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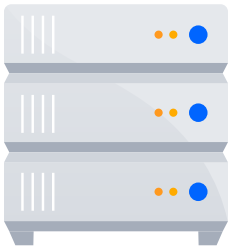

The Data Center deployment planning guide

Welcome to Data Center! Whether you're migrating from an existing server environment, consolidating several server instances, or starting from scratch, setting up your Data Center environment for success can take careful planning.

This guide will walk you through deployment and show you where to go for more documentation. And remember, you're not alone!

Want to extend your team? We're here to help!

Free with Data Center

Priority Support (for your first six months): Need some technical expertise? For the first 180 days of your subscription, we're giving you access to Atlassian Priority Support. This means when you submit a request to Atlassian Support, your high priority issues will route directly to our most Senior Engineers committed to delivering higher SLAs, faster triage, and faster resolutions.

Customer Success Managers: Looking for help achieving your team goals and business needs? As a new Data Center customer, you have access to a dedicated Customer Success Manager as an ongoing resource throughout your first year. Get in touch here.

Atlassian Community: Prefer to crowdsource? Find answers, support, and inspiration from other Atlassian users. We recommend that you join the Enterprise community group for stories, tips, and best practices for using Atlassian products at scale.

Paid support resources

Technical Account Managers: Want an experienced Atlassian advisor with product and industry knowledge? Think of a Technical Account Manager as your strategic partner for all things Atlassian. They'll help guide your journey by providing expertise and asking the questions you wouldn't think to ask yourself.

Premier Support: Premier Support: Looking for an elevated level of service? Atlassian Premier Support offers our highest level of support with 24/7 access to a dedicated Senior Support Team.

Enterprise Partners: Looking for a one-stop-shop? Enterprise Partners conduct hands-on system integrations, deployments, and upgrades. Enterprise Partners are a great option for organizations with complex requirements or that are looking for onsite help. Visit our Partner Directory to find a partner that is right for you.

Happy deploying!

Contents

Choosing how you want to deploy Data Center

There are two ways you can deploy Data Center:

1. In a non-clustered environment (your application runs on a single server or node)

Recommended use cases:	Benefits:	How to get started:
• You don't immediately require cluster-specific capabilities (such as high availability). • You have an existing, well-configured Server installation, and want to use the same infrastructure when you upgrade to Data Center.	• Immediately unlock Data Center features out-of-the-box – Many features exclusive to Data Center (like SAML single sign-on, self-protection via rate limiting, and CDN support) don't require clustered infrastructure.	• Simply apply your Data Center license and check out page 15 to see what features you can get started with.

Don't worry, you can still decide to deploy in a clustered environment later if your needs change!

2. In a clustered environment (your application runs on multiple application nodes configured in a cluster)

Recommended use cases:	Benefits:	How to get started:
• You require high availability, or need to access Data Center features that rely on clustering. (Not sure which features require clustering? Jump to page 15 to find out!) • You expect to grow to XL scale in the short term.	• High availability and failover – if one node in your application cluster goes down, the others take on the load, ensuring your users have uninterrupted access to the application. • Instant scalability – Add new nodes to your cluster without downtime or additional licensing fees. Indexes and apps are automatically synced. • Disaster recovery – Deploy an offsite Disaster Recovery system for business continuity, even in the event of a complete system outage. Shared application indexes get you back up and running quickly.	• Keep reading!

This guide will walk you through the steps involved to seamlessly deploy Data Center in a cluster with multiple nodes (our recommendation for organizations where uptime is critical).

The right Data Center architecture for you depends largely on which features and capabilities your organization needs. For more information on whether clustering is right for you, check out Atlassian Data Center architecture and infrastructure options.

Overview

As a quick overview, here are the three key stages and estimated timing for deploying your Data Center instance in a clustered environment.

STAGE	IF LAUNCHING A FRESH DATA CENTER INSTANCE	IF UPGRADING FROM SERVER TO DATA CENTER
Planning	1 month+	1 month+
Dry Run	1 - 2 months	3 - 6 months
Go Live	1 - 4 months	2 months+
Total Time	**~ 2 - 4 months**	**~ 6 - 9 months**

Note: these timelines can be significantly reduced if you choose to deploy with a third-party cloud provider.

