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# HLD - 6

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## Designing Components for Code Deployment System:

### Build Code Component:

- Converts source code into compiled code suitable for deployment.

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## Deploy Code Component:

- Responsible for transferring compiled code to multiple machines for deployment.
- Ensures consistency across different environments.

## Deploy Code: Compiled Code Transferring to 100K Machines:

Transferring compiled code to 100K machines involves creating an efficient distribution mechanism:

- **Load Balancing:** Utilize load balancers to evenly distribute the code to a large number of machines. Round-robin or weighted algorithms can be used.
- **Content Delivery Networks (CDNs):** Employ CDNs to cache and serve the compiled code closer to end-users, reducing latency and server load.
- **Parallel Transfer:** Use parallel processing to simultaneously send code to multiple machines, optimizing transfer speed.
- **Optimized Protocols:** Implement efficient communication protocols for transferring large files, such as HTTP/2 or BitTorrent.

## Blob Storage:

Blob storage is used for storing binary large objects (BLOBs), such as images, videos, and compiled code. It's suitable for unstructured data and provides efficient retrieval.

- **Advantages:** Scalability, cost-effectiveness, replication for redundancy,

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# Designing High-Level Design for LeetCode:

## Requirement Gathering:

### Homepage:

- What content appears on the homepage? Static or dynamic?
- Is content personalized based on user activity?

### Login Page:

- What authentication methods will be used?
- Single sign-on or multi-factor authentication?

### Payment Gateway:

- How will payments be processed? Supported payment methods?
- Integration with third-party payment providers?

### Question Page:

- What details should be displayed for each question?
- How will the questions be categorized and organized?

### Code Execution System:

- How will user-submitted code be executed?

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## Design Core User Flow:

### List of Problems:

- Display a list of available problems for users to solve.
- Organize by difficulty, category, or tags.

### Submit and Run:

- Allow users to submit their solutions and run test cases.
- Provide immediate feedback on code correctness.

### User Count and Concurrency:

- Determine the expected number of users in the system.
- Assess how many users will be using the system concurrently.

### System Availability:

- Plan for high availability to ensure the system remains accessible.

### Global System:

- Decide whether the system should be accessible worldwide.

### Storing User Code:

- Determine whether user-submitted code will be stored for analysis or reference.

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- Static UI Content:
- Static elements can be cached in CDNs or blob storage for faster loading.
- Use content delivery networks to efficiently distribute static assets globally.

Assessment: <https://www.bosscoderacademy.com/blog/hld-6-assessment>



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