



Technical Guide

Third Party PMS Integration

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1. Introduction

This technical guide is written for network managers who would like to integrate on-demand authentication on Controller with third-party property management systems (PMS) such as Micros Opera. For PMS other than Micros Opera, a table of attributes is provided in this guide for system integrators to achieve integration with the Controller. Implementation examples are also given to help system integrators plan and carry out integration.

With such integration, the following can be achieved

1. Check-in information entered into the PMS by the hotel receptionist can be used as Wi-Fi login credentials
2. Data usage of each logged-in guest can be monitored and managed from the Controller
3. The Controller can send billing plan rate the user chose to the PMS as part of the check-out information

After reading this document, the reader should have a clear understanding of how user data from existing PMS can be used in authenticated Wi-Fi services and how to pragmatically set up the integration on the Controller.

2. PMS Overview

2.1 What is PMS?

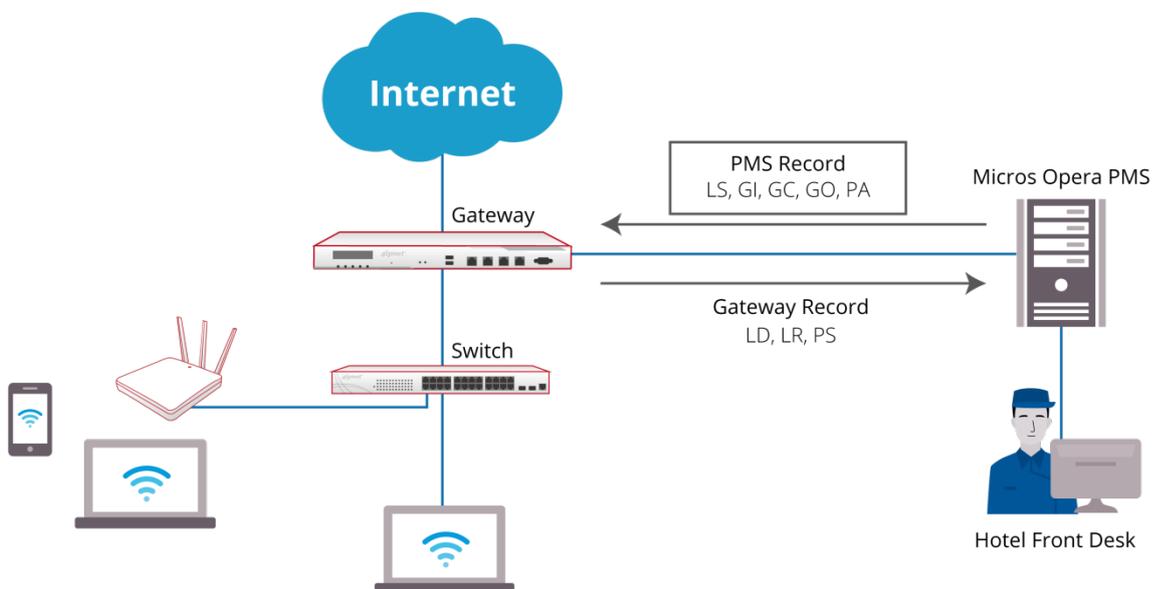
Property Management System(PMS) is a computerized systems that facilitate the management of properties, personal property, equipment, including maintenance, legalities and personnel all through a single piece of software.

2.2 PMS in Hospitality Industry

PMS is a comprehensive software application used to cover some basic objectives such as coordinating the operational functions of front office, sales and planning etc. Automate hotel functions like guest bookings, guest details, online reservations, point of sale, telephone, accounts receivable, sales and marketing, banquets, food and beverage costing, materials management, HR and payroll, maintenance management, quality management and other amenities. Hotel property management systems may interface with central reservation systems.

2.3 Why Do We Need to Integrate PMS with Controller

When hotels provide charged Internet services, the controller used will need to send information such as charged fees to the PMS for guest accounting/billing.



