Welcome to the
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Skills Bootcamp - System Architecture

The session will start shortly...

Questions? Drop them in the chat. We'll have dedicated moderators answering questions.

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Cyber Security Session Housekeeping

- The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly. **(Fundamental British Values: Mutual Respect and Tolerance)**

- No question is daft or silly - **ask them!**

- There are **Q&A sessions** midway and at the end of the session, should you wish to ask any follow-up questions.

- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Academic Sessions. You can submit these questions here: **Questions**

Cyber Security Session Housekeeping cont.

- For all **non-academic questions**, please submit a query: **www.hyperiondev.com/support**

- We would love your **feedback** on lectures: **Feedback on Lectures**

- Find all the lecture **content** in you **Lecture Backpack** on GitHub.
- If you are hearing impaired, please kindly use your computer's function through Google chrome to enable captions.

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Safeguarding & Welfare

We are committed to all our students and staff feeling safe and happy; we want to make sure there is always someone you can turn to if you are worried about anything.

If you are feeling upset or unsafe, are worried about a friend, student or family member, or you feel like something isn't right, speak to our safeguarding team:

Ian Wyles
Designated Safeguarding Lead

Simone Botes

Nurhaan Snyman

Rafiq Manan

Ronald Munodawafa

Tevin Pitts

Scan to report a safeguarding concern

or email the Designated Safeguarding Lead:
Ian Wyles
safeguarding@hyperiondev.com

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Stay Safe Series:

Mastering Online Safety One week at a Time

While the digital world can be a wonderful place to make education and learning accessible to all, it is unfortunately also a space where harmful threats like online radicalization, extremist propaganda, phishing scams, online blackmail and hackers can flourish.

As a component of this BootCamp the *Stay Safe Series* will guide you through essential measures in order to protect yourself & your community from online dangers, whether they target your privacy, personal information or even attempt to manipulate your beliefs.

Security Tip

Regularly audit and review your third-party vendors and service providers for security risks.

Make sure to regularly evaluate the security practices of anyone with access to your data or systems, including reviewing contracts for security clauses and asking for up-to-date audits or certifications.

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Skills Bootcamp - System Architecture

November 2024

Learning Objectives & Outcomes

- Define core systems architecture concepts and identify various architectural styles.
- Explain the significance of architectural decisions in system design.
- Design basic and advanced system architectures for hypothetical projects.
- Differentiate between architectural styles and assess their applicability in various scenarios.

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System Architecture

- Have you ever wondered how a big system, like a school or a city, is organised to make sure everything works together smoothly? Now, imagine the same for computers—how do you think complex software and hardware work together to handle tasks like streaming a video or booking a flight online?

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Polls

Please have a look at the poll notification and select an option.

What is the primary purpose of system architecture?

A. To design hardware components
B. To outline the structure and interaction of system components
C. To manage user interfaces
D. To develop network protocols

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Polls

Please have a look at the poll notification and select an option.

In a client-server architecture, what role does the client typically perform?

- A.   Processing requests and storing data
- B.   Sending requests and receiving responses
- C.   Distributing data across networks
- D.   Managing security for the system

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System Architecture

- **Definition**: Refers to the conceptual model that defines the structure, behavior, and more views of a system.
- **Key Points:**
    - Blueprint of the system's components and their interactions.
    - Defines how hardware, software, data, and users integrate.

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Importance of system architecture
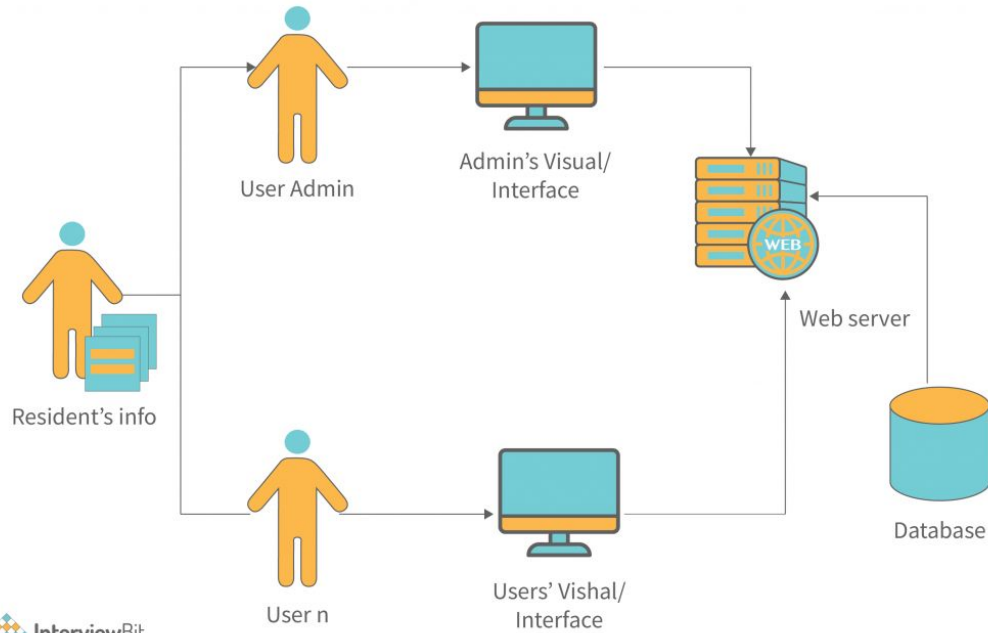
Benefits:

- Provides a clear understanding of system structure.
- Facilitates scalability and maintainability.
- Enhances communication among stakeholders.
- Improves system performance and security.

Key Components of System Architecture

Main Components:

1. **Hardware Architecture:** Physical devices like servers, routers, etc.
2. **Software Architecture:** Applications, APIs, microservices.
3. **Data Architecture:** Databases, data flows, and storage solutions.
4. **Network Architecture:** Connectivity between components.
5. **User Interface:** Interaction points with the system.

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Types of System Architecture

User Admin

Admin's Visual/ Interface

Resident's info

Web server

User n

Users' Vishal/ Interface

Database

InterviewBit

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Types of System Architecture

Monolithic Architecture

- Single-tiered and tightly coupled.
- Example: Legacy enterprise applications.

Layered Architecture

- Presentation, business logic, data layers.
- Example: Traditional web applications.

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Types of System Architecture.

Microservices Architecture

- Modular and loosely coupled services.
- Example: Netflix, Uber.

Serverless Architecture

- Cloud-native, event-driven systems.
- Example: AWS Lambda.

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Key Design Principles

- **Scalability:** Ability to handle growth.

- **Reliability:** Ensures consistent performance.

- **Flexibility:** Easy to adapt to changes.

- **Performance:** Meets speed and efficiency requirements.

- **Security:** Protects data and interactions.

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Design Process

Steps to Design:

1. Requirement Analysis.
2. Define Logical Components.
3. Map Logical to Physical Architecture.
4. Identify Technology Stack.
5. Validate and Iterate.

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Best Practices

- Start with clear requirements.

- Prioritize scalability and flexibility.

- Use established patterns (e.g., MVC, Event-Driven).

- Document extensively.

- Test for edge cases early.

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Polls

Please have a look at the poll notification and select an option.

Which of the following is NOT a common system architecture pattern?

A. Microservices
B. Monolithic
C. Modular
D. Relational

Questions and Answers

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Thank you for attending

Skills for Life — Skills Bootcamps

Department for Education

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