iNeuron

Architecture Design

NBA DRAFT COMBINES MEASUREMENT

Written By	Author 1
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Chet Mani Singh

iNeuron

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3 ARCHITECTURE DESIGN

iNeuron

Contents

iNeuron

1. Introduction

1.1 What is an Architecture design document?

Any software needs an architectural design to represent the design of the software. IEEE defines architectural design as “the process of defining a collection of hardware and software components and their interfaces to establish the framework for the development of a computer system.” The software that is built for computer-based systems can exhibit one of these many architectures.

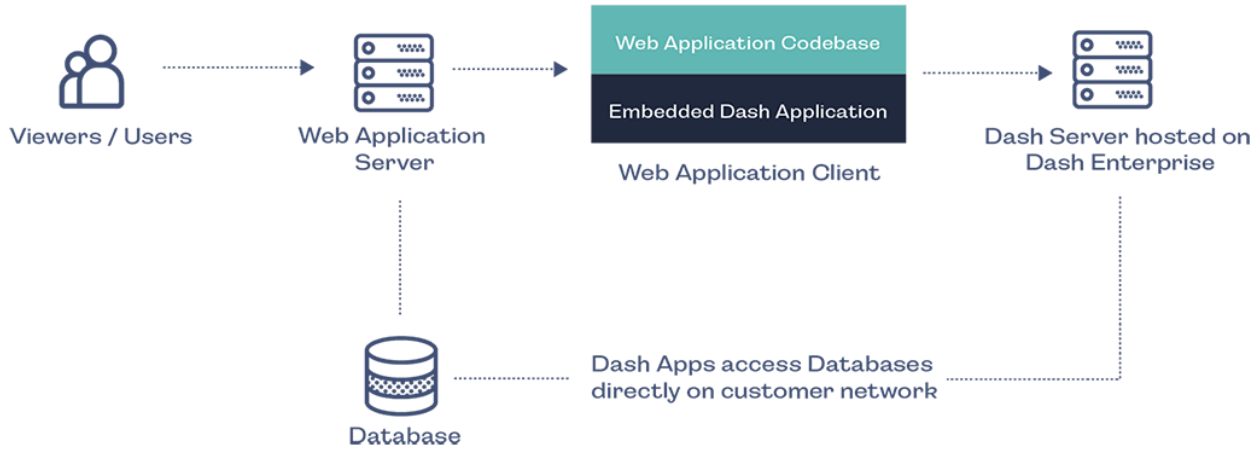
Each style will describe a system category that consists of:

- A set of components (eg: a database, computational modules) that will perform a function required by the system.
- The set of connectors will help in coordination, communication, and cooperation between the components.
- Conditions that how components can be integrated to form the system.
- Semantic models that help the designer to understand the overall properties of the system.

1.2 Scope

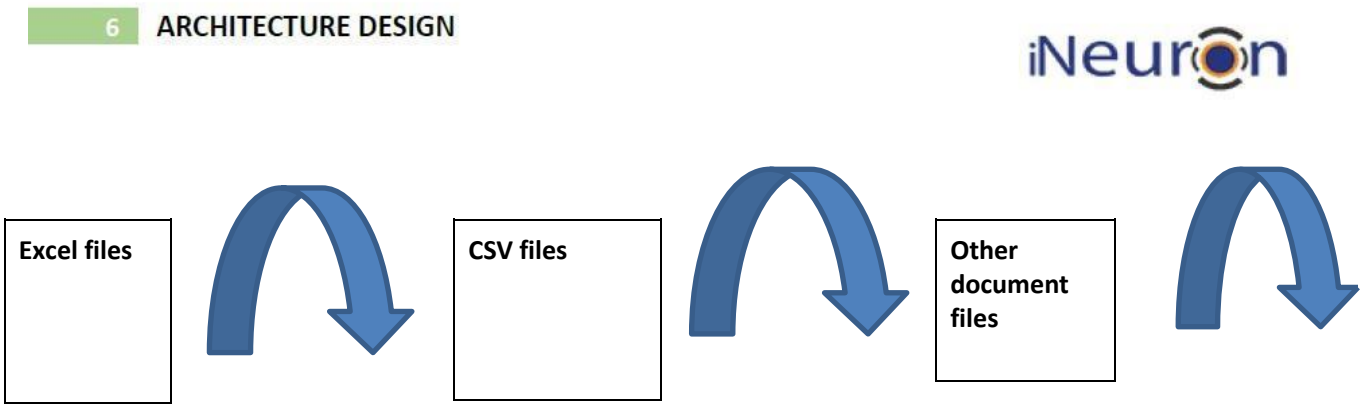
Architecture Design Document (ADD) is an architectural design process that follows a step-by-step refinement process. The process can be used for designing data structures, required software architecture, source code, and ultimately, performance algorithms. Overall, the design principles may be defined during requirement analysis and then refined during architectural design work.

