BlueWater Software – Constant Innovation by Orca Wave

Overview:
Revenue assurance, cost management and delivering key and timely information to BlueWater Users; are operational pillars of our BlueWater software for carriers, enhanced services providers and messaging companies. These comprehensive and complimentary features augment BlueWater's Intelligent Routing and integrated destination cost/code management functions.

Some of the critical areas we address include:

- Fraud Management & Protection
- Credit Monitoring with Notifications & Auto-blocking
- Net Balance of Traffic & Revenue
- iTest for QoS testing and CLI Verification
- Number Management

Below is an overview of each of these key areas and some of the methods Orca Wave's BlueWater Software protects its Users.

1.0   Fraud Management and Protection

Unfortunately, fraud appears in many forms – everything from DOS (denial of service) attacks, unethical switch techs, stolen PINs, weak IP PBX security, FAS (false answer supervision with fake rings) to numerous other forms of very expensive attacks on a carrier's network. As soon as the routing plan covers the full A – Z international destinations, carriers need to protect themselves from fraudulent and unbillable calls, which can turn into $100,000s of dollars lost traffic very quickly.

1.1   BlueWater Fraud Alerts
Carriers are experiencing serious losses due to fraud and are wisely seeking new tools to fight these aggressive offenders. To proactively address these various sources of fraud Orca Wave offers several types of Fraud Alerts that are contained within our BlueWater software.

The Fraud Alerts include:
- **Simultaneous Call Alert**. Displaying by Calling Number, simultaneous calls from one originating number. This can be set hourly.

- **Traffic Variance Alert**. Displaying by Destination, hourly traffic spikes above a carrier defined percent of traffic variance. This alert can be set as an hourly report.

- **Unauthorized IP Address**. This alert is triggered anytime an unauthorized IP or ANI is detected in the CDRs, with sufficient information to be able to pull the CDRs.

- **Short Call Alert**. This alert is triggered when a threshold for short calls is contained within the CDRs. For example, all calls in the previous hour that are under 15 seconds in length.

Below are examples of each type of Fraud Alert. In addition, Orca Wave creates unique monitoring alerts for its BlueWater customers that are specific to the business and traffic profiles of our customers. These unique alerts are a normal part of our overall services to enhance the profitability of our BlueWater customers.

1.2   BlueWater Standard Fraud Reports

Below are examples of various Fraud Reports. Additional alerts can be created based on the specific requirements of our Users.

- **Fraud Surge Alert:** BlueWater provides the user with key destination data comparisons on an hourly basis, so as to note both increases and spikes in calling patterns, as well as drops in traffic by destinations. The User defines the floor percents that triggers the variance alert.

Minimum Call Count: 20		High Supplier Cost: 0.0001			Surge Percentage: 10%	

Fraud - Call Surge Alert for 10/20/2014 14:00						
Customer	Destination	Actual Total Calls	Actual Minutes	Projected Total Calls	Projected Minutes	Call Surge Percentage
Digicel	United States	40	222.32	19	83.61	52%
Bermuda Digital	United States	53	161.62	43	170.23	18%
TATA Communications	Bermuda - Quantum	26	64.83	6	12.45	76%

Report created on Monday, October 20, 2014 at 9:38 AM.

- **Fraud Concurrent Calls Alert:** BlueWater software data mines a user's CDRs to look for simultaneous call attempts that are originating from the same Calling Number—which can often mean a source of fraudulent calls by PIN / ANI sharing.

BlueWater Customer – Fraud Concurrent Calls Alert			
Calling Number	Simultaneous Attempts	Time of Occurrence	Duration in Minutes
4163384500	7	2013-03-20T06:58:14	3.28
0000123456	4	2013-03-20T06:36:26	18.77
2392054843	4	2013-03-20T06:58:57	10.50
5143535948	4	2013-03-20T06:48:37	2.43
6477161554	4	2013-03-20T06:50:24	66.73
9058901286	4	2013-03-20T06:51:43	3.22
2392344377	3	2013-03-20T06:04:58	10.97
2899399906	3	2013-03-20T06:57:14	1.47

■ **Fraud Report – Short Call Alert:** Based on the ALOC / short call threshold defined by the User, the Short Call Alert identifies all the Calling Numbers / destinations that are creating the short calls. We can also indicate the origination trunk group / IP address, as well as the time of the calls

BlueWater Customer - Too Many Short Calls Alert					
Calling Number	Customer Name	Destination	Minutes	Completed Calls	Avg Duration in Seconds
4318906076	UPC Telekabel Wien GmbH	Switzerland fix-other operators	89.7	459	11.73
4318906076	UPC Telekabel Wien GmbH	Switzerland-Mobile-Swisscom	19.18	136	8.46
4318906076	UPC Telekabel Wien GmbH	Switzerland-Mobile-Sunrise	8.72	69	7.58
4318906076	UPC Telekabel Wien GmbH	Switzerland-Mobile-Orange	4.83	41	7.07
4318906076	UPC Telekabel Wien GmbH	Switzerland fix-upc cablecom	3.95	23	10.3

Report created on Friday, June 21, 2013 at 1:32 PM.

