ClearPass
Integration with Teem LobbyConnect
Change Log

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Modified By</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>March 2018</td>
<td>Arpit Bhatt</td>
<td>Draft TechNote</td>
</tr>
<tr>
<td>1.0</td>
<td>May 2018</td>
<td>Arpit Bhatt</td>
<td>First Published Version</td>
</tr>
<tr>
<td>1.1</td>
<td>Aug 2018</td>
<td>Arpit Bhatt</td>
<td>Minor documentation update for the ClearPass URL to be used</td>
</tr>
</tbody>
</table>

Copyright

© Copyright 2018 Hewlett Packard Enterprise Development LP.

Open Source Code

This product includes code licensed under the GNU General Public License, the GNU Lesser General Public License, and/or certain other open source licenses. A complete machine-readable copy of the source code corresponding to such code is available upon request. This offer is valid to anyone in receipt of this information and shall expire three years following the date of the final distribution of this product version by Hewlett-Packard Company. To obtain such source code, send a check or money order in the amount of US $10.00 to:

Hewlett-Packard Company  
Attn: General Counsel  
3000 Hanover Street  
Palo Alto, CA 94304  
USA

Please specify the product and version for which you are requesting source code. You may also request a copy of this source code free of charge at HPE-Aruba-gplquery@hpe.com.
Figures

Figure 1: Entering HP Passport credentials ................................................................. 6
Figure 2: Pictorial view of ClearPass Policy Manager integration with Teem LobbyConnect ..................................................... 7
Figure 3: Extension Framework GUI ......................................................................... 8
Figure 4: Defining the base IP SUBNET and LOCALHOST for the Extensions Framework ................................................................. 9
Figure 5: Skyhook tenant registration email ID ............................................................ 10
Figure 6: Skyhook tenant registration application to integrate .................................... 11
Figure 7: Skyhook tenant registration company identifier ......................................... 11
Figure 8: Sample email response upon registration .................................................. 12
Figure 9: ClearPass Plugin within the Teem App ......................................................... 14
Figure 10: ClearPass Plugin Configuration Settings ................................................... 14
Figure 11: Extensions Framework GUI ....................................................................... 16
Figure 12: GUI Extension Installation ....................................................................... 16
Figure 13: GUI Extension Search .............................................................................. 17
Figure 14: GUI Extension Configuration at Install time .......................................... 17
Figure 15: Extension Configuration options .............................................................. 18
Figure 16: GUI Review and Setting the Extension configuration ............................... 19
Figure 17: Log Validation ......................................................................................... 19
Figure 18: Visitor Check In ....................................................................................... 20
Figure 19: Visitor Details .......................................................................................... 21
Figure 20: Host Lookup ............................................................................................. 21
Figure 21: Visitor Email Receipt ............................................................................... 22
Figure 22: Visitor Check Out ..................................................................................... 23
Figure 23: ClearPass Guest Account Creation .......................................................... 23
Figure 24: Teem Logs for Check In Event ................................................................. 24
Figure 25: ClearPass Guest Account Disabled .......................................................... 25
Figure 26: Checking on the extensions service and how to start/stop the service .......... 26
Figure 27: Using the GUI to change the DEBUG level ............................................. 27
Figure 28: Extension logs location in 'Collect Logs' diagnostic GZ file ...................... 29
Introduction

This TechNote covers the setup, configuration, and monitoring of the ClearPass extension for Teem LobbyConnect and the configuration of the ClearPass plugin in Teem.

This Extension serves two primary use-cases

1. Guest account creation upon Visitor Check In
2. Guest account deletion upon Visitor Check Out

LobbyConnect(LCx) is a visitor management module of Teem’s cloud-based platform. When visitors arrive, LCx presents them with relevant forms where they can provide their information, sign documents (NDAs) and it optionally notifies the person they are visiting of their arrival.

ClearPass is an industry leading Guest Management solution that delivers secure, automated guest access workflows. It’s very useful for an enterprise to combine these two applications to get a seamless visitor management system that automates visitor’s Wifi requirements.

With LCx hosted in the cloud and ClearPass sitting primarily on-prem, there are challenges in making these two applications communicate in real time so that a visitor gets guest WiFi credentials from ClearPass as soon as he registers on Teem’s LCx application. Traditionally the apps would communicate using APIs where an application would request information which is usually followed by a response. Hence in order to get real-time information you have to poll or request as often as possible which is not scalable. The answer or the solution is a webhook which does not wait for a request to send information but sends the data as soon as it’s available.

