Understanding Modeling and Structure of Process Chain

Applies to:

SAP R/3, SAP ECC 6.0 and SAP BI NetWeaver 2004s. For more information, visit the EDW homepage.

Summary

This article gives the idea about Architecture and structure of Process Chain and different features available in Process Chain to analysis in different scenarios.

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Created on: 27 September 2011

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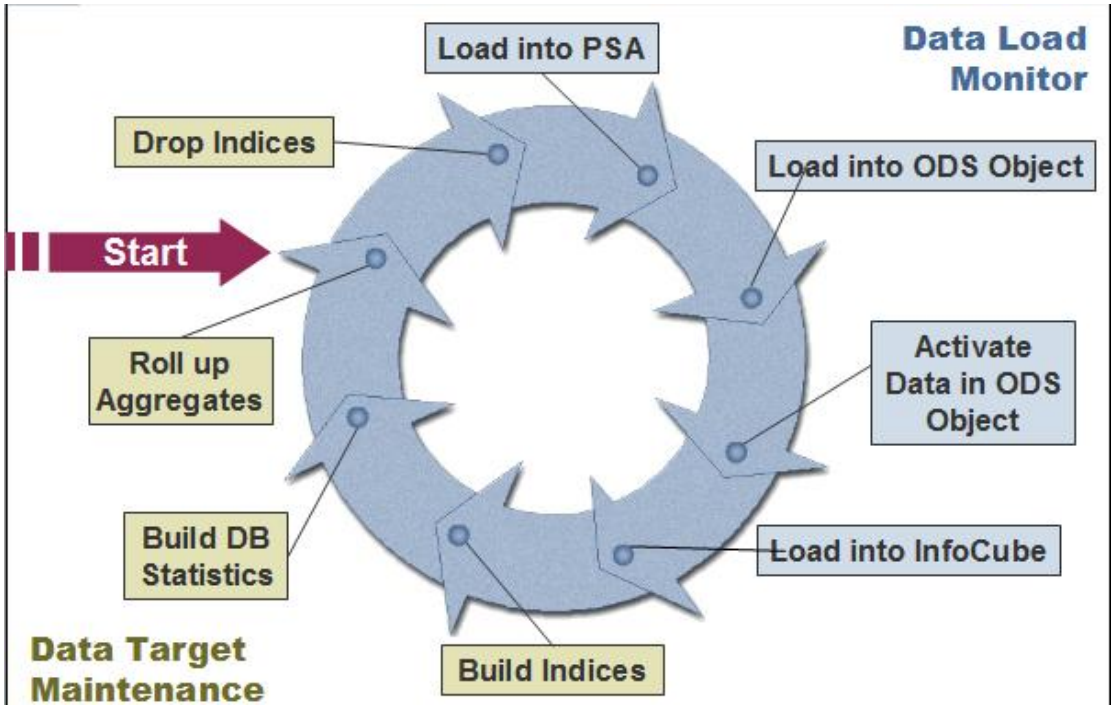
Introduction

A Process chain is a sequence of processes that wait in the background for an event.

Some of these processes trigger a separate event that can start processes in turn.

A normal Process chain activities look like:



We can achieve following objects by Process chain:

A) Automate BW activities by the principle of event controlled processing
B) Graphical Modeling and monitoring in one cockpit
C) Central monitoring of BW Process
D) High Termination security
E) Handle event based in a linear fashion
F) Openness

Important Concepts in Process Chain:

1) Start Process:

   This provides the scheduling options of Process chain. Each Start process can be linked with only One Process chain and each Process chain can contain only one Start process
2) Application Process:

   They are actual processes that are automated. They can be any BW activities, an ABAP Program, an OS command or even another Process chain.
3) Collector Process:

   The collection process are necessary when you want to schedule process in parallel and the scheduling of the successor processes are based on the outcome of the successor parallel processes.

   The collection processes are AND (Last), OR (Every), EXOR (First).

Terminologies in Process chain:

A) Process Type:

   These are the processes that are included in the Process chain framework like load process, ABAP, rollup etc.

   Main table for Process type is RSPROCESSTYPES. It captures various Process types, their properties and the Implementation object details
B) Process variant:

   It is the name of the process type with respect to the Process chain context. It is the definition of a process type at design tiem
C) Process Instance:

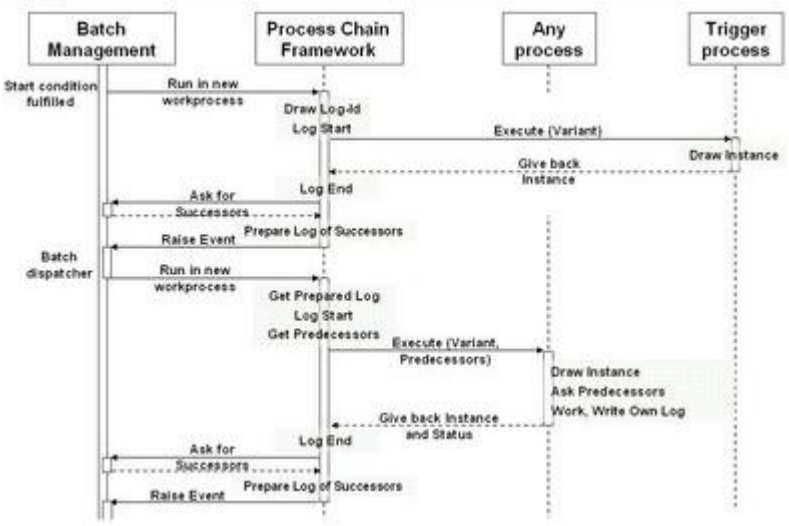
   It is the run time object of the process. It is necessary for the communication with the framework and also the successor processes. It also contains the runtime logs.
D) LogID: It is the runtime instance of the chain.