■ **Unauthorized IP Fraud Report:** The integration of CDR importing, fraud analysis and data mining for traffic anomalies, allows Orca Wave's BlueWater software to specifically identify any and all non-authorized calls for our BlueWater customer.

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Once an unauthorized IP is located, then BlueWater generates a specific alert with the appropriate information needed by NOC for further follow up. In addition, BlueWater can be setup to take specific action – block a customer, etc. – beyond just an alerting.

BlueWater - Hourly Unauthorized Report									
Today's Hour	Customer Name	IP Address	Duration	Total Calls	Completed Calls	Revenue	Cost	Gross Margin	Gross Margin %
Grand Totals:			22,623.34	10,183	10,183	$3,789.76	$3,567.09	$222.67	5.88%
00	FC-VIT	88810	5,017.8	2,515	2,515	$880.52	$828.59	$51.93	5.89%
01	FC-VIT	88810	6,618.73	2,685	2,685	$1,096.42	$1,032.06	$64.36	5.87%
02	FC-VIT	88810	6,745.94	2,770	2,770	$1,105.25	$1,040.43	$64.82	5.86%
03	FC-VIT	88810	4,240.87	2,213	2,213	$707.57	$666.01	$41.56	5.87%

Report created on Thursday, February 06, 2014 at 4:57 AM.

The appropriate information for these and other types of specific Fraud alerts and alarms is defined between Orca Wave and our BlueWater customer. Besides these examples, Orca Wave has additional Fraud protection and alerts.

We can easily support a variety of different business and data analysis needs with distinct actions defined by our BlueWater customer.

2.0 Credit Monitoring – Notifications & Auto-Blocking to Protect Margins

Overview: Besides fraud, a carrier needs to be constantly alert to their customer's traffic flows and timely payments. To further protect our BlueWater Customers, Orca Wave provides Credit Monitoring with Notifications and Auto-Blocking. This BlueWater module provides enormous flexibility to uniquely track each carrier relationship with predefined credit limits. These credit assignments can track all traffic or just specific destinations. These limits are then associated with specific alerts and various percent of credit values. Messages and recipients in the alerts are defined by customer. For example, one carrier could be auto-blocked at 96% of assigned credit / destinations, while another could be at a higher percent, and never blocked – but receive auto email reminders. As the call data is processed, the carriers are checked against their setup alerts. Once the data reaches an alert level, notifications and auto-blocking are generated based on setup.

Also note that each carrier relationship can be set up uniquely with notifications and that there is a Credit Management **Forecasting of Critical Dates**, as to when the carrier will cross the 90% Credit Limit.

2.1 Example of Credit Report Status:

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Application Mgmt. ▶ Alerts ▶ Rates and Costs ▶ Carrier Profile ▶ Site Admin ▶

Credit Monitor Current Status

	Refresh Results	Export to Excel

Carrier Name	Class of Service	Direction	Total Minutes	Completed Calls	Credit Used	Credit Amount	Remaining Credit	Percent Used	Daily Burn Rate	Estimated Critical Date (> 90%)
Carrier - 35	Wholesale	Inbound	47,446.00	1,089	100.30	110.00	9.70	91.18%	5.28	Sunday, May 19, 2013
Carrier - 40	Wholesale	Inbound	497,531.00	5,965	27.36	35.00	7.64	78.17%	1.44	Wednesday, May 22, 2013
Carrier - 107	Wholesale	Inbound	10,405.00	59	7.28	50.00	42.72	14.56%	0.38	Monday, August 26, 2013
Carrier - 65	Wholesale	Inbound	25,360.00	39	6.45	50.00	43.55	12.90%	0.34	Tuesday, September 10, 2013
Carrier - 44	Wholesale	Inbound	2,548.00	10	6.35	50.00	43.65	12.70%	0.33	Thursday, September 12, 2013
Carrier - 58	Wholesale	Inbound	15,739.00	43	5.90	50.00	44.10	11.80%	0.31	Sunday, September 22, 2013
Carrier - 56	Wholesale	Inbound	93,096.00	215	5.43	50.00	44.57	10.86%	0.29	Saturday, October 05, 2013
Carrier - 25	Wholesale	Inbound	26,328.00	166	1.64	50.00	48.36	3.28%	0.09	Saturday, October 04, 2014
Carrier - 61	Wholesale	Inbound	2,117.00	9	1.25	50.00	48.75	2.50%	0.07	Monday, March 16, 2015
Carrier - 66	Wholesale	Inbound	9,821.00	14	1.24	50.00	48.76	2.48%	0.07	Saturday, March 21, 2015