Before we proceed with the flow, we need to understand the concept of webhooks and skyhook.

What is a webhook?

A webhook (also called a web callback or HTTP push API) is a way for an app to provide other applications with real-time information. A webhook delivers data to other applications as it happens, meaning you get data immediately.

What is skyhook?

Skyhook was developed to overcome the inability for Cloud based applications to send events [webhooks] directly into a ClearPass that was typically deployed on the Trust side of a corporate firewall. In short, it is a service that runs in AWS. ClearPass nodes running on-prem, use extensions to open a persistent connection into Skyhook to receive the events originally sent from a 3rd party cloud application specific for that customer/tenant.

As an overview, Teem LCx running in the cloud will send a webhook upon a Visitor CheckIn or a CheckOut event. This will communicate with Skyhook. The ClearPass extension configured and installed will maintain a persistent connection with Skyhook awaiting an event (Check In/ Check Out).
Software Requirements

The minimum software version required for ClearPass is 6.7.2. At the time of writing, version 6.7.2 is available and is the recommended release. The TechNote covers installation steps and screenshots from a ClearPass server running 6.7.2. ClearPass runs on hardware appliances with pre-installed software or as a Virtual Machine under the following hypervisors. Hypervisors that run on a client computer such as VMware Player are not supported.

- VMware ESXi 5.5, 6.0, 6.5 or higher
- Microsoft Hyper-V Server 2012 R2 or 2016 R2
- Hyper-V on Microsoft Windows Server 2012 R2 or 2016 R2
- KVM on CentOS 6.6, 6.7, or 6.8 (Soon to be released for ClearPass 6.7)

To access the ClearPass Plugin on Teem, please contact your Teem Account Manager.

Access to the Extension Store

Access to the Extension Store to download extensions is simplified in ClearPass 6.7. The ability to download extensions from the store and to validate support entitlement for access to the Software Updates Portal (e.g. Posture & Profile Data Updates, Software Updates, & Skins) now uses the HPE Passport account credentials that are associated with the customers’ ClearPass licenses. This is configured where previously the subscription-id was defined, under Administration -> Agents and Software Updates -> Software Updates as shown below. Ensure you enter your HPE Passport credentials to enable Extension download capabilities.

![Figure 1: Entering HP Passport credentials](image)

Installation and Deployment Guide

The generic ClearPass installation and deployment guide is located here:

Pictorial View of the Integration

The diagram below shows a pictorial overview of the components and how they interact with each other.

**Figure 2: Pictorial view of ClearPass Policy Manager integration with Teem LobbyConnect**
New Extension Support in ClearPass 6.7+

With the release of 6.7, several new features have been added to enhance the functionality of the extension framework. Previously, all extension installation and operation tasks required use of the API Explorer to interoperate with the Extension and the underlying framework. Now this functionality has been exposed with a new GUI. The GUI is accessed from within the Guest UI and is shown below, Administration -> Extensions.

Extensions and IP address configuration support

The other major additions in the 6.7 release are the ability to define the extension framework base IP network and statically define the IP address of the individual extensions. The latter being useful when deploying extensions in a cluster and the requirement for a fixed IP address for the same extension across a cluster regardless of which ClearPass node or nodes it is installed on.

Extensions and web proxy support

Prior to 6.7 support for web proxy was limited to the installation of the extensions. Starting in ClearPass 6.7, extensions now support communications with 3rd parties via a web proxy. This adds incremental web proxy functionality. If a web proxy is defined in ClearPass Policy Manager, then an extension will use that configuration.

Note that the Policy Manager web proxy configuration is ONLY read by the extension at installation time. If the web proxy configuration is changed in Policy Manager, then the extension must be re-installed so the new settings are re-read and bonded to the extension.

Figure 3: Extension Framework GUI

Configuring the base Extension IP subnet, this is defined within Policy Manager as shown below under Administration -> Server Manager -> Server Configuration [chose your node] Service Parameters [ClearPass system service]. The default is 172.17.0.1/16, this address is the non-routed address of the ClearPass node itself. The IP addresses range for the extensions are based upon the network prefix used.

Note that the subnet defined here for the extension framework must be one of the following 10.0.0.0/8, 172.16.0.0/12, 192.168.0.0/16.
Figure 4: Defining the base IP SUBNET and LOCALHOST for the Extensions Framework

Note that changing the extension base IP address will require the extension service to be restarted.

Changing the “Extensions Network Address” range is necessary if either the MGMT or DATA interface are also using an address in the extension default range of 172.17.x.x/12. Set the new network address range as needed and restart the extension service for this to take effect.
Configurations Steps

There are primarily 3 steps involved in getting this Integration configured.

