



Incognito's Digital Experience Solution and TR-369 User Services Platform

Building better-connected smart home services through strategic partnerships and USP innovation

The explosion of connected devices in the home today, which use various technologies such as Wi-Fi, IoT, mesh, and anything 'smart,' presents new challenges to operators — how to maintain seamless, always-on connectivity.

This ever-evolving landscape of connected devices and how consumers are taking advantage of smart home offerings is putting pressure on service providers to deliver additional value-added and customizable services to end-users.

Meanwhile, service providers are also facing a number of growth challenges due to limiting infrastructure and an uncertain future.

The Broadband Forum User Services Platform (USP) TR-369 specification sets out capabilities to enable Wi-Fi optimization, virtualized services on connected devices, and real-time device management to proactively monitor and manage the customer experience.

This document provides an overview of the supported USP capabilities in Incognito's Digital Experience Solution, which offers a unified approach to device management using TR-069 and TR-369, and the ability to deploy third-party virtualized applications on connected devices.

Market Trends and Service Provider Challenges

With the number of connected devices and broadband usage going up, connectivity issues and increased Wi-Fi strain are a threat to disrupting life in the home. Customers continue to expect seamless, uninterrupted in-home Wi-Fi connectivity and reliable network performance. In addition, the expectation of personalized and customizable services are also increasing. Not all users are the same: many are working from home while others are gaming or streaming. Rising concerns around security, data protection, and maintaining responsible online behavior through strong parental controls are feeding the demand for more robust virtualized services and more customized options that will ultimately provide a better customer experience. These changes result in new pressures for service providers to resolve even more technical issues and maintain always-on connectivity for complex voice, video, and data services. However, this comes with challenges.

Over the next five years, the compound annual growth rate (CAGR) of revenue from broadband access will be down to low single digits. Operators need to find ways to generate new streams of revenue. What's more, service providers are now going up against tech companies like Amazon and Google in the smart home space and, at the same time, are struggling with restrictions due to the architectural limitations of legacy device management platforms.



Did You Know?

Smart home as a service market is expected to grow to \$109 billion by 2025.

Impact on Service Providers and Hardware Vendors

There is emerging competition from operators, digital companies, and new breeds of home automation service providers. To capitalize on the connected home, service providers and hardware vendors must take a comprehensive approach to:

Service Providers

- Prioritize adaptive, self-optimizing connectivity throughout the home.
- Support service diagnostics and performance measuring.
- Launch new value-added services to unlock new revenues.
- Effectively manage customer privacy and data security.
- Enhance visibility into in-home Wi-Fi.

Vendors

- Develop market-ready applications to generate new opportunities.
- Develop new partnerships.
- Enable smart home solutions from third-party suppliers.

TR-369 User Services Platform (USP)

The User Services Platform (USP) is a new device management standard that enables a faster, scalable, and more secure way of managing the full lifecycle of connected devices and provides the platform to support the delivery of next-generation virtualized services. TR-369 USP is reshaping the way the broadband experience is delivered and measured, driving a shift from reactivity to proactivity, and serving up the following benefits:

- Real-time communication to devices allows for continuous device monitoring and advanced telemetry.
- Efficient communication between a device and controller using lightweight protocols improving performance.

- New architecture using multiple controllers to manage different services/application on a single device.
- Virtualized applications can be rapidly deployed directly on devices using USP Software Module Management.

USP is expected to become the target architecture for remote device management over the course of the next decade but will co-exist with current Auto Configuration Server (ACS) TR-069 device management tools for many years.

USP Technical Description

The User Services Platform is a system of controllers and agents enabling remote manipulation of software and hardware capabilities. A TR-369 agent resides on a device and can serve one or more functions, such as exposing local service elements (functions on the device, e.g., Wi-Fi networking) to controllers. A service provider device management system, like an Auto Configuration Server, could have a controller. Subscribers can also be given access to a controller through a self-service user portal in the cloud, on a gateway, or a smartphone.

With USP, multiple controllers can manage the same device with strict access control rules to ensure security and data protection. This architecture creates the opportunity to utilize functional-specific controllers and mobile apps to communicate to devices directly, which differs from ACS, where only one controller can manage a single device.

Connections between USP controllers and agents have several key features which help improve performance over TR-069 CWMP. Persistent connections eliminate the need to establish sessions for every individual message transmission, improving efficiency and reducing overhead. Role-based access control defines the trust mechanisms for associating controllers with agents and implements access control based on roles and privileges at a per-data-model-element (parameter or object) and per-action (read, write, execute) level. Additionally, USP supports Transport Layer Security (TLS) encryption, ensuring that messages remain secure and not broken by intermediate proxies or brokers.

Incognito Digital Experience Solution

The Incognito Digital Experience (DX) Solution provides a unified platform to support both ACS (TR-069 CWMP, SNMP, MQTT) and USP (TR-369) device management architectures allowing service providers to remotely manage in-home networks and devices, resolve connectivity issues, reduce operational support costs, and launch high-ARPU services. With Incognito's standards-based User Services Platform (USP) controller, conquering the connected home has never been easier thanks to Incognito's ability to rapidly configure and deploy virtualized services on devices by eliminating the need for device firmware upgrades and agent-based approaches. Additionally, Incognito's big-data telemetry capabilities enables proactive care and KPI analytics monitoring by ensuring always-on connectivity to in-home devices.

