SAP NetWeaver
How-To Guide

Best Practices for Designing the Portal Homepage

Applicable Releases:

SAP NetWeaver 2004

SAP NetWeaver 7.0

IT Practice:

User Productivity Enablement

IT Scenario:

Running an Enterprise Portal

Version 1.0

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HOW-TO GUIDE

THE BEST-RUN BUSINESSES RUN SAP™

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Document History

Document Version	Description
1.00	First official release of this guide

Typographic Conventions

Type Style	Description
Example Text	Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options. Cross-references to other documentation
Example text	Emphasized words or phrases in body text, graphic titles, and table titles
`Example text`	File and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.
`Example text`	User entry texts. These are words or characters that you enter in the system exactly as they appear in the documentation.
`<Example text>`	Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.
`EXAMPLE TEXT`	Keys on the keyboard, for example, `F2` or `ENTER`.

Icons

Icon	Description
	Caution
	Note or Important
	Example
	Recommendation or Tip

Table of Contents

1. Business Scenario 1

2. Background Information 1

3. Prerequisites 1

4. Guidelines on Best Practices 2

4.1 Overview and general recommendations 2

4.2 Portal Content – Technical Background 2

4.3 Portal Content – Tips and Tricks 6

4.4 KM Content – Tips and Tricks 11

4.5 The Concept of Portal Landing Page 12

5. Important Links 14

1. Business Scenario

What takes to make a successful SAP NetWeaver Portal Implementation? The answer is very simple, rich and positive User Experience, Performance, Stability and Security, just to name a few.

The very first step which leaves an impression and helps the end users to evaluate some of these critical factors is to see how much time it takes for the portal to load and render the homepage. Secondly, the number of clicks one would need to reach to the desired application or page and so on.

Through this guide, we would address all those points that should be taken into consideration while creating the Portal Homepage. The objective is to reduce the loading and rendering time for the Portal Homepage and hence improve the User Experience and Productivity.

2. Background Information

Designing the Portal Homepage would certainly be one of the most common implementation scenarios. There have been instances where the loading and rendering time for Portal Homepage has been exceptionally high. After a thorough analysis, it was understood that a few critical points had been ignored and missed out during configuration, hence the high response time. Secondly, a few network issues we identified, which anyways would not be in our control. With this background in mind, it was decided that we could have these points incorporated in one of the how-to guides.

The key to successfully implement this scenario is to understand the business requirements, understand the Portal concepts clearly and finally, come up with a matrix to see how many of the business scenarios are met with the standard product offerings. Moreover, the other scenarios could be implemented through custom developments.

3. Prerequisites

This guide is applicable to SAP NetWeaver 04 and higher.

- SAP NW04 and higher installed on supported OS and DB
- Please check the Product Availability Matrix (PAM) at www.service.sap.com/pam

4. Guidelines on Best Practices

Best practices are derived out of case studies, past experiences and thorough analysis. This guide focuses on the best practices which have been derived out of different real-time implementation scenarios and through extensive discussions with the SAP Portal - Product Development Team, SAP Israel.

4.1 Overview and general recommendations

It is very important to clearly understand the business requirements and to offer solutions strictly based on the requirements and taking into consideration the limitations and the best practices.

Recommendation

Share content based on end user requirements and authorizations. This would lead to positive user experience.

UI Designing best practices suggest that the access to information for end users should be simple and in a way that offers rich user experience to them. Hence make sure that you:

- Provide a static landing page especially incase of SSO with Windows Authentication
- Avoid cluttering the homepage by using minimal number of iViews
- Minimize the scrolling efforts for end users
- Avoid too many navigational links
- Provide links to the most frequently used iViews or applications

What kind of information must be loaded?

- Avoid loading heavy applications and content on the homepage
- Make applications available through standard navigation
- Avoid loading too many KM applications on the homepage

If better performance is what you are eyeing at, then

- Do an appropriate sizing of applications loaded and rendered on homepage
- Make good use of caching and compression features of SAP NetWeaver Portal
- Make proper use of isolation methods offered by SAP NetWeaver Portal

4.2 Portal Content – Technical Background

There are a few configurations which should be considered while creating Portal Content. These configurations can change the results drastically and can offer a better performance and improve the end user experience. The critical areas that could possibly be affected are:

- Loading and rendering content on homepage
- Navigation Performance

The critical factors which influence the performance of Portal are mainly the following:

- Cache Efficiency
- Page / Content Layout
- Role / Workset structure and hierarchy
- Object Size

Let's try to understand a few concepts before we dive deeper and talk about the best practices.

- **Cache Efficiency - Navigation Resolution**

  - How is the Standard Top Navigation rendered?

