pi-CON uCPE portfolio, based on Intel® Select Solutions for uCPE, replaces fixed-function network appliances with a white-box platform suitable for a wide range of applications.

Imagine bringing a new office online and connecting it to a corporate WAN in minutes, then deploying new services at the click of a button—all with a network abstracted from the physical to provide unprecedented agility and cost efficiencies. Communications service providers (CSPs) are achieving this vision by replacing costly and difficult-to-manage proprietary appliances with universal customer premise equipment (uCPE) solutions that can reduce expenses, decrease time to service, and support more value-added services.

KGPCo's PREMIER Pi-CON portfolio, based on Intel® Select Solutions for uCPE, features four devices that can be installed in any location. Each all-in-one device includes an operating system, hypervisor, and framework for provision, orchestration, and management, so CSPs can replace multiple proprietary appliances with a variety of software functions running on standardized, open hardware.

Devices in the PREMIER Pi-CON portfolio are powered by a range of reliable Intel® processors to meet the needs of enterprise, medium, and small deployments. And because they are based on Intel® Select Solutions for uCPE, CSPs can trust the preverified and fully tested solutions to speed time to market and accelerate the virtualized network services they provide to customers.

Multipurpose Hardware Built for the Cloud

The PREMIER Pi-CON portfolio is truly universal, providing everything CSPs need for network provisioning of high-bandwidth, low-latency applications. By stitching together an optimized hardware platform with market-leading SD-WAN, security, and routing software components, the PREMIER Pi-CON uCPE series enables CSPs to replace their costly and complex fixed-function network appliances with a single nonproprietary, white box platform based on Intel® X86 Encoder Decoder architecture.

The simplified solutions are suitable for a broad array of applications and can help CSPs streamline network services while also reducing costs.

Benefits of KGPCo's PREMIER Pi-CON Portfolio:

- **Customizable:** The white box or commercial off-the-shelf (COTS) server platform provides standard and open source software.
- **Flexible:** Eliminates vendor lock-in, providing flexibility for multivendor solutions and nonvirtualized and virtualized network functions (VNFs).
- **Cost-effective:** One appliance helps reduce capital expenditures, and VNFs enable service turn-up.
- **Simplified deployment:** Deploy fast with nonproprietary devices. The one-touch deployment streamlines customer premise equipment (CPE) and service offerings.
- **Scalable:** A range of Intel® processors offer performance to meet changing workload needs.
- **Future-proofed:** The portfolio serves current and future network requirements in an evolving technology ecosystem.
- **Preverified:** Because it's an Intel® Select Solution for uCPE, customers have a preverified and tested solution benchmarked for their workloads.equipment (CPE) and service offerings.

Solutions for Entry-Level to Enterprise Deployments

The PREMIER Pi-CON uCPE lineup includes four platforms for entry-level to large-enterprise deployments:

Pi-CON AT-CASCADE is an Intel Select Solution for uCPE platform powered by 2nd Generation Intel® Xeon® Scalable processors that is designed for enterprise deployments. It allows CSPs to leverage the benefits of higher packet processing throughput and increased virtual machine density across a fully scalable product line with up to 28 processor cores and high base frequencies.

Pi-CON AT-SKY is an Intel Select Solution for uCPE platform with two configurations in a compact 1U enclosure, both optimized to run enterprise workloads while providing advanced security features. The VNF-ready platform integrates the Ubuntu operating system and is powered by the Intel® Xeon® D-2100 series processor up to 18 cores and 36 threads, with optional Intel® QuickAssist Technology and data plane development kit to boost performance. The PREMIER software package enables out-of-band management, remote monitoring, and advanced LAN bypass utility.

Pi-CON AT-C3 is a universal network appliance powered by the Intel Atom® C3000 processor for uE-CPE and SD-WAN solutions. Features include Intel QuickAssist Technology at 10 Gbps, Intel® AES-NI and Intel® Virtualization Technology (Intel® VT) for Directed I/O (Intel® VT-d) support, SR-IOV Network Virtual Functions in KVM support on all ports by Intel® SoC integrated MAC, and an Intel® Ethernet Controller I350.

