

# Unity Revenue Assurance

Configuration, Source Data, Output Data Validation

# Revenue Assurance (RA)

## Purpose of Revenue Assurance

1. Main target is to ensure that Revenue, workflow, functionality and output of Unity are correct
2. Detect potential issues before they are made visible to customers and have impact on revenue
3. Help to visualize potential issues and help to get these solved
4. Help to perform real time monitoring of software and workflow

## How will RA ensure correct workflow and correct Output?

1. Analyse and visualize issues on Configuration, Source Data, Data Input validation
2. Analyse and visualize main data points across provisioning, billing, monitoring and invoicing
3. Implement software and functionality measurement points that can generate automated alarms

Visualization through GUI, Alarm API's and lots of reports that give fast overview across the environment.

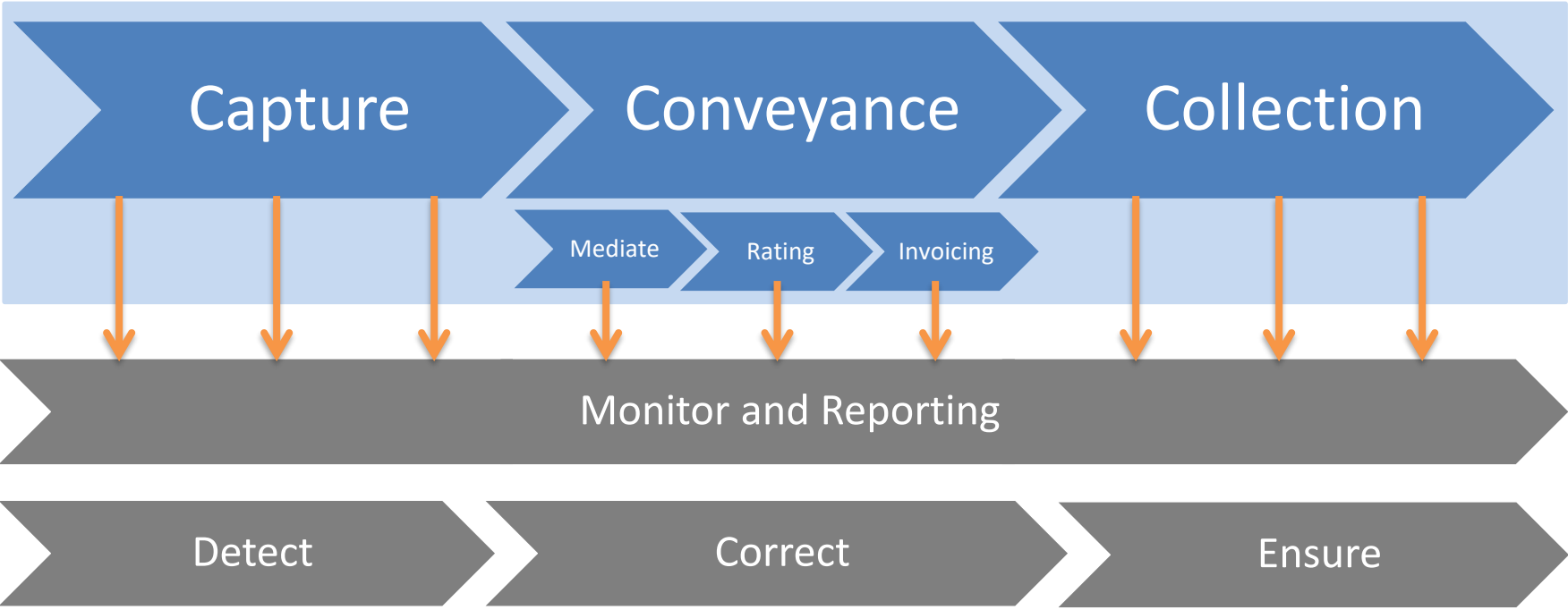
# Revenue Assurance (RA)