    The Portal Server first reads the entry points that form the first level top navigation. It then reads the direct sub-nodes for first entry point in the first level top navigation.

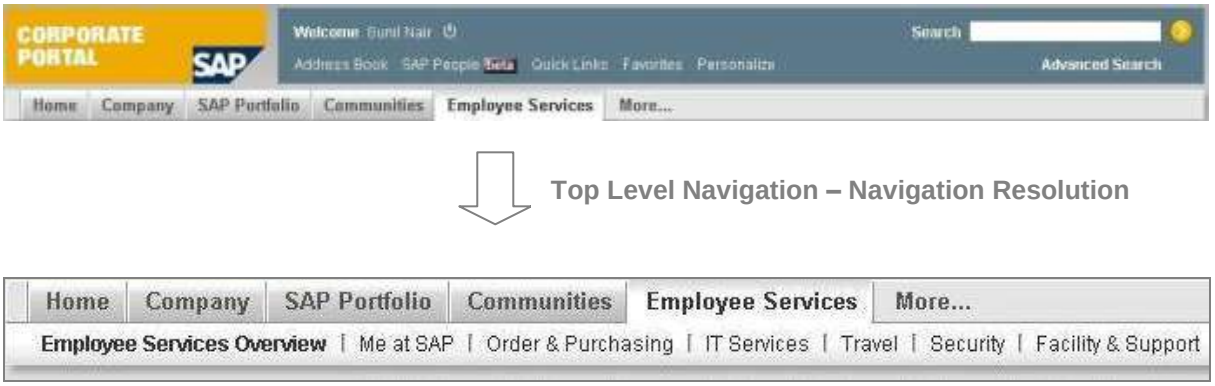


Figure: Standard Top Level Navigation

  - How is the Standard Detailed Navigation rendered?

    The Portal Server first reads the direct sub-nodes for selected entry point in second level top navigation. And then each click on navigation node in Detailed Top Navigation reads one level under the current node from the server.

Note

Therefore, we understand that reaching delta link from PCD during navigation resolution results into loading of complete sub-tree from persistence. Hence, in case an entry point is located within a delta-linked object, all related objects (delta links) need to be loaded.

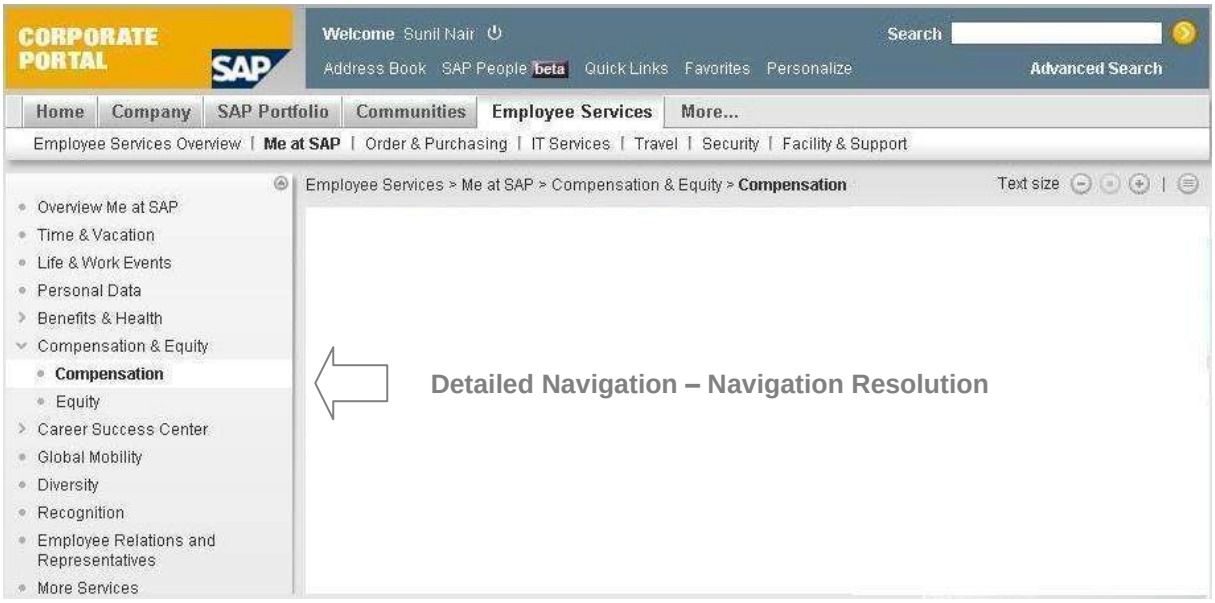


Figure: Standard Detailed Navigation

- **Cache Efficiency - Navigation Cache**

  It's important to know that the Navigation Cache can store the following two objects in the cache:

  - Entry Points
  - Navigation Nodes

  The two flavors of cache available depending on the version are listed here.