3. Feature Overview

3.1 Usage Scenario

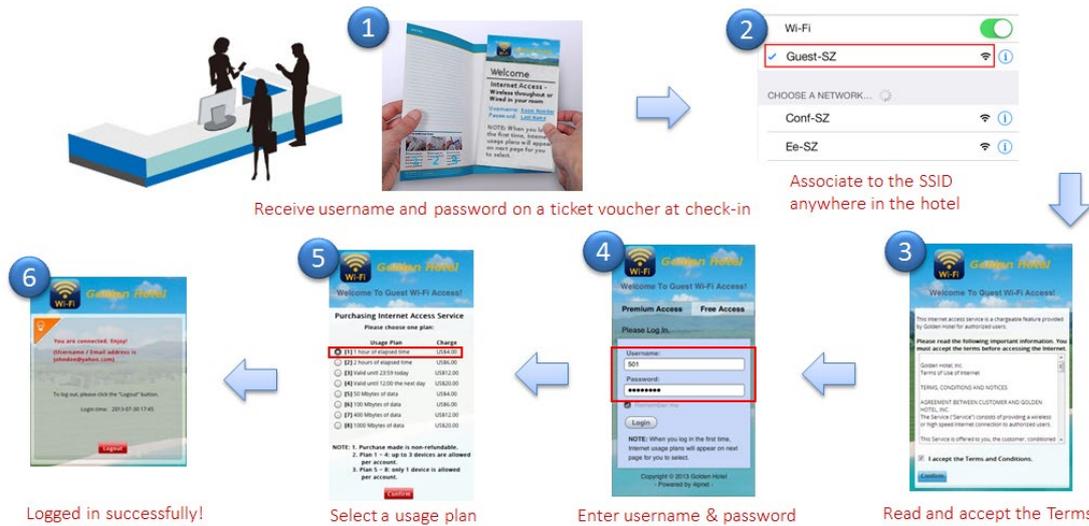
Guest John comes to Golden Hotel for a 3-day stay with a laptop, an iPhone, and a tablet. At check-in, a receptionist named Stacy follows the standard procedure of check-in, filling in John's personal information on the hotel's Micros Opera system. John asks about Wi-Fi access. She kindly replies that he can connect his devices to the Wi-Fi network named "Guest-SZ" and surf the Internet by entering his room number and last name on the pop-up login page. "Normally it is a charged service," she says it with a smile, "but you could use it for your entire stay because you are our member." John feels pleasant hearing about it.



While in the hotel, he keeps his iPhone and tablet always connected, and logs in with his computer only when he needs to connect back to his office. When checking out, he sees a 'Wi-Fi service' description on his invoice, but the Charges show \$0.00. He happily pays the bill by credit card, thinking that he might want to come back again because of the convenience that Golden Hotel offers him.

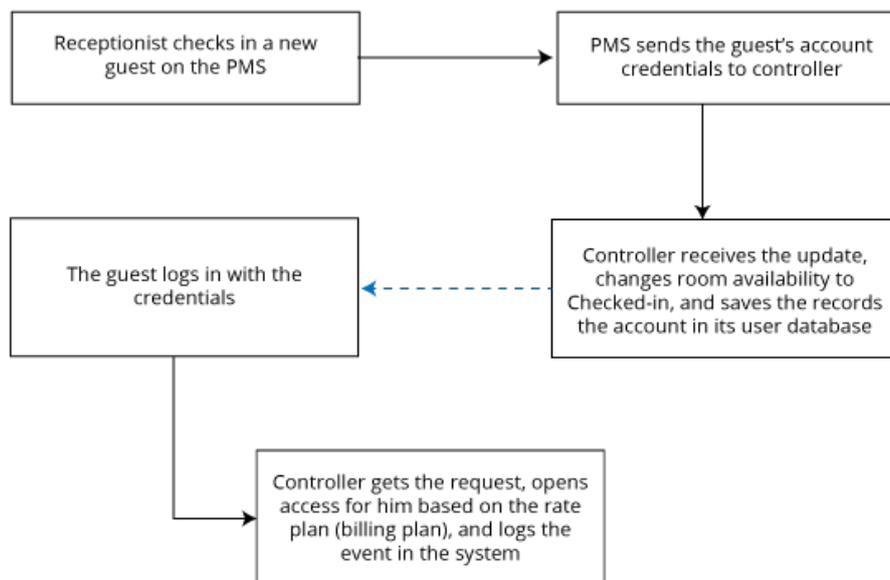
3.2 Use Cases

Hotels can charge guest users for Wi-Fi services and see the charges posted on the PMS. Guest can easily self-register for Wi-Fi:



