

Qlik NPrinting® Report Development Best Practices

This document is a supplementary guide for Qlik NPrinting® report designers using Qlik NPrinting version 17+. This document is not a replacement for training. This guide promotes design and development practices that will save time and optimize report execution. Because Qlik NPrinting relies on the metadata and data made previously available by QlikView® or Qlik Sense® applications, many of the efficiencies to be gained with Qlik NPrinting rely on preparing Qlik® applications that also follow best practices.

The best practices in this guide have been verified against Qlik NPrinting Feb 2018 and April 2018. Product enhancements may influence best practices in future versions.

Using QlikView vs Qlik Sense with Qlik NPrinting

While Qlik Sense offers an improved architecture, at the time of writing (March 2018) there are a few differences in the features available when using Qlik NPrinting with QlikView vs. Qlik Sense.

Feature Differences

- Qlik Sense pivot tables cannot be imported as tables into Qlik NPrinting, only as images. This should be addressed in Qlik Sense June 2018 release.
- Qlik Sense entity reports are not available
- Qlik Sense sheets are not available as images
- Qlik Sense does not have a native On-Demand reporting solution

Architecture Differences

Either product is suitable but over time Qlik Sense' architecture will be a benefit for Qlik NPrinting report generation.

- Connections to QlikView requires use of a thick client (QlikView Desktop) to be installed on all Qlik NPrinting Engine machines. This is required for QlikView Server, QlikView local or QlikView cluster connections. And while QlikView Server and QlikView Cluster connections have a better architecture than QlikView local connections, Qlik Sense has no such need for a thick client and the associated overhead and can more quickly open/close connections
- Connections to Qlik Sense use a modern Rest API compared to QlikView's COM API
- Connections to QlikView require a named user CAL license be dedicated to the domain account running the Qlik NPrinting Engine Service or a local client CAL license to be dedicated to the QlikView desktop installation
- With QlikView connections, Qlik NPrinting report production can scale linearly to 12 cores before reaching a bottleneck in performance. At the time of writing, Qlik Sense can scale linearly up to 16 cores. Please visit help.qlik.com for more details

Avoiding unsupported objects

QlikView

Applications containing the following objects are unsupported for reporting use in QlikView connections:

- Triggers
- Alternate states
- List boxes with 'always one selected value' enabled. If present, they should be disabled automatically
- QlikView extensions

For more details please visit qlik.help.com

Qlik Sense

The following Qlik Sense objects cannot be used in Qlik NPrinting reports:

- Qlik Sense Extensions, however some are supported. Please review the extension policy to ensure any extensions used are supported. Please visit help.qlik.com for more details
- **Widgets** are not supported.

Which Template to Use ?

- Use the native template of the format you want to product.
 - For example if you need an HTML report, the preference is to create an HTML template.
- While PDF is possible with many formats, PixelPerfect is recommended for PDF reporting.
- Excel is recommended for tabular reporting.
- QlikView Entity reports are the simplest report. They are merely an 'export' of the QlikView Application Sheets or Objects 'as is'.

Editor vs Output formats

		Qlik NPrinting Template Editors					
Output Formats Supported		Excel	Powerpoint	Word	PixelPerfect	HTML	Qlik Entity
	XLS / XLSX	✓			✓		
	PPTX		✓				
	DOC / DOCX			✓			
	PDF	✓	✓	✓	✓		✓
	TIFF	✓			✓		✓
	JPG	✓			✓		✓
	PNG	✓			✓		✓
	GIF	✓			✓		✓
	BMP						✓
	SKV						✓
	HTML	✓		✓	✓	✓	
	HTM					✓	
	TAB						✓
	CSV						✓

**please note that QlikView Entity reports do not support TAB / CSV / XLS / PDF when the object (such as a button) cannot be right clicked and exported as anything but an image

- Not all capabilities are possible with each editor:

Editor vs Capabilities

		Qlik NPrinting Template Editors					
		Excel	PowerPoint	Word	Pixel Perfect	HTML	Qlik Entity
Design Capabilities	Images	✓	✓	✓	✓	✓	✓
	Tables	✓	✓	✓	✓	✓	
	Office Design	✓	✓	✓			
	Qlik Design				✓		
	Cells	✓	✓	✓	✓	✓	
	Variables	✓	✓	✓	✓	✓	
	Formulas	✓	✓	✓	✓	✓	
	Pages / Pagination	✓	✓	✓	✓	✓	
	Levels	✓		✓	✓		

Preparing the Qlik app

- Follow Qlik best practices, e.g. segment monolithic applications, discard unused fields and tables, remove un-necessary uniqueness

- In the Qlik Sense or QlikView app, create application objects (charts, tables etc..) that provide the necessary aggregation of data for Qlik NPrinting. The dimensionality of the object defines the aggregation
- Add titles to application objects, otherwise Qlik NPrinting will only be able to reference the object by ID which is non-intuitive to the Qlik NPrinting designer
- Avoid using application objects with an excessive number of fields. “Wide” table objects with dozens of fields , for example, will bottleneck performance in QlikView and Qlik Sense and impact Qlik NPrinting reports. Instead, separate wide table objects into different objects that share a common key
- Creating app objects with master items, allows improved code organization by allowing more re-use of expressions between Qlik and Qlik NPrinting
- If *additional* app objects need to be added to a QlikView or Qlik Sense app in order to meet a Qlik NPrinting report design objective, you can hide these from regular Qlik users:
 - 1.Prepare a 2nd Qlik app dedicated solely for Qlik NPrinting.
 - 2.Add the additional objects to a hidden sheet that is only visible to the NP Engine service account
 - With QlikView, you can use the `QVUser()` function to set the show/hide condition of the sheet to TRUE or FALSE. This is done on the layout tab of the sheet properties. A QlikView developer can do this
 - With Qlik Sense, you must hide the extra sheets through security rules so that only the Qlik NPrinting Engine account can see them. Note that with Qlik Sense, authoring security rules is an administrative function done through the Qlik Management Console (QMC)

Qlik Apps used solely by Qlik NPrinting

With the exception of QlikView applications used for on-demand, preparing dedicated Qlik apps solely for use by Qlik NPrinting can help reports run faster and prevent the need for configuring hidden sheets.

- Add only objects and data to the Qlik app that are needed to create reports
- Calculate fields in the reload script and, where possible, avoid calculations in objects
- Save QlikView apps with all objects minimized

BE CAREFUL: With Qlik Sense it is possible to pass on-demand selections to a report that uses a different Qlik Sense app . This is only possible if the data fields are an exact match. A different app may contain different security or data so this is not recommended in many cases. However, this tip may allow you to deploy a substantially less complicated Qlik Sense app for the purposes of Qlik NPrinting reports while still deploying a complex Qlik Sense app to end users with on-demand enabled.

Metadata updates

- Allow developers the ability to update connection metadata
- If using QlikView local connections , connection metadata should be reloaded after each data reload of a QlikView app. This is not required for Qlik Sense. It is also not required for QlikView server and QlikView cluster connections, provided one of the following sets of settings is used in the QlikView Worksheet file (.QVW)

Document Properties -> Server Tab -> Refresh Mode when Document is Updated on Server

= server performs refresh automatically without client action

Document Properties -> Server Tab -> Enable Push From Server

= <unchecked >

The settings on this page define the document's behavior when run on QlikView Server

Refresh Mode when Document is Updated on Server
Server performs refresh automatically without client action

Client Refresh Initiation Mode
Indicate with toolbar button.

Server Objects

- Allow Server Bookmarks
- Allow Server Reports
- Allow Server Objects

Maximum Inactive Session Time (seconds)
300

Maximum Total Session Time (seconds)
600

Enable Push from Server

Enable Dynamic Data Update

Filter AccessPoint Document List Based on Section Access

OK Cancel Apply Help

Document Properties -> Server Tab -> Refresh Mode when Document is Updated on Server
 = Client initiates refresh. If old data not kept in server or client too old, refresh will be performed automatically
Document Properties -> Server Tab -> Client Refresh Initiation Mode
 = Just do it
Document Properties -> Server Tab -> Enable Push From Server
 = <unchecked >

The settings on this page define the document's behavior when run on QlikView Server

Refresh Mode when Document is Updated on Server
 Client initiates refresh. If old data not kept in server or client too old, refresh will be performed automatically.