  - Caching based on users' role combination (until NW04 SPS19 and NW7.0 SPS11)
  - Caching based on roles only (as of NW2004 SPS20 and NW 7.0 SPS12) which can be activated /deactivated per navigation connector

  Taking these points into considerations, we can say that caching reduces the overall number of delta link resolutions on the PCD.

Recommendation

It is highly recommended to switch on the navigation cache for productive systems especially for PCD Navigation Connector.

CAUTION

There is an exception, for example, certain navigation connectors it may be required to switch off the connector-specific navigation cache since the navigation is calculated per user and not per role (e.g. collaboration).

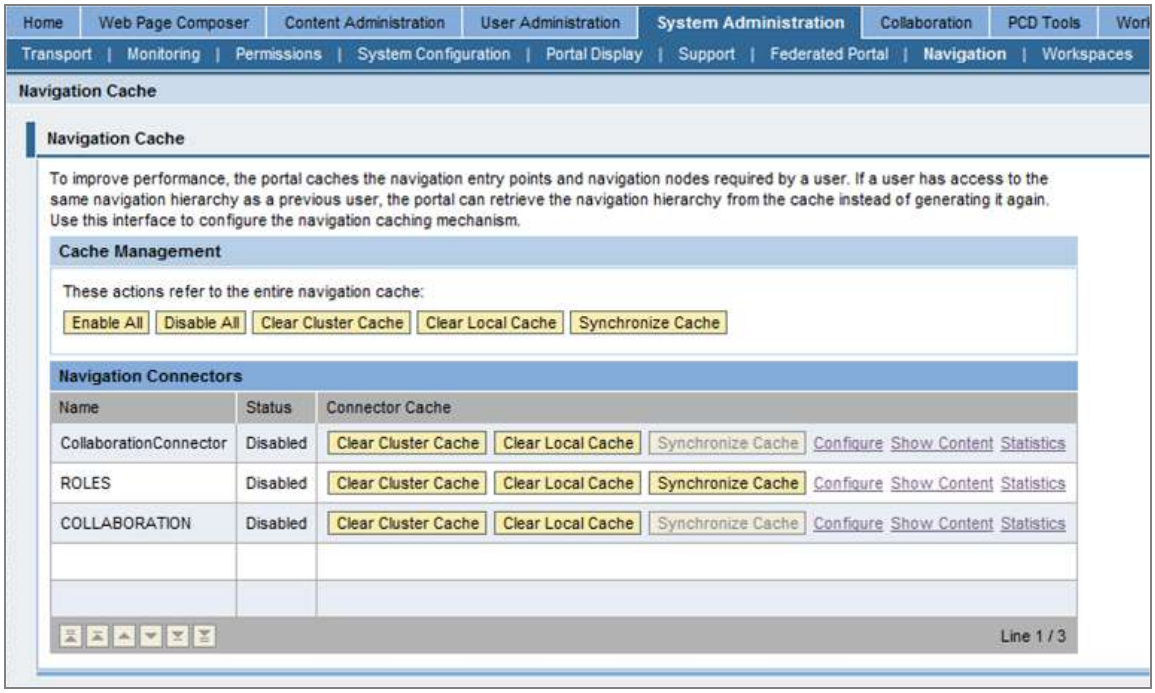


Figure: Navigation Cache

- **Cache Efficiency - PCD Cache**

  PCD Cache uses SoftCache Mechanism to cache objects.

  - What is SoftCache Mechanism?

    It means that the objects are cached in memory as softly referenced Java objects. There is no dedicated lifetime for objects stored in the cache. The VM is responsible for lifetime. It's important to note that different VMs behave differently. There is no upper limit on number of objects stored in cache. The Object size differs heavily depending on type and complexity of object. And maximum limit before eviction is set by memory limits.

  - What are the advantages?

    As mentioned earlier, Object sizes differ heavily which makes a cache with a fixed number of objects not suitable. The Cache size is flexible in all directions since no hard limit exists

  - What are the disadvantages?

    The main disadvantage is that there is no defined cache lifetime. Secondly, major Garbage Collections cause cache eviction. Hence cache efficiency decreases with rising number of major Garbage Collections.

4.3 Portal Content – Tips and Tricks

1. Merging Navigational Nodes

- You can merge an entry point from one role (or workset) with an entry point from another role. Nodes are merged if they have same Merge ID and shown according to their merge priority.
- The merging happens and is calculated after navigation nodes are retrieved from the connectors, and the process takes some time looking for merge IDs properties, building the TLN tree, etc. The more merging of nodes done, it will take more the time to build the navigation structure.
- Using navigation cache can improve performance of navigation structure building, but the cache holds the nodes before the merge so it can be reused with all users. Thus merging process itself happens after nodes are retrieved from cache, and is being done in any case whether cache is used or not.

