

Paper 204-2007

**“Development, Test, Production ... Oh My!”  
Making It to the Land of Oz (also known as a satisfied IT Department)  
Using SAS®9 and Business Processes**

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**INTRODUCTION**

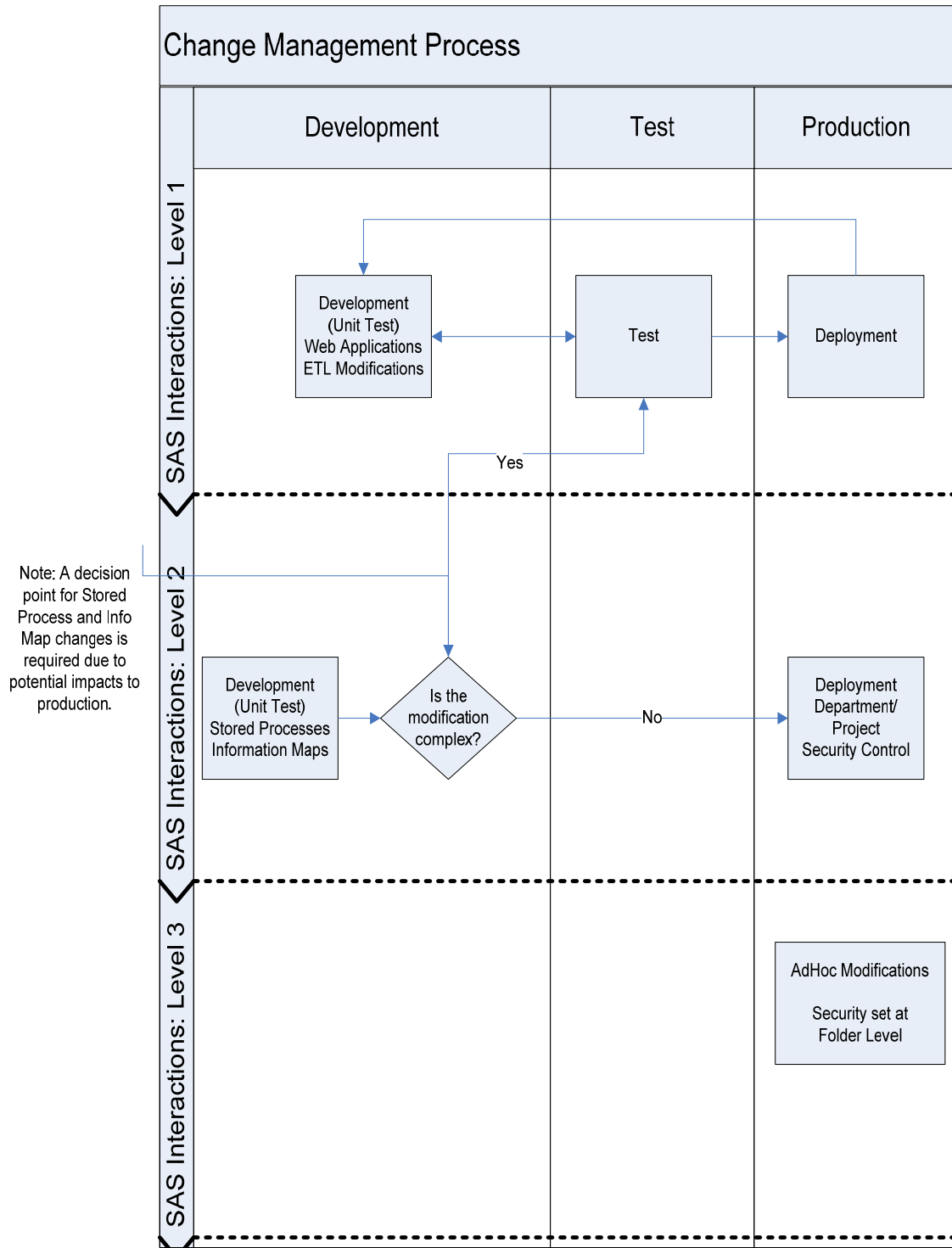
Requirements from IT say a Development and Test environment are required; however the business clients bought the SAS v9 product because of its ability to address report requests immediately. Of course, you don't want to say 'impossible' to any party, so how do you accomplish a Development/Test/Production environment and keep everyone satisfied? The short answer is yes, between a mix of business processes and some fancy SAS footwork you can make everyone believe in Oz.

**BUSINESS PROCESSES VS. SAS FUNCTIONALITY**

The first item on the agenda is to agree that the SAS tools require differing levels of change management. A SAS EG user should be testing out the data queries and Stored Processes on a Development Box, but a SAS Web Report Studio user needs to be able to modify their personal report (on the production system) immediately. Included is a possible categorization of these interactions with the SAS v9 system.

Level	SAS System Interface	Definition
1	Application Development	A new project or changes to an existing project that include Web Application (Java, JavaScript)
	Data Integration Studio	New ETL processes or changes to existing.
	OLAP Cube Studio	Development of a new data cube or changes to an existing one.
2	Stored Processes (STP)	Department Power Users creating or modifying an STP to existing Department Application
	Information Maps	Department Power Users creating or modifying an Information Map used for Web Report Studio or Portal.
3	Web Report Studio	Any individual user's creation of reports on existing Information Maps.
	Information Delivery Portal	Any individual user's modification of personal preferences or pages.

