Change Control Management – Building a Bridge
Building a bridge between today’s environment and tomorrow’s technologies
Disclaimer

The information in this presentation is confidential and proprietary to SAP and may not be disclosed without the permission of SAP. Except for your obligation to protect confidential information, this presentation is not subject to your license agreement or any other service or subscription agreement with SAP. SAP has no obligation to pursue any course of business outlined in this presentation or any related document, or to develop or release any functionality mentioned therein.

This presentation, or any related document and SAP’s strategy and possible future developments, products and or platforms directions and functionality are all subject to change and may be changed by SAP at any time for any reason without notice. The information in this presentation is not a commitment, promise or legal obligation to deliver any material, code or functionality. This presentation is provided without a warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. This presentation is for informational purposes and may not be incorporated into a contract. SAP assumes no responsibility for errors or omissions in this presentation, except if such damages were caused by SAP’s intentional or gross negligence.

All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of their dates, and they should not be relied upon in making purchasing decisions.
1. Building a bridge between today’s environment and tomorrow’s technology
2. Build the foundation through integration
3. Bridge Pier - Keep the overview and obtain the benefit from increased transparency
4. Bridge Pier - Central control without risking consistency and flexibility
5. Bridge Segment - Full change traceability with built-in safety assurance for your IT infrastructure
6. Bridge Segment - Provide an integrated and collaborative Requirements to Deploy Process for Business and IT
Building a bridge between today’s environment and tomorrow’s technology

"Change is the law of life and those who look only to the past or present are certain to miss the future." — John F. Kennedy
Building the Bridge
Take advantage of new technology while leveraging existing investments

Digital Applications | Experimental | Innovation | Agile ♦ High Pace

SAP Leonardo

S/4HANA
Enterprise Applications | Critical Business Process Engine | Tightly Governed ♦ Moderate Pace

Source Code Management
- git
- Sonar

Build Tools
- Maven
- Bundler

Code Quality Analysis
- Coverity
- Fortify

Ideal Continuous Delivery Process
- Travis
- Bamboo

Continuous Integration Servers
- Rockspace
- OpenShift

Configuration Management and Deployment Tools
- Chef
- Puppet

Store valid binaries, packages
- Nexus

Testing Frameworks
- JUnit
- Cucumber

© 2017 SAP SE or an SAP affiliate company. All rights reserved. | CUSTOMER
Challenges for Change & Release Management

Hybrid architectures entail the risk, that IT loses the ability to govern its environment.

Expectation to get products faster to the market and drive growth much higher - even as they reduce costs through increased efficiencies.

IT will invest less in developing specialists and more in becoming brokers of IT services. Nevertheless Change Management needs to be under control.

Change Management in Hybrid environments needs to fulfill audit requirements like in on premise.
Challenges for Change & Release Management

Hybrid architectures entail the risk, that IT loses the ability to govern its environment.

Expectation to get products faster to the market and drive growth much higher - even as they reduce costs through increased efficiencies.

IT will invest less in developing specialists and more in becoming brokers of IT services. Nevertheless Change Management needs to be under control.

Change Management in Hybrid environments needs to fulfill audit requirements like in on premise.
Change Control Management

Overview

- Change Request Management
- Quality Gate Management
- Central Transport Management
- Change and Transport system (SAP / Non SAP)
- Retrofit
- Release Management
- Transport Analytics / Change Diagnostics
Build the foundation through integration
Change Control Management
Deployment across different landscape and technologies
Continuous integration / continuous delivery / continuous deployment

1. Write Code
   SAP Web IDE, Eclipse...

2. Push to central Source Code Management System (GIT)

3. SCM triggers CI Server (Jenkins)

4. Automated Build & Tests

5. Provide Feedback
Continuous Integration / Continuous Delivery / Continuous Deployment

Source Code Management
- git
- SonarQube

Build Tools
- Maven
- SonarQube

Code Quality Analysis
- SonarQube
- Fortify

Poll SCM
- Check-out code

Validate Builds
- Sanity Checks

1. Check out code and build
2. Unit Testing
3. Quality Control
4. Deploy to Test Environment
5. Fetch Latest Builds

Ideal Continuous Delivery Process

Continuous Integration Servers

Deployment Environments – VMs, Cloud, Bare-metal

Configuration Management and Deployment Tools
- Puppet
- Chef
- CFEngine

Store valid binaries, packages
- Nexus

Avoid Configuration Drift
- Ensure all environments are in sync

Testing Frameworks
- JUnit
- cucumber
High-level process non-ABAP / ABAP integration