Client Refresh Initiation Mode
 Just do it.

Server Objects

- Allow Server Bookmarks
- Allow Server Reports
- Allow Server Objects

Maximum Inactive Session Time (seconds)
 300

Maximum Total Session Time (seconds)
 600

Enable Push from Server

Enable Dynamic Data Update

Filter AccessPoint Document List Based on Section Access

OK Cancel Apply Help

- Reload metadata on both QlikView and Qlik Sense connections when the data model has changed, updated app objects are available, or updated variables are available
- After reloading metadata, close and re-open Qlik NPrinting designer
- Multiple developers should not be working on the same report
- Multiple developers can work on different reports, but only one developer should be reloading the connection metadata

Working with Designer

BE CAREFUL: Before designing a report, add a filter to the report or user to ensure testing is done against a limited amount of data. The Qlik NPrinting preview process from designer is not optimized in the same way that running a publish task is.

- Use templates as a starting point. They are a shortcut to developing new reports that are similar to other ones
NOTE: The default Qlik NPrinting 'developers' role does not allow developers to import and export. Consider lifting this constraint by creating a new custom Qlik NPrinting developers role which grants the right to do import/export. This will allow Qlik NPrinting developers to be more productive:
- Use export/import to clone an old report into a new report if you need to reuse the same metadata in a 2nd report
- Use export/import to make a backup of the report and keep prior versions. You can revert to earlier copies easily
- Perform as many calculations as possible in the Qlik App. Doing additional calculations inside the report template will add to the time it takes to generate the report
- While levels can access the data model directly, the most efficient way to extract data is via objects
- Using levels, pages and cycles inside the Qlik NPrinting report will increase the report execution time
- Minimize the use of nested levels as they increase execution time
- Qlik NPrinting parallelizes the resolution of levels, pages and cycles meaning that adding cores to the Qlik NPrinting engine servers can help speed up performance (up to 12 when using QlikView)
- Leverage existing variables from Qlik Sense or QlikView instead of duplicating expressions with formulas. Qlik variables can be externalized / stores in a central repository
- if multiple reports require the same expression from the same Qlik app, add the expression as a variable to the Qlik app and import the variable to Qlik NPrinting
- If only one Qlik NPrinting report needs a new expression not already included in a Qlik variable, a formula can be used as a one off.

Output quality

To improve imported image resolution with set image quality to 'Very High' please visit help.glik.com

Working with Section Access

BE CAREFUL: Section Access has a powerful impact on how data is filtered in Qlik NPrinting for recipients, developers, metadata reloads. It also impacts how conditions are evaluated. Be familiar with its usage prior to deploying Qlik NPrinting reports against a Qlik app with section access applied.

The value of the “domain account” property of the Qlik NPrinting user should match the “**USERID**” value of the section access table. If possible load section access tables and Qlik NPrinting domain accounts from the same source to ensure consistency

Filters

When applying an Qlik NPrinting filter, the effect is the same as if the user opened the Qlik app and made the same selection. Like a user, Qlik NPrinting filters cause a new selection state to be applied on the Qlik app prior to extracting the data.

- To simulate ‘**OR**’ logic, define a single Qlik NPrinting filter with multiple values. For example, if the need is to filter a Qlik app to include only data from the United Kingdom or France, create a single filter and include both ‘United Kingdom’ and ‘France’ as values

BE CAREFUL Qlik NPrinting allows for multiple filter type and there is an established serial order in which Qlik NPrinting filters are applied. Due to the associative model, the result of a subsequent filter may replace a preceding filter (if applied in the gray) , or it may add additional focus to a preceding filter (‘**AND**’ logic if applied in the white). Please visit help.qlik.com for more details.