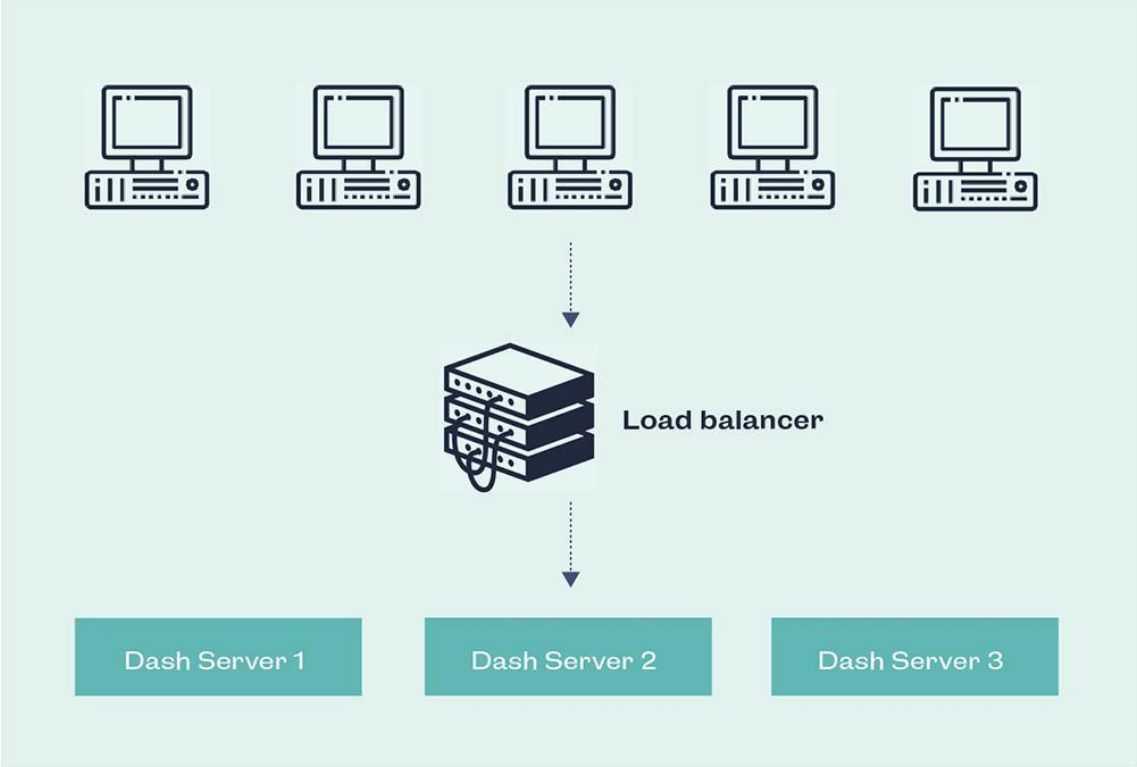
2. Architecture



2.1 Plotly Server Architecture

The following diagram shows the Plotly server architecture





1. Gateway/Load Balancer

7 ARCHITECTURE DESIGN

iNeuron

It acts as an Entry gate to the Plotly Server and also balances the load to the Server if multiple Processes are configured.

2 Application Server

Application Server processes handle browsing and permissions for the Plotly Server web and mobile interfaces. When a user opens a view in a client device, that user starts a session on Plotly Server. This means that an

The application Server thread starts and checks the permissions for that user and that view.

3 Repository

Plotly Server Repository is a Dash database that stores server data. Dash is ideal for building and deploying data apps with customized user interfaces. It's particularly suited for anyone who works with data.

