

Baicells CloudCore 7.3 Configuration & Network Administration Guide

CloudCore System – Version 7.3 CloudCore OMC – Version 7.3.5 CloudCore BOSS – Version 7.3.5

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About This Document

This document describes the mainstream applications used for configuring and administering the Baicells network components and subscriber information. The scope includes the Baicells System module, CloudCore Operations Management Console (OMC), and Business and Operation Support System (BOSS) modules. The target audience is network administrators who are responsible for managing the operator's CloudCore account, the eNodeBs (eNBs), eNBs that support Citizens Broadband Radio Service (CBRS) which needs integration with Spectrum Access System (SAS) for spectrum access, Customer Premise Equipment (CPEs), and the subscribers and service plans.

New in This Release

The following updates are provided in this release:

• Updated for CloudCore version 7.3 features, improvements, and GUI changes.

Related Documents

Understanding how the Baicells technical documentation is structured will help you know where to find the information you need. Below are some notes about where to find related configuration information:

- This guide covers only the Baicells CloudCore apps. Versions before CloudCore v6.2 and document v1.03 published December 2020 also covered the equipment GUIs. You can now find those GUIs covered in the *eNodeB Configuration Guide* and the *CPE Configuration Guide*, respectively.
- Information specific to two-carrier eNBs such as Nova436Q, Nova246, and Neutrino430, is in the *Carrier Aggregation & Dual Carrier (Split Mode) Configuration Guide*.
- For eNB HaloB operation, refer to the *HaloB User Guide*.
- How to configure eNBs to operate in CBRS SAS mode can be found in the SAS Deployment Guide.

Additionally, terms used in this document or related to LTE are listed in alphabetical order and described in *Acronyms* & *Abbreviations*. Please refer to the Baicells website (Baicells.com > Resources > *Documents*) for all installation guides, user manuals, and other customer documents.

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Unless stated otherwise, this document serves only as a user guide, and all descriptions/information/suggestions mean no guarantee, neither explicit nor implicit.

The information in this document is subject to change at any time without notice. For more information, please consult with a Baicells technical engineer or the support team. Refer to the "Contact Us" section.

Revision Record

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Resources

- **Documentation** Baicells product data sheets, technical manuals, and a list of acronyms and abbreviations can be found at baicells.com > Resources > *Documents*.
- Support Open a support ticket, process an RMA, and the Support Forum are at Baicells.com > Support

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1 Introduction

The Baicells products give network operators the ability to offer solutions in rural outdoor, urban outdoor, commercial indoor, unlicensed, and licensed, and a wide variety of vertical opportunities for subscribers using LTEbased broadband wireless access. In a standard configuration, the key components include Customer Premise Equipment (CPE), eNodeB (eNB) radio access network equipment, and cloud-based core functions and network/subscriber management applications (Figure 1-1). A subscriber connects a laptop, tablet, or other smart devices through the CPE - *aka* User Equipment (UE) - connecting wirelessly to an eNB. The eNB communicates with the LTE backhaul network.

The available operations, administration, and management (OAM) applications include an eNB GUI, a CPE GUI, the Baicells CloudCore Operations Management Console (OMC), and the Baicells CloudCore Business and Operation Support System (BOSS). The CloudCore System, OMC, and BOSS parameters are documented in this guide.

The eNB GUI and the CPE GUI are used to configure and manage individual devices. The CloudCore apps can configure and organize all the operator's network devices across multiple sites through the OMC and all the subscribers and service plans through BOSS. Baicells charges a monthly CloudCore usage fee based on the number of active users.

CloudCore includes not only management apps but also provides the core LTE network functions that are shown in the figure. Private network solutions such as Local EPC and Local OMC+BOSS are also available.



Figure 1-1: Standard Baicells LTE Network

2 CloudCore

The Baicells CloudCore services include the core LTE functions mentioned in *section 1* of this document, plus the Operations Management Console (OMC) for network management and the Business and Operation Support System (BOSS) for subscriber management. This guide covers the CloudCore System, OMC, and BOSS modules.

2.1 Client Computer Requirements

Table 2-1 describes the minimum requirements for the client computer you use to access the Baicells CloudCore OMC and BOSS applications.

Item	Description
CPU	Higher than Intel Core 1GHz
Memory	Greater than 2G RAM
Disk	No less than 100 MB space available
Operating System	Microsoft: Windows XP, Windows Vista, or Windows 7
	Mac: MacOSX 10.5 or higher
Screen Resolution	At least 1024 x 768 pixels
Browser	Google Chrome 47 or higher (recommended)
	Mozilla Firefox 47 or higher

Table 2-1: Client Requirements

2.2 Getting Started

2.2.1 Sign up for CloudCore Account

Baicells provides a CloudCore account to every operator. Each account supports multiple administrative users. For a user to access the operator's account in CloudCore, they must sign up for login credentials. Follow the steps below to sign up for access to the account.

NOTE: The first time an operator's initial administrator logs in to their CloudCore account, they are asked to enter or verify basic company information and provide a credit card number. Operators are charged monthly to use CloudCore based on the number of active users that month. Payments are administered through a secure third-party company: https://pay.stripe.com. More about the billing process is described in *section 2.3.1, Billing Menu*.

- 1. Open a web browser and enter the CloudCore address: https://cloudcore.cloudapp.net/cloudcore/
- 2. Click on the Sign up button (Figure 2-1).
- 3. Complete the mandatory fields (Figure 2-2) and click on Sign up again.
- 4. You will receive an email from CloudCore. In the email, click on the CloudCore link to go to the *Login* page. Enter your login user name (email address) and a password to authenticate. You are now ready to start using CloudCore!

Figure 2-1: CloudCore Web Page

Bricells Connect More with Less	
	CloudCore
	<u>R</u>
	Login
	Forget Password Not a member? Sign_up

Figure 2-2: Sign up Fields

0	cloudcore.baicells.com:44	43/sys/login/goRegistere	edPage.action	07	Q	☆
re						
			Sign up			
ŧ	Operator Info					
	CloudKey: XXXXX					
	Contact Email:		* User Name:			
	• Password:		Confirm Password:			_
	Company Name:		Time-zone: (UTC)Coordinated universal time			_
	Phone:					
	Billing Info					
	• Billing Emzil:		• First Name & Last Name:]
	Street Address:		Town/City:			
	State/Region:		Zip/Postal:			_
	Country:		L			
			Sign up			



2.2.2 CloudCore Users

CloudCore users are referred to as administrators or admins. Admins added to the operator's CloudCore account must be assigned to one of two user groups, either the Cloud Default Group or Exclude Billing Group, as shown in Figure 2-3. If assigned to the Exclude Billing Group, the admin will not be prompted to enter the billing information, as discussed in the previous account, when they log in.

In this window, you can further assign an admin to one of two OMC default groups, either a Default Operator Group or a more restrictive Default User Group (Figure 2-4). BOSS has only one Default Operator Group. User group assignment determines which menus the admin can access and which actions they can take. You can create custom user groups covered in *section 2.3.3.1.2 User Group Tab*.

Figure 2	-3: Defau	It Cloud	User Groups
----------	-----------	----------	-------------

ଜ cloudcore OMC	BOSS		
\$ Billing	Œ		
🛐 Invoice	Add User		
System	Basic Info		
	* User Name admin	* Password	* Confirm Password
	User name already exists		
	* Email		1
		* Cloud User Group	* OMC User Group
	• BOSS User Group Select V	Select	Select
		Exclude Billing Group	

Figure 2-4: Default OMC and BOSS User Groups

User				
Basic Info				
* User Name	- P	assword		* Confirm Password
TommyBahama				
* Email	• 0	Cloud User Group		OMC User Group
tbahama@gmail.com		Exclude Billing Group	~	Select
* BOSS User Group				Default Constant of the
Select	^			Default Operator group
				Default User group
Default Operator Group				

2.2.3 CloudCore GUI Layout

After logging in and assuming you have been assigned the Exclude Billing Group admin user group described in previous *section 2.2.2 CloudCore Users*, the CloudCore web page displays a horizontal blue bar at the top. The three main CloudCore modules - System (labeled "CloudCore"), OMC, and BOSS - are shown on the left.

The CloudCore System module contains the operator's account information, such as company name, contact information, etc.; invoices from Baicells for monthly use of CloudCore; and account administrator rules you define. The OMC is where you manage all of your network elements and features. The BOSS application is where you manage subscriber information, import SIM card IMSI numbers, and create service plans (Figure 2-5).

Figure 2-5: CloudCore Modules



You will see the operator's unique Baicells CloudKey number on the right side of the blue bar (Figure 2-6).

Figure 2-6: CloudKey

			CloudKey	
ଜ cloudcore	OMC	BOSS	P CloudKey:123456	Welcome,Mona 🗸

An operator's CloudKey is used to associate eNB and CPE devices to the operator's account in the OMC. Equipment programmed with the operator's CloudKey in the device GUI during initial installation will automatically associate to the operator's OMC account when powered on. An eNB device will be listed in OMC under the *eNB* > *Inventory* menu. A CPE device will be listed in OMC under the *CPE* > *Device* menu. If you do not use the CloudKey in the device GUI, you can still add a device in either of the OMC menus mentioned.

Next to the CloudKey number is your login name and a drop-down menu that provides three essential admin user functions: Change password, Lock screen, Logout (Figure 2-7).

Figure 2-7: Welcome Drop-Down Menu





When you log in to CloudCore, the home page defaults to the OMC Dashboard (Figure 2-8). You can see messages from Baicells at the top, e.g., announcing the latest software available. You can either dismiss or act on these messages. Baicells recommends upgrading equipment to the latest available software code. How to upgrade eNBs is covered in *section 2.4.2.5 Upgrade*. How to upgrade CPEs is covered in *section 2.4.3.5 Upgrade*.

NOTE: The dashboard information is covered in *section 2.4.1 Dashboard Menu*.

Figure 2-8: Home Page (OMC Dashboard)

Messages from Baicells will appear at the top of your OMC dashboard

Image: Several upgrade files are available and click to see details. Ignore all X Image: Several upgrade files are available and click to see details. Ignore all X Image: Several upgrade files are available and click to see details. Ignore all X Image: Several upgrade files are available and click to see details. Ignore all X Image: Several upgrade files are available and click to see details. Ignore all X Image: Several upgrade files are available and click to see details. Ignore all X Image: Several upgrade files are available and click to see details. Ignore all X Image: Several upgrade files are available and click to see details. Ignore all X Image: Several upgrade files are available and click to see details. Ignore upgrade files are available and click to see details. Image: Several upgrade files are available and click to see details. Image: Several upgrade files are available and click to see details. Image: Several upgrade files are available and click to see details. Image: Several upgrade files are available and click to see details. Image: Several upgrade files are available and click to see details. Image: Several upgrade files are available and click to see details. Image: Several upgrade files are available and click to see details. Image: Several upgrade files are available and click to see details. Image: Several upgrade files aready for	ය cloudcore	OMC	BOS	S									
(%) eNB Quick Links System NB NB New Software is ready for eNB to upgrade, version: BailBS_QRTB_2.5.4 View Ignore Upgrade View Ignore Upgrade New Software is ready for eNB to upgrade, version: BailBS_QRTB_2.5.4 View Ignore Upgrade View Ignore Upgrade New Software is ready for eNB to upgrade, version: BailBS_QRTB_2.5.4 Close Ignore Upgrade Software details: Detailed release noise can be found here: https://community.na. bailed r	Dashboard	Œ			2						Critical	163 😐 1	Major 18 😑
(m) eNB Quick Links System User NB Device Monitor Upgrade Alarm CPE Device Monitor Upgrade Alarm CPE Device Monitor Quick Links System User New Software is ready for eNB to upgrade, version: BaiBS_QRTB_2.5.4 View Ignore Upgrade View Software is ready for ODU CPE to upgrade, version: BaiES_QRTB_2.5.4 Close Ignore Upgrade Software details: Detailed release notes: can be found here: https://community.na. baicells.com.tiqntb-2.5.4-new-enb-software-has-been-released 1 430 Detail Info>> View Software is ready for ODU CPE to upgrade, version: BaiCE_BG_1.6.5.3 View Ignore Upgrade View Ignore Upgrade View Software is ready for ODU CPE to upgrade, version: BaiCE_BG_1.6.5.3 					2	Several u	ıpgrade files are	available and clic	ck to see details.	*		Ignore	all X
CPE New Software is ready for eNB to upgrade, version: BaiBS_QRTB_2.5.4 View Ignore Upgrade View Ignore Upgrade	(1) eNB	🗲 Qui	ick Links	System	User	eNB	Device	Monitor	Upgrade	Alarm	CPE	Device	Monitor
New Software is ready for eNB to upgrade, version: BaiBS_QRTB_2.5.4 View Ignore Upgrade	A CPE												
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2.2.4 GUI Icons

Table 2-2 describes the icons used in the CloudCore GUI windows.

Table 2-2: Icons

lcon	Description
Q	Search for a specific device or item
÷	Add a new device/item or a new task
€	Import multiple devices at one time or upgrade file
	Export file to the local computer
:	The operation menu of a device/item
Ŧ	Download a file
GD	The device is operating normally
(**)	The device is offline
0	Setting of display or setting of tasks



lcon	Description
T	Filter results according to alarm type, severity, and other status
	Create a new task
	Display the task list

2.2.5 CloudCore Software Structure

The CloudCore software enables the admin operators to configure the system, OMC, and BOSS in one place. An overview is shown in Figure 2-9. It depicts the size of the system, the readily identifiable modules, and functions; it also allows the admin to navigate through the CloudCore effortlessly.

Figure 2-9: CloudCore Software Structure



2.3 System

The CloudCore System menu provides operator-specific information (Figure 2-10). The Billing, Invoice, and System menus are explained in this section.

Figure 2-10: System Menu

ŵ (loudcore
\$	Billing
S=	Invoice
0	System

2.3.1 Billing Menu

Operators are charged monthly to use CloudCore based on the number of active users that month. The Billing menu contains the operator's contact information and Baicells invoicing information for their CloudCore account (Figure 2-11).

Figure 2-11: Billing Menu

100	idcore	OMC	BOSS				
	Billing						
	@ Piease	e read these Term	s and Conditions carefully before usi	g CloudCore platform.			
		ompany Info					
	Comp	pany Name :		CloudKey :		Time-zone	_
	First I	Name		Last Nama :		Email	
			-		-		
	Phone						
	Billing	p Email :		Country :		State/Region :	
	Town	/City :		Street Address :		Zip/Postal : 53711	
	Attent	tion :					
	La						
							0
	I Cr	redit Cards					-
	() U	pcoming invoice	O This is a preview of the involve that we	I be billed next ments.			
	() Uj	pcoming invoice	This is a preview of the involue that we over a preview of the invo	I be killed next month. :	AMOUNT		
	Desc Free	pcoming involce oription Pten	This is a preview of the involtes that we are a preview of the invo	t be tabled next month. UNIT PRICE \$ 0.00	AMOUNT \$ 0.00		
	C Uj Desc Free	pcoming involce oription Plan	This is a preview of the involue that w arry 192	be billed need month: UNIT PRICE \$0.00 Subsets	AMOUNT \$ 0.00 \$ 8.00		
	C Uj Desc Free	pcoming invoice oription Plan	This is a province of the investor busine	the billed need month: UNIT PRICE 8 0.00 Builted Total	AMOUNT 5.0.00 5.0.00 5.0.00		
	G Uj Desc Free	pcoming involce origina	This is a proview of the involute that we arry 322	the billed need month: UNIT PRICE 8 0.00 Budneed Total	AMOUNT 5.00 5.849 5.849		
	G Uj Desc Free	pcoming involce uription Plan	This is a proview of the investor but on	E le billet neet werdt. Uwr Price 8 0.00 Buitesti Yotal	AMOUNT 5000 58.60 88.60		
	C Uy Free Net	pcoming involce unption Plan ew Devices	This is a preview of the involtes that we arry 302 Ony Week Month	Else billed neet neets: Unit PRICE 5 0.00 Butnetal Total	ANOUNT 50.00 50.00 50.00 50.00 Send small per day		
	S Ug	pcoming involce stiption Plan ew Devices	This is a preview of the involtes that we Try Try Try Try Try Try Try Tr	No bible need words: Unit Parce 8 0.00 Buildented Total Octore Time	ANCUNT 5000 88.00 88.00 88.00		
	s Uj Desc Free	pcoming involce origina Plan ew Devices	This is a preview of the mostan bala we	No Miller Hand Henrich: UNIT PRICE 8-050 Buildensel Total Octoor Time	ANGUNT 50:00 5		
	G Ug Prec Ne	pcoming invoice origina Pan ew Devices	This is a preview of the motion bad we	the billed need needs: Sector	ANGUNT 8000 80.00 80		
	G Ug Desc Free S Net	ew Davices	This is a preview of the module bad we arry 102 Day Week Month	the biller neet neets: UNIT PRICE 8 0.00 Biolensed Test Obline Time No Date	ANGUNT 8000 80.00 80.00 80.00 Send email per day		
	Uy Denc Free Free Overdue Inv	peaming involce	This is a preview of the motion back arry 102 Day Week Month	the biller neet neets: UNUT PRICE 5 0:00 Biolensel Testal No Date	ANGUNT 10:00 10:00 10:00 10:00 50 50:00 50 50 50 50 50 50 50 50 50 50 50 50 5		10**
2	Uy Desc Free Free No Overdue Inv Monti	ever Devices (5N	This is a province of the involute balance Ory Outy Weak Materia Created Date 2020-01-02 00 10 06	Eie bilad read waret: Unit P Picce 8 0.00 Buttered Total Data	AMOUNT 1000 18.80 18.20 Send small per day User Count 7	Anort	URL
3	Ug	ever Devices	This is a province of the threates balance Transmission	No Date Dev Date Over 2000 Over 200 Over 200 Over 2000 Over 2000 Over	AMOUNT 5000 500	Anout 577 378	URL MacJe
6	Ug Free Free No Overdue Inv Mont 1 2 3	pcaming involce orgition Plan ew Devices SN solution a	This is a preview of the threshold balance Try 102 Day Week Month Created Date 2039-4.02.03.10.06 2039-4.02.03.10.01 2039-3.02.03.10 2039-3.02.03.10 2039-3.02.03.10 2039-3.02.03.10 2039-3.02.03 2039-3.02.03 2039-3.02.03 2039-3.02.03 2039-3.02.03 2039-3.02.03 2039-3.02.03 2039-3.02.03 2039-3.02 2039-3.02 2039-3.02 2039-3.02 2039-3.02 2039-3.02 2039-3.02 2039-3.02 2039-3.02 20	ke keller neet neette: Se oor oor oor oor oor oor oor oor oor oo	ANOUNT 10:00 8	Anout 377 376 379	URL blassie blassie
	Overdue Inv	pcoming involce orgition Plan ew Devices EN solution h	This is a preview of the motion balance Gry <u>102 </u> Ory Weak March Created Date Z020-01-02 03 10.06 2020-01-02 03 10.01 2020-02 03 10.01 2020-02 03 10.01 2020-02 03 10.01 2020-02 03 10.01 2020-02 02 10.10 Created Date Created Dat	كلا الالبات المحالية العالية المحالية العالية المحالية العالية العالية العالية العالية العالية العالية ال كان المحالية المح حمالية محالية المحالية ال حمالية محالية المحالية المحا حمالية محالية المحالية الم	ANCONT 5 0.00 8 8.09 8 8.09 8 8.09 8 6 on small per day User Count 22 23 23 23 23	Antoint 877 878 879 8102	URL Massile Massile Massile



Click on + Add and enter the card number, expiration date, CVC [sic], zip code, and billing email to add credit card information. Click on More Options to add the cardholder's name, address, etc. (Figure 2-12). The credit card entry will be shown in the list. Use the *Operations* actions to View, Modify, Delete, or Set as Default.

Figure 2-12: Add Credit Card

		No Cards	
your Credit Card			
Card Number			
GB Card number			
• Zip/Postal		Billing Email	
More aptions			
More options ->			
More options →	Street	Street(line 2)	

Under Upcoming Invoice, you will see the Description, QTY, unit price, and dollar amount owed. When you click on the QTY number, it takes you to the user details (Figure 2-13). In the New Devices pane, if you leave "*Send email per day*" ON (green), the system will send a reminder every day to subscribers who are behind on payments. The email will include all unpaid invoices.



🗐 Up	coming invo	ice () This is a preview of the in	nvoice that will be billed next	t month.	
🗐 Ne	w Devices	Day Week Month			Send email per day
Descri	otion	QTY		UNIT PRICE	AMOUNT
Free Pl	an	<u>108</u>		\$ 0.00	\$ 0.00
Detai	+				68
	Month	IMSI 🗢	SAS Days 💠	Online Days 🗢	Online Time 💠
1	2022-02				
2	2022-02				
3	2022-02				

The Invoice section lists all the operator's invoices from Baicells like the billing month, status (paid/unpaid), invoice date, due date, active user count, dollar amount, date of payment, and the URL to a secure third-party e-commerce system used by Baicells: *https://pay.stripe.com*. The Figure 2-14 shows the Stripe GUI where you can pay by credit card or bank transfer, as well as download a PDF of the invoice.

Figure 2-14: Stripe Payment

Invoice from Baicells Te B Invoice	echnologies Nor Billed to FiSci #04D735FC-0006	th Ameri	ca Inc.					
	PAST DUE							
\$79.00 USI Choose h	\$79.00 USD due Mar 11, 2020 Choose how you'd like to pay.							
Card	血 Bank transfer	͡፹ Bank transfer						
Card number		MM/YY CV	rc					
	Pay invoice							
DESCRIPTION	QTY	PRICE	TOTAL					
FEB 2 - MAR 2, 2020 CloudCore Standard Plan	79	\$1.00	\$79.00					
↓ PDF	Am	ount due	\$79.00					
If you have any questions, contae Billing.Baicells@na.ba	ct Baicells Technologies aicells.com or call (972)	North Amer) 357-6412.	ica Inc. at					
Inve Baicells Technologies North Amer invoicing ar	picing by Stripe rica Inc. partners with S nd payment processing	tripe to prov	ide secure					

If the operator fails to pay the fee in time, they cannot access CloudCore until the invoice is paid. When they try to log in, they will get a prompt window to resolve the unpaid invoice(s). The operator must click on the third-party payment service used by Baicells - currently, *https://pay.Stripe.com* - and make the payment (Figure 2-14). Once paid, the operator clicks on the *I have paid all invoices* button in the prompt window to restore their CloudCore services.

Figure 2-15: Overdue Invoice Example

0	At tha Over	tention!Your at,You can cl due Invoice	account is ick button	locked due to [I have paid all	overdue invoi]and get back	ces.Please cl to CloudCor	ick the payn e service.	nent URL in list to pay al	l of them,After
		Month	Chature	Create Date	Due Date	Liser Count	Amount	1101	Invoice Number
	1	2020-10	C Unpaid	create pare	2020-10-25	6	\$ 14	https://pay.stripe.com/invoice/acct_1E	
					2 ha	ve paid all of invoice:	s.		

2.3.2 Invoice

The Invoice menu has two tabs, one showing statistical data about your Baicells invoice information and one showing a detailed list of each historical invoice (Figure 2-16). The menu opens to the Statistic[s] tab, which displays the total billing amount and how much of that total has been paid or not paid during the period you select. At the top, you can set the timeframe of the statistics information you want to see. Hovering over the graph will display the numerical data for a data point.

Figure 2-16: Invoice Statistic[s] tab



The *List tab* displays all invoices received from Baicells, indicating their payment status, the number of active users, when the invoice was paid, etc. (Figure 2-17). Clicking on the User Count number will display information about each active user during the invoice period. Use *Operations* actions to download invoices, display invoice details, or send an email notification about the invoice to someone else. To Export all invoices, click on the *Export* icon, an Excel file Invoice.csv downloads to your browser.

Figure 2-17: List Tab

View View<	tistic Li	st									
Note	nvoice Number			× Q							
2010 0 Paid 2010-401 100 0 000 000-000 0 </th <th>Month 🔶</th> <th>Status 💠</th> <th>Created Date</th> <th>Due Date</th> <th>User Count</th> <th>Amount 💠</th> <th>Payment Date</th> <th>URL</th> <th>Billing Plan</th> <th>Operat</th> <th>tions</th>	Month 🔶	Status 💠	Created Date	Due Date	User Count	Amount 💠	Payment Date	URL	Billing Plan	Operat	tions
2020 0 10400 202401 16 95 100 100000 100000 100000 100000 100000 100000 100000 100000 1000000 1000000 1000000 1000000 1000000 1000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 10000000 100000000 100000000 1000000000	2021-03	loo Paid	2021-04-02	2021-04-11	<u>119</u>	\$ 0	2021-04-02 05:11:58	https://invoice.stripe.com/i/acct_1		*	E
2020 © Quad Quad <t< td=""><td>2021-02</td><td>Unpaid Overdue</td><td>2021-03-02</td><td>2021-03-11</td><td>116</td><td>\$ 116</td><td></td><td>https://invoice.stripe.com/i/acct_1</td><td></td><td>1</td><td>E</td></t<>	2021-02	Unpaid Overdue	2021-03-02	2021-03-11	116	\$ 116		https://invoice.stripe.com/i/acct_1		1	E
2021 % upd 20104 20104 116 116 117	2021-01	Unpaid Overdue	2021-02-02	2021-02-11	117	\$ 117		https://invoice.stripe.com/i/acct_1		Ŧ	E
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2.3.3 System

The *CloudCore System module > System* menu is used to add CloudCore administrative users to the operator's account, view operational and security activity logs for the account, and establish security rules for the administrative users (Figure 2-18). Each of the three sub-menus - User, Logs, Security Setting- is explained in this section.

Figure 2-18: System Menu



2.3.3.1 User

In CloudCore, an administrative user (admin) is one who can access the operator's account in CloudCore to view, edit, or delete information. Depending on which role you assign to an admin, they can modify data in all CloudCore apps.

The *System module > System menu* is the only place to *add* administrative account users. However, you can assign admins to user groups, associate role sets (privilege levels), and delete user groups or role sets in any app.

There are three tabs at the top of the System window, Role Set, User Group, and User (Figure 2-19). When you add a new user's information, the user will automatically be placed in a default user group unless you assign them to a custom group you have created. Each user group can be associated with one or more role sets. For this reason, it makes sense to first create role sets and user groups before adding users.

NOTE: The default user group cannot be modified or deleted.

Figure 2-19: Admin User

Ro	le Set	User Group User							Đ
	User	r Name	C	2					
		User Name	Online	Status	User Group	Phone	Email	Password Lock	Description
1	÷		Yes	Active				Sormal	
2	÷		i No	Active				Sormal	
3	1		No	Active				Sormal	

2.3.3.1.1 Role Set Tab

A role set is a group of permissions that enables you to define various levels of CloudCore account privileges. These privileges are permissive roles given to access one or more system objects. Admin can assign roles to a user or user group, and a user or user group can have more than one role. Any existing role sets will be listed when you click on this tab. You can manage OMC/BOSS user group and role from the CloudCore. Click on the *Operations* icon to view information about a role set or to modify or delete the role set (Figure 2-20). To create a new role set:

- 1. Click on the + Add icon to open the *Add Role* window and enter a role name and description.
- 2. CloudCore role is a mandatory (*) authority list. Select the permissions (View, all, Edit all) that you want to designate for the role set to access the CloudCore functionalities.
- 3. BOSS Role, OMC Role, MML has a toggle button to create the *Functional Authority List* for each; you can select the functionalities listed under the pane and its permissions. For MML, you have additional permissions like LST (List), MOD (Modify), ADD, and RMV (Remove).
- 4. The device group pane allows the admins to select the device group to view the functionalities.
- 5. Click on OK to save the settings.



Figure 2-20: Role Set

tole Set User	Group User								6
Role Name			Q						9
Role Name		User	Upd	late Time			Description		
Default Oper	ator Role	SYS							
le Name	Desc	ation							
Cloudcore Role udcore Functional Authority List		BOSS Role BOSS Functional Authority List							
Autority List	Q	Authority Lini		Q					
uthority List	View All	Edit All Authority Last			View All	Edit All			
Rilling		Butterpton							
Invoice		· Network			T	H			
		, System				11 11			
		 Statistica Outlower 							
OMC Role 💽							Device Group (Only the devices in the sal	ected group could be view)	
Functional Authority List		MML C					Oroug Nerre	0	
Autority Lini	Q	Autority List		Q				4	
uthority List	View All	Edit All Command Action	LST	MOD	ADD	RMV	Group Name		
Dashboard		MAF					1 Default Level Group/Kend	kbor	
eNB	0 - 0	Timer Configuration					2 Default Level Group/Defa	ult Device Group	
OPE	0 - 0	······································	-				3 Default Level Groun/GEN	1843Alon:19	
Alarm	u u	······································							
Vere		Neighbour Cell Carlicaration	87	-1 ·**			Default Level Group/test		
		E UTILAN Neighborg Fal					5 Default Level Group/teet1		
Library		a o more magnesse see							
Library Performance	G G	··· Aniphus Frequency Config	noision	100	100	1000	Sõipago Go	to 1 C	Total 5

2.3.3.1.2 User Group Tab

You can create custom admin user groups in the User Group tab. When you click on the tab, any existing user groups will be listed. Use the *Operations* actions to display group information, modify a group, or delete a group (Figure 2-21).

Figure 2-21: User Group

0	Śroup Name	Q				Ð
	Group Name		User	Update Time	Description	
1	:		SYS	2020-07-21 02:13:00	Upgrade create data	
2	 Information Modify Delete 		SYS	2020-07-21 02:13:00	Upgrade create data	



To add a new admin user group (Figure 2-22):

- 1. Click on the + Add icon to open the Add Group window.
- 2. Enter a Group Name and optionally a description.
- 3. Select the role(s) from the Role List to assign the privileges level to this group.
- 4. Click on *OK* to save the settings.

Figure 2-22: Add User Group

₽	System / User	
A	ld Group	Description
l	* Group Name Description	
	* Role List	
	Role Name Q	
	Role Name	

2.3.3.1.3 User Tab

Although the *System > User* menu defaults to the User tab, setting up the role sets and user groups you intend to use is more efficient. Why? When you add a user, you must associate them to one or more user groups, and a user group has one or more associated role sets. If a user is not placed in a custom user group, the user will be placed in a default user group. The default user group cannot be modified or deleted.

Any admin users added are listed when you click on the tab (Figure 2-23). Use the *Operations* actions to view Information, Modify, Unlock, Delete, Reset Password, or Logout for an admin listed here in your account.

If you select Reset Password, the system will ask if you want to take that action. Click on *OK* if you're going to continue. The system will return a message stating "Success," You should receive an email with a link to reset the password (Figure 2-24). The user's password can include A-Z, a-z, 0-9, dash (-), and underscore (_) characters and can be 6 to 16 characters in length.

Figure 2-23: User Tab

Rol	e Set	User Group User							
	User	Name	Q						
		User Name	Online	Status	User Group	Phone	Email	Password Lock	Description
1	÷		 Yes 	Active				Sormal	
2	1		No	Active				💕 Normal	
3	r		No	Active				Sormal 1	
	1								
٢	Infor	nation							
1		ly:							
Ū.									
ග්		6							
•	Reset	Password							
	Logo	ut							

Figure 2-24: Reset Password

Confirm	×
Are you sure to reset password?	
ОК	Cancel
System / User	To mail please reset the password valid for 30 minutes
Role Set User Group User	
User Name	Q
Check your email for a link to reset password	d
Reset Password boss@baicells.com To Catherine Philley	← Reply ← Reply All → Forward ••• Fri 2/25/2022 2:11 PM Fri 2/25/2022 2:11 PM
There has been a request to reset your password for CloudCore. To reset your password use this link: https://beta.cloudcore.baicells.com:43/resetPassword?	Î



To add a new administrative user to your account (Figure 2-25):

- 1. Click on the + Add icon to open the Add User window. Fields with a star next to them are mandatory.
- 2. Enter a User Name and Password, and then Confirm Password.

NOTE: The User Name and Password fields appear greyed out, but they are still editable.

- 3. Enter the user's Email address.
- 4. Select the User Group you want the new user to be added to in the following pull-down menu. The pulldown lists will include any previously configured user groups and the default user groups.
- 5. Optionally you can enter a Phone number, Address, change the user's status to Active or Inactive, and Description.
- 6. Click on *OK* to save the settings.

Figure 2-25: Add Administrative User

Add User			
* User Name		* Email Please input a corre	ect email.
Password User Group	Please input the password.	* Confirm Password	
Phone		Address	
Status	Active		
Description			
ОК	Cancel		

2.3.3.1.4 Summary of Admin User Setup

An example of the relationship of roles to user groups and users to user groups is illustrated in Figure 2-26.

Figure 2-26: Admin User Setup Example



2.3.3.2 Logs

The *System > Logs* menu contains operational and security event logs (Figure 2-27). The logs represent all CloudCore administrative user activity and are listed in descending order by date and time.

Figure 2-27: Logs

Operation Log	Security Log							
Upor Harris			¥ Q					G
ID	User Name	Leg Name	Detail				Results	Time
1		Change user	Userinfo (cloud_k	ey=xxxxxx, user_code= <user name="">, user_group=<group name="">, user_tel=, user_cel=, user_email=</group></user>	; user_address=, uiidnumber=; user_desc=; s	top_sign=, operator_id=]	Operation Success	2020-06-03 11:16:29
2		Add user	Userinfo (cloud_k	eymxxxxxx, user_codennuser name>, user_groupmgroup name>, user_tellt, user_cellt, user_emailt	, user_address=, ulidnumber=, user_desc=, st	top_sign=, operator_id=	Operation Success	2020-06-03 11:16:16
Uner fiture	User Name	IP Address	¥ Q Leg Name	Detail	Results	Reason		Time
1			Login	User. <name_companylogire.session_id:xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx< td=""><td></td><td></td><td></td><td>2020-07-27 13:42:42</td></name_companylogire.session_id:xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx<>				2020-07-27 13:42:42
2			Logout		Operation Success			2020-07-27 12:54:54
3			Login		Operation Success			2020-07-27 12:01:12
4			Logout		Operation Success			2020-07-27 10:45:02
5			Login		Operation Success			2020-07-27 10:42:40

2.3.3.3 Security Setting

Selecting *System > Security Setting* allows you to set up rules concerning administrative user access to the operator's CloudCore account. Click on Security Setting to fortify the admin user access (Figure 2-28)

- 1. Security Setting
 - a. Lock login account Enter a number in the text boxes. You can customize the time to lock the account after frequent login failures.
 - Lock IP Select the check box if you want to blocklist the IP that encounters frequent login failures.
 To add IP manually to the blocklist, click "View Block IP" and click + Add icon to block IP. To remove
 IP from the blocklist, click "View Block IP" and remove the block listed IP.
 - c. Default password Select the check box if you want the users to change the password on the first login.
 - d. Password strength Select the checkbox if you want the password to contain at least two types of characters.
 - e. Password expires Select the check box if you want to determine how long a password can be used before the user is required to change it.
 - f. Lock screen Enter a number in the text box to set how long it takes to lock the screen if the user is inactive.
 - g. Login notification Select the check box if you want to display a custom message to the users when they login.
- 2. Login Setting
 - a. Select the check box to avoid multiple logins from the same IP Address simultaneously. This setting will limit concurrent logins.
 - b. Select the check box and enter a value to limit the number of active logins.
- 3. Access IP Setting
 - a. IP Whitelist Select the check box if you want to create IP address whitelists to limit which IP addresses can log in to the operator's CloudCore account.
 - b. Start IP when IP Whitelist is checked, enter the starting IP address
 - c. End IP when IP Whitelist is checked, enter the ending IP address

Figure 2-28: Security Setting

- 0	
Security Setting	
Lock login account	Lock accounts for 5 minutes after 5 times login failed
Lock IP	After password input error 8 times or login lock 3 times continuously.
	login IP will be added to block list, and the IP will be automatically released after 60 minutes View. Block IP
	IP auto unlock time(min): 60 - 9999999 ; 0 means: permanently join the block list
Default password	Require users to change password on first login.
Password strength	Must contain at least 2 different types of characters
Password expires	User should change password every 0 days, The system will notice user before 10 days
Lock screen	Lock the screen if user is inactive for 30 minutes
Login notification	Notify user every time when they login with message
	Certain State's Sales Tax Law requires Baicells to collect state sales tax on CloudCore monthly fees. Therefore,
	we request all operators to please update your company information by clicking on CloudCore in the upper left hand
	IP Block List ×
Login Setting	Name IP Lock Time Unjook-Time
	Avoid the same user logging in with different IPs at the same time
	Add
	Limit the maximum user number of logins to
	IP a
	OK Cancel
Access IP Setting	
Allowed IP List	IP White List () (Only users in the IP White List be able to login) 50/page < 1 > Go to 1 C Total 0
	Start IP End IP

2.4 OMC

The CloudCore Operations Management Console (OMC) is used to manage network elements such as eNB and Customer Premise Equipment (CPE), which is also known as User Equipment (UE) (Figure 2-29).