1. Write Code
   - SAP Web IDE, Eclipse...

2. Push to central Source Code Management System (GIT)

3. SCM triggers CI Server (Jenkins)

4. Automated Build & Tests

5. Provide Feedback

6. Deploy

7. Upload to Change and Transport System

ABAP Life Cycle Management

- Dev System
- Quality System
- Productive System

- Release of Transport Requests
- Import to Quality system
- Import to Productive system

© 2017 SAP SE or an SAP affiliate company. All rights reserved. | EXTERNAL
Landscape
SAP Transport Management
Change and Transport System (CTS) – the comprehensive transport tool

NEW!
SAP S/4 HANA

NEW!
SAP Cloud Platform

NEW!
SAP HANA XSA

NEW!
SAP Business Objects DS

Transport Tool: CTS (including CTS+ for non-ABAP)
Bridge Pier - Keep the overview and obtain the benefit from increased transparency
Change Control Management
Identify optimization potential, adjust import strategy and avoid impact on Business
A set of transport requests can be checked for import errors before the import into a target system is done.

Following checks are available:

- **Cross Reference**: Return Code 8 prediction
- **Sequence Check**: Wrong transport sequence
- **Software Component**: Wrong software component for SAP standard objects and SAP Notes
- **Import Time in Source System**: Sums up the import time of the individual transports in the source system
- **Online Import Check**: Checks the criticality of the transported objects and dependent objects when they are imported during productive system usage

**TX SE38 -> /SDF/CMO_TR_CHECK**

‘Online Import Check’ Available with ST-PI SP6
# Transport Check Report
## Cross Reference Check Result

<table>
<thead>
<tr>
<th>Checked Request</th>
<th>Request Owner</th>
<th>Obj</th>
<th>Object Name</th>
<th>Ref.</th>
<th>Ref. Object Name</th>
<th>Severity</th>
<th>Status</th>
<th>Missing Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y59K903674</td>
<td>NERDING</td>
<td>T1BU</td>
<td>ZTESTRM2</td>
<td>T1BD</td>
<td>ZTESTRM2</td>
<td></td>
<td>Only in source</td>
<td>Y59K903674</td>
</tr>
<tr>
<td>Y59K903674</td>
<td>NERDING</td>
<td>FUGR</td>
<td>ZONLINEIMPORT</td>
<td>T1BD</td>
<td>ZPRONAME</td>
<td></td>
<td>Only in source</td>
<td>Y59K903674</td>
</tr>
<tr>
<td>Y59K903674</td>
<td>NERDING</td>
<td>T1BD</td>
<td>ZONIMP_OBJDEP</td>
<td>T1BD</td>
<td>ZONIMP_OBJDEP</td>
<td></td>
<td>Inconsistent in source</td>
<td>Y59K903674</td>
</tr>
<tr>
<td>Y59K903674</td>
<td>NERDING</td>
<td>T1BD</td>
<td>ZONIMP_OBJDEP</td>
<td>T1BD</td>
<td>ZONIMP_OBJDEP</td>
<td></td>
<td>Inconsistent in source</td>
<td>Y59K903674</td>
</tr>
<tr>
<td>Y59K903674</td>
<td>NERDING</td>
<td>T1BD</td>
<td>ZONIMP_RESULT</td>
<td>T1BD</td>
<td>ZONIMP_RESULT</td>
<td></td>
<td>Locked in target</td>
<td></td>
</tr>
<tr>
<td>Y59K903674</td>
<td>NERDING</td>
<td>FUGR</td>
<td>ZONLINEIMPORT</td>
<td>T1BD</td>
<td>ZONLINEIMPORT</td>
<td></td>
<td>Locked in target</td>
<td></td>
</tr>
<tr>
<td>Y59K903674</td>
<td>NERDING</td>
<td>CPDB</td>
<td>/CBAD/CL_MESSAGE_LOG</td>
<td>T1BD</td>
<td>ZONLINEIMPORT</td>
<td></td>
<td>User inconsistent in source</td>
<td>Y59K903674</td>
</tr>
<tr>
<td>Y59K903674</td>
<td>NERDING</td>
<td>CPRI</td>
<td>ZCLAS_RN6</td>
<td>T1BD</td>
<td>ZCLAS_RN6</td>
<td></td>
<td>User inconsistent in source</td>
<td>Y59K903674</td>
</tr>
<tr>
<td>Y59K904066</td>
<td>YR</td>
<td>CPRI</td>
<td>ZCLAS_RN6</td>
<td>T1BD</td>
<td>ZCLAS_RN6</td>
<td></td>
<td>Only in target</td>
<td>Y59K904066</td>
</tr>
<tr>
<td>Y59K904066</td>
<td>YR</td>
<td>CPRI</td>
<td>ZCLAS_RN6</td>
<td>T1BD</td>
<td>ZCLAS_RN6</td>
<td></td>
<td>Only in source</td>
<td>Y59K902715</td>
</tr>
<tr>
<td>Y59K904066</td>
<td>YR</td>
<td>CPRI</td>
<td>ZCLAS_RN6</td>
<td>T1BD</td>
<td>ZCLAS_RN6</td>
<td></td>
<td>Only in source</td>
<td>Y59K902715</td>
</tr>
<tr>
<td>Y59K902710</td>
<td>YR</td>
<td>CDAT</td>
<td>VVC_T662_VA</td>
<td>T1BD</td>
<td>A001</td>
<td></td>
<td>Different version</td>
<td></td>
</tr>
<tr>
<td>Y59K902710</td>
<td>YR</td>
<td>CDAT</td>
<td>VVC_T662_VA</td>
<td>T1BD</td>
<td>A001</td>
<td></td>
<td>Different version</td>
<td></td>
</tr>
</tbody>
</table>
Transport Check Report
Online Import Check Result

