

NatQuery

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NatQuery General Questions & Answers

What is NatQuery?

NatQuery is a fully graphical desktop application that allows for the quick and easy extraction of data from Software AG's ADABAS database. NatQuery was designed to be usable as an End-User Query tool, as well as a Data Warehouse extraction tool.

Platforms where NatQuery will run

NatQuery is suitable for all platforms where ADABAS C and Natural can be found; MVS, VSE, Open VMS, UNIX, Linux, and Windows

How does NatQuery work?

NatQuery works by optionally generating either Natural programs that accomplish data extraction, or by generating the parameter cards required for specific ADABAS utilities along with Natural programs that will process the output of these utilities.

To accomplish this, NatQuery is comprised of three primary components:

- An Administrative Component
- An End-User Component
- A Generation Component

Administrative Component

The Administrative Component allows for NatQuery to be given information concerning the source data environment. Through the Administrative functions, NatQuery is given the knowledge of:

1. FTP information on the Natural / ADABAS Server platform
2. Job Control Language (JCL) “templates” or scripts for a UNIX/Windows platform, that will allow for execution of various NatQuery-related tasks in “batch”
3. The files that will be made available for extraction along with information on the fields that these files contain
4. How files made available for extraction can be “linked” as well as information on how these links can be programmatically supported
5. The available Descriptors and / or Super-Descriptors that may be available to access a given file and the relative performance characteristics of these access paths. With this information, NatQuery can then compare and contrast the available access paths in order to determine an optimal path based on user-entered selection criteria.

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6. What the characteristics are for recurring fields such as Multi-Valued Fields (MUs) and Periodic-Groups (PEs), I.E. what are the expected maximums and defaults when these type of fields are referenced
7. What fields, if any, require Sign Byte handling when the fields are extracted

Through the Administrative Component, NatQuery is given the programming intelligence that can then be used by the remaining components of NatQuery to generate optimized data extraction.

End-User Component

NatQuery's End-User Component allows an individual to specify the requirements of an extraction request. Aided by an intuitive interface coupled with the information captured in the Administrative Component, the knowledge required of an end-user to initiate an extract is reduced to the most basic questions:

1. What File(s) contain the fields to be extracted, and the names of the fields
2. What selection logic, if any, should be applied to the extract fields
3. What additional variables, if any, are needed to augment the data extraction
4. What descriptive text, if any, should be used to describe the extract
5. What the target of the data extract should be

With this information captured, a data extract specification is created. This specification can then be utilized by the Generation Component to generate a NATURAL extract program.

Generation Component

The generation component is enabled once the Administration Component has been configured and an end-user has created an extract specification. By analyzing the user's data extract specification against the Administratively-provided information, NatQuery is able to generate optimized Natural programs, imbed these programs into appropriate JCL/Script, and submit extraction requests directly or indirectly into the remote Natural / ADABAS server environment for execution.

In many environments, NatQuery can be enabled to directly submit extraction requests onto the remote platform where they can automatically execute. Once executed, data can then be automatically retrieved from the remote server back onto the NatQuery workstation. Once on the workstation, NatQuery can then automatically place the extracted data into Microsoft Excel, Microsoft Access, XML / XSL, XML on the server, or into a delimited PC file or a non-delimited PC file.

Why would a Software AG (SAG) customer be interested in NatQuery?

A Software AG customer will be interested in a NatQuery solution predominantly because it represents a "native" solution in a Software AG environment. For the most flexible extraction, NatQuery generates performance-oriented Natural extract programs, with Natural being the 4th

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generational language that Software AG specifically built to access ADABAS. For the most performance-oriented extraction, NatQuery embraces specific utilities provided with ADABAS, and then generates both the parameters that these utilities require along with the Natural processing programs to process the output of these utilities into a usable format.

In almost all cases, a prospective customer who has ADABAS also owns NATURAL. By providing a prospective customer a Natural and ADABAS-utility based extraction solution, the customer gains a solution that is familiar and which they know will integrate easily into their environment.

Another very important aspect of why a Software AG customer will be interested in a NatQuery solution is the fact that NatQuery is usable beyond just Data Warehousing. The same NatQuery application that can address DWH extraction is also the same application that is completely usable as an End-User Query tool. As a result of this, a Return On Investment (ROI)/ROA (Return on Asset) can be seen through DWH or End-User Extraction or both.

By delivering an extraction solution that is based upon Natural and ADABAS utilities, the customer is purchasing a solution they will immediately understand, and find immediately usable.

Are there any limitations to the NATURAL programs that NatQuery generates?