<u>ଜ (</u>	loudcore	OMC
ø	Dashboard	
((ŋ))	eNB	
<u>ال</u>	CPE	
⋒	Alarm	
5	Performance	
	Advance	
Ø	System	

NOTE: Some menu items are available only to Beta customers trialing new features.

2.4.1 Dashboard Menu

When you click on the OMC module, the Dashboard's landing page. The dashboard menu provides a current, at-a-glance view of the operator's network (Figure 2-30).

- Alarm totals by severity level
- Quick Links to the other OMC menus
- Top 10 active alarms graph and pie chart
- Statistical graphs of aggregate device performance data

Each of the dashboard functions is explained in the sections below.

Figure 2-30: Dashboard



2.4.1.1 Alarm Totals by Severity Level

At the top of the dashboard, you will see the alarm totals from all eNBs in the operator's network. The system generates alarms for communications, QoS, processing, equipment, and the equipment's environment. Each type of alarm is given a severity level -- critical (red), major (orange), minor (yellow), warning (blue) -- to indicate the importance of urgency that applies to it.

Critical alarms are incidents that can cause system outages and should be addressed immediately. Significant alarms are incidents that can cause the poor or degrading quality of service for subscribers and, therefore, should be addressed as soon as possible. Minor alarms indicate a potential issue that needs investigation but will not disrupt service. Warnings are used to indicate errors that probably need to be corrected or at least monitored but do not require any action.



... → If you are a beta operator, you will also see the Devices Migration icon at the top of the dashboard and to the right of the alarm severity indicators. Devices Migration allows you to move your devices from production to Beta CloudCore.

If you click on one of the alarm totals icons, the page will jump to the *Alarm > View* menu, giving details about the specific alarms at that severity level (Figure 2-31).

NOTE: The Alarm menu is documented in section 2.4.4 Alarm Menu.	

Figu	re 2-	31: Alaı	rm l	con	S														
															Alarm See se	total by section 2.4	everity leve 4 Alarm Mo	el. enu.	
ø	∍	Dashboard										Critical 22	7 • M	ajor 21 OMino	r 16 🔍	arming 0			
(ty)	•	Quick Links	Syster	n	U ser	eNI	B Devi	ce Mor	nitor Upgrade	Alarm	KPI View	CPE	Device	Monitor	1 Upgrade	Advance	SAS		
L																			
0	∃ Al	arm									•	Critical 227	Maior	21 Minor 1	6 Warnin	g 0	FiSci (UTC-0	6:00)2021	-09-28 10:19
(c)	View	Library																	
۹۲ ه	🔺 т	otal	Active Alarm							× Q					Ū		0		
	All	Active	listory				Index 🤤	Severity $\hat{\boldsymbol{\varphi}}$	Alarm Identifier	Probable Cause		Alarm Source	Netw	ork Element		Event Typ	ie	Alarm	Status 🤤
-22	т	emplate	•	1		1	45605585	🔺 Major	11190	GPS unavailable	1	ENB	SN=		CellName=Pla	Equipment	Alarm	έ ο υ	nconfirmed a
* *		•	_	2		1	45605584	🛕 Major	11189	Clock source synchroniz	zation	ENB	SN=		CellName=Pla	Equipment	t Alarm	ëo u	nconfirmed a

2.4.1.2 Quick Links

The Quick Links are grouped into System, eNB, CPE, and Advance, making it easy to jump into other OMC menus. For example, in the eNB section of Quick Links, if you click on Upgrade, the screen will jump to the *eNB* > *Upgrade* menu (Figure 2-32).



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19	Ð									•	Critical 2	238 😑 Maj	jor 21 🛛 🔍	Minor 18	Warning 0	FiSci (UI	FC-06:00)202	1-09-27 11:28
(y)	🗲 Quic	k Links	System	User	eNB	Device	Monitor	1 Upgrade	Alarm	KPI View	CPE	Device	Monitor	1 Upgrade	Advance	SAS		
								·'										
ø	= eNB	/ Upgrade	•								• Cri	ritical 229	Major 22	Minor 1	6 🛛 🔵 Warnin	g 0 FiSci (UI	FC-06:00)202	21-09-29 08:3
(1)	Upgra	de&Rollb	ack	File														
<u>_</u>							× Q										\bigcirc	6
	Product T	pe: R	rs ri	ID QRTE	G CR	B4860/BU	CR-B4860/EU	CR-B4860/RU										
			Serial N	umber		Cell Name			Rollback Versio	a	Softwa	are Version		Model Name		Device Group		
~	1					unknown nan	ae(192.168.22.193)		BaiBS_RTS_3.4	.8.6	BaiBS	S_RTS_3.7.8		mBS1100		Default Device	Group	
	2	6				Lah mhe1100	(102 168 130 185)		RaiRS RTS 37	10.2	RaiRS	S RTS 3711		mB\$1100		Default Device	Group	

2.4.1.3 Top 10 Active Alarms

The Active Alarm pane contains a graph and a pie chart (Figure 2-33). The graph shows the top 10 alarms for a specified period by either day or month. The graph shows the number of alarms for each severity level for all eNBs. The pie chart shows the top 10 alarms by device group, device (serial number), or alarm ID (Figure 2-34). Hover your cursor over the graph or pie chart to see the numerical data for any given data point.

Figure 2-33: Active Alarm Pane



Figure 2-34: Active Alarm Pane - Pie Chart Display Options



You can change the timeframe of the graphed information to 24 hours (Figure 2-35) or an entire calendar month (Figure 2-36). To specify 24 hours, click on "Day"; next, click in the time interval field and use the time set box that displays to scroll and select a start and end time; then, click *OK*. To establish an entire calendar month, click on "Month"; next, click in the time interval field and use the calendar displayed to select a month.

NOTE: The start time and end time can also be entered in the time interval field instead of using the time set boxes if you prefer. Ensure you enter the times using the "hh:mm:ss" format with colons separating each increment.
Figure 2-35: Active Alarm Pane - 24-Hour Time Period



Figure 2-36: Active Alarm Pane - Full Calendar Month



2.4.1.4 Statistics

The last section of the dashboard displays aggregate eNB and CPE statistics (Figure 2-37). The graphs include the following:

eNB Active / Online - number of active and online eNBs. Active refers to eNBs that are transmitting and receiving data. Online guides to eNBs that are operational but not actively transmitting or receiving data.

NOTE: An offline eNB is not connected to the network or otherwise unavailable.

- **CPE UE Count / Online** number of CPEs in the network and of those, the number of online CPEs
- Throughput uplink (UL) and downlink (DL) throughput, in Mbps
- **PRB Utilization** UL and DL Physical Resource Block (PRB) utilization. PRB is the smallest element of physical layer resource allocation assigned to each user by the LTE eNB scheduler.

The network elements sync with the OMC to refresh the data every 5 minutes.

The data displayed via the graphs cover a period of one week, the current day, and the previous 6six days. You can select which days to view using the timeline underneath each graph. To see the numerical data for any point on a graph, simply hover your cursor over the graph, and the information will pop up.

Figure 2-37: Dashboard Statistics



2.4.2 eNB Menu

2.4.2.1 Overview of Sub-Menus

The eNB menu provides essential functions for managing, monitoring, and maintaining eNBs in the operator's network (Figure 2-38).

NOTE: Some menu items are available only to Beta customers trailing new features.



Figure 2-38: eNB Menu



- Monitor View all of the operator's eNBs that have connected with the OMC (*aka*, online), including their specifications, status, and operational measurements; perform quick operational actions and view aggregate eNB product and status graphs.
- Maintenance Use MML commands or scripts to batch-configure eNBs, configure eNBs, change the password, create reboot and recurring reboot tasks, and collect logs.
- **Upgrade** Upgrade or rollback the software image or download patch or FPGA files to multiple eNBs.
- Inventory Add or delete eNB devices in OMC, manage HaloB eNBs, and manage feature licenses.
- Backup&Restore Backup or restore eNB configuration.

2.4.2.2 Monitor

2.4.2.2.1 Landing Page Description

The *eNB* > *Monitor* window contains two tabs, Table (Figure 2-39) and Map (Figure 2-40), and the window opens first to the Table tab view. The table tab is described in more detail in *section 2.4.2.2.2 Table Tab*, and the map tab is described in *section 2.4.2.2.7 Map Tab*. See Table 2-3 for a description of the *eNB* > *Monitor* fields and Table 2-4 for *eNB* > *Monitor* graphs.

Figure	2-39:	eNB	> Mo	nitor -	Table	Tab	Genera	l Lav	vout
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ଜ (cloud	ore		омс	BOSS														CloudKey:	Welcome
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		Online Sta	atus		Active	Status All	V Produc	t Type Select	~	Model Name		✓ Software	are Version	ielect 🗸	Hardware Version	Select 🗸	Device Gro	up Select 🗸	Reset	2-
	1	HaloB Ens	able	All	~															
M	0			0	Alarm Count ©	Serial Number 🌼	Cell Name 🕈	RF Status 🌣	Active Status	ECI 0	PCI 0	MME Status	UE Count	CPE Count	IP [†] MAC [†]	Product Type	Model Name ©	Software Version	Device Group	-O- Active (3/14)
9	1		:	0	0		_	ON	Active		52	F6 F6		0		RTS	mBS1100	BaiBS_RTS_3.4	Default Level Group	43-
	2		:	0	0			OFF	Active		66	10 [1 •]	0	0		QRTB	mBS31001	BaiBS_QRTB	Default Level Group	<u>1</u>
0	3		:	0	0			GOFF G	Active		55,56		0	0		QRTB	mBS31001	BaiBS_QRTB	Default Level Group	MME Status (7/14)
	4		-		0			OFF	🔕 Inactive		58	Fo [2 •]	-	0		QRTB	mBS31001	BaiBS_QRTB	Default Level Group	-O- Connected -O- Doconnected
	5		:		0			OFF	🔘 Inactive		414	Po [2 •]	-	0		QRTB	mBS31001	BaiBS_QRTB	Default Level Group	6-
	6		-	00	0			OFF	Inactive		415	F6[2 +]	0	0		QRTB	mBS31001	BaiBS_QRTB	Default Level Group	4-
	7		-	0	0			OFF	() Inactive		55	F6 F6	-	0		QRTB	pBS31010	BaiBS_QRTB	Default Level Group	D ²
	8		:		0			OFF	() Inactive		52	Fo Fo	-	0		RTS	mBS1100	BaiBS_RTS_3.7	Default Level Group	
	9		:	•	0			OFF	() Inactive		38		0	0		RIS	mBS1100	BaiBS_RTS_3.7	Default Level Group	Product Type
	10		:	0	0			OFF	Inactive		52	16 16	-	0		RTS	pBS2120	BaiBS_RTS_3.6.6	Default Level Group	



Figure 2-40: eNB > Monitor - Map Tab General Layout



2.4.2.2.2 Table Tab

The Table tab view displays a list of the operators' eNB devices. In the Table tab view, you can sort the eNB device list using the filtering fields across the top of the page; the pull-down options for each field are shown in Figure 2-42. The Table Tab shows various fields. Each field shown on the Table tab is associated with different functions in the LTE architecture. Refer to Figure 2-41 to identify each field to its function.



Figure 2-41: Table Tab Fields

The Table tab view has two main sections – the list of eNBs registered with the OMC, their individual stats on the left, and the graphs of aggregate eNB data on the right.

Figure 2-42: eNB > Monitor Table Tab

													Each	eNE	Bs Data	& St	atus										Agg	regate	eNB Data (ira
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ø	Ξ	eN	B/M	nitor																	c	Critical 244	Major 19	Minor	14 🔵	Warning 0	5	FiSci (UTC	-06:00)2021-10-22	16:12
619	T	able]	М	ap																Click	the dowr	arrow f	or more	(•	6	eNB O	nline (7/55)	ine
ŝ,	Dr	All rop-i	dow	ı list	: filte	erial Numb	er / Cell Name / I	IP/MAC	All V	Product Type	(Set	2	Mode	Name		~	Software Ve	enion S	elect 🗸	Har	TIITEI	Select V	Device	Green Salari		Re Re	- at	CONTRACT OF THE OWNER		
₽	-					laure Ca l	Seciel Youther of	, and the second s	Coll Name C	PF States &	Antice	Etature ©	FCLO	RCI	-		Section of Cl	PE Count	TDe	100		Product Tons 0	Madel Name (Caferran Ver	ation @	During Course of		01	ative (10.55	_
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	2	. (•	0				ON	0 1	nactive		54		-	0					RTS	mB\$2130	BaiBS_RTD_	1.0.4	Default Device O	Group	864		
×.	3	(: (•	0				ON	() I	nactive		36		-	0					RTS	mBS2130	BaiBS_RTD_	1.0.8	Default Device (Group	8		
ø	4	(: (•	0				ON	0 1	nactive		37			0					RTS	mB\$2130	BaiBS_RTD_	1.0.\$	Default Device (Group	MME ?	Status (10:55)	
	5	0		: (•	0				OFF	() 1	nactive		55	16 B		0					QRTB	mBS31001	BaiBS_QRTE	3_2.5.4	Default Device O	Group	10		
	6	0		: (•	0				OFF	() I	nactive		52		-	0					RTS		BaiBS_RTS_	3.2.2	Default Device O	Group	8-		
1	7	0	כ	: (•	0				OFF	0 1	sactive		52	10 II		0					RTD	sB\$\$1040	BaiBS_RTD_	3.7.5	Default Device O	Group	4-		
	S	0		: (2	0					0 I	nactive		1	8	-	0					RTS		BaiStation_V	100R001C	Default Device O	Group 🤇		cess chart vi	ev
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- <u>i</u>	12				9	0				OFF	01	nactive		52	F0 F0	-	0					RTS	BRU3510	BaiBS_RTS_	3.6.6	Default Device C	Group			
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tus	Sele	ct	/			(A	cuve status	A	~	Product Typ	e L	Select	<u> </u>	NIOGCI	reame	Scion	~						Theorem	are version	Scieu		Devic	e Group		1
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	~					X.		A	Active	8		RTS				mB	\$1100				BaiBS_	RTS_3.7.11			VE	R.B		Defa	alt Level Gro	л
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	sy	унсп	10/112	eu r	anur			A	AII							sBS	71010				BaiBS_	QRTB_2.8.3			E0	1				
						-1		C	DN							pBS	3101S				BaiBS_	QRTB_2.6.2			A0	1				
								C	OFF																		-			

2.4.2.2.3 Display Settings

To manage which columns of information are displayed on the Monitor page, click on the Settings icon in the upper left of the window (Figure 2-43)

Select All to see all columns of information, or select specific column names, and click on *OK*. Refer to Table 2-3 *eNB* > *Monitor fields*, which follows, for a description of each column.

NOTE: Select All to view all the information of eNB and newly added features.

Figure 2-43: Display Settings



2.4.2.2.4 Field Descriptions

Table 2-3 describes each information column on the left side of the *eNB* > *Monitor* window.

Field	Description									
Checkbox	Select the checkbox for one or multiple eNBs to perform either a Synchronize action (eNB data to OMC display) or Reboot action from the Monitor page:									
	Image: Control in the series in the mean of the series in the mean of the series in									
Operations	Each row of eNBs has an Operations drop-down menu: Information, Settings, Actions. Each of these functions is described in <i>section 2.4.2.3.5 Operations</i> .									
*	Icons indicating an eNB's present status: The eNB is operating normally The eNB is offline									
	Use the arrow at the top of the column to toggle the list by status.									

Table 2-3: eNB > Monitor Fields



Field	Description
Alarm Count	The number of alarms at each severity level. Click on the icon to open the <i>Operations</i> > <i>Information</i> tab for the selected eNB.
	eNB > Monitor ► eNB > Monitor > Operations > Information
	Alarma Count
Serial Number	eNB serial number
Cell Name	Operator-configured eNB name
RF Status	Shows if the eNB's radio is on or off RF Status : Open RF Status : Close
Cell Status	The eNB is active (operating - green icon) or inactive (not operating - red icon).
ECI	E-UTRAN Cell Identifier - LTE standard network identifier is a number given to a unique cell site within the operator's network. One ECI represent multiple eNBs/PCIs on the same tower or other structure.
PCI	Physical Cell Identifier (PCI), or Layer 1 identity, is an essential configuration parameter of a radio cell that uniquely identifies each cell site in the wireless network. PCI planning is crucial for quality of service (QoS). The value can be only between (0-503) to avoid PCI confusion.
MME Status	The Mobility Management Entity (MME) plays a key role in CPEs mobility and access network. It verifies the authentication of UE to camp on operator's PLMN and initiates UE roaming restrictions. You can find the information on MME status and PLMN by clicking or hovering.
PLMN	Public Land Mobile Network ID which identifies the service provider for this eNB
Bandwidth	According to 3GPP specification, LTE supports four different bandwidth configurations such as 5 MHz, 10 MHz, 15 MHz, and 20 MHz



Field	Description
UE Count	Number of User Equipment (UEs/CPEs) actively connected to this eNB. Click on the number to display a list of the UEs and their information.
CPE Count	Number of CPEs currently connected to the network. Click on the number to display the list of CPEs and their information.
WAN Link Speed	Negotiated speed between Ethernet ports (WAN and LAN ports). This field helps the operator
Negotiated	locate speed issues on the networks.
IP	The eNB's current IP address. A clickable IP address feature is introduced to easily locate the IP.
MAC	The eNB's MAC address
Product Type	Auto populated eNB description used in OMC, e.g., RTS, RTD, QRTB, etc. The descriptions refer to the software stream name used on this product. For a description of all product types, refer to <i>Table 2-5 Product Types / Software Streams</i> .
Product Name	The name of the Baicells eNB
Model Name	The name of the eNB equipment model, which functions like a part number
Software Version	Software version currently running on the device
Device Group	The device group the eNB is assigned to by the operator. If no custom device groups have been created, the eNB will be assigned automatically to the default device group.
Earfcn	EARFCN frequency the eNB is currently using
Sync Status	The eNB is either synchronized or unsynchronized with other eNBs in the same cell Sync Status Image: Ops Synchronized
KPI Report Status	The Key Performance Indicators (KPI) report status is normal, broken, or off. KPI Report Status Z broken Z broken
Satellites	The number of GPS satellites found and reported by the eNB. Note that some eNB models do not support this reporting function.
System Uptime	Length of time this eNB has been operational - dd:hh:mm:ss



Field	Description
First Period Time	The first day and time the OMC got an inform message from the eNB, i.e., that it is online
Last Period Time	The last updated day and time the OMC got an inform message from the eNB, e.g., is offline
Duplex Mode	LTE duplexing scheme used on this eNB, either TDD or FDD
Hardware Version	The version of hardware in this device
GPS Version	GPS software version currently being used
HaloB Enable	The HaloB feature is either on or off. For more information about HaloB, refer to the <i>HaloB User Guide</i> .
ТАС	Tracking Area Code ID used to identify a geographical area within the operator's network coverage area
Subframe	In TDD, DL and UL are organized into radio frames of 10 ms each. Each frame duration contains 10 equal sub-frames the duration of each is 1 ms
Special Subframe	TDD mode must switch transmission from DL to UL and UL to DL, therefore a special subframe is required between transmissions.
Root Sequence Index	This allows UE to calculate which PRACH preamble it can use to attach to the eNB.
Longitude	The eNB's longitude coordinate
Latitude	The eNB's latitude coordinate
Height	The eNB's antenna height, in meters
Tx Power	The transmission power is set at the eNB when the RF transmission is active. Depending on the
	mode of operation indoor or outdoor, the transmission power varies from 24 dBm to 30 dBm
	(100 mw). If the eNB is not in active transmission (i.e., RF status is inactive), then the
	transmission power is set to 0 dBm.

2.4.2.2.5 Graph Descriptions

When you expand the right side of the *eNB* > *Monitor* window, you will see five graphs showing aggregate eNB data for all eNBs in the operator's network. The time window for the three main x-y graphs is one week, from the current date and back six days.

When you select a specific day in the timeline under the eNB Online, eNB Active, or MME Status graphs, all three graphs simultaneously update. Likewise, hovering over one of these three graphs will display the numerical data for that hour on all three. Refer to Table 2-4 for a description of each graph.



Table 2-4: eNB > Monitor Graphs

Graph	Description
eNB Online/Offline	Shows how many of the operator's eNBs are online, that is, operational but not currently transmitting or receiving data; and/or how many are offline, that is, not connected to the network or otherwise unavailable to provide service. Hover your cursor over the graph to see numerical data for that data point. In the lab example below, the graph indicates that there are 44 eNBs in the network, with 13 of
	those online and 31 offline on April 9.
	eN8 Online (1344) (number) 30 25 20 20 20 20 20 20 20 20 20 20
eNB Active/Inactive	Indicates how many eNBs are actively transmitting or receiving data and/or how many eNBs are
	inactive. Any eNBs that are reported as inactive means they are online but not currently active. Hover your cursor over the graph to display the numerical data for that data point.



Graph	Description
MME Status	The Mobility Management Entity (MME) is one of the core LTE network components with which the eNBs interface for user management. This graph pertains to the number of eNBs that were successfully connected to, and/or were disonnected from, the MME. Hover your cursor over the graph to display the numerical data for that data point. NOTE: An eNB operating in HaloB mode has embedded MME functionality and does not use the S1 signaling interface to the core network.
	MME Status (12:44) -O- Connected -O- Disconnected 10 25 -O- Disconnected -O- Disconnected 10 20100000000000000000000000000000000000
Product Type	The pie chart shows the distribution of the operator's eNBs based on which software stream they use, e.g., RTS, RTD, QRTB-CA (Carrier Aggregation), QRTB-DC (Dual Carrier), etc.



2.4.2.2.6 Operations

Use the Operations menu to configure each eNB to the operator's preferred settings. The menu opens are Settings, Maintenance, and Actions (Figure 2-44). Each menu item is explained below.

Figure 2-44: Operations



2.4.2.2.6.1 Information

An overview of all the eNB information is shown here. A quick view of this will outline the status of the eNB. As shown in the *Operations > Information* window's left side displays data about the eNB - its cell name and serial number, device information, cell information, network information, status, satellite information, licenses, features, alarms logs, and configuration file. In the middle of the window is the Action List. The action allows you to synchronize, reboot, and reset the configuration of the eNB. The right side contains information about the eNB in the graphs described below. The data is the same information you see on the main *Monitor* page, as described in Table 2-3 *eNB > Monitor Fields* in *Field Descriptions*, but it is visually organized in categories.

As with information on the Monitor page, the eNB's data is synced with the OMC every 5 minutes. To check when the OMC last received an eNB's information, refer to the Last Period Time field under the Device Info pane. The First Period Time is when the eNB first sent an Informed message to the OMC to let them know it was online.

NOTE 1: Not all licensed features are available on all eNB models.

NOTE 2: Some licenses are issued by quantity, and some have expiration dates. The OMC will generate an alarm (ID 13) 30 days before the license expiration.

Figure 2-45: Information (Left Side and Middle)

ø	∍	eNB / Monitor						Critical 247	• 2	Major 21	O Minor 17	Warning 0 🕞	FiSei (UTC-06:00)2	021-10-12 12:11
<i>(</i> -3)	Infor	mation Left	t Side (Da	ta Fields)			Mid	dle (Action	List)	Righ	nt Side (Graj	ohs)	
«I»								, _ <u>_</u>						
æ	1.1	Cell Na Bracells Serial N	me: Sumber:				- 13		14					
	11						- 14		н	istory	eNB Online S	Status eNB Active	Status UE Co	unt
	1	Device Info			Cell Info		''	A stilling T int	1.1	Status				1
		Serial Number			Cell Name			Action List		1				+
۲		System Uptime	0d 0h 11m 24s		TAC			Synchronize		Colling			L	ump to
ø		Product Type	RTS	0.11	ECI			Apply		Onine				Settings
		Model Name	2021-00-09 11:		PCI			Palaat						
		Last Period Time	2021-06-09 11:	14:55	Earfen					Offline				
		Software Version	BaiBS_RTS_3.	3.14	PLMN			Apply						
		MAC Address			Duplex Mode			Reset Configuration		00	02 04 06 08	10 12 14 16 18	20 22 00	lour
		GPS Version			Status			Apply			000		•	
		Device Group	Default Device	Group	Active Status	Inactive					10.06 10.07 10.08	10.09 10.10 10.11	10.12	
		N			MME Status									
		IP Address			RF Status	OFF			Р	erformance	10.05 10		15min 6	Omin
		Longitude	-\$4,779242		KPI Report Status	off					10.00	10.10 10.12		
		Latitude	49.219547		HaloB Enable	Off			ĸ	PI :UL/DL Th	roughput			
		Height(m)	٥		Syne Status	in Unsynchronized				(Mł	-0			
					UE Count	0					I			
Satell	ites													
Sate	llites													
Sate	lite List (dB-Hz)				azimuth(Degrees)			el	levation(D	egrees)				
Licer	se Info													
a B	asic Info Serial Numi	• ber:				License Ve	rsion:							
						0								
	Generate D	ate:				Mode:								
	0			All										
n F	eature List	-		Critical										
				Major										
reatu	re ib		Lestinguisa S	Minor		Quantity		Expiry	Date			in Days		
Alarm				Warning								Active Alarm	History Alarm	
	Severity	° (T	Alarm Identifier 0	Probable Cause		Alarm Status 0		Event Time 0		Upd	late Time 0	Alarm Count	2	
1	Critical		7	eNB Disconnect	ted	Unconfirmed and active		2018-07-18 12:01:09		202	1-08-24 01:42:10	9		
2	Minor		11185	No user on eNB		Unconfirmed and active		2018-07-18 11:50:45				1		
Logs											Device Report Log	Device Exception Log	Event Logs	
	Collec	tion Status ©		Files	0			Upda	ate Time 🗘					
Configu	ration File											a	00	
Config	uration File													
Restor	Status													
Latest	Update Time													

Clicking on the blue arrow setween the left and right side of the Information window opens the graphs section (Figure 2-46). The History graph reports online status, active status, and UE count for the selected eNB. Beneath the History graph is the Performance graphs. The LTE Key Performance Indicators (KPI) comprise several measurements that indicate an eNB's operational performance. Which graphs are presented depends on the KPI template(s) assigned to the eNB in the Performance menu. See *section 2.4.5 Performance Menu* for more information about the Performance menu.

*NOTE: The Performance menu is typically used by customers trialing OMC features and by operators using a private network version of OMC, referred to as "Local OMC."



Figure 2-46: Graphs (Right Side)



2.4.2.2.6.2 Settings

Reference: eNodeB Configuration Guide

The *Operations > Settings* function is how you configure or change an eNB's settings through CloudCore. You can configure the eNB through the eNB GUI and CloudCore GUI. Refer to the eNodeB Configuration Guide above to get a detailed description of the parameters in the settings to configure each eNB.



Caution: In the Network settings window, it is highly recommended to leave the Advance Setting fields with their default values. Improper changes will lead to system exceptions.

Note: A few features in the settings will be displayed only when the eNB status is active, and RF is ON.

• RTS Product Type Settings

Click on the *Operations > Settings* to view the Settings tab for the RTS product type. There are four main settings: Basic (Figure 2-47), Network (Figure 2-48), LTE (Figure 2-49), and eNB (Figure 2-50).

Figure 2-47: Basic Tab

Settings	Dasic (Senai Number: 120200005116A8P0090, Cen Name.nu	11)	
Basic	Quick Settings		
Dusie	Cell Name		Band
Network	null		42
LTE			
eNB	BandWidth		EARFCN
end	20M	~	43190(3560MHz)
	SubFrame Assignment		Special SubFrame Patterns
	2(DL:UL = 3:1)	~	7 🗸
	PLMN		ECI (ECI=eNB_ID*256+Cell_ID)
	46068		67150155
	PCI		TAC
	38		1
	MME IP		
	Input valid ip address	+	
	192.168.22.40		



Figure 2-48: Network Tab

Basic	Network (Serial Number:120200005116A8P0096,Cell Name:null)		C
Network	a IPSEC		
LTE	. IPSEC Settings		
eNB	Enable	IKE Negotiation Destination Port	
	Disable	4500	~
	Left Interface		
	none 🗸		
	. Tunnel Configure		
	IPSec Tunnel List		+
	Enable	Gateway	Operations
	Disable	0.0.0	4
	Advance Setting .		
	IKE Encryption	IKE DH Group	
			•
	IKE Authentication	ESP Encryption	
	ESP DH Group	ESP Authentication	
	KeyLife	IKELifeTime	
	RekeyMargin	Self Define Keyingtries	
	I LGW		
	Disable V		
	MTU Config •		
	MTU 1500	Cascade	~
	OK Cancel		



Figure 2-49: LTE Tab

	5116A8P0096,Cell Name:null)							C
Security -								
Ciphering Algorithm					Integrity Algorithm			
EEA0		~			128-EIA1		~	
Neighbor								
Neigh Freg								
ringaried								
Neigh Freq List								
EARFCN Q-	OffsetRange	qRxLevMinSib5		PMax	tl	teselectionEutra	tReselectionEutraSFMedium	ReselThreshHigh
Neigh Cell List								
rieign cen hint								
PLMN EC	II (ECI=eNB_IE EARFCN	PCI	qOffset	cio	TAC E	nable Operations		
PLMN EC	I (ECI=eNB_IE EARFCN	PCI	qOffset	cio	TAC E	No Data		
PLMN EC	I (ECI=eNB_IE EARFCN	PCI	qOffset	cio	TAC E	No Data		
PLMN EC	ZI (ECI=eNB_IL EARFCN	РСІ	qOffset	cio	TAC E	nable Operations		
PLMN EC	21 (ECI=eNB_IE EARFCN	PCI	qOffset	cio	TAC E	No Data		
PLMN EC	CI (ECI=eNB_IE EARFCN	РСІ	qOffset	cio	TAC E rootSequenceIndex 1	hable Operations No Dark		
PLMN EC	CI (ECI=eNB_IE EARFCN	РСІ	qOffset	cio	TAC E	nable Operations No Dark		

Figure 2-50: eNB Tab

NTP Sync Period	Time Zone
60	Africa/Abidjan
Port1	Server I
123	1.cn.pool.ntp.org
Port2	Server 2
123	2.cn.pool.ntp.org
Port3	Server 3
123	3.cn.pool.ntp.org
Port4	Server4
123	0.cn.pool.ntp.org
Management Server	
Management Server	CloudKey
http://104.42.48.220:0000/cmpllapl1/AccComvice	NOOTI C



• QRTB Product Type Settings

Click on the *Operations > Settings* to view the Settings tab for the QRTB product type. There are four main settings: Quick Settings (Figure 2-51), Network (Figure 2-52), LTE (Figure 2-53, Figure 2-54, Figure 2-55, and Figure 2-56), and BTS (Figure 2-57, Figure 2-58, and Figure 2-59).

