

DEVICES & ASSURANCE

i2i ACS

A TR-069 auto-configuration server with zero-touch provisioning and diagnostics

Customer equipment			ILLUSTRATIVE
SERIAL	MODEL	FIRMWARE	SIGNAL
ZTEG-C8A1F2	ONT · F670L	V9.0.11	-19.8 dBm
HWTG-7B20E1	ONT · HG8245H	V3R017	-21.4 dBm
TPK-40F3A9	Router · EX220	1.2.3	Online
ZTEG-C8B07D	ONT · F670L	V9.0.10	-28.6 dBm
Alarm Low optical power on ZTEG-C8B07D			

OVERVIEW

i2i ACS is a TR-069 auto-configuration server for customer-premise equipment such as ONT and ONU units and Wi-Fi routers. Devices call in, are discovered, are registered against the subscriber in your billing system and are configured by workflows that your team builds in a web console.

The current edition separates a protocol-only edge node from a multi-tenant control plane. Edge nodes speak CWMP to the devices and pull their configuration from the control plane. The control plane stores devices, workflows, sensor readings and health results, and scopes what each partner may see. Support staff can then reboot, reconfigure, diagnose or upgrade a device from the console, singly or in bulk, without visiting the customer.

THE CHALLENGE

Every ONT and Wi-Fi router an ISP installs must be configured, kept working and eventually upgraded. Doing this by technician visit, or by typing into each device, does not scale. Operators need devices to configure themselves on first contact, a way to change or check many at once, and enough visibility to find a failing line before the customer calls, without exposing one partner's devices to another.

ILLUSTRATIVE SCREEN

AT A GLANCE

- ✓ Devices discovered and registered on first contact
- ✓ Zero-touch templates for WAN and Wi-Fi setup
- ✓ Reboot, reset, diagnostics and firmware download
- ✓ Optical power and health checks per device

Capabilities

CWMP edge node

A protocol-only node terminates device sessions. It handles the session state machine, tolerates malformed SOAP, authenticates devices and reports discoveries to the control plane. Nodes pull workflow and route configuration and send a heartbeat.

- CPE authentication none, Basic or Digest
- Connection Request per device
- Optional STUN and UDP Connection Request

Discovery and registration

The first Inform creates a device in the registry.

Registration associates it with a subscriber through the billing API or, without billing, with an organisation. Failed attempts can be retried singly or in bulk.

Workflow engine

Ordered routes choose a workflow from the device and session context. Workflows are data authored in the console from steps such as get and set parameters, add and delete object, reboot, factory reset, download and apply config profile. Workflows can be cloned.

Zero-touch provisioning

Templates match by vendor, OUI, product class and model, with an organisation override. They create the WAN profile, configure dual-band Wi-Fi, remove the vendor default WAN and run an ordered set of operations.

Operations and bulk operations

One-off operations cover parameters, objects, reboot, factory reset, download and diagnostics. Bulk Ops applies one operation to a filtered device list and reports pending, running, completed, partial, failed or cancelled status.

Sensors and service check

Sensors read chosen parameters such as optical power, apply value transforms and classify readings against warn and critical thresholds. The service check grades fibre, device, WAN, LAN, account and internet layers using an editable rule catalogue.

Tenancy and access

Tenants follow partner accounts and partner scope from the sign-in token limits the devices a user sees. Roles for admin, operator and viewer are controlled by permissions.

Activity trail

Every write, diagnostic and fault is stored per device, with credentials masked and a per-device limit, so support can see what was done and when.

Technical summary

PROTOCOL	TR-069 (CWMP), namespaces 1.0 to 1.4, over HTTP or HTTPS on port 7547
DATA MODELS	TR-098 InternetGatewayDevice and TR-181 Device:2, with seeded catalogues
DEVICE AUTHENTICATION	None, HTTP Basic or Digest, chosen by configuration
NAT TRAVERSAL	Connection Request; embedded STUN responder and UDP Connection Request, off by default
DIAGNOSTICS	IPPing, TraceRoute, Download and Upload diagnostics; results read at the next Inform
INTEGRATIONS	i2i billing REST API through a Data Source; central sign-in service; service discovery
CONTROL PLANE	Java service on PostgreSQL, multi-tenant; nodes authenticate with a node key
DEPLOYMENT	systemd units with install and upgrade scripts; not delivered as a container or cloud service

Standards and interfaces

Broadband Forum

- TR-069 (CWMP)
- TR-098 data model
- TR-181 Device:2 data model
- TR-069 Annex G connection request through NAT

Transport

- HTTP Basic and Digest authentication
- STUN binding (RFC 5389)

Related modules

Modules operators often run alongside i2i ACS. Each is a separate module; the integrations that exist are listed in the technical summary above.



Where it is used

Zero-touch onboarding of a new ONT

A new ONT powers up at a customer home and sends its first Inform. The ACS discovers it, matches a template by vendor and model, creates the WAN connection, configures dual-band Wi-Fi and registers the device to the subscriber found by its PPPoE username.

Bulk change across a fleet

An operator needs to change a parameter set or trigger a firmware download on one device model. Bulk Ops applies one operation to a filtered list of devices and tracks the result of each, so failures can be retried instead of guessed at.

Support desk diagnosis

A customer calls about a poor connection. The agent runs the service check, which grades fibre, device, WAN, LAN and account layers, then runs a ping or traceroute from the device itself and checks which Wi-Fi clients are connected.

See i2i ACS on your network

Talk to our team about your operator type, your network and where to start. We will show you the module and answer the technical questions.

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