



Polarion Software®  
CONCEPT

# High Availability of the Polarion Server

Installing Polarion in a high availability environment

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# Introduction

This document describes a concept for different scenarios when using Polaron in high availability (HA) environments. Goal is to ensure that Polaron meets the HA requirements listed below.

## Requirements

Following requirements have been identified as critical for a high availability solution:

1. Downtime should be less than 5 minutes:  
If for some reasons (hardware problems, hard disk, memory, etc.) Polaron fails to run the downtime should be less than 5 minutes.
2. Restarting the system should be done automatically.  
No manual interaction should be necessary to restart the system
3. Updating the software (Polarion, SVN) should be done with a minimum of downtime.
4. The solution should reflect requirements regarding scalability of Polaron.  
It must address a smooth integration of new business units when they start working with Polaron.

## Polarion data storage

In a high availability environment the data storage is the most crucial part of the whole system. Since Polaron is using subversion as the persistence storage and an in-memory indexer, memory and data storage faults will stop the system. Polaron system starts are normally faster than 5 minutes, except if the index should be newly created. In order to get Polaron restarted within 5 minutes it is necessary to have the data storage available.

### Polarion data storage

The Polaron data storage consists of the following parts:

#### 1. The Subversion Repository

Located under the installation directory in data/svn/repo

#### 2. The indexers

Located under the installation directory in data/workspace/polarion-data/index where are the different indexers stored

#### 3. The Report Repository

Located under the installation directory in data/RR which contains all calculations of jobs (factbase).

#### 4. The Build Repository

Located under the installation directory in data/BIR. The directory contains information about the build processes.

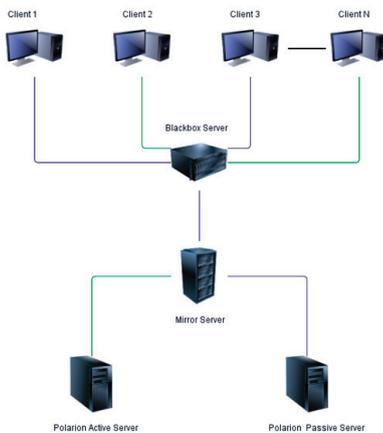
These directories have to be available when Polaron is restarted, otherwise a re-index process starts which is time consuming and the restart within 5 minutes can't be met.

# Solutions

To fulfill the high availability requirements mentioned above two possible scenarios can be identified:

Either the Polarion storage is mirrored in real time or the Polarion storage is itself a high available (HA) storage. We summarized this in the following 2 chapters.

## Scenario 1



In this scenario the hardware is able to duplicate the whole system (heartbeat).

In a Polarion environment the HA system should be configured as active/passive, having one Polarion server running and one which is mirrored. In the case of a failure, the passive node becomes active.

The configuration should have two systems connected where the Polarion storage is located on the server. This is different to the link where the HA cluster is described.

This scenario needs a special hardware that is able to mirror both systems.

## Scenario 2

In Scenario 2 the Polarion storage is maintained by a SAN storage, which is defined as HA data storage. In this scenario Polarion is installed on a virtual machine. The Polarion storage is configured in the SAN. A snapshot of the current configuration of the primary node is stored and updated whenever the Polarion configuration is changed.

If the primary node does fail the secondary node is started, taking over the IP and MAC address of the primary node. End users will need to refresh their browser and reconnect to Polarion. After that they can continue their work in the same manner as few minutes ago.

The restarting process should be configured to switch over automatically. This is provided by the clustering software and/or, vendors such as VMware have proven solutions on this.

