

**IBM Cognos TM1 & Planning Analytics
Code Migrations, Separation of Roles,
Duties & Procedures:
Scenarios, Options & Proven Practices**

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Document Version History

Date	Version	Author	Description
7/2014	1.0	Andreas Kugelmeier	Version 1.0
12/01/2015	1.1	Andreas Kugelmeier	Various enhancements and additional documentation on the use of the TM1 Transfer utility
12/01/2015	1.11	Andreas Kugelmeier	Misc. minor layout changes
11/2016	1.2	Andreas Kugelmeier	Add Section 5, misc. minor edits
11/2019	1.3	Andreas Kugelmeier	Add information on Git source control to Section 4

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1. About this document

This document outlines IBM Cognos TM1 & Planning Analytics code/object migration scenarios, options and practices and outlines related recommendations for the separation of roles, duties and IT procedures.

Section (2) describes an optional approach for a rapid first migration from DEV to QA

Section (3) describes a corresponding optional approach for a rapid first migration from a QA environment to PROD

Section (4) describes the recommended approach for 'classic' code migrations.

For Planning Analytics versions < 2.0.7 and for TM1 10.2.2, the recommended utility for TM1 code migrations as of TM1 10 is the TM1 Transfer Utility (available within TM1 Performance Modeler) or 3rd party tools & utilities.

As of Planning Analytics 2.0.7, the recommended migration method is via Git source control: To learn more, see [Managing TM1 database assets with Git](#) and an introductory guide to [Planning Analytics Git integration](#).

Section (5) contains recommendations and proven practices related to the separation of roles & duties and corresponding procedures

2. First Migration: DEV to QA and QA Configuration

2.1 DEV to QA migration prerequisites

- a) Validate Master-, Meta- and Fact-Data in DEV.
- b) Test security model, roles and associated credentials in DEV, prior to migration to QA and UAT

2.2 Preparation of QA for UAT

2.2.1 Create new QA TM1 database instance

- a) Create and configure the QA instance server configuration file TM1S.cfg file as needed. Give the instance a name that clearly designates it as a QA instance, for example '<InstanceName> QA'. For details on configuration options, please refer to http://pic.dhe.ibm.com/infocenter/ctm1/v10r2m0/index.jsp?topic=%2Fcom.ibm.swg.ba.cognos.tm1_inst.10.2.0.doc%2Fctm1s.cfgfile_n150029.html&path%3D0_3_18
- b) Copy all objects from the data directory of the TM1 DEV Database '<InstanceName> DEV' to the data directory of '<InstanceName> QA'. **Optional approach for rapid first Dev to QA migration. Alternative: see <Migration via GiT source control>**
- c) Use 'IBM Cognos Configuration' for TM1 create a new instance '<InstanceName> QA' on the QA Server

2.2.2 Clean-up of QA instance

- a) If you are using CAM Security, temporarily change the TM1s.cfg file to use standard TM1 Security (IntegratedSecurityMode=1)
- b) Start the instance with standard TM1 Security
- c) Delete ALL TM1 Client IDs except the Admin, SecurityAdmin and DataAdmin IDs, i.e. 'reset' security
- d) Delete any User folders (the user folders contain private subsets and views)
- e) Delete Test cubes, cubes in development, dimensions not used/needed for current Go-Live
- f) Clean-up version/scenario dimension: delete un-used, archived historical versions, configure version attributes and alias names as appropriate for QA
- g) make applicable changes to any system lookup cubes (logging directories etc.).
- h) clear out Fact-Data by running a process with the CubeClearData against all applicable cubes.
- i) Run SAVEDATAALL().
- j) Check the QA data directory for folders and files/objects that should not be in the QA environment (file system validation of (e) above). Delete any such objects.
- k) Restart QA and ensure the TM1Server.log does not contain startup errors

2.2.3 Adjust and validate QA Security

- a) Switch QA to CAM Security (IntegratedSecurityMode=4 or 5) or Active Directory security provider (if and where applicable) and restart QA
- b) IF QA points to a different Cognos BI Instance or Active Directory Store than DEV:
 - re-import the Security Groups if the CAM IDs / Active Directory Groups are different
 - remove DEV CAM IDs / Active Directory Groups
- c) Re-process / adjust security if QA CAM IDs / Active Directory Groups in (b) are different than CAM IDs in DEV, i.e. if adjustments had to be made in (b) above.
- a) Validate security is working as expected, i.e. if for example CAM Security is in place: Log in with a new user and validate the users security profile is applied correctly (this is not a security credentials test, simply a test to ensure that the 'AD Workspace - Cognos BI - TM1' integration and links are working as expected.).