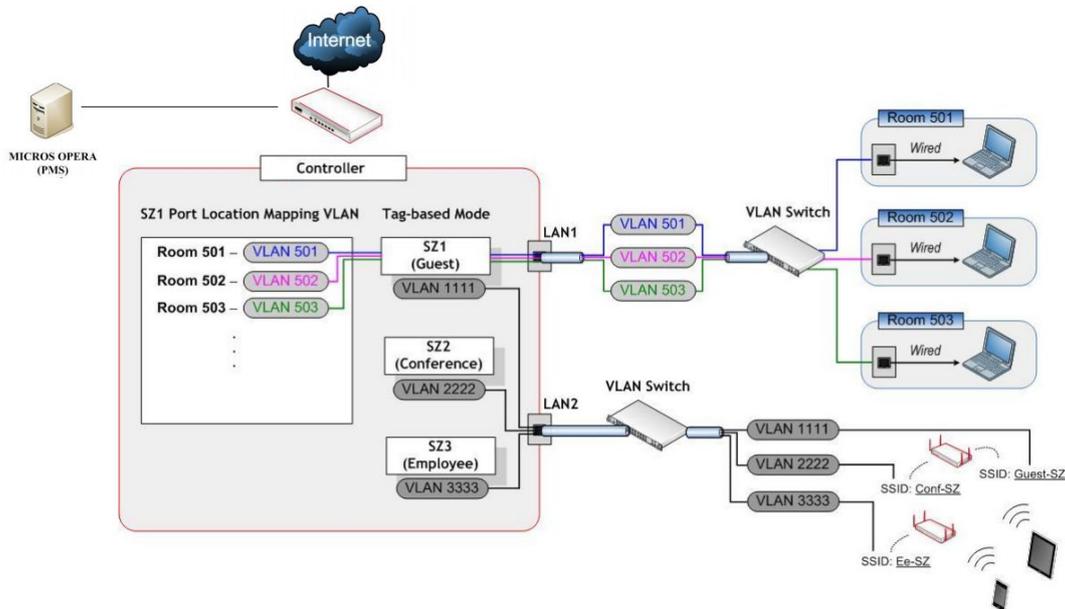
1. Guest receives a Wi-Fi service account
2. Guest turns on Wi-Fi and connects to the specific SSID and the portal page displays on the user's device screen
3. Guest reads and accepts the usage terms
4. Guest selects Premium Access and then enters the username and password from step 1
5. Guest selects a billing plan and confirm the selection
6. Charge is posted to the hotel's PMS and guest is logged in for Wi-Fi access

3.3 Technical Work Flow



4. Implementation

A generic network topology regarding WLAN/PMS integration should be understood in the first place:



As the figure shows, the gateway should be able to connect to Micros Opera via Ethernet. The two systems communicate with each other by the FIAS protocol v2.20 and an API provided by Micros Opera PMS.

4.1 Configuration Step #1: Network Planning

In practice, when carrying out Micros Opera integration with the Controller, it is suggested to plan your wireless network in advance, including the rooms and the areas Wi-Fi signal should cover. For hotels, charges are often billed individually by rooms, so it is recommended to separate rooms with a set of unique VLANs.

For example, Service Zone (SZ) 1 - 3 are configured for guests, conference-use, and employees, respectively. VLAN 2222 is assigned to SZ2 (conference-use), which means traffic tagged with VLAN 2222 will be directed to SZ2 for authentication. In the same way, VLAN 3333 is assigned to Service Zone 3 to authenticate employees and VLAN 1111 to Service Zone 1 (Guest-SZ) for guests. It is recommended to map all the users to different VLAN IDs, as described before, for easier configuration.

4.2 Configuration Step #2: Enable PMS Integration

PMS integration can be activated from **System > PMS interface**. Included details are:

1. Interface Type (Micros Opera is recommended)
2. PMS network information (IP address and its port)

3. Login credentials for authentication can be based on the following:

- (1) RN = room number
- (2) GN = guest name
- (3) G# = guest number
- (4) G+ = profile number

For the username, only three of the four parameters can be selected, which are RN, G# and G+. For the password, any one of the four can be selected. At check-in, the selected parameters for username and password should have been entered on the Micros Opera PMS.

Main > System > PMS Interface

PMS Interface Configuration

PMS Interface Type: Disable Net Retriever Micros Opera

PMS IP Address:

PMS Port:

Account Credentials: Username: Password:

Room Bill Description:

Login Error Message:

An error has occurred during login. Please contact the front desk for assistance.

User Account Log:

Synchronize Data with PMS:

PMS External Page Customization API: Disable Enable

4.3 Configuration Step #3: Configure Billing Plans and Groups

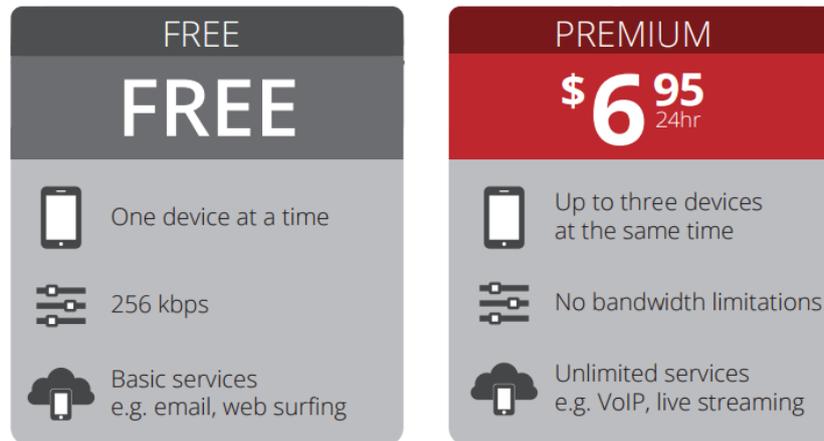
PMS integration accompanies presenting a set of billing plans to hotel guests on the captive portal for selection before they can access the Internet. Charges incurred based on these plans are considered amenity charges that can be posted to guests' room bills. Hotel IT managers should carefully configure the plans from **Users > Internet Authentication > On-Demand > Billing Plans**. Only active plans will be displayed on the login page.