Structure and Flow of Process Chain:

Execution of Process Chain follows:

A) Get the variant and predecessor list
B) Instantiate process object
C) Ask predecessors fro information
D) Execution of the defined process
E) Report ending the status and Instance

Runtime sequence Diagram:



Processes are executed one after another depending on success or failures of predecessors.

Every process types is basically a set of interfaces. There are a number of interfaces that are implemented for each process type.

Questions for Process Chain:

A) What are the different Processes?

We need to collect all processes that have to run, so that end user can get proper values. Some processes are:

i) Data Loading processes
ii) Administration processes
iii) Reporting Agent processes

B) When to run Process Chain?

When business having requirement on Data availability.

C) How to run Process Chain?

i) Define whether one or several predecessor processes have to run before a single process can start
ii) Define whether a single process has to run when the process chain is executed or whether failures can be (temporarily) accepted

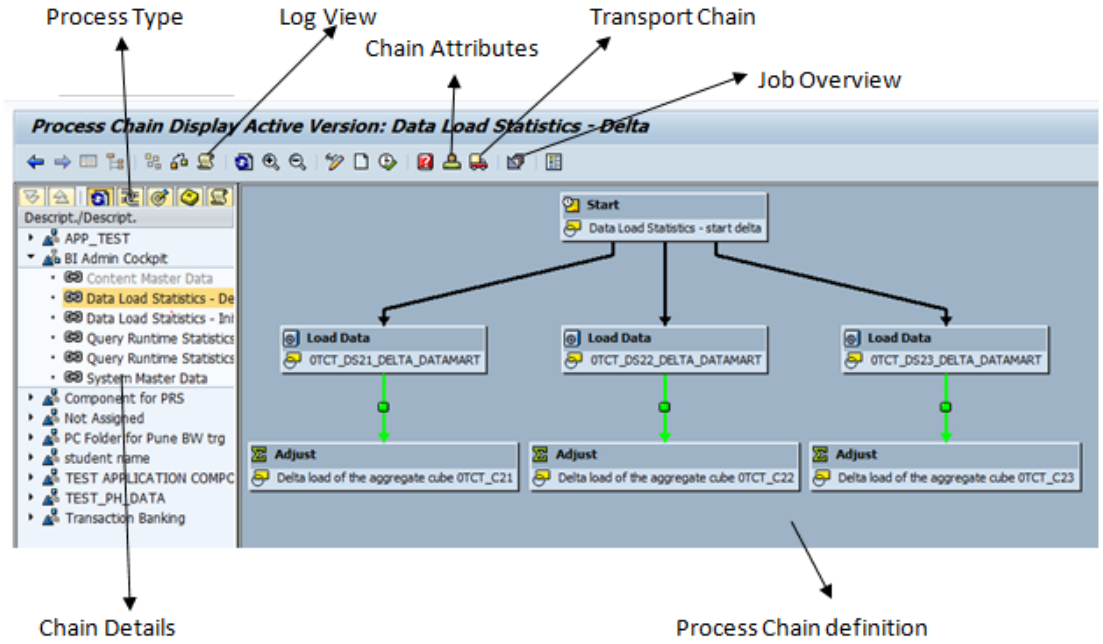
D) What will be the frequency for Process Chain?

It can be hours, daily, weekly, monthly etc. It all depends upon the business Requirements'.