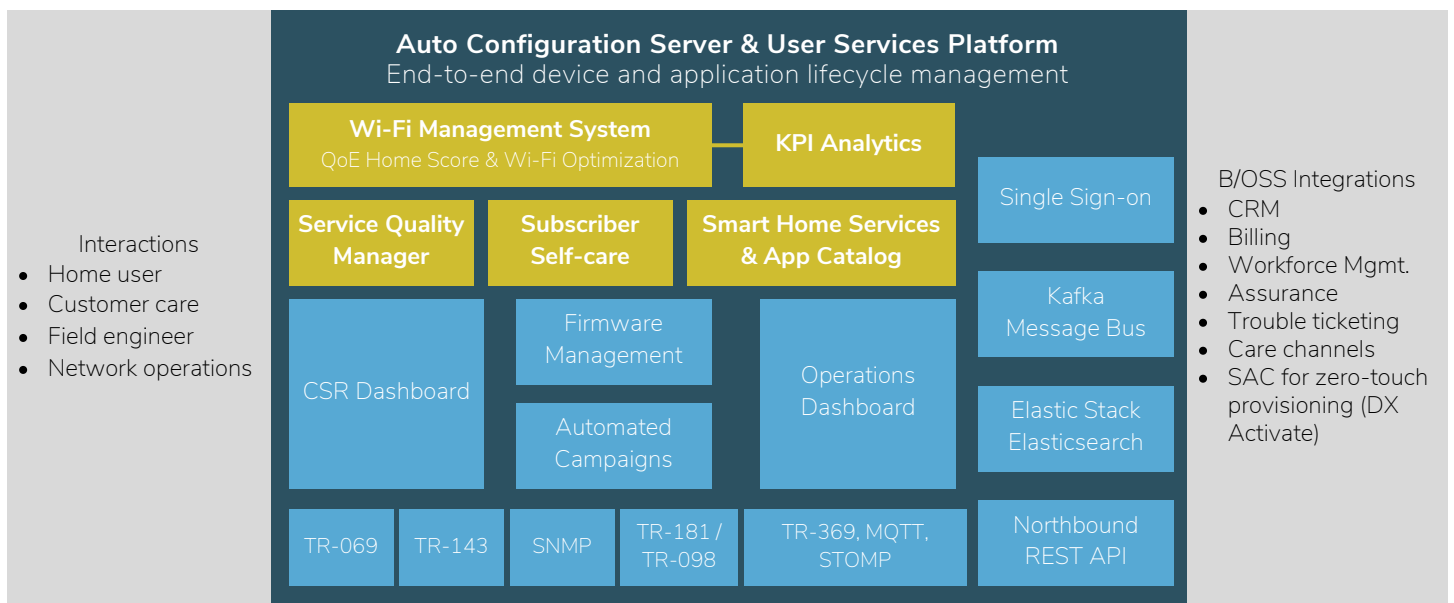


Figure 1 – Digital Experience Solution Architecture

● Value-added modules

Incognito's DX solution allows ACS and USP controllers to co-exist in a hybrid deployment model to support current TR-069 devices and services while introducing TR-369 functionality, allowing service providers to continue to innovate the next-generation broadband experience. Incognito's DX Solution allows service providers to take advantage of new use cases such as multi-AP mesh networking, virtualized applications in the home or SMB gateways, smart home IoT automation, and managed Wi-Fi. With carrier-grade USP controller capabilities, Incognito's DX solution improves visibility and control over the entire lifecycle of devices to support today's devices and next-generation device models.

Build a Better Connected Home Experience with Incognito Software Systems

By offering a unified approach to device management using TR-069 and TR-369, service providers can capitalize on the connected home. Incognito's solution allows service providers to leverage investments in common tools across ACS and USP, including self-care tools, service quality management, and KPI analytics, and business processes while preparing for the transition to TR-369 as it becomes more commercially available. The solution helps optimize Wi-Fi quality with real-time analytics, and improves visibility and control of customer premise equipment and IoT device lifecycles. With Incognito's DX Solution, service providers can enhance the digital experience with key capabilities that include:

- Built-in App Store available through Incognito's platform provides flexibility to add and download apps that unlock the full potential of TR-369 devices.
- Deploy third-party applications into virtual containers on devices and manage them using Incognito's USP controller.
- Centralized platform that is network access agnostic and vendor neutral.
- Fully integrated USP agent and controller logic and ability to manage the diverse set of broadband functions.
- Proactively monitor and optimize Wi-Fi and device performance, automate issue resolution, and gain insights into service quality.

Why Choose Incognito for USP?

With over 30 years of industry experience, Incognito is at the forefront of innovation when it comes to automated broadband OSS solutions to manage the connected home. As an active member of the Broadband Forum and leading contributor to the development of the TR-369 standard, Incognito has helped global service providers accelerate and optimize in-home broadband services with our robust device management solution which has been deployed on millions of devices. What's more, Incognito DX Solution has been the recipient of multiple accolades from notable industry bodies including Leading Lights, Broadband Technology Report, and Glotel Awards.

Incognito brings the right solutions and expertise. We offer access to knowledgeable technology experts and the connections to build a thriving USP ecosystem thanks to our strong and established relationships with device and virtualized app vendors. With Incognito's DX Solution, operators can gain early market advantage with TR-369 USP today and begin developing premium smart home offers for customers and explore commercial production pilots with vendors.

Service Provider Benefits

- New revenue streams through value-added services
- Increase service velocity
- Greater customer lifetime value by improving customer satisfaction and retention
- Quick to deploy – no service impact. Traditional firmware upgrades require a device reboot
- A standardized approach to lifecycle management without any firmware upgrades
- Launch market pilots and evaluate services and measure service uptake very quickly
- Launch new virtualized services on customer premise equipment
- Take advantage of a complete USP ecosystem and build a better connected home experience

Vendors Benefits

- Gives partners a tested and proven way to work with operators
- Provides a new service delivery channel
- Access to wider service provider market
- Vendor- and technology-agnostic platform
- Secure services – vendors are tested and securely deployed through Incognito's platform
- Strengthen market position against competitors