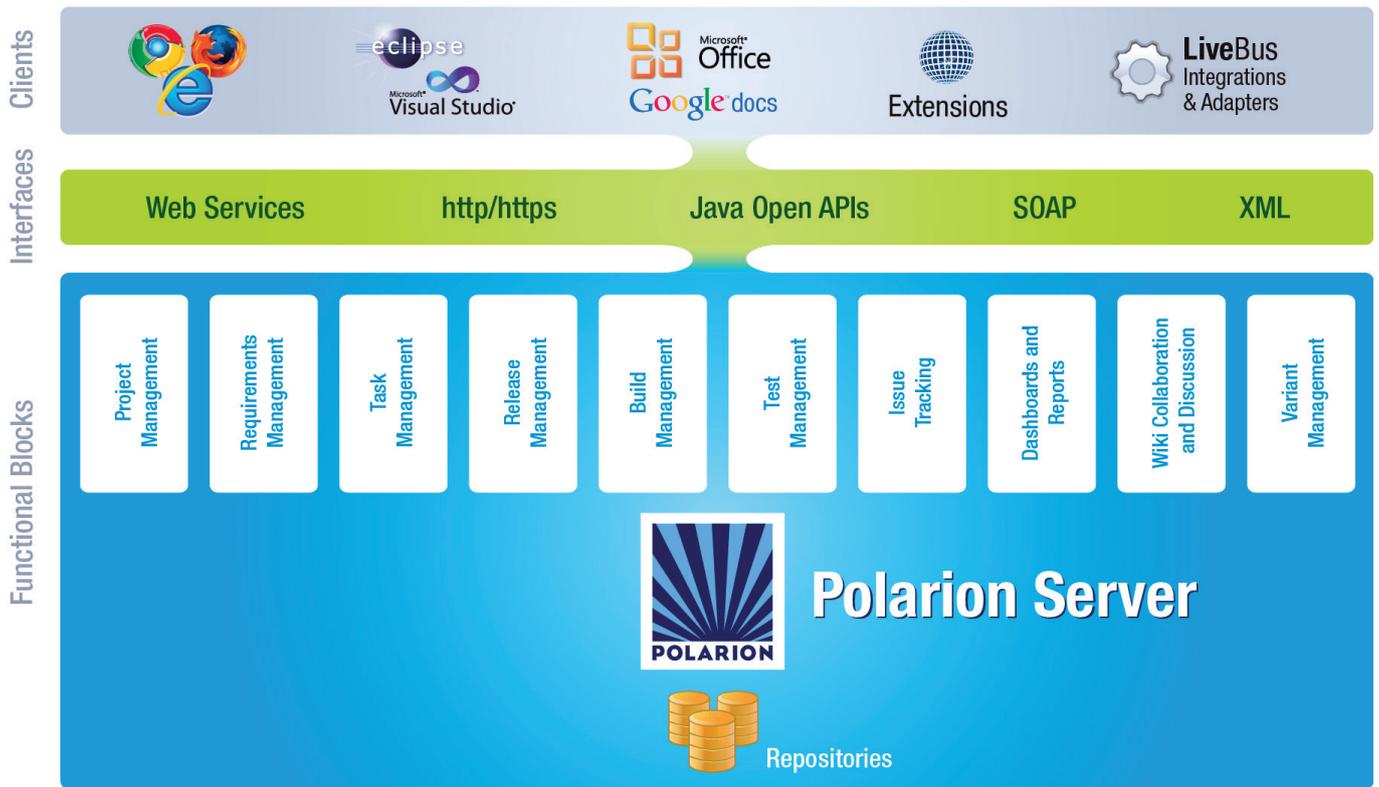
This scenario needs no extra hardware assuming that a SAN is already in use.

Another advantage in this scenario is the ability to update the Polarion version in parallel by installing it (after verifying on the test server) on another virtual machine. The data directory is defined as read only. After starting Polarion the index is created and maintained on the updated Polarion instance. After the index is created the new Polarion version may become active with a minimum of downtime.

# Technical solution

The following picture illustrates the architecture of Polarion.

## Polarion Architecture



## Virtual machines

Polarion should be installed on a virtual machine which runs, preferably, on a Linux operating system. The clustering solution should be able to switch over to a different node in the case that there is a problem with the primary one. It is necessary to obtain the same MAC/IP address as the primary node.