1st level: Result aggregated on transport requests

2nd level: Critical objects per transport request

3rd level: Table accesses per hour of week (or alternatively table changes or report executions)
Transport Analytics & Change Diagnostics
Analysis, Reporting and Proactive Checks

Transport Process Analysis

Emergency Changes
- Transports created in production or with short transition time

Failed Changes
- Import Errors, sequence errors, frequently changed objects

Transport Statistics
- Change volume and time profiles for imports

Transport Backlogs
- Transports not yet in Production

Transport Execution Analysis
S/4 HANA and Analytics

Change Analysis
- Software Release, Transports and Parameter (SAP Application & Kernel, Database, Operating System, Security)

Configuration Validation
- Analyze and compare transports with existing systems or targets

Scope for

Transport Process Reporting

Import Time Estimation
- Prediction of upcoming import time based on reference system

Sequence Check
- Identification of wrong sequences in a planned import queue

Cross Reference Check
- Transport dependencies based on environment analysis

Cross Release Check
- Transports with wrong component

Proactive Checks

Transport Execution Analysis for Projects

Indicators for
Bridge Pier - Central control without risking consistency and flexibility
Change Control Management
Simplifies Transition to SAP S/4HANA

Retrofit

Central Transport Management

Change and Transport system (SAP / Non SAP)

Transport Analytics / Change Diagnostics
SAP S/4HANA Dual Landscape Synchronization with Retrofit

SAP S/4 Conversion Scenario
Minor Releases / Changes

<table>
<thead>
<tr>
<th>Object Types</th>
<th>Same Level</th>
<th>ERP Upg.</th>
<th>S/4 Conv.</th>
<th>S/4 Upg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP Notes</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>SAP Objects</td>
<td>✓</td>
<td>![⚠️]</td>
<td>![⚠️]</td>
<td>![⚠️]</td>
</tr>
<tr>
<td>Customizing</td>
<td>✓</td>
<td>![⚠️]</td>
<td>![⚠️]</td>
<td>![⚠️]</td>
</tr>
<tr>
<td>Custom Code</td>
<td>✓</td>
<td>![⚠️]</td>
<td>![⚠️]</td>
<td>![⚠️]</td>
</tr>
</tbody>
</table>

Covered by Retrofit

Not covered by Retrofit, due to technical / semantical differences

Could be covered by Retrofit with ATC checks (open)

Check for SAP HANA and SAP S/4HANA Compatibility
The Code Inspector tool (transaction SCI), which is included with SAP NetWeaver AS ABAP, provides check variants for evaluating custom code for SAP HANA and SAP S/4HANA compatibility based on SAP NW 7.51
Central Transport Management - Link between technology and process
SAP Transport best practices

Enhanced Change and Transport System (CTS+)