**Step I:** Register and request for a Skyhook tenant

**Step II:** Configuration of Teem LobbyConnect for Integration

**Step III:** Installation and Configuration of the Teem Extension using GUI in ClearPass 6.7.X

It's assumed you have SMTP and SMS configured to allow ClearPass Guest to send account data to the Visitor/Guest.

**Step I: Register and Request for a Skyhook Tenant ID**

- Register on the URL [https://peoplemove.typeform.com/to/Z80ezD](https://peoplemove.typeform.com/to/Z80ezD)
  
The steps that follow are pretty self-explanatory. Please follow the same to request for the Skyhook tenant ID. This ID is unique per customer

- Read Instructions carefully and ensure you use your company email address only.

*Figure 5: Skyhook tenant registration email ID*

- Select Teem LobbyConnect for our integration
Choose a Unique Company Identifier for your skyhook app. Kindly read the instructions carefully and avoid spaces or special characters.

Note that you will receive a response within 24-48 hours upon submitting a request.
Following is a sample response with the desired details

**Figure 8:** Sample email response upon registration

```
Skyhook Registration details (TEEM LobbyConnect)

Jump, Danny (ClearPass PLM)
Thursday, March 8, 2018 at 6:00 AM
To: Bhatt, Arpit

Thanks for your interest in our integration between TEEM LobbyConnect and ClearPass. Please find below your registered tenant details for our Skyhook platform which will enable your ClearPass deployment to receive realtime sign-in events from the LobbyConnect cloud platform.

You can find an Technote for the LobbyConnect integration on the following portal:

Below are your Skyhook tenant mapping details as requested:

``skyhookTenant": "arubacptmelab1",
"username": "arpit.bhatt@hpe.com",
"dbAccessToken": "

The extension id required to download the latest build of the Envoy integration is as follows:

```json
{ 
  "store_id": "fb53b9fd-52b9-49bb-a7ad-7ca21298c491b"
}
```

Rgds
Danny Jump
```
Step II: Configuring Teem LobbyConnect for ClearPass Integration

For the ClearPass Plugin to be available under 3rd Party Apps on Teem, please contact your Teem Account Manager. This is currently enabled upon request.

Setup and Configuration of Teem LobbyConnect is beyond the scope of this guide. Here we specify the steps necessary to configure ClearPass Plugin within the Teem LobbyConnect application.

Below we cover the configuration required in the Teem environment. To aid the configuration of the extension it helps to collect a number of items from the email received above.

You would require the following details on Teem for the config:

1. Skyhook Webhook Posting URL
2. Teem Secret
3. ClearPass Expiration Time: Account expiration time for the guest checked in
4. SMS Gateway configured on ClearPass (optional)
5. SMTP server configured on ClearPass (optional)

Below are the configuration steps to follow:

- Login to Teem using your credentials on www.teem.com

  Click on Manage > Apps & Integration > 3rd Party Apps. Search for ClearPass by Aruba and click on Activate, you should see the following
Ensure you select the correct Aruba plugin. Teem already integrates with Aruba Beacons and Sensors. Ensure you activate the ClearPass Plugin under User Management

- Once activated Click on Settings and use the details collected above

**Figure 9: ClearPass Plugin within the Teem App**

Ensure you select the correct Aruba plugin. Teem already integrates with Aruba Beacons and Sensors. Ensure you activate the ClearPass Plugin under User Management

- Once activated Click on Settings and use the details collected above

**Figure 10: ClearPass Plugin Configuration Settings**
**ClearPass URL:** Skyhook Post URL received upon registration.

The format of this URL would be similar to https://skyhook.clearpassbeta.com/api/skyhook/teem/<skyhook tenant>

Example: https://skyhook.clearpassbeta.com/api/skyhook/teem/3f5913f5-b4b0-4e38-8d53-b7425baabbcc

**Secret:** A shared secret that needs to be configured later in the ClearPass extension and must match what is configured here.

**ClearPass Expiration Time:** Directly controls the period of time the Visitor account can remain active in ClearPass Guest based upon the account creation time.

**Send ClearPass SMS:** Setting it to yes invokes ClearPass to send credentials for Guest login via SMS with the SMS Gateway configured on ClearPass.

**Send ClearPass Email:** Setting it to yes invokes ClearPass to send credentials for Guest login via Email with the SMTP Server configured on ClearPass.
Step III: Teem Extension Installation and Configuration

Starting in ClearPass 6.7, a Graphical User Interface (GUI) was introduced to make the process of interacting with the extension framework easier. To access the extension GUI, from the Guest System, under Administration find the Extension User Interface as shown below.

