



AKAMAI AND WIND RIVER: FLEXIBLE VCDN-BASED VIDEO DELIVERY FOR A HIGHLY DYNAMIC AUDIENCE

Meeting Performance, Manageability, Security, and Reliability Demands for Communication Service Provider (CSP) Video Delivery

As part of the Wind River® Titanium Cloud™ Ecosystem, Akamai Technologies and Wind River have partnered to accelerate the flexible deployment of content delivery network (CDN) caching components onto virtualized infrastructure from core data centers through network edge locations. Together, Akamai and Wind River provide a market-ready, carrier grade solution for a highly dynamic and high-volume audience that offers interoperability with other pre-validated cloud or Network Functions Virtualization (NFV) orchestration elements. Product benefits include:

- Secure management of remote OpenStack elements distributed throughout the carrier network, e.g., at central and regional points of presence (POPs), nano data centers such as access POPs, central offices, headends, etc.
- In-service software upgrades of OpenStack elements with backward compatibility between multiple OpenStack versions
- Ability to flexibly scale CDN capacity for:
 - Best-in-class video delivery through traffic engineering optimizations across bottleneck links
 - Maximized available hardware utilization for high-audience video-watching scenarios
 - Elimination of stranded hardware assets
- Carrier-class I/O performance meeting the demands of high-audience video delivery from CDN caches

VIRTUALIZED CDN (VCDN) FOR OPTIMAL CSP OTT-STYLE VIDEO DELIVERY

A network transformation is underway to enable better utilization through software-defined services. Communication service providers (CSPs) are seeking best-of-breed solutions that can help accelerate this transformation. They are also demanding solutions that provide seamless automation without compromising the “always on” reliability expected from carrier grade systems. CDN solutions will play a central role in the delivery of high-quality video at scale. Furthermore, CDN caching components are ideal candidates for placement throughout the carrier network, including at the network edge. Akamai and Wind River have joined forces to accelerate the deployment of Akamai’s Aura virtualized caching components on top of Titanium Cloud deployed at any CSP network location, from core data centers to edge POPs, without sacrificing performance, manageability, security, or reliability.



Ecosystem Component
VNF provider

Solution
Akamai Aura Licensed CDN

Value

- Optimizes available hardware utilization relative to video audience demand
- Increases flexibility in how services, and resources needed for those services, are allocated
- Decreases operational costs with a virtualized all-IP delivery infrastructure

AN ECOSYSTEM ENABLES THE PROMISE OF NFV FOR CSPS

Through the Titanium Cloud Ecosystem, Wind River has collaborated with industry-leading hardware and software companies to ensure the availability of interoperable standard NFV products optimized for deployment with Titanium Cloud. Utilizing solutions from the Titanium Cloud Ecosystem will accelerate time-to-market, reduce risk, and significantly improve the deployment of an end-to-end NFV infrastructure.

OPERATIONALIZING VCDN THROUGHOUT THE CSP NETWORK

With the NFV/Software Defined Networking (SDN) network transformation underway, there are various efforts to re-architect data centers, or POPs, throughout the CSP network, particularly those located much closer to viewers. Examples of such transformation efforts include, but are not limited to, open source and open standards projects such as Central Office Re-architected as a Datacenter (CORD), Multi-access Edge Computing (MEC), and myriad variants led by CSPs themselves. These efforts run in parallel with the emergence of OpenStack as the de facto standard for NFV infrastructure.

The POPs might be central offices for telco operators or headends for cable operators, either of which can serve as anchor points for fixed and/or mobile broadband offerings. Since these POPs tend to be unlit, numerous, and widely distributed, lifecycle automation via a policy-driven orchestrated vCDN solution eliminates the complexity of technicians manually assigning CDN resources across a variably provisioned virtual infrastructure deployed across many physical locations. Titanium Cloud is an OpenStack-based virtual infrastructure platform that meets the stringent performance, manageability, security, and reliability requirements to realize this vision. OpenStack was not originally developed for such highly distributed deployments, so Wind River has contributed the technology in Titanium Cloud to StarlingX, the OpenStack edge computing infrastructure project. New releases of Titanium Cloud are based on StarlingX.

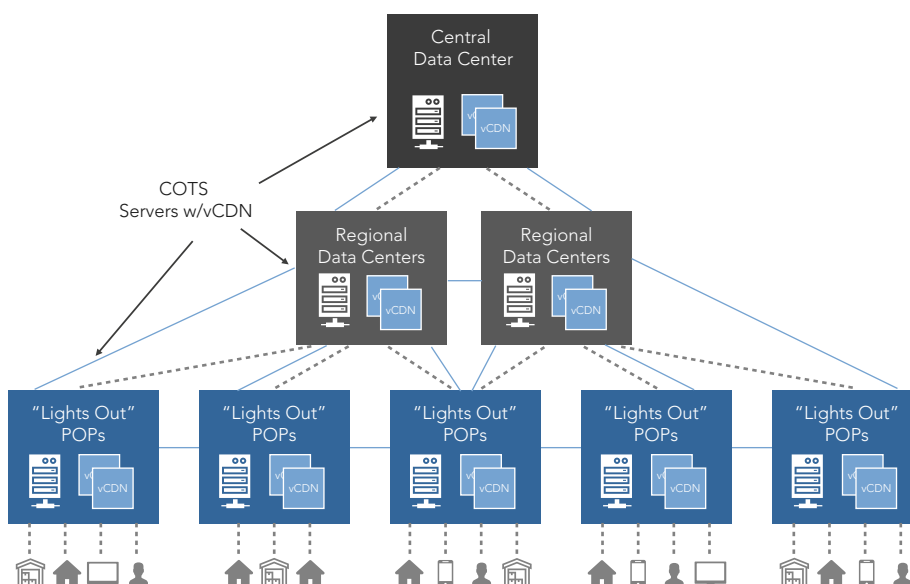


Figure 1. vCDN delivering OTT-style video from different levels of the CSP network hierarchy, e.g., dynamically placing caching closer to the consumer during high-audience events and removing such capacity during low-audience periods