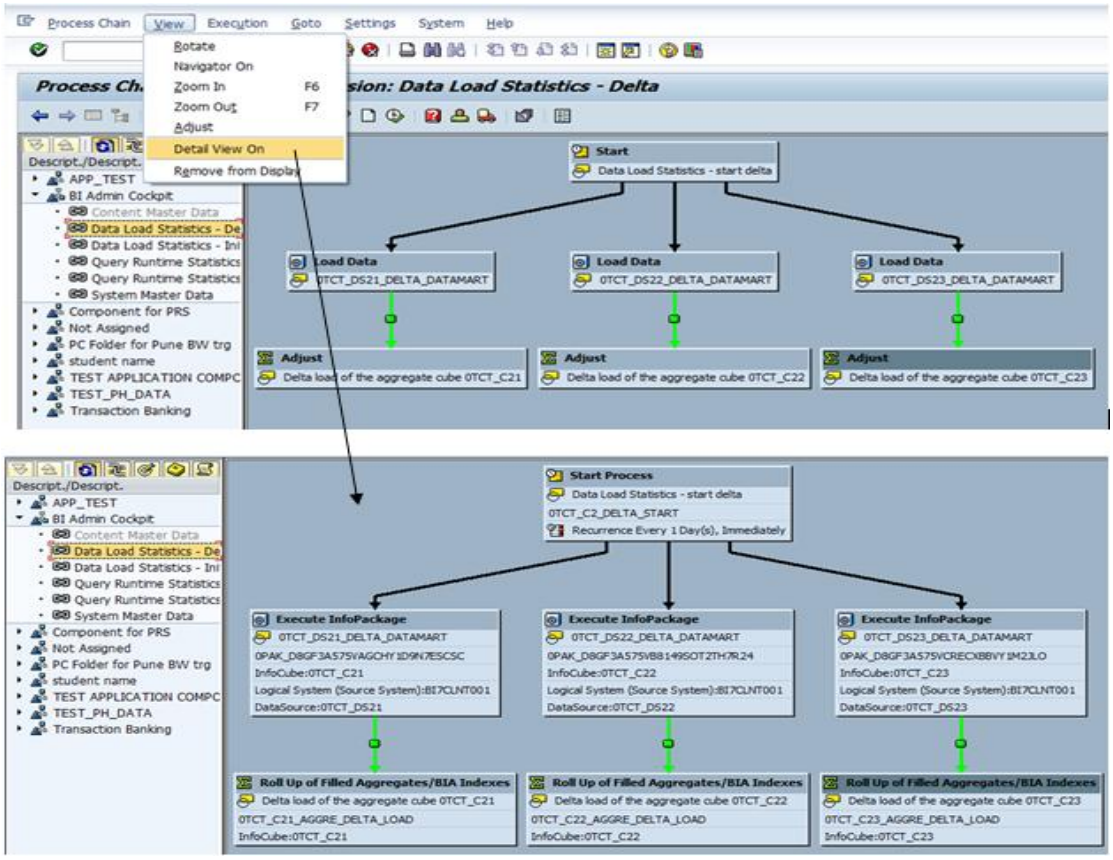
Technical aspects of Process Chain

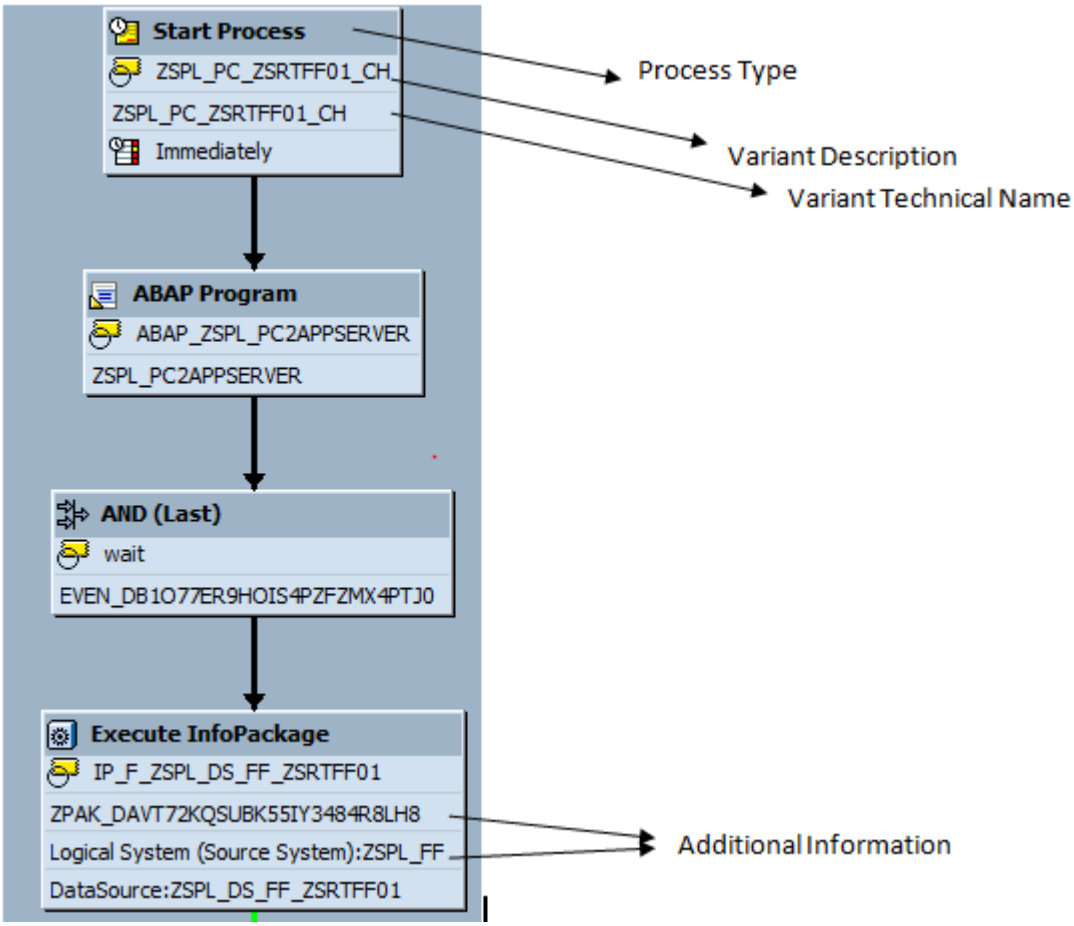
General Functionality

There are 3 Transaction for Process chain: RSPC/RSPC1/RSPCM



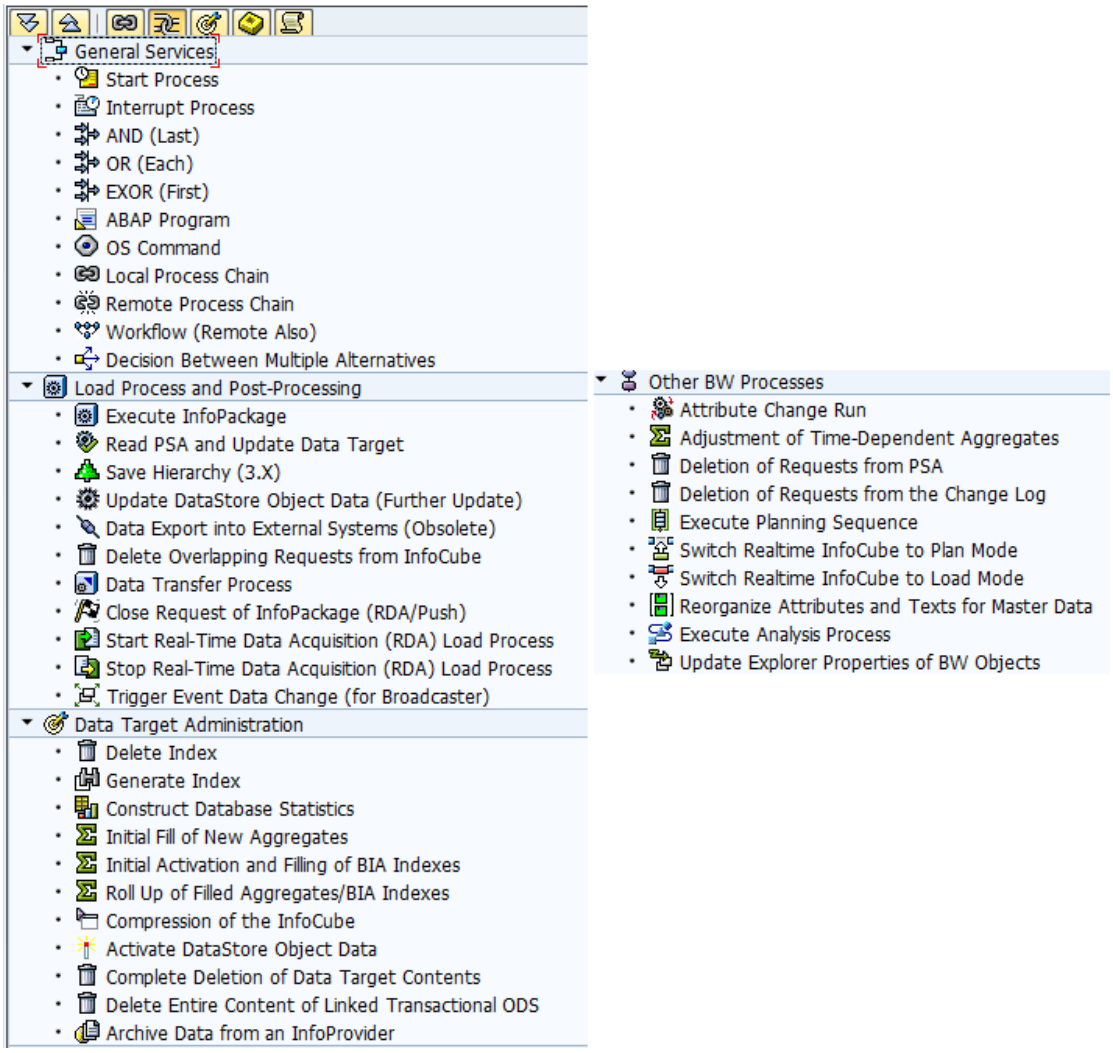
Detail View for Process Chain:





In additional information we can find Technical Info package and name of Data Target etc.

Process Types



There are some new features in Process chain in 7.0

i) Decision Between Multiple Alternatives

Once you put all conditions in the process type, then when you connect a link between decision process type to the next process, it will asks on what condition you need to proceed to next process type.
You can find the process type in "General Services".

ii) Data Transfer Process

This process is used for automatically load data into an Info provider. It is just like an info package.
You can find the process type in "Load process and post-processing".

iii) Close Request of InfoPackage (RDA/Push)

