

Solution Brief

Amartus* Cameleon* SDS*
Intel® Xeon® Processors



Look Inside™

Delivering Dynamic, Programmable, End-to-End Orchestration for Cloud, WAN, NFV, and SDN

Technologies from Amartus* and Intel help service providers streamline the design and rollout of end-to-end cloud and network services.

Introduction

Today, service providers are facing ever-increasing demand for high-quality, elastic, pay-per-use cloud and WAN services. Although there are applications that offer the capabilities to address this need, they do not solve the issue of long delivery cycles, which prolong time-to-market and negatively impact service providers' ROI. The new architectural approaches, like network functions virtualization (NFV), software-defined networking (SDN), and cloud computing, provide the flexible infrastructure, but the existing operation support systems (OSSs) are too slow and cumbersome to support it. The present brief addresses this common problem by proposing an innovative solution and providing a practical example of its implementation.





Service Provider Service Management Challenges

The ability to streamline the design and rollout of new end-to-end (E2E) cloud and network services, and accelerate their provisioning and operation has become imperative for service providers to monetize their cloud and network infrastructure and accelerate their ROI. Traditional OSSs are hardwired for specific technologies and services, are typically network and resource-centric, and lack service awareness. The majority of processes are manual, which negatively impacts the quality of services and their delivery time. The multiplicity of disparate, stovepipe management application prolongs the time-to-market even more through inevitable and expensive integration.

What service providers need in order to overcome these challenges is a completely new service management and orchestration software systems architecture, one that is optimized for rapid introduction of any type of service across all domains and technologies, including cloud (storage, compute, data center network), NFV, SDN, and traditional networks (e.g., Carrier Ethernet, IP / MPLS, Optical). This solution must eliminate the primary problems of current OSSs, including the need for multiple silo'd management applications, as well as lengthy software development and integration cycles. At run-time and on-the-fly, it must be fully customizable and extensible without the need for new code or extensive testing.

Delivering High-Quality, Elastic, On-Demand Cloud and Network Services

Amartus* Chameleon* SDS* offers such a solution. It is a new breed of run-time programmable, meta-model driven, multi-vendor, and multi-technology service management and orchestration software that supports the full service life-cycle on a single unified platform and takes advantage of the massive scaling offered by cloud computing. Its future-proof design abstracts the resource and service layers to isolate their orchestration from the complexities of the network. As a result, it significantly reduces the rollout time and streamlines operations, which are the key elements of service providers' commercial success.

The example solution presented in Figure 1 demonstrates the power of a lean, dynamic, real-time OSS to automate E2E service delivery for combined cloud and WAN services. Chameleon SDS is at the core of this example. It acts as an umbrella service manager and orchestrator, which is integrated with OpenStack* for compute (Nova), storage (Cinder), and network (Neutron) in a data center (via open standard RESTful JSON APIs), and with a separate WAN controller (via network services RESTful XML API) that provides MEF Carrier Ethernet 2.0 services in the WAN. Any third party API can be easily plugged into the master controller, which makes the extension possibilities endless.

