Architecture Design

E-COMMERCE SALES DASHBOARD

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Contents

1. Introduction

1.1 What is Architecture design document?

Any software needs the architectural design to represents the design of 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.

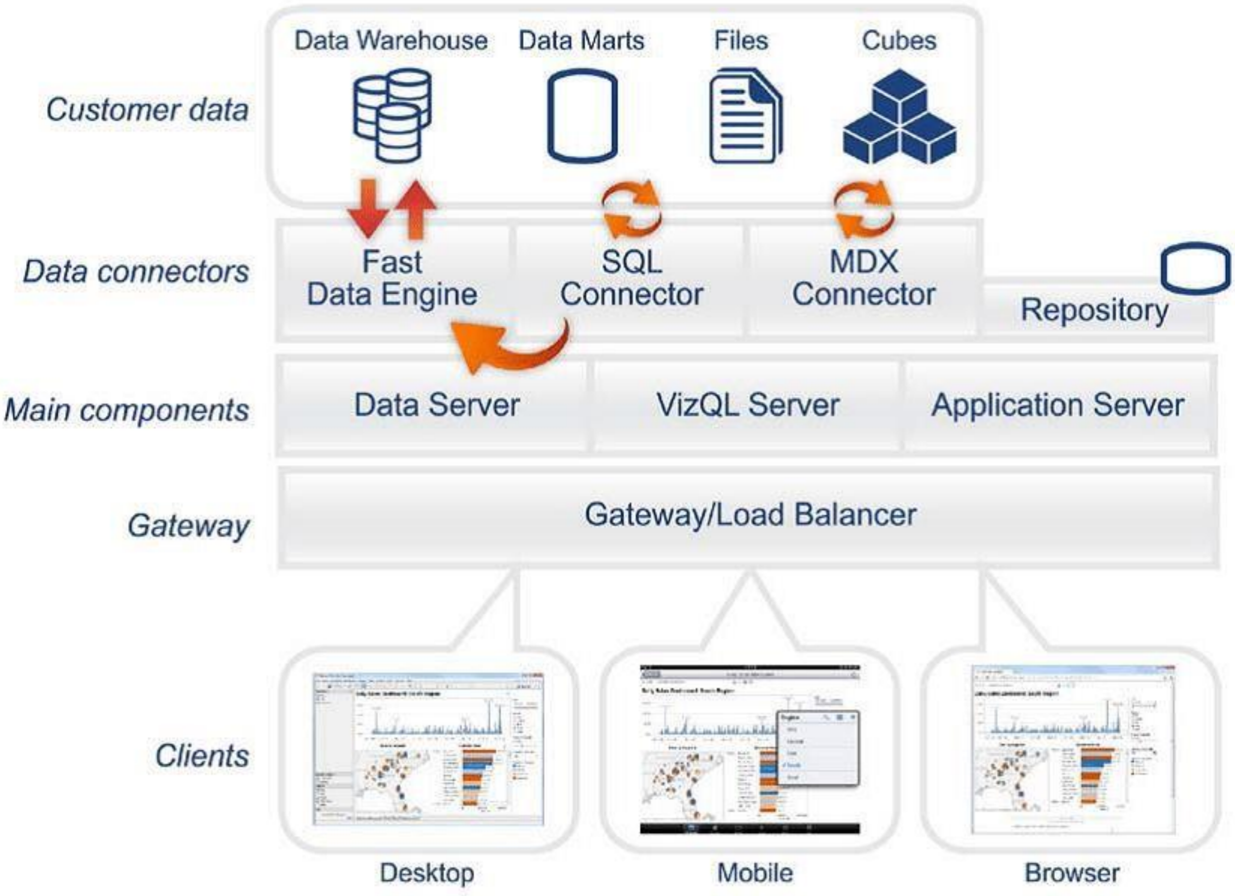
Each style will describe a system category that consists of :

- 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 architecture 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. Excel Architecture