## RA will deliver following functionality

1. Source Data validation – CDR, GUI input, Provisioning, Configuration, Product templates, Rating plans...
2. Integrated workflow monitoring – and KPI data capture every 5-15 minutes
3. API access to KPI monitoring points – to allow monitoring + SNMP supervision on workflow and software
4. Daily reports that pull key data set for validation
5. Interface in Operator dashboard that allow access to RA process and overviews
6. Ability to define alarm thresholds linked to workflow and KPI counters like failed CDRs etc.
7. Monthly reporting that extract key data for validation process across:

CDR Data	User Data	Package Data	Rating Data
Product Data	Monitoring Data	Package Data	Provisioning
Earning	Credit Risk	Alarms	Inventory

# Revenue Assurance Mechanisms



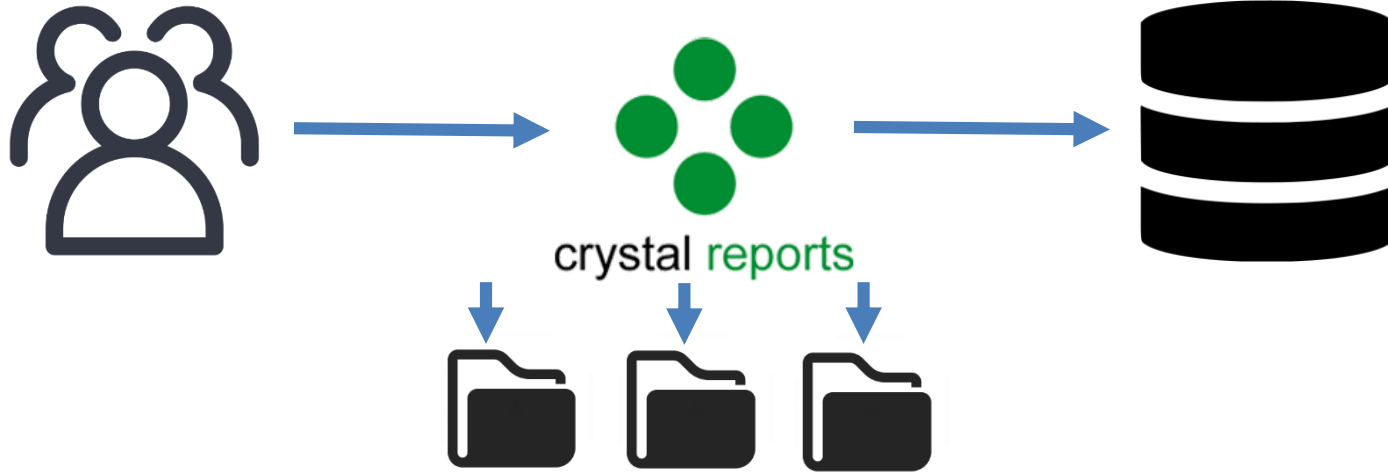
# Revenue Assurance Mechanisms

- The underpinning principle for processing of source data for workflow, billing and monitoring follows four logical steps:
  - Capture – recording source data flow like CDRs and staff input
  - Calculation – the calculation of traffic, charges..
  - Conveyance – the transmission and processing of data from capture to the output in reports, financial output and invoices – to the point where it is transferred to customers
  - Collection – invoice presentation, collection of the applied charges due from offered and rated services
- Revenue Assurance focuses on each of these area in order to detect leakages, issues, correct or fix the issues and then ensure that changes are made to prevent the same issue from occurring in the future.
- As RA develops other area's of leakage are identified throughout the monitoring and reporting process. Using a mix of data analysis and process improvement techniques RA is able to move through the levels of getting more and more maturity by striving for continual improvement.
- Data analysis is focused upon a known leakage or area of leakage and offer quantitative results that the MW team or Operator can monitor over time. At this point the process improvement team are used to identify the root cause.
- Process improvement considers the end to end process.

