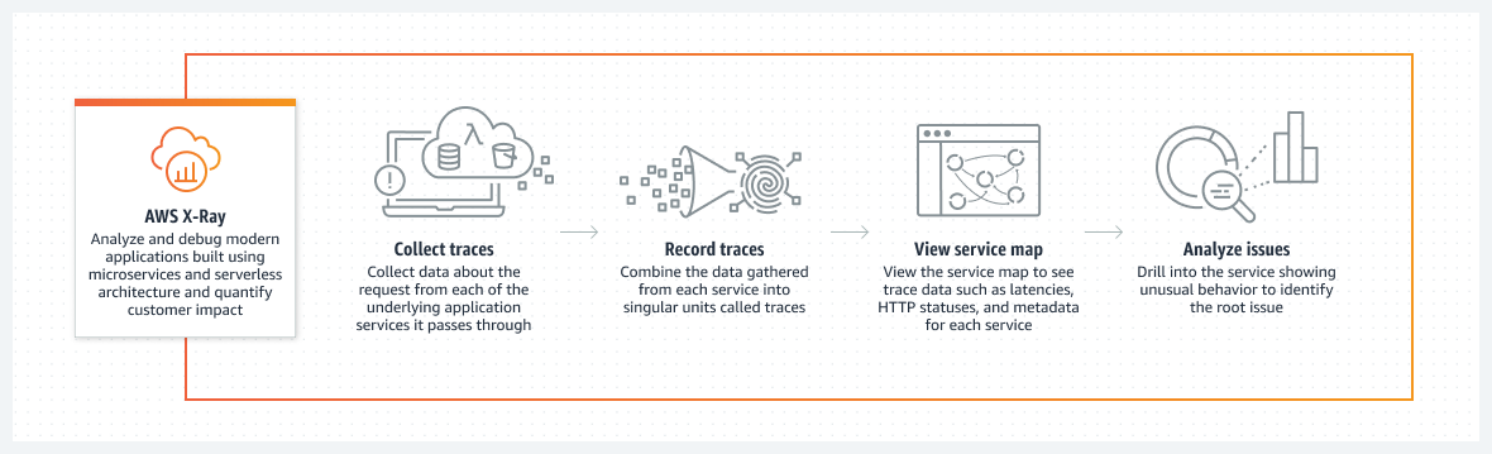
AWS X-Ray

- Analyze and debug production and distributed applications.
- AWS X-Ray provides a complete view of requests as they travel through the application and filters visual data across payloads, functions, traces, services, APIs, and more with no-code and low-code motions.
- You can use X-Ray to identify performance bottlenecks, edge case errors, and other hard to detect issues.
- supports applications, either in development or in production, of any type or size, from simple asynchronous event calls and three-tier web applications to complex distributed applications built using a microservices architecture.
- X-ray is integrated with IAM so that permissions to access traces can be controlled.(Security).
- X-Ray daemon collects traces and sends them to the X-Ray service for aggregation, analysis, and storage.
- **Benefits** :
  - Easy tracking
  - Improved performance
  - Removing Obstacles
  - Save time and money



How to Use X-Ray

- Can be used with apps running on EC2, ECS, AWS lambda, AWS Elastic Beanstalk.
- Must integrate X-Ray SDK and install X-Ray agent.
- With Elastic Beanstalk, only integrate with X-Ray SDK, X-Ray is pre-installed in Beanstalk. Only include the language-specific X-Ray libraries in application code.
- For EC2 or ECS, need to install the X-Ray daemon and instrument application code.
- can use AWS X-Ray with the AWS Management Console, AWS CLI, and AWS SDKs for console & programmatic access.

End-to-end tracing

- Gives application-centric view of request flowing through app by aggregating data gathered from individual services in the app to a single unit called trace.
- The X-Ray SDK captures metadata for requests made to MySQL and PostgreSQL databases (self-hosted, Amazon RDS, Amazon Aurora), and Amazon DynamoDB.
- It also captures metadata for requests made to Amazon Simple Queue Service and Amazon Simple Notification Service.

Service Map

- X-Ray creates a map of services used by the application with trace data that can be used to drill into specific issues.
- X-Ray allows you to visually detect node and edge latency distribution directly from the service map.
- can quickly isolate outliers, graph pattern and trends, drill into traces and filter by built-in keys and custom annotations to better understand performance issues impacting your application and end users.

Data annotation and filtering

- X-ray can annotate data emitted from specific components or services in the application.
- This can be used to append business-specific metadata to help better diagnose the issue.

- Can filter data for traces by annotation value, average latencies, HTTP response status, timestamp, database table used, and more.