THE FUTURE OF CONVERGED POLICY CONTROL

ALCATEL-LUCENT 5780 DYNAMIC SERVICES CONTROLLER (DSC) – POLICY CONTROL MODULE

- **Quickly and easily create policies with flexibility, and execute them with performance and scale**
- **Define policies across wireless and wireline access networks**
- **Efficiently and easily integrate with existing network and IT environments, reducing integration cost and time**

Service providers are faced with a need to reinvent themselves to capture new opportunities in this era of mobile data. One prospect for the service providers is to address their subscribers demand for more personalized services. Other promising opportunities lie in business services and the Machine-to-Machine (M2M) requirements. To capture these emerging opportunities service providers will need to deploy a next-generation Policy and Charging Rules Function (PCRF) that is easy-to-use, flexible, scalable and offers high performance even for highly complex use cases.

VALUE PROPOSITION

Alcatel-Lucent addresses this challenge with the 5780 Dynamic Services Controller (DSC). Based on this highly scalable and powerful platform the Policy Control Module allows service providers to model personalized services quickly and easily to capture new revenue opportunities, while also contributing to increased customer loyalty and reduced churn. The 5780 DSC is adaptable into any existing Policy and Charging Control (PCC) environment due to:

- standardized 3GPP interfaces
- broadly tested interoperability across PCC elements provided by different vendors (IOT)
- interfaces can be easily customized to meet specific compatibility requirements

SOLUTION OVERVIEW

The Policy Control Module assumes the role of the PCRF within the 3GPP PCC architecture and supports all of its standard interfaces. The 5780 DSC also extends policy control for wireline access (for example, xDSL/GPON) through its RADIUS/Change of Authorization (CoA) support.

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The 5780 DSC is part of an extended pre-integrated in-house ecosystem as reflected in Figure 1. In this figure, the text at the bottom of each box represents the general PCC function while the text on the top represents the Alcatel-Lucent product that fulfills that role. Having this level of in-house product coverage provides broad and deep experience that is leveraged to facilitate ease of integration into existing multivendor environments.
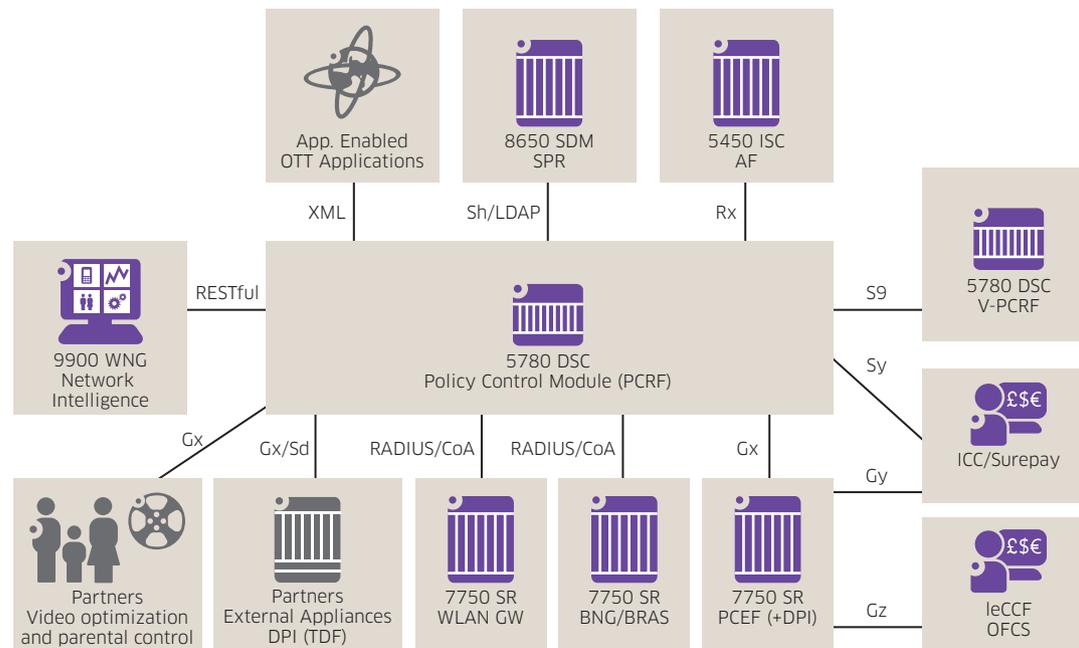
The 5780 DSC is a policy rules engine built on a unique and innovative technology called Agile Rules Technology (A.R.T.). A.R.T. is a collection of patented features allowing service providers to model complex business goals easily and flexibly into policy rules that are evaluated in real-time with high performance and scale. After policy rules are evaluated in real time by the 5780 DSC and actions are determined, they are sent to one or more of the enforcement points for instantiation on a per-device and per-service data flow (SDF) basis. Policies typically instruct the network on how to deliver and charge for each packet flow. Policies can trigger many other actions as well, including subscriber notification through SMS or e-mail.