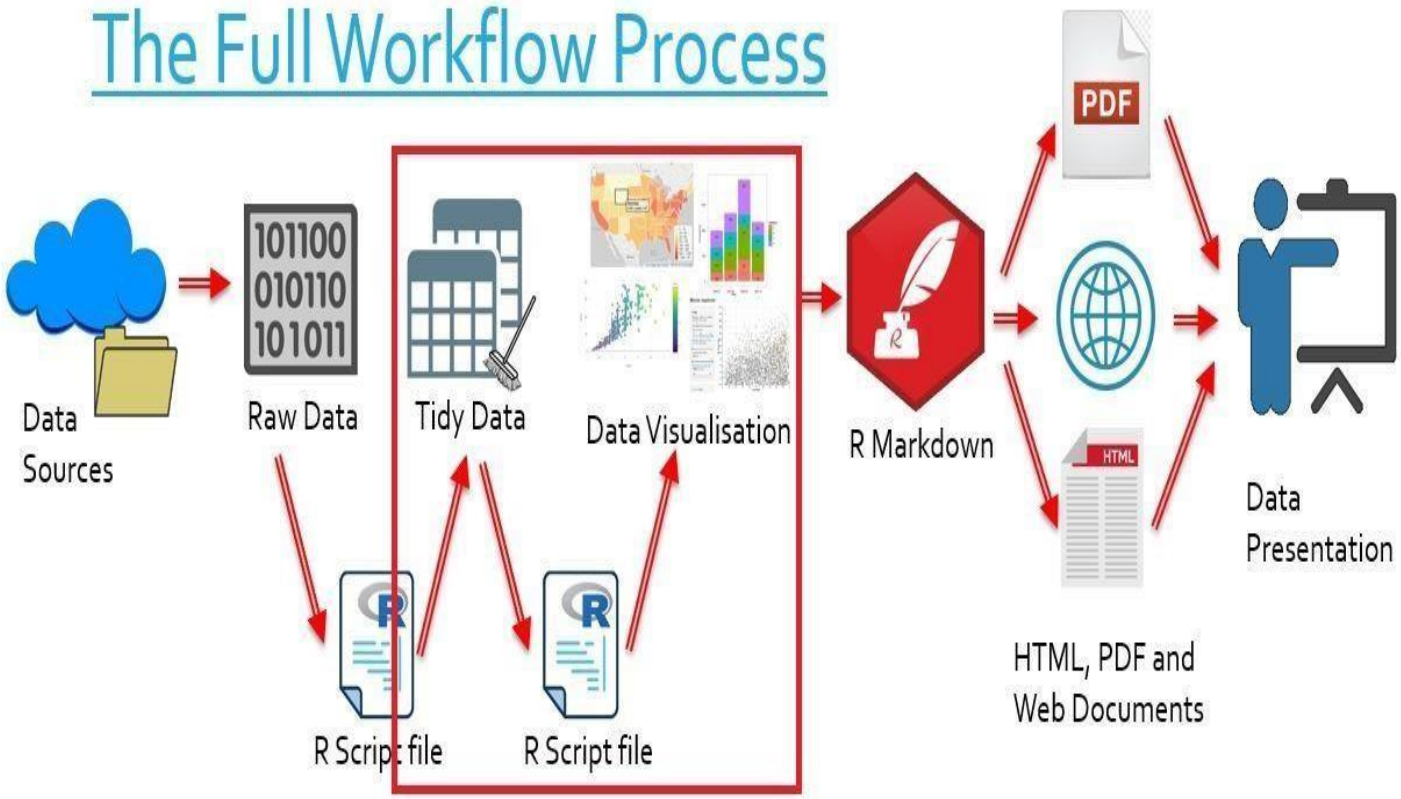
4. Data Engine

It Stores data extracts and answers queries

5. Data Server

Data Server Manages connections to Plotly Server data sources It also maintains metadata from Plotly Desktop, such as calculations, definitions, and groups.

6. Plotly Communication Flow



2.2. Plotly Express Architecture

High-Level Features

The Plotly Express API in general offers the following features:

A single-entry point into plotly: just `import plotly.express as px` and get access to all the plotting functions, plus built-in demo datasets under `px.data` and built-in color scales and sequences under `px.color`. Every PX

Sensible, Overridable Defaults: PX functions will infer sensible defaults wherever possible, and will always let you override them.

Flexible Input Formats: PX functions accept input in a variety of formats, from `lists` and `dicts` to long-form or wide-form Pandas `DataFrames` to `NumPy` arrays and `arrays` to GeoPandas `GeoDataFrames`.

Automatic Trace and Layout configuration: PX functions will create one trace per animation frame for each unique combination of data values mapped to discrete color, symbol, line-dash, facet-row, and/or facet-column. Traces' `legend group` and `showlegend` attributes are set such that only one legend item appears per unique combination of discrete color, symbol, and/or line-dash. Traces are automatically linked to a correctly-configured subplot of the appropriate type.

Automatic Figure Labelling: PX functions label axes, legends, and colorbars based on the input `DataFrame` or `xarray`, and provide extra control with the `labels` argument.