With this process type, you can close an open PSA request for a Web service DataSource or a DataSource for real-time data acquisition in an SAP source system before the entry value is reached.
You can find the process type in "Load process and post-processing".

iv) Archive Data from an InfoProvider

This process type is used to automate the Archiving data from info provider.
You can find the process type in "Data Target Administration".

v) Deletion of Requests from the Change Log

This process is used for deleting data from the change log of a DataStore object is which are no longer needed for the delta update.
You can find the process type in "Other BW Processes".

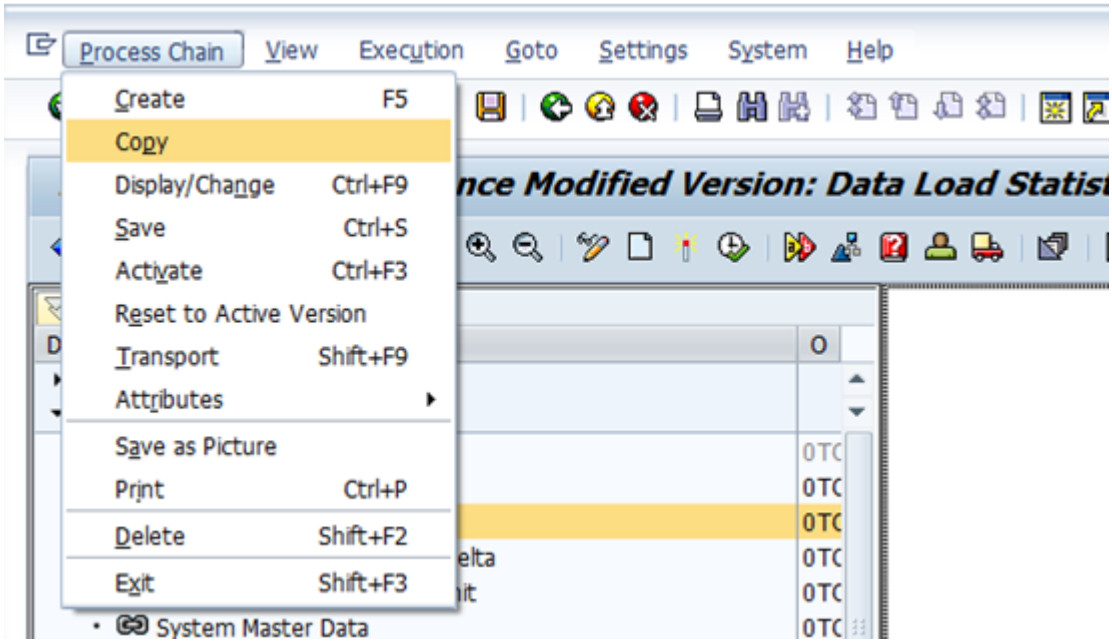
vi) Switch Realtime InfoCube to Plan Mode / Switch Realtime InfoCube to Load Mode

This both process types are used to automate the process of converting real time Infocube to plan mode or load mode.
You can find the process types in "Other BW Processes".