- 1	Quick Settings						
	• CBRS						
	SAS Enabled						
	Quick Mode						
	HaloB	• Normal			O CloudEPC	LocalEPC	
	Duplex Mode	TDDMode			Carrier Type	Single Carrier	
- 1	CoreNetwork						
	• MME						
	PLMN ID		+	Range:5~6,No more than 6	TAC	1	Range:0~65535
		314030 🙁					
					S1 Link Port	36412	Range:0~65535
	MME IP		PLMN	Select V No more than 16			
		10.3.0.9	PLMN:314030	8			
		10.5.0.9	PLMN:314030	0			
- 8	Cell						
	• Cell1						
	Cell Name	mBS31001-120200	02401978P0021-	Range:0~64	ECI	135787604	Range:0~268435455
	EARFCN DL	55440		Band: 48 55440(3570MHz)	Bandwidth	20M ~	
				Frequency Range: [3550,3700]			
	Subframe Assignment	1(DL:UL = 2:2)			Special Subframe Patterns	7 ~	
	PCI	55		Range:0~503	Power Modify	2 ~ ~	X 30dBm \checkmark
1							

Figure 2-51: Quick Settings Tab

Figure 2-52: Network Tab

	MTU		1500	Range:700~1600	
- B II •	PSec IPSec S Enable	Setting			
п	PSec Tun	nel List Operations	Enable		Tunnel Gateway
	1	2	true		baicells-westepc-03.cloudapp.net
	2	∠	true		baicells-eastepc04.eastus.cloudapp.azure.com



Figure 2-53 LTE Tab (1 of 4)

ITE Neigh											
	Freq/Cell										
Neigh Freq Li	ist										
	Operations	Index	EARFCN	Q-OffsetRang e	qRxLevMinSi b5	PMax	tReselectionE utra	ReselThreshH igh	ReselThreshL ow	ReselectionPri ority	Enable
						No Data					
Neigh Cell Lir	ist								/		
	Operations	Index	PLMN	Cell ID	Е	ARFCN	PCI	QOffset	Сю	T	AC
						No Data					
dd Neigh Freq List											
- 🗈 Neigh Freq	Setting										
Enable		0									
EARFCN			Ra	Range:-127~33			qRxLevMinSib5			Range:-70~-22	
Q-OffsetRa	ange						tReselectionEutra			Range:0~7	
PMax			Ra				ReselThreshLow				
										Range:0~31	
ReselThres	shHigh		Ra	nge:0~31			ReselectionPriority			Range:0~31 Range:0~7	
ReselThres .dd Neigh Cell List	shHigh		Ra	nge:0~31			ReselectionPriority			Range:0~31 Range:0~7	ļ
ReselThres	shHigh nel/Configure		Ra	nge:0-31			ReselectionPriority			Range:0~31 Range:0~7	ļ
ReselThres	shHigh nel/Configure	D	Ra	nge:0~31			ReselectionPriority			Range:0-31 Range:0-7	ļ
ReselThres	shHigh nel/Configure	D	Ra	nge:0-31 unge:0-268435455			ReselectionPriority			Range:0-31 Range:0-7 Range:5-6 digits	Ţ
ReselThres	nel/Configure	D	Ra	nge:0-31 nge:0-268435455 nge:0-65535			ReselectionPriority PLMN PCI			Range:0-31 Range:0-7 Range:5-6 digits Range:0-503	ļ
Add Neigh Cell List IPSec Tunn Enable Cell ID EARFCN QOffset	nel/Configure	O ielest	Ra R R V	nge:0-31 ange:0-268435455 ange:0-65535			ReselectionPriority PLMN PCI TAC			Range:0-31 Range:0-7 Range:5-6 digits Range:0-503 Range:0-65535	Ţ



Figure 2-54: LTE Tab (2 of 4)

	- E Mobility Parameter					
	A1 Event Threshold					
	A1 Threshold-RSRP	50	Range:0~97			
	A2 Event Threshold					
	A2 Threshold-RSRP	30	Range:0-97			
	A3 Event Threshold					
	A3 Offset	10	Range:-30 ~ 30			
	A4 Event Threshold					
	A4 Threshold-RSRP	60	Range:0~97			
	A5 Event Threshold					
	A5 Threshold1-RSRP	70	Range:0~97	A5 Threshold2-RSRP	65	Range:0~97
	B2 Event Threshold					
	B2 Threshold1-RSRP	70	Range:0~97	B2 Threshold2-RSRP	10	Range:0~97
	CED AN DO ID AT Threshold	20	Panga-0. 63			
-	OERAN D2 IRAT THESHOL		Rangelo-65			
	Cell Selection Parameter					
	Qrxlevmin	-65	dBm Range:-70~22	Qrxlevminoffset	1	Range:1~8
	Cell ReSelection Parameter					
	S-IntraSearch	31	dBm Range:0~31	QrxlevminSib3		
				-64 dBm	Range:-70 ~ -22	
	ThreshServingLow	31	Range:0~31	Qhyst	dB1 🗸	
	S-NonIntraSearch	31	Range:0~31	Reselection Priority	7	Range:0~7
	Allowed Meas BW	CELL_BW_N50(10M)				
	• X2					
	X2 Enable					
	ANR Parameters					
	Measurement Configuration	Intera A5 Event 🗸		Inter-Freq ANR A5 RSRP Threshold1	75	Range:0~97
	Inter-Freq ANR A5 RSRP Threshold2	50	Range:0~97			
1						



Figure 2-55: LTE Tab (3 of 4)

- 6 1	Power Control				
	Total Tx Power			Po_nominal_pusch	
	23	Range:-30~33		-70	Range:-126~24
	Preamble Init Target Power	dBm-98 V		Target ul sinr	Range:-6~10
	РВ	1	Range:0~3	Power Ramping	2 ~
	Po_nominal_pucch			Alpha	70 ~
	-96	Range:-127~-96			
	РА	-3dB 🗸			
- 8	Security Setting				
	Ciphering Algorithm	EEA0 V		Integrity Algorithm	128-EIA1 ~

Figure 2-56: LTE Tab (4 of 4)

- E Advance					
Scheduling Algorithm					
UL Schd Algorithm	RR 🗸		DL Schd Algorithm	RR 🗸	
• Sync Adjust Parameters					
GPS Sync Adjust Value	0	Range:-65535~65535	ICTA Adjust Value	0	Range:-65535~65535
Link Activation State Detector					
Link Keep Alive			Link Keep Alive Timer	10 Minutes 💛	
Working Mode					
Working Mode	64UE 🗸				
Random Access Parameters					
Zero Correlation Zone Config	10	Range:0~94	rootSequenceIndex1	22	Range:0~837
rootSequenceIndex2	10	Range:0~837	PRACH Freq Offset	6	Range:0~94
configurationIndex	3	Range:0~837			



Figure 2-57: BTS Tab (1 of 3)

- B OMC					
Management Server					
Management Server	http://bctestlabomc.cloudapp.net:8080/	smallcell/AcsServi	Range:0~120		
Port	8080	Range:0~65535		SSL Enable	
• Cloud					
CloudKey	123456	Range:0~6			

Figure 2-58: BTS Tab (2 of 3)

- E CoreNetwork				
Cloud EPC				
• MME				
PLMN ID	Range:5~6digits,No more than 6	TAC	1	Range:0~65535
	314030	S1 Link Port	36412	Range:0~65535
MME IP	PLMN Select V + Range:0-255,No more than 6			
	10.3.0.9 PLMN:314030 10.5.0.9 PLMN:314030 S			
S1 Connection Mode	ALL 🗸			
• HaloB				
HaloB Enable		HaloB Mode 0		
• LGW				
Enable				
Mode	NAT	Interface Binding	AN 💛	
IP POOL	10.10.0.1	IP POOL Netmask 25	5.255.255.0	

Figure 2-59: BTS Tab (3 of 3)

NI. Sync	List									
NL Sylic	Operations	Index	priority	technology	Band	Channel Number	PCI	freqUncertaintyThreshold	syncInterval	phase
1	2	1	1	LTE	0	0	0	250	4	0
2	1	2	1	LTE	0	0	0	250	4	0
• NTP										
Enable	c					timeZone	America/Chicago			



2.4.2.2.6.3 Maintenance

The *Operations > Maintenance* function perform quick maintenance actions for a selected eNB. Maintenance actions include *Reboot, Reset Configuration,* and *Logs*.

• Reboot

To reboot an eNB, select *Operations > Maintenance > Reboot*. When the confirmation dialogue box opens, click *Ok* (Figure 2-60).

Figure 2-60: Reboot

: 📼	0				
	Information				
0	Settings				
	Maintenance	⊡ →	Reboot	Confirm	×
·	Actions		Reset Configuration	Are you sure you want to reboot the device?	
			Logs	Ok	Cancel

• Reset Configuration

You can reset an eNB to its default settings by selecting *Operations > Maintenance > Reset Configuration*. When the confirmation dialogue box opens, click *Ok* (Figure 2-61).

Information		
10004		
Settings		
🐼 Maintenance …	→ Reboot	Confirm ×
Actions	Reset Configuration	Are you sure you want to reset the configuration?
	Logs	Ok Cancel

Figure 2-61: Reset Configuration

Logs

To create a device log for an eNB, select *Operations > Maintenance > Logs,* and a message will inform you that the log collection task has been created. Go to the main eNB GUI and click Logs under the Maintenance tab to view the log. Under *Device Logs,* click the checkbox next to the log record you want to view and select *Download* (Figure 2-62).

Figure 2-62: Logs

 Information Settings Maintenance Actions 	Reboot Reset Configuration Logs							
o view logs:								
eNB / Maintenance / Logs								
enb enb		Device Logs	Alarm Logs Exception	Logs Event Logs				
2 Monitor	Backup&Restore	Serial Number		× Q				
Maintenance			Serial Number	Collection Status	Execute Type	Period(Min)	Files	Operation Time
MML		1		Success	Immediately		1	2022-02-09 11:21:10
Configuration		2		Success	Immediately		5	2022-02-07 11:02:37
Change Password		3		Lo Success	Immediately		1	2022-02-02 14:37:21
Reboot		4		Lo Success	Immediately		1	2022-01-24 09:42:45
Halob-IMSI Resource								
Upgrade								
Inventory								
Duries								

2.4.2.2.6.4 Actions

Additional operations can be performed when you highlight an eNB in the Monitor window, select *Operations*, and then select Actions (Figure 2-63):

- Synchronize updates the OMC with the latest information from the eNB
- HaloB Enable/Disable Enable or disable HaloB mode on the eNB (if the eNB has the HaloB software license); the actions will include any software license option to enable/disable operation
- RF ON/OFF Toggle to turn the RF transmissions for this eNB ON or OFF
- Force RF Disable When SAS is enabled on the eNB, operators can disable RF transmissions even if the grant request is in an Authorized state

NOTE: The available *Operations > Actions* will vary by eNB type and operating mode.

Figure 2-63: Actions

: \cdots 🛛		
📮 Information		
Settings		
Maintenance		
Les Wannenance		Synchronize
💮 Actions	···	
		RF OFF
		HaloB Enable

If you select the checkbox for more than one eNB listed in the Monitor window, a dialogue box will open at the bottom of the screen where you can simultaneously synchronize those eNBs to the OMC or reboot them at the same time (Figure 2-64). To synchronize an eNB means to refresh the OMC display with the eNB's local data.

Figure 2-64: Multi-Device Operations

0			\$	Alarm Count 🗘	Serial Number 🗘	Cell Name 🗘	IP Address 🗘	MME Interface Binding(Non-IPs IPsec Address	Site ID 🗘
1		÷	00	1					
2		÷	00	3					
3		:	00	0					
4		÷	00	0					
	Ţ								
electe	d Devi	ces(2) 📀					Synchronize	Reboot

2.4.2.2.7 Map Tab

The *eNB* > *Monitor* > *Map* tab view displays a topographical map that shows which eNB devices are online and offline and identifies each location (Figure 2-65). The *Location* legend in the upper right indicates the number of eNBs online and offline compared to the total number of eNBs in the network. If you hover over one of these symbols on the map, it will display the *Serial Number, the Device Status, Active Status, Severity,* and *State* of an eNB.

Additionally, hovering over a map icon displays the device's latitude and longitude location. You can click on a legend icon with a plus (+) and number to open the *Devices* pane, which indicates the serial number and cell name of additional eNBs. Click the icon in ext to the eNBs cell name to locate the eNB on the map. The legend icon associated with that eNB will become green. The hand cursor enables you to move the map around, while the + and - functions provide a way to zoom in for greater granularity or out to enlarge the map.

Bricells

Figure 2-65: Map Tab View



As shown in Figure 2-66, to view an eNBs serial number, cell name, longitude, and latitude, click on the right blue arrow. You can search for a cell by its serial number or cell name by typing either into the search box. Once the eNB information is displayed, you can double click on any of the eNBs information to highlight that eNBs location on the map. The *Non-Location Devices* checkbox views the eNBs configured without the Latitude and Longitude. If you click the information icon next to *Non-Location Devices*, you will see a dialogue box with instructions and disabling SAS settings.



Figure 2-66: Optional Information View



Clicking on a map icon opens an *Information* pane, providing more information about the eNB (Figure 2-67). The *Information* pane provides the eNBs serial number, cell name, IP address, device group, active status, GPS position, severity, MME status, MME IP address, SAS enabled or not, and state (authorized or not).

Figure 2-67: Information Pane



You can use the tabs in the top right corner to filter which eNBs show on the map. The *Settings* tab allows you to filter by *Device Status, Active Status,* and *SAS Status.* The *Location* pane will reflect your choice (Figure 2-68).



Figure 2-68: Map Display Filters

2.4.2.2.8 Distance Tab

The Distance tab calculates the inter-distance between two eNBs and between the CPEs and the corresponding eNB. As shown in Figure 2-69, you can view the distance between one or more selected points on the map. To begin, double-click the ruler icon next to *Distance*. Then use the hand tool icon to click on the desired starting point you want to measure. A distance box will appear displaying 0.00 km (your starting point). A blue line will follow as you move the hand tool icon on the map, measuring the distance between your starting point and the endpoint. Once you have chosen the endpoint, click again, and the distance between the points will appear. You can move the hand tool to several issues. Each time you click again, distance is cumulatively added. At any point, click refresh to end measuring and clear the map.

Figure 2-69: Display Tab





2.4.2.3 Maintenance

The *eNB* > *Maintenance* menu covers Man-Machine Language (MML) batch configuration, Configuration, Change Password, Reboot, and Logs eNB functions (Figure 2-70). For each part, you can define and schedule tasks that will apply to one or more eNBs.

Figure 2-70: Maintenance

I	Maintenance	
	MML	
	Configuration	
	Change Password	
	Reboot	
	Logs	
	Signaling Trace	
	Halob-IMSI Resource	

2.4.2.3.1 MML

After eNBs are registered in OMC, you can configure them in batches using MML commands. You can modify eNB and core network configuration information by MML commands. The *eNB* > *Maintenance* > *MML* menu contains two tabs: MML and MML Script

Figure 2-71: MML Menu



2.4.2.3.1.1 MML Tab

To use MML configuration, follow the steps below while referring to Figure 2-72.

In the MML window, select the software stream from the drop-down list to identify the type of eNB(s) you
want to display. See *Table 2-5 Product Types / Software Streams* concerning Baicells products and
software. You can also search by eNB serial number or name.



Figure 2-72: MML Tab



Software Stream	Description	Example(s)			
CR-B4860	Future 5G product with NXP processors	Nova846, Pulsar4G			
Neutrino430	Two-carrier indoor eNBs with Qualcomm	Neutrino430			
	processors and running in LTE TDD duplexing				
	mode				
QAFA	Single-carrier eNBs with Qualcomm processors	Neutrino224			
QAFB	Two-carrier eNBs with Qualcomm processors and	Nova246 FDD mode			
	running in LTE FDD duplexing mode				
QRTB-DC	Two-carrier eNBs with Qualcomm processors	Nova436Q in DC/split mode, Neutrino430 in			
	running in Dual Carrier (DC) / split mode	DC/split mode			
QRTB-CA	Two-carrier eNBs with Qualcomm processors	Nova436Q CA mode, Neutrino430 CA mode			
	running in Carrier Aggregation (CA) mode				
RTS	Single-carrier eNBs with Intel processors	Nova227, Nova233, Nova243			
RTD	Two-carrier eNBs with Intel processors	Nova246 TDD mode			

Table 2-5: Product Types / Software Streams

- 2. In the list of eNBs that appears, select the checkbox next to the ones you want to batch configure.
- 3. To identify the MML commands you want to execute:
 - a. MML List: In the MML List pane, select the MML command to execute. The Control Panel pane will display the MML command and its parameters. You can choose more MML commands if each is separated by a semi-colon (;).
 - b. Control Panel: In the Control Panel pane, fill in the MML parameters, separating multiple commands with a semi-colon (;), and click on DO. Or use the pull-down menu to select each command.
 - c. ParameterPath Command: In the Control Panel pane, click on the ParameterPath Command tab and use the Operation Type pull-down menu to select the type of action to be performed:
 - i. LST List
 - ii. MOD Modify
 - iii. ADD Add
 - iv. RMV Remove

You can also type the command directly into the field.

- d. Then, type the MML command(s) directly into the MML command window. The path cannot contain brackets, e.g., [1], and must include a period (.) but not end with a period (.).
- e. Click on DO to execute the command. The results will display in the Results pane.



2.4.2.3.1.2 MML Script Tab

The batch configuration of eNB devices is done by creating an MML script task. You can generate MML scripts by importing and executing MML script files. Select the MML Script tab in the *eNB* > *Maintenance* > *MML* menu and follow the steps below (Figure 2-73).

- 1. Click on the + Add icon to open the New Task window.
- 2. Export the MML template and enter the MML script. Save; do not change the file name.
- 3. Accept the auto-generated Task Name or enter a new one.
- 4. Select MML Script, click on the import icon, and navigate the completed script file.
- 5. Select an Execute Type, per *Table 2-6 Execute Modes*, determining when the task executes.
- 6. Click on OK to save the settings. The new task will be added to the MML Script list.



Figure 2-73: MML Script



Table 2-6: Execute Modes

Mode	Description
Immediately	The task will execute as soon as you click on <i>OK</i> .
Awaiting Start	Suspends the execution until you are ready to choose one of the other two options - to run it
	immediately or schedule a day and time for the task to execute
Schedule Time	Identify a day and time for the task to take place.

2.4.2.3.2 Configuration

The *eNB* > *Maintenance* > *Configuration* page is where you configure an eNB. The configuration menu contains three tabs: *Configuration, Neighbor Cell Configure,* and *Neighbor Frequency Configure* (Figure 2-74). Refer to the *eNB Configuration Guide* for a description of each parameter.

Figure 2-74: eNB Configuration

eNB / Maintenance / Configuration		Critical 32 Major 7 Minor 8 Warning 0 FiSci (UTC-06:00)2	2021-12-09 11:3
Configuration Neighbor Cell Configure Neighbor	Frequency Configure	6	9 0
Serial Number	Q	Import	Export
Serial Number Status Failure Reason Finish Time	FrequencyBand Bandwidth(MHZ) Earfcn Subframe Assignment	gnment Special Subframe Patterns PLMN TAC ECI PCI Root Sequence Index	MINE IP
Configuration Neighbor Cell Configure	Neighbor Frequency Configure	(R) (A) (A)	
	Q		
Serial Number Status Failure Reason	Finish Time Earfcn PCI qOffset CIO	TAC PLMN cell ID	
Configuration Neighbor Cell Configure Neighb	or Frequency Configure	© g ß	
	Q		
Serial Number Status Failure Reason Finish Time	Earfcn Q-OffsetRange Q-RxLevMin Reselection Priority	ty Reselection Thresh High Reselection Thresh Low P-Max TReselection Eutra	

2.4.2.3.2.1 Import/Export

To know the information of the neighboring cells and their frequency, the eNB needs information about the cells. You can import a spreadsheet (Figure 2-75) to quickly configure one or more eNBs and give information about neighbor cells and neighbor frequency. This can lead to smooth handover and overcome interference issues. It must be in the .xlx or .xlxs extension to import a file. To download a sample template for the file format, click on an *Export template* as shown in (Figure 2-75). Click the *Import* icon and select the file from your computer. Then click *OK*.

Figure 2-75: Import

onfiguration	Neighbor C	ell Configure	Neighbor	Frequency Co	nfigure							R	
				Q									
Serial Num	ber Status	Failure Reason	Finish Time	FrequencyBand	Bandwidth(MHZ)	Earfcn	Subframe Assignment	Special Subframe Patterns	PLMN	HC ECI	PCI	Root Sequence Index	MME IP
					Import	+							
									_				
					Import	File	Please select the file.		→ 0	nly .xls and .xlsx ar	re supported		
					O Imp	port the file u	using the same format specifi	ied in the sample template. 👌	Export Temp	late			
						_							



To export a .xlsx spreadsheet and view *Batch Config Plan Results, Neighbor Frequency,* and *Neighbor Cell* information of each eNB, click the *export* icon, and the file will begin to download automatically (Figure 2-76). This file will contain all the configuration parameters of the eNB.

Figure 2-76: Export

	on Neighbor	Cell Configure	Neighbor Frequer	ncy Config	gure								6		(
			Q												
Ser	rial Number Status	Failure Reason	Finish Time Frequenc	yBand B	andwidth(MHZ) Earfer	Subframe Assignment	Special Sul	oframe Pa	tterns	PLMN	TAC I	ECI PCI	Root Sequence Index	MME IP	
	•														_
Fi	ile Home Ins	ert Page Layout	Formulas Data	Review	View Help Acro	bat							占 Share	Comm	n
Pa	Calibri aste v ≪ B 1	- 11 ' <u>U</u> - ⊞ - ◊		∎ ≫ • ■ ⊡ ⊡	란 Wrap Text ∰ Merge & Center →	General	Condi Format	tional Fo	rmat as able ~ Si	Cell tyles ~	Insert De	elete Format	∑ Ž Ž Sort & Find & ♦ Filter Select	Analyze Data	
Cli	lipboard 😼	Font	F5	Align	nment f	Number	rs,	Sty	les		c	ells	Editing	Analysis	
A1		× × fr	Serial Number												
		P	6	0	c	c .		c				v	1		
1	A Serial Number	B	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	atterns	G PLMN	H TAC E	I J	Root Se	K equence Inde	L x MME address	M Update Tim	ne
1 2	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	atterns	G PLMN	H TAC E	I J	Root Se	K equence Inde	L x MME address	M Update Tim	n
1 2 3	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	atterns	G PLMN	H TAC E	I J CI PCI	Root Se	K equence Inde	L X MME address	M Update Tim	n
1 2 3 4	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	atterns	G PLMN	H TAC E	I J	Root Se	K equence Inde	L x MME address	M Update Tim	n
1 2 3 4 5	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	atterns	G PLMN	H TAC E	I J	Root Se	K equence Inde	L x MME address	M Update Tim	n
1 2 3 4 5 6	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F t Special Subframe P	'atterns	G PLMN	H TAC E	I J	Root St	K equence Inde	L x MME address	M Update Tim	n
1 2 3 4 5 6 7	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	atterns	G PLMN	H TAC E	I J	Root Se	K equence Inde	L X MME address	M Update Tim	
1 2 3 4 5 6 7 8	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	'atterns	G PLMN	H TAC E	I J	Root Se	K equence Inde	L X MME address	M Update Tim	
1 2 3 4 5 6 7 8 9	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	'atterns	G PLMN	H TAC E	I J	Root St	K equence Inde	L X MME address	M Update Tim	n
1 2 3 4 5 6 7 8 9 9 10	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F. Special Subframe P	'atterns	G PLMN	H TAC E	I J	Root St	K equence Inde	L X MME address	M Update Tim	
1 1 2 3 4 5 6 7 8 9 10 11	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	'atterns	G	H TAC E	I J	Root St	K equence Inde	L X MME address	M Update Tim	
1 1 2 3 4 5 6 7 8 9 10 11 11 12	A Serial Number	8 FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	atterns	G PLMN	H TAC E		Root St	K equence Inde	X MME address	M Update Tim	
1 2 3 4 5 6 7 8 9 10 11 11 12 13	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	atterns	G PLMN	H TAC E		Root Se	K equence Inde	L X MME address	M Update Tim	n
1 2 3 4 5 6 7 8 9 10 11 11 12 13 14	A Serial Number	B FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	'atterns	G PLMN	H TAC E		Root Se	K equence Inde	X MME address	M Update Tim	n
1 2 3 4 5 6 7 8 9 9 10 11 12 13 14 15	A Serial Number	8 FrequencyBand	C Bandwidth(MHz)	D Earfcn	E Subframe Assignmen	F Special Subframe P	atterns	G PLMN	H		Root Se	K Requence Inde	X MME address	M Update Tim	n

2.4.2.3.3 Change Password

This *eNB* > *Maintenance* > *Change Password* menu is used to create tasks pertaining to eNB passwords. You can reset the password on one or more eNBs to the default password (typically, admin) or change the password to a new character string. When you open the Change Password window, any existing tasks will be listed along with information about the execution of that task.

To create a Change Password task:

- 1. Click on the + Add icon to open the New Change Password Task window (Figure 2-77).
- 2. Accept the auto-generated task name or enter a new name.
- 3. Under *Select Device*, search for the eNB by product type or click the checkbox next to the target eNB devices for this task. You can select the radio button next to *All* to choose all eNBs.
- 4. For Operation Type, choose the radio button for either Reset Password or Change Password.
- 5. Choose an Execute Type, per *Table 2-6 Execute Modes*, determining when the task executes.
- 6. Click on OK to save the settings. The new task will be added to the Change Password list.



Figure 2-77: Change eNB Password

Ø		NB / Ma	aintenance / Change	e Password		• 242	19	• • FiSci (UTC-06:00)2021-10-14 13:10
(q)	S		ber / Cell Name		Q			
	Produ	ct Type:	RTS RT	D				and the second se
⋒			Serial N	amber	Cell Name		Version	Device Group
	1		00				BaiBS_RTS_3.7.8	Default Device Group
ы	2		00				BaiBS_RTS_3.4.8	Default Device Group
٢	3		00				BaiBS_RTS_3.4.8	Default Device Group
~	4		00				BaiBS_RTS_3.7.10	Default Device Group
	5		0			and the second sec	BaiBS_RTS_3.6.6	Default Device Group
	6		0			and the second	BaiStation_	Default Device Group
	7		0		and the second se		BaiStation_	test
	8				and a start of the		BaiBS_RTS_3.3.14	Default Device Group
	9 10	D/page	✓ < 1 > Devices	Go to 1	C		BaiBS RTS 3.5.4	Default Device Group Total 35
	- [[1	ask Name		- A CAR	* Q [Waiting 0	To In progress 0	Co Suspend 0 Co End 1
			er e					

Basic Info								
Task Name	Change Pass	word_o						
Select Device								
Product Type	RTS			~				
eNBS								
Equipment	Specified	s	erial Numł	er / Cell ?	Same	Q		Selected (0) 💿
) All					Serial Number	Cell Name	Version	Device Group
Select		1		0			BaiB5_RTS_3.7.\$	Default Device Group
	-			0			BaiBS_RTS_3.4.3	Default Device Group
		3		\odot			BaiBS_RTS_3.4.8	Default Device Group
		4		0			BaiBS_RTS_3.7.10	Default Device Group
		5		\odot			BaBS_RTS_3.6.6	Default Device Group
		6					BaiStation	Default Device Group
		7		\odot			BaiStation	test
		50	page	~ <	1 > Go to 1	C		Total 35
C Oursile Tra								
Operation Type								
 Reset Passwork 	d		Change I	assword		¥		
T Example Made								
E Execute Mode								
 Immediately 		\bigcirc An	aiting St	art	 Schedule 	Time 💿		


Use the *Operations* functions to view the task results, to start or terminate the task, modify, or delete the task (Figure 2-78). Task results will appear at the bottom of the window. You can view additional information about a task by selecting *Operations* > *Information*.

Figure 2-78: Task List Operations

Ta	sk List Devices								
n			× Q				Waiting	0 In progress 0	Suspend 0 End 8
	Task Name		User	Operation Time	Status	Progress	Results	Start Time	End Time
1	Change Password_FiSciAdmi	in_2021-11-08 15:22:29		2021-11-08 15:22:48	Co End	1/1	Success	2021-11-08 15:22:48	2021-11-08 15:22:51
2	Start	:021-09-29 10:19:11		2021-09-29 10:19:17	Co End	1/1	Success	2021-09-29 10:19:17	2021-09-29 10:19:19
3	(Terminate	21-09-29 10:17:17		2021-09-29 10:17:25	Co End	1/1	Fail	2021-09-29 10:17:25	2021-09-29 10:17:44
4	Information	:021-09-29 10:08:37		2021-09-29 10:10:54	Co End	1/1	Fail	2021-09-29 10:10:54	2021-09-29 10:10:56
5	Delete	s_2021-09-27 09:		2021-09-27 09:16:25	Co End	1/1	Success	2021-09-27 09:16:25	2021-09-27 09:16:27
50/	'page ′ < 1 >	Go to 1 C							Total 8

Figure 2-79: Devices Tab

т	ask List Devices								
			Q					Success 4	S Fail 4
	Serial Number	Cell Name	Task Name	Product Type	Status	Results	Failure Reason	Start Time	End Time
1	1202000291216HB0050	unknown name(19	Change Password_FiSciAdmin_2021-11-08 15:22:29	QRTB-SC	Co End	Success		2021-11-08 15:22:48	2021-11-08 15:22:51
2	12020002402016Y0005	unknown name(19	Change Password_seng_baicells_2021-09-29 10:19:11	QRTB-CA	Co End	Success		2021-09-29 10:19:17	2021-09-29 10:19:19
3	12020002401978P0021	mBS31001-12020	Change Password_FiSciAdmin_2021-09-29 10:17:17	QRTB-SC	Co End	Fail	Method not supported	2021-09-29 10:17:25	2021-09-29 10:17:44
4	12020002402016Y0005	unknown name(19	Change Password_seng_baicells_2021-09-29 10:08:37	QRTB-CA	Co End	Fail	Method not supported	2021-09-29 10:10:54	2021-09-29 10:10:56
5	12020002402016Y0005	unknown name(19	Change Password_Pengyu_Baicells_2021-09-27 09:16:12	QRTB-CA	Co End	Success		2021-09-27 09:16:25	2021-09-27 09:16:27

2.4.2.3.4 Reboot

The *eNB* > *Maintenance* > *Reboot* page allows you to view existing and completed reboot tasks or create a reboot or recurring reboot task for one or more eNBs. The *eNB* > *Maintenance* > *Reboot* window has two tabs, Reboot and Recurring Reboot (Figure 2-80). You can search for a task by entering the task name in the search box.

Ø	= e	NB /	Maintenance / Reboot			 Critical 	30 😑 Majo	or 5 🧲	Minor 6	Warning 0 I	FiSci (UTC-06:00)2021-11-16 11:19
(y)	Ret	oot	Recurring Reboot								
æ.					× Q Sear	ch by task name.					(+)
			Task Name	User	Operation Time	Product Type	Status	Progress	Results	Start Time	End Time
	1	÷	Reboot_		2021-11-05 15:58:45	QRTB	End End	1/1	Fail	2021-11-05 15:58:45	2021-11-05 16:14:18
5	2	÷	Reboot_		2021-11-04 09:37:26	QRTB	Co End	1/1	Success	2021-11-04 09:37:26	2021-11-04 09:39:46
~	3	÷	Reboot_		2021-09-29 10:03:57	QRTB	Co End	1/1	Fail	2021-09-29 10:03:57	2021-09-29 10:19:07
₩	4	÷	Reboot_		2021-09-24 08:47:05	QRTB	End End	1/1	Success	2021-09-24 08:47:05	2021-09-24 08:49:27
<u>ତ</u>	5	÷	Reboot_		2021-09-24 08:33:52	QRTB	Co End	1/1	Success	2021-09-24 08:33:52	2021-09-24 08:38:47

Figure 2-80: Reboot

2.4.2.3.4.1 Reboot Tab

Any existing and completed reboot tasks are listed in the reboot tab window. Task list information includes the task name, user, operation time, product type, status, progress, results, and start and end time (Figure 2-80).

2.4.2.3.4.2 Create a Reboot Task



Caution: A reboot will take the device(s) out of service for a few minutes.

To create a new reboot task (Figure 2-81):

- 1. Click on the + *Add* icon to open the *New Task* window.
- 2. Accept the auto-generated task name or enter a different task name.
- 3. Select the *Product Type*, per *Table 2-5 Product Types / Software Streams*, and choose the target eNB devices.
- 4. Choose an *Execute Type*, per *Table 2-6 Execute Modes* which will determine when the task executes.
- 5. Click on OK to save the settings. The new task will be added to the Reboot list.

In the *Reboot* window task list, the *Operations* functions include *Results* (view the task execution results), *Start* (begin the task), *Terminate* (end the task), and *Delete* (remove the task). Clicking *Operations > Results* opens the *Task Results* window where the eNB's serial number, cell name, status, results, failure reason, and time are displayed, as shown in Figure 2-81.



Figure 2-81: Create a Reboot Task



2.4.2.4.3 Recurring Reboot Tab

Any existing and completed reboot tasks are listed under Task List in the Recurring Reboot tab window. Tasklist information includes the task name, user, operation time, status, progress, results, and start and end time. You can start or stop a recurring reboot task by clicking the checkbox next to the task and clicking the *Enable/Disable* radio button (Figure 2-82). Click *OK* to confirm your selection or *Cancel* in the dialogue box.

Figure 2-82: Recurring Reboot

\odot	eNB / Maintenance /	Reboot			26	5	9 4 🔍 (FiSci (UTC-06:0	00)2021-11-02 1
(the second s	Reboot Recurr	ing Reboot							
<u>e</u>	📋 Task List	Device List	Task Name				× (Disable	
	Task Name	User	Operation Time	Status	Progress	Results	Start Time	End Time	
							*		
					Confirm	ı			×
					Are you	sure you was	nt to stop the recu	rring task?	

You can search for a task by entering the task name in the search box or using the *Advance Query* and entering the task name and start and end time (Figure 2-83).

Figure 2-83: Advanced Query Search

Reboot Recurring Reboot		
Task List 🗄 Device List	Fask Name Advance Query × Q Disable	
Task Name	Start Time	
	Start Time . End Time	
Query Reset		

2.4.2.3.4.3 Create a Recurring Reboot Task

To create a recurring reboot task (Figure 2-84):

- 1. In either the *Task List* or the *Devices List* tab window, click the blue *Settings* button in the right corner to open the *Recurring Reboot Task* window.
- 2. From the *Device List*, choose *All* for all devices, *Select* and choose individual devices, or *Except* to choose all devices except specific devices.
- 3. Select the radio button next to Once or Recurring in the Reboot Time window and enter the start and end time and date. Click the calendar icon to open a window and select the date. Use the arrows to move quickly through the calendar. Click the clock icon to choose to open a window and select the time.
- 4. In the *Reboot Task Configure* window, enter the base stations to reboot concurrently. The maximum number of base stations that can reboot concurrently is 500.
- 5. You can choose the number of reboots in a reboot cycle by clicking the checkbox next to *Maximum Number of Reboots Per Cycle*. Enter the number of reboots between 1-1000.
- 6. Click OK.



Figure 2-84: Creating Recurring Reboot Task

eNB / Maintenance / Reb	ooot			3 2 7	• 7 •	0 FiSci (UTC-0	6:00)2021-12-09 12:33
Recurring	Reboot						\frown
📋 Task List 📑	Device List				× Q	Disa	ible (💿)
Task Name	User	Operation Time	Status	Progress Re	sults Star	t Time End Tin	ne
ring Keboot Task					•		
boot Conditions(Uptime&Devic	e&Version)	Only more than	Hour				
Device List						_	
		Serial Number	Cell	Name			
All Select	1						
 Except 	2						
	3						
	4						
	6						
	7						
	50/page ~	< 1 > Go to 1	C				
Version List				0	C		
				Q			Selected version (
All		Version			Serial Number		Q
Select	5	BaiBS_QRTB_2.8.9			Version		
Except	6	BaiBS_QRTB_2.9.2					
	7	BaiBS_RTS_3.4.8.6					
	8	BaiBS_RTS_3.6.6				No Data	
	9	BaiBS_RTS_3.7.10				NO Data	
	10	BaiBS_RTS_3.7.11					
	11	BaiBU_DNB4_1.3.8					
	50/pa	age ~ < 1 >	Go to 1 C		50/page 🗠	< 1 > C	To
		r	7]
Reboot Time		10 04 22 11 05 23		« < s	2021 December an Mon Tue Wed Th	rr >>> u Fri Sat	
		12 00 24 13 07 25		2	8 29 30 1 2	3 4	
Once	Recurring	ng Cancel OB			5 6 7 8 9 2 13 14 15 16	10 11 17 18	
Start Date		End Date		I	9 20 21 22 23	24 25	
Start Time	12:06:24	E. 4 Time			6 27 28 29 30	31 1 7 8	
Start Time	5 12.00.24	End Tune	0	L_			
Reboot Task Configu	re						
Restart The Maximum	Number Of Co	oncurrent Base Stations		Range: 1-500			
Maximum Number	r Of Reboots Pe	er Cycle	Range: 1-10	00			
							-



2.4.2.3.4.4 Export a Recurring Reboot Task

The *Device List* tab displays a device's serial number, cell name, task name (tasks associated with that device), status, results, failure reason, and start and end time. You can search for a device by entering the device's serial number or task name in the search box (Figure 2-85). The device tab also shows the number of recurring reboot successes and fails in the right corner.

