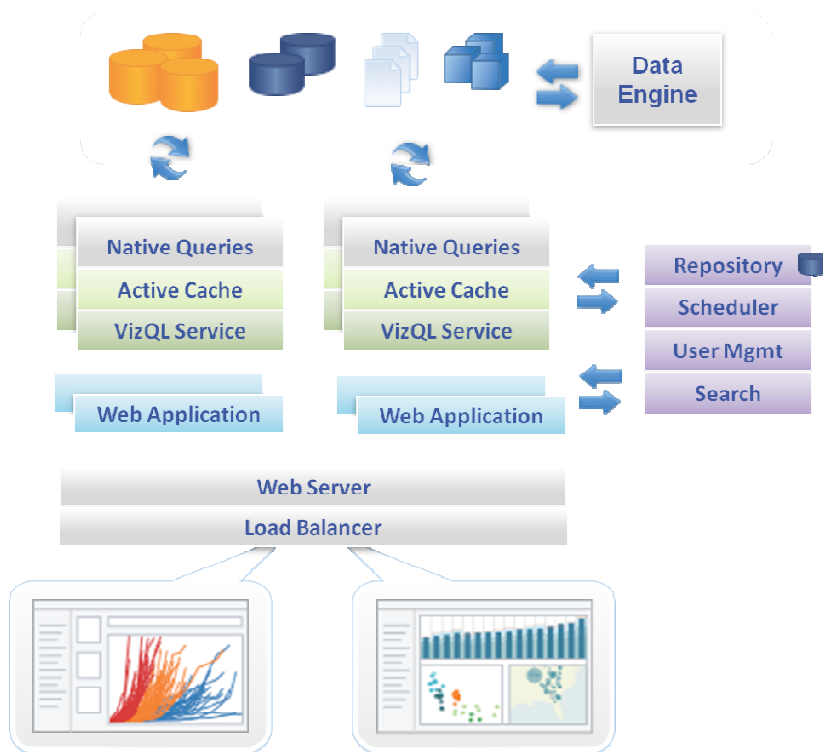


## High Availability

High availability is a system design approach to hardware/software configuration to ensure applications are available for end users for a contractually specified amount of time. High availability is often applied to mission critical hardware and software applications.

### Tableau Server Components:



### Service Level Agreement:

Before selecting a highly available system design, you must first answer the question: "What Service Level Agreement (SLA) does this application need to meet?" If you do not have an answer to this question, you will not be able to pick the right approach. Many times you may implement something more complex and costly than is necessary.

When defining your SLA, it is important to identify the risks associated with the Tableau Server implementation, and what are general risks associated with any Server.

*Operating System Risk:* This is a general risk you assume with using Windows Server software. In the event of Operating System failure, you can install Tableau Server from a backup on a new Windows installation. If you are using virtualization technology, those providers often have very robust backup, recovery and failover to mitigate OS risk.

*Hardware Risk:* There is always the risk of hardware failure. Virtualization of your Server Environment can help mitigate this risk. Additionally, keeping a backup of Tableau Server in 2 locations can also help mitigate this hardware risk.

*Geographic Risk:* Physical separation of the storage of your backup files can help mitigate any geographic risk of natural or manmade disasters.

*Driver Risk:* The driver for the database can crash as part of any application deployment. IF the driver crashes, the VizQL process will fail as well. The Tableau Server will adapt and reroute traffic to another VizQL process that is available. There is no hard failure here.

*Software Risk:* The following describes possible failure points and how the Tableau Server is designed to handle those failures.

VizQL Process Failure: There will be a minor loss in scalability. The Tableau Server will reroute incoming traffic to available VizQL processes and will try to repair the hung process. A restart of Tableau Server will restore the server to normal operation.

Application Process failure: There will be a minor loss in scalability. The Tableau Server will reroute incoming traffic to an available Application process and will try and release the hung process. A restart of Tableau Server will restore normal operation.

Backgrounder failure: This is automatically restarted if it fails or is in a degraded state. No intervention is necessary here.