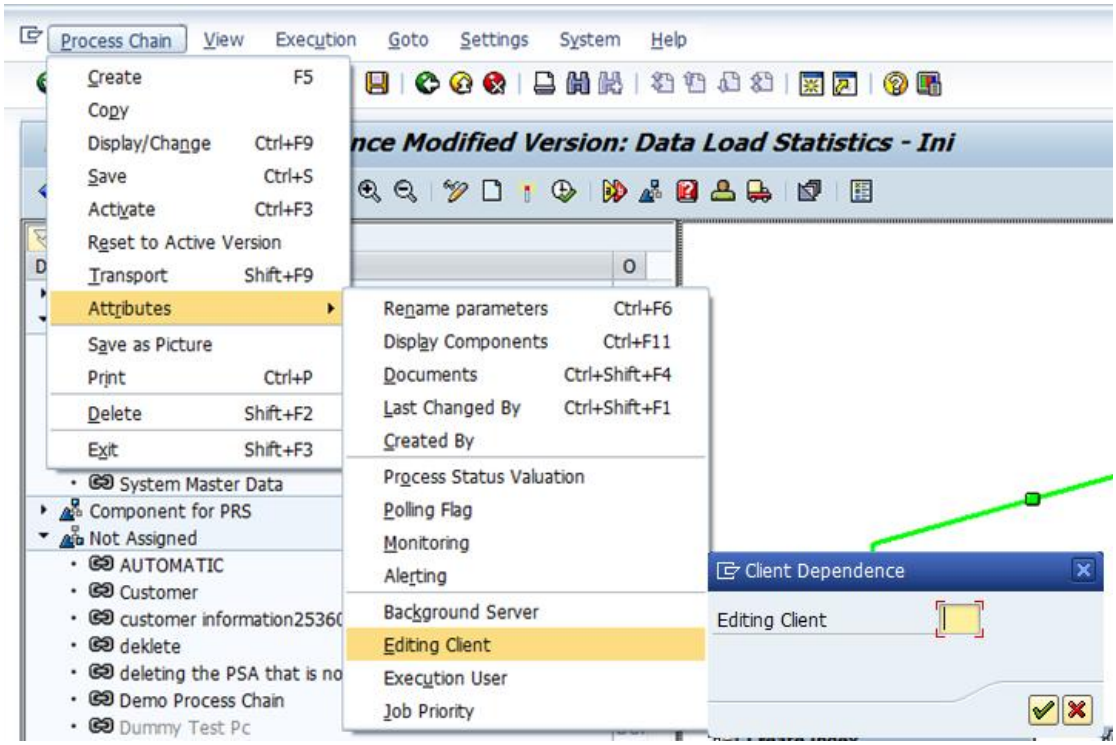
vii) Display mode:

Default view is always DISPLAY mode. There is NO locking issue in Process chain. One user can change and other user is just displaying it.

Copy of Process chain:



vii) Client Dependent Process chain



Assignment of Process chain for particular Client.

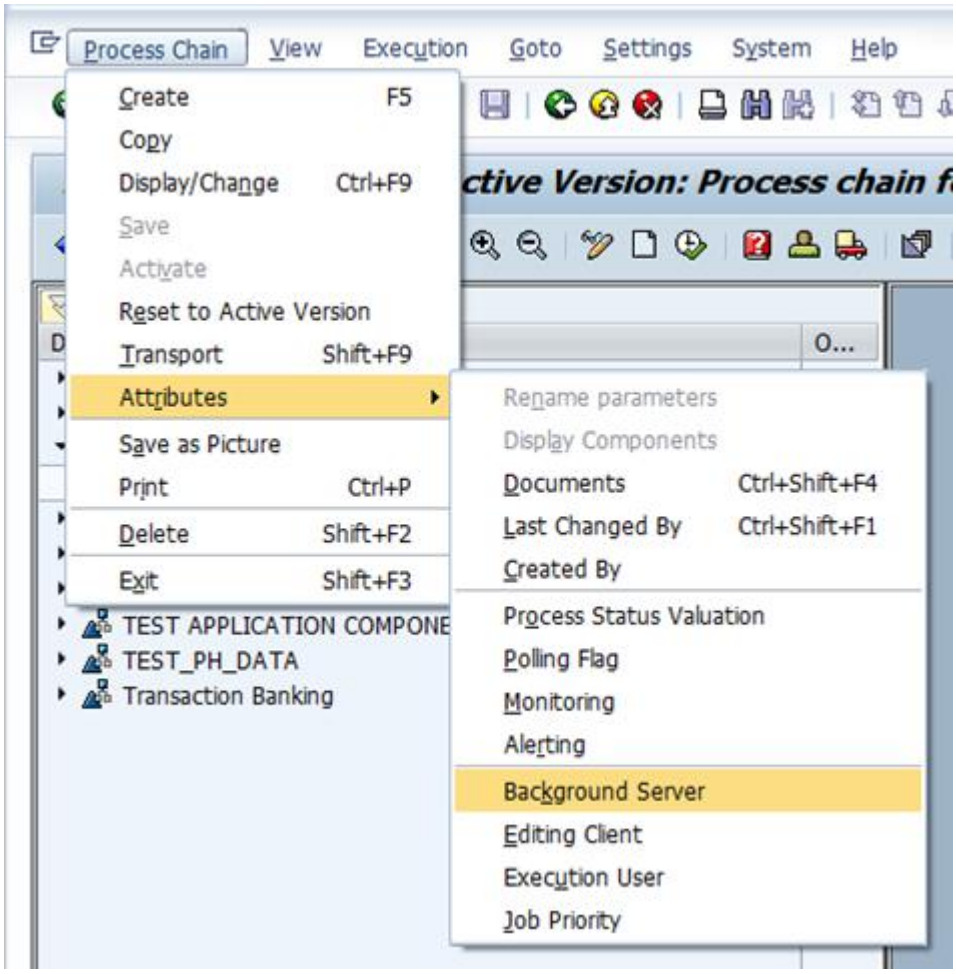
Scenario: client-dependent applications that incorporate SAP NetWeaver BI (e.g. SAP SCM) → process chain can only be seen in the specified client