The timelines included are based on a number of our customers who have successfully installed Data Center, but it is important to note that the actual timeline will vary based on factors unique to your environment including, but not limited to, environment size, complexity, and preparedness.

Planning 1 month +

Team assembly

One of the most important parts of this journey is assembling the right team and doing so as early as possible. The launch of Data Center will impact multiple parties across your organization and often necessitates their collective involvement.

Once your project team is assembled, it's important to align the team on shared goals and build your timeline with an agreed-upon target date.

☐ **Assemble your team.**

There's no definitive answer to which roles and how many people should be included on the team. However, it's important to consider the following areas of expertise when assembling your team:

Executive sponsorship: to ensure budget and organizational commitment in case of unforeseen changes.

System administration: to maintain oversight of infrastructure, backup, storage, performance, support coverage, etc.

Network engineering: to spec and build your deployment.

Database administration: to ensure database integrity and smooth operations.

Site reliability: to ensure instance uptime, performance, and disaster recovery operations.

Security: to ensure compliance with security standards (VPN, firewall, etc.)

☐ **Agree on a target date for deployment.**

Evaluate technology decisions

To ensure a smooth deployment, it's important to consider your hardware needs early. One of the most common reasons for a delayed Data Center deployment is operational difficulty in acquiring the necessary hardware. In addition to infrastructure, you'll also want to consider your OS and user management strategies.

Remember to plan for the future, not simply the now. Scale is the name of the game – try not to cut corners.

☐ **Will you host on-premise (bare metal) or through third-party cloud service providers like AWS or Azure?**

ⓘ If you decide to host through AWS or Azure, our AWS Quick Starts and Azure Resource Manager Templates will actually provision and configure your cluster component needs for you. They even use recommended defaults for those bits when you're unsure what to choose!

ⓘ Not sure where to begin? We recommend you check out this video or get in touch with your Customer Success Manager here.

Jira Software/Jira Service Desk resources:

AWS:
If you opt to host Jira on AWS, we highly recommend you follow this step-by-step guide and refer to it as your knowledge base for a streamlined deployment.

Azure:
Getting started with Jira Data Center on Azure

On-premise:
Installing Jira Data Center on your own hardware

Confluence resources:

AWS:
If you opt to host Confluence on AWS, we highly recommend you follow this step-by-step guide and refer to it as your knowledge base for a streamlined deployment.

Azure:
Getting started with Confluence Data Center on Azure

On-premise:
Installing Confluence Data Center

Bitbucket resources:

AWS:
Infrastructure recommendations

Getting started with Bitbucket Data Center in AWS

Administering Bitbucket Data Center in AWS

Quick start reference deployment

Azure:
Getting started with Bitbucket Data Center in Azure

On-premise:
Installing Bitbucket Data Center

Crowd resources:

On-premise:
Installing Crowd Data Center

☐ Decide what Operating System you will use.

ℹ Linux consumes fewer resources, runs a lower risk of contamination, and is generally more stable.

General resources:

Sample Data Center configurations

Jira Software/Jira Service Desk resources:

Supported platforms

Jira single server requirements

Confluence resources:

Supported platforms

Confluence single server requirements

Confluence Data Center technical overview

Bitbucket resources:

Supported platforms

Bitbucket Data Center requirements

Bitbucket Data Center Resources

Crowd resources:

Supported platforms

Crowd Data Center

Crowd Data Center FAQ

☐ What load balancer will you use?

ℹ If you want to implement SSL, we recommend using your load balancer.

General resources:

Load balancer configuration options

Traffic distribution with Atlassian Data Center

Jira Software/Jira Service Desk resources:

Jira Data Center Load Balancer examples

Example SSL setup:
Integrating Jira with Apache using SSL

Confluence resources:

Example SSL setup:
Running Confluence behind NGINX with SSL

Bitbucket resources:

Example SSL setup:
Securing your Atlassian applications with Apache using SSL

Securing Bitbucket Server behind nginx using SSL

Securing Bitbucket Server behind HAProxy using SSL

☐ **How many application nodes will you require?**
Reminder: an ElasticSearch node is needed for **Bitbucket Data Center**.