In addition, a User can create as many Notification Types as they want, and assign the notification templates to customers—with the ability to either just warn of blocking traffic or actually block traffic. Credit Notifications, Alerts and Auto Blocking functions can be assigned uniquely to 1 customer or 1 supplier, to a group of customers or suppliers or to all customer or supplier—with different information delivery items unique to each carrier. These functions are managed in the Credit Management Alerts:

2.2   Example of Notification Assignments

Creating email templates with different types of messages, that have varying degrees of "reminder" language and "action to be taken", are easy for Users to create and assign to each customer.

Besides the protection of our BlueWater customers from Fraud attacks and Credit issues, we provide additional analysis – Net Balance Statement and iTest Module reviewed below.

2.3   Net Balance Statement

BlueWater provides a daily update of all traffic and revenue that is associated with a two-way relationship, so that our customers do not establish unacceptable traffic and services balance with any carrier relationship.   Below is one example of this daily report:

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Net Settlement Report						
Direction	Minutes	Amount	Margin	Margin %	Previous Net Margin %	Net Difference
382 Communications						
Inbound	1,582.10	52.73	8.00	15.17		
Outbound	134,910.40	202.08	31.09	13.33		
Net	133,328.30	149.35	39.09	28.50	18.23	10.27
AMC Telecom LLC						
Inbound	1,013.57	25.24	0.40	1.60		
Outbound	0.78	0.04	0.02	38.06		
Net	-1,012.79	-25.20	0.42	39.66	30.44	9.22
Asia Telecom Ltd.						
Inbound	11.02	0.10	0.01	14.32		
Outbound	439.40	39.28	5.30	11.88		
Net	428.38	39.18	5.31	26.20	25.47	0.73

Besides vigilance against fraud and credit issues, Orca Wave provides an excellent and easy to use testing platform, so that our BlueWater Customer's termination suppliers can be screened and filtered for high quality and no FAS type calling. We are pleased to be integrated with our technology partner, iTest!

3.0 iTest Module - Key Features

Easy to Use graphical interface, accessible from our BlueWater Software, with direct access from our BlueWater Software to iTest. This integration allows Users the benefit of loading your data once for both applications. Once in iTest, the UI shows all information necessary to perform automated tests and gather information on the QoS of the routes tested. This works with all major internet browsers and tablets – allowing testing to be completed and results to be seen from anywhere. The UI only requires the input of basic information allowing any non-technical users to perform tests and check results.

3.1 iTest Features Summary:

Standard Tests - Each Test is usually 5 calls, but you can set this number to as many as you require (up to a maximum of 100 per Test).

- PDD - Standard - i.e. when switch tells us the call is ringing
- PDD - User - i.e. when the iTest logarithms detect a that the end user is hearing a ring tone on the live audio)
- Average PDD over the Test calls
- Ring Time
- Call Time
- Packet Loss
- Jitter
- Out of Sequence Packet monitoring and reporting
- MOS Scoring
- Disconnection message via final SIP Code
- Ring Tone Quality - Recordings of the end Ring Tones
- Call Quality - Recordings of the Call Audio
- Total Calls made
- Calls Connected
- Calls Failed
- Calls Not Answered
- FAS detection - Early Charging (i.e. Ringtone being presented after the switch sends the "Call Connected" SIP message 200)
- Dead Air (i.e. call connected but no return Audio / RTP Stream)
- No Ring Back Tone (i.e. no Ringtone is presented before call is answered by the end party)
- Detailed SIP Log for each call within the test showing all the SIP messages between the switches for each call.

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3.2   CLI Tests - Each Test is usually 10 calls, but you can set this number to be 1, 5 or 10 calls as part of a single CLI Test.