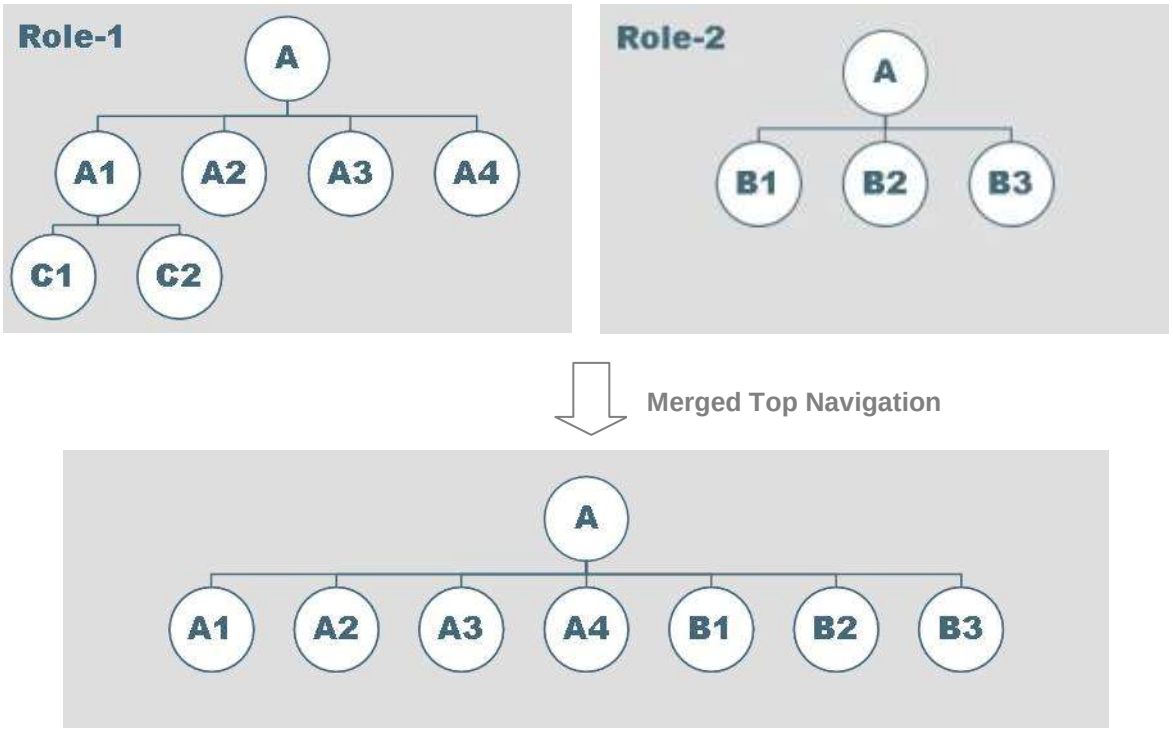


Figure: Merging of Navigational Nodes

Note

Info on merging navigation nodes can be found here:
http://help.sap.com/saphelp_nw70/helpdata/en/53/89503ede925441e10000000a114084/content.htm

Recommendation

Avoid heavily merging navigational nodes. If you rely heavily on the merged nodes, say for instance, 30 roles merged into one – this may affect performance. It is advised to use merging capabilities wisely and not overuse it. If the navigation merging is used heavily (as in the example above), consider building your navigation structure perhaps differently.

2. Speed up the navigation resolution with caching

- Please note that enabling the navigation cache can bring significant improvement to end user response times.

Note

Incase there are scenarios where you need to change the content frequently, use the Navigation Cache Administration to clear cache after each change. Clearing cache will assure that only the first user will suffer the impact of loading new content to cache, while all subsequent users will benefit from cached role.

- Second point to be noted is to set the navigation cache expiration to short time. This will limit the availability of old content in cache while most end users will still enjoy the benefits of caching. In addition, we recommend not using heavily merging navigation nodes
- We have been asked on what is the recommended number of cached objects. The answer is that default setting should be sufficient in most cases. But having said that, we have to keep a close watch on cache overview iView.

Note

Please check these links here to learn more on this.

