

## Enabling Centralized

## Service and Device Management

Product companies (Device Manufacturers) and Service providers face significant challenges with regards to deploying, provisioning, and managing a wide range of increasingly complex CPE (Customer Premises Equipment) types, devices and services. While these devices enable innovative and high value services that gain new customers and greater revenues, they also pose serious challenges including:

- High costs incurred in deploying, provisioning and managing mass deployment of devices and services. Service providers also face high complexity in delivering multiple services to multiple devices in multiple networks.
- Increasingly complex devices that are normally beyond the grasp of subscribers are resulting in complex customer experiences, increase in support calls, and impediments in service adoption with most subscribers struggling with the burden of CPE configuration.

Remote device management solutions are increasingly being leveraged in this context to securely auto-configure and remotely manage devices. The end-to-end automated provisioning of CPE devices dramatically reduces operational and support costs, decreases customer churn, promotes service adoption, and ultimately enhances service providers' profitability.

### Remote Device Management Technologies

The TR-069 CPE WAN Management Protocol (CWMP) details a common method for CPE devices to be automatically configured and remotely managed. TR-069 was created by the Broadband Forum (formerly the DSL-forum), to manage end-user devices in broadband networks, such as SIP phones, IPTV Set-Top-Boxes or VoIP adapters. TR-069 was created to be device independent. By this, a TR-069 Auto Configuration

Server can manage any CPE device, no matter who the manufacturer is. TR-069 has a strong security mechanism using Shared Secret and SSL/TLS. The protocol is firewall-friendly (HTTP, Web Services) and eases the management of devices remotely.

### Celstream Remote Device Management Components

Celstream's Remote Device Management Solution is built over CWMP and SNMP. It includes pre-built components like a fully-functional, portable and light-weight TR-069 client stack, highly scalable and portable ACS server, and several value added pluggable server side modules such as heart-beat, alerts, trends, and logs. It also has several applications built on top, e.g., remote software upgrade management. The client stack provides integration with SNMP for data model value collection. The ACS server is designed to be extensible in terms of both modules and applications, and provides a fully customizable GUI framework.

Celstream's TR-069 client is tested against the PD-128 standard published by the DSL forum and is certification ready. It is tested against third party ACS servers. The solution allows IP STB, multi-function printers, DVR, smart power meters and other such devices to be automatically configured and remotely monitored. The solution significantly reduces the time and cost of deploying and supporting these devices and the services that run on them.

### Celstream's Remote Device Management Solutions

Celstream provides end-to-end remote device management solutions for equipment manufacturers and service providers using its component leveraged service delivery model. It provides integration with CPE devices and custom application/GUI

development to complete the remote device management solution. The solution thus allows service providers to perform several remote management tasks such as configuration, control, monitoring, diagnostics and firmware upgrade in addition to delivering value added information such as trends and alerts.

## Key Solution Features

The solution manages devices remotely with a web-based front-end for ease of use. The solution is also highly customized to meet specific market needs. Key features of the solution include:

- **Device management** - discovery, configuration, and parameter polling.
- **Alert** - generation and distribution with logging.
- **Open interface** - web services interface to the ACS.
- **Trending** - trend data with granularity of minute, hour, day, month, and year.
- **Reliability** - guaranteed message delivery even with unreliable network connectivity.
- **Portable** - to any client operating system.
- **Third party compliance** - tested against published standards and third party ACS.

## Key Business Benefits

- **Reduces operational and support costs** - sharply reduces operational, customer service and support costs through automated service provisioning and comprehensive device management.
- **Centralizes service and device management** - enables administration of multiple devices with one easy to use remote device control.

- **Ensures service reliability** - active monitoring of devices and services ensures diagnosis and resolution of problems remotely and in real-time. The solution also provides realtime information of device usage and service performance that helps in making informed decisions. The solution thus helps exceed customer expectations and differentiates services through superior customer care.
- **Addresses network challenges** - effectively addresses challenges of network reliability, protection, configuration, updates, maintenance and replacement.
- **Personalizes customer experience** - helps deploy innovative hardware solutions that support high customization of services to specific target markets.
- **Increases average revenue per use (ARPU)** - promotes service adoption by making it easier for users to access new services. Simplifies customer experience by removing the burden of CPE configuration from the subscribers.
- **Reduces customer churn** - with proactive remote service and maintenance management that alerts potential problems even before they occur.
- **Increases customer satisfaction** - helps exceed customer expectations, builds customer loyalty, and ultimately enhances service providers' profitability.
- **Increases revenues** - efficient management of a broad array of devices facilitates higher-level functionality that helps service providers launch new and enhanced services that increase revenues.
- **Accelerates the delivery of enhanced devices and new services** - already developed remote device management components enable devices to be configured and remotely managed rapidly. The components reduce the time and cost of deploying and supporting these devices and the services running on them.



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