2.2.4 Adjust access credentials for external data sources

(re-)configure SQL DSNs in (a) TM1 (DSN Name, User, PW) and (b) ODBC DSN if applicable, i.e. if QA instance points to different external data sources than DEV.

2.2.5 Load QA Data

(re-)load (a) master-, meta- and fact data where applicable

2.3 UAT in QA

- a) conduct UAT testing
- b) migrate fixes, changes etc. from DEV to QA using one of the following approaches
 - **Object migration via TM1 Transfer Utility**
See section 'TM1 Transfer Migration Utility' below for details. Recommended approach for all migrations.
 - **'Hot' migration**
Applicable migration method for 'quick' fixes (smaller rules and configuration changes etc.). See section on 'Hot' Migration below for details.
- c) finalize UAT testing

2.4 Configure TM1 Operations console for QA¹

¹ See below section 'Configure TM1 Operations Console for PRD'

3. First Migration: QA to PRD and PRD Configuration

3.1 QA to PRD migration prerequisites

- a) Completed UAT testing
- b) PRD support roles are defined
- c) Knowledge transfer to and training of the PRD support team has been completed. If not, processes need to be put in place to ensure the PRD support team is adequately supported during the initial go-live phase.

3.2 Preparation of PRD for Go-Live

3.2.1 Create new PRD TM1 database instance

Owners: TM1 team & IT team

- a) Create and configure the PRD instance server configuration file TM1S.cfg file as needed. Give the instance a name that clearly designates it as a production instance, for example '<INSTANCENAME> PRD'. For details on configuration options, please refer to http://pic.dhe.ibm.com/infocenter/ctm1/v10r2m0/index.jsp?topic=%2Fcom.ibm.swg.ba.cognos.tm1_inst.10.2.0.doc%2Fctm1s.cfgfile_n150029.html&path%3D0_3_18
- b) **Optional:** Copy all objects from the data directory of the TM1 QA Database '<InstanceName> QA' to the data directory of '<InstanceName> PRD'. **Optional approach for rapid first QA to PROD migration. Alternative: see <Migration via GiT source control>**
- c) Use 'IBM Cognos Configuration' for TM1 create a new instance '<InstanceName> PRD' on the PRD Server

3.2.2 Clean-up of PRD instance

Owner: TM1 team

- a) If you are using CAM Security, temporarily change the TM1s.cfg file to use standard TM1 Security (IntegratedSecurityMode=1)
- b) Restart the instance with standard TM1 Security
- c) Delete ALL TM1 Client IDs except the Admin, SecurityAdmin and DataAdmin IDs, i.e. 'reset security'
- d) Delete any User folders (the user folders contain private subsets and views)
- e) Clean-up version dimension: delete un-used, archived historical versions created during UAT, configure version attributes and alias names as appropriate for PRD
- f) make applicable changes to lookup cubes (logging directories etc.).
- g) clear out Fact-Data: (i) (Temporarily) remove Cube rules from applicable cubes, (ii) run a process with the CubeClearData against all applicable cubes, (iii) re-attach rules from (i).
- h) Run SAVEDATAALL().

3.2.3 Adjust and Validate PRD Security

Owner: TM1 team

- a) Switch PRD to CAM Security (IntegratedSecurityMode=4) and restart PRD
- b) ensure the TM1Server.log does not contain startup errors
- c) IF PRD points to a different Cognos BI Instance than QA:
 - re-import the Security Groups if the CAM IDs are different
 - remove QA CAM IDs
 - map the Security Staging Groups to the PRD CAM IDs

In any case, validate the CAM IDs, make sure the security staging groups are properly mapped to the CAM roles/groups

- d) Re-process / adjust security if PRD CAM IDs in (b) are different than CAM IDs in QA, i.e. if adjustments had to be made in (b) above.

Owners: TM1 team, Admin Users, Power Users

- e) Validate security is working as expected, i.e. if CAM Security is in place: Log in with a new user and validate the users security profile is applied correctly (this is not a security credentials test, simply a test to ensure that the 'AD Workspace - Cognos BI - TM1' integration and links are working as expected.).