Main > Users > Internal Authentication > On-Demand Authentication > Billing Configuration

Billing Plans

No	Plan Type	Quota	Price (\$)	Active	Group	Function
1	Usage-time	1 day(s) of usage time	1	<input checked="" type="checkbox"/>	Group 1	<input type="button" value="Reset"/>
2	Volume	500 Mbyte(s) of traffic volume and expired in 1 day(s)	2	<input checked="" type="checkbox"/>	Group 2	<input type="button" value="Reset"/>
3	Hotel Cut-off-time	Valid until 12:00 the following day; 3 devices allowed per account	3	<input checked="" type="checkbox"/>	Group 1	<input type="button" value="Reset"/>
4	Duration-time	Valid for 182 day(s) 2 min(s) elapsed time; Unlimited device(s) allowed per account	4	<input checked="" type="checkbox"/>	Group 1	<input type="button" value="Reset"/>
5	Volume	2 Mbyte(s) of traffic volume and expired in 1 day(s)	6	<input checked="" type="checkbox"/>	Group 1	<input type="button" value="Reset"/>

Furthermore, each plan can be mapped to a specific user group having its own user policy for flexible deployment. For example, two billing plans – FREE and PREMIUM – can be setup, where the FREE billing plan maps to a user group with a policy that limits the bandwidth to 256 kbps and offers only basic services, and the PREMIUM billing plan maps to another user group with a policy that doesn't impose bandwidth limitations and offers unlimited services. Please see the figure below.



4.4 Configuration Step #4: Set up Service Zone and Web Pages

PMS integration on the Controller is tied to On-Demand authentication. The following settings should be configured:

1. There is a Service Zone appointed for On-Demand.
2. Possible customization of the General Login Page and PMS Billing Plan Selection Page, which can be left at default. Disclaimer is optional.

4.5 Configuration Step #5: Configure Port Location Mapping (Optional)

Port Location Mapping (PLM) is often used alongside PMS integration, for it enables VLAN tagging and Ethernet connection for each guest room.

Main > System > Port Location Mapping > Port Location Mapping List

Port Location Mapping List

<input type="checkbox"/>	VLAN ID	Location ID	Location Description	Port Type	From	Service Zone	Availability
<input type="checkbox"/>	501	501		Auth. Required	LAN1	Guest-SZ	●
<input type="checkbox"/>	502	502		Auth. Required	LAN1	Guest-SZ	●
<input type="checkbox"/>	503	503		Auth. Required	LAN1	Guest-SZ	●

(Total:3) (Page:1/1)

Hotels can create a room number-VLAN-Service Zone mapping list at **System > Port Location Mapping** on the controller's management interface. For instance, map rooms 501, 502, and 503 to Service Zone 1 (Guest-SZ) and choose "Auth. Required". Thus, authentication is required for Internet access in these rooms, and Service Zone 1's constraints are imposed. Additionally, the PLM list shows room availability – a green light means the room is available for check-in, and a red light means the room is occupied.

4.6 Configuration Step #6: Enable PMS API (Optional)

To allow network administrators to easily and flexibly customize the PMS integration, Controller also provides PMS API. For configurations, please go to **System > PMS Interface** and enable "PMS External Page Customization API". Username and password are required for security.

PMS Interface Configuration

PMS Interface Type: Disable Net Retriever Micros Opera

PMS IP Address:

PMS Port:

Account Credentials: Username RN Password RN

Room Bill Description: Wireless Access

Login Error Message: An error has occurred during login. Please contact the front desk for assistance.

User Account Log:

Synchronize Data with PMS:

PMS External Page Customization API: Disable Enable

External Page Validity Verification: Username Password

Sample External Login Page:

The PMS API has three functions.

Function 1: Get billing plan from gateway in JSON format

Function 2: Check parameters of the login request in advance (to determine whether to redirect the client to the login page)

Function 3: Query to see whether an account is still active and has quota (to determine whether to show billing plans)

For billing plan queries, this API is required for the external web server to get updated billing plan details, including billing plan number, billing type, quota, price and so on. For billing plan purchases and login requests, the external page only needs to send the required information to the API, and then the API would send the result back to the external server. For more information, please download the "Sample External Login Page", which is shown on the configuration page when PMS API is enabled.

Furthermore, when PMS API is enabled, please go to **System > Service Zone > Service Zone Configuration > Login Page Customization**, and choose “Use External Page” for the General Login Page for the Service Zone being used for the On-Demand accounts.