**Figure 11: Extensions Framework GUI**

From here, click on ‘Install Extension’, and the search box below appears.

**Figure 12: GUI Extension Installation**

Enter the Store-ID 6732660f-d59b-4c86-929b-080446f1ad1d and click on ‘Search’. See the example below:
Click on the extension and then the “Install” option, and if necessary, set the IP address. Note it can be set later if required.

After the extension has been installed, if the option to automatically start was not selected, review the
extension configuration as necessary and adjust as needed. Notice the options to Start, Delete, Reinstall or Show Logs and the option to review and set the extension configuration.

The default configuration used for extension is below:

```
{
  "logLevel": "INFO",
  "verifySSLCerts": true,
  "teemSecret": ",",
  "randomPasswordLength": 6,
  "skyhookTenant": "",
  "dbAccessToken": ""
}
```

<table>
<thead>
<tr>
<th>Configuration Value</th>
<th>Description</th>
<th>Values / Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>logLevel</td>
<td>The logging level the extensions should use.</td>
<td>DEBUG, INFO, WARN, ERROR</td>
</tr>
<tr>
<td>verifySSLCerts</td>
<td>Should the extension validate SSL certificates.</td>
<td>true or false</td>
</tr>
<tr>
<td>teemSecret</td>
<td>The secret configured previously in LCx ClearPass plugin</td>
<td></td>
</tr>
<tr>
<td>randomPasswordLength</td>
<td>The length of the random password to generate new Guest/Visitor accounts that are created.</td>
<td>6</td>
</tr>
<tr>
<td>skyhookTenant</td>
<td>The Skyhook tenant ID</td>
<td>965abd48-zzzz-aaaa-8164-xxxxxxxxxx</td>
</tr>
<tr>
<td>dbAccessToken</td>
<td>The access token for Skyhook.</td>
<td></td>
</tr>
</tbody>
</table>

Configure the **teemSecret**, **skyhookTenant** and **dbAccessToken** and **restart the extension**.

**Figure 15**: Extension Configuration options
A copy of the default Teem LobbyConnect Extension is shown above, this will need to be modified for your deployment. Include the `teemSecret`, `skyhookTenant` and `dbAccessToken` that will be specific to your environment. This needs to be requested per customer which is explained later in the document.

Select ‘Restart’ and click on Save Changes to restart the extension. Following the restart, click on Show Logs. You should see the following:

**Figure 17: Log Validation**

You can change the logLevel to DEBUG for detailed logs and troubleshooting or include the same before raising a TAC case if necessary.
Testing/Demo

Now that the components are all configured and ready to use, let’s walk through the experience from the user and administrator perspective. In order to do so, the first step for a visitor is to register using the LobbyConnect app running on an iPad or other smartdevice in the customer setup.

Configuring an iPad or any other device to assist customers with registration at front desk is beyond the scope of this document. Essentially, you download the LobbyConnect app from the appstore and use the activation code to register this device with your TEEM LobbyConnect tenant. Add a device for the Location in Teem using the Activation Code. Detailed steps are available here:

https://teem.com/support/eventboard-room-scheduling/how-to-add-move-or-delete-eventboard-devices#subarticleNum2

I. Visitor walks up to a tablet used for Registration

**Figure 18: Visitor Check In**

II. Visitor enters his details as shown below. It is important to enter the cell phone number with the country code, e.g. in the US prefix a ‘+1’ before your cell number, for India it is ‘+91’ and so on.
III. The next screen will ask for the details of the host or sponsor. A notification about the visitor’s arrival will be sent to this host via an email or SMS as configured within LobbyConnect.

Figure 20: Host Lookup

IV. You may or may not be asked to take a picture. This depends on the setup used in Teem. This finishes the registration from the user perspective.

V. User should receive an email as well as an SMS with his credentials. Following is the snapshot of the email.
Figure 21: Visitor Email Receipt

You can change the Receipt Template (Guest Manager Receipt) under Configuration > Receipts > Templates.

VI. After the visit, user can Check Out at the registration desk using the same Tablet. Type and Select your name. Click Next
Figure 22: Visitor Check Out

Now let’s see what happens in the backend from an administrator perspective.

I. Login to ClearPass Guest and go to Manage Accounts under Guest.

Figure 23: ClearPass Guest Account Creation

The new account has been created upon registration. Note the Expiration time, this should match with the setting configured in the ClearPass Plugin in Teem. In this example, it is set to 4 hours.