Import Scheduling

Retrofit

Platform Functions

Administration Cockpit

Transport of Copies

Transport related Check Framework
Administration Cockpit - unites all key information in a central place

Task List & Import Scheduling

Landscape Overview

Full text Enterprise Search

CSOL Data Tracking

Transport Overview
Bridge Segment - Full change traceability with built-in safety assurance for your IT infrastructure
Change Control Management
Best Practice Change Management Processes and Governance

- Change Request Management
- Quality Gate Management
- Central Transport Management
- Change and Transport system (SAP / Non SAP)
- Retrofit
- Transport Analytics / Change Diagnostics
Process meets Technology

Quality Gate Management
- Establish Quality Gates with Segregation of Duties
- Provides integrated and consistent quality process for all operational units across all organizations
- One central build, test, and deployment plan for all projects including their Quality Gates

Change Request Management
- Predefined Change Management Workflows & Processes
- Provides link between requirement and implementation with full traceability
- Highly integrated in other SAP Solution Manager functionalities

SAP’s Central Transport Management Infrastructure
- Full control & transparency over change execution
- Fully integrated transport mechanism and change control system to manage changes across technology stacks and application components
- Incorporates SAP’s best practices regarding transport management
- One source of truth to avoid and manage risks of application changes in a project
- Additional functions to increase consistency and minimize manual efforts
Common Features
Features - Overview

- Turn off local TMS
- Parallelized Import
- Transport risks visualization
- Uneven Landscapes
- External Transport Requests
- Sequence Control
- Transport Bundling & Synchronization
- Import Strategies - Status driven import
- Downgrade Checks
- No Domain Link
- Speed up Development Changes
- Decouple / Assign Transport Requests
- Reassign of Changes
Hybrid Architectures - SAP Digital Transformation Platform

7.2 Solution Manager

DEV Cluster → TC → QAS Cluster → PRD Cluster

SCD Non-ABAP

SCQ Non-ABAP

SCP Non-ABAP

S4D ABAP

S4Q ABAP

S4P ABAP

SAP Leonardo

SAP S/4HANA

© 2017 SAP SE or an SAP affiliate company. All rights reserved. | CUSTOMER
Upon-Saving Transport-Related Checks in Workbench

Highlights

When a developer switch to change mode in the ABAP workbench, a notification will show potential conflicts.

Checks:

- CSOL
- Critical Objects
- White List Objects
- Custom Checks

*ABAP Eclipse workbench planned
Don’t lose the link between Process- and Technical-Layer Transport related Risks & Transport related Check Framework

Transport related Risks
- Missing Synchronization
- Open Transports
- Transport Errors
- Missing Transports

Transport related Checks
- Downgrade Protection
- Critical Objects
- ABAP Test Cockpit (ATC)
- Code Inspector
- Custom specific Checks (Open framework – Integrate your own checks)

Downgrade Protection Checks for HANA transports based on Central Transport System (CTS+) & HANA Transport for ABAP (HTA)
Being flexible with changes and transports

Manage Transport Requests on Change Level

- Decouple modifiable / released Transport requests
- Assign modifiable / released Transport requests
- Assign external Transport requests
Transport Analysis based on System, Transport Request or Scenario
Dual Landscape Synchronization via integrated Retrofit functionality
Two-Speed IT - Pick your Change & Release Management Strategy!

Continual Deployment
Development and Imports may happen either individually or bundled (on demand / daily / weekly)

However:
- No phases, no gates! Every single change can be handled independently ‒ full flexibility

Phase Driven Deployment
All changes and transports of a cycle shall be imported together (Project - Import All)

- Mostly relevant for Project or Wave based transport- and change management
- Additional flexibility options for preliminary or “no risk” changes

Release Management
Based on Release Planning according to ITIL definition
- Defined Relationships and dependencies between each Release
- Import job for the entire Release content
- Additionally, “no risk” changes can be imported bundled
Quality Gate Management
Quality Gate Management – Details

- One central build, test, and deployment plan for all projects including their Quality Gates
- Quality Gate Maintenance with SoD (Segregation of Duties)
- Guided Self Services to assess the risk and document the Quality Gate Criteria
- Central transport mechanism and change control
  Manage changes across the technology framework and application
  Every development workbench is integrated
Enhanced Scenario Capabilities

- Segregation of Duties (4-eye principle, optional)
- Single User or Group can be assigned for QM / QAB approval
- Q-Gates can be disabled as required
Fiori approval app for Quality Gates and Urgent Changes