To export the recurring reboot task (Figure 2-85):

- 1. In the *Devices List* tab window, click the blue *export* button to download the recurring reboot tasks in the right corner.
- 2. A .csv file will be downloaded

Figure 2-85: Recurring Reboot Devices List

Reboot Recurri	ng Reboot							
Task List	Device List				Q Success	0 🛛 🐼 F	ail 0	<u>()</u>
Serial Number	Cell Name	Task Name	Status	Results	Failure Reason	Start Time	End Time	

2.4.2.3.5 Logs

The eNB > Maintenance > Logs menu offers four categories of eNB log reports (Figure 2-86):

- Device Logs select one or more eNBs to collect and download the eNB log reports, or create a logging task
- Alarm Logs select one or more eNBs to download just the alarm logs, or create a log task
- Exception Logs select one or more eNBs to download only the exception (error) logs, e.g., when an eNB crashes
- Event Logs view a list or chart of all (aggregate) eNB log events, reboots, or both

Figure 2-86: Logs



You can create tasks to generate the log files for the device and alarm logs for up to 5 eNBs. The *Operations* functions for all, but the Exception Logs are Results, Terminate, Download, and Delete.

2.4.2.3.5.1 Device Logs

To report the operation log information of the eNB regularly or immediately create a new Device log task.

To add a new Device Logs task (Figure 2-87):

- 1. Select the Device Logs task and click on the + Add icon to open the New Device Report Log Task window.
- 2. Select up to 5 eNBs from the list.
- 3. Select an Execute Type, per *Table 2-6 Execute Modes*, which will determine when the task executes.



- 4. If you select Immediately, the new task will run as soon as you click OK. Click within the Start Time and End Time rectangular fields to schedule a day and time. A calendar for each will pop up. You can also select a Period(min) to specify how long the log collection should occur, either 15, 30, or 60 minutes. Click on OK to save the settings.
- 5. The new log task will appear in the main Device Logs window, showing status and, when completed, providing results. In the *Operations > Results* window, you can view, download, or delete the log files.



Figure 2-87: New Device Log Task



Figure 2-88: Execute Type

		eNB / Ma	aintena	ice / Log	5		 Critical 	30	Major 5	Minor 6	Warning 0	FiSci (UTC-06:00)2021-11-15 11
)	Ne	w Devie	ce Rep	ort Log	g Task							8
		eNBs	S	lect max 3	5 devices.							Selected (3)
					Name	Q	[Q	
					Serial Number	Cell Name			Serial Number		Cell Nam	e
		1						1				
		2		•••				3				
		4					i					
		5										
		6										
		7		\odot								
		8										
		9										
		10										
		50/1	page	- - -	1 > Go to 1 C			50/p	age 🗸 <			Total 3



Execute Type: Schedule Time

	5		×	Start D	Date		5	Start Tim	e		>	End D	late			End Tim	e		
	6																		
	7			« <		2021 1	Novem	ber						202	1 Dece	mber		> »	
	0			Sun	Mon	Tue	Wed	Thu	Fri	Sat		Sun	Mon	Tue	Wed	Thu	Fri	Sat	
	0											28	29	30	1	2	3	4	
	9												4	7	0	0	10		
	10											5	0	1	8	9	10	11	
					15	16	17	18	19	20		12	13	14	15	16	17	18	
	50/p	page ~	·	21	22	23	24	25	26	27		10	20	21	22	23	24	25	
						20	24	20	20	27		.,	20			20	24	23	15
				28	29	30	1	2	3	4		26	27	28	29	30	31	1	20
٦	Execute	e Type		5	6	7	8	9	10	11		2	3	4	5	6	7	8	60
	⊖ Imn	nediatel	ly												(Clear		OK	
(🗿 Sch	edule T	ïme	0	Sta	rt Time		—	E	ind Time				Perio	d(Min)	15			
	OK		Ca	ancel															

2.4.2.3.5.2 Alarm Logs

By creating an Alarm log task, the alarm information of the eNB is collected. It supports the operation of viewing, terminating, downloading, and deleting the results of the alarm log task.

To create an Alarm Logs task (Figure 2-89)

- 1. Select the Alarm Logs tab and click on + ADD to open the New Alarm Log Task window.
- 2. Select the eNBs from the list and click on *OK*. The new task will appear in the main Alarm Logs window, and the alarm logs will start collecting immediately.

Figure 2-89: New Alarm Log Task

evice Logs Alarm Logs E	Exception Logs Event Logs				
	Q				
Serial Number		Collection Stat	tus	Files	Update Time
1	9	Collect failed			2020-03-20 04:56:26
	Sel	lect Device			
	eN	Bs			
					Q
			Serial Number		Cell Name
		1	8		
		2	8		
		3			
		4			
			((2))		
		5	0		
		5 🗹	8		

After the Alarm logs are collected, the *Collection status* will show the *Success* or *Failure* for a given eNB. You can view, terminate, download, or delete the Alarm log task by clicking the *operations* (Figure 2-90).

Figure 2-90: Results of The Alarm Log

Device Log	s Alarm Logs	Exception Logs	Event Logs					Ð
			Q					
	Serial Number			Collection Status		Files	Update Time	
1	<u>ار</u>			Co Success		1	2022-01-27 19:13:56	
	Results							
Results	Download							×
File Na	me				Upload Time			Operations
1					2022-01-27 19:13:56	5		© <u>↓</u> 🗵

2.4.2.3.5.3 Exception Logs

The OMC automatically collects and records abnormal conditions of the eNB. In the Exception Logs tab, select one or more eNBs and use the *Operations* actions to download or delete the exception (error) logs (Figure 2-91). An example of when you might want to download exception logs would be when an eNB crashes or when the eNB is experiencing an abnormal start. When you open a support ticket, the support team will ask you to send the log files.



Figure 2-91: Exception Logs

Device Logs Alarm Logs Exception Logs Event Logs Serial Number & Q Serial Number Device Name Device Type eNodeB IP Exception Type File Name Time 1 Image: Serial Number Image: Serial Number <th><u> </u></th> <th>D / IVIAI</th> <th>intenance / Logs</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>•0</th> <th>anucai 244</th> <th>- Major 1</th>	<u> </u>	D / IVIAI	intenance / Logs						•0	anucai 244	- Major 1
Image: Second system Device Name Device Type eNodeB IP Exception Type File Name Time Image:	evice Lo	ogs	Alarm Logs	Exception L	ogs Event I	.ogs					
er Device Name Device Type eNodeB IP Exception Type File Name Time unknown name eNB Abnormal Reboot 2021-09-17 17:38:53			ber			× Q					
unknown name eNB Abnormal Reboot 2021-09-17 17:38:53			Serial Number	r	Device Name	Device Type	eNodeB IP	Exception Type	File Name	Time	
	1		:		unknown name	eNB		Abnormal Reboot		2021-09-17	17:38:53
	1				unknown name	eNB		Abnormal Reboot		2021-09-17	17:3
			Delete								

2.4.2.3.5.4 Event Logs

The OMC automatically collects and records events and information of the eNB. For example, it records events like a reboot of the eNB. The Event Logs tab lists all eNB devices' event logs in descending order by date and time (Figure 2-92). Use the Export icon in the upper right to export the data to a .csv file on your computer for further analysis.

Clicking on the Statistics icon will summarize the total count of each event ID for the period you specify in the Start Time and End Time fields. The list will show the highest to the least number of logs per ID.

The Chart icon will display the statistics data in a chart format, one graph per event ID. Select the Table icon to return to the Statistics list, and from there, click on the back arrow to return to the main Event Logs list.

Figure 2-92: Event Logs



2.4.2.4 Upgrade

New software typically contains the latest features and bug fixes, and it is generally recommended to implement the newest version in the field. You can also return (rollback) one or more eNBs to their previous software version.



Caution: A software rollback requires a reboot of the eNB, which will take the device out of service for a few minutes.

Baicells notifies operators of newly available software by including a message at the top of the OMC window. You can select the link in the message to go straight to the upgrade menu as explained in *section* 2.4.1.2 *Quick Links* or use the *eNB* > *Upgrade* menu. The top of the *eNB* > *Upgrade* landing page has two main sections, *Upgrade&Rollback* and *File* (Figure 2-93). The bottom of the landing page contains software upgrade and rollback tasks, viewable by task list or device list.

Figure 2-93: eNB > Upgrade Landing Page

ø	⊒ e	NB / Up	ograde		_					🔵 Cri	tical 29	Major
(y)	Up	grade&	Rollback	c File								
	Ser	ial Numbe	er/Cell Name	3	×	Q						
_	Produ	ct Type:	RTS	QRTB CR-B4	860/BU CR-B4860/EU	CR-B4860/RU						
			5	Serial Number	Cell Name	Rollback Version	Software Version	n Model Name	e Device Group	p		
2	1		œ			BaiBS_RTS_3.4.8	.6 BaiBS_RTS_3.7.	10 mBS1100	Default Level	Group/Defaul	t Device Grou	p
۲	2		(x)			BaiBS_RTS_3.7.1	0.2 BaiBS_RTS_3.7.	11 mBS1100	Default Level	Group/Defaul	t Device Grou	p
~	3		\odot			BaiBS_RTS_3.3.1	4 BaiBS_RTS_3.4.	8.6 mBS1100	Default Level	Group/Defaul	t Device Grou	р
Ŵ	4		Ø			BaiBS_RTS_3.6.6	BaiBS_RTS_3.6.	6 pBS2120	Default Level	Group/Defaul	t Device Grou	р
	5		(BaiBS_RTS_3.4.8	.3 BaiBS_RTS_3.6.	6 pBS2120	Default Level	Group/Defaul	t Device Grou	р
	6					BaiBS_RTS_3.7.1	1 BaiBS_RTS_3.7.	11 pBS2120	Default Level	Group/Defaul	t Device Grou	р
	50	/page	~ <	1 > Go to	1 C							
				0.6 D.W.								
	50	onware	Upgrade	Software Kollbac	ĸ							
	Ē	Task Lis	t 🗐 D	Device List Tas	c Name		*	Q				Co Wait
			Task Name		User	Operation Time	Version	Upgrade Type	Product Type	Status	Progress	Results
	1	÷			seng_baicells	2021-09-29 10:14:35	BaiBS_QRTB_2.8.3	Software Upgr	QRTB	Co End	1/1	Success
	2	•					D		0.0.7.0			~

2.4.2.4.1 Upgrade & Rollback

The *Upgrade & Rollback* tab displays a list of available software. Clicking on a software version filters the list of devices below by product type to which the software applies. Device information includes serial number, cell name, rollback version (the software version to which the device would revert), software version (current software version), model name, and device group.

NOTE: After you execute a rollback, you cannot roll the software back again unless you have subsequently upgraded the eNB software at least once.

As shown in Figure 2-94 to upgrade or rollback, use the checkbox to choose a device/s, or search for a device by entering the eNBs serial number or cell name. Then select the upgrade or rollback button to perform the selected desired action.





2.4.2.4.2 File

The *eNB* > *Upgrade* > *File* tab provides additional information about available software and contains four-choice types: *IMAGE Upgrade File, PATCH Upgrade File, FPGA Upgrade File,* and *AP Upgrade File* (Figure 2-95). An image file is an operating software on the eNB. A patch file is a software patch to an existing software version, typically for bug fixes. An FPGA file pertains to semiconductor hardware within the eNB. An AP file upgrades the eNBs access point.

The window displays the available software list, the version name, product type to which it applies, file size, release status* and upload time (date and time the file was uploaded). The *Operations* actions are *Information*, which displays additional information about the software file, and *Download*, an option to download the software file.

*NOTE: "GA" means General Availability to customers. BETA release status means the software is being trialed by a few customers and is not yet generally available.



Figure 2-95: eNB > Upgrade > File

2.4.2.4.3 Software Upgrade and Software Rollback

As shown in (Figure 2-96), The *Software Upgrade* and *Software Rollback* window allow you to view any upgrade and rollback tasks in waiting by task or device. In the *Task List*, you will see the task name, the user who created the task, operation time, version, upgrade type, product type, status, progress, results, retain configuration, and the start and end time of the task. The *Operations* actions are *Start*, *Terminate*, *Information*, *and Delete*.

Figure 2-96: Task List

10				× (2				Waiting	0 In progress	0 Suspend
ue		Lear	Operation Time	Varian	Unwada Tuna	Product Type	Status	Program P	enlte	Patain Configuration	Start Time
		C.A.	2021-09-29 10-14-35	BaiBS OPTE 283	Software Lingrade	ORTR	End	1/1 Sn		Ves	2021-09-29 10-14-35
			2021-09-24 14-16-32	BaiBS ORTB 2.83	Software Lingrade	ORTR	E End	1/1 Su	noess	Ves	2021-09-24 14-16-32
			2021-00-23 18-20-45	Builds OPTR 275	Software Ungrade	OPTR	E End	1/1 Fa	1	Vas	2021-00-23 18-20-45
			2021-07-23 18.27.43	Babba QRIB_2.1.5	Souware Opgrade	QUID	CO Enu	DI Fa	•	165	2021-07-23 18:27:43
ь	aformation										Ø
6	Basic Info										
-	Task Name Uj	pgrade_FiSciAdmin_J	2021-09-23 18:25:34								
on											
6	Select Device										
	Upgrade Type 💿	Software Upgrade	O PATCH Upp	rade 💿 FPGA 1	Upgrade 🔘 AP	Upgrade					
	Product Type QI	RTB	~								
	eNBs Device Spec	ofe									Selected (1) ③
	brint opti		Secial Number Cell Name		× C	2					
	0.41 0.5	Glat	Seri	al Number Cell	Name	_	Rollback Version	Version	Model Nam	e Device Group	
	0.4							BuBS_QRIB_23.	mB\$31001	Default Level Group I	Default Devic
			2 0					DUDS_QRIB_23		Default Level Group L	Actual Devic
			3 0 0					Bubs_QKIB_2.7.	-5231001	Detaut Level Group L	Actual Devic
								Bubs_QKIB_233	EBSSIO	Design Level Group L	Actual Devic
			, .					BuBS_QRIB_29.	mB\$31001	Default Level Group I	Jefault Devic
			6 0					BaBS_QRTB_263	pB\$31010	Default Level Group I	Default Devic
			, 🖸 💿 🖿					BuBS_QRTB_2.8.	p8531015	Default Level Group I	Jedault Devic
			50'page ~ < 1	> Go to 1	с						Total 7
	File list 🛛 🖸 Retain G	Configuration									
	Select	Version	Product Ty	pe F	'ile Name	FileS	size(Byte)	Upload Time		Description	

In the Device List (Figure 2-97), you will see the serial number, cell name, task name, original version, upgraded version, upgrade type, product type, status, results, failure reason, and the start and end time.



Figure 2-97: Device List

S	Software Upgrade Software Rollback													
Ē	Task List	Device List		Q						[Success 2	Fail 0		
		Serial Number	Cell Name Task Name	Original Version	Upgraded Version	Upgrade Type	Product Type	Status	Results	Failure Reason	Start Time	End Time		
1			Upgrade	BaiBS_QRTB_2.7.8	BaiBS_QRTB_2.8.3	Software Upgrade	QRTB	End	Success		2021-09-29 10:14:35	2021-09-29 10:18:20		
2			Upgrade	BaiBS_QRTB_2.7.8	BaiBS_QRTB_2.8.3	Software Upgrade	QRTB	Co End	Success		2021-09-24 14:16:32	2021-09-24 14:30:05		
3			Upgrade	BaiBS_QRTB_2.6.2	BaiBS_QRTB_2.7.5	Software Upgrade	QRTB	Co End	Termin		2021-11-30 11:40:57	2021-11-30 11:41:34		

2.4.2.4.4 Upgrade From the OMC Upgrade Messages

Baicells notifies operators of available new software/firmware versions using a message format at the top of the OMC window explained in (Figure 2-98). If you click on the down arrow, the message window displays each available software version. It gives you the ability to view information about that version, ignore the message, or upgrade to the new software. If you select Upgrade, it opens the Upgrade Task window.

You can configure an upgrade task for one or more eNBs of the same product type (refer to *Table 2-5 Product Types* / *Software Streams*). Product types are grouped according to their common chipset and software. If you are unsure of an eNB's product type, check the *eNB* > *Monitor* window Product Type column.

To configure an upgrade task in the Upgrade Task window:

- 1. Accept the Task Name or enter a new name for this upgrade task.
- 2. In the eNBs list, you can leave the default list of All the device groups [sic], or you can select a specific device group to filter the list of eligible eNBs for this software version.
- 3. Select the specific eNBs that you want to include in this task. The eNB will appear in the Selected pane as you click on a checkbox.
- 4. Select an Execute Type, per *Table 2-6 Execute Modes*, determining when the task executes.
- 5. Click on *OK* to save the settings. The new task will be added to the eNB Upgrade list. Use the *Operations* function to view results, view eNB information, or delete the task.



Figure 2-98: Upgrade from the OMC Upgrade Messages



2.4.2.5 Inventory

Equipment configured with the operator's CloudKey in the device GUI during initial installation will automatically associate to the operator's OMC account when powered on. Therefore, it will appear in the *eNB* > *Inventory* > *Device* list (Figure 2-99). Otherwise, use the *Inventory* menu to add, delete and modify devices and device groups, register devices by adding their serial number, view a list of all CPE's associated with an eNB that is operating in HaloB mode, import and export one or more eNB, and register software licenses.

Figure 2-99: Inventory



2.4.2.5.1 Device

The Device menu is where you can create custom eNB device groups; add eNBs to device groups; delete device groups or delete eNBs (Figure 2-100). If not assigned to a custom group, an eNB will be added to the default device group. Using device groups, grouping eNBs with the same parameters or characteristics is valuable in executing configuration changes, reboots, upgrades, and other tasks affecting multiple devices.

NOTE: Default groups cannot be modified or deleted.



Figure 2-100: Device



The Device Group pane (left side) lists the default device group and previously defined custom groups. The *Operations* functions allow you to view the group information, and in the case of custom groups, also modify or delete the group.

The right side of the *Inventory > Device* window is a list of the operator's eNBs, showing each one's serial number, MAC address, longitude, latitude, and height. Use the *Operations* functions to move an eNB into a device group or delete an eNB.

To create a new device group (Figure 2-101):

- 1. Click on the + Add icon in the Device Group pane to open the Add Group window.
- 2. Enter a group name and description.
- 3. Select the eNBs you want to include in the list.
- 4. Click on OK to save the settings. The new group will appear in the list of device groups.

Figure 2-101: Add Group

Device Group	
Group Name Q	d
Default Level Group	:
Default Device Group	:
test	:
Add	>
Group Name	
OK Cancel	

2.4.2.5.1.1 Adding an eNB in OMC

The easiest way to add an eNB in the OMC is to configure the operator's CloudKey in the device GUI. When the eNB comes online, it will automatically register in the operator's OMC account. The CloudKey is described in *section 2.2.3, CloudCore GUI Layout*.

You can add an eNB in the OMC either before or after the eNB is online – *online,* meaning connected to the OMC and LTE network. However, it must be online to configure an eNB in the OMC.

You will need the eNB serial number to add it to the OMC. To add an eNB to the OMC:

- 1. Go to eNB > Inventory > Device.
- 2. Click on the + Add icon to open the Add eNB window in the upper right.
- 3. In the empty field, enter the serial number. You can add multiple eNBs by adding a semi-colon (;) at the end and hit *Enter*. Put each serial number in this way on a separate line.
- 4. Select a device *Group Name* (or let the eNB automatically be placed in the default group).
- 5. Click on OK.



Referring to section 2.4.2.2.6.2 Settings, you can configure an eNB once it is online or change an eNB's settings:

- 1. Go to *eNB* > *Monitor*.
- 2. Find the device in the list, click on the *Operations* icon, and select *Settings > eNB*.
- 3. Refer to the *eNodeB Configuration Guide* for a description of all the parameters. Once you complete the configuration, click on *OK* to save it.

Or, as described in *section 2.4.2.3.2 Configuration* in the OMC, go to *eNB > Maintenance > Configuration*.

NOTE: Alternatively, in the *eNB* > *Monitor* window, you can click on the device's IP address to open a new browser tab to the eNB's GUI.

2.4.2.5.1.2 Register an eNB in OMC

To register an eNB in OMC (Figure 2-102):

- 1. Click on the + Add icon to open the Add eNB window.
- 2. Enter the eNB serial number for each eNB. You can add more than one eNB simultaneously by entering each serial number on a separate line, using a semi-colon (;) at the end of each entry, and hitting Enter.
- 3. If you want to add the eNBs to a device group, use the pull-down Group Name field to select the group.
- 4. Click on *OK* to save the settings. The new eNB will be added to the eNB list.

Figure 2-102: Register eNB in OMC

<u>ح</u>	NB / Inventory / Device			Critic	al 168 🛑 Major	18 OMinor 9	• Warning 0	FiSci (UTC-06:00	0)2020-10-20 13:30	
Devie	e Group	Ð	eNB				Q		• 3	C
	Group Name				Serial Number	MAC Address	Longitude	Latitude	Height(m)	
1	Default Device Group	1	1	: 0)				0	
2	test	1	2	: 0) 1		-93.558782	33.679885	0	
3		1	3	Ð	Move To Device Group	,				
4		1	4	x	Delete	4	-79.17769	43.007372	0	
					, H	Vhen registering multi ut each device on a se erial Number	ple devices, use a se parate line.	mi-colon(;) after eac	ch one and hit Ent	ter to
						Group Name Default Device Group OK Ca	ncel			



2.4.2.5.1.3 Import Multiple eNBs

Another way to add multiple eNB devices is by importing the information using a template. To use this method (Figure 2-103):

- 1. Click on the Import icon to open the Import Device window.
- 2. Select Export Template and save the file to your computer (do not change the file name).
- 3. Enter the eNB serial numbers on each row of column A in the template and save the file.
- 4. Click on the File field icon to navigate the completed template and import it.
- 5. Click on *OK* to save the settings. The new eNBs will be added to the eNB list.

E eNB / Inventory / Device Major 16 O Warni FiSci (UTC-06:00) Critical 166 Minor 9 ne 0 **Device** Group eNB Q Group Name Serial Number Import Device ┥ 1 Default Device Group 1 2 test 2 File ÷ ÷ 60 ÷ : Please import a file as the fo . Export Te CH. ÷ ÷ 60 Cancel ÷ 6 6-0 日 importCellTemplate A ~ ₹ A File Home Strikethr Page La Insert Draw Formula Data A2 fx \sim В С D 1 Serial Number 3 2 3 4 5 Sheet1 (+)

Figure 2-103: Import eNB information

2.4.2.5.2 License

Licenses are required for specific software options and are issued on a per-eNB basis based on the serial number. Examples of software licenses are HaloB, Carrier Aggregation (CA), and Dual Carrier (Split Mode).

NOTE 1: Not all licensed features are available on all eNB models.

NOTE 2: Some licenses are issued by quantity, and some have expiration dates. The OMC will generate an alarm (ID 13) 30 days before the license expiration.

2.4.2.5.2.1 Basic License

In the *Inventory > License* window (Figure 2-104), the *Basic License* tab will display the list of license files by serial number. At the bottom of the window, you can view or delete the log of imported licenses. The log task list includes the serial number, start time, task progress, and result. Both windows have the option to search for an eNB's license by serial number.

2.4.2.5.2.2 Import Basic License

To import a basic license file:

- 1. Go to *eNB* > *Inventory* > *License*.
- 2. Click on the import icon, and navigate to the license file.
- 3. The file will be imported into OMC and included in the Basic License list when you select the file.
- 4. Find the serial number in the main Basic License tab list and select *Operations > Execute*.



Figure 2-104: Basic License



2.4.2.6 Backup & Restore

Backup & restore is where you can backup and restore one or more eNBs configurations. The *eNB* > *Backup&Restore* landing page displays eNB devices, a *Task List,* and a *Device List* (Figure 2-105)

Figure 2-105: Backup & Restore Landing Page



2.4.2.6.1 eNB Devices

The eNB Devices pane (Figure 2-106) displays a device's serial number, cell name, product type, latest update file, and latest update time. To backup or restore one or more device/s, you can search for a device by its serial number or cell name and filter devices by product type. Then select the operation you want to execute (backup or restore).

Figure 2-106: eNB Devices

			Search by serial number or	cell name		
eNI	Devices	Serial Number / Cell Name		Q Import File	Export File Filter by product type	Backup
		Serial Number 🗢	Cell Name 🗢	Product Type 🗢	Latest Update File	Latest Update Time 🕤
1				RTS	ALL	Display by latest update time.
2				RTS	RTS	
3				RTS	QRIB	U
4				RTS	CR-B4860	
50	/page >	< 1 > Go to	1 C			Total 16
	Select	one or more devices to b	ackup or restore.			

X

2.4.2.6.2 Import File/Export File

From the eNB > Backup & Restore > eNB Devices window, you can import and export configuration files for one or more devices.

To batch import a .xml file (Figure 2-107):

- 1. Select one or more devices.
- 2. Click Import File.

1

2

- 3. In the Batch Import window, select Click Upload.
- 4. Navigate to the file/s you wish to upload and select Open.

Note: The maximum number of files that can be imported is 20.

Figure 2-107: Import File eNB Devices Serial Number / Cell Name Q ➔ Import File Export File ß Ð -Serial Number ≑ Cell Name Product Type Latest Update File Latest Update Time ~ RTS \checkmark RTS **Batch Import** Match the device based on the imported file name(SN_CFG.xml). O The selected device matches a profile Import mode Only devices of the same product type can be selected. Import File Only .xml is supported and select max 20 files. Q Serial Number ≑ Cell Name 🌻 Product Type **Configuration File** RTS 1 🚱 Open X Search Downloads ↓ > This... > DownI... 6 \wedge C Organize • New folder 2 Date modified Name Туре Size > o Creative Cloud File This PC

To export a .xml file:

1. Select one or more devices using the checkbox/es.

File name:

- 2. Select Export File.
- 3. Open, unzip, and save the file to your computer.

 \sim

XML Document (*.xml) Open

Cancel

2.4.2.6.3 Task List

The *Task List* (Figure 2-108) contains a count of tasks in waiting, in progress, tasks suspended, and tasks that have ended. The task list includes the task name, the user who performed the task, the operation time, type, status, progress, results, and the start and end time. You can start, terminate, and delete tasks by selecting the *Operations* function next to the task name.

Figure 2-108: Task List

			Se	earch by task name.						Task count	
Tas	k List	Device List)
Tas	k Name			× Q				Co Waiting	0 5	In progress 0	Suspend 0 To End 7
		Task Name		User	Operation Time	Type	Status	Task Progress	Results	Start Time	End Time
1	:	File Backup	_		2021-11-05 11:33:35	Backup	Co End	1/1	Success	2021-11-05 11:33:35	2021-11-05 11:45:03
2	۲	Start	1-11-05 11:32:29		2021-11-05 11:32:39	Backup	Co End	1/1	Fail	2021-11-05 11:32:39	2021-11-05 11:47:43
3	(*)	Terminate	11-05 09:22:16		2021-11-05 09:22:45	Backup	Co End	1/1	Fail	2021-11-05 09:22:45	2021-11-05 09:37:49
4	R	Delete	l-10-27 14:47:48		2021-10-27 14:48:31	Backup	Co End	1/1	Success	2021-10-27 14:48:32	2021-10-27 15:00:03
5 50/p	5 File Backup 2021-09-30 12:37:02 Backup to End 1/1 Success 2021-09-30 12:37:02 2021-09-30 12:37:02 2021-09-30 12:37:02 Total 7										

2.4.2.6.4 Device List

The *Device List* (Figure 2-109) contains a count of tasks assigned to a device and the success or failure status. The Device List includes the serial number, cell name, type (of task), task name, configuration file name, status, results, failure reason, and start and end time. You can search for a task by serial number, cell name, or task name. There is an option to download the *Backup&Restore* task device list.

Figure 2-109: Device List

		Search b	y serial number, cell name	or task name.				Task result count	
Task List Device List Serial Number / Cell Name/Task Name Q									
Serial Number	Cell Name	Type	Task Name	Configuration File	Status	Results	Failure Reason	Start Time	End Time
1		Backup	File Backup_	1202	Co End	Success		2021-11-05 11:33	2021-11-05 11:
2		Backup	File Backup_		End	Fail	Upload timeout	2021-11-05 11:32	2021-11-05 11:

2.4.3 CPE Menu

2.4.3.1 Description of Sub-Menus

The CPE menu provides essential functions for managing, monitoring, and maintaining CPEs in the operator's network (Figure 2-110). Each sub-menu is described below the figure.

NOTE: Some menu items are available only to Beta customers trialing new features.

Figure 2-110: CPE Menu

\$	CPE	Monitor - View all of the operator's CPEs and their data; perform quick operational actions; and view aggregate
⋒	Monitor	CPE data graphs
5	Maintenance	Maintenance - Create tasks to reboot, implement
	Reboot	scanning methods (PCI Lock), change the password, or
\$	Configure	collect logs on multiple CPEs simultaneously.
3	PCI Lock	
æ	Change Password	Opgrade - Create tasks to upgrade the software on
	Logs	multiple CPEs simultaneously.
	Upgrade	Device - Add CPE device groups and devices (aka,
	Device	register) in OMC

2.4.3.2 Monitor

2.4.3.2.1 Landing Page Description

The *CPE > Monitor* window contains two tabs (Table and Map), and the window opens first to the Table tab view (Figure 2-111). Each tab is described in more detail in the following sections. See Table 2-7 for a description of the *CPE > Monitor* fields and graphs.

Ø	∋	CPE /	Moni	tor						Critical 236	Major 22 Minor	16 • Warning 0	FiSci (UTC-06:00)2021-10-06 14:23
(t)	Tab	ole 1		Map ~				Q				+ 0	CPE Connected (15/178) Connected Disconnected 30
ē		Onlin	e Statu	s Se	Software Version		Module	All 🗸	Product Model Sel	ect V Devic	ce Group Select 🗸	Reset	20 -
	0			¢	Serial Number \Rightarrow	CPE Name \Leftrightarrow	IMSI ‡	$\mathbf{MAC} \ \Leftrightarrow$	$\mathbf{IP} \ \diamondsuit$	Product Model \diamondsuit	Software Version $\ensuremath{\hat{\mp}}$	Device Group $\stackrel{\circ}{\Rightarrow}$ Ce	11 Nam 30 -
6	1		÷	00						EG7010AM11	BaiCE_BG_1.6.16	Default Device Group	0
۲	2		÷	00						EG7010CM11	BaiCE_BG_1.5.0	Default Device Group	Product Model
	3		÷	00						EG7010CM11	BaiCE_BG_1.5.0 🔶	Default Device Group	
0	4		÷	00						EG7010CM11	BaiCE_BG_1.5.0 🔶	Default Device Group	
	5		÷	00						EG7010CM11	BaiCE_BG_1.5.0 🔶	Default Device Group	
	6		÷	00						EG7010CM11	BaiCE_BG_1.5.0 🔶	Default Device Group	 walt 15 (8.47%) 85328 2 (1.12%) 85328 2 (1.12%)
	7		÷	00						EG7035E-M11	BaiCE_AP_2.2.1_NA 🔶	Default Device Group	EG20118M0:1 (856%) EG20138M11:1 (856%) EG20138,M11:2 (1.89%) EG20138,M11:2 (1.89%) EG2000C:1 (0.56%)
	8		÷	00						EG7010A_M11_Ver.B	BaiCE_BG_1.5.0 會	Default Device Group	 EG2000C-M2: 2 (1.12%) EG2010EAMT1: 16 (6.99%) Others: 135 (75.84%)
	9		÷	00						EG7010A_M11_Ver.B	BaiCE_BG_1.5.0 會	Default Device Group	Device Running Time
	10		1	00						EG7010A_M11_Ver.B	BaiCE_BG_1.5.0 會	Default Device Group	178
	11		÷	00						EG7010A_M11_Ver.B	BaiCE_BG_1.5.0 會	Default Device Group	120 - 90 - 60 -
	12		÷	00						EG7010A_M11_Ver.B	BaiCE_BG_1.5.0 🚖	Default Device Group	0 0 0 0 Day
	13											Phine Incident and Add and Add a	 < rudays: 178 (100.00%) 10-30days: 0 (0.00%) 50.9046 (0.00%)

Figure 2-111: CPE > Monitor General Layout

2.4.3.2.2 Table Tab Description

The Table tab view displays a list of the operator's CPE devices. In the Table tab view, you can sort the CPE devices list using the filtering fields across the top of the page; the pull-down options for each field are shown in Figure 2-112. The Table tab view has two main sections - the list of CPEs with their stats on the left (Figure 2-113) and the graphs of aggregate CPE data on the right (Figure 2-114).

Figure 2-112: CPE Monitor – Table Tab (1 of 3)





Figure 2-113: CPE Monitor – Table Tab (2 of 3)

Fable M IMSI ~	lan							C1	itical 236	Major	22 🔴	Minor 10	5 O Wa	rming 0	
IMSI ~	-up												Ð	Ð	
	IMSI				Q										
Online Status	Select 🗸	Software	Version	Select 🗸	Module All	~	Product Model		~ D	evice Group		\sim		F	te
	Serial Num	ber ‡		CPE Name ≑ I	MSI ≑ MAC	÷	IP ≑	Prod	uct Model ‡	Softwar	re Version ≑		Device Grou	p \$	X
				ł				EG70	10AM11	BaiCE_	BG_1.6.16 懀		Default Devi	ce Group	
2 🗆 : 🤇	50							EG70	10CM11	BaiCE_	BG_1.5.0 會		Default Devi	ce Group	
3 🗆 : 🤇	60							EG70	10CM11	BaiCE_	BG_1.5.0 會		Default Devi	ce Group	
															V
	Cell Name 🌩	$\mathbf{ECI} \Leftrightarrow$	$\mathbf{PCI} \Leftrightarrow$	LGW IP ADDRESS 🖨	LGW MAC ADDRESS	UL_MCS	DL_MCS	🖗 RSRP1 🌩	RSRP2 🌩	$\mathbf{CINR1} \Leftrightarrow$	CINR2 ‡	SINR \$	DL Thre	ughput (M	(bps) 🌩
		68121407	52			26	26	-86.1	-85.6	30.6	29.3	29	0.0		
		248248	248	10.10.0.12		26	26	-54.3	-61.5	26.9	29.6	27	4.8		
		248248	248	10.10.0.4		26	26	·	-59.7	31	27.3	30	4.6		
UL TI	hroughput (Mbps)	System	Uptime 🌐	First Period Time ≑	Last Period Time \doteqdot	$\mathbf{Module} \ \diamondsuit$	Tx Power ≑	Bandwidth(MI	Hz) MCC ≑	$\mathbf{MNC} \ \Leftrightarrow \ % \ \mathbf{MNC} \ $	Longitude	Latitude	Height(m)	Distance	Module
0.0		0d 2h 18	lm 0s	2021-10-06 12:47:47	2021-10-06 15:02:46	ODU		20	314	030					GDM724
0.1		6d 10h 1	8m 0s		2021-10-06 15:04:15	ODU	-13.5	20	314	030	0	0	6.0		GDM724
0.1		6d 10h 1	8m 0s		2021-10-06 15:04:05	ODU	-8.8	20	314	030	0	0	6.0		GDM724

Figure 2-114: CPE Monitor – Table Tab (3 of 3)



2.4.3.2.3 Map Tab Description

The Map tab view shows a topographical map of the CPE devices and their status (Figure 2-115).