Automatic Hover Labels: PX functions populate the hover label using the labels mentioned above, and provide extra control with the `hover_name` and `hover_data` arguments.

Styling Control: PX functions read styling information from the default figure template, and support commonly-needed cosmetic controls like `category_orders` and `color_discrete_map` to precisely control categorical variables.

Uniform Color Handling: PX functions automatically switch between continuous and categorical colors based on the input type.

Faceting: the 2D-cartesian plotting functions support row, column, and wrapped facetting with `facet_row`, `facet_col`, and `facet_col_wrap` arguments.

Marginal Plots: the 2D-cartesian plotting functions support marginal distribution plots with the `marginal`, `marginal_x`, and `marginal_y` arguments.

A Pandas backend: the 2D-cartesian plotting functions are available as a Pandas plotting backend so you can call them via `df.plot()`.

Trendlines: `px.scatter` supports built-in trendlines with accessible model output.

Animations: many PX functions support simple animation support via the `animation_frame` and `animation_group` arguments.

Automatic WebGL switching: for sufficiently large scatter plots, PX will automatically use WebGL for hardware-accelerated rendering.

3. Deployment Description

3.1 Deployment options in Plotly

.Plotly contains many deployment options

.Some of them are deployed using Heroku, Docker, etc.

Plotly Online

Get up and running quickly with no hardware required. Plotly Online is fully hosted by Plotly, so all upgrades and maintenance are automatically managed for you.

Plotly Server deployed on-premises

Manage and scale your hardware and software (whether Windows or Linux) as needed. Customize your deployment as you see fit.

Plotly Server

Deployed on public cloud: Leverage the flexibility and scalability of cloud infrastructure without giving up control. Deploy to Amazon Web Services, Google Cloud Platform or Microsoft Azure infrastructure to quickly get

started with Plotly Server (on your choice of Windows or Linux). Bring your license or purchase on your preferred marketplace.

Deploying Dash/Plotly App

By default, Dash/Plotly apps run on `localhost`- you can only access them on your machine. To share a Dash/Plotly app, you need to "deploy" it to a server.

Our recommended method for securely deploying Dash applications is Dash Enterprise.

Dash Enterprise can be installed on the Kubernetes services of AWS, Azure, GCP, or an on-premise Linux Server.

Dash Enterprise Deployment

Dash Enterprise is Plotly's commercial product for developing & deploying Dash Apps on your company's on-premises Linux servers or VPC (AWS, Google Cloud, or Azure).

In addition to easy, git-based deployment, the Dash Enterprise platform provides a complete Analytical App Stack. This includes:

. LDAP & SAML Authentication Middleware

. Data Science Workspaces

. High Availability & Horizontal Scaling

. Job Queue Support

. Enterprise-Wide Dash App Portal

. Design Kit

. Reporting, Alerting, Saved Views, and PDF Reports

. Dashboard Toolkit

. Embedding Dash apps in Existing websites or Salesforce

. AI App Catalog

. Big Data Best Practices

. GPU support

13.

ARCHITECTURE DESIGN

Dash Open Source	**> 2M users** *The largest open-source community for building ML apps*	Open Source Features
	Python, R, & Julia support *Build Dash apps in your language of choice*	
	Extensive docs & gallery *+ 60 gallery apps with code, +2k forum posts monthly*	
Dash Enterprise	**App Manager** *Deploy, share, and manage your Dash apps*	ML Ops Features
	Kubernetes *Horizontal scaling & zero downtime deployment*	
	No-Code Authentication *Login to Dash apps with SSO, SAML, AD, LDAP, & more*	
	Job Queue *Queueing is key to buliding scalable ML apps*	
	Password Vault *Secure access to tokens and passwords in your Dash app code*	
	Design Kit *Professional grade styling & branding*	Low-Code Features
	Snapshot Engine *Create, archive, & share Dash app views as links*	
	Reporting *Programatically generate pixel-perfect PDFs & reports*	
	Dashboard Toolkit *Drag & drop, crossfilter, & chart editing for Dash apps*	
	Embedding *Embed Dash apps inside web apps or Salesforce*	
	ML & AI Templates *Copy-paste Dash templates for PyTorch, Tensorflow, Keras, etc.*	Enterprise AI Features
	User Analytics *Built-in user database & usage dashboard*	
	GPU & Dask Acceleration *Parallelize your Python code or run in GPU memory*	
	Data Science Workspaces *Write Dash & Jupyter code in the Workspaces editor*	
	Big Data for Python *Connect Dash apps to Databricks, Snowflake, Dask, and more*	