- Everything in the Standard Test above, plus....
- CLI presentation (number sent versus number presented)
- FAS detection - (Late Charging and Early Charging as well as Call Hijacking) False message or IVR Systems i.e. when a carrier connects the call to a false End point –
- CLI Prefixes - i.e. 00(Country Code) (End Number) is acceptable, but 0+ (Country code) (End Number) may not be - you can set what you discern as acceptable.

3.3   Automated Simultaneous Test Calls: Once a test has been initiated, multiple calls are placed simultaneously and once complete all call statistics are displayed. This includes PDD, ring time, call duration, number of packets, jitter and packet loss and an audio recording of the early media (ring back tone) and call. This allows testing to be completed in a fraction of the time of manual testing and gives you all the necessary tools to analyze the results. It also allows for routes to be checked under more load than by manual testing. The full sip details of the call are also logged and can be downloaded for more in-

depth analysis. G.711 and G.729 codecs are supported for test calls and can be set at a vendor or test level.

3.4   Scheduled Test Calls: As well as manual tests, it is also possible to set up test schedules, allowing calls to be initiated automatically. The results are emailed once complete. These tests can recur on a daily, weekly, monthly schedule or even for as often   as every 5 minutes until the desired number of tests has been run or the schedule end time occurs.

3.5   CLI Country support

Multiple networks in different countries are currently on the iTest CLI network and with an extensive rollout continuing in 2014, CLI tests are increasingly available throughout the world. See the below map and list for current and planned CLI coverage. Ask for the most recent country listing.

4.0   Number Management:

Orca Wave's BlueWater software, besides updating a carrier's switching platform routing tables with our Intelligent Routing, also provides Users with the ability load DID and Toll Free (US and International) numbers onto the carrier's switching platform via our BlueWater Number Management module.

The Search box capability allows the User to insert general and/or specific, number searches. Also, note that all of underlined columns are sortable on-screen, with results exportable.

Application Mgmt. ▸ Intelligent LCR ▸ Reports ▸ Customer Rates ▸ Supplier Costs ▸ Billing ▸ Code Mgmt. ▸ Carrier Profile ▸ Credit Monitoring ▸ Bilateral ▸ Help ▸

Site Admin ▸

Carrier Profile | **Number Mgmt.** | Manage Numbers

Current Numbers   **Add/Update Numbers**

Filter Options

View Type:
Current Numbers Only
Deleted Numbers Only
Both Current and Deleted Numbers

Search Options

Search Numbers:
Optional - will find all Numbers starting with the selected digits. | Search |

| Send to Switch | Export to TDF |

1 2 3 4 5 6 7 8 9 10 ...

Number ▲	Route Label	View Partitions	Last Modified Date	Last Modified By	Send to Switch Date	Comments		
2012213120	RL_ETEL_SG1	View Partitions	9/6/2013 12:00 AM	John Tang	9/6/2013 7:01 PM	First entry made	Edit	Delete
2013322999	42_ALTSYR_NYC_001_SIP	View Partitions	4/21/2015 6:11 AM	Kerrie Miller	4/21/2015 6:11 AM	Uploaded on 2015-04-21 06:11:33	Edit	Delete
2015551212	RL_AVOC_LD	View Partitions	9/27/2013 12:00 AM	John Tang	9/27/2013 4:07 PM	First entry made	Edit	Delete
2016444050	RL_ETEL_SG1	View Partitions	9/6/2013 12:00 AM	John Tang	9/6/2013 7:01 PM	First entry made	Edit	Delete
2018086011	RL_ETEL_SG1	View Partitions	9/6/2013 12:00 AM	John Tang	9/6/2013 7:01 PM	First entry made	Edit	Delete
2023866991	42_ALTSYR_NYC_001_SIP	View Partitions	4/21/2015 6:00 AM	Kerrie Miller	4/21/2015 6:00 AM	Uploaded on 2015-04-21 06:00:21	Edit	Delete
2023866992	42_ALTSYR_NYC_001_SIP	View Partitions	4/21/2015 6:00 AM	Kerrie Miller	4/21/2015 6:00 AM	Uploaded on 2015-04-21 06:00:21	Edit	Delete
2023866993	42_ALTSYR_NYC_001_SIP	View Partitions	4/21/2015 6:00 AM	Kerrie Miller	4/21/2015 6:00 AM	Uploaded on 2015-04-21 06:00:21	Edit	Delete
2023866994	42_ALTSYR_NYC_001_SIP	View Partitions	4/21/2015 6:00 AM	Kerrie Miller	4/21/2015 6:00 AM	Uploaded on 2015-04-21 06:00:21	Edit	Delete
2023866995	42_ALTSYR_NYC_001_SIP	View Partitions	4/21/2015 6:00 AM	Kerrie Miller	4/21/2015 6:00 AM	Uploaded on 2015-04-21 06:00:21	Edit	Delete
2023866996	42_ALTSYR_NYC_001_SIP	View Partitions	4/21/2015 6:00 AM	Kerrie Miller	4/21/2015 6:00 AM	Uploaded on 2015-04-21 06:00:21	Edit	Delete