3.2.4 Adjust access credentials for external data sources

Owners: TM1 team

(Re-)Configure SQL DSNs in (a) TM1 (DSN Name, User, PW) and (b) ODBC DSN if applicable, i.e. if PRD instance points to different external data sources than QA.

3.2.5 Load PRD Data

Owners: TM1 team

(Re-)Load /Update master-, meta- and fact data.

3.2.6 Data Validation

Owners: TM1 team, Admin Users, Power Users

- a) Validate Planning/FCSTing Drivers, FX Rates etc.
- b) Validate PRD data

3.2.7 Configure TM1 Operations console for PRD

Owners: TM1 team

TM1 Operations Console is a web-based monitoring, logging and troubleshooting utility for TM1 Databases. For details on using the TM1 Operations Console please refer to:

http://pic.dhe.ibm.com/infocenter/ctm1/v10r2m0/index.jsp?topic=%2Fcom.ibm.swg.ba.cognos.tm1_ops_console.10.2.0.doc%2Fctm1_ops_console_usingthecognostm1operationsconsole_2.html

4. Recommended Practice for (consecutive) Migrations

4.1 Delta Migration Process Flow

Consecutive migrations for new implementation Phases of Phase X blockpoints etc. should always be performed in the form of a delta migration, where only new or changed objects are being migrated between instances.

However, new or changed objects may be migrated physically only if by definition/character they are to be identical across instances. Examples:

- TI processes should be identical across QA and PRD and hence should be migrated physically.
- TM1 cube rules should be identical too between QA and PRD and hence should be migrated physically.
- Version/Scenario dimensions in DEV, QA & PRD will contain different archived versions and version attribute values. Such Version Dimensions and associated attributes are never to be migrated across instances.
- Fact-data (cube content), Master-Data (dimension elements and hierarchies), Drivers (Assumptions etc., Allocation configurations) and dimension attribute values however may be different across instances. Data should be updated using existing processes to load/refresh master- meta- and fact data based on external load files. In cases where the receiving instance does not yet contain the new objects (a new deployment), it is a recommended practice to physically migrate the objects between environments using the Transfer Utility and then re-load master-, meta- and fact-data where applicable.

For consecutive migrations from DEV to QA to PRD, we recommend the following process-flow

1. Unit Testing and Functional Testing in DEV
2. Migration from DEV to QA:
 - a) In a migration document, define migration context, Specify migration method(s), related migration objects (physical objects and meta-data) and migration steps & tasks
 - b) Approval of QA migration as per Migration Document
 - c) After (b), QA migration as per (a)
3. UAT and (Security)Integration Testing in QA
4. If further migrations are needed to successfully conclude QA UAT and Integration testing, amend the delta migrations to the original migration document. The amended migration document needs to be approved prior to any delta-migration.
5. Migration to PRD:
 - a) Use the (amended) Dev-to-QA migration document to create a QA to PRD migration document. If the original DEV-to-QA migration document was amended, merge the amendments with the original migrations to simplify the QA-to-PRD migration
 - b) Approval of QA migration as per Migration Document,
 - c) After (b), PRD migration as per (a)
6. Migration Validation in PRD

