



cloud4WISP provides the billing, subscriber management, network supervision and CRM functionality that a Wireless Internet Service Provider (WISP) business requires.

cloud4WISP Management Feature Summary

Sales: Add and manage subscribers.

Provisioning: Create work orders to schedule subscriber installations..

Activation: Activate new subscribers onto the network.

Authentication: The CPE MAC address is entered to authenticate the subscriber.

Subscriber rate plans: Create multiple cost/performance plans for subscribers to choose.

Fixed broadband billing:

Subscriber pre- and post-paid billing, with invoicing, collection notification and past-due automatic disable.

Mobile broadband service:

Access code generation and authentication for a non-subscriber Hotspot service.

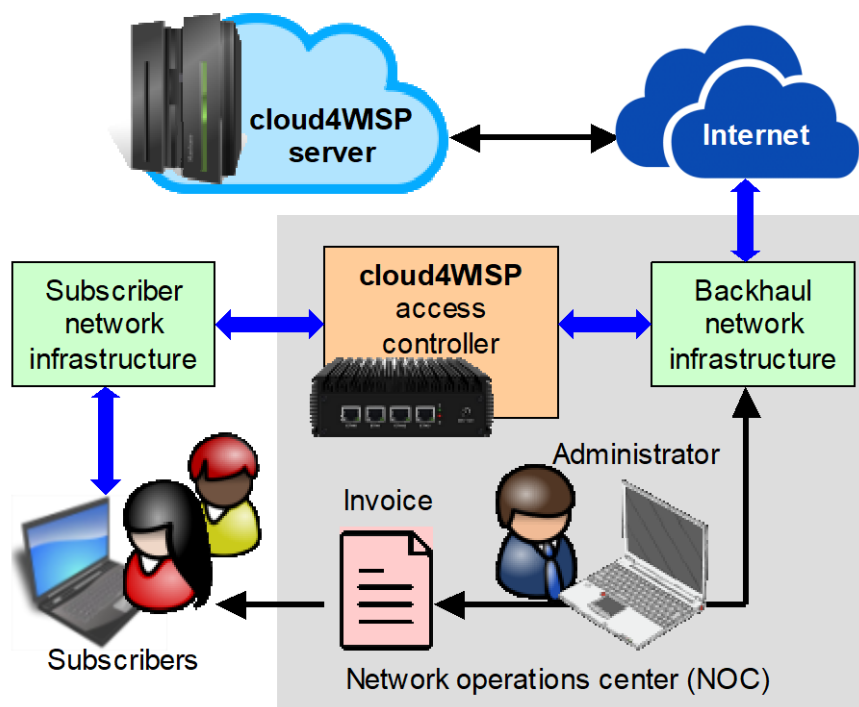
Network monitoring: Detection and alarm of cloud4WISP gateway and subscriber network to CPE data link failures.

Customer relationship management:

A CRM portal that subscribers use to access account data and submit a support request.

Helpdesk: Support staff respond to ticket requests, and escalate issues to other staff and management.

Reports: Report categories include billing, maintenance, data traffic and support.



The cloud4WISP management system

The cloud4WISP management system was designed using telecommunications industry best practices; the OSS/BSS process model for telecom business management. The cloud4WISP provides all the systems functionality that is required to manage a WISP business. The cloud4WISP is integrated with the cloud4WISP access controller that is installed at the Network Operations Center (NOC) to manage the flow of subscriber data traffic. A cloud4WISP account can manage multiple cloud4WISP access controllers concurrently for WISP's that have more than one NOC, or else install access control at the PtMP tower. There is no limit to the number of subscribers that can be managed by a cloud4WISP account.

