

SeaChange® Universal Resource Manager

QuickSpec

Dynamic Resource and Admission Control for Multi-Service Access and Aggregation Networks

Operators are investing in next generation networks as they scramble to meet the voracious demands of their customers for content anytime, anyplace. In broadband pre-IMS and IMS networks the challenge is cost-effectively providing guaranteed Quality of service (QoS.) Success will be defined by a high ROI once new services such as IPTV, VoIP, and Fixed Mobile Convergence (FMC) are commercially deployed.

For network operators seeking these capabilities today, SeaChange's Universal Resource Manager provides dynamic Resource and Admission Control (dRAC) solutions for real-time IP Service Quality, while minimizing network capital and operational costs.

OVERVIEW

SeaChange's Universal Resource Manager (URM) is a dynamic Resource and Admission Control (dRAC) system for large scale single and multi-application deployments. It provides per session and per subscriber QoS guarantees across broadband access, aggregation and edge networks – while allowing efficient resource utilization.

The URM logically resides between the transport network layer and applications. From its control plane position it controls the use of network resources on behalf of applications to provide QoS guarantees.

Key benefits of the URM include:

- Topology awareness combined with path sensitive admission control to maximize resource utilization while guaranteeing QoS for each session admitted to the network.
- Dynamic subscriber attachment awareness to automate subscriber provisioning.
- Single point of contact for applications combined with topology hiding to simplify and speed service deployment.
- Scalability to grow with your service both as user volumes increase, and as more services are deployed.

- Generic topology and resource policy modeling to support multiple network technologies, with pre-built templates supporting most common architectures such as ATM or Ethernet.

Major features of the SeaChange URM include:

SINGLE POINT OF CONTACT

The URM exposes a network topology and network technology agnostic interface for applications. This feature implements complete topology hiding and network abstraction to application functions. New services can therefore be launched without need for the application to understand the underlying transport topology or technology, simplifying and improving time to market for new services.

SINGLE OR MULTI-SERVICE

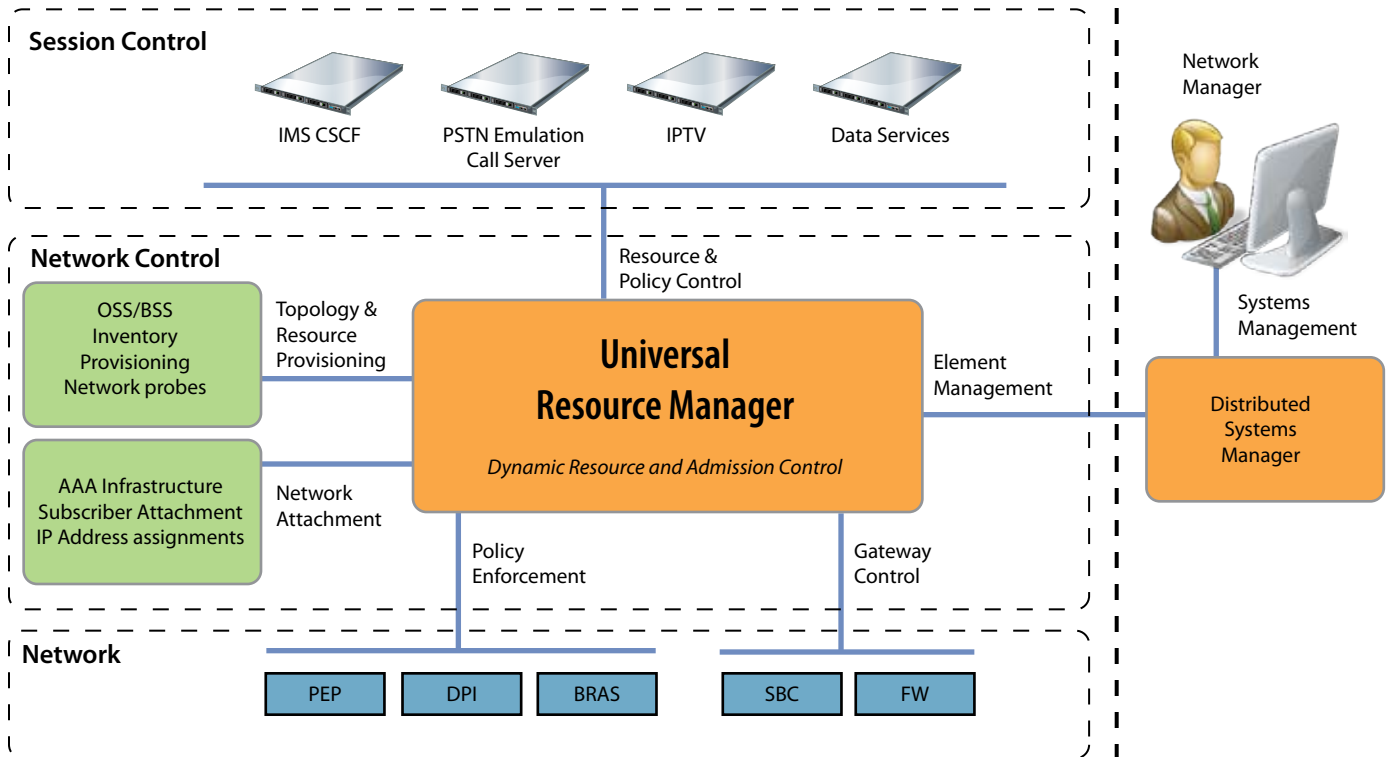
SeaChange's Universal Resource Manager can be used for large scale single applications as well as for multi-application purposes. It supports pre IMS, IMS, IPTV / VoD and over-the-top internet services, either individually, or in combination, as well as ensuring that best effort internet services maintain pre-determined throughput levels. Example types of applications include IPTV, typically using an XML/SOAP interface, and IMS using the standardized Gq'/DIAMETER interface.