4.2 Migration Utilities and Methods

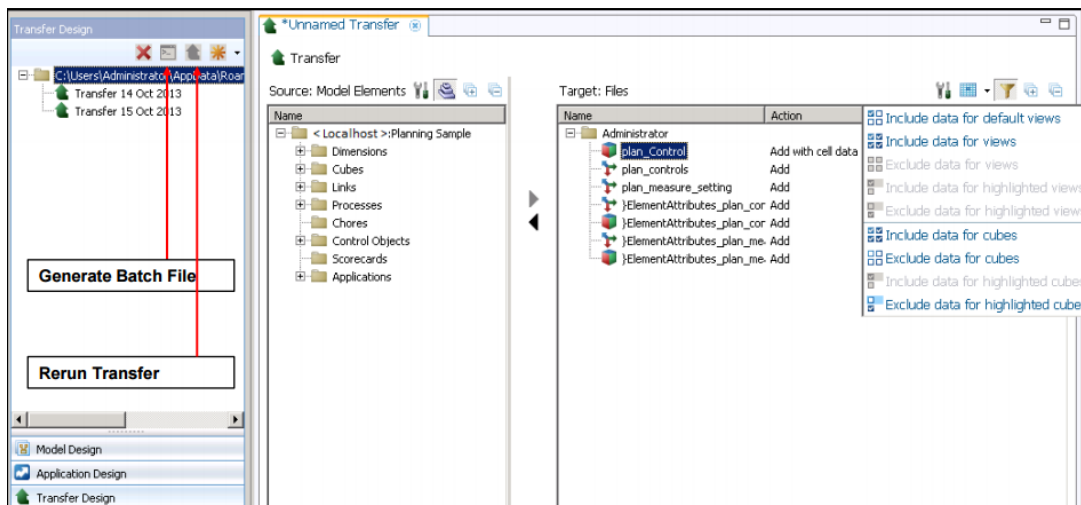
4.2.1 Migration via GiT source control

Migration via Git-integration is the recommended migration method as of Planning Analytics version 2.0.7.

To learn more, see [Managing TM1 database assets with Git](#) and an introductory guide to [Planning Analytics Git integration](#).

4.2.2 Object-migration via TM1 Transfer Utility²

Use of the TM1 Transfer Migration Utility is the recommended migration approach.



If a source safe software solution system is to be used, we recommend to use the TM1 Transfer Utility to transfer objects to a folder from where then the objects will be imported into and exported out of the source save system.

4.2.2.1 Transferring model objects from an IBM Cognos TM1 environment

Use the Transfer Out command to copy selected objects from an IBM Cognos TM1 development environment to a target staging directory. You can transfer the following model objects:

- cubes
- views
- dimensions
- subsets
- links
- processes

² See 'TM1 performance Modeler User Guide', under 'Transfer of model objects and applications': http://pic.dhe.ibm.com/infocenter/ctm1/v10r2m0/index.jsp?topic=%2Fcom.ibm.swg.ba.cognos.prfmdl_ug.10.2.0.doc%2Fc_prfmdl_tranferring_data.html

- chores
- scorecards

Notes:

- cube rules at this point cannot be transferred specifically and are transferred along with the cube.
- You can use the Add Dependencies command to include objects that are related to other objects. For example, a dimension is part of the structure of a cube. If a dimension is added, it affects the structure of the cube.

Procedure:

1. In the Model Design pane, select all the objects that you want to transfer. Tip: Press Ctrl and click or press Shift and click to select multiple items.
2. Right-click the selection and click Transfer Out.

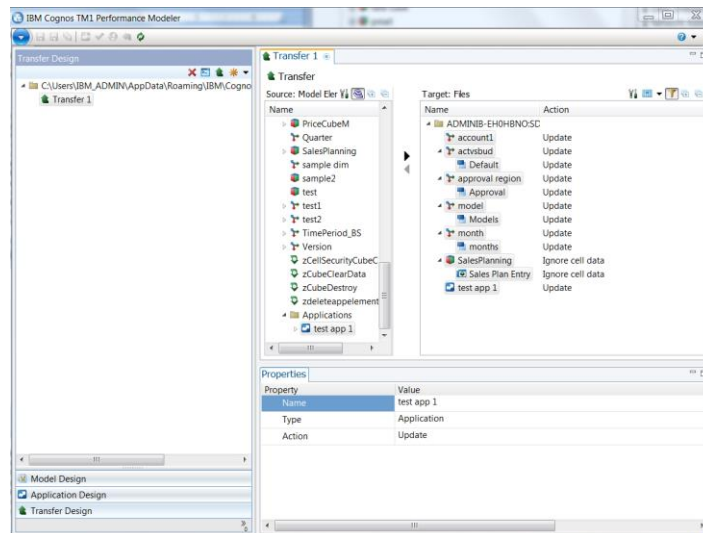
OR

1. Click 'Transfer design'
2. As the transfer source, select 'Model Elements'

And then

3. Specify the Transfer Target staging directory: in Transfer Target, click Files. Then, in the Select Folder window, go to the directory where you want to save your transfer specification, and click OK.
4. Form the source pane, select further objects to be transferred.
5. Click the 'Add' button to include an object in the transfer (target pane). The transfer specification will for a cube will automatically include dependent objects in the transfer target pane³. A preview of the transfer is displayed in the Transfer Specification Editor. The Transfer Out operation analyzes the dependents of the selected objects that are required and displays them in the Target pane. The Source pane displays model objects that you can add to the initial selection of objects. If the directory specified under (3) above contains objects from prior transfers, the tree in the Target pane includes a merge of the new, updated, and existing content. I.e. if the target environment contains existing content, the Action column provides details on how the changes affect the target environment. By default, a concise view of the changes is displayed. To show all the model objects, click Show All.