The screenshot shows the 'Login Page Customization' interface. On the left, there is a sidebar with four options: 'Service Disclaimer' (Default), 'General Login Page' (External), 'PLM Open Type Login Page' (Default), and 'PMS Billing Plan Selection Page' (Default). The 'General Login Page' is highlighted with a red box. In the main content area, there are four radio buttons: '4ipnet Default', 'Customize with Template', 'Upload Your Own', and 'Use External Page'. The 'Use External Page' option is selected and highlighted with a red box. Below the radio buttons, there is an 'External URL' input field and a 'Preview' button. At the bottom of the main area, there are two buttons: 'Apply' and 'Cancel'.

5. Integration with Third Party PMS

Controller supports Micros-Fidelio PMS integration, and the attributes supported by the Controller are listed in the following sections. Since there are countless PMS/POS for different hospitality applications, system integrators can use these attributes for integration with their preferred non-Micros Opera PMS.

Before introducing third party PMS integration, the concept of Micros-Fidelio PMS should be understood first.

5.1 Fields and Records

Micros-Fidelio PMS utilizes FIAS, which is a universal protocol specification used by different kinds of third party systems to exchange data. FIAS provides **Fields and Records** to be used by vendor systems to define their own specific data records to create functionalities to be supported within an interface. In addition, vendor systems have to provide record types and fields of the desired records to the interface when the communication starts, after which the PMS will be able to provide the related information for each action to the vendor systems.

The first field in all records is the **Record ID (in bold typeface)**, which has no data and is followed immediately by the field separator character, Field Types and relevant data.

See the example below. When Controller receives the following record, this means a guest named Mr. Roger has checked in to Room 103.

GI|RN103|GNMr. Rogers|

GI - Check-in

RN - Room number: 103

GN - Guest Name: Mr. Rogers

5.2 Command Message Layout

For integration with the middleware, programmers should utilize these Micros' **Record-ID Types** to communicate with third party PMS as seen in the previous diagram depicting using middleware for communication between the Controller and the PMS.

Record-ID Types currently supported by Controllers include:

- » Communications and Link Control (free-to-use)
 - **LS** - Link Start
 - **LA** - Link Alive
 - **LD** - Link Description
 - **LR** - Link Record
- » Guest Data (registered)
 - **GI** - Guest Check-in
 - **GO** - Guest Check-out
 - **GC** - Guest data change
- » SPA & other charge systems [Posting] (registered)
 - **PR** - Posting Request
 - **PL** - Posting List
 - **PA** - Posting Answer
- » Database Synchronization (registered)
 - **DR** - Database Resync request
 - **DS** - Database Resync start
 - **DE** - Database Resync end

For these Record-ID types, there are several **fields with attached data** providing detail information about customer behaviors. In this way, Controller could access the hospitality customers' information with the registered fields and data listed below,

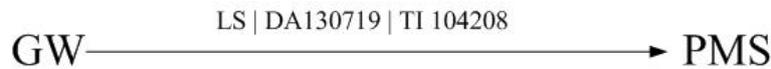
GI	Guest Check-in	RN G# GN GL GV GD GS NP DA TI G+ SF RN : Room Number G# : Reservation Number GN : Guest Name GV : Guest VIP Status GD : Guest Departure Date GS : Share Flag NP : No posting status DA: Date TI : Time G+ : Profile Number
GO	Guest Check-out	RN G# GS DA TI SF RN : Room Number G# : Reservation Number GS : Share Flag DA: date TI : time
GC	Guest data change	RN G# GN GL GV GD GS NP RO DA TI G+ RN : Room Number G# : Reservation Number GN : Guest Name

		GL : Guest Language GV : Guest VIP Status GD : Guest Departure Date GS : Share Flag RO : Old Room Number NP : No posting status DA: Date TI : Time G+ : Profile Number
PR	Posting Request	DA G# GN PI PM RN P# TA TI WS CT DA: Date G# : Reservation Number GN : Guest Name PI : Posting Inquiry PM : Payment Method RN : Room Number P# : Posting Sequence Number TA : Total Posting Amount TI : Time WS: Workstation ID CT : Clear Text
PL	Posting List	G# GN P# RN WS NP G# : Reservation Number GN : Guest Name P# : Posting Sequence Number RN : Room Number WS: Workstation ID NP : No posting status
PA	Posting Answer	AS CT DA P# RN TI WS AS : Answer Status CT : Clear Text DA: Date P# : Posting Sequence Number RN : Room Number TA : Total Posting Amount TI : Time WS: Workstation ID
DR	Database Resync request	DA TI DA: date TI : time
DS	Database Resync start	DA TI DA: date TI : time
DE	Database Resync end	DA TI DA: date TI : time

5.3 Link Communication Process

Starting the communication of PMS integration, it is necessary to define the data format for original Micros' System in the beginning connection establishment. Therefore, there are step-by-step procedures to define all the commands mentioned above. Please follow the flow of making connection between PMS and Gateway below.