When NatQuery is instructed to generate Natural extraction programs, they will be limited to only logically referencing up to 5 “primary” files. For each of the 5 “primary” files however, any number of logical “Lookup” files can be used (allowing for code-to-text translations and reference lookups).

When NatQuery is instructed to generate Natural programs (and related parameters) for an ADABAS utility execution, only a single file can be referenced – and no “Lookup” files are presently supported.

What kind of NATURAL programs does NatQuery generate?

NatQuery generates NATURAL 2 structured code. When resolving extraction requests, NatQuery is sensitive to what record selection logic has been requested (if any) for an extract, and it intelligently compares this user-entered selection logic to the I/O paths (Descriptor, Super-Descriptor, etc.) that are available for the requested source files. From this comparison, NatQuery generates the most optimum I/O statements that will result in the requested data extraction, and can determine if a FIND, READ LOGICAL or READ PHYSICAL is most appropriate.

At the time NatQuery generates a NATURAL program, it can, if requested, additionally generate a report explaining which I/O paths were available, and of these, which one was optimal.

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Is NatQuery dependent on PREDICT?

NatQuery uses DDMs (Data Definition Modules) to obtain basic information it needs about file structures. While it is typical to use the Software AG product Predict to generate DDMs, due to the fact that DDMs can be generated in other ways (with the Natural SYSDDM application for example), NatQuery is NOT dependent upon Predict.

While not dependent on PREDICT, with the release of version 2.5.0 of NatQuery, NatQuery has the ability to extract all field-level information from PREDICT and make this information available to users of NatQuery. Additionally, this valuable metadata can be further integrated into ETL tools such as Ascential's DataStage.

How complex is NatQuery to Administer?

For an installation that involves approximately 10 Data Source files, full administration of NatQuery can be accomplished in approximately 4 hours. The tasks that are required to accomplish Administration are as follows:

- Information is provided on the Natural Environment
- Information is provided on FTP
- Information is provided on the Users of NatQuery
- Information is provided on the Job Control Language (JCL) / Script that will be used to execute tasks on the remote server
- The DDMs of interest are captured
- Information on the DDMs of interest is provided, including:
 - Descriptor Statistics
 - File Relationships (optional)
 - Recurring Field Information (only required if a DDM contains any recurring fields)
 - Sign Byte Information on DDM fields (optional)

Once Administration is accomplished, generation of required data extracts can immediately begin.

Does NatQuery handle recurring structures?

NatQuery was built specifically to fully handle recurring structures, and it handles Periodic-Groups (PEs), Multi-Valued Fields (MUs), as well as MUs in PEs. Through an Administration function, an Administrator provides both a "default" number of occurrences as well as the "maximum" number of occurrences for each recurring field; both the default and maximum values can be set to the same value.

When recurring fields are selected for extraction, NatQuery automatically references each recurring field by its "default" occurrences, and will then allow the end-user to modify the

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default occurrence reference if desired, but this modification must stay within the defined maximum.

In outputting the contents of a recurring field, NatQuery allows recurring fields to be either “concatenated” or “flattened” in the final extract output.

“Concatenated” output means that a recurring field will have its occurrences concatenated together so that they are all output into one data extract record. “Flattened” means that a recurring field will have its individual occurrences put into separate extract records (along with a NatQuery provided Index) to facilitate data normalization.

How does NatQuery work with IBM’s WebSphere Data Stage suite®?

NatQuery provides the capability (either through Natural or through ADABAS utility execution augmented with Natural) to extract required data elements from ADABAS source files. This processing results in the creation of sequential data files on the server platform, or “flat files”.

When an extract specification is entered into NatQuery and is then submitted for execution, one of the pieces of information required by NatQuery is the designated target for the data extraction. While NatQuery can load many different targets, one of the currently supported (proprietary) targets is IBM® WebSphere® DataStage®.

When NatQuery is instructed to generate a DataStage extract, then in addition to other generation tasks, NatQuery will optionally generate interface files that describe the precise layout of the “flat file” that the extraction process will create. The generated “interface file” can be in one of two formats; it can either be generated into a DSX format (with DSX being a proprietary format for DataStage) or a COBOL File Definition (CFD) format.

With the generation of either DSX or CFD files, then DataStage can be used to import either interface file – at which point DataStage will be able to immediately process the NatQuery-provided “flat file”.

What products does NatQuery require?

NatWorks recommends that NatQuery be run on any 32-bit English Microsoft Windows operating system. To communicate between NatQuery on a workstation and the remote mainframe in a fully automated manner, requires File Transfer Protocol between the workstation and the remote Natural / ADABAS server platform.