The 5780 DSC uses real-time information to assist in making specific policy decisions:

- **Network:** network status, device type, access type, location
- **Network Intelligence/Analytics:** signaling, airtime, bandwidth loading levels, application/device behavior, anomalies, and trends, subscriber insights
- **Subscriber:** status, service tier, service entitlement, usage balance, preferences
- **System:** state, time of day
- **Application:** service description, traffic parameters

SOLUTION KEY FUNCTIONAL AREAS

The 5780 DSC goes beyond the capabilities typical of a PCRF in the following areas to maximize its value to service providers.

Converged usage management

The 5780 DSC can act as a fully converged usage management policy control engine across wireless and wireline networks. With access to real-time usage information, per-session and per-flow metering limits are defined that can trigger various actions when these limits are exceeded. The 5780 DSC obtains real-time usage information from various sources including:

- 3GPP-compliant Sy interface from an online charging system (OCS) for wireless access
- RADIUS/CoA messages from a Broadband Network Gateway/Broadband Remote Access Server (BNG/BRAS) or WLAN GW for wireline and Wi-Fi® access, respectively

Figure 1. The 5780 DSC within an extended PCC architecture

- Gx interface where the 5780 DSC leverages its embedded quota management system when usage counts are maintained directly

With other contextual information (for example, location, time of day, service entitlements, network/subscriber status), the 5780 DSC is able to model a new generation of personalized services through its rules engine. Some examples include: service tiers with usage caps, turbo boosts, lifestyle packages, shared data plans (across devices/family members), roaming packages, and location-based data packages (for example, home zone).

Embedded quota management

The 5780 DSC offers an embedded quota manager that uses multiple on-board counters for each subscriber, allowing for multiple data usage caps that represent multiple services or bundles. For example, a subscriber may have one usage cap for a specific service such as video and another cap for a social networking service. The subscriber may have multiple Access Point Names (APNs), and each of these connections could have their own data usage cap. It obtains usage counts directly from the network through the Gx interface.

Subscriber Profile Repository (SPR) capabilities

The 5780 DSC offers a flexible and comprehensive approach using SPR information. It offers support of external SPR records through the Lightweight Directory Access Protocol (LDAP) or Sh interface. It can also access subscriber records that are distributed across many different sources (horizontal) or stitch together subscriber records across multiple rows (vertical).

The 5780 DSC also has its own embedded SPR that can be used to replace or complement existing external SPRs. Subscriber records can coexist externally or internally.

PLATFORM FEATURES

FEATURE	BENEFIT
Agile Rules Technology (A.R.T.)	Provides ease of use, flexibility, performance, scalability, and maintainability across all use cases.
Three levels of stateful redundancy (local redundancy, connection redundancy, and geo-redundancy) with no single point of failure	Minimizes service outages by providing over 99.999% availability while maximizing return on investment
Flexible deployment options including colocated, distributed, and multi-shelf	Minimizes initial capital expenditures with flexible growth options
Support for multiple colocated deployments in a single ATCAv2 chassis or rack-mounted PCRF complex	Attractive for Mobile Virtual Network Enabler (MVNE) as they can offer partitioned policy control to multiple Mobile Virtual Network Operators (MVNOs) in the same chassis
Rich set of SPR features, including support for external databases or an embedded SPR	Deployable with its own SPR or the ability to integrate seamlessly into existing environments with access to subscriber records distributed across multiple sources
• Flexible and fully customizable interfaces for integration with third-party network elements • Field proven integration and IOT completion with a wide range of PCC and 3G/4G mobile packet core components, including the major suppliers of mobile gateways and DPI appliances	Ease of integration across a multitude of network environments, reduces time to deployment and slashes operational deployment costs
Harmonized pricing approach that is based upon per-session or per-subscriber use independent of use case and access type	Provides easy, simple to understand and simple to build pricing models that scale with session and subscriber count