Pi-CON AT-CELERON is a small network appliance powered by the Intel® Celeron® processor that features an entry-level uCPE and SD-WAN gateway. Ideal for small office environments, this modestly sized appliance includes a fanless design supported by an optional wall/VESA/DIN-rail mounting kit.

Small	Medium	Large	Extra Large
» **Pi-CON AT-CELERON** with Intel® Celeron® N3350/J3455 processor	» **Pi-CON AT-C3K** with Intel Atom® C3000 processor	» **Pi-CON AT-SKY** with scalable Intel® Xeon® D-2100 series processor	» **Pi-CON AT-CASCADE** with 2nd Gen Intel® Xeon® Scalable processors

Flexibility with White Box uCPEs

PREMIER Pi-CON solutions leverage white box hardware from industry partner Advantech. White box uCPEs are commercial off-the-shelf (COTS) server-grade appliances that operate on the customer premises, where close proximity to users can reduce service latency. White box uCPEs can host VNFs that run on an open operating system such as Ubuntu, CentOS, or Red Hat Enterprise Linux, and they provide a virtualization layer for resource abstraction and control.

The advantages of white box uCPEs include the flexibility to host both open source and commercial software solutions, as well as zero-touch provisioning at power-on, so CSPs can connect the uCPE to the internet automatically and securely over a choice of WAN connections. Encryption can be performed in software or can be accelerated by hardware based on Intel QuickAssist Technology to ensure secure communications.

Intel® Select Solutions for uCPE Configurations

The PREMIER Pi-CON uCPE portfolio is based on the Intel Select Solution for uCPE reference design to give CSPs a head start, speeding time to market and shortening network evaluation time. Network function virtualization (NFV) systems architecture requirements are fully tested and preverified, along with powerful Intel processor technology ranging from four-core Intel® Xeon® D processors to 28-core Intel® Xeon® Scalable processors.

The Intel Select Solutions for uCPE reference design provides a strong value proposition to telecommunications equipment manufacturers (TEMs), original equipment manufacturers (OEMs), independent software vendors (ISVs), and system integrators (SIs), which includes:

- Product-ready reference design for faster time to market
- Intel solution verification that reduces network evaluation time needed by CSPs
- Partnering with Intel for joint go-to-market solutions and strategies

What Are Intel® Select Solutions?

Intel Select Solutions are predefined, workload-optimized solutions designed to minimize the challenges of infrastructure evaluation and deployment. Solutions are validated by OEMs/ODMs, certified by ISVs, and verified by Intel. Intel develops these solutions in extensive collaboration with hardware, software, and operating system vendor partners and with the world's leading data center and service providers. Every Intel Select Solution is a tailored combination of Intel® data center compute, memory, storage, and network technologies that together deliver predictable, trusted, and compelling performance.

Two Configurations to Meet Common Use Cases

Intel Select Solutions for uCPE were defined based on the functional requirements of a wide range of uCPE use cases to arrive at a verified and workload-optimized configuration for VNFs and other network functions virtualization infrastructure (NFVI) applications. Intel designed two product configurations as part of the Intel Select Solutions for uCPE reference design, which were tested with Ubuntu and ADVA Ensemble Connector distributions.

ADVA Ensemble Connector is a carrier-class virtualization platform equipped for automated deployment at scale. As part of a verified Intel Select Solution for uCPE, it can help accelerate service provisioning, streamline management, and reduce costs. With its embedded cloud, Ensemble Connector provides NFV infrastructure and offers several key benefits for uCPE, including platform security, zero-touch provisioning, and access to the Ensemble Harmony Ecosystem of VNFs. Ensemble Connector built on Intel Xeon D and Intel Xeon Scalable processors is an optimized configuration that gives customers a hardware-software solution that is pre-integrated and ready to deploy.

Two configuration variants of the PREMIER Pi-CON AT-SKY uCPE, based on the Advantech FWA-3050 white box uCPE, passed Intel Select Solution for uCPE Base and Plus configuration tests (see tables one and two). One configuration variant of the PREMIER Pi-CON AT-CASCADE uCPE, based on the Advantech FWA-5070, passed the Intel Select Solution for uCPE Plus performance thresholds, providing a cost-efficient option with up to 16 processor cores (see table three).