A world-class WISP management system with minimum cost

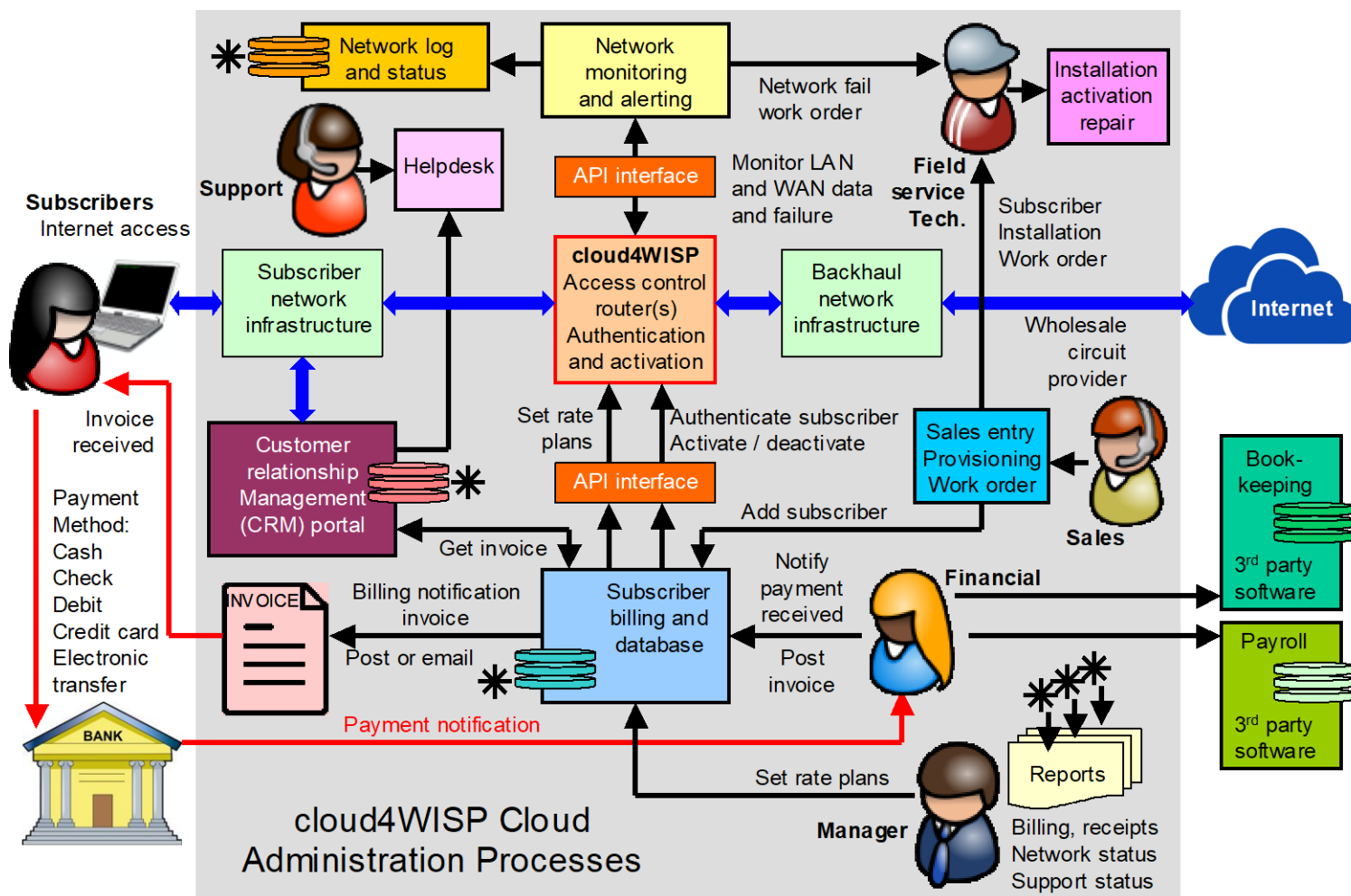
WISP's are accustomed to paying a fee which might be \$1 or more for each subscriber each month when using a cloud management system. Not with cloud4WISP, the subscription account charge is a few cents per subscriber per month. There is no limit to the number of subscribers and multiple cloud4WISP access controllers that can be added to one cloud4WISP account. This is possible because each cloud4WISP controller is a computing element in the Cloud network and processes all access transactions. The Cloud manages batch tasks, which greatly reduces the operating overhead. Once programmed by the Cloud, each cloud4WISP access controller manages network access without supervision.



Cloud4WISP overview

The administration process flow is initiated by sales adding a subscriber to the system. The subscriber information is added to the billing database and an installation work order is created and sent to the technician. The subscribers billing cycle is initiated upon activation.

Financial staff issue invoices as indicated by the billing cycle and post notifications of receipts. Each cloud4WISP access controller is monitored and an alert advises the administrator of a failure. Each subscriber has access to the CRM Portal to check the account and open a support ticket. The manager can obtain reports from each of the sub-systems to monitor the operation of the business.



Cloud4WISP staff roles

Cloud4WISP has five roles and each role has unique access privileges. Each role can have an unlimited number of staff login credentials.

Manager: responsible for supervision of all roles and business decisions, access to operational reports.

Sales: responsible for acquiring new subscribers and adding subscribers to the system.

Customer service: responsible for the customer interface regarding any questions, problems, terminations, requests for upgrades, etc.

Finance: responsible for income and expenses, principle tasks are to maintain the billing system and ensure that subscribers pay invoices.