We have found that between two and four nodes is sufficient for nearly all organizations who are planning to run Data Center in a cluster. In general, we recommend starting small and growing as needed.

General resources:

- Data Center infrastructure recommendations
- Node sizing overview for Data Center
- Adding a second node to Data Center

Jira Software/Jira Service Desk resources:

- Node sizing in a clustered Jira environment

Bitbucket resources:

- Adding cluster nodes to Bitbucket Data Center

☐ **What kind of database will you use?** Do you have the flexibility to shift to a more efficient database?

Many of our customers have reported the best performance when using PostgreSQL.

☐ **Do you have a Network File System (NFS) ready?**

Note: our AWS Quick Start templates implement the shared file system by using the highly available Amazon Elastic File System (EFS) service.

☐ **If you have your users and groups** stored in a corporate directory, will you choose to integrate with LDAP, AD, or Azure?

☐ **How will your users authenticate?** Do you have special security requirements?

Atlassian provides a native SAML single sign-on (SSO) app that allows you to connect to an IdP to provide SSO for your Data Center users.

☐ **How many applications do you have to manage?**

If you are managing more than two applications or are integrating your users from Azure we suggest using Crowd for more effective user management.

General resources:

- Adding SAML integration to your existing user management infrastructure
- SAML single sign-on for Atlassian Data Center applications
- Connecting to Crowd or another Jira application for user management
- Supported IdP Providers

Jira Software/Jira Service Desk resources:

- Connecting to an LDAP directory

Confluence resources:

- Connecting to an LDAP directory

Bitbucket resources:

- External user directories

Review current Server installation*

Before you move to Data Center, it's important to look at your existing Server environment. Not only should you understand existing conditions, but it's also important to look for ways to optimize the existing Server environment so those same improvements can be translated to your new Data Center environment.

Remember: Atlassian Support can help you identify causes for any performance degradation.

☐ **Benchmark your Server** application's current functionality/performance to measure the improvements you should expect once you've migrated to Data Center.

Jira Software/Jira Service Desk resources:

Jira performance tests

☐ **Fine-tune your Server application.**

Spend the time to identify and peel back usage issues so these issues don't come back to bite you. Any performance issues that are not related to concurrency and are due to suboptimal configurations or usage in your Server application will likely persist or even worsen in Data Center.

Although it may take 1-2 weeks to identify and make these performance optimizations, we've found that customers who don't do this early on tend to have a longer and more challenging deployment.

Jira Software/Jira Service Desk resources:

Performance and scale testing

Confluence resources:

Performance tuning

Bitbucket resources:

Scaling Bitbucket Server

☐ **Assess and update governance.**

Before deploying Data Center, assess these usage characteristics and determine whether you need to establish any restrictions on things like scripts that make REST calls or other integrations to protect performance.

☐ **Review installed Marketplace apps.**

If you are renewing an app with a license start date after September 3, 2019:

- You will be required to purchase a Data Center approved app license if there is a Data Center approved version available in the Marketplace.
- You will no longer be able to renew maintenance for Server versions of apps if a Data Center approved version is available.

Marketplace app guidelines:

FAQ: Data Center Approved Apps

Evaluate apps for Data Center migration

☐ **Document current processes.**

Here are a few recommendations on things to document:

- General system behavior benchmarks regarding operation, functionality, or performance of the Server application to identify if the Data Center deployment exhibits new or previously existing behavior
- API access patterns for the application (heavy API usage may indicate a need to provision for specific nodes to handle API traffic)
- Backup processes and frequency
- Reporting processes, frequency, and recipients
- Monitoring tools and what is being measured
- Scheduled maintenance routines
- Disaster Recovery plans for the organization

Dry Run

If upgrading from Server to Data Center: 3-6 months
If launching a fresh Data Center instance (no existing data): 1-2 months

Testing (proof of concept)

The testing phase is a fundamental step in deploying Data Center and often the most intensive part of the deployment process.