³ Depending on the model design, not all dependent objects may be recognized or recognizable. Such objects will have to be added manually to the transfer



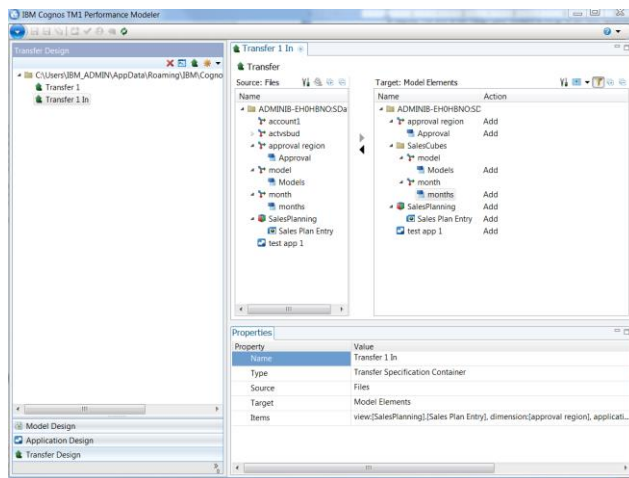
6. If a dependent object is not to be transferred, select it in the target pane and exclude it from the transfer by hitting the 'Remove' button. Example: you are migrating a new cube, but the cube's Version and Time dimension already exist in the target environment and are not to be overwritten. => 'Remove' the version and time dimension, version and time dimension attributes dimension and version and time dimension attribute cube from the transfer specification.
7. To add more elements from the source system, in the Source pane, click the object in the tree and click Add.
8. To add all the dependent objects that are related to a model object, in the Source pane, select the object that you want to transfer and click Add Dependencies.
9. To transfer cell data for a view, select the view and, in the Properties pane, set the Transfer Data property to Yes.
10. click Transfer to transfer the objects to the target directory

4.2.2.2 Transferring model objects to a IBM Cognos TM1 environment

After model objects are transferred from a source environment to a staging directory, you can transfer the objects from the staging directory to a target environment. The effects that the transfer will have on the target environment are indicated in the Actions column of the Target pane.

Procedure:

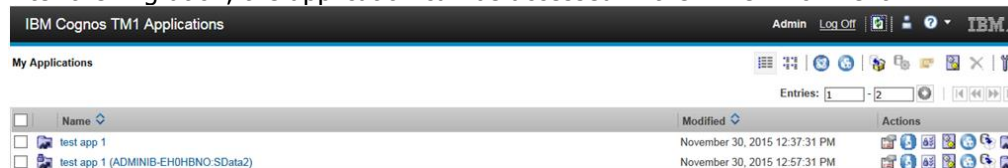
1. In the Model Design pane of the target environment, right-click the top-level *admin_host:server_name* object and click Transfer In.
2. In the Transfer Source window, click Files.
3. In the Select Folder window, go to the folder that contains the transfer specification (the staging directory), and click OK.
4. A preview of the transfer is displayed in the Transfer Specification Editor. The Transfer In operation analyzes the dependents of the selected objects that are required and displays them in the Target pane. The Source pane displays model objects that you can add to the initial selection of objects. The tree in the Target pane includes a merge of the new, updated, and existing content. If the target environment contains existing content, the Action column provides details on how the changes affect the target environment. By default, a concise view of the changes is displayed. To show all the model objects, click Show All.



5. To change the model objects, complete one or more of the following tasks:
 - To add more elements from the source environment, in the Source pane, select the element and click Add.
 - To remove an element from the selection that is ready for transfer, in the Target pane, select the element and click Remove.
 - To transfer cell data for a view, in the Source or Target pane, select the cube view that you want to update and, in the Properties pane, set the Transfer Data property to Yes.