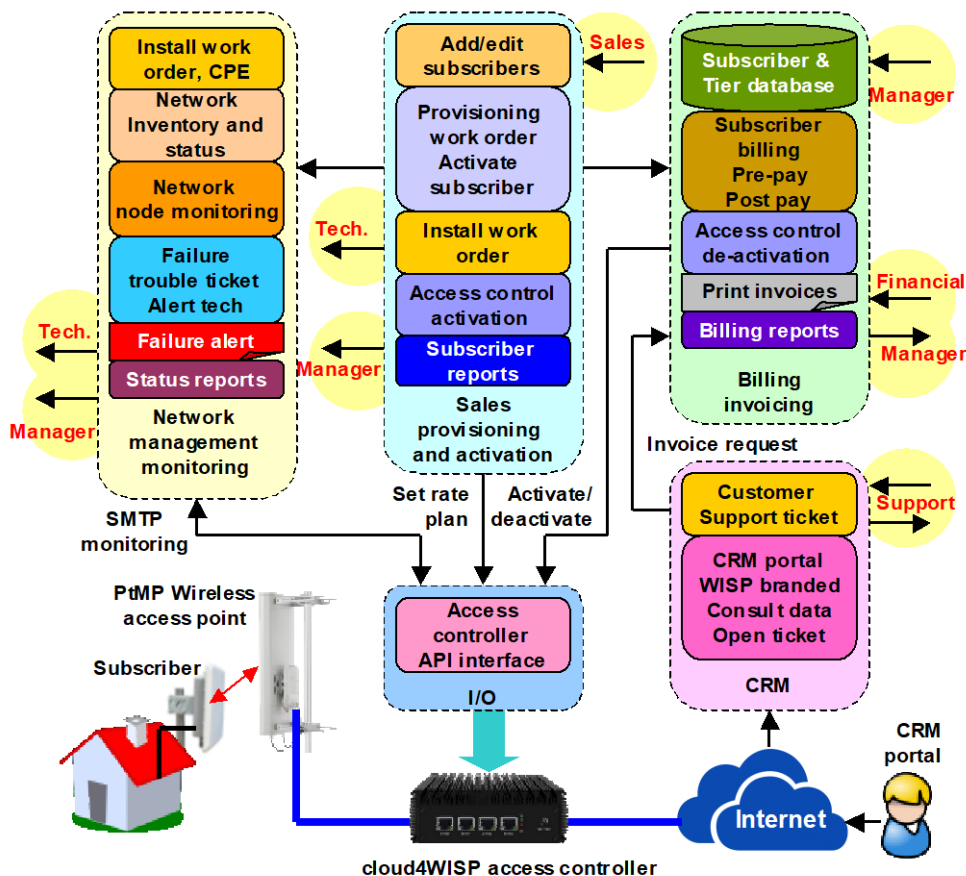
Technical: responsible for work orders, installation of new subscribers, maintenance of existing subscribers, repairs to the network, and expansion of the network.



Cloud4WISP: sub-systems and sub-system processes.

Subscriber billing

The WISP creates a number of rate plans, each is a data speed and corresponding charge. A new subscriber chooses a rate plan that is added to the subscriber's profile. Activation of the subscriber initiates the start of the billing cycle. An invoice is issued for each billing cycle and the subscriber payment is noted in the billing system by the financial staff. The billing system sends the subscriber activation and rate plan instructions to the respective cloud4WISP access controller. In the case of non-payment the subscriber is deactivated.



Sales, provisioning and activation

Sales staff can add new subscribers and change subscriber information. The subscriber chooses a rate-plan. Entry of a new subscriber initiates a workflow process that will generate a work order for technical staff to install the CPE wireless equipment at the subscriber premises. Subscriber billing information is added to the billing database. On completion of the subscriber installation the technician activates the subscriber and initiates the billing cycle.

Customer relationship management (CRM)

Each new subscriber receives a login credential for the CRM portal. This is a WISP branded website that the subscriber can login to see information about the account and retrieve billing invoices. The subscriber can open a customer support ticket that is sent to the support staff for answer. On-line payments can be made through the CRM portal. In the case that the Internet is not available due to circuit failure or non-payment then the captive portal displays a message.

Network monitoring and reporting

cloud4WISP monitors all access controllers for failure and sends an alert to the administrator if this occurs. Support staff can test the circuit to the subscriber CPE wireless when the subscriber reports no connection. Data traffic through each cloud4WISP access controller is monitored and a bandwidth use time graph indicates when a WAN circuit is nearing congestion. The administrator can see a status report for each cloud4WISP access controller.