This categorization is then used to determine the procedure for moving a modification from Development to Test to Production.



Here are scenarios for each of the SAS Interaction Levels and how this process flow would play out.

**Interaction Level 1.** In the development environment, a SAS Programmer has created a new SAS program to prepare data. With this data they have also developed a cube via OLAP Cube Studio. Therefore according to the diagram above, this would play out as follows. After completing an initial unit test, migrate the SAS program and the OLAP program to the Test Environment. Once testing is completed, the

same SAS program and OLAP program can be moved into Production. If there are serious issues, the programmer must recode, in the development environment and resubmit to test.

**Interaction Level 2.** A Web Report Studio user requests of the SAS Team a new information map that joins together several tables. They also request that an existing information map have one value added (from same source table) to add to their report.

Within Development, the information map modifications are made and then tested by the developer. Then there is a decision point, was the change complex? For the first item, a new info map with multiple joins, the map would be moved into the test environment to ensure performance isn't negatively affected. The addition of a variable to an existing info map wouldn't require further test and could be immediately transitioned to production.

**Interaction Level 3.** A user creates a Web Report Studio report and stores in his personal folder in the BIP Tree, adds a portlet to his personal portal page, then adds a link to the newly created report.

According to the diagram, all of these changes are done on Production, without any interventions with the Development or Test Environments. If the user then wants to share the report they created with others, they would save the report in a folder that allows others access.

## THE FANCY FOOTWORK

Partial and full metadata promotion has been a subject of discussion at users conferences for the last couple of years. Added to this, SAS has been listening and creating more functionality to allow for users to move bits of information between services. Data Integration Studio 3.4 is the most recent example. This allows a user to create a metadata package that can be exported and imported between repositories. SAS Management Console (SP4) also allows promotion between project/custom repositories and the foundation repository. Currently, there is no one-stop-shop to move metadata from all the various SAS interactions as mentioned in the previous section. Included are approaches that are preferred.

### 1. SAS Stored Processes

The process is simple, move the .sas file and update the parameters in SMC as necessary.

SMC, EG and DI Studio are three mechanisms to register the metadata on each of the servers. Depending on which product you use the logic would be as follows in order to move STPs through the three environments.

- a. SMC ->BI Manager
- b. EG -> Stored Process Wizard
- c. DI Studio -> Any job can be converted to a Stored Process, therefore following the packaging described in the next section; a job can be moved to another server and then set up as a stored process.

### 2. DI Studio Job/Library/Data

Version 3.4 allows for packaging in export/import functionality allows for partial or full promotion of metadata.

### 3. Portal Application

This relates to the application development, such as via portlets, rather than user preferences, pages, or other selections within their view of the Portal. Within application development, the portlets would be created in the development environment; unit tested and then compiled into a par file for deployment to the test server and the production server for implementation.

### 4. Information Maps

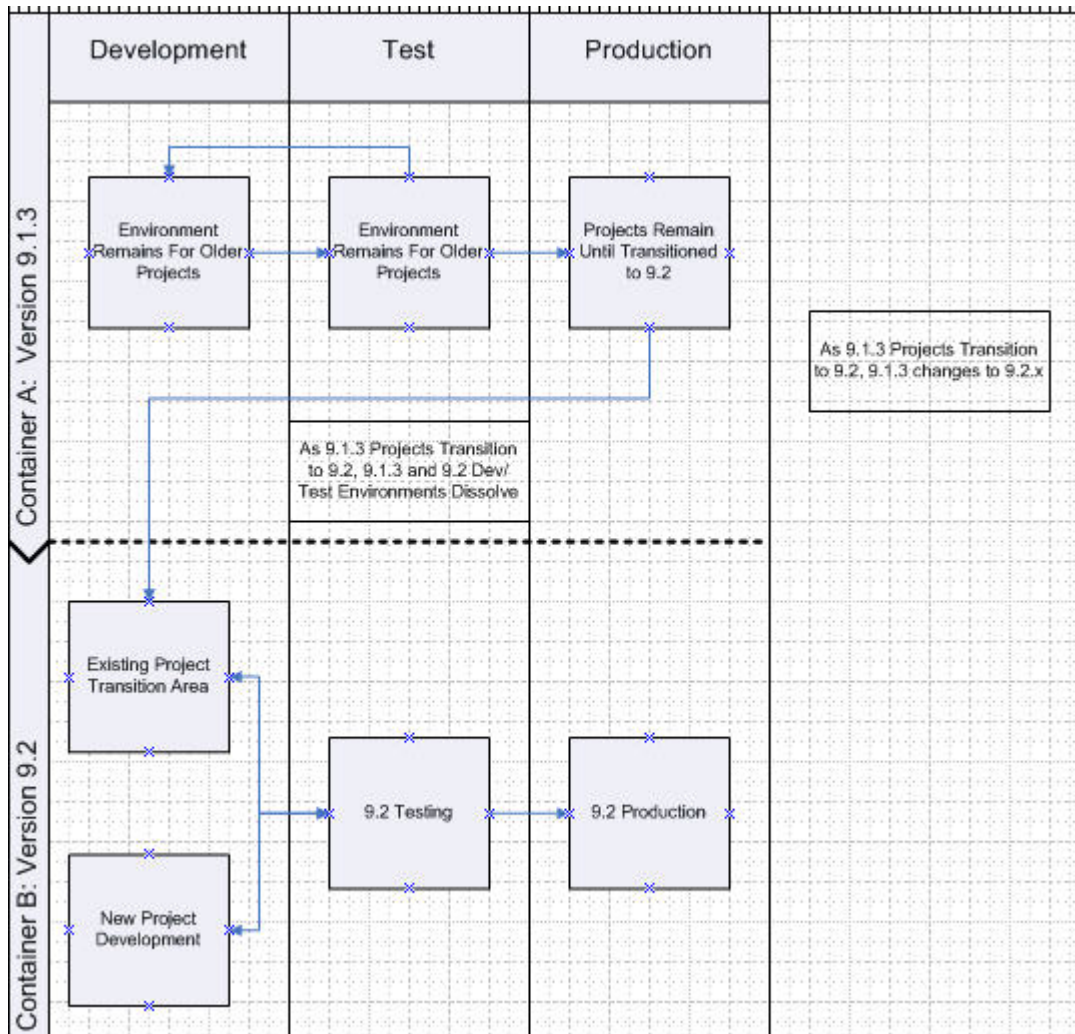
Two methods of migrating the Information Map between servers are the Proc INFOMAP and use of XML generated from Information Map Studio. The preferred approach is to utilize proc infomap and its import/export functionality.