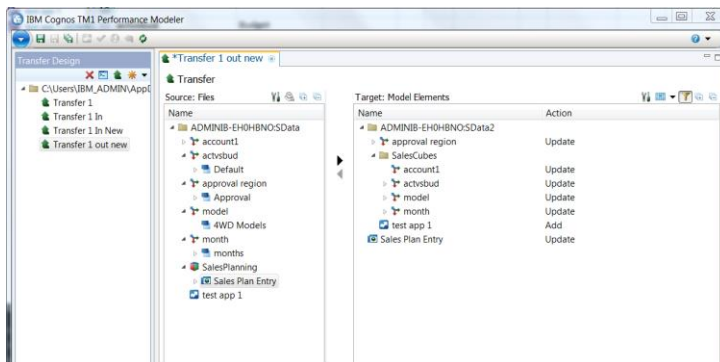
Note: the transfer specification and staging directory contains a 'report' subfolder with HTML reports on the transfer objects. The reports may be used for migration management and approval purposes.

After the migration, the application can be accessed in the 2nd environment:



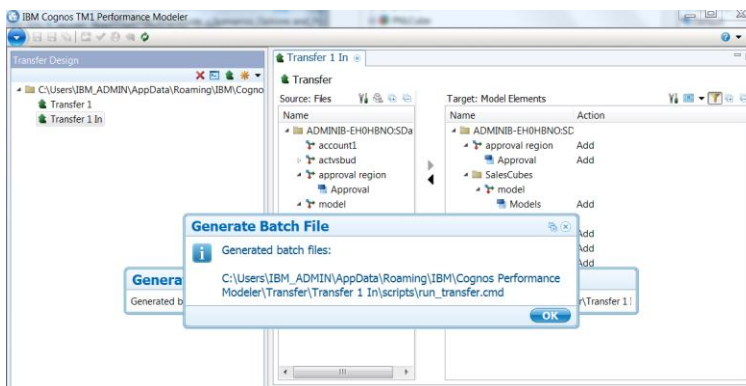
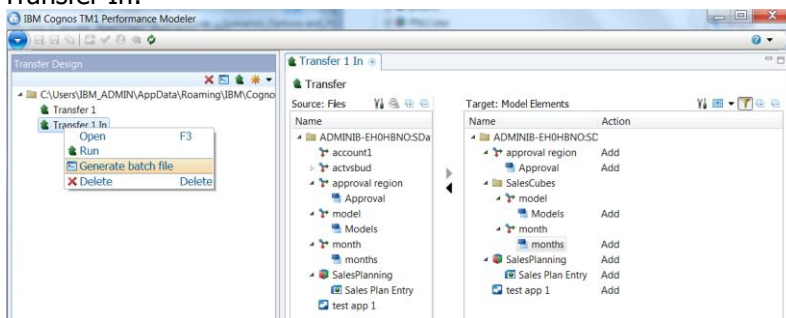
4.2.2.3 Notes on TM1 Transfer Utility Features

- The retrieval and transfer of objects via the TM1 transfer utility occurs via use of the TM1 API and hence is OS independent.
- You can define the model structure that you want to transfer by saving the selection of objects as a transfer specification. By using the transfer specification, modelers, contributors, or other authorized users can run the transfer process at scheduled intervals.
- TM1 Web Sheets cannot be transferred at this time unless they are deployed (and transferred) as part of a TM1 Application
- Migrations of type 'update' function the same way as migrations of type 'Add':