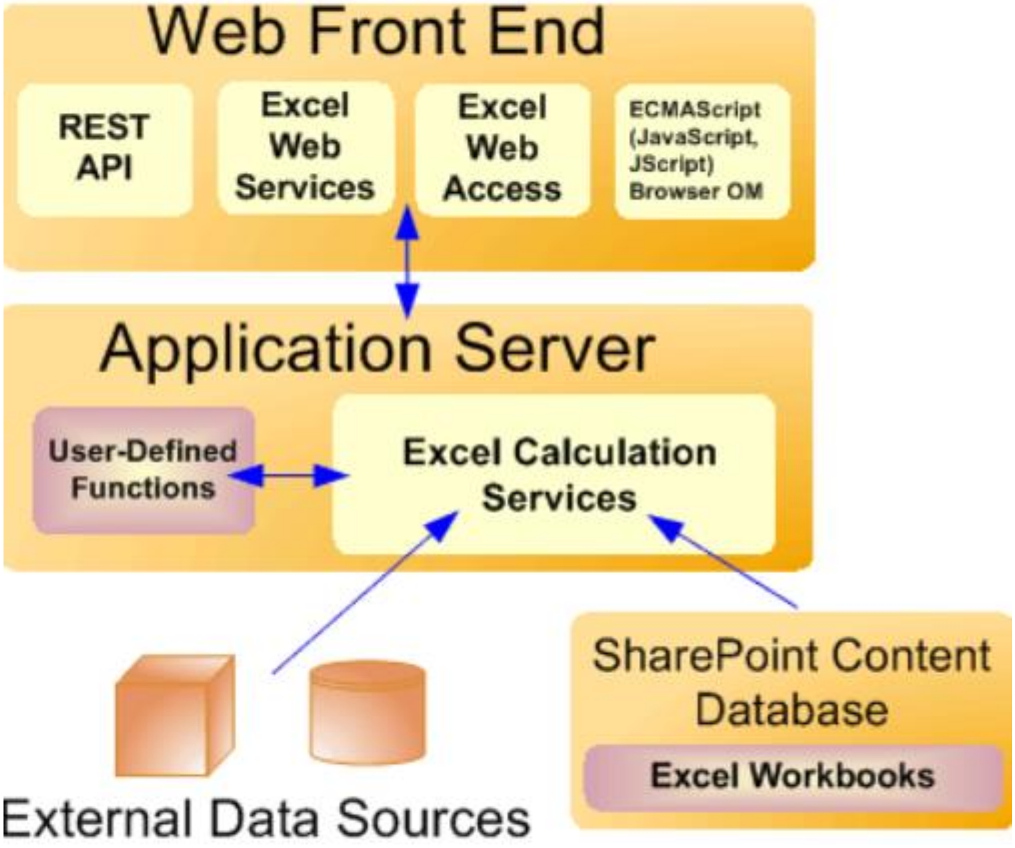


2.1) Excel Server Architecture

Microsoft Excel has a highly scalable, n-tier client-server architecture that serves mobile clients,and web clients . Excel Server architecture supports fast and flexible deployments. Following are the core components in Excel Services:-

- Excel Web Access
- Excel Web Services
- User-defined functions (UDFs)
- ECMAScript (JavaScript, JScript)

- REST API
- Excel Calculation Services



2.1.1) Excel Web Access

Excel Web Services is the Excel Services component that provides programmatic access to its Web service. We can develop applications that call Excel Web Services to calculate, set, and extract values from workbooks, and to refresh external data connections. By using Excel Web Services, we can incorporate server-side workbook logic into an application, automate the updating of Excel workbooks, and create application-specific user interfaces around server-side Excel calculation.

2.1.2) User-Defined Functions (UDFs)

Excel Services UDFs enable us to use formulas in a cell to call custom functions that are written in managed code and deployed to SharePoint Server 2010.

2.1.3) ECMAScript (JavaScript, JScript)

The JavaScript object model in Excel Services enables developers to customize, automate, and drive the Excel Web Access web part control on a page. By using the JavaScript object model, we can build mashups and other integrated solutions that interact with one or more Excel Web Access web part controls on a page or an iframe with script on the page. It also enables us to add more capabilities to your workbooks and code around them.

2.1.4) REST API

The REST API in Excel Services enables you to access workbook parts or elements directly through a URL. The URL contains a "marker" path, which is the entry point to an .aspx page, to the workbook file location, and to the path to the requested element inside the workbook.

The discovery mechanisms built into the Excel Services REST API enables developers and users to explore the content of a workbook manually or programmatically.