SAP NetWeaver 7.0:
http://help.sap.com/saphelp_nw70/helpdata/en/a2/19edcf16474a9798a5681ce4fe4b25/frameset.htm

SAP NetWeaver 2004:
http://help.sap.com/saphelp_nw04/helpdata/en/a2/19edcf16474a9798a5681ce4fe4b25/frameset.htm

Note

With SAP NetWeaver 7.0 EhP1, you can configure the Navigation Cache Preloader which allows the System Administrator to automatically load certain predefined roles without waiting for the end user to login into the portal and initiate the load of the roles. To learn more about Navigation Cache Preloader, please visit the link: http://www.sdn.sap.com/irj/scn/weblogs?blog=/pub/wlg/14180

CAUTION

Please note that this feature is only available from SAP NetWeaver 7.0 EhP1 onwards. Please use this feature wisely and carefully.

3. Speed up the navigation resolution with no cache or empty

- After having cleaned the cache or when the cache is empty, when the end user tries to access Portal or when the Portal is accessed for the first time, the end user will experience the impact of loading new content to cache.
- It is advised that we keep the navigation structure inside a role.
    - Especially the entry point + it's direct children (as far as possible)

- Quicker search for entry points

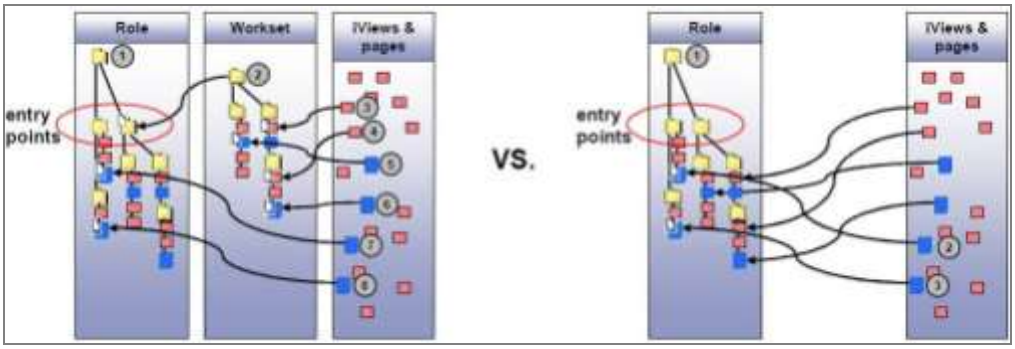


Figure: Navigation Resolution with no cache or empty cache

4. Improve loading time of PCD

Recommendation

It is recommended that you use only one entry point for bigger roles and hence you can avoid unnecessary loading of objects.

- One more point you need to keep in mind is to avoid nesting of big objects. Remember, big units have higher memory footprint and faster cache extrusion. Not to forget that many small units increase the database roundtrip and so it becomes important that we strike a balance and reuse the small units frequently for cache optimization.

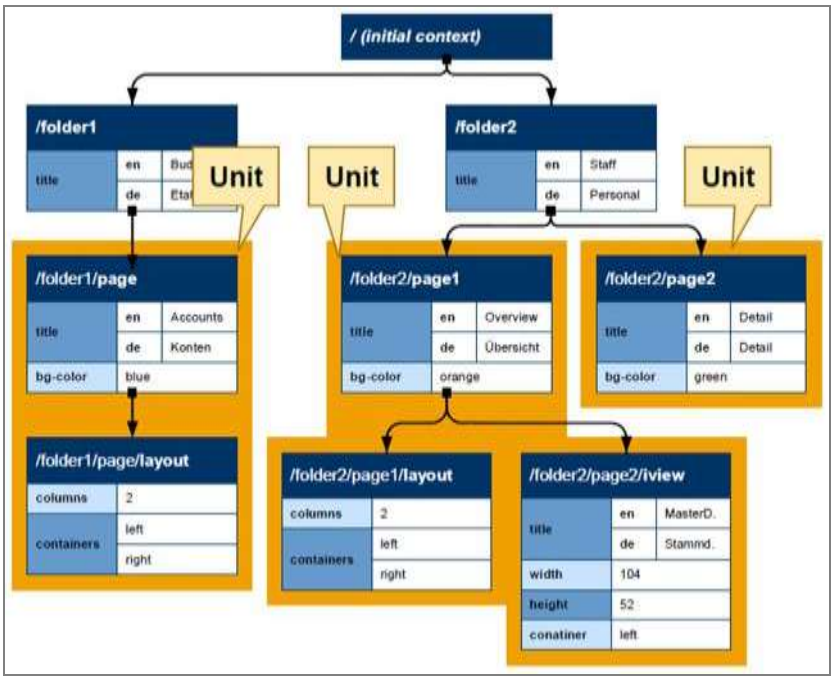


Figure: PCD Cache - Object Size

- Now that we have discussed that we need to use small units, having said so it's important for us to understand how can we reduce the object size? The answer is simple; we should look to reduce the number of delta links used.

Note

Many delta link units increase the number of database roundtrips. Hence, rule of thumb; keep the delta link chains as short as possible while not complicating the content administration.

