BI4.x Architecture

SAP CEG & GTM BI
Planning, deployment, configuration

- Users
- Reports
- Hardware
- Licenses

Deployment
- Sizing Servers
- Choosing
  - WAS
  - DB Vendor
  - Deployment Method

Configuration
- Authentication
- CMC Configuration
- Security Setup

Designing System Landscape
What are the conceptual tiers in a BIPlatform?

For a good design, understanding the different tiers is very important.
Complex topics for consideration

- Architecture
- Virtualization
- Sizing & Configuration
- Fail-Over
- Load-Balancing
- Clustering
- Backup Strategy
- Storage for FileStores
- SSO Authentication protocols, Identity Management
- Portal Integration
- Cross-domain policies & Firewalls / proxies
- 3rd-Party Compatibility (IE 9/10, Flash 11.x, JRE 1.7.x)
- Interoperability fixes for integration assets (BW, HANA etc)
- Database clients/middleware downloads, 32/64-bit DSN administration
- Prerequisites like SAP GUI, SMD AGENT
- Monitoring solution (Wily IntroScope / Solution Manager)
Hardware, landscape Topology, Infrastructure

<table>
<thead>
<tr>
<th>Measure</th>
<th>Scalability</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAPS (SAP Application Performance Standard)</td>
<td>Vertical</td>
<td>Network Latency</td>
</tr>
<tr>
<td>is Hardware Independent Unit describing System Performance</td>
<td>Horizontal</td>
<td>Bandwidth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disk I/O</td>
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</table>
SAP BI 4.x is much more than a technical upgrade from BOE

- **BI 4 is all 64-bit**
  - BOE 3.1 was designed to squeeze the whole suite within a 32-bit architecture
  - BI 4 is designed to take advantage of modern hardware and RAM (64-bit addressing)
    - BI 4 can “stretch out” and is no longer artificially limited for resources

- **BI 4 is architecturally different than 3.1**
  - BOE 3.1 was a collection of applications with their own connectivity stacks
    - BI 4 components share a new common Semantic Layer for data connectivity
  - BI 4 is designed as a first-class and highly integrated SAP client for BI

- **BI 4 is bigger because it includes new services and applications**
  - BI 4 is designed for modern infrastructure – don’t expect to run on the same hardware
SAP Business Intelligence considerations

- **BI is I/O intensive**
  - Stresses to I/O even more critical (and harder to measure than CPU/RAM)
  - Aggregating millions of rows is very different from streaming transactions
  - Spiky load makes estimation even harder – constant load vs. peak times
  - Underscores importance of understanding the workload *before* you start

- **BI is designed to use all system resources**
  - Real enterprise systems are “resource greedy” for performance
  - No real reason to restrict resource usage on a per-system basis.
  - Throttling outside BI often attributed to vLANs, QoS, and storage tiering
SAP BI 4 platform services

- **Sizing of each service is important**
  - Pay attention to specific recommendations in BI Sizing Companion Guide
  - Some services have recommended values, limits, or locations
    - Ex: Java App Server should have a 8 GB heap size and 1000 maximum threads configured

- **Number and placement of each service is also important**
  - Ex: Keep the Crystal Caching and Processing Services on the same machine
  - Ex: Analysis OLAP services need one instance for 100 active connections
  - Ex: DSL (BICS) and STS (SSO) on the same APS node.

- **New in 4.0 – Adaptive Processing Service (APS)**
  - Special service that hosts multiple other services
  - Refer to sizing and admin guides for full list of hosted services
BI Platform tiers & process flows – architecture is complex!
Vertical or Horizontal Scaling?

• “Scale Up (Vertical)” or “Scale Out (Horizontal)”?
  • Scaling up has its limits, but machines are too large for single processes anymore
    • Putting 5 WEBI servers on a machine might make sense – but watch out for bottlenecks (i.e. I/O)!
  • Requires planning and analysis of your scenarios:
    • If you schedule Crystal Reports mostly at night, the CR Job/Processing Services may be run on the same machine as the Web Intelligence Server
    • If CR users are actively analyzing data, putting CR and WEBI on the same server is a bad idea since they are both resource intensive

• “Scale out” more of an option than before
  • Virtualization enables “splitting” a lot easier as there isn’t incremental hardware cost.
  • Design principles for scale out are no different than other enterprise software
Role of external systems to deployment

- **Poorly provisioned databases will have an invisible effect**
  - CMS DB latencies have a cascading effect – one BI admins can’t see!
  - Ensure that each reporting database and it’s I/O paths are large enough

- **I/O bottlenecks – disk and network – have severe effects**
  - Worst thing you can do to an I/O intensive application is to starve it for data
  - Being on an underperforming file server can starve the BI system

- **Patch your SAP BW systems – incremental performance gains can be big**
  - Many poorly performing WEBI instances can be traced back to a lack of BW patches

- **Ensure virtualization hosts can handle aggregate requirements**
  - Putting 5 processing server VMs on one host means the host must have at least 5x the IO capability and 5x the RAM!
Architecting BI Systems

- **Processing architecture**
  - Do you have enough CPU power? Go beyond SAPS.
  - Are you set to properly scale your systems out?
  - Are your processes properly distributed across nodes

- **Evaluate I/O requirements**
  - Consider reporting databases, inter-node communication, I/O links, etc..
  - CMS DB properly provisioned to ensure low latency/high throughput?
  - DB vendor specific, not part of SAP BI documentation

- **Memory – do you really have enough?**
  - Nature of application means spikey and dynamic memory allocations