Web Server failure: If the web server fails, it will be automatically restarted. No intervention is necessary here.

Tableau Server repository failure: Tableau Server will need to be restarted.

Tableau Server his designed to be very fault tolerant. Many of the software risks do not stop the Server from working, or impact the end user community with a complete work stoppage.

Tableau Server is often times a mission critical application for our customers. This paper will cover, in theory and in practice, how to configure Tableau Server to meet high availability standards. This paper will also examine the technical, licensing and hardware considerations for a successful high availability implementation.

## **Solutions in Theory**

When considering a highly available application, you must first define how available the system needs to be. This paper will discuss only unplanned unavailability. This is in contrast to planned unavailability (e.g. system upgrades, patches, hardware maintenance). For SLAs that are at or greater

than 1 hour, simplicity is key. For SLAs around 5 minutes, you are adding complexity and cost. Both types of solutions are outlined below.

It is commonly accepted, that the more components you add to a system, the more possible failure points you introduce to the system. Highly complex HA solutions, often times achieve the opposite of the intended results. Tableau provides a number of elegant solutions that introduce minimal complexity, while remaining highly available.

The Tableau Server solution can be installed from scratch in an average of 15-30 minutes. This install includes a restore from a backup (a process described in next section). Many times, this very short install time, especially when installed on virtual machines, is all that is needed to ensure the Tableau Server is available for the end business users. This type of solution requires no additional hardware, scripting or network controls.

The Tableau Server solution can be mirrored between 2 different servers to achieve an Active/Passive High Availability cluster. This solution requires that a backup is scripted from the primary server, and a restore from backup is scripted to the secondary. The schedule of this scripting process can be as frequently or infrequently as needed. This solution often times has a proxy server in between the end user and the 2 server nodes so that the switch from active to passive servers is seamless for the end user. Note: this solution can be used to achieve a Disaster Recovery strategy assuming the 2 server are in different locations and meet your recovery standards.

### **Solution in Practice – For SLAs 1 hour and greater.**

#### *Manually Restoring Tableau Server from a Backup:*

Restoring Tableau Server from a backup is a very simple and short process. The length of this process often times makes complex HA solutions unnecessary. This process should also be followed in any implementation as a best practice. Below are the following steps.

1. Script backup of primary server.  
tabadmin stop  
tabadmin backup {filename} -d  
copy {original backup path and name} {network drive or other location path and name}  
tabadmin cleanup  
tabadmin start  
tabadmin cleanup
2. Install Tableau Server on new machine.  
<http://www.tableausoftware.com/products/server/download>
3. Restore Tableau Server from that backup.

If you are restoring to the same computer:

```
C:\TableauServer\[version]\bin\tabadmin stop  
C:\TableauServer\[version]\bin\tabadmin restore [filename]\your.backup.file  
C:\TableauServer\[version]\bin\tabadmin start
```

If you are restoring to another computer:

```
C:\TableauServer\[version]\bin\tabadmin stop
```

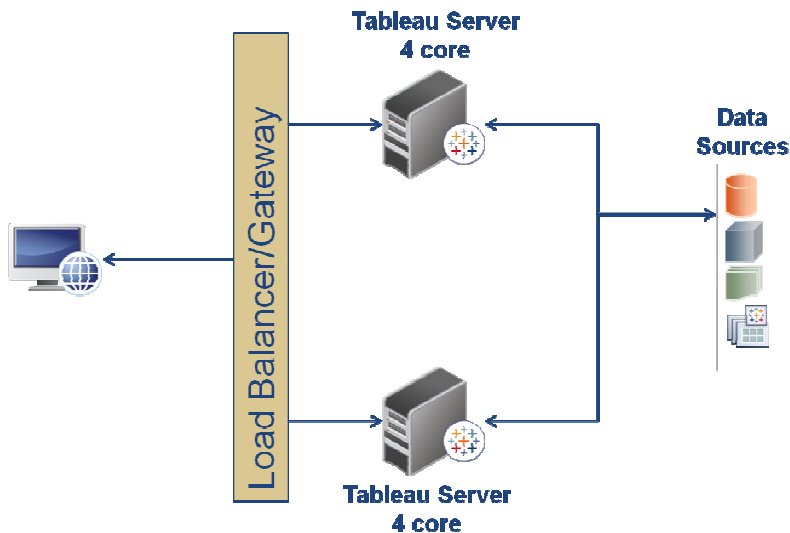
```
C:\TableauServer\[version]\bin\tabadmin restore -- no-config [filename]\your.backup.file
```

```
C:\TableauServer\[version]\bin\tabadmin start
```