Figure 2-115: CPE Monitor Map Tab



Table 2-7: CPE > Monitor Fields

Field Name Description							
Left Side Data (Per CPE)							
<untitled></untitled>	When you select the row of a CPE and click on the Operations icon [‡] a list of actions you can take on that CPE is displayed: Information, Settings, and Reboot. Refer to <i>section 2.4.3.2.4 Operations</i> .						
CPE is offline. Hover over the icon to see the status description. Use the filter icon list by sync status, i.e., to see all "green" CPEs first or vice-versa.							
Serial Number	The CPE unit's serial number						
CPE Name	Name given to the CPE by the operator						
IMSI	The CPE's unique International Mobile Subscriber Identity (IMSI) number						
MAC	The CPE unit's MAC address						
IP	The CPE's current IP address						
Product Model	odel The specific CPE hardware model						

Bricells

Field Name	Description
Software Version	The current version of software loaded on this CPE. A yellow arrow in ext to the version means there is a later version of software available for this CPE product type. Click on the arrow to display the software version(s) that are available. Baicells recommends running the latest version available to address any known bugs that have been fixed as well as to provide the latest features.
Device Group	The configured CPE device group to which this CPE belongs
Cell Name	The name of the cell in which the CPE's currently serving eNB is identified
ECI	E-UTRAN Cell Identifier LTE identifier for an operator's cell site; each ECI/site have multiple eNBs, each with a unique Physical Cell Identifier (PCI)
Scan Mode	Refer to Table 2-8 Scan Modes for a description of each option
PCI	Currently serving eNB's Physical Cell Identifier, or Layer 1 identity, which uniquely identifies each cell site in the wireless network. The blue lock icon means the CPE is not locked to an eNB; the gold icon indicates it is locked to an eNB's PCI(s) and/or EARFCN(s) (frequency).
LGW IP Address	The IP address of the eNB to which the CPE is currently attached. A clickable IP address feature is added.
LGW MAC Address	The MAC address of the eNB to which the CPE is currently attached
UL_MCS	The currently serving eNB's Modulation and Coding Scheme (MCS) index value on the uplink. The value is based on channel quality. If the value reaches single digits, you likely have channel quality problems.
DL_MCS	The currently serving eNB's Modulation and Coding Scheme (MCS) index value on the downlink. The value is based on channel quality. If the value reaches single digits, you likely have channel quality problems.
LTE Uptime	The LTE Uptime represents the RF active duration in-terms of days hours minutes seconds
DL BLER	This indicates the block error rate and is used to determine the in-sync or out-sync indication during radio link monitoring.
RSRP1 and RSRP2	Reference Symbol Received Power (RSRP) is an LTE power metric, in dB, which indicates signal strength. RSRP uses an average of the RF power in each subcarrier. If there are 2 antenna cables from the eNB to the RF antenna, or dual polarity, RSRP is reported on each. Weak signal strength can cause connectivity issues and dropped sessions.
CINR1 and CINR2	Carrier-to-Interference-plus-Noise Ratio (CINR) is a measurement (dB) of multiple subcarriers, which reflects the signal quality of the LTE carrier system. (For most eNBs there are 2 antenna cables from the eNB to the RF antenna, with dual polarity. The system measures the CINR on each.)
SINR	Signal-to-Interference-plus-Noise-Ratio (SINR), also known as the carrier-to-interference ratio (CIR or C/I), is a quantity (dB) used to give theoretical upper bounds on channel capacity. SINR is calculated based on the power of a certain signal of interest divided by the sum of interference power from all the other interfering signals and background noise.
DL Throughput (Mbps)	The current downlink data rate from eNB to CPE - in Megabits per second (Mbps)
UL Throughput (Mbps)	The current uplink data rate from CPE to eNB - in Megabits per second (Mbps)

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Field Name	Description			
System Uptime	Number of hours the CPE has been powered on			
First Period Time	The first day and time the OMC got an inform message from the CPE, e.g., is online			
Last Period Time	The last updated day and time the OMC got an inform message from the CPE, e.g., is offline			
Module	Indoor Unit (IDU) or Outdoor Unit (ODU)			
Tx Power	urrent CPE transmit power, in dBm			
EARFCN	The CPE needs to operate on the same EarFcn of eNB			
Bandwidth	Channel bandwidth used by the eNB and CPE, e.g., 20 MHz or 10 MHz Depending on the CPE model and software version, the field display as 20000 or 20 for 20 MHz, or 10000 or 10 for 10 MHz			
MCC	Mobile Country Code - used to uniquely identify the operator of a telecommunications network. MCC + MNC = PLMN.			
MNC	Mobile Network Code - uniquely identifies a mobile network operator (carrier) using the GSM (including GSM-R), UMTS, and LTE public land mobile networks. MCC + MNC = PLMN.			
Longitude	CPE antenna longitude			
Latitude	CPE antenna latitude			
Height(m)	CPE antenna height, in meters			
Distance	The operator can enter the distance between the CPE and the serving eNB for reference			
Link Condition	This shows the condition or reliability of the radio link between the CPE and eNB			
Module Name	Name of the CPE hardware module, e.g., MT422e			
Module Version	The CPE software module version			
Right Side (Aggregate Data	Graphs)			
CPE[s] Connected / Disconnected	Displays the number of CPEs connected (green) and disconnected (red) to/from the network out of the total number of CPEs. Hover over the graph to see the numerical data for a given data point. Example:			
Product Model	Pie chart indicates the number and percentage of CPEs per model name Example:			



Field Name	Description
Device Running Time	Graph of the number and percentage of CPEs running < 10 days, 10-30 days, 30-90 days, and >
	90 days
	Example:
	Device Running Time

2.4.3.2.4 Operations

The *CPE > Monitor Operations* on each row of CPEs includes information about the CPE, the available CPE settings, and actions such as rebooting the CPE (Figure 2-116).

Figure 2-116: CPE Operations

= C	PE / Mo	nitor	
Tab	le	Map	
All		\sim	
(Online Sta	itus S	elect Vers
¢			Serial Number \$\\$
1		:	G D
2		Ģ	Information
3		1	Diagnostic
4		0	Settings
5			Actions

2.4.3.2.4.1 Information

The *Operations > Information* window has two sections. On the left are data fields; on the right are graphs. The left side includes the CPE's identity details, serial number, model, current software version, etc., and its wireless and LAN connection status (Figure 2-117).

If a CPE has a CBRS SAS* license, the window will include a CBSD Status pane at the bottom. The pane provides the only action you can take from the Information window to enable/disable SAS operation on the CPE. This pane also shows the CPE's connection status with the SAS provider. You can jump from the Information window into the Settings window by clicking on the Settings icon in the upper right.

^{*}NOTE: Please refer to the *SAS Deployment Guide* for information about this feature.



To expand the right side of the window, click on the blue arrow pointing left < . The graphs render cumulative, historical LTE measurements for the CPE (Figure 2-118 and Figure 2-119). These measurements are essential to understanding the CPE's wireless communications with the serving eNB(s) and the backhaul network. Information about performance metrics can be found in *section 2.4.5 Performance Menu*.

If you hover your cursor over any point on a graph, it will display the numerical data for that data point. You can change the time reported in the History graphs by selecting either Day or Month in the top right of the window. Selecting Day will report the last seven days of KPIs, beginning with today's date. Selecting Month will report the current month and then the previous 4-month, 8-month, and 12-month periods so you can compare the CPE's performance over time.

T CPE / Monitor Critical 169 Major 23 Silmor 13 O War ning 0 Information Settings Export 00 CPE Name IMSI: JOSE History BA Day Month Serial Number: I 04.15 04.17 04.19 04.21 UL MCS Serial Number Device Infe LTE Statu 2021-30-06 16:22:09 35.3 EORISO-MIL 31.1 2021-10-06 16 22 18 PCI -ODU 30.0 Cell Na = Th.Pres BaCE_B0_16.11 ECI Od Ob fes Or Earlin Default Devis GD5/7243A DL_MC CPE Name 203.014 -19.7 dBm LAN Statu -773 (Ber DL_MCS Serial Number WAN Status 1000 **CBSD** Status 2 0 Unregistered Registered Granted Authorized(Tran Confirm × Ape you sure you want to enable SAS? CIC Canc

Figure 2-117: CPE Monitor Information (Left Side)



Figure 2-118: CPE Monitor Information – Graphs (Right Side, 1 of 2)



Figure 2-119: CPE Monitor Information – Graphs (Right Side, 2 of 2)



2.4.3.2.4.2 Diagnostic

To monitor and diagnose the state of the network path serving numerous subscribers who use the CPE, the operators can leverage this generic diagnostic tool to provide a platform for validating QoS objectives. A vital benefit of this tool is that the operators can procure CPE performance data and identify the fault point that seems weak and likely to cause problems. You can perform DownloadTest, UploadTest, PingTest, and Traceroute functions through this Diagnostic feature. The diagnostic tab will open by clicking the *Operation > Diagnostics* (Figure 2-120).

NOTE: To get help to configure the Diagnostic settings, contact the support team.

Figure 2-120: Diagnostic

E CPE / Monitor			Critical 38	Major 11	Minor 12	• Warning 0	FiSci (UTC-06:00)2022-01-29 22:07
Diagnostic							\otimes
	DownloadTest 🗸	http://			Start		
	DownloadTest						
	UploadTest						
	PingTest						
	Traceroute						

• DownloadTest

This feature can test the download speed of CPE files and display parameters such as TestTime, Time server address, Status, ConnectedTime (ms), DownloadTime (ms), FileSize (MB), and Speed (Mbps) refer (Figure 2-121).

Figure 2-121: DownloadTest

DownloadTest		
	TestTime	Server
x 1 /	2021-12-16 09:22:35	http://172.19.3.81/downloads/1m.txt
400 500 600	Status	ConnectTime(ms)
300 700	Completed	224
200 800	DownloadTime(ms)	FileSize(MB)
- 100 900 0 1000	6098	1.024296
1.344	Speed(Mbps)	
Mbps	1.344	

• UploadTest

To test the upload speed of CPE files and display parameters such as TestTime, Test server address, Status, ConnectedTime (ms), UploadTime (ms), FileSize (MB), and Speed (Mbps), refer to (Figure 2-122).



Figure 2-122: UploadTest



• PingTest

Ping is a network utility that helps in sending signals out across the network to the CPE, which then sends its signal back. This signal is the Average Response Time in milliseconds (ms), which helps the operator know how long it takes for a packet of data to travel from the CPE to a server on the internet and back. PingTest helps identify the latency and connection between CPE and the server. The ping test displays parameters such as TestTime, URL of Test Server, Status, Success Count, Failure Count, and Average Response Time as shown in (Figure 2-123).

Figure 2-123: PingTest

P	ingTest					
	TestTime	Server	Status	SuccessCount	FailureCount	AverageResponseTime
1	2021-09-10 14:43:30	172.19.3.58	🧭 Finish	44	20	52ms
z	2021-09-10 14:43:30	192.168.111.247	S Finish	280	20	152ms
3	2021-09-10 14:43:30	172.17.9.126	🤣 Finish	48	145	56ms
4	2021-09-10 14:43:30	172.17.9.130	S Fail(Error_InitConnectionFailed)	44	176	29ms
5	2021-09-10 14:43:30	192.168.10.174	Seal(Error_InitConnectionFailed)	18	18	96ms
6	2021-09-10 14:43:30	192.168.10.185	S Fail(Error_InitConnectionFailed)	36	25	83ms
7	2021-09-10 14:43:30	192.168.111.244	S Finish	8	78	103ms
8	2021-09-10 14:43:30	192.168.111.140	Sinish	10	88	15ms
9	2021-09-10 14:43:30	192.168.14.22	S Fail(Error_InitConnectionFailed)	47	66	160ms
10	2021-09-10 14:43:30	192.168.14.23	8 Fail(Error_InitConnectionFailed)	64	99	167ms

• Traceroute

Traceroute examines the direction of how data travels on the internet from source to destination. Traceroute report lists data pertaining to every router the packets pass through as they move towards their destination. Running the traceroute helps identify routing hops data must go through and response delays across the eNBs. It also helps in conveniently locating the point of failure for operators. The HopRTTtime in milliseconds denotes the time to send data from CPE to the router and back. Traceroute diagnostic displays, TestTime, Server, Status, HopHost, HopHostAddress, HopErrorCode, and HopRTTtimes (Figure 2-124).

Figure 2-124: Traceroute

٦	raceroute						⊘
	TestTime	Server	Status	HopHost	HopHostAddresst	HopErrorCode	HopATTimes
1	2021-09-10 14:43:30	172.19.3.58	Finish		192.168.100.101		20ms
2	2021-09-10 14:43:30	192.168.111.247	Finish		192.168.1.1		200ms
3	2021-09-10 14:43:30	172.17.9.126	Finish		192.168.14.22		145ms
4	2021-09-10 14:43:30	172.17.9.130	6 Fail(Error_InitConnectionFailed)		192.168.100.100	Error_InitConnecti	176ms
5	2021-09-10 14:43:30	192.168.10.174	Fail(Error_InitConnectionFailed)		192.168.1.10	Error_InitConnectio	180ms
6	2021-09-10 14:43:30	192.168.10.185	Fail(Error_InitConnectionFailed)		192.168.14.122	Error_InitConnectio	25ms
7	2021-09-10 14:43:30	192.168.111.244	Finish		192.168.100.102		78ms
8	2021-09-10 14:43:30	192.168.111.140	Finish		192.168.1.12		80ms
9	2021-09-10 14:43:30	192.168.14.22	Fail(Error_InitConnectionFailed)		192.168.14.23	Error_InitConnection	66ms
10	2021-09-10 14:43:30	192.168.14.23	Fail(Error_InitConnectionFailed)		192.168.10.76	Error_InitConnection .	99ms

2.4.3.2.4.3 Settings

Reference: CPE Configuration Guide

Most operators use the CPE GUI to configure the end-user devices. The CPE GUI menus and fields are described in the above-referenced document. Based on operator feedback concerning which CPE settings operators change most often from the OMC, only a limited number of settings are offered through the OMC: CPE Name, Remote Web Login, and Frequency Lock (*aka*, Scan Mode or PCI Lock) (Figure 2-125). When you click on *Operations > Settings*, the page opens to show more tabs. Depending on which version of the CPE is running, you can see Basic Settings, Network, LTE, and System tabs. Examples are shown in the figure.

The Settings page defaults to the Basic Settings tab to enter or change the CPE Name. The Network tab is where you enable/disable remote login to the CPE in the Network. Use the LTE tab if you want to lock the CPE to one or more specific PCIs and frequencies via the Scan Mode field.

Scan Mode refers to how the CPE performs its routine scan of available eNBs and frequencies to select the best available one for attaching to the network. Sometimes, an operator requires the CPE to use a specific eNB PCI and a specific frequency, e.g., to avoid ping-ponging between two adjacent eNBs, where the cell coverage areas overlap. The Scan Mode fields will display differently based on which option you select. Refer to *Table 2-8 Scan Modes* for a description of each option. More information about this feature can be found in *section 2.4.3.3.2 PCI Lock*.


Figure 2-125: Settings

Settings		Settings	
Basic Settings	Basic Settings (Serial Number: 1203000013188FP0038, CPE Name:)	Basic Settings	LTE (Serial Number: 1203000013188FP0038, CPE Name:)
Network	Basic Info	Network	Frequency Lock
LTE		LTE	
System	CPE Name String min 0,max 35	System	Scan Mode Full Band ~
CPE / Monitor		CPE / Monitor	
Settings		Settings	
Basic Settings	Network (Serial Number: 1203000013188FP0038, CPE Name:)	Basic Settings	System (Serial Number: 1203000013188FP0038, CPE Name:)
Network		Network	Wan Access Settings O Not support
LTE		LTE	Https://www.income
System	LAN Interface	System	HttpsEnable
	DMZ Settings (Not support		HttpsWanEnable
	DMZ Enable		Access Control Enable
	DMZ Address		
	WLAN Network		
	WiFi		
	Frequency(Channel) AUTO ~		

Table 2-8: Scan Modes

Field Name	Description
Full Band	The CPE will scan all available frequencies within the band and select the one with the best signal quality
Band/Frequency Preferred	You can identify specific frequencies you want the CPE to use for network connection.
PCI Lock	Enter one or more frequency + PCI combinations to limit the network connection options
PCI Only Lock	Specify one or more PCIs to which the CPE can connect

2.4.3.2.4.4 Actions

The only *CPE Operations > Action* available is Reboot, as shown in Figure 2-126. To reboot more than one device simultaneously, select the checkbox next to the CPEs in the list to pop up a dialogue box at the bottom of the window. Select *Reboot* and all the selected CPEs will immediately reboot.

You can use this same method to simultaneously change the password on multiple devices to reset them to the same password (Figure 2-127).

Figure 2-126: Reboot



Figure 2-127: Change Password

	-	8	E	3G7010A_M11	BaiCE_BG_1.1.15.1
elected D	evices	(2) 📀	Confirm	Change Passw	ord Cancel
			Are you sure you want to ch New Password	hange the password?	*

2.4.3.2.5 Display Options

You can customize the columns displayed in the *CPE* > *Monitor* window. To do so, click on the gear icon in the upper left of the window (Figure 2-128). Select the checkbox for All if you want all columns of information displayed or choose the specific column headers to view.

Figure 2-128: Display

>	✓ Al	1						
	⊡ 🔽	Device info						
	~	Serial Number	~	CPE Name	~	Product Model	\checkmark	Module
	~	Software Version	\checkmark	System Uptime	~	First Period Time	~	Last Period Time
	~	MCC	~	MNC	~	Device Group	~	Module Name
	- 🗸	LTE Status						
	~	IMSI	~	PCI		Cell Name	1	ECI
	~	Earfen	~	Bandwidth	~	CINR1	~	CINR2
	~	SINR	~	DL Throughput	~	UL Throughput	~	Tx Power
	\checkmark	RSRP1	~	RSRP2	~	UL_MCS	~	DL_MCS
	- 🗸	LAN Status						
	~	MAC Address	~	IP Address	\checkmark	LGW IP ADDRESS	~	LGW MAC ADDRESS
	⊡ 🔽	Location						
	~	Longitude	~	Latitude	~	Height(m)	~	Distance
	\checkmark	Link Condition						
	_							
	0	Cancel						

2.4.3.2.6 Adding a CPE in OMC

The easiest way to register (add) a CPE in the OMC is to configure the operator's CloudKey in the device GUI. When the CPE comes online, it will automatically register in the operator's OMC account. The CloudKey is described in *section 2.2.3, CloudCore GUI Layout*.

You can add a CPE in the OMC either before or after the CPE is online - in other words, connected to the LTE network. However, the CPE must be online before you can configure or change its configuration settings in OMC. You will need the device's MAC address to add it to OMC. There are two ways you can add a CPE in the OMC: from *CPE > Device* menu (see *section 2.4.3.5 Device*) or from *CPE > Monitor* menu and performing the steps below:

To add the device (Figure 2-138):

- 1. Go to CPE > Monitor and click on the + Add icon in the upper right to open the Add CPE dialogue window.
- 2. Enter the device's MAC address.
- 3. Select a device group (or let the CPE automatically be placed in the default group).
- 4. Optional: In the Link Condition pull-down menu, select NLOS, pLOS, or LOS if you want to identify the RF propagation conditions between the CPE and the nearest eNB:
 - NLOS Non-Line-of-Sight: Problematic physical signal obstructions such as trees, buildings, terrain
 - pLOS Partial Line-of-Sight: Some physical signal obstructions
 - LOS Line-of-Sight: No physical signal obstructions
- 5. Click on OK.



Figure 2-129: CPE Monitor Add a Device

0	⊒	CPE /	Moni	tor							Critical 240	Major 20 Minor	17 • Warning 0		FiSci (UTC-06:00)2021-10-06 09:35
619	Tal	ble		Мар									• 0	0	CPE Connected (12/177)
	A	Ш							Q						30
•		Onlin	e Statu	1		Software Version		Module	All 🗸	Product Model	lect Y D	evice Group		Reset	20 -
	0			٥.	Serial Numbe	er 0.	CPE Name ©	IMSI 0	MAC ©	IP 0	Product Model 🗘	Software Version 🗘	Device Group ©	Cell Nam	50 -
ß	1		÷								EG7010CM11	BaiCE_BG_1.5.0 🔶	Default Device Group		0
2	2		1	•							EG7010CM11	BaiCE_BG_1.5.0 會	Default Device Group		Product Model
~	3		1	0							EG7010CM11	BaiCE_BG_1.5.0 會	Default Device Group		
0				-							50701003411	Burn Dr. Lan	Defects Device Crown		

Most operators use the CPE GUI to configure the end-user devices. Based on operator feedback concerning which CPE configuration fields they most often use the OMC to change, only a few key fields are available: CPE Name, Remote Web Login, and Scan Mode.

Referring to *section 2.4.3.2.4.2 Settings*, to configure any of the three types of settings in OMC once the CPE is online, or to change these settings:

- 1. Go to *CPE > Monitor*.
- 2. Find the device in the list, click on the Operations icon, and select Settings.

1	60
Ţ	Information
\odot	Diagnostic
0	Settings
	Actions

- 3. Enter the parameters, referring to the *CPE Configuration Guide* to describe all CPE settings.
- 4. Once you complete the configuration, click on OK to save it.

2.4.3.3 Maintenance

The *CPE* > *Maintenance* menu is used to create Reboot, Configure, PCI Lock, Change Password, and Logs tasks for one or more CPEs (Figure 2-130). Creating a task enables you to achieve the same action on multiple devices simultaneously and schedule when the task will occur. This is called Batch Config. For example, you can create a task to upgrade several CPEs to the latest software version but make the event happen later.

Figure 2-130: Maintenance



2.4.3.3.1 Reboot

Any CPE reboot tasks that have been created will be listed in the *Maintenance > Reboot* window (Figure 2-131).

Figure 2-131: Reboot

⊒ (CPE / Ma	intenance / Reboot				9 38	9 11	9 12	٠	0	FiSci (UTC-06:00)2022-01-31 09:05
CPE	List				Q						
		Serial Number	CPE Name	IMSI	Model Name	MAC Address	IP Address		PCI		Device Group
1					EG2030C-M2				52		Default Level Group/
2					EG7010A_M11_Ver.B				248		Default Level Group/
3					EG7035E-M11				30		Default Level Group/

To create a new reboot task for one or more CPEs (Figure 2-132):

- 1. Click on the + Add icon to open the New Task window in the Reboot window.
- 2. Accept the default task name or enter a new name.
- 3. Select the CPEs you want to include in this task.
- 4. Choose an Execute Mode, per *Table 2-6 Execute Modes*, determining when the task executes.
- 5. Click on OK to save the settings. The new task will appear in the Reboot window.

Figure 2-132: New Task 4 New Task Basic Info Task Name Reboot_FiSciAdmin_2021-05-02 15:32:43 Select Device Serial Number Selected (0) 📀 × Q Serial Number Name 60 60 60 60 60 60 60 50/page < 1 2 3 > Go to 1 C Total 141 Execute Mode Awaiting Start Schedule Time Immediately Cancel 102



Using the *Operations* actions next to a task in the main window, you can view the results of an executed task, or start, terminate, or delete a task (Figure 2-133). Terminating a task stops the task while it is running. Deleting the task completely removes the task from the list.

Figure 2-133: Operations

	Task Name									
-	Reboot_ 10000	Baic								
8	Results		Task Results						2	×
۲	Start					Q				
۲	Terminate		Serial Number	CPE Name	Status	Results	Failure Reason	Time		
X	Delete		1		Co End	Success		2019-11-12 13:54:16		

2.4.3.3.2 Configure

To configure the parameters of many CPEs, go to Maintenance > Configure (Figure 2-134)

Figure 2-134: Configure

€	CPE /	Maintena	ice / Configure				9 38	• 11 • 12	• 0	FiSci (UTC-06:00)2022-01-31 09:30
Bat	ch C	onfig								
CPE	List	Serial	Number / CPE Name / PCI		Q					
			Serial Number	CPE Name	IMSI	Product Model	MAC Address	IP Address	PCI	Device Group
1		60				EG2030C-M2		1	52	Default Level Grou
2		00				EG7010A_M11_Ver.B			248	Default Level Grou

To create a new Configure task for one or more CPEs (Figure 2-135):

- 1. In the *Configure* window, click on the + Add icon to open the New Task window.
- 2. Accept the default task name or enter a new name.
- 3. Select the CPEs you want to include in this task.
- 4. Enter the parameters, referring to the *CPE Configuration Guide* to describe all CPE settings.
- 5. Once you complete the configuration, click on OK to save it.
- 6. The Task will run in the Task List tab. To see the results of successfully configured devices, click on the Device List Tab. You can Export the Batch Configure CPEs and their information by clicking the Export icon.

Figure 2-135: Task and Device List

Task List Device Serial Number / CPE Name / T	List Fask Name	Q				Succ	ess 0	Fail 0
Serial Number	IMSI	CPE Name	Task Name		Status	Results	Failure Reason	Start Time
				No Data				

2.4.3.3.3 PCI Lock

2.4.3.3.3.1 Overview

In an LTE network, each eNB is identified by a Physical Cell Identifier (PCI) number. The PCI Lock function (also referred to as Frequency Lock in some menus and fields) enables you to select how the CPE's routine scan of available eNBs and frequencies is determined. If left in default mode, the scan method will be Full Band, meaning the CPE will scan all frequencies within the band - giving it more selections and taking longer to complete the scan, select the best option, and connect to the network.

Configuring a scan method other than Full Band can be instrumental. For example, suppose a CPE is ping-ponging between two adjacent eNBs where the cell coverage overlaps, thereby disrupting user service. In that case, the operator can bind the CPE to a specific eNB or configure one or more particular eNBs and frequencies to limit those that the CPE scans and chooses for its network connection.

The scan options are Full Band, Band/Frequency Preferred, PCI lock, and PCI Only Lock. Refer to *Table 2-8 Scan Modes* for a description of each. The fields will vary depending on which option you select.

The *CPE > Maintenance > PCI Lock* menu presents two tabs: eNB and CPE (Figure 2-136). The eNB tab can bind one or more CPEs to selected eNBs. The CPE tab can be used to specify the scan mode for one or more CPEs.

The figure also shows the *Operations* actions: View the Results of an executed task, Start the task, Terminate the task, view the task Information, or Delete the task.



Caution: When a task is run, it performs a warm reboot of the affected devices, momentarily interrupting service.

Important: During the execution of a task, any offline CPEs will not receive the change. You need to check the status of each one and possibly reinitiate the task to ensure all CPEs are updated.

Refer to section 2.4.3.4.2.2 eNB Tab and section 2.4.3.4.2.3 CPE Tab on creating a new task.

Figure 2-136: PCI Lock

;	с	PE									
	esk Nar	me/Creator			× Q						
		Task Name		Creator	Start Time	End Time		Scan Mode	Status	Progres	s Results
1	÷	PCI Lock_ad	min_2020-10-15 15:07:58	admin	2020-10-15 15:07:58	2020-10-15 15	5:08:46	PCI only lock	Co End	1/1	Success
2	÷	PCI Lock_ad	min_2020-09-22 20:50:30	admin	2020-09-22 20:50:30 2020-09-		0:50:59 Full Band		Co End	1/1	Success
3	i	PCI Lock_ad	min_2020-09-03 16:27:49	admin	2020-09-03 16:27:49	2020-09-03 16	5:33:41	PCI only lock	Co End	1/1	Fail
0	Resul	lts 🔶	Task Results								
9	Start				Q						
2	Term	inate	Serial Number	Name	IMSI	Earfcn	PCI	Status	Res	sults	Failure Reaso
2	Infor	mation	1				11	Co En	d Suc	ccess	
for	Delet matic Basi Tas	te on ic Info ik Name CI Lock_admin	2020-10-15 15:07:58								
for	Delet matic Tas P Sele	te on ic Info & Name CI Lock_admin ct Device	_2020-10-15 15:07:58								
for	Delet matic Basi Tas P Sele	te ic Info k Name CI Lock_admin ct Device Serial N	2020-10-15 15:07:58 Yumber	CPE Name	Earfen	PCI	Device	Group			
for	Delet matic Tas P(Sele	te ic Info k Name CI Lock_admin ct Device Serial N 1	2020-10-15 15:07:58 Sumber	CPE Name	Earfen 44190	PCI 11	Device Defau	Group t Device Group			
	Delet matic l Basi Tas P l Sele	te ic Info k Name CI Lock_admin ct Device Serial N 1	2020-10-15 15:07:58 Sumber	CPE Name	Earfcn 44190	PCI 11	Device Defau	Group t Device Group			
s for a	Delet matic Basi Tas P Sele	te ic Info k Name CI Lock_admin ct Device Serial N 1 quency Lock Full Band	2020-10-15 15:07:58	CPE Name equency Preferred	Earfen 44190 O PCI I	PCI 11	Device Defau	Group t Device Group PCI Only Lock			
	Delet matic Tas P	te ic Info k Name CI Lock_admin ct Device Serial N 1 quency Lock PCI	2020-10-15 15:07:58	CPE Name equency Preferred	Earfen 44190 PCI I	PCI 11 ock	Device Defau	Group t Device Group PCI Only Lock			
	Delet matic	te ic Info k Name CI Lock_admin ct Device Serial N 1 quency Lock PCI 11	_2020-10-15 15:07:58	CPE Name equency Preferred + 0	Earfen 44190 PCI I No more than three)	PCI 11 .ock	Device Defau	Group t Device Group PCI Only Lock			
	Delet matic J Basi Tas P J Sele J Free L L L L L L L L L L L L L L L L L L	te ic Info k Name CI Lock_admin ct Device Serial N 1 quency Lock PCI 11 cute Mode	_2020-10-15 15:07:58	CPE Name equency Preferred + 0	Earfen 44190 • PCI I No more than three)	PCI 11 .ock Scan	Device Defau	Group t Device Group PCI Only Lock			

2.4.3.3.3.2 eNB Tab

Select the *eNB* tab to bind CPEs to specific eNBs. To create a new PCI Lock task (Figure 2-137):

- 1. Click on the + Add icon and accept the auto-generated task name or create a new name.
- 2. Select the eNBs to which you want to bind CPEs. Refer to *section 2.4.3.4.2.4 Advanced Query Fields* for ways to limit the list of devices.
- 3. In the list of CPEs, select the ones you want to bind to the chosen eNBs.
- 4. Choose an Execute Mode, per *Table 2-6 Execute Modes*, determining when the task executes.
- 5. Click on *OK* to save the settings. The new task will appear in the eNB PCI Lock window.

Figure 2-137: New PCI Lock Task (eNB Tab)

Earfen_Mon:	2020-10-20 14-16-16											
Select Device	As you select	the eNBs, th	ney will ap	pear in the	Selected pane.	Selected						
				× Q				Q				
	Serial Number	Cell Name	Earfen	PCI	Device Group	Serial Number	Cell Name	Earfen		PCI	Binding CPE	
			a 44450	-	Default Device Group		unknown n	44190	(3660MHz)			
			39990	-	Default Device Group		unknown n	44290	(3670MHz)			
		,	43650	-	Default Device Group							
		-	a 44190	-	Default Device Group							
			4 4190	-	Default Device Group							
• ••			é 44290	-	Default Device Group							
20/page	200000001200000	> Go to 1	C	a 53	Dedenis Denies Comm	20/page 🗸	< 1 > C					1
Binding CPEs												
eNB S	SN	eNB Name		Serial Number	CPE Name	Earfen	PCI	Device Gr	oup	Earfen(A	îter)	PCI(

2.4.3.3.3.3 CPE Tab

Select the *CPE* tab to configure specific PCIs, EARFCNs/frequencies, or a combination of PCI+EARFCN/frequency for one or more CPEs. To create a *New PCI Lock Task* (Figure 2-138):

- 1. Click on the + Add icon and accept the auto-generated task name or create a new name.
- 2. Select the CPEs you want to lock using the same scan method (see *Table 2-8 Scan Modes*). Refer to *section* 2.4.3.4.2.4 Advanced Query Fields for ways to limit the list of devices.

NOTE 1: You can configure up to 3 EARFCNs/frequencies, EARFCN+PCI combinations, or PCIs. NOTE 2: The resulting fields will vary based on which scan option you choose.

- 3. Select the Frequency Lock: Full Band, Frequency Preferred, PCI Lock, or PCI Only Lock
- 4. Choose an Execute Mode, per *Table 2-6 Execute Modes*, determining when the task executes.
- 5. Click on OK to save the settings. The new task will appear in the CPE PCI Lock window.