- Not all filter types are valid for all scenarios. For example, on-demand selections are not applied when running a task. Task filters are not applied when previewing a report from Qlik NPrinting report designer

Consult the table below for how Qlik NPrinting resolve the correct section access context and the order in which Qlik NPrinting filters are applied.

	Report Execution Scenario		
	"Preview"	"Task Execution"	"On-Demand Request"
Order of filter application			
1. Apply Section Access with NPrinting Connection Identity	✗	✓	✗
2. Evaluate Task Filter	✗	✓	✗
3. Apply Section Access with NPrinting User Identity	✓	✓	✓
4. Re-apply evaluated Task Filter	✗	✓	✗
5. Apply On-Demand Selections	✗	✗	✓
6. Apply On-Demand Additional Filters	✗	✗	✓
7. Apply NPrinting User Filter	✓	✓	✓
8. Apply NPrinting Report Filter	✓	✓	✓
9. Apply NPrinting Object Filter	✓	✓	✓

- Keep in mind that set analysis, dimension limits, and conditional null filtering on the Qlik objects will also be evaluated when Qlik NPrinting requests data from Qlik. This type of evaluation is done immediately after section access and prior to any Qlik NPrinting filter or condition evaluation.

Conditions

Conditions determines whether a report is delivered to a recipient of a task. There are two types:

1. Conditions applied to 'Tasks' (Conditions tab of a task)
2. Conditions applied to individual reports that have been added to 'Tasks' (reports tab of a task)

BE CAREFUL Conditions are also influenced by section access and filters. Like filters, ensure you understand the section access context and order of filters that occur prior to the evaluation of the condition.

- If a Task Condition evaluates to false, none of the reports are sent and none of the recipients will receive the report (with email distribution, there is no email).
- If a Report Condition evaluates to false for a given recipient, the report is not sent to that recipient. Report conditions are evaluated per recipient using Qlik NPrinting user filters and the identity of the Qlik NPrinting recipient for section access purposes. Report conditions are not evaluated if they are found in a task which has a condition that evaluates to false
- If a task contains multiple reports and each report has their own report condition, the conditions are evaluated separately. Each report condition is also evaluated separately for each recipient . Recipients will receive only the reports where the condition was met.

When conditions are present, the application of section access, application of filters and resolution of conditions is done in the following sequence

Order of Condition Evaluation
Steps to Evaluate Task Condition
1. Apply Section Access with NPrinting Connection Identity
2. Evaluate and Apply Task Filter
3. Evaluate Task Condition
Steps to Evaluate Report Condition
4. Apply Section Access with NPrinting User Identity
5. Re-apply evaluated Task Filter
6. Apply NPrinting User Filter
7. Apply NPrinting Report Filter
8. Evaluate Report Condition
Additional Steps to complete "Report Execution" Filters
9. Apply NPrinting Object Filter

Task Development

- Consider all filter possibilities and all condition possibilities. Review Filters and Conditions in the above sections
- Test with NewsStand first , it eliminates any issues communicating with an SMTP server, writing to a network folder, or writing to Qlik Sense hub. Architecturally, NewsStand is the simplest destination to send reports to.
- Ensure recipients are elevated to have “NewsStand Users” role , even if they are not going to be using NewsStand.

Resources

Full list of links used in this document:

- <https://help.qlik.com/en-US/nprinting/February2018/Content/DeployingQVNprinting/Performance.htm>
- <https://help.qlik.com/en-US/nprinting/February2018/Content/GettingStarted/HowCreateConnections/Connect-to-QlikView-docs.htm>
- <https://help.qlik.com/en-US/nprinting/February2018/Content/MultiDocument/UsingSenseThirdPartyExtensions/Using-Sense-third-party-extensions.htm>
- <https://help.qlik.com/en-US/nprinting/February2018/Content/ReportsDevelopment/SetImageQuality/Image-quality.htm>
- <https://help.qlik.com/en-US/nprinting/February2018/Content/ReportsDevelopment/Static-dynamic-filters.htm>

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