viii) New Authorization Objects:

There is a new authorization object on the process chain itself S_RS_PC which checks on the sub objects:

- DEFINITION (Metadata) the activities display (03) and change (23)
- PROTOCOLS (Protocols) the activity deletion (06),
- RUNTIME (Execution) the activity execution (16).

ix) Background user



- Scenarios
  - Special users for load balancing
  - Be able to see in sm50 which user has scheduled a certain process chain and is in charge of it
- Three options
  - BWREMOTE (default)
  - User actually scheduling the process chain
  - Manually specified user

Collector Process:

They manage multiple predecessor processes that feed into the same subsequent process.

- AND: All of the processes that are direct predecessors must send an event in order for subsequent processes to be executed
- OR: A least one predecessor process must send an event

  The first predecessor process that sends an event triggers the subsequent process

  Any additional predecessor processes that send an event will again trigger subsequent process (Only if the chain is planned as "periodic")
- EXOR: Exclusive "OR"

  Similar to regular "OR", but there is only ONE execution of the successor processes, even if several predecessor processes raise an event
- Decision:

  A more complex status of process flow for which flexible execution paths are implemented is possible

  Up to 99 different outcomes (plus one failure) possible

  Formula editor available
- Interrupt:

  A chain or part of it shall not run except explicite conditions are met

  Both conditions (of the chain and the Interrupt wait job) shall become true

  Only if both are true, the chain will go beyond the Interrupt chain job

Job Notification

When a chain gets started, its processes will be planned in batch

- as program RSPROCESS with type and variant given as parameters
- with job name BI_PROCESS_<TYPE>
- waiting for event, except the trigger
- The trigger is planned as specified in its variant, if “start via meta-chain” it is not planned to batch

In table RSPROCESSTYPEST, we can find all details for Process Chain Jobs:

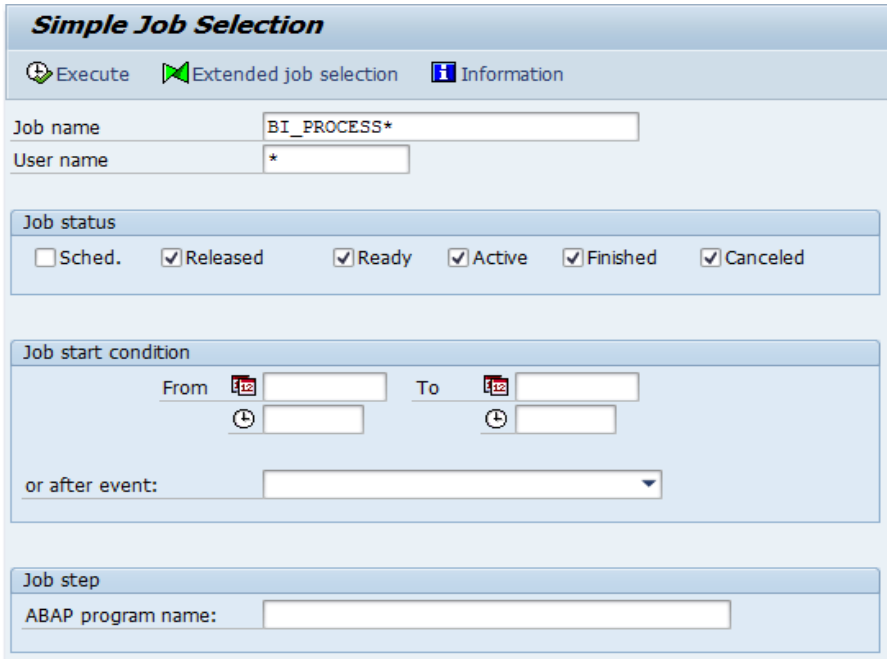
Data Browser: Table RSPROCESSTYPEST Select Entries 11