Q-Gate / Urgent Changes

- Optimized for fast processing
- Fast and easy approval
Transport of copies can be created and imported automatically
Change Request Management
Change Control Cycles and Change Documents

Continual Deployment

Phase Driven Deployment

Release Management

Normal Change

Urgent Change

Standard Change

General Change

Admin Change

All Change Documents available in all variants
Separate Requests from Change Implementation & Deployment

Process Layer: Change & Release Management Process

1. Request for Change
2. Change Document
3. Change Cycle
My messages - Workflow Inbox
Standard Change

Highlights

- Standard change is used to perform low-risk changes that are uncritical and frequently used.
- Changes can be processed without approval.
- Standard change is controlled by authorizations.
Highlights

- The **White list** contains the objects that are allowed to be saved to a transport request of a **Standard Change**.

- **White List Objects** will be defined within Administration Cockpit.
Bridge Segment - Provide an integrated and collaborative Requirements to Deploy Process for Business and IT
Change Control Management
Increase stability by aligned and predefined Releases
Release Management
Releases Synchronize Projects and Help to Keep the Control

Reduce Risk, Simplify Go-Live Process and Decrease Test Effort

Scope Build Test Deploy Hypercare Operate

Release 1
Release Management – Major and Minor Releases

Major Release 2.0

Minor Release 1.1

Major Release 2.0

Minor Release 1.2

Minor Rel. 2.1

Release 1.0

Release 1.1

Release 1.2

Release 2.0

Urgent Changes for Release 1.0

Urgent Changes for Release 1.1

Urgent Changes for Release 1.2

Urgent Changes for Release 2.0
Solution Manager integration capabilities

- Requirements Management
  - Business Requirements
  - IT Requirement

- Change & Release Management
  - Request for Change
  - Change Documents
  - Change Document (stand-alone)

- Process Management
  - Process and Application Landscape

- Project Management
  - Phase
    - Task
    - Task
    - Task
    - Task

© 2017 SAP SE or an SAP affiliate company. All rights reserved. | CUSTOMER
SAP Solution Manager 7.2
Project Management Integrated with Change & Release Management

- Incident
- Problem
- Request for Change
- Business Requirement
- IT Requirement
- SAP PPM Project
- Release
- Project Task
- Change Document

Links:
- Incident to Problem
- Problem to Request for Change
- Business Requirement to IT Requirement
- IT Requirement to SAP PPM Project
- SAP PPM Project to Release
- Release to Change Document

This is the current state of planning and may be changed by SAP at any time.
Summary
Change Control Management - Building the Bridge
Building a bridge between today’s environment and tomorrow’s technologies
## Change Control Management

### Key take away

<table>
<thead>
<tr>
<th></th>
<th>Change and Transport Management</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ü One Transport Tool for Multiple Content Types</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ü Integration of several development environments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ü Open API's to integrate customer specific applications</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Transport Analytics / Change Diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>ü Guided Self Service analysis the transport process to improve quality, reliability and throughput</td>
</tr>
<tr>
<td></td>
<td>ü Change Diagnostics and Configuration Validation reduce the manual work of regular Transport Execution Reporting</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Transport Management / Retrofit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>ü Create, Release and Import Transport Requests within Solution Manager</td>
</tr>
<tr>
<td></td>
<td>ü Retrofit improves quality in running phased Transport Landscape</td>
</tr>
<tr>
<td></td>
<td>ü Less manual effort for double maintenance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Quality Gate Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>ü One central build, test, and deployment plan</td>
</tr>
<tr>
<td></td>
<td>ü Build in central Change and Transport Best Practices</td>
</tr>
<tr>
<td></td>
<td>ü Flexible reassignment of development objects at any time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Change Request Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>ü Integrated IT Service Management and Application Lifecycle Management</td>
</tr>
<tr>
<td></td>
<td>ü Change Request Management provides full flexibility</td>
</tr>
<tr>
<td></td>
<td>ü Provides full control &amp; transparency over change execution</td>
</tr>
<tr>
<td></td>
<td>ü Delivers predefined change management processes &amp; workflows</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Release Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>ü Release schedule for Major and Minor releases including version history</td>
</tr>
<tr>
<td></td>
<td>ü Assign development activities to the planned release, unfinished development activities well be taken over automatically</td>
</tr>
</tbody>
</table>
Thank you.

Contact information:

**F name L name**
Title
Address
Phone number