Figure 2-138: New PCI Lock Task (CPE Tab)

Basic Info	•					
addTask)	ne Name PCI Lock Mona 202	20-10-20 14:12:27				
Select Dev CPEs	vice					
				× Q		
	Serial Number	CPE Name	Earfen	PCI	Device Group	
	60		43390	52	Default Device Group	
	60		44190	6 52	Default Device Group	
	60		43390	52	Default Device Group	
	00		43390	52	Default Device Group	
	60		44190	64	Default Device Group	
	60		44190	1 1	Default Device Group	
20/p	cage 🗸 🔍 < 1	2 7 > Go to	1 C	<u>-</u> **e	D.4k D	
Execute M	fode mmediately	Awaiting Sta	irt	O PCI L	Schedule Time	I Only Lock
Execute N	fode mmediately	Awaiting Sta	ut		Schedule Time	I Only Lock
Execute N	fode mmediately Canel	Awaiting Sta	ut		Schedule Time	I Only Lock
E Execute M	fode mmediately Canel Lock	Awaiting Sta Frequency Preference Frequency Preference	rt ferred		Schedule Time O PC PC PC	I Only Lock
Execute N CK Frequency Fu Earfcn	fode mmediately Canel Lock ill Band	Awaiting Sta Frequency Preference Frequency Preference	urt ferred		Schedule Time PCI Lock	21 Only Lock
E Execute N C K K K K K K K K K K K K	fode mmediately Canel Lock ill Band	Awaiting Sta Frequency Pref	ferred + (No mo	re than three)	ock PC Schedule Time PCI Lock Scan	I Only Lock
E Execute M	fode mmediately Canel Lock All Band	Awaiting Sta Frequency Preference Frequency Preference	ferred	PCI La	ock PC	I Only Lock
E Execute N C C C C C C C C C C C C C	fode mmediately Canel Lock all Band a sock Band	Frequency Preferred	ferred • (No mo	re than three)	ock PC Schedule Time PCI Lock Scan	I Only Lock PCI Only Lock ck
E Execute M	fode mmediately Canel Canel Lock all Band a pok Band (PCI	Frequency Preferred	ferred	PCI Lock	ock PC Schedule Time PCI Lock Scan	21 Only Lock
E Execute N C K K K K K K K K K K K K	fode mmediately Canel Canel Lock ill Band i Sand (PCI	Frequency Preferred Frequency Preferred	ferred (No mo	re than three)	ock PC Schedule Time () PCI Lock Scan PCI Only Lo PCI Only Lo	I Only Lock PCI Only Lock ck nthree) Scan
E Execute M Cox Frequency Frequency Lo Frequency Lo Full E Earfcn—F Frequency I	Aode mmediately Canel Canel Canel Cock and Cock Band Cock Cock Cock Cock Cock Cock Cock Cock	Frequency Preferred Frequency Preferred	ferred	re than three)	Schedule Time () PCI Lock Scan PCI Only Lo + (No more that	I Only Lock PCI Only Lock ck an three) Scan
E Execute M CK CK Frequency CK Frequency Lo Full E Earfon-F Earfon-F Frequency I Frequency I Full E Earfon-F	fode mmediately Canel Canel Canel Cock all Band cock Band Cock I Band I Band I Band	Frequency Preferred Frequency Preferred Frequency Preferred Frequency Preferred	ferred	PCI Lock	ock PC Schedule Time Image: Control of the second	I Only Lock PCI Only Lock ck n three) Scan PCI Only Lock
E Execute N C C C C C C C C C C C C C	Jode mmediately Canel Canel Canel Canel Cock all Band a cock Band Cock I Band	Frequency Preferred Frequency Preferred Frequency Preferred Frequency Preferred	erred	PCI Lock	ock PC Schedule Time PCI Lock PCI Only Lo PCI Lock	I Only Lock PCI Only Lock ck ntbree) Scan

2.4.3.3.3.4 Advanced Query Fields

To search for a specific device or to limit the list of devices shown in either tab, use the Advanced Query pull-down fields as shown in (Figure 2-139). When creating a new PCI Lock task, you can also use Advanced Query for the same purpose.

Figure 2-139: Advanced Query Fields

eNB & CPE Advanced Query Fields:

CPE / Maintenance / PCI Lock			Critical 166	Major 20	Minor 14	Warning 0	FiS
NB CPE							
		* Q					
Task Name	Status	~	Creator		Results		~
Start Time							
Query Reset			Critical 166	Major 20	Minor 14	• Warning 0	Fi
Task Name Creator		* Q					
Task Name	Status All	~	Creator		Results All		~
Start Time							

eNB & CPE New PCI Lock Task Advanced Query Fields:

Select Device		Select Device			
eNBs		CPEs			
	* Q	Secial Number/CPE Name	* Q		
Serial Number	Cell Name	Serial Number	CPE Name	Denice Group	
Device Group All	Earfen	Earlin	PCI		
Query Reset		Query Reset			

2.4.3.3.4 Change Password

To change the password on one device or set the same password for multiple CPE devices, you can create a task using the Change Password task (Figure 2-140).

Figure 2-140: Change Password

⊒	CPE / Ma	intenanc	ce / Change Password			9 38 9 11	12 0	FiSci (UTC-06:00)2022-01-31 10:04
	Serial Number / CPE Name / PCI							
			Serial Number	CPE Name	MAC Address	IMSI	PCI	Device Group
1		00					52	Default Level Group/Default Dev
2		00					248	Default Level Group/Default Dev
3		00					30	Default Level Group/Default Dev



To create a new Change Password task for one or more CPEs (Figure 2-141):

- 1. Click on the + Add icon to open the New Task window in the Change Password window.
- 2. Accept the default task name or enter a new name.
- 3. Select all or the CPEs you want to include in this task.
- 4. Under Operation type, give the new password.
- 5. Choose an Execute Mode, per *Table 2-6 Execute Modes*, determining when the task executes.
- 6. Once you complete the change password task, click OK to save it.

Figure 2-141: New Change Password Task

B ksk hole Tak Name Image Reserved Reliand	Basic Info Task Name Change Select Device CPES	Password_FiSc	iAdmin_2	022-02-02	03:15:49					
Tax mu Description Set Description Description Figures Specifie Set of all memory (T2 M M T) All memory (T2 M M T)	Task Name Change	Password_FiSc	iAdmin_2	022-02-02	03:15:49					
Bit CFUS Bitpinnet Specifie Serial Number OPE Name MA MA PCI Destance I I I I I I I I I I I I I I I I I I I	Select Device									
CFUS Teginant Specifie Section (Section (Sec	CPES									
Imported product Import and product an										
All Feid Number OPE Name MACAdress INSI PCI Decision	Equipment Specified					Q				Selected (0) 📀
Select 13 13 1000000000000000000000000000000000000) All				Serial Number	CPE Name	MAC Address	IMSI	PCI	Device Group
1 0 0.0000003022020072 ukownance(21.64.15.01.06) 48.87.40.82.52 19800004572 66 DafalLee(GongDafalLee)Gengengengengengengengengengengengengenge	Select	13			120300009419CGQ0697	unknown name(172.18.187.72)	48:BF:74:0C:F4:5C	31403000040053	457	Default Level Group/Default Device Group
15 0 2000000000000000000000000000000000000		14			1203000083202XQ0472	unknown name(192.168.130.106)	48:BF:74:0D:B2:52	311980000046572	66	Default Level Group/Default Device Group
16 0 10000010729AQA33 ukawa mane(10.243.1) 48.BF7.41.3EE.38 34000000979 52 Default CercGomperfunction CercGomperfunctin CercGomperfunctin CercGomperfunctin CercGo		15			1203000080205GP0980	CAT 4 CO(172.19.157.73)	48:bf:74:0f:e4:2b	314030000020819	30	Default Level Group/Default Device Group
10 0 1000001412168B4520 ukawam amer(192.168.130.117) 4k.BE?A1.D.51.6k 3198000003129 66 Default Level Group Default Device Group 18 0 0 1000001142168B4652 ukawam amer(192.168.130.117) 4k.BE?A1.D.51.6k 3198000003129 66 Default Level Group Default Device Group 19 0 0 1000001332168B075 ukawam amer(192.168.10254) 4k.BE?A1.D.58.1B 31980000310 55 Default Level Group Default Device Group 50/per < 1 > 610 1 C Total Performance Total Performance Total Performance		16		-	1203000107209AQ0433	unknown name(10.244.3.1)	48:BF:74:13:EE:38	314030000049379	52	Default Level Group/Default Device Group
18 Image: Solution of the section o		17			1203000141216BB4520	unknown name(192.168.130.117)	48:BF:74:1D:51:0E	31198000003129	66	Default Level Group/Default Device Group
19 203000133216580075 usknown nume(192.168.101.254) 48.8P:74.1D.98.1B 31190000013401 55 Default Level Group/Default Device Group 50/page < 1 > Go to 1 C Total 19 Total 19		18		-	1203000141216BB4684	unknown name(173.16.0.1)	48:BF:74:1D:56:2E	31198000003129	66	Default Level Group/Default Device Group
50/page (1 > Go to 1 C Total 19		19			1203000133216SB0075	unknown name(192.168.101.254)	48:BF:74:1D:9B:1B	311980000013401	55	Default Level Group/Default Device Group
		50	/page	~ <	1 > Go to 1	c				Total 19
	Operation Type									
Operation Type	Channe Browned				-					
Operation Type	Change Password									
Change Password										
Change Password	OV Caroal									

2.4.3.3.5 Logs

Logs are highly valuable when it comes to gaining insight into security and system performance. You can create a device log task to report the operation log information of CPE regularly or immediately. There are two tabs, Device Logs, and Access Logs. To automatically export all the log information, go to the Access Log tab and click on the Export icon (Figure 2-144).



Figure 2-142: Device Log

CPE / Maintenance / Logs				Critical 38 Major 11	Minor 12 Warning	0 FiSci (U	TC-06:00)2022-01-31 12:09
Device Logs Access Log Serial Number/CPB Name/MAC Address/IMS1	Advance	d Query					New Task
Serial Number	IMSI	CPE Name	MAC Address	Collection Status	Files	Results	Operation Time
		Testing		Co End	1	Success	2022-01-14 16:04:23
Lownload Delete		DE Monto	MAG	Adams			
Serial Number		PE Name	MAC	Address			
IMSI	0	peration Time					
Query Reset			- End Tim				

To create a new Device Log Task for one or more CPEs (Figure 2-143):

- 1. Click on the + Add icon to open the New Task window in the Device Log task.
- 2. Select the CPEs you want to include in this task; only a max of 20 devices can be included for one task.
- 3. Choose an Execute Mode, per *Table 2-6 Execute Modes*, determining when the task executes.
- 4. Once you complete the change password task, click OK to save it.
- 5. The new task will appear at the Device Log tab. By clicking the operation, you can Terminate, Download or Delete the Task.



Figure 2-143: New Device Log Task

New Tasl	k					
CPE	(Select ma	x 20 device	s.)			
				Q		Selected Devices (0) 💿
			Serial Number	MAC Address	PCI	CPE Name
1		60			52	
2		00			248	
3		00			30	
4		00			52	
5		(*)			55	
6		(×1			66	
7		(*)			75	
8		(*1)			70	
4	50/page	~ <	1 > Go to 1	C		Total 19
F Execu	te Mode					
E LACCO	ite moue					
O Im	mediately		Schedule Time			
0	К	Cancel				

Figure 2-144: Access Log

CPE / Maintena	unce / Logs		9 38	• 11	12	• 0	FiSci (UTC-06:00)2022-01-31 12:11
Device Logs	Access Log						
			C	2			Export 🕑
IMSI	Serial N	umber	CPE Nam	e	IP Address		Date
1							2022-01-28 09:52:44
2							2022-01-27 10:47:25

2.4.3.4 Upgrade



Caution: A software upgrade requires a reboot of the CPEs; the reboot action will temporarily take the CPEs out of service.

New software typically contains new features and bug fixes, and it is generally recommended to implement the latest version in the field. Baicells notifies operators of newly available software by including a message at the top of the OMC window. You can select the link in the message to go straight to the upgrade menu, in this case, the *CPE* > *Upgrade* menu, as explained in *section 2.4.2.5.1 Upgrade From the OMC Upgrade Messages*.

The Upgrade window will display a list of available software files for the outdoor unit (ODU) and the indoor unit (IDU), as well as CAT4 and CAT6/7 CPE models. Use the *Operations* functions to view the software version or download the .bin file. Refer to Figure 2-145.

NOTE: A CPE's current software version is displayed under *CPE > Monitor* in OMC and the *CPE GUI Status > Overview* window. The CPE GUI is documented in the *CPE Configuration Guide*.

1	51	opgrade i ne							New Task
				Q					0
		File Name		Version	Product Model	Product Type	File Size(Byte)	Release	Upload Time
	÷	BaiCE_BG_1.6.4_EG2013B	_M11_NA.bin	BaiCE_BG_1.6.4 *	EG2013BM11 [3]	IDU	27463672	GA	2020-10-16 11:19:03
	:	BaiCE_BG_1.6.4_EG7010A	_M11.bin	BaiCE_BG_1.6.4 *	EG7010AM11 [3]	ODU	27070456	GA	2020-10-16 11:12:32
	÷	BaiCE_BG_1.6.4_EG7010C	_M11.bin	BaiCE_BG_1.6.4 *	EG7010CM11 [3]	ODU	27070456	GA	2020-10-15 20:19:21
Ŧ	I	nformation Inf	File Name BaiCE_BG_1.6.2_E	G2013B_M11_NA.bin		Versio Bait	n CE_BG_1.6.2		
Ŧ	I	nformation Inf	File Name BaiCE_BG_1.6.2_E	G2013B_M11_NA.bin		Versio Bait	n CE_BG_1.6.2		
1	I	nformation Inf	File Name BaiCE_BG_1.6.2_E	G2013B_M11_NA.bin		Versio Bait	n CE_BG_1.6.2		
Ţ	I	nformation Info	File Name BaiCE_BG_1.6.2_E Recommend Yes	G2013B_M11_NA.bin	~	Versio Bail Produ IDU	n CE_BG_1.6.2 ct Type		
Ţ	I	nformation Inf	File Name BaiCE_BG_1.6.2_E Recommend Yes	G2013B_M11_NA.bin	~	Versio Bait Produ IDU	n CE_BG_1.6.2 ct Type		
₽	I	nformation Inf	File Name BaiCE_BG_1.6.2_E Recommend Yes Product Model	G2013B_M11_NA.bin	~	Versio Bail Produ IDU Visibb	n CE_BG_1.6.2 ct Type		
1	I	nformation Inf	File Name BaiCE_BG_1.6.2_E Recommend Yes Product Model EG2013B_M11	G2013B_M11_NA.bin EG2013BM11	~	Versio Bait Produ IDU Visible GA (n CE_BG_1.6.2 et Type e Visible for All)		

Figure 2-145: CPE > Upgrade

To create a new upgrade task for one or more CPEs of the same product type (Figure 2-146):

- 1. Click on the New Task icon in the upper right part of the Image Upgrade File window.
- 2. Accept the default Task Name or enter a new name.
- 3. Select the Product Type of ODU or IDU.
- 4. CPEs of the product type you selected will be listed under Select Device. Select the CPEs to include in the task. There is no limit on the number of CPEs you can include, though only 20 devices will be upgraded



simultaneously. Use the Advanced Query fields to search for a specific device or to limit the list of devices, as shown previously in *section* 2.4.3.3.3.4 *Advanced Query Fields*.

- 5. Under File list, the checkbox for "Only display the supported software versions based on the CPEs selected above" is checked by default; uncheck it if you want to see all software versions in the list. Choose the target software version.
- 6. Under File List, select or deselect the checkbox for "The upgrade is ignored if the original version is the same as the target version." In other words, even if the software version you are upgrading to is the same as the one already on the device, if you leave the box unchecked, the upgrade will still occur (overwriting the existing software).
- 7. Choose an Execute Mode, per *Table 2-6 Execute Modes*, determining when the task executes.
- 8. Click on OK to save the settings. The new task will appear in the Image Upgrade File window.

After the upgrade task has been executed, verify that the target devices are running the new software version. An error message will be generated if any device fails to get the upgrade.

Figure 2-146: New CPE Upgrade task

Task Na	ame			Select Device							
Softwa	are Upgrade	_Mona_2020-10-20 14:32:12		CPEs							
				En anter a sure							
Product	t Type			Serul Milline / Cri				× u			
0	ODU	IDU		Serial Number		CPE Nam	e	1	Device Group		
				1		Product M			All	×-	
				All		All	lodel		Jell Name		
Select 1	Device					140					
ODE.				OK	Reset						
CPES											Selec
				× Q							
		Serial Number	CPE Name	MAC Address	Vertion		Product Mod	el Cell name	ECI	PCI	Device Group
1		0			BCE-ODU-1.0.12		EG7035				Default Device Group
2		<u>@</u>			BaiCE_AP_2.4.5	NA	EG7035E-M2				Default Device Group
3	2	©			BaiCE_AP_2.4.5	NA	EG7035E-M2				Default Device Group
4		60			BCE-MD-1.0.1-B	036SP18-NA	EG7010CM11				Default Device Group
5		60			BaiCE_BG_1.5.0		EG7010AM11				Default Device Group
6		60			BaiCE_BG_1.6.4		EG7010CM11				Default Device Group
7		6 0			BaiCE_AP_2.2.1	NA	EG7035E-M1	1			Default Device Group
8		0			BCE-ODU-1.0.12		MT422e				Default Device Group
9		0			BCE-ODU-1.0.12		MT422e				Default Device Group
20	0/page	< 1 2 6 1	Go to 1 C								Te
File list		Only display the supported softw	are versions based on the CPEs	selected above. 💟 The up	ograde is ignored if the	original versio	m is the same as t	be target version.			
	Select	File Name	Version	Product Model	Pro	luct Type 1	File Size(Byte)	Upload Time	Description		
1	~	BaiCE_AP_2.4.5_NA.bin	BaiCE_AP_2.4.5_NA	EG7035E-M2,EG7035E,EG70	035L,EG7035 OD	U	11534340	2020-10-05 09:12:	33 Detailed relea	ase notes can be f	found here: https://comm
Execute	Mode										
O Imm	nediately	O Schedule Time									

2.4.3.5 Device

The *CPE > Device* menu is used to create and manage CPE groups and register CPE devices in the operator's OMC account (Figure 2-147). The left pane lists the default device group and any existing customized groups the operator has created. Using device groups makes it easier to manage CPEs and perform specific bulk tasks, such as software upgrades, reboots, PCI Lock, etc. The Device Group operations include (a) Information to view the group details; (b) Modify the device group, and (c) Delete the group.

NOTE: If a CPE is not assigned to a custom group, it will automatically be placed in the default group. You cannot modify or delete the default group.

The right pane lists all of the operator's CPEs, showing each one's status (active or offline), serial number, MAC address, IMSI number, and for outdoor CPEs, the longitude, latitude, height, and distance. The CPE operations are Move to Device Group and Delete the device.

NOTE: If you entered the operator's unique CloudKey in the CPE GUI when the CPE is powered on, it would automatically associate to the operator's account in OMC.

CPE / Device							Critical	24 😑 Major 🔅	2 😑 Minor 1	Warning 0	FiSci (UTC)202	0-12-14 17:49
vice Group	Ð	CPE					Q				Ŧ	Ð
Group Name					Sarial Number	MAC Address	TMST	Link Condition	Longituda	Latituda	Haight(m)	Distance
Default Device Group	1				Serial Number	MINC Address	13151	Link Condition	Longhade	Dattitude	rieignt(m)	Distance
test	1	1										
	1	2		()								
	1	3										
		4										
rmation	Delete	y 9										
Group Name												
test												
escription			11									
PEs												
			¥	Q								
Serial Number			MAC Address	_	г	MSI						
ee												

Figure 2-147: Device

To add a device group (Figure 2-148):

- 1. Click on the + Add icon to open the Add Group window in the left pane.
- 2. Enter a group name and description.
- 3. Select the CPEs you want to include in the group.
- 4. Click on OK to save the settings. The new group will appear in the Device Group list.



To add one or more CPE devices (Figure 2-148):

- 1. Click on the + Add icon to open the Add CPE window.
- 2. Enter the CPE's MAC address. If adding more than one CPE, put each device on a separate line. Use a semicolon at the end of each line (;) and hit Enter.
- 3. Select the Group Name in the pull-down list*.
- 4. Select the Link Condition of NLOS, pLOS, or LOS. This field enables the operator to identify if the path between the CPE and serving eNB is described as Non-Line-of-Sight (NLOS), Partial Line-of-Sight (pLOS), or Line-of-Sight (LOS).
- 5. Click on *OK* to save. The new CPE(s) will appear in the CPE list.

*NOTE: Alternatively, you can put all CPEs in the default group and later use the *Operations > Move to Device Group* function to assign CPEs to groups.

Figure 2-148: Add CPE Device Group, Add CPE(s)

Add Group				Add CPE	×
• Group Nar Description	se			When registering multiple devices, use a semi-col put each device on a separate line. MAC	on(;) after each one and hit Enter to
CPEs		ti.			11
		× Q		Group Name	
	Serial Number	MAC Address	IMSI	Select 🗸	
				Link Condition NLOS	3
20 page	<pre></pre>	Go to 1 C		OK Cancel	

Another quick way to move multiple CPEs to the same device group is by selecting the checkbox next to the CPEs in the main Device window. A dialogue window appears at the bottom (Figure 2-149). Select the *Move to Device Group* button. You can also batch-delete CPEs.

Figure	2-149.	Ouick	Move T	o Device	Groun
Figure	2-143.	Quick	INDVE I	O Device	uloup

Devic	e Group	Ð	CPE	Set	ial Nur	aber			Q				Ð	Ð	C
	Group Name						Serial Number	MAC Address	IMSI	Longitude	Latitude	Height(m)	Distar	ace	
1	Default Device Group	1	1		÷	60			1						
2	test	1.1	2		÷	60			1						
3		1	3		÷	60			1						
4		1.1	4		÷	60			1						
5		÷	5		÷	00									
Sele	ected Devices (2) 📀										Batch Delete	Move To Device G	roup	Cane	el:

2.4.4 Alarm Menu

2.4.4.1 Overview

Network alarm conditions are reported in OMC. The types of events that can trigger alarms include issues with communications, Quality of Service (QoS), equipment, environmental conditions, and processing errors.

Alarms are categorized into four severity levels: Critical, Major, Minor, or Warning. Critical alarms are incidents that can cause system outages and should be attended to immediately. Significant alarms are incidents that can cause the poor or degrading quality of service for subscribers and, therefore, should be addressed as soon as possible. Minor alarms indicate a potential issue that needs investigation but will not disrupt service. Warnings are used to indicate errors that probably need to be corrected or at least monitored but do not require any action.

The Alarm menu is where you can create alarm templates to view only the alarm sources or specific alarm IDs you want to see; set up filtering rules to tell the system what actions to take for specific alarm sources and alarms; view all of the operator's currently active and historical alarms, and display a library of all system alarms (Figure 2-150).

Figure 2-150: Alarm Menu



2.4.4.2 Landing Page Description

The Alarm window contains two tabs (View and Library), and the window opens first to the View tab (Figure 2-151). Each tab is described in more detail in the following sections.

Figure 2-151: Alarm Menu - General Layout

∃ Alarm										• Cr	itical 243 🔍 Major 20	Minor 16 Warning 0	FiSci (UT	C-06:00)2021-10-07 09:16
View Library														
🔺 Total		Active	Alarm					ent × Q) 🖸 🖸
All Active	History				Index $^{\diamond}$	Severity ©	Alarm Identifier	Probable Cause	Alarm Source	Network Element	Event Type	Alarm Status 🌣	Alarm Type	Event Time 💠
Template	•	1		4	46237527	A Critical	7	eNB Disconnected	ENB		Communication Alarm	C Unconfirmed and active	Active Alarm	2021-10-07 08:41:59
•		2		1	46237251	A Critical	9	CPE Disconnected	CPE		Communication Alarm	to Unconfirmed and active	Active Alarm	2021-10-07 08:35:55
Critical/Major - S1 - East			-			A						Aug		

2.4.4.2.1 View Tab Description

The View tab contains two panes of data (Figure 2-152). The left pane provides three tabs for sorting the alarms on the right. The All tab will list all alarms, both active and historical (cleared), for all severity levels. The Active tab is the default view of just the currently active alarms. The History tab will display only historical, inactive alarms. Beneath these three tabs will be any alarm templates that the operator has created. Refer to *section 2.4.4.2.1.1 Add New Alarm Template* on creating an alarm template.



Figure 2-152: View Tab

➡ Alarm										•	Critical 2	143 🔍 Major 20	Minor 1	6 🛛 🔍 Warning 0	FiSci (UTC-	-06:00)2021-10-07 09:16
View Library																Chart
🔺 Total		Active	Alarm					ent × Q							C	
All Active	History				Index \diamond	Severity \diamond	Alarm Identifier	Probable Cause	Alarm Source	Network Element		Event Type	Alarm	Status ¢	Alarm Type	Event Time
Template	•	1		÷	46237527	A Critical	7	eNB Disconnected	ENB			Communication Alarm	ÉO Us	confirmed and active	Active Alarm	2021-10-07 08:41:59
- Anna		2		1	46237251	A Critical	9	CPE Disconnected	CPE			Communication Alarm	🖆 Uz	confirmed and active	Active Alarm	2021-10-07 08:35:55
Critical/Major - S1 - East			-			A		5.7 5.00	PR 10				A			
														Update Time	Specific Problem	Alarm Count $^{\oplus}$
															Smallcell is disconnected	i. 1
															CPE is disconnected.	1
															No user on eNB	1

Use the *Operations* functions to look at alarm detail, invoke an alarm filter, confirm an alarm, unconfirm an alarm, clear an active alarm, or delete a historic alarm (Figure 2-162). An example of an alarm detail is shown in Figure 2-154.

Figure 2-153: Operations

All Active History			Index $\stackrel{\diamond}{=}$ Severity $\stackrel{\diamond}{=}$	All Active History		Index 🗘 S
Translation 👩	1	V	46237527 A Critical		1	46238690
	2		📮 Detail	e lemplate	2	🖵 Detail
Critical/Major - S1 - East	3		V Alarm Filter	Critical/Major - S1 - East	3	V Alarm Filter
mona test	4		Alarm Confirm	mona test	4	⊘ Alarm Confi
FiSci	5		Unconfirm Alarm	FiSci	5	Unconfirm A
testi	6		🖉 Clear Alarm	testl	6	Delete Alarr
	7		16102507 A C-Hard	1	7	46022720

Figure 2-154: Alarm Detail

Detail	
Index:	53066
Alarm Identifier:	12
Probable Cause:	SAS Abnormal alarm
Specific Problem:	Illegal registration parameter
Additional Information:	
Severity:	Critical
Event Type:	Equipment Alarm
Alarm Source:	CPE
Network Element:	SN=
Alarm Status:	Unconfirmed and active
Event Time:	2020-12-01 07:27:24
Update Time:	2020-12-01 14:57:04
Suggestion:	Refer to SAS log



The three icons in the upper right of the Alarm window are Filter, Chart, and Export, as was shown in Figure 2-152. The Filter function is discussed in *section 2.4.4.2.1.2 Add New Alarm Filter Template*. Clicking on the Chart icon will display the top 10 alarms information in graphical and pie chart formats, by day or by month (Figure 2-155). Hover over any data point on the graph to see the numerical data.

Select Device Group, Device, Device, or Alarm ID, and a date or date range in the pie chart pane. In the figure, the *Device* was selected, and the pie chart displayed the eNB serial numbers for each of the top 10 alarm IDs. Examples of Device Group and Alarm ID are shown in Figure 2-156 and Figure 2-157.







Figure 2-156: Chart View of Top 10 Alarms (by Device Group)





Figure 2-157: Chart View of Top 10 Alarms (by Alarm ID)



2.4.4.2.1.1 Add New Alarm Template

To add a new alarm template (Figure 2-158):

- 1. Click on the + Add icon under the three tabs in the left pane. This will open the New Alarm Template window.
- 2. In the Basic Info pane, either accept the auto-generated Template Name or enter a new name. Optionally, add a description.
- 3. Under Conditions, select one or more alarm sources -- OMC, eNB, CPE. You must select at least one. Your selection will result in a filtered Alarm List beneath it.
- 4. In the Alarm List, select All to see all alarms for the alarm source(s), choose Device to choose specific devices, or choose Device Group to choose one or more specific device groups.
- 5. In the Alarm List, select the All checkbox to include all alarms in this template. Or leave the All checkbox unchecked and choose the specific alarms you want to have.
- 6. For Email Notification, slide the toggle to the right to enable email notifications for the entities and alarms selected above.
- 7. At the Interval (minute) field, select Real Time, 10 Minute, 30 Minute, or 60 Minute. This will determine how often the system checks for the conditions selected in the template and notifies one or more parties via the email addresses that you enter in the Email box beneath. If you want to enter more than one email address, use a semi-colon (;) after each address.
- 8. Click on *OK* to save the template. The new template will now be listed in the Alarm window.



Figure 2-158: Add New Alarm Template

New Ala	rm Template	ſ	Alarm	List	A11				
a	Basic Info						× Q		
	Template Name Iength:1-5				Alarm Source	Alarm Identifier	Probable Cause	Event Type	Severity
	Description		1		eNB	100671499	S1 SCTP association is interrupted	Communication Alarm	🛕 Critical
			2		eNB	100671500	S1 AP setup fail	Processing Error Alarm	🛕 Critical
		_	3		eNB	100675586	Cell fault	Quality Of Service Alarm	🔺 Major
1	Conditions		Email	Notifica	tion 🚺				
	Alarm Source OMC 🗹 ENB CPE		Interva	ll(minute) 0	Real Time 1	0 Minute 🔿 30 Minute 🔿	60 Minute	
	ENB ×								
	All O Customized Device Device Group		Email						
	Group Name				0	Tine: If you send an emai	l to multiple reginients please separate multiple	nla a mails with samicolon (*)	
	1 Default Device Group					anpre an your sense all entrai	а но манарна косарнанодрибале зеракане шиши		
			OK		Cancel				

2.4.4.2.1.2 Add New Alarm Filter Template

An alarm filter template provides a way to tell the system what actions to take for specific alarms. The filter icon is on the upper right of the Alarm window (Figure 2-159).

When you click on the icon, the Alarm Filter window opens and shows a default alarm filter template that includes all alarm sources and defaults to an Execution Action of No Store, No Display. The available execution actions will be described below.

Figure 2-159: Alarm Filter

ø	₽	Alarm									Critic	al 243 🔴 Major 20	Minor 16 🛛 🔍	ming 0 FiSci (U	TC-06:00)2021-10-07 09:57
(1)	View	Library												F	ilter
ج ج		Total	Active Alarm					× Q							00
		All Active History	- h	ndex °	Severity ©	Alarm Identifier	Probable Cause		Alarm Source	Network Element		Event Type	Alarm Status ©	Alarm Type	Event Time $^{\circ}$
▲		Tamplata	1 🖬 🗄 4	16237527	A Critical	7	eNB Disconnected	1	ENB			Communication Alarm	n Unconfirmed an	d active Alarm	2021-10-07 08:41:59
M			2 : 4	6737251	A Critical	0	CPF Disconnected		CPF			Communication Alarm	to Unconfirmed an	d active Alarm	2021-10-07-08-35-55
	⊒ A	Alarm									Critical	243 • Major 20 •	Minor 16 • Warn	ing 0 FiSci (UTO	C-06:00)2021-10-07 10:02
1	larm	Filter													
					Q										+ ×
		Status	Rule Name			Alarm Source			Execution A	rtion		User		Update Time	
	1	Disable	Default Alarm Ru	ile		ALL			No Store , No	Display		admin		2021-01-13 02:12:21	
	2	Disable	disable 11217 alar	rm		ENB			No Store , No	Display		FiSciAdmin		2020-01-10 16:07:38	

To create a new alarm filter template (Figure 2-160):

- 1. Click on the + Add icon in the upper right of the Alarm window to open the New Alarm Filter Template window.
- 2. Accept the auto-generated Filter Rule Name or enter a new name.
- 3. For now, keep the Status of the template as Disable. Once the other parameters have been entered, you can enable the template.
- 4. Choose an Execution Action to indicate how the system will treat the alarms:
 - a. No Store, No Display (default) The OMC will not store or display the alarms identified in the template.
 - b. Only Store, No Display The OMC will store but not display the alarms identified in the template.
 - c. Display, auto-confirm Each alarm in the template will be auto-confirmed. Confirming an alarm indicates the alarm was acknowledged in the system but not yet resolved.



- 5. Under Conditions, select one or more alarm sources in the filter template: OMC, eNB, CPE.
- 6. For the list which follows the Alarm Source field, you can select All OMC alarms, All eNB device groups, and All CPE device groups. Alternatively, use the Customized option to choose between Device and Device Group to view and select specific eNBs or CPEs.
- 7. The next part of the Conditions pane pertains to the alarms you want to include in this filter template. If you select the All checkbox, all alarm IDs will appear in the list. Only the alarms pertaining to those entities will be listed if you selected only eNB or CPE for the alarm source. Select the checkbox next to the alarms you want to be included in this filter template.
- 8. Set an Event Time using the Start Time and End Time, which determines the time window when the alarms will be reported.
- 9. Enable the template:
 - a. If you are ready to start using the filter template, go back to the Basic Info section of the window, set the Status to Enable, and click on *OK*. The new alarm filter template will appear in the Alarm Filter list.
 - b. If you want to enable the template later, leave the Status as Disable and click OK. The new alarm filter template will appear in the Alarm Filter list. Use the Operations> Enable action when you are ready to enable the template; use the Operations > Enable action (Figure 2-161).

Figure 2-160: Add New Alarm Filter Template

Basic In	fo					
Filter Ru	ile Nam	le			length:1~50	
Status			Enable Disable			
E			No Store No Display	Only Stars No Display		
Executio	n Acuc	n 🤮	No Store, No Display	O Only Store, No Display	O Display,auto commin	
Conditio	ons					
			01/2			
Alarm S	ource		OMC VENB	CPE		
ENB	×					
0	A11	 Customi 	zed Device Device	e Group		
		Group Na	me			
1	L [Default D	evice Group			
Alarm L	.1ST	All				Selected Alarm (C
				× Q		
		tifier/Probable Cau Alarm Source	Alarm Identifier	Probable Cause	Event Type	Severity
Ab		Alarm Source eNB	Alarm Identifier 100671499	 Q Probable Cause S1 SCTP association is inte 	Event Type Communication Alarm	Severity A Critical
AL 1 2		Alarm Source eNB eNB	Alarm Identifier 100671499 100671500	C Probable Cause S1 SCTP association is inte S1 AP setup fail	Event Type Communication Alarm Processing Error Alarm	Severity Critical Critical
Ab 1 2 3		Alarm Source eNB eNB eNB	Alarm Identifier 100671499 100671500 100675586	 Q Probable Cause S1 SCTP association is inte S1 AP setup fail Cell fault 	Event Type Communication Alarm Processing Error Alarm Quality Of Service Alarm	Severity Critical Critical Migor
Ab 1 2 3 4		Alarm Source eNB eNB eNB eNB eNB	Alarm Identifier 100671499 100671500 100675586 100675587	Q Probable Cause S1 SCTP association is inte S1 AP setup fail Cell fault Henodeb cann not provide s	Event Type Communication Alarm Processing Error Alarm Quality Of Service Alarm Quality Of Service Alarm	Severity Critical Critical Major Critical
1 2 3 4 5		Alarm Source eNB eNB eNB eNB eNB eNB eNB	Alarm Identifier 100671499 100675586 100675587 11	Q Probable Cause S1 SCTP association is inte S1 AP setup fail Cell fault Henodeb cann not provide s SAS Abnormal alarm	Event Type Communication Alarm Processing Error Alarm Quality Of Service Alarm Quality Of Service Alarm Equipment Alarm	Severity Critical Critical Major Critical Critical Critical
1 2 3 4 5 6		Alarm Source eNB eNB eNB eNB eNB eNB eNB eNB eNB	Alarm Identifier 100671499 100675586 100675587 11 11 11109	Q Probable Cause S1 SCTP association is inte S1 AP setup fail Cell fault Henodeb cann not provide s SAS Abnormal alarm S1 Setup failure	Event Type Communication Alarm Processing Error Alarm Quality Of Service Alarm Quality Of Service Alarm Equipment Alarm Communication Alarm	Severity Critical Critical Major Critical Critical Critical Major
1 2 3 4 5 6 7		Alarm Source eNB eNB eNB eNB eNB eNB eNB eNB eNB eN	Alarm Identifier 100671499 100675586 100675587 11 11109 11110		Event Type Communication Alarm Processing Error Alarm Quality Of Service Alarm Quality Of Service Alarm Equipment Alarm Communication Alarm Communication Alarm	Severity Critical Critical Major Critical Critical Major Major
1 2 3 4 5 6 7 50		Alarm Source eNB eNB eNB eNB eNB eNB eNB eNB eNB eN	Alarm Identifier 100671499 100675586 100675587 11 11109 11110 Go to 1 C	Probable Cause Probable Cause S1 SCTP association is inte S1 AP setup fail Cell fault Cell fault Henodeb cann not provide s SAS Abnormal alarm S1 Setup failure X2 Setup failure	Event Type Communication Alarm Processing Error Alarm Quality Of Service Alarm Quality Of Service Alarm Equipment Alarm Communication Alarm	Severity Critical Critical Major Critical Critical Major Major Total 12
1 1 2 3 4 5 6 7 50 Event Tr	ime lies	Alarm Source a/VB	Alarm Identifier 100671499 100671500 100675585 100675587 11 11109 11110 Go to 1 C	Q Probable Cause S1 SCTP association is inte S1 AP setup fail Ceil fault Henodeb cann not provide s SAS Abnormal alarm S1 Setup failure X2 Setup failure D End Time	Event Type Communication Alarm Processing Error Alarm Quality Of Service Alarm Quality Of Service Alarm Equipment Alarm Communication Alarm Communication Alarm	Severity Critical Critical Critical Critical Critical Critical Major Major Total 12

Figure 2-161: Operations



2.4.4.2.2 Library Tab Description

The Library tab displays a list of all possible system alarms, providing a probable cause and the severity level of each alarm (Figure 2-162). You can sort the data in the Device Type, Alarm Identifier, and Severity columns. Use the search bar to look for specific alarm IDs or probable causes. Use the Export icon in the top right of the window to save the list to your computer.