### 5. OLAP Cube Processing

Export the .sas program, register the tables in the production metadata (if not already registered), and run the SAS program on the production system.

## ADVANCED TOPICS OUT WITH THE OLD, IN WITH THE NEW

Adding this complexity to the Dev-Test-Prod environment requires two layers of Dev-Test-Prod as applications (or departments) move into the next SAS version.



In addition to the complexity for managing software versions, reporting applications, and data in a complex shared environment, metadata adds another wrinkle into the management and maintenance of your SAS Platform. There are a variety of different techniques for managing and maintaining metadata in an Enterprise Architecture that utilizes a Development-Test-Production environment. The following section will discuss alternatives and approaches for managing metadata and address pros and cons for different approaches.

### METADATA MAINTENANCE

Metadata Maintenance consists of many different topics. In this section we will focus on approaches for configuring Metadata Servers based on the physical server environment as well as approaches for migration and maintenance of metadata.

The first step in determining a methodology for configuring your metadata environment is to understand the physical structure of your platform. The environments can be configured in a variety of ways based on whether or not SAS has been architected for Development-Test-Production systems on a single domain/server or separated out into multiple environments (separation is the recommended approach).

We will discuss two approaches for configuring the metadata server in a single server environment.

- 1) Single Metadata Server with Multiple Levels to distribute Development-Test-Production metadata
  - a) Cons:
    - i) Web-based BI tools do not function well since some of them can only access the Foundation Repository
    - ii) Impact on one environment will have a residual effect on other 2 environments (i.e. a Metadata Server Restart will restart Development, Test, and Production)
  - b) Pros:
    - i) Configuration of Ports can be kept to a minimum
    - ii) Migration of metadata from one environment to another is simplified
- 2) Separate Metadata Server
  - a) Cons:
    - i) Additional memory resources to start up multiple metadata servers
    - ii) Additional ports will need to be opened to allow each metadata server to run on its own port
    - iii) Administrative Metadata Server will need to be configured to support migration
  - b) Pros:
    - i) No conflict for access from the Web-based BI tools
    - ii) No impact for downtime for maintenance of individual metadata servers

Beyond using a single server environment, to create a SAS Metadata environment that can be easier to maintain across Development-Test-Production, it is recommended to separate out the environments across multiple servers or logical server instances. This will ensure that impact of the hardware in one environment will not have any effect on the other environments. When utilizing separate logical or physical server environments it is important to define a process for migration that does not negatively impact the other environments. There are 2 approaches for migrating metadata, on the first is truly supported by SAS.

- 1) Utilizing an intermediate Administrative Metadata Server for Replication or Promotion jobs
  - a) Pros:
    - i) Supported by SAS
    - ii) Can be accomplished using the SAS Management Console Promotion/Replication Jobs
    - iii) Allows for Partial or full migration
  - b) Cons:
    - i) Cannot go across platforms (i.e. all metadata servers must be on same Host system)
    - ii) Cannot migrate across systems on different domains or VPNs without opening up access
- 2) Running Backup and Restore routines
  - a) Pros:
    - i) Enables migration across different hosts/platforms through manual mechanisms
    - ii) Enables migration across disconnected servers through manual mechanisms
  - b) Cons:
    - i) Supports full migration only
    - ii) Overwrites existing metadata in target system
    - iii) Requires manual intervention in the process to create packages that are platform independent

## CONTACT INFORMATION

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