SOLUTION FEATURES

FEATURE	BENEFIT
Fully 3GPP R7/8/9/10/11 compliant PCRF functionality, supporting 3G and 4G networks	Provides a standardized approach to allow service providers to personalize their service offerings while more efficiently monetizing each bit delivered
Support for wireline policy management with a RADIUS/CoA interface to the BNG or BRAS	Provides concurrent support for wireline access access, providing operational benefits while making the service provider's network future ready
3GPP S9 roaming interface	Ensures seamless policy and charging control when the subscriber is roaming
Converged per-session, per-flow usage management	Provides real-time visibility of data usage for each subscriber across multiple devices and access types leading to a new set of innovative service options
Integration with the Alcatel-Lucent 9900 Wireless Network Guardian (WNG), enabling Intelligent Traffic Managenment (ITM)	Leverages wireless network intelligence to dynamically protect subscriber QoE while maintaining the integrity of the network
Leverages wireless network intelligence to dynamically protect subscriber QoE while maintaining the integrity of the network	Ease of integration across a multitude of network environments, reduces time to deployment and slashes operational deployment costs
3GPP-compliant Sy interface that provides real-time notifications of predefined usage events on a per-subscriber, per-service basis	Provides interoperability with Online Charging Systems/Intelligent Network OCS/IN platforms to offer the next generation of personalized services that can help to monetize the network by introducing policies influenced by the subscriber's credit balance and service plans
DPI support across PGW/GGSN/BNG or on standalone DPI appliances including support for the 3GPP Sd standard	Provides ability to apply policies directly and specifically to application level flows in addition to bearer level policies, thus empowering service providers with the tools needed to monetize personalized services

Multiple enforcement points

The 5780 DSC supports the standard 3GPP defined Policy and Charging Enforcement Function (PCEF) and has extended its network enforcement capabilities to support a host of new data plane capabilities that can be controlled by policy decisions. The 5780 DSC has completed IOTs with several leading vendors offering some of these enforcement points, for example:

- **Traffic Detection Function (TDF) (for example, Deep Packet Inspection [DPI]) –** The 5780 DSC uses the Sd interface to communicate with the TDF like a DPI appliance.
- **BNG/BRAS –** These enforcement points represent the service edge of many wireline (xDSL, GPON) networks and the 5780 DSC deploys RADIUS as a means to communicate with them.
- **Parental control –** These enforcement points allow parents to control the content that can be viewed across a particular mobile broadband session.
- **Video optimization –** These enforcement points allow the operator to dynamically alter video flows based on a given policy to maximize subscriber experience while optimizing network resources.
- **WLAN GW –** The wireless LAN GW is used to aggregate and deliver data from Wi-Fi Access Points (APs) and can be communicated with by RADIUS to acquire visibility of Wi-Fi data.

THE ALCATEL-LUCENT ADVANTAGE

Agile Rules Technology

The Alcatel-Lucent 5780 DSC leverages A.R.T. providing ease of use, flexibility, high performance, scalability and maintainability and has over 150 patents pending as a testament of these values. Deploying the 5780 DSC with A.R.T. offers a range of benefits unique to this solution:

- **Powerful policy visualization GUI –** service providers are empowered to quickly and easily create and modify policies in-house
- **Excellent flexibility –** offers a wide range of use cases that can be tailored for for specific scenarios
- **High performance –** provides high performance (low latency and high transaction rate) across massive subscriber and session scale for a new breed of complex policy scenarios
- **Maintainability –** specifically tailored for service providers, A.R.T. reduces time and costs to operate, install, upgrade, troubleshoot and debug the system and associated policies

Interoperability, adaptability, and ease of deployment

As part of a complete in-house ecosystem, the 5780 DSC leverages a vast amount of experience in the space of policy control and charging that has been used to create a product flexible enough to integrate and adapt into a specific operations/business support system (OSS/BSS) environment with minimal cost and lead time.

The 5780 DSC has also completed IOTs with many third-party PCC elements, further simplifying interoperability within a multivendor environment.

LEARN MORE

The 5780 DSC enables services providers to address subscriber demand for personalized broadband services. With the Policy Control Module they can quickly and easily develop policies and to execute them with scale and performance.

Visit the Alcatel-Lucent Web site for more information on the Alcatel-Lucent 5780 DSC at **www.alcatel-lucent.com/5780dsc**

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