The scripting of the backup should be scheduled as to match the frequency of changes of the Tableau Server. Keep in mind that a creation of the backup requires the Tableau Server to be stopped for the duration of the backup creation. This process is best done at times that meet your services windows and business continuity requirements.

***Solution in Practice – For SLAs less than 1 hour.***

***Diagram:***



***Keeping a Mirror of the Primary Server w/ Proxy:***

The following solution is very similar to the solution above, but utilizes an exact mirror of the Primary Tableau Server, as automates the backup and restore process between servers. This ensures that there is a live copy of the Tableau Server running to further reduce the possibility of downtime.

1. Install Tableau Server in 2 different locations (this is also where Disaster Recovery standards can be used).

<http://www.tableausoftware.com/products/server/download>

2. Script the backup process

```
tabadmin stop
```

```
tabadmin backup {filename} -d
```

```
copy {original backup path and name} {network drive or other location path and name}
```

3. Script the restore process

```
C:\TableauServer\[version]\bin\tabadmin stop
C:\TableauServer\[version]\bin\tabadmin restore -- no-config [filename]\your.backup.file
C:\TableauServer\[version]\bin\tabadmin start
```

#### 4. Configure a Reverse Proxy server to direct client traffic to functioning Tableau Server

The Reverse proxy will be what the end user is communicating with. Once the primary goes down, the proxy server will direct network traffic to the second Tableau Server. The monitoring of the Tableau Server can be done manually. The monitoring can also be done systematically by checking if the Tableau Server is running.

Tableau Server can provide an XML response of its status by running the following:

remote IP address: `tabadmin set wgserver.systeminfo.allow_referrer_ips xxx.xx.x.x`

Or run from the localhost machine:

Then visit <http://<server>/admin/systeminfo>

The XML will contain a listing for each service you have running (backgroundtasks, repository, vizqlserver, serverwebapplication) with a value of OK, BUSY or DOWN.

Example Output:

```
<?xml version="1.0" encoding="UTF-8"?>
<systeminfo>
  <machines>
    <machine name="Primary">
      <repository worker="Primary:8080" status="OK"/>
      <serverwebapplication worker="Primary:8000" status="Busy"/>
      <vizqlserver worker="Primary:8100" status="OK"/>
      <backgroundtasks worker="Primary:8200" status="Busy"/>
    </machine>
  </machines>
</systeminfo>
```

The emailing can be implemented with Tableau Server's command line utility in the following way:

Tabcmd login -s <http://tableauserver:80> -u admin -p admin

Tabcmd get / views/Wow/SummaryReports.pdf -f progressReport.pdf

Once this PDF is created, it can be picked up by any number of systems you have internally. I Common systems include e-mail/SharePoint or a wiki.

#### **Technical/Licensing Considerations:**

1. Using a distributed server configuration can make limit the exposure to system failure by making the primary server do none of the processing. (Images coming).
2. The manual restore process only requires additional hardware in the event of a failure.
3. The mirroring solution requires more hardware which increases cost and complexity.
4. In the mirroring solution, Tableau does not provide the proxy server (user supplied).
5. Mirroring in two different locations (on-site/off-site) can help achieve disaster recovery goals
6. Scripting backups off-site can also help achieve disaster recovery goals.
7. Tableau Server allows for 3 environments as part of our standard EULA.
8. Tableau Server can only have 1 environment running as the active Primary environment
9. A mirror of Tableau Server is considered 1 environment against the 3 available.