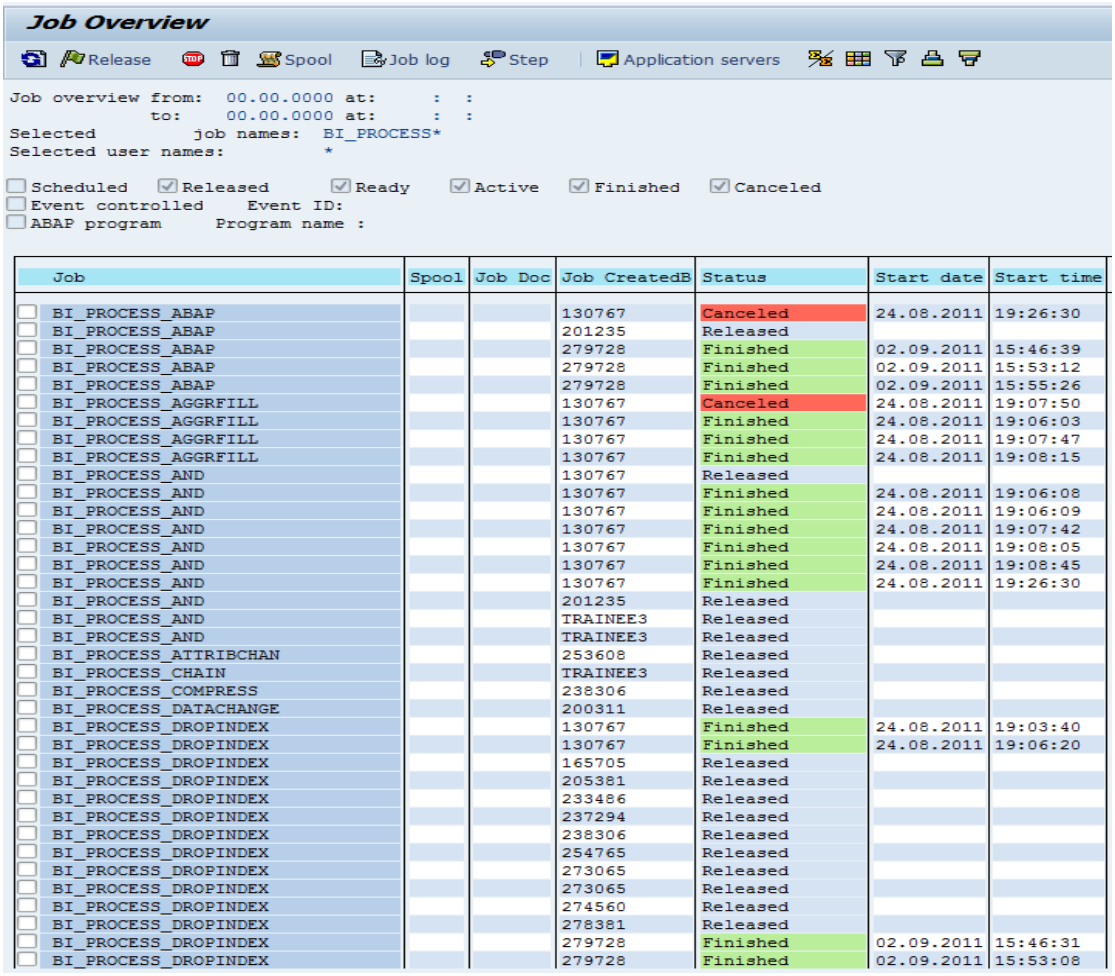
Check Table...

Table: RSPROCESSTYPEST
Displayed Fields: 2 of 2 Fixed Columns: 2 Li

TYPE	DESCRIPTION
ABAP	ABAP Programm
AGGRFILL	Initiales Füllen neuer Aggregate
AND	AND (Letzter)
ANPR	Analyseprozess ausführen
ARCHIVE	Daten aus einem InfoProvider archivieren
ATTRIBCHAN	Attributsänderungslauf
AUTOCLASS	Automatische Klassifizierung
BIAINDEX	Initiales Aktivieren und Füllen von BIA-Indizes
BIA_TPS	Explorer-Eigenschaften von BW-Objekten aktualisieren
CHAIN	Prozesskette lokal
CHGLOGDEL	Löschen von Requests aus dem Changelog
CLEARTODS	Lösche gesamten Inhalt des gekoppelten transaktionalen ODS
COMMAND	Betriebssystemkommando
COMPRESS	Komprimieren des InfoCubes
CPS_EVENT	Ereignis in SAP CPS
CPS_JOB	Job in SAP CPS
DATACHANGE	Event Datenänderung auslösen (für Broadcaster)
DBSTAT	Datenbankstatistik aufbauen
DECISION	Entscheidung zwischen mehreren Alternativen
DROPCUBE	Vollständiges Löschen des Datenziel-Inhalts
DROPINDEX	Index löschen
DSOREPLIC	DataStore Object-Replikation
DTP_LOAD	Datentransferprozess
EXOR	EXOR (Erster)
HIERSAVE	Hierarchie sichern (3.X)
INDEX	Index aufbauen
INTERRUPT	Interruptprozess
LOADING	InfoPackage ausführen
LPI	Logisch Partitionierte InfoPackages
MAIL	Nachricht senden
MDREORG	Stammdatenattribute und -texte reorganisieren
MDUPDATEGK	Stammdatenaktualisierung mit Globalen Schlüsseln
ODSACTIVAT	DataStore Objekt Daten aktivieren
ODSPROCESS	DataStore Objekt Daten fortschreiben (Weiterverbuchung)
OPENHUB	Datenexport in Fremdsysteme (obsolet)
OR	OR (Jeder)
PC_ACTIVE	Ist voriger Lauf der Kette noch aktiv?
PLSEQ	Planungssequenz ausführen
PLSWITCHL	Realtime InfoCube in Lademodus schalten
PLSWITCHP	Realtime InfoCube in Planmodus schalten
PSADELETE	Löschen von Requests aus dem PSA
PSAPROCESS	PSA lesen und Datenziel verbuchen
RDA_CLOSE	Request eines InfoPackages (RDA/Push) schließen
RDA_RESET	Real-Time Data Acquisition (RDA) Ladeprozess stoppen