# RA Reporting Capability

Generating validation reports

# Report generation



Unity are developing all the reports using SAP Crystal Reports for Enterprise – SAP Crystal reports do have the ability to automatically generate daily reports and also allow our staff to manually generate reports after billing periods are ending and after staff operator have generated invoices.

# RA Validation Reports

These reports are generated across following main area's:

CDR Data

User Data

Package Data

Rating Data

Product Data

Monitoring Data

Configuration

Provisioning

Earning

Credit Risk

Alarms

Inventory

Each report contain a lot of tabs with dedicated data extracts that highlight data set belonging the the data group – these reports are generated after billing period are ending and invoices are generated, in the case where thgir are issues or CDR failures are these corrected and RA reprocessed.



# RA Validation Reports

Generated reports currently only available for mobilware staff – temporary enabled access in KD Dashboard Export folder where the reports are uploaded by SAP Crystal Report server.

The screenshot displays the KD Dashboard interface for user AIRTIME (LG) Gottlieb (admin). The breadcrumb navigation path is Home / Report / Export Directory / Invoice Export. The 'Report' menu is expanded, showing a list of report categories including Traffic, Finance, Inventory, Subscriber, Subscription, Invoice, IGX Reports, Report Delivery, and Export Directory. The 'Export Directory' is selected, showing a folder named 'invoice\_export → revenue\_assurance' containing 8 items. The 'CDR Export' tab is active, displaying a list of report files:

File Name	Size
RA_CDR_201811.xlsx	37 KB
RA_INVOICE_201811.xlsx	264 KB
RA_PACKAGES_201811.xlsx	33 KB
RA_PACKAGES_NOV_201811.xlsx	14 MB
RA_PRODUCTS_201811.xlsx	264 KB
RA_PROVISIONING_201811.xlsx	34 KB
RA_TEMPLATES_PRINTING_201811.xlsx	21 KB
RA_USER_DATA_201811.xlsx	2 MB

# RA Sample Reports

ASBICK Files	ASBICK	INVOICE	Invoice Management	ASBICK Report	Notes	Status
ASBICK_20181115081_7506	29.394,32	29.394,32	29.394,32	29.394,32	No duplicate group	OK
ASBICK_20181115093_7500	192.445,31	192.445,31	192.445,31	192.445,31	No duplicate group	OK
ASBICK_20181115097_J500	29.602,68	29.602,68	29.602,68	29.602,68	No duplicate group	OK
ASBICK_20181115101_7505	40.193,50	40.193,50	40.193,50	40.193,50	No duplicate group	OK
ASBICK_20181115105_J505	8.250,96	8.250,96	8.250,96	8.250,96	No duplicate group	OK

Date	CDRs	Event_id	Description	CDR's	Event	Description
01-11-2018	11056	1000	Background IP	308470	1000	Background IP
01-11-2018	3	1003	Streaming 128	5	1001	Streaming 32
01-11-2018	1	1027	SMS	1	1002	Streaming 64 Services
01-11-2018	18	1028	Voice - BGAN to BGAN	27	1003	Streaming 128
01-11-2018	243	1029	Voice - FB to Fixed	202	1004	Streaming 256

Invoice Overview Customers & Invoices ELVIS Validation ELVIS 15085 ELVIS 37397 **ASBICK Validation**