Billing rate plans

The WISP can install an unlimited number of rate plans for fixed broadband subscribers. Each rate plan specifies a maximum download / upload speed and the corresponding plan charge. When enrolling a new subscriber the rate plan is chosen based on cost or data speed. Billing invoices charge the customer at the chosen rate plan. The billing system sends the customers chosen data speed to the cloud4WISP access controller.

Mobile broadband billing

Mobile broadband provides Internet access for customers who are not subscribers. The billing system issues access codes that have the parameters of duration and data speed. The customer will access an unencrypted WiFi wireless access point using a mobile device. cloud4WISP manages handoff of customers from one AP to the next to implement roaming. Mobile broadband eliminates the cost of fixed broadband premises installation and a monthly payment obligation.

Cloud4WISP access controller functions

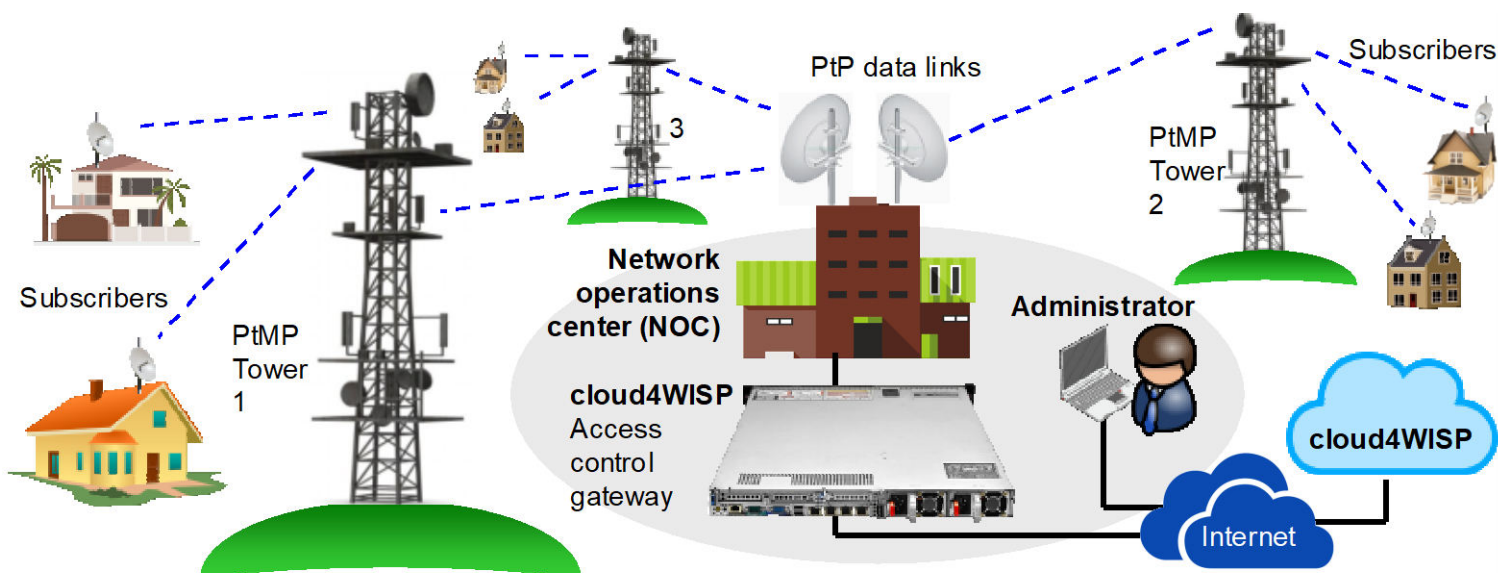
Each cloud4WISP access controller implements several tasks:

- Authenticate each subscriber CPE onto the network.
- Apply subscriber rate plans.
- Enable/disable subscriber access.
- Monitor CPE status.
- Update the Cloud with network status and traffic.
- Captive portal for CRM and status.
- Mobile broadband authentication.

Cloud4WISP network implementation

cloud4WISP can manage multiple cloud4WISP access controllers. Install a cloud4WISP controller at the network operations center (NOC) and install additional cloud4WISP controllers at tower sites that have Internet access, eliminating a point-to-point wireless backhaul from the tower to the NOC.

When a subscriber is added to the billing system the cloud4WISP controller that will service the subscriber is specified, this might be a NOC or one of the PtMP towers. Each cloud4WISP controller downloads a partial database for the subscribers assigned to that controller. The cloud4WISP access controller functions autonomously and only receives updates from the Cloud when a new subscriber is added to that controller.



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