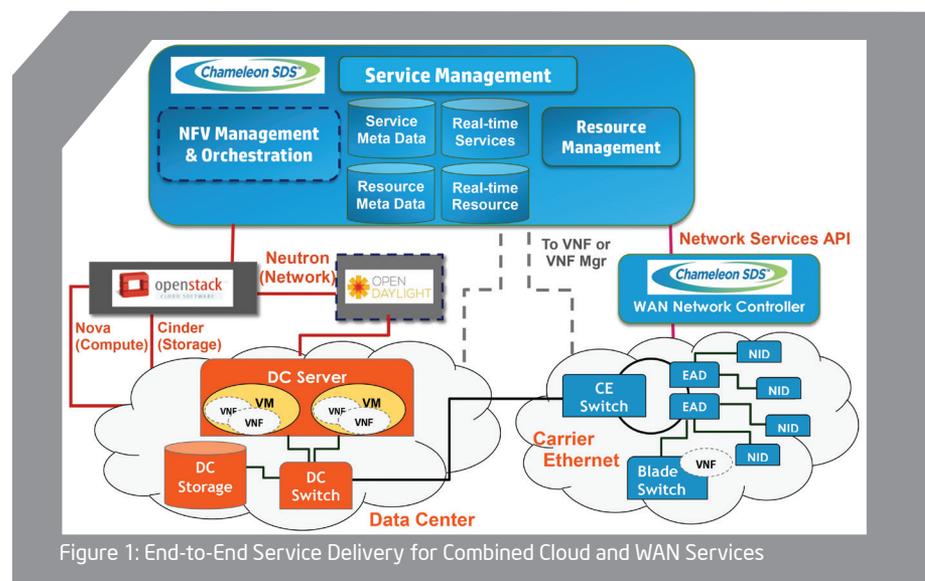


Figure 1: End-to-End Service Delivery for Combined Cloud and WAN Services



Using Dynamic Programmability to Roll Out and Orchestrate Any Services

Chameleon SDS technology applications with dynamic programmability are built by defining policies that instruct pre-built orchestration modules to manage various parts of the common information module. These orchestration modules (e.g., discovery, provisioning, fault, performance, usage, diagnostics) are completely abstracted from technology, service, or vendor-specific models, and the transformation to external, specific models proceeds via adapter plug-ins. New and updated models of services and technologies only require updating of the metadata (i.e., XML descriptors), which is done at run-time. This means that new services and technologies can be rolled out within a day, without any code written, changed, or tested. The key characteristics of the solution are:

- Clear separation between the core orchestration application and the underlying systems maximize solution efficiency and speed.
- Generic, standards-based models ensure high-quality and reliability of services.
- Dynamic modelling technology boosts service velocity and allows much-desired service agility.
- Revolutionary, run-time programmable architecture of the solution eliminates the need for costly code development and testing cycles.

Key Ingredients

End-to-End Service and Resource Management Orchestrator, Chameleon* SDS*

Chameleon SDS is a single, unified software-defined service orchestration platform that allows dynamic programmability of any services and technologies. It utilizes generic, standards-based service and resource models, which can be dynamically extended and modified through XML configuration to encompass any technology or service type, including cloud, SDN, NFV, and network services. This unique, model-driven, flexible design guarantees real-time and automated management and orchestration of the full life-cycle of services and resources.

WAN Controller, Chameleon* SDS*

Acting as a WAN controller, Chameleon SDS provides MEF-based Metro Carrier Ethernet services, as well as supports any other network services, including IP / MPLS, MPLS-TP, and optical transport. The solution provides full E2E service design, discovery, inventory, provisioning, and assurance capabilities for both traditional and virtualized networks. The service design is driven by a service catalogue with central management of service definitions, specifications, and templates. Chameleon SDS supports full E2E, policy-based service discovery; and service inventory combines service repository, advanced browsing capabilities, physical topology and transport reconciliation,

service topology, and service inventory reporting. Services are provisioned upon a single click, based on customizable, technology-agnostic templates and definitions. The comprehensive provisioning state engine offers feasibility checking, planning, and resource pool reservation options. Service assurance capabilities include fault, monitoring, performance and test management, service operations, administration, and maintenance (OAM), service analysis with topology, and service SLA compliance reporting.

OpenStack

This is a cloud computing platform integrated with Carrier Ethernet services through Chameleon SDS MANO (Management and Orchestrator). The compute, storage, and network cloud capabilities are implemented using Nova, Cinder, and Neutron components. Statistics are collected by the umbrella application via the Ceilometer tool. The discovery, registration, and delivery image services are delivered through the Glance component, and Chameleon SDS uses Keystone for server authentication.

Platforms Based on Intel® Xeon® Processors

Chameleon SDS performs best on carrier-grade, best-of-breed, physical and virtualized platforms, which benefit from the latest Intel® microarchitecture enhancements. In order to maximize performance, Amartus takes advantaged



of Intel® Hyper-Threading Technology (Intel® HT Technology)¹ and Intel® Virtualization Technology (Intel® VT)².

Although virtualization is generally viewed as a software technology, Intel has added hardware features to their processors to improve the performance and security of virtualization. For instance, Intel VT performs various virtualization tasks in hardware, like I/O address translation, which reduce the overhead and footprint of virtualization software and improve its performance. For instance, VM to VM context switching time is significantly faster when memory address translation is performed in hardware instead of by software.

Conclusion

Service providers are looking for new network architectures that deliver the agility and economics needed to address constantly changing market requirements. In response, the industry is developing more flexible and lower cost solutions per the principles outlined by NFV and SDN. Achieving these key objectives and more, Chameleon SDS and Intel platforms are making it much easier, less costly, and faster for service providers to deploy E2E cloud and network services.

For more information about offerings from Amartus,
visit www.amartus.com.

Solution Provided By:



For more information about Intel solutions for communications infrastructure, visit www.intel.com/go/commsinfrastructure.

¹ Available on select Intel® processors. Requires an Intel® HT Technology-enabled system. Consult your PC manufacturer. Performance will vary depending on the specific hardware and software used. For more information including details on which processors support HT Technology, visit <http://www.intel.com/info/hyperthreading>.

² Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, and virtual machine monitor (VMM). Functionality, performance or other benefits will vary depending on hardware and software configurations. Software applications may not be compatible with all operating systems. Consult your PC manufacturer. For more information, visit <http://www.intel.com/go/virtualization>.

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