The PREMIER Pi-CON AT-CASCADE white box is a single-socket design that brings cost savings to next-generation designs where just-in-time integration flexibility based on a broad choice of build options can help optimize uCPE supply chain costs and alleviate buffer stocking constraints. With a choice of Intel Xeon Scalable processors up to 28 cores, Intel QuickAssist Technology, and 1GbE, 10GbE, 25GbE, and 40GbE network interfaces, the Pi-CON AT-CASCADE allows CSPs to cost-optimize compute and acceleration for a broad range of VNF and application workloads while meeting throughput requirements up to 200 Mbps.

The PREMIER Pi-CON AT-CASCADE configuration verified to meet Intel's plus reference benchmark performance threshold was equipped with a 16-core, 2nd Gen Intel® Xeon® Silver 4216 processor (2.1 GHz Turbo boost to 3.2 GHz, 100 W). Additional configurations of the FWA-5070 allow integration of Intel Xeon Scalable processors of up to 28 cores. The platform supports 12 banks of DDR4 DIMMs for up to 384 GB of ECC memory for high-speed memory access. Support for one low-profile PCIe x8 add-on card enables further encryption offload or internet broadband connectivity extension. The 4x 10GbE SFP+ ports specified in the Intel reference configuration are controlled by an Intel® Ethernet Controller XL710-BM1 on an Advantech NMC-4005.

The two Intel® Select Solutions for uCPE configurations are:

- **Intel® Select Solutions for uCPE base configuration:** This uCPE design utilizes a four-core or greater Intel Xeon D processor and network and storage products from Intel targeting value-based solutions with at least two virtual machines in a small-to-medium-sized business environment.
- **Intel® Select Solutions for for uCPE plus configuration:** This uCPE design utilizes a 14-core Intel Xeon D processor and specifies the network, storage, and integrated platform acceleration products from Intel to maximize virtual machine density.

Table One

PREMIER PI-CON AT-SKY COMPATIBILITY WITH INTEL® SELECT SOLUTION FOR UCPE BASE CONFIGURATION		
Platform	**Intel Reference Platform**	**PREMIER Pi-CON AT-SKY 4CA1S**
Processor	Intel® Xeon® processor D-2123IT, 4-core, 2.2 GHz, 60 W, or higher SKU	Verified with Intel® Xeon® D-2123IT processor, 4-core, 2.2 GHz Turbo boost to 3.0 GHz, 60 W
Memory	16 GB DDR4 2133 MHz, 4x 4 GB (16 GB total). Minimum all 4 memory channels populated (1 DPC) to achieve 16 GB (i.e., 4x 4 GB RDIMM)populated (1 DPC) to achieve 16 GB (i.e., 4 * 4GB RDIMM)	Configured with 4x 4 GB (16 GB total). All 4 memory channels populated
NICs	2x 10GbE integrated Ethernet ports	4x 10GbE integrated Ethernet SFP+ ports, 2x RJ45 mgmt ports 8x 1GbE RJ45 Ethernet ports, 1 Network Mezzanine Card (NMC) slot for expansion
Intel® QAT	Integrated Intel® QuickAssist Technology (recommended but not required)	Without Intel® QuickAssist Technology
Storage	Intel® Solid State Drive Data Center S3110 256 GB 2.5” internal solid state drive (SATA or M.2)	2x Intel® Solid State Drive Data Center Family S4510 2x 960 GB