Implementing a policy-driven orchestrated vCDN solution helps the CSP achieve the following important goals:

- **Flexible traffic offload:** This is seen particularly through the “middle mile,” or the network that connects centralized data centers to small POPs located at the network edge. At this level in the network, the unicast CDN effectively has network efficiency akin to multicast, as this is often the point where multicast fans out into unicast streams.
- **Flexible scaling:** Capacity, performance, and network throughput all increase to deliver video at high quality on behalf of high-audience events. Conversely, when the audience level subsides, the vCDN capacity can be reduced, freeing up hardware resources for other NFV/SDN functions.
- **Better QoE:** With dynamic placement of vCDN caches closer to the end user, high-speed broadband offers plentiful bandwidth, even for ultra-HD, and there is less resource contention for video delivery in a more highly distributed CDN.

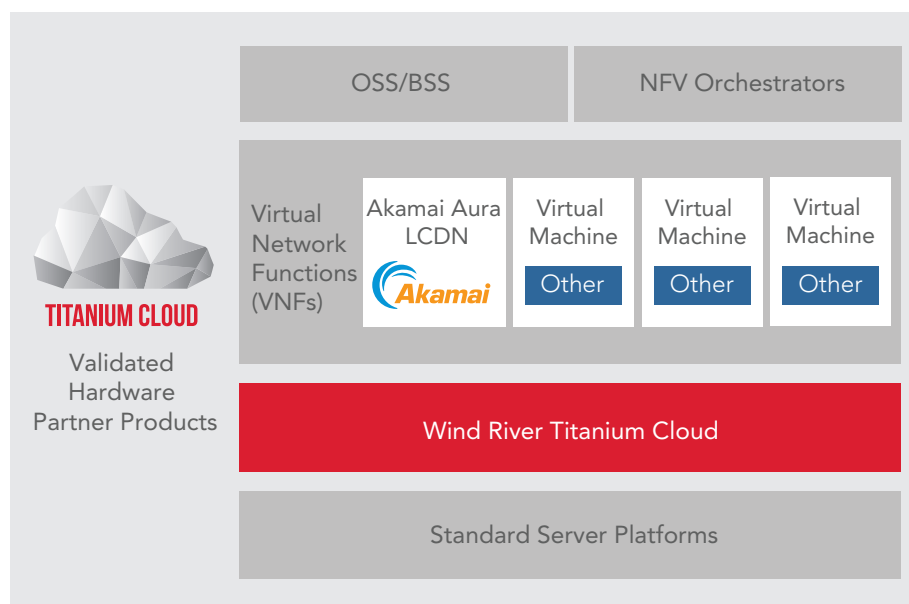


Figure 2. Titanium Cloud components with the Akamai Aura Licensed CDN

AKAMAI AURA LICENSED CDN

Aura Licensed CDN is highly scalable carrier grade CDN software that efficiently delivers high-quality video or other content using a common HTTP caching infrastructure. Aura LCDN software runs on commercial off-the-shelf (COTS) hardware, virtual machines (VMs), or a hybrid thereof.

Aura LCDN leverages distinct software components, including content routing and mapping, caching, and management and analytics, that operate in tandem to deliver HTTP content in a highly efficient, scalable, and reliable fashion.

MORE INFORMATION

Detailed technical information about Akamai Aura LCDN can be found at www.akamai.com/aura, or contact sales@akamai.com.

Detailed technical information about Wind River Titanium Cloud can be found at www.windriver.com/products/titanium-cloud/telco/, or contact salesinquiry@windriver.com.

Additional information about the Titanium Cloud Ecosystem can be found at www.windriver.com/partners/titanium-cloud-ecosystem/.

Aura LCDN features a scaled-out hierarchical caching architecture that eliminates the need for expensive load balancers, reduces CAPEX, and improves network efficiency. Its low latency cut-through caching method enhances quality by ensuring minimal rebuffering.

TITANIUM CLOUD

As the industry's first fully integrated and feature-complete NFV software platform, Titanium Cloud enables an NFV infrastructure to achieve the ultra-reliability and high performance mandated for telecom networks. It delivers six nines (99.9999%) reliability compared to the three nines of virtualized platforms based on common enterprise software. Combining open source and open industry standards, Titanium Cloud is the only commercial server solution enabling service providers to maintain the rigorous uptime required as networks transition to a virtualized infrastructure. With Titanium Cloud, service providers can now meet the "always on" expectations of consumers.

SUMMARY

The Akamai and Wind River partnership enables service providers to leverage NFV without sacrificing the reliability and performance of hardware networking solutions. By collaborating with Wind River through the Titanium Cloud Ecosystem to provide interoperable networking services, Akamai delivers best-in-class deployment flexibility, enabling innovative traffic engineering opportunities for CSPs to optimize high-audience video flows onto their diverse network topologies.