5. Usage of Delta link

- Delta links should be used cautiously especially for roles and worksets.
- We should avoid deep hierarchies and should use delta links only if the objects are reused or for instance if multiple administrators need to administer (sub-) objects in parallel or other administrative limitations applies.
- Avoid delta link to big units.
- Avoid frequent updates to central object, keep templates stable.
- Use delta link for commonly used objects and make attribute changes only on source objects, if possible.
- Optimize iView re-usage using generic iViews (e.g. BW iView)
    - Small generic objects are loaded quickly into cache
    - High re-use brings better PCD cache efficiency because lower number of disjunct objects needs to be loaded.

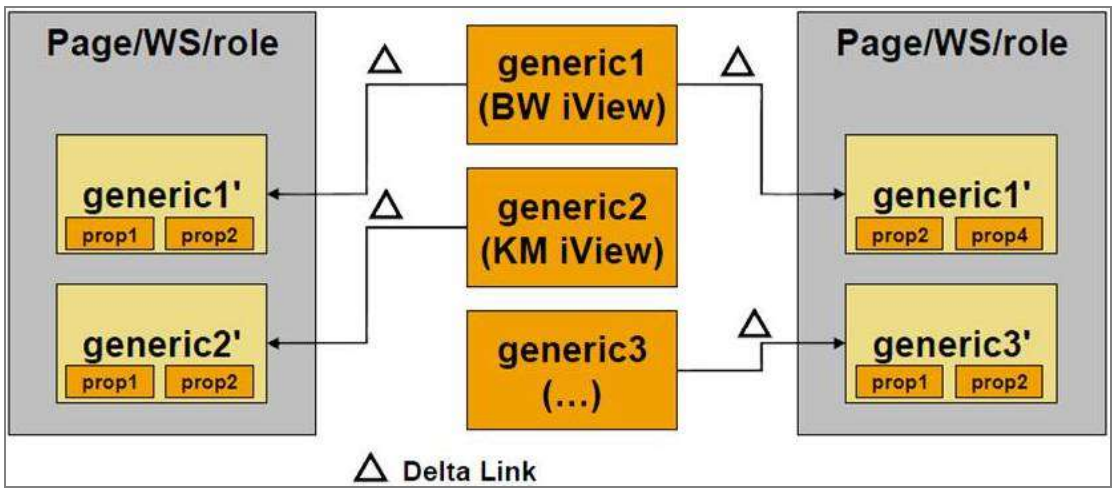


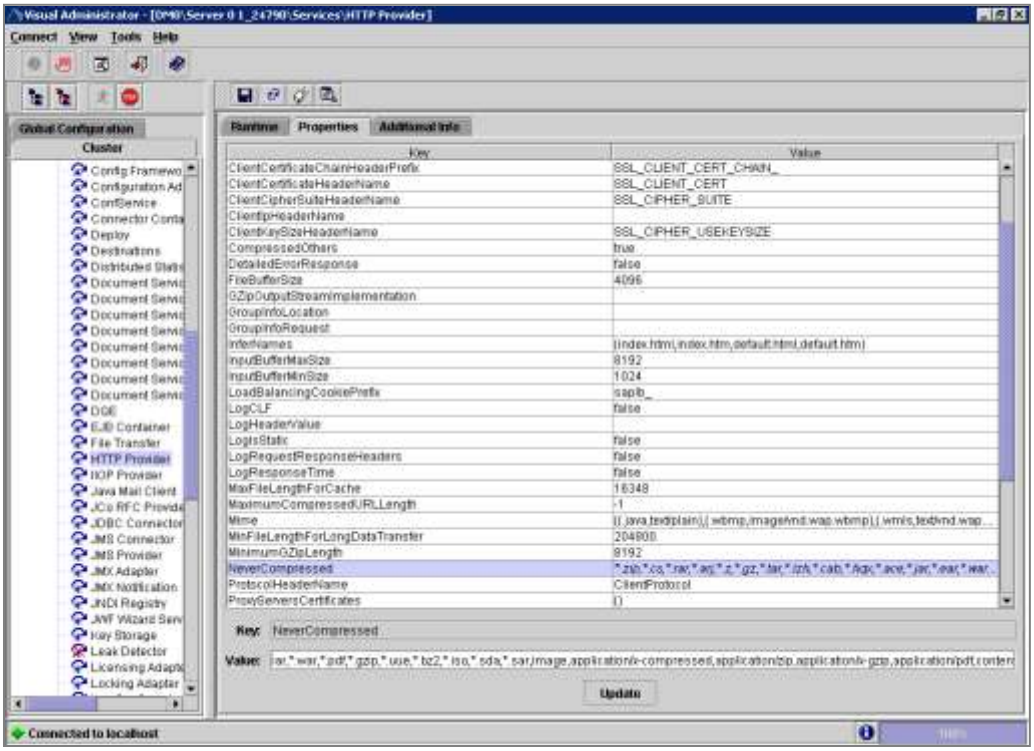
Figure: Delta Links

6. Activate Compression

Note

Please note that using compression for textual resources (such as HTML) will reduce the network traffic between the browser and the server, leading to better response time.