Table Two

PREMIER PI-CON AT-SKY COMPATIBILITY WITH INTEL® SELECT SOLUTION FOR UCPE PLUS CONFIGURATION		
Platform	**Intel Reference Platform**	**PREMIER Pi-CON AT-SKY 16CAR1**
Processor	Intel® Xeon® processor D-2177NT, 14-core, 1.9 GHz, 105 W, or higher SKU	Intel® Xeon® D-2187NT processor, 16-core, 2.0 GHz Turbo boost to 3.0 GHz, 110 W
Memory	64GB DDR4 2667 MHz, 4 * 16GB (64GB Total) Minimum all 4 memory channels populated (1 DPC) to achieve 64GB (i.e., 4x 16GB RDIMM)	64GB DDR4 2667 MHz, 4 * 16GB (64GB Total) Minimum all 4 memory channels populated (1 DPC) to achieve 64GB (i.e., 4 * 16GB RDIMM)
NICs	4x 10GbE integrated Ethernet ports	4x 10GbE integrated Ethernet SFP+ ports, 2x RJ45 mgmt ports, 8x 1GbE RJ45 Ethernet ports, 1 Network Mezzanine Card slot (NMC) for expansion
Intel® QAT	Integrated Intel® QuickAssist Technology	Integrated Intel® QuickAssist Technology 100G
Storage	Intel® Solid State Drive Data Center S3110 512GB 2.5" internal solid state drive (SATA or M.2)	2x Intel® Solid State Drive Data Center Family S4510 2x 960 GB

Table Three

PREMIER PI-CON AT-CASCADE COMPATIBILITY WITH INTEL® SELECT SOLUTION FOR UCPE PLUS CONFIGURATION		
Platform	**Intel Reference Platform**	**PREMIER Pi-CON AT-CASCADE 00A1R**
Processor	Intel® Xeon® processor D-2177NT, 14-core, 1.9 GHz, 105W, or higher SKU	Intel® Xeon® Silver 4216 Processor 16-core, 2.1GHz Turbo boost to 3.2GHz,100W
Memory	64GB DDR4 2667 MHz, 4 * 16GB (64GB Total) Minimum all 4 memory channels populated (1 DPC) to achieve 64GB (i.e., 4 * 16GB RDIMM)	96 GB DDR4 2667 MHz, 12x 8 GB (96 GB total) Minimum all 4 memory channels populated (1 DPC) to achieve 64 GB (i.e., 4x 16 GB RDIMM))
NICs	4x 10GbE integrated Ethernet ports	2x RJ45 management ports, 1x NMC-4005 Network Mezzanine Card (NMC) slot with 4x 10GbE SFP+ ports, 1x NMC-0805 NMC with 4x 1 GbE ports
Intel® QAT	Integrated Intel® QuickAssist Technology	Internal Advantech PCIE-3031 adapter card with Intel® C627 chipset (3x Intel QAT engines)
Storage	Intel® Solid State Drive Data Center S3110 512GB 2.5" internal solid state drive (SATA or M.2)	1x Intel® Solid State Drive Data Center S4610 960 GB

End-to-End Support from KGPCo

To support the PREMIER Pi-CON portfolio, KGPCo offers an end-to-end, turnkey, zero-touch solution designed to help customers conserve both capital and operating expenses. KGPCo provides complete, integrated, preverified, ready-for-deployment solutions with ongoing management.

In addition to preset hardware solutions, KGPCo can deliver highly customized à la carte services, architecting solutions that fit unique IT environments or use cases. KGPCo can test, optimize, and validate uCPE solutions and handle logistics, inventory management, and sourcing—all while extending the relationship with ongoing support.

In addition to Intel Select Solutions for uCPE and Advantech hardware, KGPCo leverages its ever-growing telecom ecosystem partnerships to deliver a full range of solutions that include:

- VNF management and orchestration to help service providers design, deploy, and manage virtualized services in their networks
- SD-WAN solutions
- vRouter, Broadband Network Gateway (BNG) solutions
- Next-generation firewall and Internet Protocol (IP) security solutions
- WAN optimization, acceleration, and load balancing

Achieve Optimal Performance for Network Services

PREMIER's Pi-CON uCPE series, powered by high-performance Intel processors with built-in acceleration and low-latency ethernet ports, is available in a range of configurations to meet the needs of small businesses to enterprises. The fully tested and preverified Intel Select Solutions for uCPE are designed to deploy quickly, so CSPs can get to market fast with a solution that reduces expenses, decreases time to service, and enables rapid deployment of value-added services.

To learn more about the PREMIER Pi-CON uCPE series, contact KGPCo at uCPE@kgpco.com

For more information on Intel® Select Solutions, visit intel.com/selectsolutions

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3305 Hwy 60 West
Faribault, MN 55021
1.800.755.1950