Cisco PowerKEY Conditional Access System Gateway (PCG) 3.0: Entitlement Control Message Generation Maximizes Your MPEG Scrambling Capabilities

Evolve to a more flexible architecture that fosters more competition across the video control plane with the Cisco® PowerKEY® Conditional Access System Gateway (PCG) 3.0. It supports both bulk- and edge-encryption architectures, enables an open set-top marketplace, and provides a cost-effective mechanism to administer and operate a multi-CAS environment.

The Cisco PCG performs real-time PowerKEY Entitlement Control Message (ECM) generation and distribution, Simple Content Protection (SCP), and Simple Channel Control (SCC) ECM generation and distribution in support of universal Digital Transport Adapters (uDTAs). The PCG operates within the DVB Simulcrypt headend reference model, acting as an ECM Generator (ECMG) that uses the standard ECMG-to-Simulcrypt Synchronizer (SCS) interface. An SCS can be configured to connect to multiple PCG virtual machines, providing fault tolerance through the ECMG-to-SCS interface.

By using standard interfaces, the PCG can be integrated with headend equipment from multiple vendors. Using the PCG allows you to run PowerKEY Conditional Access along with other conditional access systems in a mixed environment. Both bulk- and edge-encrypted architectures are supported.

Product Overview

The Cisco PCG is a software product that runs on a virtual machine and has been qualified based on extensive testing on a Cisco Unified Computing System™ (Cisco UCS®) C220 M3 rack-mount server. The Explorer Controller (EC) and Digital Transport Adapter Control System (DTACS) configure the gateway and manage sessions on it in much the same way as on QAM devices. However, unlike the QAM devices, each PCG virtual machine can provide ECM generation for 3000 PowerKEY digital broadcast streams or 3000 uDTA digital broadcast streams. Multiple virtual machines per server are supported for larger stream counts on a single device, as shown in Table 1.

Table 1. Deployment Scenarios for the PowerKEY Conditional Access System Gateway

Deployment Scenario	PCG Virtual Machines per Chassis	CAS Mode	Max Number of Streams Supported	Virtual Machine Resources (Hardware Specs Detailed in Table 2)	
				Reserved	Max
1	VM1	SCP	3000	1 vCPU (2600 MHz), 2-GB RAM	4 vCPU, 4-GB RAM
	VM2	SCP	3000	1 vCPU (2600 MHz), 2-GB RAM	4 vCPU, 4-GB RAM
	VM3	PowerKEY	3000	1 vCPU (2600 MHz), 2-GB RAM	4 vCPU, 4-GB RAM
	VM4	PowerKEY	3000	1 vCPU (2600 MHz), 2-GB RAM	4 vCPU, 4-GB RAM

Deployment Scenario	PCG Virtual Machines per Chassis	CAS Mode	Max Number of Streams Supported	Virtual Machine Resources (Hardware Specs Detailed in Table 2)	
				Reserved	Max
2	VM1	PowerKEY	3000	1 vCPU (2600 MHz), 2-GB RAM	4 vCPU, 4-GB RAM
	VM2	PowerKEY	3000	1 vCPU (2600 MHz), 2-GB RAM	4 vCPU, 4-GB RAM
	VM3	PowerKEY	3000	1 vCPU (2600 MHz), 2-GB RAM	4 vCPU, 4-GB RAM
	VM4	PowerKEY	3000	1 vCPU (2600 MHz), 2-GB RAM	4 vCPU, 4-GB RAM

Features of the Cisco PCG follow:

- Create integrated PowerKEY conditional access ECMs and SCP/SCC ECMs (ACMs)
- Complies with the DVB Simulcrypt interface (ETSI TS 103 197 V1.5.1 (2008-10))
- Supports 3000 uDTA (SCP) broadcast streams at a 4-second crypto period
- Supports 3000 PowerKEY broadcast streams at a 4-second crypto period
- Multiple virtual machines per server are supported. Supports either PK or SCP on a single virtual machine (PowerKEY gateway instance)
- Reports DVB ECMG-to-SCS errors via SNMP traps with two alarm options: 1) PCG traps are directed to the EC, which forwards them to the ECS alarm manager for display (forwarding gateway traps through the EC provides PCG site localization in the regionally scoped ECS alarm manager), or 2) PCG traps are sent directly to a third-party NMS. An alarm example is if the SCS stops requesting an ECM on an active ECM stream

Product specifications for the Cisco PCG are shown in Table 2.

Table 2. Product Specifications

Specification	Value
Compute Requirements	
Hardware	Qualified on Cisco UCS C220 M3, 2 CPU (2x 2.60 GHz E5-2650, 8C), 16-GB RAM (2x 8-GB DDR3-1866-MHz), 3x 300-GB HDD (1+1 mirrored + 1 spare). 32 vCPUs available to reserve for virtual machine use (8 core x 2 CPUs x 2 threads/CPU).
Virtual-Machine Resources	See Table 1.
PowerKEY Specifications	
ECM Generation	Each virtual machine supports 3000 broadcast PowerKEY streams at 4-second crypto period.
ECMG-to-SCS Interface	• Per DVB Simulcrypt specification (ETSI TS 103 197: Digital Video Broadcast, Headend implementation of DVB SimulCrypt). • Multiple SCS connections allowed supporting distributed SCS and redundancy. • 1200 streams per SCS, 20 SCSs per PCG.
PowerKEY Conditional Access System	Secures digital broadcast services using symmetric encryption algorithm for content protection and strong authentication and digital signature for entitlement delivery.
SCP/SCC Specifications	
ECM (ACM) Generation	Each virtual machine supports 3000 broadcast SCP/SCC streams at 4-second crypto period.
SCP/SCC ECM (ACM) handling	As per uDTA Specifications as licensed to multiple SOC and equipment vendors.
ECMG-to-SCS Interface	• Per DVB Simulcrypt specification (ETSI TS 103 197: Digital Video Broadcast, Headend implementation of DVB SimulCrypt). • Multiple SCS connections allowed supporting distributed SCS and redundancy.. • 1200 streams per SCS, 20 SCSs per gateway.

For More Information

For more information on Cisco PowerKEY Conditional Access System Gateway 3.0, please visit http://www.cisco.com/c/en/us/products/video/headend-system-releases/literature.html.

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