- Step 1: Making connection, send the **LS** record from Gateway to PMS



- Step 2: PMS responds **LS** back to Gateway



- Step 3: Gateway send the **LD**, **LR** and **LA** to PMS. **LD** indicates the start of **LR**, **LR** defines the format of record and **LA** states link is alive.



5.4 Guest Check-In Message Links

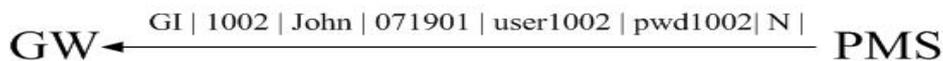
After connection completion, it usually comes up with guest check-in when you start using the PMS. What administrator would like to integrate Controller is to generate on-demand accounts utilizing customer's information like his/ her names and room numbers.

Scenario

Guest named **John** is going to check-in with reservation number **071901**. Hotel offers him room **1002** and his Internet access username and password are **user1002** and **pwd1002**.

Flow of Guest Check-in between PMS and Gateway

- Step 1: PMS sends the Guest check-in message to Gateway. The message contains Reservation Number, Room Number, Guest Name, Username, Password and No Posting Status.



- Step 2: Gateway responds the same information back to PMS. (GL and GS are the reserved record for future extension).



5.5 Guest Check-Out Flow

Check-Out is also a frequent procedure with hospitality PMS.

Scenario

John is going to check-out the room **1001**.

Flow of guest check-out between PMS and Gateway

- Step 1: PMS send the guest check-out message to Gateway. It just sends the check-out room number

GW ← GO | 1001 | PMS

- Step 2: Gateway responds the message with reservation number and check-out room number

GW → GO | G#071901 | RN1001 | PMS

5.6 Guest Room Change Message Flow

When a guest changes room, the administrator would like to continue to provide Wi-Fi service for the guest while making sure that the charges on the bill will be correct and not be affected by the room change.

Scenario

John wants to change from room **1002** to room **1001**. Hotel staff helps him change the room to 1001 and provide him with the new Internet access username **user1001** and password **pwd1001**.

Flow of guest room change between PMS and Gateway

- Step 1: PMS sends the guest change room message to gateway. Message contains old room number, new room number, guest name, new username, new password and no posting status.

GW ← GC | 1002 | 1001 | John | 071901 | user1001 | pwd1001 | N | PMS

- Step 2: Gateway responds the same information back to PMS. (GL, GS are reserved record for future extension)

GW → GC | G#071901 | GNJohn | GLEN | NPN | user1001 | pwd1001 | RN1001 | GSN | RN1002 | GSN | PMS

5.7 Confirmation Link Message Flow

The GW to PMS will send each other confirmation link messages to do room postings without having to verify the guest, one from PMS to GW and the other from GW to PMS.

Scenario

John, who lives in room **1001**, paid **\$10.00** for **wireless access**.

Flow of guest change room between PMS and Gateway

- Step 1: Once the guest selects the billing plan, gateway will send the PS message to PMS for accounting.

GW → PMS
PS | PTC | RN1001 | TA1000 | DA130719 | TI 190721 | WS20130719-190721 |
CTWireless Access

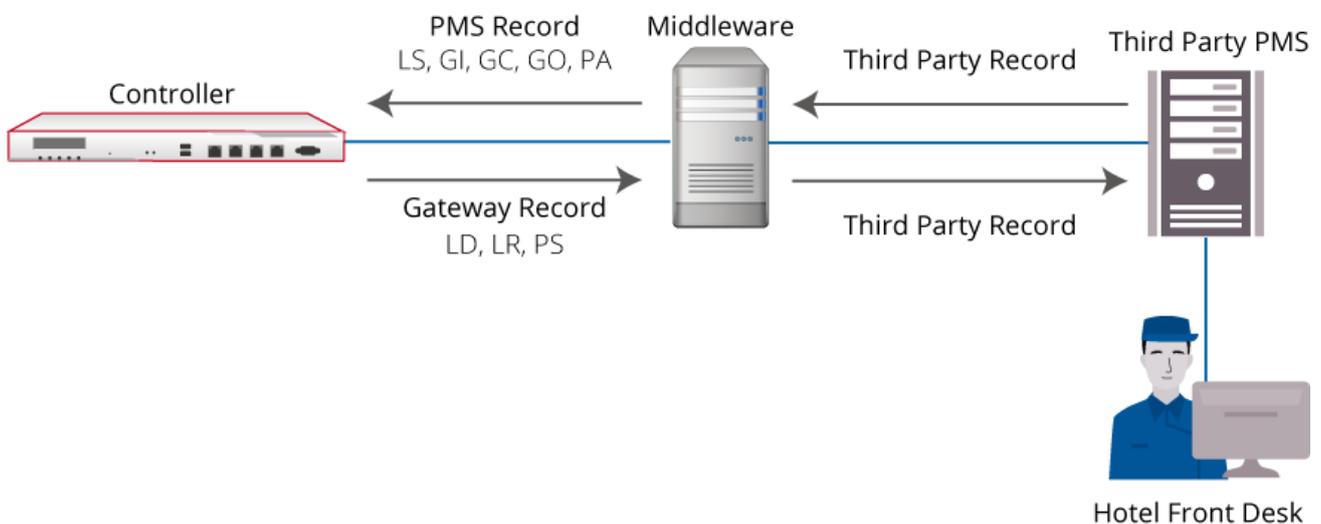
- Step 2: When PMS receives the message, it will send the PA as acknowledgement.