We can analyze jobs in SM37:

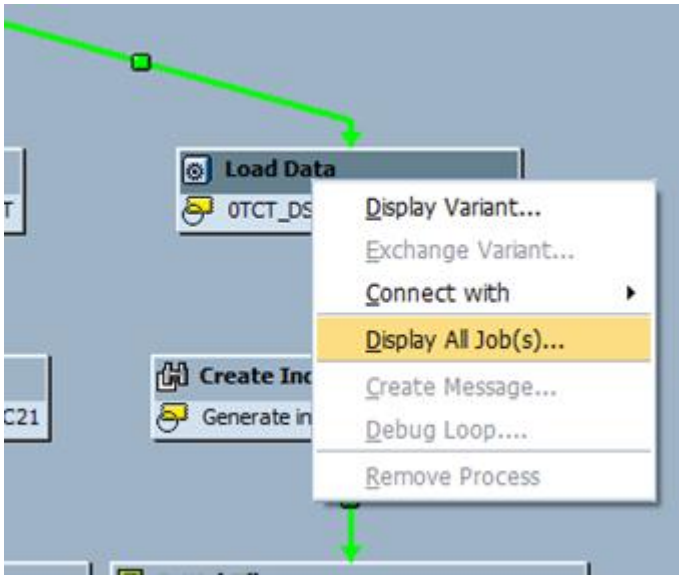


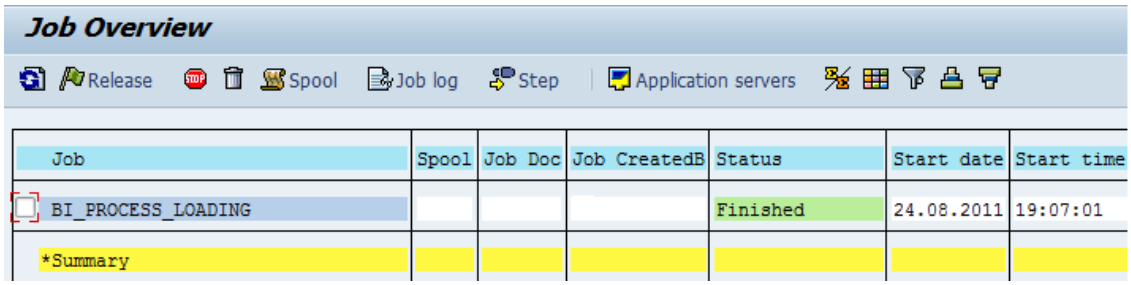


Job	Spool	Job Doc	Job CreatedB	Status	Start date	Start time
BI_PROCESS_ABAP			130767	Canceled	24.08.2011	19:26:30
BI_PROCESS_ABAP			201235	Released		
BI_PROCESS_ABAP			279728	Finished	02.09.2011	15:46:39
BI_PROCESS_ABAP			279728	Finished	02.09.2011	15:53:12
BI_PROCESS_ABAP			279728	Finished	02.09.2011	15:55:26
BI_PROCESS_AGGRFILL			130767	Canceled	24.08.2011	19:07:50
BI_PROCESS_AGGRFILL			130767	Finished	24.08.2011	19:06:03
BI_PROCESS_AGGRFILL			130767	Finished	24.08.2011	19:07:47
BI_PROCESS_AGGRFILL			130767	Finished	24.08.2011	19:08:15
BI_PROCESS_AND			130767	Released		
BI_PROCESS_AND			130767	Finished	24.08.2011	19:06:08
BI_PROCESS_AND			130767	Finished	24.08.2011	19:06:09
BI_PROCESS_AND			130767	Finished	24.08.2011	19:07:42
BI_PROCESS_AND			130767	Finished	24.08.2011	19:08:05
BI_PROCESS_AND			130767	Finished	24.08.2011	19:08:45
BI_PROCESS_AND			130767	Finished	24.08.2011	19:26:30
BI_PROCESS_AND			201235	Released		
BI_PROCESS_AND			TRAINEE3	Released		
BI_PROCESS_AND			TRAINEE3	Released		
BI_PROCESS_ATTRIBCHAN			253608	Released		
BI_PROCESS_CHAIN			TRAINEE3	Released		
BI_PROCESS_COMPRESS			238306	Released		
BI_PROCESS_DATACHANGE			200311	Released		
BI_PROCESS_DROPINDEX			130767	Finished	24.08.2011	19:03:40
BI_PROCESS_DROPINDEX			130767	Finished	24.08.2011	19:06:20
BI_PROCESS_DROPINDEX			165705	Released		
BI_PROCESS_DROPINDEX			205381	Released		
BI_PROCESS_DROPINDEX			233486	Released		
BI_PROCESS_DROPINDEX			237294	Released		
BI_PROCESS_DROPINDEX			238306	Released		
BI_PROCESS_DROPINDEX			254765	Released		
BI_PROCESS_DROPINDEX			273065	Released		
BI_PROCESS_DROPINDEX			273065	Released		
BI_PROCESS_DROPINDEX			274560	Released		
BI_PROCESS_DROPINDEX			278381	Released		
BI_PROCESS_DROPINDEX			279728	Finished	02.09.2011	15:46:31
BI_PROCESS_DROPINDEX			279728	Finished	02.09.2011	15:53:08

Above we can see status of job for our process Chain.

Displaying all jobs for a particular Process Chain:





We can see all jobs running for particular Process Chain

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