- Steps to enable compression:
  - From the “Config Tool”, select: *<instance> -> services -> http provider-> NeverCompressed*
  - To enable script files compression, delete the following content types from the value of property “NeverCompressed”: *.css, *.pdf, *.js, image, application/pdf, and text/JavaScript.
  - The default value for compression is 8KB but you may also set it to 4KB and lower.



7. Isolation Methods

Recommendation

It is recommended to set the iView Isolation Method to “URL” for all iViews that are known to be relatively slow. Setting it to “URL” decreases the usage of application threads, and also eliminates the portal page timeout error.

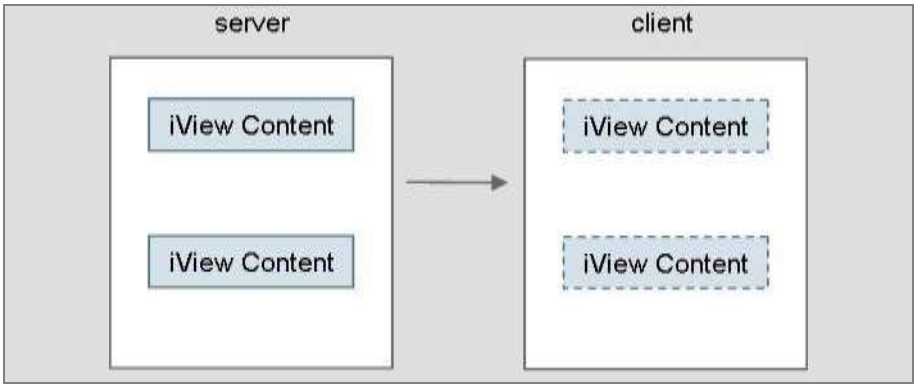


Figure: Isolation Method: Embedded

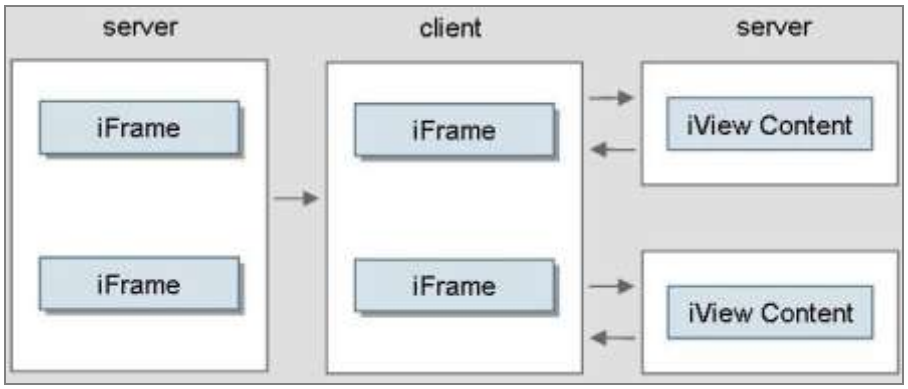


Figure: Isolation Method: URL

Note

For more information, please refer to the link:
http://help.sap.com/saphelp_nw2004s/helpdata/en/b7/60b54066ea8531e10000000a1550b0/frameset.htm

4.4 KM Content – Tips and Tricks

A few tips and tricks which could prove handy have been listed below.

- Please make sure that you have set appropriate caching settings for the KM content.
- Use portal iViews as wrappers to the KM content and use the iView settings to enable the content caching on the browser.
- Read Only Content Expiry Delay: This parameter specifies the time for which write protected content is to be stored by the clients. During this period, write-protected content is not loaded from the server to the client and is taking directly from the client cache. Based on the business requirements with respect to the change in content, this parameter needs to be adjusted.

Note

For extra details refer to:

- SAP Note: 739829 - Central Note for Performance of EP KMC

  - CM Repository Manager at http://help.sap.com/saphelp_nw70/helpdata/EN/62/468698a8e611d5993600508b6b8b11/frameset.htm

- Conditional requests are http requests where the browser asks for a newer content than the one it has stored on his local cache. The impact is a full network roundtrip to the server with all request headers, where the result (in the case of 304 responses) is an empty response that signals the browser to use its local copy. This can be prevented by setting cache expiration for the KM resources. Static resources like gif, jpg, css etc. can be cached in the browser and thus saves much of the request time.
- Frequent redirects should be avoided since it creates additional network roundtrips.