PMS → GW
PA | ASOK | RN1001 | WS20130719-190721 |

5.8 Implementation Examples

Example 1: Integration with Non-Micros Opera PMS via Middleware

When PMS other than Micros Opera is to be integrated, middleware may be used to “translate” the PMS records into the format the Controller could understand, which is the format used by Micros Opera. Please refer to the Field Types and Record-ID Types supported above when developing the middleware. Diagram below illustrates the communication between the Controller and a non-Micros Opera PMS via middleware.

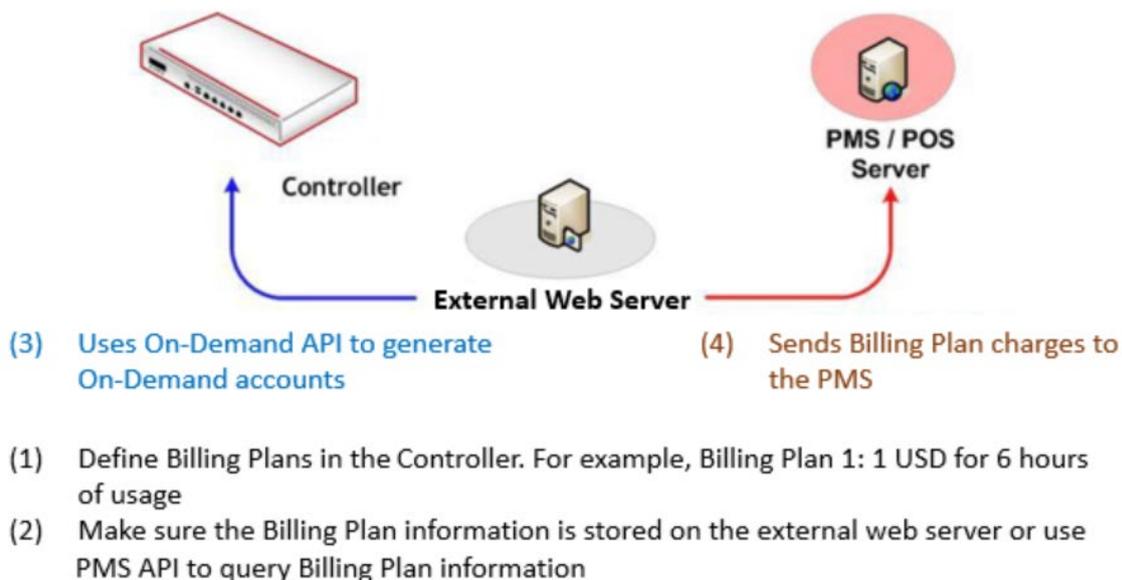


For configurations, please go to **SYSTEM › PMS Interface** and choose “Micros Opera” as PMS Interface Type. Then, fill in the IP address of the middleware as the “PMS IP Address”, and its port as the “PMS Port”. Account Credentials and other fields can be modified as desired.