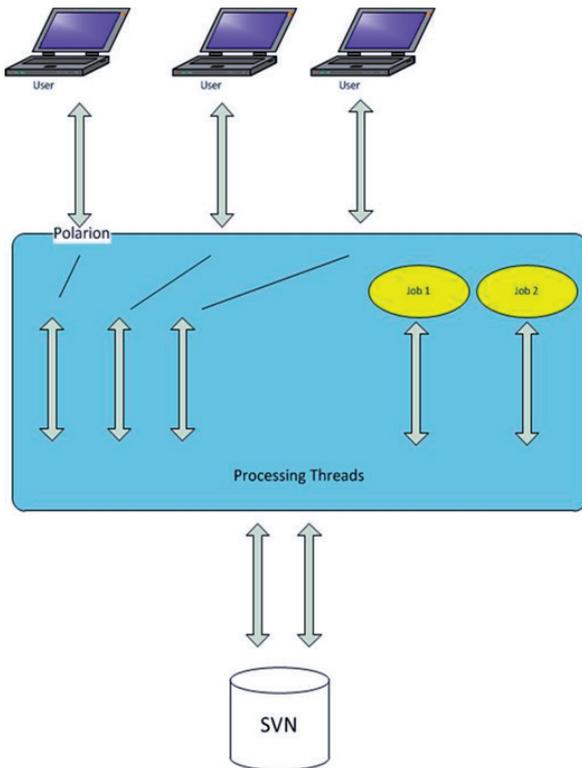
The maximum downtime should be 5-10 minutes, so switching over means to boot the new virtual machine after the cluster manager has detected a problem (losing of heartbeat).

## System requirements

The virtual machines should have the following settings only used by Polarion dependent on the size of usage.

	<b>S</b>	<b>M</b>	<b>L</b>	<b>XL</b>	<b>XXL</b>
<b>Operating System</b>	32 or 64-bit	64-bit	64-bit	64-bit	64-bit
<b>CPU Cores</b>	4	8	8	16	32
<b>GB RAM</b> (dedicated to Polarion)	8 (4)	16 (8)	32 (16)	64 (32)	128 (64)
<b>Storage for Polarion</b>	250GB+	500GB+	1TB+ (SCSi or similar)	1TB+ (RAID 10, NAS, SAN)	1TB+ (RAID 10, NAS, SAN)
<b># Projects</b>	< 100	> 100	> 300	500	500
<b># Users</b>	< 50	< 150	> 150	> 300	> 500

The following pictures show why it is necessary to have more cores available where the Polarion server is running.



## Polarion installation

Polarion is installed on a virtual machine as a normal installation. After the installation the following files are copied from the currently productive installation, the paths are relative to the installation directory, which is by default under Linux `/opt/polarion`:

- `etc/polarion.properties`
- `etc/config.sh`
- `polarion/license/polarion.lic`
- `polarion/license/users`
- `data/svn/access`
- `data/svn/passwd` (only used for local users, not supported by LDAP)
- `polarion/extensions/*` all subdirectories if any extensions are installed

The next step is move the directory `<Polarion-Install>/data` to the location of the SAN. So all files are copied from the local installation to the SAN and the local data directory then points to the SAN directory.

Then the currently productive repository should be copied to the SAN location. This could be done by either

- make a `svn hotcopy` of the repository or
- `svn dump` the repository in several different dumps

## Summary

The first choice is faster during the migration, because the repository is copied directly to the new SAN location. The second choice is safer and it gives SVN the possibility to optimize the size of the repository by using the latest write algorithms. But this may take a while depending on the size of the repository.

After the repository is on the SAN, a reindex should be performed. Therefore the `reindex.sh` shell script should be executed. Then the Polarion installation is finished and the result could be tested.

# About Polarion Software



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