*Always think about system design – and read the manuals*
*Default systems are just that – the default, not optimal*
Single Server Deployments

- Suited for a small organization
- Assuming you have proper backup, a disaster may lead to long periods of unavailability.
- Trusted disaster recovery and back up strategies are critical to regaining availability.
- Vertical Deployment
Horizontal Scaling
Web Server to server static content

Web Client
Web Server
  Serves static content or
  redirector only

Web Application Server
  Serves dynamic content only

BI Server(s)
Horizontal and Vertical Scaling of Application Tier

- **Web Client**
- **Hardware redirector** (Load Balancer)
- **Web Server Farm**
  - Static content or redirector only
- **Clustered Application Servers (Session Replication)**
- **Business Intelligence Servers**
SAP BusinessObjects BI
Process Flows
Process Flows – What are they?

Process Flows are interactive diagrams that provide you insights into the SAP BusinessObjects BI4.x Platform

The diagrams present in an interactive way the communications that are taking place within the BI Platform on various common use cases.
Process Flows - Sample
Process Flows – Where to Find Them

http://scn.sap.com/docs/DOC-8292
SAP BusinessObjects BI Pattern Books
Pattern books - Available online – free of charge

BIP on Linux with Tomcat and Sybase ASE

In this pattern, we deploy SAP BusinessObjects BI platform on Linux. This pattern uses one web server, two application servers (Tomcat 7), and two BI platform installations (Red Hat). The CMS database is Sybase ASE and the authentication is Windows AD.

This pattern is applicable to Red Hat and SUSE.

BIP on Windows with Mobile and Explorer

In this pattern, we deploy SAP BusinessObjects BI platform on Windows 2008 release 2. This pattern uses one web server, two application servers (Tomcat 7), and two BI platform installations. The CMS database is SQL Server 2008 R2, and the authentication is Windows AD.

Pattern books - Available online – free of charge

**SAP BI Pattern Books: Pattern Book on BI 4.1 Update**
This pattern book covers the workflow required to perform an **UPDATE** of the SAP BusinessObjects BI 4.0 SP04 environment to the SAP BusinessObjects BI 4.1 SP04 release on Microsoft Windows platform.

**SAP BI Pattern Books - Pattern Book on BI 4.1 Upgrade**
This pattern book covers the workflow required to **UPGRADE** objects (reports, users, groups, and so on) from the source (SAP BusinessObjects Enterprise XI 3.1 SP07 platform) system to the target (SAP BusinessObjects BI 4.1 SP04 platform) system deployed on Microsoft Windows platform.
Pattern books - Available online – free of charge

Source (SAP BOE XI 3.1)

Before planning for an upgrade, make a note of necessary details like BI content (number deployment of source and target systems, which can be used for post upgrade validation.

Architecture highlights

Here are the main highlights of the SAP BusinessObjects XI 3.1 SP07 source system list:

- Clustering
- Load Balanced
- Reverse Proxy Supported
- SSL Secure
- Windows AD (with SSO) and SAP Authentication Supported

Source software components and their versions.

The following table summarizes the software components used, with their version information:

<table>
<thead>
<tr>
<th>Software</th>
<th>Type/scope</th>
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</thead>
<tbody>
<tr>
<td>SAP BusinessObjects Enterprise</td>
<td>BI application server</td>
</tr>
<tr>
<td>Windows</td>
<td>Operating system</td>
</tr>
<tr>
<td>Apache</td>
<td>Web server/Reverse Proxy/Load Balance</td>
</tr>
<tr>
<td>Tomcat</td>
<td>Web Application Server</td>
</tr>
<tr>
<td>MS SQL Server</td>
<td>Database server for CMS and Audit data</td>
</tr>
</tbody>
</table>

Source system landscape and components

The following diagrams show the technical architecture of the SAP BusinessObjects XI 3 server node is identified with the logical name corresponding to the architecture component.

Upgrade workflow

You need to start the upgrade in the order defined in the planning phase. In this phase, the actual upgrade is performed using the Upgrade Management Tool (UMT). As multiple iterations have been defined in the planning phase, this section describes the actual upgrade for this pattern.

- Launching UMT and logging on to the source and destination systems
  - Iteration 1
  - Iteration 2
  - Performing tests
  - Iteration 3
  - Iteration 4
  - Iteration 5
  - Iteration 6

Launching UMT and logging on to the source and destination systems

1. Go to Start > All Programs > SAP Business Intelligence > SAP BusinessObjects BI Platform > Upgrade Management Tool.
2. Right-click Upgrade Management Tool and select Run as administrator.
Pattern Books – Where to Find Them

Useful Resources

- Upgrade microsite
  www.sapbi.com

- BI Innovation Value Calculator
  www.sap.com/Blcalculator

- BI Upgrade Value Calculator
  www.sap.com/Blupgradecalc

- BI Platform Features by version matrix
  http://scn.sap.com/docs/DOC-61127

- Get Personalized Upgrade Advice
  https://www.sapbi.com/uprade

- Get a Personalized Implementation Report
  https://www.sapbi.com/implement
Key Links

- sapbusinessobjectsbi.com
- sap.com/upgradebi
- sap.com/bivirtualization
- sap.com/bisizing
- sap.com/learnbi
- service.sap.com/roadmap

- Getting started with SAP BI
- How to Select the Right BI Tool for Your Environment
- SAP’s Release Strategy for Major Releases of SAP BusinessObjects BI
Thank you

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