Figure	2-162:	Library
--------	--------	---------

⊒ /	llarm					● Critical 243 ● Major 20 ● Minor 16 ● Warning 0 FiSci (UTC-06:00)2021-10-07 10:11
View	Library					
			Q			G
	Alarm Source ©	Alarm Identifier $^{\oplus}$	Probable Cause	Severity ©	Event Type	Explanation
1	OMC	10	HA Master-Slave server switched	A Critical	Communication Alarm	The master system fails and master-slave server switched
2	eNB	11	SAS Abnormal alarm	A Critical	Equipment Alarm	SAS Abnormal alarm
3	eNB	11109	S1 Setup failure	🔺 Major	Communication Alarm	After the MME receives the response from the eNB, the S1 Application Protocol (S1AP) is connected to the underlying SCTP link resources available. T
4	eNB	11110	X2 Setup failure	🔺 Major	Communication Alarm	During handover, in the X2 Application Protocol (X2AP) connection - when the underlying SCTP link resources are available, the peer eNB will initiate t
5	eNB	11111	Memory allocation failure	A Critical	Equipment Alarm	When the eNB cache drops below 20 MB of free space the alarm is generated.
6	eNB	11112	SCTP link failure	A Critical	Communication Alarm	When the eNB detects the Stream Control Transmission Protocol (SCTP), the bearer service link cannot be established and it generates the alarm.

2.4.5 Performance Menu

The Performance menu is used to collect LTE Key Performance Indicator (KPI) metrics (Figure 2-163). As the network operators endeavor to provide qualitative service to the subscribers without exhausting the radio resources, monitoring and optimizing radio network performance is critical. Typically, LTE KPI metrics can be characterized into Accessibility KPI, Retainability KPI, Mobility KPI, Integrity KPI, Availability KPI, and Utilization KPI.

- Accessibility KPI: It is the success rate of users able to access the network.
- Retainability KPI: This helps retain the subscribers with the network to provide service.
- Mobility KPI: Handover is crucial to maintaining a moving subscriber connection. This KPI measures the performance in such events.
- Integrity KPI: This KPI measures the exact throughput and latency of the network
- Availability KPI: It measures the availability of the network to serve the users.
- Utilization KPI: To optimize the use of network resources, this KPI helps measure the usage of the resources.

This section helps in creating and configuring the custom and default KPI templates to measure the performance of various radio network resources.

Any eNBs included in a KPI template will collect standard KPI metrics. In addition to standard KPIs, operators can create custom KPI indices. Each function is explained in this section.

Figure 2-163: Performance Menu



2.4.5.1 KPI View

There are two panes in the KPI View window: On the left is a list of KPI templates, where Basic is a default template, and on the right is a list of the operator's eNBs shown in Table format (Figure 2-164). When you click on a KPI Template, you can select the report interval you wish to see: 15Min, 60Min, or 24Hour. Click on a field to display the formula used to calculate the indices.



The Table format and the Chart format (Figure 2-165) can be toggled using the icons in the upper right of the KPI View window. Hover over a data point to view the numerical data.

Figure 2-164: KPI View Table Format

xer view													
KPI Template					⇒ (a (15Min	60Min	24Hour				6
+ Add Template		Serial Number	Cell Name	ECI	Group Name	P	eriodic Is	aterval(Minute)	Start	Time	End Time		RRC setup success rate(%
Template Name	1				Default Device G	Group 1	5		2021-0	05-03 11:15:0	2021-05-03 11:3	0:00	100
Basic	2				Default Device G	Group 1	5		2021-0	5-03 11:15:0	2021-05-03 11:3	0:00	<u>N/A</u>
3.5.X test	3				Default Device G	Group 1	5		2021-0	5-03 11:15:0	2021-05-03 11:3	0:00	N/A
			E-RAB setup succe	ss rate(%)	Initial establishmer	nf success s	rate(%)	E-RAB drop rat	te(%)	Uplink Tr	affic Volume(KByte)	Down	link Traffic Volume(KByte)
			<u>N/A</u>		<u>N/A</u>			0		319589		12027	79
			<u>N/A</u>		<u>N/A</u>			0		<u>38921</u>		<u>12791</u>	21
			N/A		<u>N/A</u>			Q		49763		11198	88
					k	KPI Det	ail	4					
						Form	ula	Time	Granul	arity(Minu	ite) Start Time		Results



Figure 2-165: KPI View Chart Format

Tim	Deg Test Mont C 2014/12 - 2	Select to switch	
KP11 KRO000001 (RRC setup success sate) • eNB Serial Numbers			
N			30,001 State 15.00 1,000 0.00000071462/00042000 mmmm. 2,000 0.00000071462/00042000 mmmm. 2,000 0.00000071462/00042000 mmmm. 3,000 0.00000000000000000000000000000000000
00 01 02 00 04 05 06	新 論 論 读 前 读 销 诵 销 祷 前 销 销	1 21 22 23 Hour	⁶
KPI2 K90000002 (E-RAB setup success rate)		×	KP66 K00000001) (Devenliek Treffic Volume)
	*****	1 2 2 2 ¹⁰	
KPI3: K90000004 (Initial establishment success rate)		1	
	O 1 O O	2 - 22 - 23 - 1957	
KP14: K90000009 (E-RAB drop rate)			
		200000117792020adraws samt	

The Filter button provides a way to sort the devices and KPIs you want to see Figure 2-166).

Figure 2-166: Filter KPI View



Customizing KPI indices opens additional ways to look at network performance and facilitates the long-term monitoring of an index group. To create a custom KPI template (Figure 2-167):

Bricells

- 1. Click on + Add Template to enter the KPI Template window.
- 2. Enter a Template Name and Description.
- 3. Under Period Setting, select the Periodic Interval and days of the week plus hours for collecting the data.
- 4. Select the eNB device group(s) and device(s) you want to monitor.
- 5. Select the KPIs to report.
- 6. Click on *OK* to save the settings. The new template will appear in the KPI View list. You have the option to download the results as a .csv file.

Figure 2-167: Add New KPI Template





The View Template List icon displays all templates. It provides *Operations* functions: Set as default, view Information about the template configuration, Modify the template configuration, Delete the template, Export the template data, and make this a Regular Report.

If you enable the Regular Report function, you can automate report generation by Day or Hour, create a Send Time, and enter Email addresses where the report will be sent. Use a semi-colon (;) to separate multiple email addresses.

2.4.5.2 KPI Meas

The KPI Meas (measurement) menu is used to check the status of per-eNB KPI measurements via the KPI View template. The column headers include the current measurement period (how long the KPI was tracked), the date and time the measurement started, and the last time the KPI information was updated (Figure 2-168).

Figure 2-168: KPI Meas

E	Perf	ormance / KPI Meas				Critical 157 Major 18	i 😑 Minor 10 🔍 Warn	ing 0 FiSci
KPI	Meas							
	Secial Nu			Q				
	Status 0	Serial Number ©	Cell Name 🗘	ECI 0	Measure Period(Minute)	Start Time 🗘	Update Time 🗘	Operations
1	1				15	2020-07-27 14:45:01	2020-07-28 13:45:02	• ±
2	*				15	2020-07-13 11:22:28	2020-07-17 12:00:08	(i) <u>i</u>
3	1				15	2020-07-01 14:02:28	2020-07-28 13:45:28	⊙ <u>∔</u>
4	<u>\$</u>				15	2020-04-20 11:03:09	2020-07-07 11:29:06	• • • • •
5	<u>\$</u> .				15	2020-02-04 13:06:06	2020-02-05 10:30:48	۰ ا
6	ŵ.				15	2019-12-09 15:37:10	2020-03-12 09:31:14	⊕ ±
7	Ŷ.				15	2019-12-04 17:04:34	2020-02-26 10:21:02	⊕ ⊥
8	Ŷ.				15	2019-11-19 17:13:26		⊕ ±

Under Operations, select the circle to close the KPI for that eNB. If you select the Download arrow, a pop-up window will ask you to choose the period from the KPI measurements you want to download. The XML files will download as a zip folder. Once extracted, you can open each XML file to examine the raw KPI data (Figure 2-169).



Figure 2-169: Download XML Files

date Time 🗘	Operations	📕 Fil	le	Home	Share	View										
10-07-17 12:00:08 10-07-31 14:55:37 10-08-17 07:01:34	1 1 1	in to ac	o Quick ccess	Copy	Paste	 ✓ Cut ✓ Copy path Paste shortcut 	Move to *	Copy to *	Delete Renam	New folde	New item Key access	Propertie	Edit	 Select all Select none Invert selection 		
Please select the time.	×				pooard	his DC > Desiste		202000	17071005		INEW		open	Select		Cearsh KDL 2
Plasse salect the time. Start Time: 2020-08-16 07.16.56 End Time: 2020-08-17 07.16.56 OX Cancel X91_2022008177 07/10305 X91_20220081,77		-	->	Cli V 1 versi I versi I ile xsi: xsi=" FileHeat Con <se <se <se <se <se <se <se <se< th=""><th>pboard > T > T</th><th>his PC > Deskt</th><th>p > KPI Name Ai Ai Ai Ai Ai Ai Ai Ai Ai Ai Ai Ai Ai</th><th>Crg; 202006 20200081 202081 202081 20</th><th>nize 117071005 6.2345+0000- 7.0000+0000- 7.0015+0000- 7.0015+0000- 7.0045+0000- 7.01045+0000- 7.01045+0000- PmFileForm LSchema-i B-PM-V2.5 =1Manag +00:00 N></th><th>0000+0000 0015+0000 0030+0000 045+0000 1100+0000 1100+0000 0ement Time></th><th>New 10_488F74.1202000 10_488F74.120200 10_488F74.1200 10_488F74.12</th><th>00511696Pi 00511696Pi 00511696Pi 00511696Pi 00511696Pi 00511696Pi</th><th>0381 0381 0381 0381 0381 0381 0381 0381</th><th>Select Date modified 8/17/2020 08:10 AM 8/17/2020 08:10 AM</th><th>V ひ Type XML Document XML Document XML Document XML Document XML Document</th><th>Search KPL2 Size 36 KB 35 KB 35 KB 35 KB 35 KB</th></se<></se </se </se </se </se </se </se 	pboard > T > T	his PC > Deskt	p > KPI Name Ai Ai Ai Ai Ai Ai Ai Ai Ai Ai Ai Ai Ai	Crg; 202006 20200081 202081 202081 20	nize 117071005 6.2345+0000- 7.0000+0000- 7.0015+0000- 7.0015+0000- 7.0045+0000- 7.01045+0000- 7.01045+0000- PmFileForm LSchema-i B-PM-V2.5 =1Manag +00:00 N>	0000+0000 0015+0000 0030+0000 045+0000 1100+0000 1100+0000 0ement Time>	New 10_488F74.1202000 10_488F74.120200 10_488F74.1200 10_488F74.12	00511696Pi 00511696Pi 00511696Pi 00511696Pi 00511696Pi 00511696Pi	0381 0381 0381 0381 0381 0381 0381 0381	Select Date modified 8/17/2020 08:10 AM	V ひ Type XML Document XML Document XML Document XML Document XML Document	Search KPL2 Size 36 KB 35 KB 35 KB 35 KB 35 KB
					<n <br="" i="
<N i="><n <br="" i="
<N i="><n i="</th><th>6">RRC.Con 7">USER.Co 8">USER.Co 9">USER.Co 9">USER.Ac 10">USER.A</n></n></n>	nAbnor nnMear nnMax tMean ctMax<	rmalR/ n 	ei								

2.4.5.3 KPI Mgmt

The KPI Mgmt (management) menu shows the library of KPI function sets (Figure 2-170). A function set is a grouping of KPIs related to the same operation; for example, the EQPT function set contains all KPI indices related to Layer 1 Physical Layer. Most KPIs are standard LTE indices, like the one shown in Figure 2-171; however, any Baicells-specific KPIs are considered customized and contain a formula that uses multiple standard KPIs.

Use the *Operations > View* function to open the details about a specific KPI. The KPI information includes the KPI name; the function set it belongs to, the unit of measurement used, the KPI ID, the statistic type (e.g., average, mean, sum, etc.), an explanation (description), and if customized, the formula used to calculate the KPI.

Figure 2-170:	KPI Mgmt	Standard	LTE KPI	Example
1. Baic - 1/0.		standara		Example

PI Function Set			Q					
MPI Function Set	Line and	100 March 10	6	82-1c			11-1-1-11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	
CONTEXT	KPI ID =	KPI Name ©	Custom Name =	Unit	Lype =	User	Update Time =	Operations
Customize	1 C000000001	RRC.SetupTimeMean	RRC.SetupTimeMean	ms	Basic KPI	admin	2018-03-30 18:00:00	۲
Customize_Q	2 C000000002	RRC.SetupTimeMax	RRC.SetupTimeMax	223	Basic KPI	admin	2018-03-30 18:00:00	۲
DRB	3 C00000003	R.R.C.ConnMean	RRC.ConnMean	number	Basic KPI	admin	2018-03-30 18:00:00	۲
EQPT	4 C000000004	RR.C.ConnMax	RRC.ConnMax	number	Basic KPI	admin	2018-03-30 18:00:00	۲
ERAB	5 C00000005	R.R.C.AttConnEstab	RRC.AttConnEstab	time	Basic KPI	admin	2018-03-30 18:00:00	۲
HO	6 C00000006	RR.C.AttCounEstab.Emergency	RRC.AttConnEstab.Ex	time	Basic KPI	admin	2018-03-30 18:00:00	۲
IRATHO	7 C00000007	RRC.AttConnEstab.HI_PRIO_ACCESS	RRC AttConnEstab H	time	Basic KPI	admin	2018-03-30 18:00:00	۲
MAC RAG	\$ C000000008	RRC_AttConnEstab.MT_ACCESS	RRC.AttConnEstab.M	time	Basic KPI	admin	2018-03-30 18:00:00	۲
PDCP	9 C000000009	RRC.AttConnEstab.MO_SIGNAL	RRC_AttConnEstab.M	time	Basic KPI	admin	2018-03-30 18:00:00	۲
D PHY	10 C00000010	RRC.AttConnEstab.MO_DATA	RRC.AttConnEstab.M	time	Basic KPI	admin	2018-03-30 18:00:00	۲
RLC	11 C000000011	RRC_AttConnEstab.DeToAccess	RRC_AttConnEstab.D	time	Basic KPI	admin	2018-03-30 18:00:00	۲
RRU	12 C000000012	RRC.SuccConnEstab	RRC.SuccConnEstab	time	Basic KPI	admin	2018-03-30 18:00:00	@ V
S1	13 C000000013	RRC.SuccConnEstab.EMERGENCY	RRC.SuccConnEstab.J	time	Basic KPI	admin	2018-03-30 18:00:00	ø
SISIO	14 C000000014	RRC.SuccConnEstab HIGHPRIORITYACCES	RRC.SuccConnEstab.J	time	Basic KPI	admin	2018-03-30 18:00:00	
USER .	12	BBA Passa Passa S PEACORCE	BBC Fundame Patrick	-	Partie West	a dan la		-

Basic Info			
KPI Name		Custom Name	
RRC SuccConaEstab		RRC SuccConnEstab	
Function Set.		KPI ID.	
RRC	*	C00000012	
Unit		Statistic Type:	
604		Sum	
🗊 Formula			
© Formula	ndard LTE KPI		

T



Figure 2-171: KPI Mgmt, Custom KPI Example

KPI Fun	ction Set										
і 📄 КРІ 📄 Сі	Function Set	KPI ID 🗘	KPI Name 🗘		Custom Name \diamondsuit	Unit	Type 🗘	۲	User 🗘	Update Time \oplus	Operations
C	ustomize	1 K90000000	Signaling connect	ion establishment success rate	Signaling connection establishment success rate	96	Basic KPI		admin	2018-03-30 18:00:00	0
C	ustomize_Q								Г		
Informati	on					•	•				
	Basic Info										
	KPI Name:			Custom N	ame:						
	Signaling connection estab	blishment success rate		Signalin	g connection establishment success rate						
	Function Set:			KPI ID:							
	Customize		~	K90000	0007						
	Unit:			Statistic T	ype:						
	96		~	Pct		~					
	Presidente										
	Explain.										
	Formula										
	, or in a la										
	(C000120002	/ C00012000	1) * 100	Custom KPI							
				Custom KFT							
	(S1SIG.ConnEstab	Succ / S1SIG.Cor	nEstabAtt) * 100								

2.4.5.4 KPI Alarm

The *Performance > KPI Alarm* function enables operators to create "compare" operations for specific devices (Figure 2-172). A specified threshold is compared to a standard KPI. If the data exceeds the threshold, the system reports the alarm. You can add up to 5 comparisons per template.

The compare operations are:

- > Greater than
- < Less than
- = Equal to
- ≥ Greater than or equal to
- \leq Less than or equal to



Figure 2-172: New KPI Alarm Template

Name	Status		Latest	Alarm Index	Latest Alarm Tin	ie User		Update Tim
								_
New KI	PI Alarm Template							
	Basic Info							
	* Name							
	Description							
	maximum length: 200							
			/_					
	Status							
	🔿 Enable 💿 Disable							
	Select Device Device Group Device							
	Select Device Device Group O Device eNBs						Sele	ected (0) 📀
	Select Device Device Group Ovice eNBs Device Group					Q	Sele	ected (0) 📀
	Select Device Device Group Device eNBs Device Group 1 Default Device Group			r / Cell Name Serial Number		Q	Sele Cell Name	ected (0) 📀
	Select Device Device Group eNBs Device Group 1 Default Device Group 2 test			er / Cell Name Serial Number		٩	Sele Cell Name	ected (0) 🕤
	Select Device Device Group Device eNBs Device Group 1 Default Device Group 2 test	1		e / Cell Name Serial Number		Q	Seld	ected (0) 📀
	Select Device Device Group eNBs Device Group 1 Default Device Group 2 test 3 4 5	1 2 3		e / Cell Name Serial Number		٩	Sele Cell Name	ected (0) ⓒ
	Select Device Device Group Device eNBs Device Group 1 Default Device Group 2 test 3 4 5			er / Cell Name Serial Number Co Co Co Co Co Co		Q	Sele	ected (0) ⓒ
	Select Device Device Group Device eNBs Device Group 1 Default Device Group 2 test 3 4 5	1 2 3 4 5 6		e / Coll Number		Q	Sele	ected (0) ⓒ
	Select Device Device Group Device eNBs Device Group 1 Default Device Group 2 test 3 4 5	1 1 2 3 4 5 6 7		e / Cell Name Serial Number 60 60 60 60 60 60 60 60 60 60 60 60 60		Q	Sele	ected (0) ⓒ
	Select Device Device Group eNBs Device Group 1 Default Device Group 2 test 3 4 5	5 1 2 3 4 5 6 7 8		er / Cell Name Serial Number Co Co Co Co Co Co Co Co Co		Q	Sele	ected (0) ©
	Select Device Device Group eNBs Device Group 1 Default Device Group 2 test 3 4 5 20/page × 4 >	1 1 2 3 4 5 6 7 8 9		er / Cell Name Serial Number Co Co Co Co Co Co Co Co Co Co Co Co Co		Q	Sele	ected (0) ③
	Select Device Device Group eNBs 1 Default Device Group 2 test 3 4 5 20/page < 1 > Go to 1 C To	1 1 2 3 4 5 6 7 7 8 9 9 2		er / Coll Nume Serial Number Co Co Co Co Co Co Co Co Co Co Co Co Co	Go to 1	Q	Sele	ected (0) S
	Select Device Device Group eNBs Device Group 1 Default Device Group 2 test 3 4 5 20)page < 1 > Go to 1 C To KPI (Up to 5 allowable settings)	1 1 2 3 4 5 6 7 8 9 9 2 4	erial Numbr	r / Cell Xams Serial Number Serial Number Serial Number Serial Sum Seria Sum	Go to 1	Q	Sele	ected (0) 📀
	Select Device Device Group eNBs Device Group 1 Default Device Group 2 test 3 4 5 20:page < 1 > G to 1 C To KPI (Up to 5 allowable settings) * KPI Name	1 1 2 3 4 5 6 7 8 9 9 tal 5 20	erial Neesba	e / Cell Name Serial Number Co Co Co Co Co Co Co Co Co Co Co Co Co	Ge te 1	C KPI Threshold	Sele	ected (0) ③

To create a new KPI Alarm template (see Figure 2-172 above):

- 1. Select the + Add icon in the upper right of the window.
- 2. Enter a template name and, optionally, a description. For now, skip the Status setting; you will enable the template after saving the template information.
- 3. Under Conditions, select either Device Group or Device to display the eNBs by group or individually.
- 4. Select the checkbox next to the eNBs you wish to include in the template.

- 5. Under KPI:
 - a. Select the standard KPI Name from the drop-down menu.
 - b. Select the Compare operation from the drop-down menu, e.g., less than, greater than, equal to.
 - c. Enter the threshold value.
 - d. If you wish to add another comparison, select the + Add icon and repeat steps 5a-5c.
- 6. Click on *OK* to save the settings. The template will be added to the KPI Alarm list.

Use the *Operations > Enable* the function to start using the new KPI alarm. To see the results of the data, select *Operations > Results*. The information will display at the bottom of the window (Figure 2-173).

Figure 2-173: Results

PI Alarm						
		Q				G
Name	Status		Latest Alarm Index	Latest Alarm Time	User	Update Time
1 Denton eNBs UL F	acket Loss 💿 Disable				Mona	2020-10-30 11:23:18
 € Enable ☐ Information ∠ Modify ☑ Delete 						
Results						×
Index Severity	Identifier	Probable Cause	Specif	lic Problem	Alarm Time	Status

2.4.6 Advance Menu

The Advance menu contains the configuration fields for SAS and Plug-and-play (Figure 2-174). These unique functions are explained in this section.

Figure 2-174: Advance Menu



2.4.6.1 SAS

The Citizens Broadband Radio Service (CBRS) Spectrum Access System (SAS) is an operating solution available only in the United States. The solution requires a working knowledge of SAS, preparation of personnel and equipment, and coordinated configuration across device GUIs, the OMC, and the selected SAS vendor's portal. For this reason, Baicells created the *SAS Deployment Guide* to assist operators in planning their deployment of SAS. Refer to that guide for more information about SAS.

2.4.6.2 Plug-and-play

The OMC supports a plug-and-play mechanism for eNB and CPE. Plug-and-play is configuring software upgrades and adding cell configuration rules on OMC. When a new eNB /CPE is connected to OMC, the device can be configured or upgraded automatically without any intervention from the user. The display of plug-and-play has eNB and CPE.

2.4.6.2.1 eNB and CPE display

To configure new eNBs and CPEs or test upgrade software plug-and-play mechanism can be used. Each new plugand-play strategy is added to the display. You can view information, detect, or delete each strategy. (Figure 2-175)

⊒	Advance /	Plug-and-play				. 3	38 🔴 11	• 12 • 0	FiSci (UTC-	-06:00)2022-01-31 16:36
eN	в	CPE								
					Q			New	Plug-and-	play Task 🕂
		Enable	Pushed Policy		Product Type	Upgrade	Policy Name	Configure	User	Operation Time
1	÷		•		RTS	Target Version	Testing2	Yes		2021-06-17 15:
2	÷		0		RTS	Target Version	Testing	Yes		2021-06-17 15:
3	001		0		RTS	Target Version	test	Yes		2021-06-16 15:
5	^{0/pa;} 📮	Information	o to 1	C						Total 3
Ex	ecut 😋	detect								
	Polic, 🗵	Delete			Q			Succe	ss 1	Fail 1
		Serial Number	Product Type	Policy Name	Upgrade Start T ime	Upgrade End Ti me	Configure Start Time	Configure End Time	Status	Failure Reason
2	Þ ē	120200005116	RTS	Testing	2021-06-17 15	2021-06-17 15	2021-06-17 15	2021-06-17 16	Success	

Figure 2-175: Plug-and-play eNB Display

To create a new Plug-and-play task (Figure 2-176)

- 1. Click on the "+" icon at the top right corner to create a new Plug-and-play strategy.
- 2. Under Basic Info, enter the policy and product type.
- 3. In Software Upgrade, select the target version from the drop-down list.
- 4. Refer to the eNB configuration guide for parameter configuration and enter the parameters.
- 5. Click OK and save the settings.

Note: CPE operation is the same as eNB except for parameter configuration.


Figure 2-176: New Plug and Play Task

Advance	e / Plug-and-play				Critical 38 Major 11	Minor 12	Varning 0 FiSci (UT
w							
Basi	sic Info						
* Po	olicy Name			* Product Type Select			
] Soft	tware Upgrade						
* Ta	arget Version			Retain Configuration	Yes 🔿 No		
Sala	act Varcian						Selected (0) 📀
3616	eet version	Version	Version List				Đ
) All	Original Version Original Version		Q		
		• Select					
Para	ameter Configura	ition					
C	Cell Configuratio	n				MME/HaloB Cor	figuration
F	Frequency Band			Earfcn(DL)		HaloB Enable	False
В	Bandwidth			PLMN		MME	+
т	ГАС			PCI			
Е	ECI(ECI=eNB_ID	*256+Cell_ID)		Subframe Assignment	Please Select 🗸		
s	Special Subframe	Patterns	Please Select				
ОК	Cancel						

2.4.7 System Menu

The OMC System menu contains settings that the operator can view, create, modify, or delete for specific OMC displays, OMC account logs, and administrative user settings for their account (Figure 2-177). Each function is described in this section.

Figure 2-177: OMC System Menu



2.4.7.1 Resources

The *System* > *Resource* menu shows the utilization of the CPU, disk space, database size, and memory usage. The administrator can refer to the statistics to maintain and optimize the system. To view the Resources landing page, select *System* > *Resources*, and a graph of resource utilization is seen. To view the usage statistics of resources in a particular period, select the time frame from the calendar. You can also view the usage by hovering over the graph (Figure 2-178). To export the usage as a .csv file, click on the *Export* icon at the top right corner of the page.





2.4.7.2 Settings

The *System > Settings* menu has two fields: Device name synchronize and CPE Signal strength display (Figure 2-179). For Device name synchronizes, if you click the first checkbox, the OMC will display the same device name in OMC as is used in the device GUI [referred to as Local Maintenance Terminal (LMT) on the screen]. If you click on the second checkbox, OMC will notify you to manually sync the device name in OMC.

For the CPE signal strength (RSSI), you can set the values for what is considered a weak signal threshold and a strong signal threshold for the icons in any of the OMC windows that report signal strength. The closer the dBm value is to zero, the stronger the signal.



Figure 2-179: Settings

➡ System / Settings		Critical 227	Major 19	Minor 16	Warning 0	FiSci
System Settings						
Device Setting Select Device name synchronize	t preferred option Check the device name on the OMC and configure it to match the configuration Notify me to sync manual	a on the LMT				
CPE Signal strength display	Display the signal strength in range: Weak < -105 ONormal < -90	Strong				
OK Cancel	Values are editable					

2.4.7.3 Logs

The *System* > *Logs* menu displays all operational logs concerning OMC usage of the operator's account (Figure 2-180). Each log appears on a separate row and details the event: user's ID, name, IP address; the name of the log, record detail, results, failure reason (if applicable); and the operation's start and stop time. The latest logs will appear at the top of the list. Click on the Export icon to export logs for further analysis.

Figure 2-180: OMC Operation Logs

-	System / Log	S					Critical 227 Major 19	Minor 16	Warning 0
era	tion Logs								
				¥	Q				
	ID	User Name	IP Address	Log Name	Record Detail	Results	Failure Reason	Op Start Time	Op End Time
1	298371			Update self-start info	set self config info, operator code is:	Success		2021-04-26 12:13:04	2021-04-26 12:13:04
2	298370			Update self-start info	set self config info, operator code is:	Success		2021-04-26 12:13:01	2021-04-26 12:13:01
3	298325			Update self-start info	set self config info, operator code is:	Success		2021-04-26 11:02:56	2021-04-26 11:02:56
4	296031			Activate Device	cell config activate, cell code is :null	Fail	send config active timeout	2021-04-20 09:43:14	2021-04-20 09:49:07
5	296030			Activate Device	cell config activate, cell code is :null	Fail	send config active timeout	2021-04-20 09:43:03	2021-04-20 09:48:56
6	296024			Register Device	Add the device of eNodeB data(Dev	Success		2021-04-20 09:37:48	2021-04-20 09:37:48
7	296023			Register Device	Add the device of eNodeB data(Dev	Fail	The device already exists.Device alrealy exists : [120	2021-04-20 09:37:40	2021-04-20 09:37:40



2.4.7.4 Backup & Restore

2.4.7.4.1 Backup

Backup is used to store the system settings and device data elsewhere to restore the data in the event of an OMC system crash, natural disaster, or data corruption.

To create a backup (Figure 2-181):

- 1. Select *System > Backup & Restore* to enter the system Backup window.
- 2. Using the radio button select the Execute Mode, either immediately or timed. For Timed Backup, enter the calendar's start time (Figure 2-181).
- 3. Select which part of the backup you want to execute, system settings, operation history, or device data.
- 4. Enter how often you want to perform a backup for each part in days in the text box.
- 5. To take a Backup on a list of files, enter the files list in the text box and hit search.
- 6. Click *Start* to start a backup.

Figure 2-181: Backup

		Start Time	Select							
		0	≪≮		202	2 Jan	uary		>>	
Execute Mode	/		Sun	Mon	Tue	Wed	Thu	Fri	Sat	
Immediately Backup	Timed Backup		26		28	29	30		1	
			2	3	4	5	6	7	8	
			9	10	11	12	13	14	15	
Backup Part			16	17	18	19	20	21	22	
			23	24	25	26	27	28	29	
System Settings			30	31	1	2	3	4	5	
 Operation History 	365	(Days)				P	iow		OK	
Device Data	7	(Days)								
									5	Start
-										

2.4.7.4.2 Restore

To reinstate the files back into the system, select the restore tab in the restore window and enter the file that needs to be restored. Using the search bar search the files. After selecting the files, click on the *Export* icon to restore the files (Figure 2-182).

Figure 2-182: Restore

➡ System / Backup&Restore		38	11 0 12 0	FiSci (UTC-06:00)2022-01-31 21:43
Backup Restore				
File Name	Q			Export
File Name		Backup Version	Backup Part	Backup Time

2.4.7.5 License

The license setting shows the current license of the OMC. The license window shows the basic info like License ID, Expiry Date, and License type. The feature list shows the licenses of various features in the OMC. To update the license lists, click on the *Update* button at the bottom of the page and enter the license file name to import (Figure 2-184). Click *OK* to save the License file.

Figure 2-183: License

➡ System / License	Critical 38	Major 11	Minor 12	Warning 0
Basic Info				
License ID :	License Type : Co	mmercial		
Expiry Date : 2036-05-06 00:00:00 (Remain 5211 Days)				
Devices Support Quantity 100000 Quantity 1000000				
Feature List				
Dashboard All				
Management (1)				
Update				

Figure 2-184: Update License

Update License	×
	€
OK Cancel	

2.5 BOSS

2.5.1 Overview

An operator's CloudCore account includes the Business and Operation Support System (BOSS) module. Operators can use BOSS to add/change/delete subscribers and create/change/delete service plans. Figure 2-185 shows the BOSS menus.

Figure 2-185: BOSS Menu



2.5.2 Subscription Menu

2.5.2.1 Description

The BOSS Subscription menu is where you add, modify, activate/deactivate, or delete existing subscription accounts. Existing subscriptions are shown in the list on the main page. For each existing subscription, you will see the name, SIM card IMSI, the assigned service plan, the status, the name of the CPE being used, the origin (which CloudCore administrator added the subscription), and a description. You can search the IMSI/Name using the text box. Also, by clicking the advanced query filter option, you can filter the required fields and process the search

NOTE: The terms subscription, subscriber, user, and customer are used interchangeably to indicate the entity given access to the network. The general term used is account.

Figure 2-186: Advanced Query Filter

Subscription				
IMSI/Name	¥	Q		
Name:	Advanced query filter	IMSI :	Status:	
			All	\sim
Query Reset				

Figure 2-187: Subscription Menu

ଜ cloudcore	OMC		BOSS	5							
Subscription		Ξ									
S Network		Subsc	ription								Add Records
System		IN	ISI/Name				× Q				000
					Name \$	IMSI \Leftrightarrow	Service Plan 💠	Status 💠	CPE Name 🌩	Origin	Description Export
		1		÷			test	C Active		Boss-user	move user
		2		÷			Default User Plan	C Active		Boss-user	Manual Active
		3		÷			100m	C Active		Boss-user	Manual Active
		4		1			250Mbps	C Active		Boss-user	Active by add subscriber
		5		÷			default	C Active		Boss-user	Bulk Active Users
		6		÷			default	C Active		Boss-user	Bulk Active Users
		7		÷			default	C Active		Boss-user	Bulk Active Users
		8		1			default	C Active		Boss-user	Bulk Active Users
		9		÷			default	C Active		Boss-user	Bulk Active Users
		10		÷			default	C Active		Boss-user	Bulk Active Users
		11		÷			test200	C Active		Boss-user	Manual Active

2.5.2.2 Operations

To view more details about an existing subscription, use the *Operations* icon and select Detail. The Overview window opens, displaying the service plan, SIM card, invoice status, and other information (Figure 2-188).