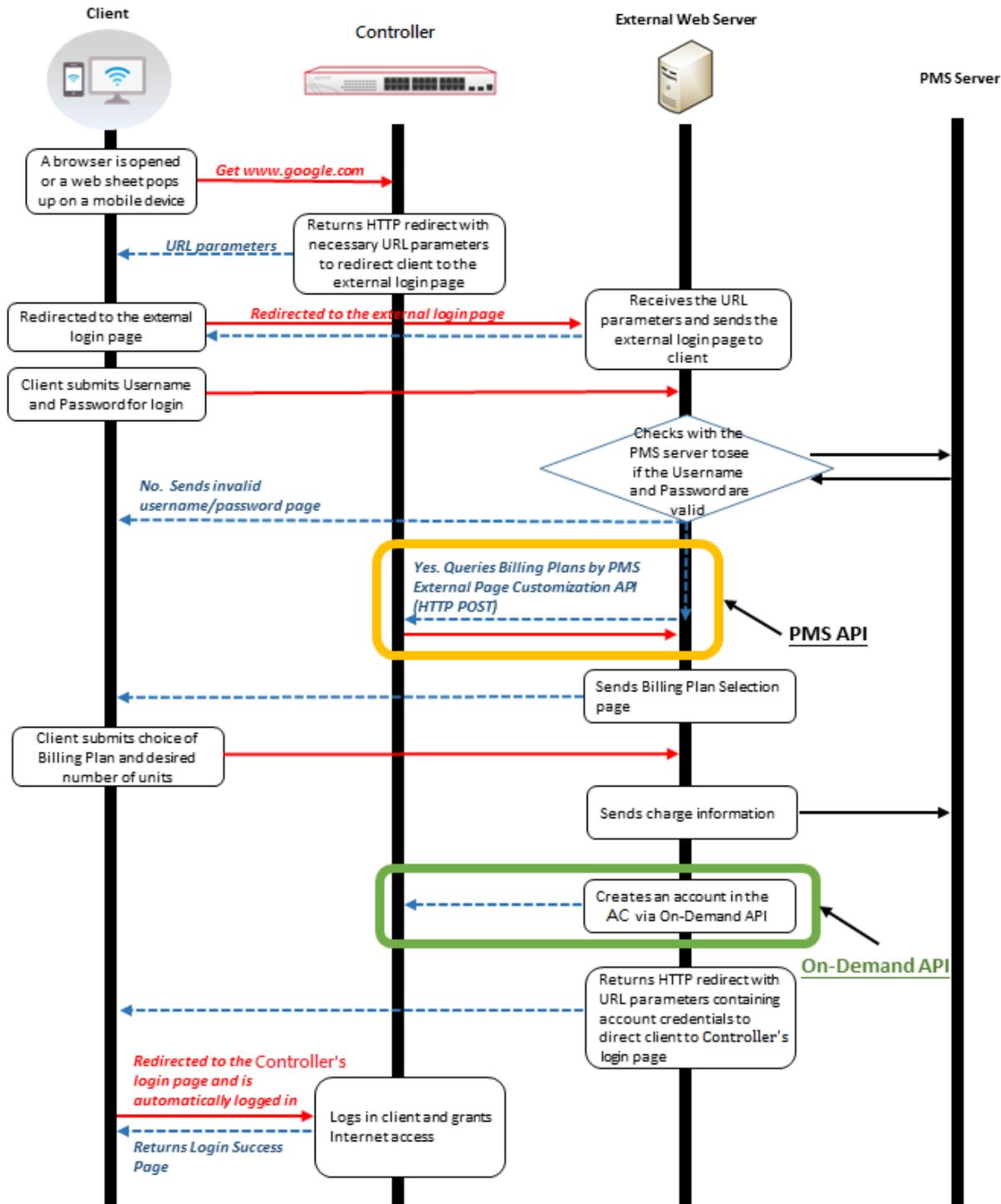
Example 2: Integration via External Web Server and API

Network administrators can also use an external web server in PMS integration for more flexible deployment, and our PMS API and On-Demand API can be used for such integration. The PMS API has been introduced previously in Section 4.6. However, only Function 1 is used for this example. As for On-Demand API, the external web server can use this API to make requests to create, delete or query On-Demand accounts. We also offer a technical guide on On-Demand API, in which API parameters are listed and implementation examples are given.

The diagram below illustrates the role an external web server may play in this type of deployment.



The login flow is as follows.



For configurations, please also go to **SYSTEM > PMS Interface** and choose “Micros Opera” as PMS Interface Type. Then, fill in the IP address of the external web server as the “PMS IP Address”, and its port as the “PMS Port”. Again, Account Credentials and other fields can be modified as desired. In addition, please enable “PMS External Page Customization API” and follow the instructions in Section 4.6.

6. Verification

- From the guest's perspective
 1. Connect to the SSID for guest
 2. See a disclaimer if configured
 3. See the login page. Log in with the check-in credentials
 4. See a list of billing plans. Select any one of them
 5. See a login success page with countdown of the remaining quota if configured.
- From the administrator's perspective
 1. Check in a guest for testing and have the guest logs in to the network
 2. Checks if **Status > Logs and Reports > Micros Opera Log** records the login event
 3. Check if **On-Demand Account List at Users > On-Demand Accounts > Account List** records the entry with the chosen billing plan activated.
 4. Checks room availability at **System > Port Location Mapping > List**. See if the icon referring to the guest's room turns from green light to red.
 5. Check out the guest and see if the PMS shows information on the guest's use of Wi-Fi

7. Conclusion

Controllers could successfully integrate with Micros-Fidelio PMS and other PMS. They could also combine powerful and useful features like Port Location Mapping, On-Demand Billing Plans and Role-based Service. Furthermore, there are also robust On-Demand API and PMS API for different hospitality applications. In the end, for some flexible system integration, there is another integration approach for third party PMS with customized middleware.

8. Remarks

For more information, please contact our Technical Support team.