In order to confidently deploy Data Center to production, the team should run through an iterative set of functional tests, integration tests, and performance tests to vet the Data Center installation. If you're migrating from Server, each test may span 1 to 2 weeks.

Don't skimp- a thorough testing phase will expedite your production deployment and allow you to account for unforeseen circumstances. Run multiple User Acceptance Tests (UATs) if necessary until you're fully confident with going live.

Don't fret! Unless you have an exact replica of your production environment in your testing phase, expect overall performance and operations to occur more slowly. For example, if failover takes one hour during your dry run; it very well could take less in production.

☐ **Set up your testing environment (if you don't have one already) and install your software on it.**

Jira Software / Jira Service Desk resources:

AWS:
If you opt to host Jira on AWS, we highly recommend you follow this step-by-step guide and refer to it as your knowledge base for a streamlined deployment.

Azure:
Getting started with Jira Data Center on Azure

On-premise:
Installing Jira Data Center on your own hardware

Confluence resources:

AWS:
If you opt to host Confluence on AWS, we highly recommend you follow this step-by-step guide and refer to it as your knowledge base for a streamlined deployment.

Azure:
Getting started with Confluence Data Center on Azure

On-premise:
Installing Confluence Data Center

Bitbucket resources:

AWS:
Getting started with Bitbucket Data Center in AWS

Azure:
Getting started with Bitbucket Data Center in Azure

On-premise:
Installing Bitbucket Data Center

Crowd resources:

On-premise:
Installing Crowd Data Center

* This stage only applies if you're upgrading from Server to Data Center.

☐ **Migrate your existing production data over to your testing environment.***

If you're consolidating multiple instances or coming from the cloud, this procedure may take longer.

General resources:

Data Center Migration Essentials Summit Talk

Overview of Atlassian Data Center instance consolidation

Jira Software/Jira Service Desk resources:

Migrating Jira Software applications

Migrating data with 3rd party apps

Merge multiple instances of Jira Server

Confluence resources:

Migrating Confluence Data Center

Bitbucket resources:

Data Center migration

Crowd resources:

Moving to Crowd Data Center

Migrating Crowd Between Servers

Migrating from OnDemand to a Crowd installed site

☐ **Before upgrading to a later version, check if your apps are compatible with that version.**

☐ **Update your apps if needed.**

☐ **Review all your plugins and scripts to** ensure they are Data Center compatible and are operating as expected.

Test in an environment as close to production as possible, including installing all 3rd party apps that will be used. Even minor environmental changes can cause customizations to have unintended behaviors.

For more information about managing apps, see Using the Universal Plugin Manager.

Jira Software/Jira Service Desk resources:

Jira Data Center Add-Ons

Bitbucket resources:

Bitbucket Data Center Add-Ons

☐ **Upgrade your application version in your testing environment.***

When deciding what version to deploy with, we recommend adhering to our latest Enterprise release version.

Jira Software/Jira Service Desk resources:

Jira Software upgrade guide

Upgrade health check

AWS:
Upgrading Jira Data Center on AWS

Confluence resources:

Upgrading Confluence Data Center

AWS:
Upgrading Confluence Data Center on AWS

Bitbucket resources:

Enable integrity checks (if you haven't already)

Bitbucket Server upgrade guide

AWS:
Upgrading Bitbucket Data Center on AWS

☐ **Test and retest significant shifts between versions that could impact operations and plan for potential rollbacks.**

Consider a dry run of any Data Center specific features (i.e., Smart Mirrors, Zero Downtime Upgrades, or Project Archiving) and plan for potential rollbacks, just in case.

* This step only applies if you're upgrading from Server to Data Center.

☐ **Stress-test your application** to ensure that it can handle your anticipated load.

When stress testing, try to mirror real-world scenarios. If you have a 5,000 user license but only anticipate having a concurrent load of 1,500 users, test for 1,500 and not 5,000.