Beyond FTP connectivity, the only other pre-requisite is that the customer has Natural on their source platform.

For complete details on software pre-requisites for NatQuery, please contact NatWorks, Inc. For information on contacting NatWorks, please refer to the section of this document entitled How to contact NatWorks (page 9).

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How does NatQuery on the PC interact with the mainframe?

The extract processes that NatQuery generates are designed to operate in a “batch” environment on the remote Natural / ADABAS server. To this end, and in situations where Natural extraction is used, then NatQuery will generate the Natural program required to perform the extraction and will additionally generate the Job Control Language (JCL) required to execute the generated Natural program.

With the required objects generated on the NatQuery workstation, these objects must then be moved onto the remote Natural / ADABAS server platform where they can then be executed. To achieve this movement in an automated fashion, NatQuery utilizes File Transfer Protocol (FTP).

If the customer’s environment is configured to allow for FTP operations directly against the remote Natural / ADABAS system’s “reader queue” (for MVS systems this would be JES, for VSE systems this would be POWER), then NatQuery can take advantage of this to directly place Job Control Language (JCL) into the reader for execution.

If the customer’s environment is configured to use FTP but is not configured to allow direct access to the remote Natural / ADABAS system’s “reader queue”, then FTP can be employed to move NatQuery generated processes onto the mainframe. With the generated processes on the mainframe, the customer then has two options to implement process execution:

- A NatQuery-supplied “server” can be executed on the mainframe to implement automated execution of NatQuery-generated processing
- The customer can manually submit NatQuery-generated processing

In situations where FTP is not available, then manual intervention will be required to move generated processes between the NatQuery workstation and the remote Natural / ADABAS server. These approaches might utilize such products as Software AG’s Entire Connection, IBM’s IND\$FILE utility, or similar software.

Can NatQuery be used against other data sources besides ADABAS?

While Software AG built NATURAL specifically for ADABAS, they built it with “data interfaces” so that Natural could be usable against other data stores / databases. Natively, NATURAL will only communicate with ADABAS. If the customer has additionally purchased one of the many NATURAL interfaces in addition to purchasing NATURAL, then NATURAL can talk to such data stores as VSAM, DB2 and many others.

Because NatQuery generates NATURAL, and the basic syntax of NATURAL does not have to change across most data sources, NatQuery can be used effectively against any of these other data sources: As long as the customer owns the proper interface.

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With the proper interface software available, a single NatQuery generated NATURAL program has the capability of accessing multiple data stores from within a single program, because NATURAL provides this capability.

Does NatQuery handle variables within a data extraction?

When NatQuery is instructed to perform extraction using Natural extracts, then NatQuery supports the user-definition of the following types of variables:

- Redefinitions
- Constants
- Dynamic (both date-related and user-supplied)
- Mathematical Expressions
- Compressions

Does NatQuery address Change Data Capture (CDC)?

NatQuery by itself does not address Change Data Capture from ADABAS. However, NatWorks has developed an add-on product to NatQuery called NatCDC that has been specifically designed to handle the demanding requirements of properly processing the data stored in ADABAS Protection Logs (PLOGs).

Using NatCDC with NatQuery – the data stored in PLOGs can be transformed into data “deltas” that will properly feed a Data Warehouse with changes made to ADABAS since the initial extraction of data. Additionally, the NatCDC tool can be used to make queries against the PLOG data – providing a Natural-based auditing utility for ADABAS.

For further information on NatCDC, please contact NatWorks, Inc. Information on contacting NatWorks is contained in this document in the section entitled How to contact NatWorks (Page 9).

What about data security?

NatQuery completely embraces whatever security measures are in place on a customer’s Natural / ADABAS server platform.

NatQuery and NatCDC specifically address integration with Software AG’s Natural Security product, complying with a customer’s individual security system(s).

Does NatQuery support extract program “versioning”?

NatQuery does not currently have automatic “versioning” mechanism, however this could be accomplished manually by saving progressive copies of a given query’s specification.

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If versioning is an issue, then it should be noted that NatQuery generates Natural code – code that can be utilized with any site-specific “librarian” software.

Can NatQuery support multiple users?

NatQuery can be used either standalone or in a networked environment. Customized user configuration can be set up at the administrative level, with users having the ability to share query specifications.

How to contact NatWorks

Information on NatWorks and NatWorks’ products can be found on the NatWorks website. This website is located at URL <http://www.natworks-inc.com>.

NatWorks can be directly contacted by phone at (802) 485-6112 (US), or can additionally be contacted by e-mail at <mailto:info@natworks-inc.com>.