II. If you enable DEBUG and Click on Show Logs under Extension, you should see the following details as a part of the Check In event.

[2018-03-07T11:54:55.651] [DEBUG] teem - Event Details:
[2018-03-07T11:54:55.651] [DEBUG] teem - {
  "auto_send_sms": true,
  "last_name": "Bhatt",
  "enabled": true,
  "sponsor_name": null,
III. A similar log entry can be seen in the Teem app as well. Go to Manage > Apps & Integrations > 3rd Party Apps. Click on Settings and then select the Logs tab as shown below

**Figure 24: Teem Logs for Check In Event**
IV. Upon Check Out, the User account will have been disabled, see this under Manage Accounts in ClearPass Guest

Figure 25: ClearPass Guest Account Disabled

V. The user’s WiFi session should also get disconnected automatically upon Check Out. This depends on the Policy configured for the Guest SSID. This configuration is beyond the scope of this document.

VI. You would see a Check Out event in the DEBUG logs.
Appendix A – Additional Diagnostics & Support

The Extensions Service

The ClearPass extension is supported by a new system service that was initially added in 6.6. This service should be running. Note that restarting this service will affect all deployed and running extensions.

To check on the state and to restart the service, go to Administration > Server Manager > Server Configuration [select a cppm node] > Service Control. From here start/stop the extension service. By default, this service is automatically started.

Figure 26: Checking on the extensions service and how to start/stop the service

Extension logs and debugging

If there is a need to access the logs from inside the extension, turn on log collection from the API Explorer. Referencing the configuration previously used, adjust the "logLevel" to "DEBUG". In the new 6.7 GUI change the config and restart the extension as shown below. Logs can then be viewed from the 'Show Logs'.

[Figure showing service control page with 'Extensions service' highlighted and status as 'Running']
Figure 27: Using the GUI to change the DEBUG level

Alternatively, the config can be changed from the API Explorer. Remember after changing the logging level, the extension will need to be restarted for this change to take effect.

Here are a few examples of 'normal' logs under DEBUG

[2018-03-07T12:46:05.538] [INFO] teem - Connecting to skyhook database...
[2018-03-07T12:46:05.542] [DEBUG] teem - p:0: Browser went online.
Errors observed during configuration

1. Configuration error

[2018-03-07T11:41:29.940] [ERROR] teem - Error: Received message that failed hash validation. Skipping.

at processEvent (/src/app.js:292:38)
at /src/app.js:364:9
at /src/node_modules/firebase/lib/firebase-node.js:203:375
at ec (/src/node_modules/firebase/lib/firebase-node.js:52:165)
at ac (/src/node_modules/firebase/lib/firebase-node.js:31:216)
at bc (/src/node_modules/firebase/lib/firebase-node.js:30:1259)
at Ji.h.Ib (/src/node_modules/firebase/lib/firebase-node.js:220:287)
at Rh.h.Jd (/src/node_modules/firebase/lib/firebase-node.js:186:251)
at Fh.Jd (/src/node_modules/firebase/lib/firebase-node.js:176:364)
at wh.Jg (/src/node_modules/firebase/lib/firebase-node.js:174:280)
**Issue:** Unable to process the message as it fails hash validation. The configuration template used for extensions is sensitive. Ensure there are no human errors. Leading space in the Shared Secret used was the issue.

**Resolution:** Have a coffee and avoid human errors

**Accessing extension logs within ClearPass ‘Collect Logs’**

In addition to the logging of messages that be examined in the extension as shown above, it’s possible to configure the extension to log messages so that they can be collected and examined via the Policy Manager ‘Collect Logs’ system function. This is extremely useful for Aruba TAC.

If there is a requirement for Aruba TAC to investigate a system issue, one of the items they regularly ask for is the system logs to aid with their diagnostic investigation. The ClearPass extension can write its logs such that they are available and can be collected with all other system diagnostics information when the ‘Collect Logs’ function is run. Remember that by default, the logLevel is set to INFO but TRACE, DEBUG, INFO, WARN, ERROR, FATAL can also be set. Any of the levels will display the information for the selected state and lower. For example, if INFO is selected, it will show messages for INFO, WARN, ERROR, FATAL.

After the Logs have been collected and exported from the system, expand the GZ file and locate the extension logs in the following location ‘PolicyManagerLogs->extension’ as shown below.

**Figure 28: Extension logs location in ‘Collect Logs’ diagnostic GZ file**