All actions that can be taken from the Overview window - such as More, Change, and Refund - will appear in blue, with hyperlinks or buttons to other dialogue windows, as shown in the figure.

Figure 2-188: Operations Detail

The three hyperlink callouts are shown beneath the main window in the figure.

:			
↓			
🗐 Detail 🔶 o	verview		
Co Deactivate	Service Plan	Remaining Throughout(MB)	Expiry Date
Delete	Sample (Main)	Unlimited	2026-07-27
	More		
	SIM Card No.:	Balance S 0.00	Invoice Paid: \$ 0.00 Unpaid: \$ 0.00
(2	Change	Recharge Refund Transactions	More
	Customer Information		Modify
	Operator: FiSci	Status: Active	Name:
	Email:	Phone:	ID Type: Other
	ID Number:		
	Country:	State/Region:	Town/City:
	Steast & James		
	Street Address.	Zip/Postal:	
	Information	ZipiPostal:	Click on Modify to Modify
	CPE Name: Sync to OMC	ZipiPostal:	Click on Modify to Modify to change the CPE Name
H	Information CPE Name: Sync to OMC	ZipiPostal:	Click on Modify to Moderno
H (1)	Information CPE Name: Sync to OMC Iyperlink Call-outs ervice Plan	Zīpi/Postal:	Click on Modify to Modify to change the CPE Name
(1) [s	Information CPE Name: Sync to OMC Sync to OMC Sync to OMC CPE Plan Main: Change	ZipiPestał	Click on Modify to Modify change the CPE Name
	Information CPE Name: Sync to OMC IVPErlink Call-outs ervice Plan Main: Change Service Name Pr	ZipiPostal:	Click on Modify to Mode change the CPE Name
(1)	Information CPE Name: Sync to OMC IVperlink Call-outs ervice Plan Main: Change Service Name Pr test \$0	ZipiPostal: ice Service Begin Date Service End Date 00 2021-09-20 2021-10-20	Click on Modify to Mode change the CPE Name
	Information CPE Name: Sync to OMC Iyperlink Call-outs ervice Plan Main: C Change Service Name Pr test \$0 Addition:	ZipiPostal: ice Service Begin Date 00 2021-09-20 2021-10-20	Click on Modify to Mode change the CPE Name
(1)	Information CPE Name: Sync to OMC Iyperlink Call-outs ervice Plan Main: ▲ Change Service Name Pr test \$0 Addition: Service Name Pri	Zip/Postal: Service Begin Date Service End Date 00 2021-09-20 2021-10-20 ce Type Throughput Period	Click on Modify to Mode change the CPE Name

		IMSI			Status	
1	0				AVAILABLE	
2	0				AVAILABLE	
3	0				AVAILABLE	
3 Balance Create D:	O de From:		Create Date To:		AVAILABLE	



2.5.2.3 Add Subscription

2.5.2.3.1 Before You Begin

If you have not already done so before you begin adding subscriptions, you should:

- From the BOSS menu, go to *Network > SIM Card* and import the IMSI information for the SIM cards provided by Baicells (*section 2.5.3.1 SIM Card*); and
- Go to *Network > Service Plans* and create custom service plans (*section 2.5.3.2 Service Plans*). Subscriptions left unassigned to a custom plan will be placed in the default plan.

2.5.2.3.2 What Happens After You Add a Subscription

When you add a new subscription - including assigning a SIM card and service plan - and save the information, the subscription and the SIM card will be immediately activated. The user will have access to the network as soon as the subscription status is active:

- Once the CPE is powered on (and if the CloudKey was entered in the CPE's GUI), the CPE is automatically registered in the operator's OMC account.
- The Baicells CloudCore per-active-user billing to the operator begins. For more information, please refer to *section 2.3.1 Billing Menu*.

2.5.2.3.3 Options for Adding Subscriptions

There are multiple ways to add subscriptions. You can (a) add a single subscription "from scratch," that is, by manually entering all of the information into the Add Subscription fields; (b) add a single subscription by copying another subscription's settings and then modifying the information as needed, or (c) bulk upload information for multiple subscriptions using an Excel .csv template.

2.5.2.3.3.1 Adding a Single Subscription

To add a new, single subscription:

- 1. Click on the + Add icon to open the New Subscription window (Figure 2-189).
- 2. Complete the Customer Information section. For now, disregard the blue hyperlink next to Customer Information called "*Select existing customers.*" This option is explained later in this section.
- 3. If a CPE Name was configured for the account associated with the CPE, it appears in the CPE Name field. Use the Sync CPE name to the OMC checkbox to sync the CPE's data to the OMC.
- 4. For SIM Card, select the radio button next to an available IMSI.
- 5. Under Service Plan (Figure 2-190), select the radio button next to the plan this subscription will use. All service plans previously created are listed under Service Name. The price, periodical (billing recurrence), bill type (time-based is the only option), billing period, throughput, and uplink (UL)/downlink (DL) speeds are displayed. When you select a plan, the plan's name appears at the top of the Service Plan pane, and the Valid Date appears at the bottom. The Valid Date reflects the Service Plan's periodical (billing recurrence) established for the chosen plan. The price of the service plan and other information appears at the bottom.



6. After completing all the fields under New Subscription, click *OK* to save the settings. The subscription is added to the list on the main Subscription window, and the account is activated by default.

NOTE 1: The GUI can take a few minutes to refresh the subscription status from inactive to active. NOTE 2: Use the *Operations > Deactivate* function to deactivate an account.

Figure 2-189: New Subscription (1 of 2)

bscriptio	on 🔸						
E Custo	mer Informati	on O Customer ini	to will be saved and can be se	elected when creating new subscri	ption <u>Select existing customers</u>		
Name				Email		Phone	
Country	,	Please Select	~	State Region		Town/City	
Street A	lddress			Zip/Postal			
SIM CPE 1	Card Name		Sync CPE name to OMC				
SIM C CPE 1 • IMS	Card Name		Sysc CPE same to OAC				
SIM C CPE 1 * IMS	Card Name SI IMSI	SI	Syste CPE same to OAAC				
SIM CPE 1	Card Name SI IMSI	SI	Sync CPE name to OMC				
SIM 0 CPE 1 IMS 1 2	Card Name SI MSI IMSI	SI	Sync CPE name to OAIC				
SIM C CPE 1 * IMS 1 1 2 3	SI IMSI O O	SI	Status AVAILABLE AVAILABLE AVAILABLE				
 SIM C CPE 1 TMS 1 2 3 4 	SI IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	SI	Status Status AVAILABLE AVAILABLE AVAILABLE AVAILABLE				

Figure 2-190: New Subscription (2 of 2)

0	U	Service Name starter	Price	Periodical	Bill Type	Period	Throughput	Speed(UL/DL
9	0	Sample	\$ 0.00	Periodically	Time	5 (Year)	Unlimit	100 / 100
10	0		\$ 0.00	Periodically	Time	1 (Month)	Unlimit	10 / 10
11	0		\$ 0.00	Periodically	Time	1 (Month)	Unlimit	1/6
12	0		\$ 0.00	Periodically	Co Time	1 (Month)	Unlimit	2 / 10
13	0		\$ 0.00	Periodically	Time	1 (Month)	Unlimit	5 / 20
5 Amoun Valid D	0/page at: \$0.00 Date: 2021-(4.1 > Go to 04-29 - 2026-04-28	1 C					



2.5.2.3.3.2 Adding a Single Subscription by Copying an Existing Subscription

To add a single new subscription by copying an existing subscription's account settings:

- 1. Click on the + Add icon to open the New Subscription window (Figure 2-191)
- 2. Click on the "Select existing customers" link to open the Customer window.
- 3. Find and select the existing customer account you wish to copy.
- 4. Click on *OK*. The New Subscription window will now display the existing customer's information. Modify any of the fields as needed for the new subscriber. Refer to section 2.5.2.3.3.1 Adding a Single Subscription above to describe the remaining steps.

Figure 2-191 Add Subscription by Copying and Modifying an Existing Subscription

ew	ubscription 🔸								
	Customer Information	Customer info will be saved and can be s	elected when creating new subs	cription Select existing custome	3				
usto	mer 🖣 – – – – – – – – – – – – – – – – – –				×	w Subscription			
[) Number/Name	¥ Q				Customer © Custom Information subscriptio	er info will be saved and can be sel n	ected when creating new	Select existing customers
	Customer ID	Name	ID Type	ID Number		Name Ray Somebody	Email	Phene	
	0		Other			ID Type	D Number 2021041561539		
	0	Ray Somebody	Other	2021041561539			1		
	0		Other		11	Country	State Region	Tewn City	
	0		Other			Please Select V			
	0		Other			Street Address	Zip Postal		
	0		Other						
	D/page v < 1 2 3 >	Go to 1 C		Total 1	43				

2.5.2.3.3.3 Add Multiple Subscriptions Using Import File

The Import option allows you to simultaneously upload information for multiple subscriptions using an Excel .csv template. Only subscriptions that will use the same service plan should be included in each file you upload.

To import subscription information:

- 1. Click on the *Import* icon shown in the upper right of the Subscription window to open the Import User dialogue box (Figure 2-192). The Active Type field will indicate because subscriptions are automatically activated when added to BOSS.
- 2. The Service Plan field is mandatory. Select the drop-down menu to open the list of existing service plans.
- 3. Select the radio button next to the service plan to assign to these subscriptions and click *OK*. The Service Plan field will automatically populate with the name of the selected plan.



- 4. Click *Export Template* and save the Excel .csv spreadsheet to your computer. The first two rows are filled out as an example; type over the examples and continue until all the subscription information is entered. You must maintain the format as provided in the template. Then select Save (do not change the file name).
- 5. In the Subscriber Information field, click on the right blue arrow, navigate to the saved Excel .csv file, click Open, then click on *OK* to upload your file. The subscriptions will now be included in the main Subscription list.

Figure 2-192: Import User

					Add	Recor	rds C											
Imp	ort User *	4																
6	J Inform	ation																
	@Act	ive																
	* Servio	e Plan:				\bigcirc		Service N					× Q					
	Select	service from t	he list			(-)-		-	Operator	5N.	Service Name	Periodical	Price(S)	Billing Type	Period	Throughput	Speed(UL/DL)(Mbps)	Notes
						\sim		10	FiSci			G One Time	0.00	Time	1(Month)	Unlimit	10/50	
									FiSci		test	🕝 One Time	0.00	Time	l(Month)	Unlimit	50 / 150	
	* Suber	riber Informa	tion:					3 0	FiSci	-	-	Periodically	0.00	Time Time	1(Month)	Unlimit	250 / 300	
	- Current	arves anavessa	area.					4 0	FiSci		Headdil	Periodically	0.00	Co Time	1(Month)	Unlimit	200 / 250	
	01		Cancel		uie sampie temptate	Tribut		Service 1	Plan:	Cascel			~					
Fil H5	』り、 e Hom	C Pa	A ~ ≂ ge Insert ≺ √ .	user ♥ Draw Form f⁄x	Data Revie [,] Ne	w View	Add-i He	- D	د ح ک	< 1 •								
	A	В	С	D	E	F	G	Н	1	-								
1	imsi	first_name	e last_name	email	phone_number	id_num	address	zip_code										
2	4.01E+14	first name	last name	test@ema	1233444	123	address	101102										
3	4.01E+14	first name	last name	test@ema	1233444	123	address	101102										
4																		
2										¥								
4		user	(\pm)		1	4			Þ									
10							Ħ		1009	6								

2.5.2.4 Subscription Records

The Records option lists all IMSI-related transactions for that operator's BOSS account. The Status field indicates if the task was successful or failed, as shown in Figure 2-193. If a task fails, the reason is provided in the last column.

Figure 2-193: Records

								Add Records
								Import Export
Record	s							
-	NSI			× Q				B S
	Task ID	Operator	IMSI	Operation Type	Service Plan	Status	Create Time	Reaton
31	20200604224657000960	FiSci		Active	250Mbps	Tail	2020-06-04 22:46:57	The imsi is not in db or is used by other subscriber or not own to the current
32	20200604224657000960	FiSci		Active	250Mbps	To Fail	2020-06-04 22:46:57	The imsi is not in db or is used by other subscriber or not own to the current
33	20200604224552000959	FiSci		Active	250Mbps	Co Success	2020-06-04 22:45:52	Success
34	20200604224552000959	FiSci		Active	250Mbps	Co Success	2020-06-04 22:45:52	Success

2.5.2.5 Export Subscriptions

The Export option enables you to export the list of subscriptions. Click on the *Export* icon and select Open With to open it and save it to your local computer (Figure 2-194).

 ription								Ex
				* C	2		Ð	9 6 (
		Name 💠	IMSI \$	Service Plan \$	Status 🗢	CPE Name	Origin	Description
	÷			MIMO Test	Active		Boss-user	Active by add Sul
	÷	Seng Test 42		250Mbps	Active		Boss-user	move user
	÷	Seng Test 42		250Mbps	C Active		Boss-user	move user
 Opening of You have I use wh fro	user_2021 e chosen er_20211 ich is: M m: https:	1028122022.csv to open: 028122022.csv icrosoft Excel Comma Sep //cloudcore.baicells.com:	arated Values File 20082	×		wr 2011/021151106 ru - D-od	60/- <u>0</u> 5m-	
 Opening You have	user_2021 e chosen er_20211 iich is: M m: https: ould Fire pen with	1028122022.csv to open: 028122022.csv icrosoft Excel Comma Sep //cloudcore.baicelis.com: fox do with this file? Excel (default)	arated Values File 20082	AutoSare File K33	 でご 房 ダン・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・	ser_20211020153106.csv - Read- Formulas Data Reviev	<mark>Only • "Д Search</mark> и View Help Acrobat	
 Vou have Vou have wh fro What sh © Qr O Sa D D	user_2021 e chosen er_20211 ich is: M m: https: ould Fire pen with ve File o this gut	1028122022.csv to open: 028122022.csv icrosoft Excel Comma Sep v/cloudcore.baicells.com: fox do with this file? Excel (default) omatically for files like this	arated Values File 1082 from now on.	X File x13 x1 Operat 2 Fise 3 Fise	Compared by the second se	ser_20211028153100.csv - Read- Formulas Data Review : D Service Plan CPI 250Mbbs	Only • D Search a View Help Acrobat E F G Name Status Active Boss-user Active Boss-user	H Description Active by add Subscription more user

Figure 2-194: Export

2.5.2.6 Bulk Changes

You can activate, deactivate, or change the service plan for multiple existing subscriptions simultaneously (Figure 2-195). Select the checkbox next to each subscription in the main Subscription window and use the action buttons that appear at the bottom of the window to implement the change. If you choose Change Service Plan, a list of existing service plans will open for you to choose from.

Figure 2-195: Bulk Changes

Subsc	ription											
1	/ISI/Name					× Q				Ð	9	6 C
			Name 🍦	IM	SI 🌲	Service Plan $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	Status 🌲	(CPE Name \Rightarrow	Origin	Descriptio	on
1		÷				test	Active			Boss-user	move user	
2		÷				test200	Active			Boss-user	Active by	add Subscr
3		÷				test	Active			Boss-user	Active by	add Subscr
	Selecte	ed (2)	⊘			Active	Deactivate	Chang	e Service Plan	Change Custon	ner (Cancel
		Se Se	rvice Plan Service Nar	ne		*	۵					
				Service ID	Service Name	Periodical	Price	Туре	Speed(UL/DL)	Throughput	Period	Description
		1	0			🕜 One Ti me	\$ 39.00	🚯 Time	1 / 10(Mbps)	Unlimit	1 (Month)	
		2	0			One Ti me	\$ 0.00	🛐 Time	10 / 50(Mbps)	Unlimit	1 (Month)	
				ОК	Cancel							

2.5.2.7 Change Customer

The Change Customer feature allows the operator to move one or more customer/s account information from an existing subscription to another established subscription. On the Subscription page, select the checkbox next to the customer/s whose information you want to move (Figure 2-196), then select the Change Customer button. The Customer window opens with a list of existing customers. Click the checkbox next to the subscription you want to move the customer/s information to and select OK. After completing this action, the accounts will share the same customer information only (i.e., operator, name, ID number, address, etc.); all other account information (i.e., IMSI, CPE name, service plan) will remain the same.



Figure 2-196: Change Customer



2.5.3 Network Menu

The BOSS Network menu lets you activate SIM cards, create service plans, and configure roaming settings (Figure 2-197). Each sub-menu is described below.

Figure 2-197: BOSS Network Menu



2.5.3.1 SIM Card

The SIM card information identifies CPE users:

- IMSI = Subscriber (the person)
- IMEI = Hardware (the CPE unit)

Network operators purchase batches of Baicells SIM cards (Figure 2-198) and activate them by using an activation code on the box label or by batch upload of an IMSI information file. A SIM card is first assigned to a subscriber when adding the subscriber in BOSS. You can later change the designated SIM card if needed. Once a subscriber is added to BOSS, the SIM card and the user become activated. The user will then have access to the operator's network.

NOTE: Proper SIM card insertion and removal is covered in each CPE user manual.

Figure 2-198: SIM Card

You can view the IMSI ID, activation code, sync status, APN policy, card status (in use or available), billing status, and last update time of any previously added SIM card. To view SIM card information, select *Network > SIM Card*. Select the *Operations* icon and choose Discard (Figure 2-199).

Figure 2-199: SIM Card List

₽	Network /	SIM Card						
	/ISI		× Q					
		IMSI 0	Activation Code	Sync Status	APN Policy	Status	Billing Status	Update Time
20	÷			Not synchronized	[0]	TN USE	Normal	2020-09-01 22:55:07
21	1			Not synchronized	[2 -]	IN USE	Normal	2020-09-01 22:44:11
22	1			(in) Not synchronized	[0]	TO IN USE	Normal	2020-08-17 22:28:24
23	+			Not synchronized	[0]	IN USE	Normal	2020-07-30 11:02:37
24	1			Not synchronized	[0]	C AVAILABLE	Normal	2020-07-30 11:02:37
	+							
	Discard	d						

2.5.3.1.1 Import SIMs

You must first import the SIM card information to activate a SIM card. There are two ways to import SIM card information (Figure 2-200).

- 1. Activation (Activate) Code Import allows you to import a batch of SIM cards in multiples of 10 (e.g., 10, 20, 30, etc.) all at once using a Baicells activation code (Figure 2-202).
- 2. File Import allows you to upload a file of unique IMSI numbers if you did not purchase a pack of 10 SIMS and do not have an activation code (Figure 2-203).

Even if you have an activation code, you can still choose the File Import method; however, it would not be as expedient as activating by code number.

SIM Card	 ≥ Q × X
Import Import Methods Activation Code File Code:	Import Import Methods Activation Code File Please select a file. You can import a file as the format specified in the sample template. Export Template
You can find the code on the box of card. OK Cancel	OK Cancel

Figure 2-200: SIM Card Import



2.5.3.1.1.1 Activation Code Import

Refer to Figure 2-201 to import SIM cards using an activation code:

- 1. Go to *BOSS > Network > SIM Card* and click on the Import icon.
- 2. Select the radio button next to *Activation Code* as the Import Method. Enter the code you received from Baicells and click on *OK*. An example of an activation code is shown in Figure 2-202.

Figure 2-201: Import by Activation Code

31	× Q (3) 6
Import	×
Import Methods	
 Activation Code	
 Activation Code	
Activation Code File Code:	
Activation Code File Code: You can find the code on the box of card.	

Figure 2-202: Activation Code Example

IMSI	Active Code	Operator	Status	Billing Status	Update Time	Operations
1 X00000000000000000	37c4a87b0a1184	Pierre	IN USE	Normal	2019-02-27 12:03:35	
	Example					

2.5.3.1.1.2 File Import

Referring to Figure 2-203 to import SIM cards using the File Import method:

- 1. In BOSS, go to *Network > SIM Card*, click on the Import icon, and for Import Method, select the radio button next to *File*.
- 2. Choose *Export Template* and save the Excel .csv template to your computer.
- 3. Enter the IMSIs in the file and save the file. Do not change the file name when you save.
- 4. Select Import, navigate to your saved IMSI file, click Open, then click on OK.
- 5. You will see a dialog box showing the number of SIM cards added successfully. Click on OK.

Figure 2-203: Import by File

ISI	× Q		
Import		×	
		This PC >	~ 0
Import Methods		New folder	
Activation Code O File		Baicell Name	Date modified
Diagon polori o filo	57	✓ Today (1)	
		importSimCardByOperato	r.csv 10/20/2021 11
You can import a file as the format specified in the	sample template Export Template		
ros can import a nic as nic ronnat specifico in the	Sample emplate. Daport remplate		

2.5.3.1.2 SIM Card Records

The Records option lists SIM card-related transactions. The information displayed is shown in Figure 2-204. Use the search bar or advanced query function to find specific SIM card records based on IMSI, IMSI Range, or Approval Status.

IMSI			× Q			0	
ds 		 ())()	IMSI Range	+ IMSI	Approval Status All	¥	
TIN	13/51	Type	Activation Code	Approval Status	Create Time	Annual Time	Paur
Task ID	18151	-78-		Approvar Status	Create 11me	Approvar 11me	User
20210602012044	INDI	Activation Code	37236ba839c386	Assigned by activation code	2021-06-02 15:04:14	2021-06-02 15:04:14	User
20210602012044 20210518011950	13131	Activation Code File	37236ba839c386	Assigned automatically	2021-06-02 15:04:14 2021-05-18 14:33:41	2021-06-02 15:04:14 2021-05-18 14:33:41	User
20210602012044 20210518011950 20210517011936	14154	Activation Code File File	37236ba839c386	Assigned automatically Assigned automatically	2021-06-02 15:04:14 2021-05-18 14:33:41 2021-05-17 10:54:22	2021-06-02 15:04:14 2021-05-18 14:33:41 2021-05-17 10:54:22	CSEP
20210602012044 20210518011950 20210517011936 20210408011625	1/1/5/	Activation Code File File File	37236ba839c386	Assigned by activation code Assigned automatically Assigned automatically Auditing	2021-06-02 15:04:14 2021-05-18 14:33:41 2021-05-17 10:54:22 2021-04-08 14:01:56	2021-06-02 15:04:14 2021-05-18 14:33:41 2021-05-17 10:54:22 2021-04-08 14:01:56	Citer
20210602012044 20210518011950 20210517011936 20210408011625 20210125011084	1/1/54	Activation Code File File File File File	37236ba839c386	Assigned by activation code Assigned automatically Assigned automatically Auditing Assigned automatically	2021-06-02 15:04:14 2021-05-18 14:33:41 2021-05-17 10:54:22 2021-04-08 14:01:56 2021-01-25 13:54:40	Approval rate 2021-06-02 15:04:14 2021-05-18 14:33:41 2021-05-17 10:54:22 2021-04-08 14:01:56 2021-01-25 13:54:40	Citer
20210602012044 20210518011950 20210517011936 20210408011625 20210125011084 20200901009708	11154	Activation Code File File File File File File File	37236ba839c386	Assigned automatically Assigned automatically Auditing Assigned automatically Assigned automatically Assigned automatically	2021-06-02 15:04:14 2021-05-18 14:33:41 2021-05-17 10:54:22 2021-04-08 14:01:56 2021-01-25 13:54:40 2020-09-01 22:55:07	2021-06-02 15:04:14 2021-05-18 14:33:41 2021-05-17 10:54:22 2021-04-08 14:01:56 2021-01-25 13:54:40 2020-09-01 22:55:07	Cser

Figure 2-204: SIM Cards

2.5.3.1.3 Export

To enhance the subscriber's privacy, the operators need to access to the cryptographic information in IMSI. Furthermore, IMSI hosts the customer's data, making it critical to specific security vulnerabilities. Therefore, each IMSI has KI (secret key of IMSI) and OPC (secret key of the operator) values. The admin can export the sim card data by clicking the *Export* icon at the top right (Figure 2-205) to view KI and OPC for each IMSI.

Figure 2-205: Export IMSI file

ß													
125% ~					<u>[+]</u>		C	A	G	2.	Ţ		
View Zoom		Add C	ategory		Insert	Table	Chart	Text	Shape	Media	Comment		Collaborate
+ Sheet 1													
	IMSI_20220125134411									- 1			
IMSI	Active Code	Operator	Status	Billing Status	Update Time	Ð	кі					OPC	
		FiSci	IN USE	Normal	2021-11-08	11:52:18	60107	fbe114	1311271	901de3t	o19f0711	1475eaa52953835e46b2fd1b	8437d8a1
		FiSci	IN USE	Normal	2021-10-19	11:02:51	62939	fb20f20)d87bb2	9404db1	5124de8	f00f034d0002d5381bfd48632	c89d323

2.5.3.2 Service Plans

BOSS is preconfigured with a default service plan set to a rate limit of 100 Mbps uplink (UL) and 100 Mbps downlink (DL). You can create custom service plans and billing methods. Billing settings, such as interval and price, can be set for reference.

BOSS does not currently support direct billing for subscriptions. The BOSS API can be used by third-party billing solutions, which then activates/deactivates SIMs and changes service plans.

```
*NOTE: Refer to the BOSS API Manual for integration information.
```

Existing service plans will be listed on the main Service Plans page, showing the plan status, service type, billing period, billing price, throughput, UL/DL speed, and the date the plan was created (Figure 2-206). The fields are described in the steps below. Use the *Operations* icon to disable, edit, delete, or set a plan as the default.

Figure 2-206: Service Plans

Service N	ame		× Q												Đ
Display Setting	Service ID	Service Name ©	Status 0	Default Service 0	Service Type 0	Periodical 0	Billing Type 💿	Price 0	Period	Throughput	Speed(UL/DL)	Create Date	Origin	Reminder Service	Description
1	T202110188586	Test Service Plan Blake	Enable	No No	Main Main	Periodically	Time	\$ 0.00	1 (Year)	Unlimit	100 / 50 (Mbps)	2021-10-18 13:49:23	BOSS	Disable	test
2 🚦	T202110098585	200x200	G Enable	🔞 No	Main	Periodically	Time	\$ 0.00	1 (Year)	Unlimit	200 / 200 (Mbps)	2021-10-09 20:19:19	BOSS	 Disable 	
3	T202010087871	test10082020	Enable	1 No	Main	G One Time	Time	\$ 0.00	1 (Month)	Unlimit	10/50 (Mbps)	2020-10-08 13:09:20	BOSS	 Disable 	
4	T202009297841	test	(Enable	No No	Main	G One Time	Time	\$ 0.00	1 (Month)	Unlimit	50 / 150 (Mbps)	2020-09-29 13:22:22	BOSS	 Disable 	
 ✓ Edit ☑ Delete ✓ Set Defat 	ult														



To create a new service plan (Figure 2-207):

- 1. In BOSS, go to *Network > Service Plans*, click on the + Add icon, and click on *Service plan* to open the New Service Plan dialogue window.
- 2. Click on \checkmark it to view all the service plan sections.
- 3. Under *Basic Information*, enter the name for this plan under *Service Name*.
- 4. Enter the Price you will charge subscribers for this plan, as it applies to either a periodic (e.g., monthly) or one-time charge, or select the checkbox for Free.
- 5. Under *Speed Limit,* you will need to select the desired radio button *Unlimit (*Unlimited) for no speed restrictions or *Limit* for the UL and DL. If you choose the radio button *Limit,* you must enter the maximum Mbps in the UL and DL directions.
- 6. Enter a description of the plan (optional).
- 7. Under *Billing Settings*, use the *Time* or *Throughput* radio button to select the Billing Type. An explanation of these options is given below. Figure 2-207 shows screen changes based on your selection.
 - Time-based billing has no throughput limit, and subscribers with this plan will be charged the price entered as a periodic or one-time charge.
 - Throughput-based billing enables you to choose the maximum throughput and length of time this service will be available to subscribers. Select either MB (megabytes) or GB (gigabytes) from the drop-down menu and enter the maximum throughput number.
- 8. Under *Billing Interval*, select Year, Month, or Day. Then select the radio button to choose either *One Time* or Periodically.
- If you selected the Throughput billing type, you could offer subscribers with this plan a discount for a window of time by toggling the Discount Time radio button to the right. You can set up two discount times, for example, one with 100% throughput rate from 8:00am 5:00pm and another with 50% throughput rate from 5:00pm 8:00am.
- 10. Under *Reminder Service*, turn on the Service Switch toggle button and enter a value in the text box to set a reminder on the remaining service days, remaining data flow to the customer. Also, select the checkbox to set a reminder on the expiry date.
- 11. Under Action When Payment Is Overdue, select the desired radio button Deactivate, Limit Speed, Redirect, or Continue to use.
 - Deactivate Service will stop and not be restored until the payment is made.
 - Limit Speed Service will continue but at a reduced speed. A pop-up window prompts the UL and DL speed (Mbps) to be entered.
 - Redirect (available only when using private network "Local BOSS"; not available in CloudCore BOSS)
 If the operator is using a third-party billing management system, Subscribers will be redirected to a URL where they can make payment.
 - Continue to use Service will continue per the existing parameters.



12. If you want this plan to be the default service plan for your network, select the checkbox next to *Set as Default Service*.

NOTE: If you forgot to select the default checkbox before saving and you want to make this plan your default service plan, use the *Operations > Set Default* action in the main Service Plans list.

- 13. Click on *OK* to save the settings. The new plan will be added to the main Service Plans list with a Service ID assigned by the BOSS system. However, the plan will not become active and available to assign to subscribers until you complete the next step.
- 14. When you are ready to activate the new service plan, find the row where the new plan is listed and select *Operations > Enable* in the main Service Plans window.

New Service Plan					
Basic Informatio	n				
Service Name				Price	V Free
		Length: 1-100		\$ 0	
DI Speed Limit		10			
DE Speed Linit		MI	Unlimit		
UL Speed Limit		M	Unlimit		
Description					
				ĥ	
APN Config (Select max	4 APNs)				•
Index		APN Name 🇅	APN Downlin	k Limit 🗢 APN Uplink Limit 🗢	OCI 🗢
Advance A					
Billing Settings					
Billing Ture	• Time	Theorematical			
Billing Type		Inrougnput			
Billing Interval	1	Year 🗸 🔽 P	eriodically		
Reminder Service					
Camica Switch	Enable	Start the reminder comi	and notify the user hy em	oil often reaching the cat threshold	
Service Switch	Enable	Start the reminder service	ce and notify the user by em	an after reaching the set threshold	
Action when Paymen	t is Overdue				
Action When Payment Is	 Deactivate 				
Overdue	C Limit Spe	ed			
	Redirect				
	Cartin				
	• Continue	o use			

Figure 2-207: New Service Plan



To create a new Flow package (Figure 2-208)

- 1. Flow Package is used for subscribers who have exhausted all of the allowable throughputs in the main service plan and will pay a one-time charge for additional throughput.
- 2. In BOSS, go to *Network > Service Plans*, click on the + Add icon, and click on Flow Package to open the New Service Plan dialogue window.
- 3. Under *Basic Information*, enter the name for this plan under Service Name.
- 4. Enter the *Price* you will charge subscribers for this plan, as it applies to a one-time charge, or select the checkbox for *Free*.
- 5. Enter a *Description* of the plan (optional).
- 6. Under *Billing Settings*, choose the billing type as *Throughput*, enter the amount of data usage in the text box, and select MB/GB from the drop-down menu.
- 7. Enter the *Billing interval* in the text box and choose Year, Month, Day for the break from the drop-down menu.
- 8. Click on *OK* to save the settings. The new flow package plan will be added to the main Service Plans list with a Service ID assigned by the BOSS system. The plan will not become active and available to assign to subscribers until you complete the next step.
- 9. When you are ready to activate the new service plan, find the row where the new plan is listed and select *Operations > Enable* in the main Service Plans window.

New Service Plan						
Basic Information						
Service Name			Length: 1-100	Price	\$ 0	✓ Free
Description						
Billing Settings				a		
Billing Type	• Throughput		MB 🗸			
Billing Interval		Month \vee	Periodically			
OK Cancel						

Figure 2-208: Flow Package

2.5.3.3 Roaming Configuration

A Roaming function is used to configure which operators can roam to your network. It enables roaming to other CloudCore operators to allow other operators' SIMs to attach to their network. The operators can select which operator's subscribers can roam into your network. Roaming Config is where you view, configure, and modify roaming in networks. Select *Network > Roaming Config* to view the roaming configuration page. Click the checkbox next to the operator's name to allow their customers to roam in your network. To remove an operator's permission to roam, click the delete icon next to the operator's name, as shown in Figure 2-209.

Click *Who Configured Me*? to view a list of operators who have allowed you to roam in their network, as shown in Figure 2-210.



Network / Koaming Config			
		Safety	Code:
Operators that roaming allowed	I allow the customers of the following operate	ors to user my network service	
	8	× ·	Ī
CloudKey	CloudKey	CloudKey	Operators that allowed me to use their network
Operation time	Operation Time	Operation Time	default
			CloudKey Operation Time

To add an operator, click the + Add icon. Enter the *Cloudkey* and *Safety Code*, as shown in Figure 2-210 (you must obtain the CloudKey number for the operator). Then enter the *Safety Code* shown at the top of the screen. If the Safety Code does not work, click the refresh icon to obtain a new one. Then click on *OK*.

ഹിര്	udcore	OMC	BOSS	P CloudKey:	Welcome, V
6	■ Network	c / Roaming Config	ğ		
(a)					Safety Code: C
0	Opera	ators that roaming	g allowed 🛛 🔞	I allow the customers of the following operators to user my network service	Who Configured me?
			Add	×	
			* Clou	cey.	
			* Safet	Code	
				Cancel	

Figure 2-210: Add Operator to Roam

2.5.4 System Menu

The BOSS System menu (Figure 2-211) enables you to modify or delete admin user groups or role sets and view each subscriber's activity logs (e.g., password resets, service plan changes, etc.). There are two sub-menus: Logs and License.

Figure 2-211: System Menu



2.5.4.1 Logs

The *BOSS System > Logs menu* contains a record of actions that have been taken by BOSS account administrators (Figure 2-212). The list is shown in descending order by date.

The columns display the admin username as User Account; the IMSI affected by the action, as appropriate; the log name (description) of the action; record detail for any activities related to adding a subscriber, user group, or service plan; the results of the action; the failure reason if the action failed; and a timestamp of when the action started and ended. You can export the logs to an Excel .csv file using the *Export* icon in the top right of the window.

Figure 2-212: Logs

	Operation Log							
	MSI			× Q				6
	User Account	IMSI	Log Name	Record Detail	Results	Failure Reason	Start Time	End Time
1			Subscriber Active		success		2021-01-25 13:57:10	2021-01-25 13:57:10
2			Subscriber Created	{"service plan":"T201805233425"}	success		2021-01-25 13:57:03	2021-01-25 13:57:03
3			Subscriber Active		success		2021-01-18 19:36:10	2021-01-18 19:36:10
4			Subscriber Created	{"service plan":"T201805233425"}	success		2021-01-18 19:36:08	2021-01-18 19:36:08
5	0.0	51105000020012	Subscriber Active		success		2021-01-18 18:51:30	2021-01-18 18:51:30