TOPOLOGY AWARE

The URM is topology aware, which enables path sensitive admission control. For each resource reservation request the relevant sub-set of network resource contention points are identified and considered in the admission control process. This warrants the highest possible levels of resource utilization while enforcing per-session guaranteed QoS. Any network technology and topology is supported without imposing architectural requirements or limitations on the network. This support includes pre-built interfaces for ATM and Ethernet networks and open APIs for generic network modeling.

SUBSCRIBER AWARE

By automatically and dynamically being aware of where end-users attach to the network the URM can perform dRAC on per subscriber, per application and per session basis without any subscriber provisioning overhead.



SeaChange URM Architecture

SERVICE PRIORITY

Priority can be assigned on a per service basis relative to other services within the network or, different priorities can exist within the same service. For example emergency calling sessions can be assigned a higher priority to normal voice sessions in a VoIP service.

DYNAMIC POLICY ENFORCEMENT

For un-trusted sessions where media sent may exceed that negotiated at the signaling layer, URM can dynamically push policy into network elements such as: (1) L2 aggregation nodes, which typically control a PPPoE session or a DHCP address; and (2) Border Gateways, applying gateway control on a per session basis typically when controlling voice and associated multimedia over IP services.

Interfaces may be based on the SeaChange open API or use the ETSI TISPAN Ia interface.

SCALABILITY

A topology map is provided for each aggregation network managed by the URM. Multiple maps may be hosted on one hardware instance. Multiple hardware instances may be deployed. For very large aggregation networks, representations

may be split across multiple hardware instances. Where growth results in a need to span more than one hardware instance, this can be achieved without impact to service continuity. Regardless of size of deployment, the application layer is provided with a single point of contact. The application layer therefore requires no understanding of transport or control layer topology allowing the network to grow without impact to the application.

CARRIER GRADE REDUNDANCY

From a software perspective, the URM provides 1 + 1 resilience between servers connected on a high-speed LAN. Session data is asynchronously replicated between internal databases of active and standby nodes allowing failover and recovery without impact to sessions. The URM is deployed on carrier grade server hardware.

STANDARDS COMPLIANCE

The URM complies with the requirements of ETSI TISPAN, performing the Resource and Admission Control Subsystem (RACS) function. Within ITU-T the product provides a Resource and Admission Control Function (RACF) and within 3GPP a Policy Decision Function (PDF) / Policy and Charging Rules Function (PCRF).

TECHNICAL SPECIFICATIONS

URM Key Features

- Topology aware, session by session, resource based admission control for broadband access and aggregation networks
- ETSI TISPAN RACS compliant (interfaces and functionality)
- Automated topology hiding through dynamic acquisition of IP prefix distribution
- Pre-build ATM VP/VC and Ethernet VLAN topology templates
- XML API with generic topology modeling and resource policy provisioning support
- Dynamic provisioning of access line, IP assignment and QoS profile information
- Support for bridged and routed access modes

Dynamic Resource Admission Control Features

- Resource Reservation priority handling
- Cross service resource sharing
- Support for both soft and hard state reservation models
- Support for two-phase reservation with reserve-commit behavior
- On-demand and time-based advance resource reservation support
- Multi-domain resource reservation support

Interfaces

- IRc - XML/SOAP with WSDL description for Topology and Resource Provisioning API
- ETSI TISPAN Gq' (DIAMETER). RFC-3359, RFC-3588, ETSI TS 183 017
- 3GPP Rx (DIAMETER), RFC-3359, RFC-3588, 3GPP TS 29.213
- ETSI TISPAN Rq (DIAMETER). RFC-3359, RFC-3588, ETSI ES 283 026
- ETSI TISPAN e4 (DIAMETER). RFC-3359, RFC-3588, ETSI ES 283 034
- BGP v4. RFC-4271
- SeaChange Policy Enforcement API

Resiliency

- 1+1 redundant configuration with active and hot standby
- Sub-second automatic recovery from switch- and fail-over without service interruption
- IP failover through use of gratuitous ARP
- Interface bonding, e.g., IPMP, for network level resiliency
- Automated backup and restore
- Rate limiters on all interfaces for overload protection

Security

- IP range ACLs for each interface
- Secure internal and external management interfaces using HTTPS
- Management interface login session timeout
- Management interface password management

Management

- Web based FCAPS Element Manager
- SNMP MIB for fault and performance management
- Centralized software deployment, inventory and update/upgrade tool
- In-service maintenance and configuration changes
- CSV log files for enhanced performance management and support to network planning

Available Feature packages

- XML/SOAP with WSDL description for Resource and Policy Control API
- RADIUS support for acquisition of subscriber, access line and IP binding information
- Hardware Node fault and performance management monitor

ABOUT SEACHANGE

SeaChange International is a leading provider of software applications, services and integrated solutions that deliver a high-quality television experience across TVs, PCs and mobile devices. By partnering with leading cable and telco companies, SeaChange enables in-home and mobile entertainment, as well as advanced advertising solutions, allowing broadband operators to differentiate their offerings and create strong customer loyalty.

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