Jira Software/Jira Service Desk resources:

Jira Data Center Performance

Video:
Jira Performance Testing in Pictures

Tools:
Available Performance Testing Tools

Sizing:
Jira Data Center size profiles

Confluence resources:

Confluence Data Center Performance

Sizing:
Confluence Data Center load profiles

Experiments:
Performance Testing Framework for Confluence

Bitbucket resources:

Bitbucket Data Center Performance

Sizing:
Bitbucket Data Center load profiles

Experiments:
Performance Testing Framework for Bitbucket

Crowd resources:

Crowd Data Center Performance

☐ **Document as you go**. Be sure to document processes and steps taken, whether it pertains to data migration, proxy configuration, load balancers, etc.

Be specific- the majority of this information cannot be or is not easily surfaced in application.

Health Check with Atlassian Support (if eligible)

During a health check, the team will search for known issues with configurations, compatibility, driver versions, performance conditions, memory settings, among other things.

Eligibility:

If it's within 180 days of your Data Center purchase or if you have a license for 2,000+ users.

OR

If you've purchased Priority or Premier Support.

☐ **Schedule a Health Check** (if eligible).

Support:

Priority Support Offering Details

Premier Support Offering Details

When requesting a health check, be explicit on the description of the support request. If it's within the first 180 days since your Data Center purchase, you'll automatically be routed to Priority Support. We highly recommend you take advantage of this offering.

Go Live

If upgrading from Server to Data Center: 2 months+
If launching a fresh Data Center instance (no existing data): 1 - 4 weeks

Production installation and/or upgrade

It's time to install the latest version of your software on a fresh Data Center environment.

If you're upgrading from Server to Data Center you'll also want to upgrade the production environment that you are planning to migrate over to the Data Center deployment, following the same procedures you performed in testing to ready your data.

☐ Set up your production environment.

Jira Software/Jira Service Desk resources:

AWS:
If you opt to host Jira on AWS, we highly recommend you follow this step-by-step guide and refer to it as your knowledge base for a streamlined deployment.

Azure:
Getting started with Jira Data Center on Azure

On-premise:
Installing Jira Data Center on your own hardware

Confluence resources:

AWS:
If you opt to host Confluence on AWS, we highly recommend you follow this step-by-step guide and refer to it as your knowledge base for a streamlined deployment.

Azure:
Getting started with Confluence Data Center on Azure

On-premise:
Installing Confluence Data Center

Bitbucket resources:

AWS:
Getting started with Bitbucket Data Center in AWS

Azure:
Getting started with Bitbucket Data Center in Azure

On-premise:
Installing Bitbucket Data Center

Crowd resources:

On-premise:
Installing Crowd Data Center

☐ Upgrade your application version in your production environment.*

Jira Software/Jira Service Desk resources:

Jira Software upgrade guide

Upgrade health check

AWS:
Upgrading Jira Data Center on AWS

Confluence resources:

Upgrading Confluence Data Center

AWS:
Upgrading Confluence Data Center on AWS

Bitbucket resources:

Bitbucket Server upgrade guide

AWS:
Upgrading Bitbucket Data Center on AWS

☐ Install your Atlassian apps.

Apps:

Data Center approved apps

* This step only applies if you're upgrading from Server to Data Center.

Production migration*

If you're migrating onto new hardware, you'll want to execute your migration now.

Using a native database is the preferred database migration method.

☐ **Migrate production data over to your new Data Center.**

It is significantly easier to perform a full backup and restore, but piecemeal migrations are also possible.

General resources:

Data Center Migration Essentials Summit Talk

Jira Software / Jira Service Desk resources:

Migrating Jira Software applications

Migrating data with 3rd party apps

Merge multiple instances of Jira Server

Confluence resources:

Migrating Confluence Data Center

Bitbucket resources:

Data Center migration

Crowd resources:

Moving to Crowd Data Center

Migrating Crowd Between Servers

Migrating from OnDemand to a Crowd installed site

Cutover*

How you perform the cutover is up to your discretion. If you have gone through thorough UAT cycles, we recommend setting a firm cutover date during an off-peak day.

In other scenarios, some find it helpful to run a pilot that allows you to move one or a few of your teams over to Data Center so they can kick the tires and ensure that all features are working in production before implementing a firm cutover date for the rest of your users.