"Deleted Numbers" -- These are numbers that have been taken out of the active routing pool and are available to be re-assigned to other customers.

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Carrier Profile | **Number Mgmt.** | Manage Numbers

Current Numbers   Add/Update Numbers

Filter Options

View Type:
Deleted Numbers Only ▾

Search Options

Search Numbers:
Optional - will find all Numbers starting with the selected digits.   [Search]

[Send to Switch]   [Export to TDF]

1 2 3 4 5 6 7 8 9 10 ...

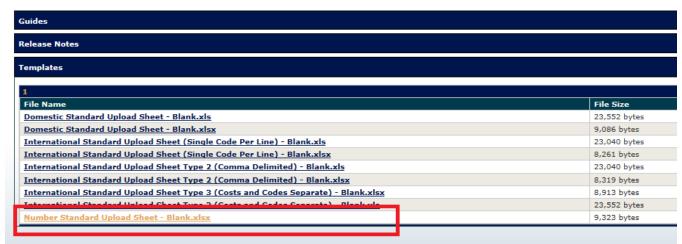| Number	Route Label	View Partitions	Last Modified Date ▲	Last Modified By	Send to Switch Date	Comments
2054172438	RL_ETEL_SG1	View Partitions	10/1/2013 2:10 PM	John Tang	10/1/2013 2:10 PM	Deleted from Current
2095542600	RL_ETEL_SG1	View Partitions	10/1/2013 2:10 PM	John Tang	10/1/2013 2:10 PM	Deleted from Current
2095542601	RL_ETEL_SG1	View Partitions	10/1/2013 2:10 PM	John Tang	10/1/2013 2:10 PM	Deleted from Current
2095542602	RL_ETEL_SG1	View Partitions	10/1/2013 2:10 PM	John Tang	10/1/2013 2:10 PM	Deleted from Current
2095542603	RL_ETEL_SG1	View Partitions	10/1/2013 2:10 PM	John Tang	10/1/2013 2:10 PM	Deleted from Current
2095542604	RL_ETEL_SG1	View Partitions	10/1/2013 2:10 PM	John Tang	10/1/2013 2:10 PM	Deleted from Current
2095542605	RL_ETEL_SG1	View Partitions	10/1/2013 2:10 PM	John Tang	10/1/2013 2:10 PM	Deleted from Current
2095542606	RL_ETEL_SG1	View Partitions	10/1/2013 2:10 PM	John Tang	10/1/2013 2:10 PM	Deleted from Current
2095542607	RL_ETEL_SG1	View Partitions	10/1/2013 2:10 PM	John Tang	10/1/2013 2:10 PM	Deleted from Current
2095542608	RL_ETEL_SG1	View Partitions	10/1/2013 2:10 PM	John Tang	10/1/2013 2:10 PM	Deleted from Current

A User can assign single or multiple numbers to the same / different route labels via the Number Standard Upload file

Documentation

Guides

Release Notes

Templates

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File Name	File Size
Domestic Standard Upload Sheet - Blank.xls	23,552 bytes
Domestic Standard Upload Sheet - Blank.xlsx	9,086 bytes
International Standard Upload Sheet (Single Code Per Line) - Blank.xls	23,040 bytes
International Standard Upload Sheet (Single Code Per Line) - Blank.xlsx	8,261 bytes
International Standard Upload Sheet Type 2 (Comma Delimited) - Blank.xls	23,040 bytes
International Standard Upload Sheet Type 2 (Comma Delimited) - Blank.xlsx	8,319 bytes
International Standard Upload Sheet Type 3 (Costs and Codes Separate) - Blank.xlsx	8,913 bytes
International Standard Upload Sheet Type 3 (Costs and Codes Separate) - Blank.xls	23,552 bytes
Number Standard Upload Sheet - Blank.xlsx	9,323 bytes

Users receive email confirmation of successful switch load from delivery to a carrier's switching platform(s).

For more information, please contact:

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