4.5 The Concept of Portal Landing Page

Let us try to understand the concept of Portal Landing Page with a real-time scenario.

Business Scenario: The Corporate Portal is being accessed by employees across multiple geographical locations. SSO with Windows Authentication has been established, which means that the moment the end user has logged on to the Corporate Network, the user can access all the SAP Systems and Applications, strictly based on the authorizations, without entering the user credentials separately for each system. As defined in the Corporate Policy, the Corporate Portal should be the default Homepage for the internet browser.

This resulted in a substantially large number of hits. Every time the internet browser was launched, even for browsing other sites, there was a hit on Portal Server and this caused heavy load on the infrastructure. In addition, when the page wasn't fast enough it delayed the work flow of the employee that was aiming for a different page on the portal or to a different site.

There are several ways to deal with such situation; you may use them separately or all together:

- Leave the homepage decision to the employee. Some work heavily with the portal and some don't.
- Create a shortcut on the desktop for launching the Corporate Portal.
- The concept of Portal Landing Page got introduced. The Portal Landing Page should be an anonymous business Portal Homepage which is extremely fast and lean. This page displays the most important news, quotes, company information, and the most frequently used links. The anonymous page allows the employee to log into the business portal by clicking on the login button, or any of the displayed links.

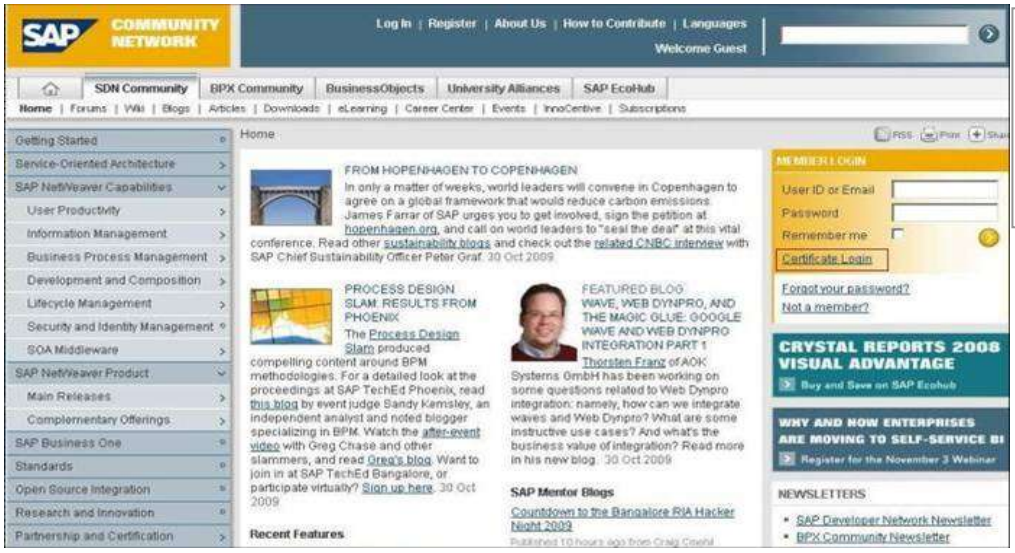
The introduction of Portal Landing Page led to extremely positive results, both in terms of end user experience and satisfaction and moreover, in terms of landscape/performance.

Recommendation

The Portal Landing Page is the first page rendered to the end users, hence it is recommended that the Portal Landing Page should be as lean as possible, in terms of both number and type of iViews.

Here is an overview of steps involved in created a Portal Landing Page:

- Create a lean layout page with no HTMLB controls usage
- Create the portal pages on this layout
- Use embedded iViews with EPCM level set to 0
- Use iView cache (shared) to allow storing the page in the browser – can be set to 2 Hours validity
- Set the AuthScheme to anonymous
- For performance improvement we also implemented a java iView that displays plain HTML from the file system



- Static Landing Page
- Anonymous Access
- Minimize load
- Certificate Login

On the click of 'Certificate Login' Link

- Dynamic, Role-based
- Cached Content
- Faster Navigation
- Better Performance

Figure: The Concept of Portal Landing Page

5. Important Links

Here are a few important links for Portal Performance:

Note

SAP NetWeaver Portal Best Practices:
http://www.sdn.sap.com/irj/sdn/index?rid=/webcontent/uuid/e0b46f8a-8fce-2b10-95a5-b72dd53a952b

Note

SAP NetWeaver Portal Performance – Series of Blogs:
http://www.sdn.sap.com/irj/scn/weblogs?blog=/pub/u/59389

www.sdn.sap.com/irj/sdn/howtoguides

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