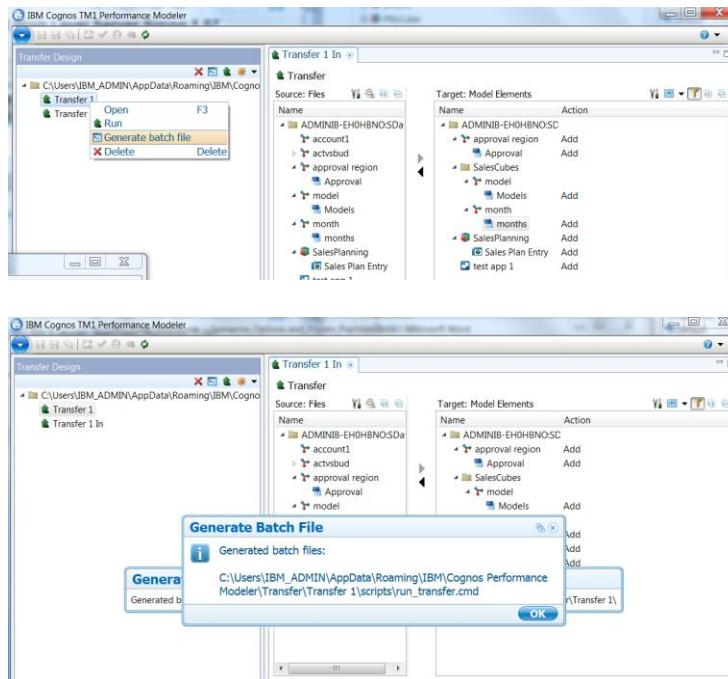


- For transfer of larger models and/or objects, we recommend using the 64-bit version of Performance Modeler along with sufficient amounts of RAM.
- You can create a batch file that is based on the definition of a transfer (transfer_specification.json) and use the command-line utility to run the transfer process at a scheduled time. Such a transfer has to be initiated from a Windows computer (due to the particular JAR files referenced by the command line code) yet the TM1 Server(s) may be on any supported OS (Windows, Linux, Unix).

Transfer In:



Transfer Out:



- In addition to the selected model object, you can transfer the associated cell data and metadata when you transfer the structure of a model to a source or to a target system.
- You can copy model structures of hundreds to up to 1,000 dimensions in a single transfer process.
- The dependent objects like Dimensions, Subsets, Cubes, Views, Links (both process and rule generated) and control objects are automatically included into the transfer specification editor.
- The objects such as TI processes, chores, flowcharts, rights are not included automatically. Such objects need to be added manually to the transfer specification editor.
- You cannot add a folder into Transfer specification editor.
- When performing a transfer In, by default the cube data and cube view data is not included, even if it was included during transfer out operation. You have the ability to choose which cubes and views for which the data should be included during „Transfer In“ operation.
- You have to manually regroup the objects after a Transfer In.

4.2.3 'Hot' Migration

A 'Hot' migration – where code is physically altered/changed in an environment according to code changes in a preceding (DEV or QA) environment - should only be performed if

- the change is very minor (such as a typographical error in a TI process or in a rule)
- the delta can very easily be defined and described
- the change was tested in the preceding environment

Any production 'hot fix' - where code changes are directly conducted in Production without the completion of a full testing cycle via DEV & Test - should require an approval process (using a simple, yet mandatory approval process), where reason/rationale/context, impact, risk (how are other users or models affected), complexity & effort are to be evaluated and weighted against a 'migration' fix or a fix that will first be tested & evaluated in a Test environment.

We recommend the availability of a 'Production Test' environment, where a pre-configured TM1 instance can be started up rapidly against the current Production Data Set. Such a test environment could be used to evaluate and pre-qualify efforts and risks involved in a Production HotFix

If a Production 'Hot-Fix' involves the clearing of data or changing of data, it is a recommended practice to perform a file-export of the associated data prior to the zero-out or change operation.

5. Separation of Duties, Roles & Procedures

5.1 Admin Roles in Dev/Test/QA vs PROD

While TM1 Admin rights are needed on a DEV instance for Application Development purposes, (Data)ADMIN credentials on a PRD instance should only be used temporarily for Production support tasks that do require ADMIN access (such as restoring data from a transaction log for example). For other production support tasks, so-called 'application administrator' security roles should be set up that have the following access credentials:

- Read access to all applicable TI processes,
- Read Access to all cubes (no Write-Access) or Read Access to all Read-Only cubes,
- Maximum READ/WRITE access to input/contribution models, which means Actuals (for example) will always be read only, WRITE access will be granted for all data that end-users as a whole may write to.
- WRITE access will be granted for applicable configuration/lookup/system cubes.
- For dimensions that are not maintained via TI: Admin access to Dimensions (to allow dimension maintenance) that require regular maintenance
- If Dimensions are maintained via TI: Read Access
- READ/WRITE access to all applicable dimension element attributes (exception would be Employee information and other personal & confidential information), READ only in cases where attributes are only maintained via external source/TI.

Admin access to PROD should be reserved to dedicated ADMIN IDs and access should be controlled by IT Managers. Depending on the sensitivity of the data, it can be a good practice to change PROD Admin Passwords after each authorized Admin access to PROD, such that admin access will have to be requested and authorized for each occurrence.

5.2 Security Management

Security processing should be handled by a Dedicated User with the SecurityAdmin role or by users with a user role that is specifically configured to allow for security management and administration.

Note that the SecurityAdmin role is an exclusive role and cannot be mixed with other groups.

It follows that in case a security management framework is leveraged to (semi)automate security maintenance, a separate user and user role should be set up that grants access rights to the corresponding security framework model components.