☐ **Institute a firm cutover date** (or alternatively, run a short pilot stage in production).

☐ **Communicate the change to all stakeholders.**

☐ **Migrate production data over to your new Data Center.**

If you have Priority or Premier support from Atlassian, you can arrange weekend coverage in case of unforeseen complications.

Reminder: if you're within the first 180 days of your Data Center purchase you have free access to Priority Support.

Provide your team between 2-3 weeks of dedicated support after the cutover with your Database Administrator, System Administrator, etc. to ensure smooth operations.

* This stage only applies if you're upgrading from Server to Data Center.

Other considerations

Monitoring

With increased hardware and larger infrastructure, pinpointing points of failure is greatly helped by monitoring tools. Leveraging a monitoring tool strategy is strongly recommended.

In our AWS Quick Starts, users can deploy basic monitoring and logging out-of-the-box via Amazon Cloudwatch for Jira, Confluence, and Bitbucket.

Our Azure templates also offer out-of-the-box monitoring for Jira, Confluence, and Bitbucket.

General resources:

Monitoring strategy

Monitoring tools

How Atlassians monitor their enterprise deployments

Watch:

The Four Principles of Atlassian Performance Tuning

Disaster recovery

While Data Center provides you with a highly available application, it is highly recommended that you consider standby and disaster recovery options.

Jira Software/Jira Service Desk resources:

Jira Data Center Disaster Recovery

Confluence resources:

Confluence Data Center Disaster Recovery

Bitbucket resources:

Bitbucket Data Center Disaster Recovery

Docker images

We've released Atlassian-supported and maintained Docker container images if you wish to include them to easily standardize across your deployment, regardless of what hardware you're using.

General resources:

Why Docker matters in your enterprise infrastructure

Jira Software/Jira Service Desk resources:

Atlassian Jira Software

Atlassian Jira Service Desk

Confluence resources:

Atlassian Confluence

Bitbucket resources:

Atlassian Bitbucket

Data Center enterprise features

Haven't rolled out all of our Data Center features yet? Familiarize yourself with features designed exclusively for our enterprise customers and consider what you might implement next.

Jira Software, Jira Service Desk, Confluence, and Bitbucket

Advanced User Management:

- SAML single sign-on: Simplify login experience and ensure compliance by using your existing identity provider for authentication.
- OpenID support: Enable single sign-on for your self-hosted Atlassian products and manage your users seamlessly and securely.

Enhanced Reliability Options:

- Rate limiting: Keep your instance safe and improve stability with rate limiting.
- Amazon Aurora: Double down on stability with a true fault-tolerant relational database built for the cloud.

Scale & Performance

- Content Delivery Network (CDN) support: Deliver faster load times for geographically distributed offices.

Jira Software/Jira Service Desk

Enhanced Reliability Options:

- Zero downtime upgrades: Eliminate downtime and interruptions to users during upgrades.*

Scale & Performance:

- Custom field optimizer: Proactively manage custom fields and speed up your instance.
- Project & issue archiving: Manage growth and make Jira more performant.

Confluence

Compliance, governance, & security:

- Advanced permissions management features: Minimize overhead with auditing, troubleshooting, and bulk editing capabilities

Enhanced Reliability Options:

- External process pool: Minimize the possibility of actions crashing your instance.
- Read-only mode: Minimize downtime with access to content during maintenance or upgrades.

Bitbucket

Scale & Performance:

- Smart mirroring: Improve Git clone speeds for distributed teams and large repositories.*
- Mirror farms: Scale and increase CI/CD capacity.*

Crowd

Compliance, governance, & security:

- Centralized license visbility: Find out who's NOT using your Atlassian products.

Advanced User Management:

- Group-Level Admins: Admins can delegate some admin responsibilities over groups.
- Multi-domain SSO: Easily enable single sign-on across multiple domains.
- Azure AD user filtering: Clean up license waste and speed up synchronization.

*Feature is only available if you install Data Center in a cluster with multiple nodes.

Migrating from Server to Data Center and want more? Check out our webinar and whitepaper.

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