RawCDR Overview RawCDR I4 Details Mediated CDRs Failed CDRs **Rated CDRs**

Username	Company	Contact	Currency	Debit Balance	Monitoring	Anonymis	Notify	External ID	Invoice	Invoice template	Email	Created_at	ID	Status	Network	Vessel Name
ORIENTALCORE	none	GOTO	USD	0.00000	0	0	0	\N	\N	INVOICE_CLASSIC	mw@kddi.com	17-02-2013 06:33	5850	ACTIVE	ACTIVE	ORIENTAL
FRONTIERANGEL	none	81368321805	USD	0.00000	0	0	0	\N	\N	INVOICE_CLASSIC	mw@kddi.com	17-02-2013 11:27	5854	ACTIVE	ACTIVE	FRONTIER
OAKLAND	none	FUJISAKI	USD	0.00000	0	0	0	\N	\N	INVOICE_CLASSIC	mw@kddi.com	17-02-2013 11:27	5858	ACTIVE	ACTIVE	OAKLAND
YUSHANBLOSSOM	none	GOTO	USD	0.00000	0	0	0	\N	\N	INVOICE_CLASSIC	mw@kddi.com	17-02-2013 11:34	5862	ACTIVE	ACTIVE	YUSHAN B
CHEMROADDITA	none	HASHIMOTO	USD	0.00000	0	0	0	\N	\N	INVOICE_CLASSIC	mw@kddi.com	17-02-2013 11:34	5866	ACTIVE	ACTIVE	CHEMROA
BAIZO	none	HASHIMOTO	USD	0.00000	0	0	0	\N	\N	INVOICE_CLASSIC	mw@kddi.com	17-02-2013 11:34	5870	ACTIVE	ACTIVE	BAIZO

User Overview Resellers Companies Subscribers **Vessels** Packages Users\_IMSI

# RA periodic Data Measure

RA will every 5-15 minut capture measure points

# RA KPI Table – Validation Points

Unity do now have a dedicated KPI table that get updated every 5-15 min – Unity do grap a set of counter values to monitor the main work flow points in the system, like across following to sample some of the main points:

- CDR's from different sources Inmarsat I4, Iridium, Thuraya, Intelsat, Inmarsat GX, Inmarsat GX VoIP...
- CDR failures, mediation failures, rated events, CDR delay... + SFTP connectivity from remote networks
- Module responses – Provisioning, Billing, Monitoring, Notification, Database access, End to end ping...
- Provisioning service orders across different networks including API work flow – OK/NOK...
- Rating, Monitoring performance counters...
- Order number associated credits / amounts

Data collected can be pulled from our API interface allowing integration to external SNMP environments – allowing deep software and workflow based monitoring compared with traditional hardware and operatigh system related monitoring.

# RA System Health Check

Below API calls are the first that have been enabled for external usage – these are based on the internal MW monitoring API calls that allow software modules and work flow to be monitored into standard SNMP environments.

Module	HTTP Method	URL
Provisioning	GET	http://{IP address}:8122/provisioning/system/ping
Billing	GET	http://{IP address}:8121/billing/system/ping
Notification	GET	http://{IP address}:8123/notification/system/ping
POP Manager	GET	http://{IP address}:5433/popmgr/system/ping

# RA API Sample

Unity System status report API.

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**Module HTTP Method URL**

Provisioning GET <http://{IP address}:8122/provisioning/system/status>

Ex.

```
{  
  "node":"active",  
  "up-time":"1 days 1 hr 36 minutes",  
  "db-up-time":"115 days 15 hr 47 minutes",  
  "status-code":"AIRTIME-P4001",  
  "status-msg":"DB date is 2018-09-14 07:53:21",  
  "software-version":"2.26.56"  
}
```

# RA Roadmap

# RA Current implemented functionality

Unity Revenue Assurance have been implement across operators for several years mainly targeting revenue validation across customers and packages, validating cost price with list price across actual used traffic combined with the allowances linked to packages and group packages.

Current version have been expanded with following functionality:

- RA Table structure that capture KPI values from Unity workflow and data flow
- API interface that allow monitoring of software related processes – and allow SNMP integration on software
- Source data validation across CDR collection, SFTP, mediation, GUI entered data
- RA Reports ´through SAP Crystal Reports across several modules and functionality
- Initail monitoring display linked to new RA functionality



# RA Roadmap

Next version of Unity RA is targeted for March 2019 where we are releasing next version of our Operator Dashboard – this OD version will include a dedicated RA interface for the operator offering the listed functionality below:

- Workflow and software - Alarm panel in Operator Dashboard
- Extended APIs to allow more external extracts
- Listing and display online RA report data
- Ability to set alarm and notification thresholds for RA counters
- More reports linked to RA monitoring
- Summery reports