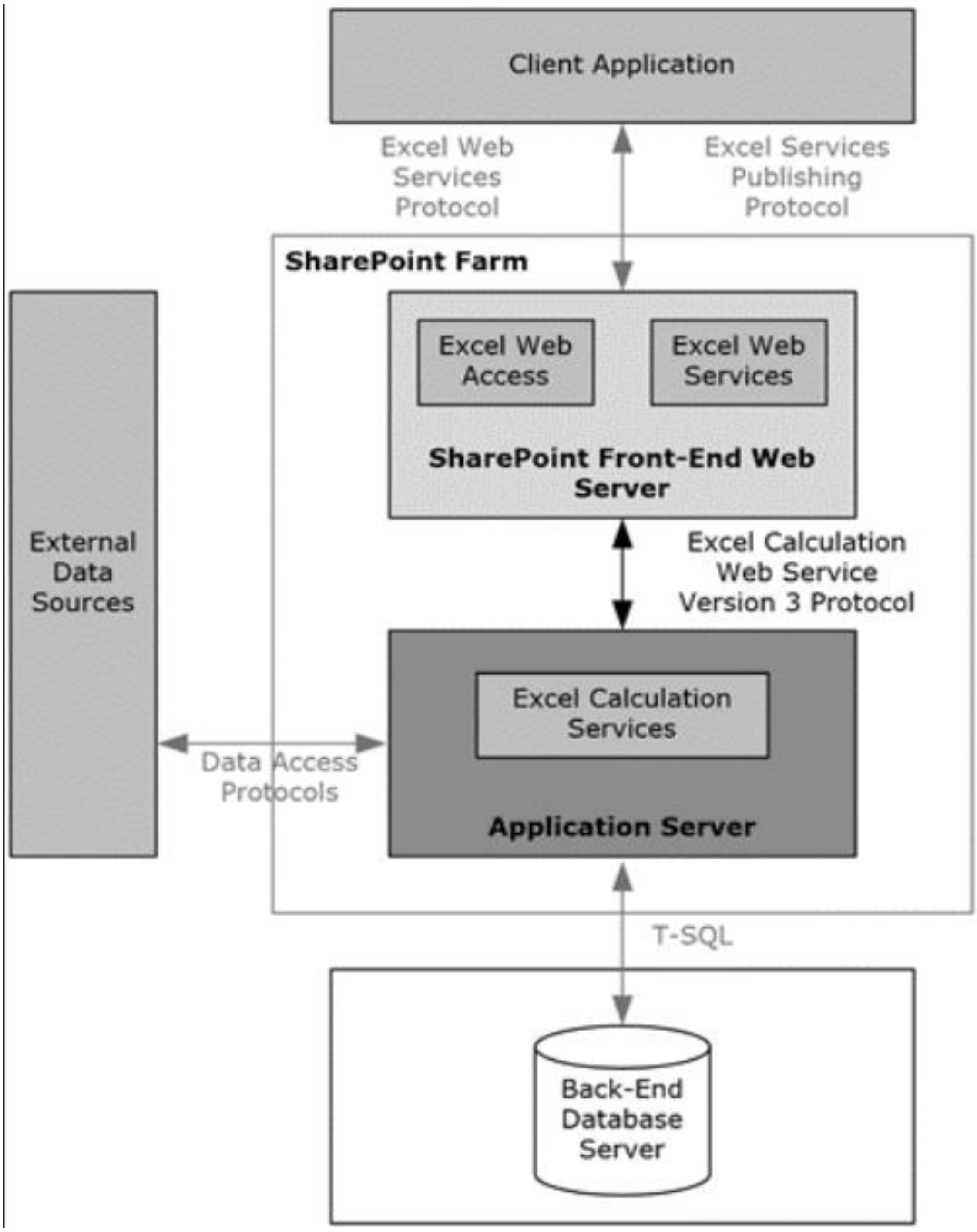
2.1.5) Excel Calculation Services

The role of Excel Calculation Services is to load workbooks, calculate workbooks, call custom code (UDFs), and refresh external data. It also maintains the session state for interactivity. Excel Calculation Services maintains a session for the duration of interactions with the same workbook by a user or caller. A session is closed when the caller explicitly closes it or when the session times out on the server. Excel Services caches the opened Excel workbooks, calculation states, and external data query results, for improved performance when multiple users access the same set of workbooks..

2.1.6) Load-Balancing

In multiple-server configurations, Excel Services load-balances requests across multiple Excel Calculation Services occurrences in a farm configuration. If the installation includes multiple application servers, Excel Services will balance the load in an attempt to help ensure that no single application server is overloaded by requests.

2.1.7)Excel Communication Flow


Client Application
Excel Web Services Protocol
Excel Services Publishing Protocol
SharePoint Farm
Excel Web Access
Excel Web Services
SharePoint Front-End Web Server
External Data Sources
Excel Calculation Web Service Version 3 Protocol
Excel Calculation Services
Data Access Protocols
Application Server
T-SQL
Back-End Database Server

3. Deployment Description

3.1 Deployment options in Excel

The deployment options that are available depend on the Office application that you're targeting and the type of add-in you create.

Integrated Apps via the Microsoft 365 admin center

The Microsoft 365 admin center makes it easy for an administrator to deploy Office Add-ins to users and groups in their organization. Add-ins deployed via the admin center are available to users in their Office applications right away, with no client configuration required. You can use Integrated Apps to deploy internal add-ins as well as add-ins provided by ISVs. Integrated Apps also shows admins add-ins and other apps bundled together by same ISV, giving them exposure to the entire experience across the Microsoft 365 platform..

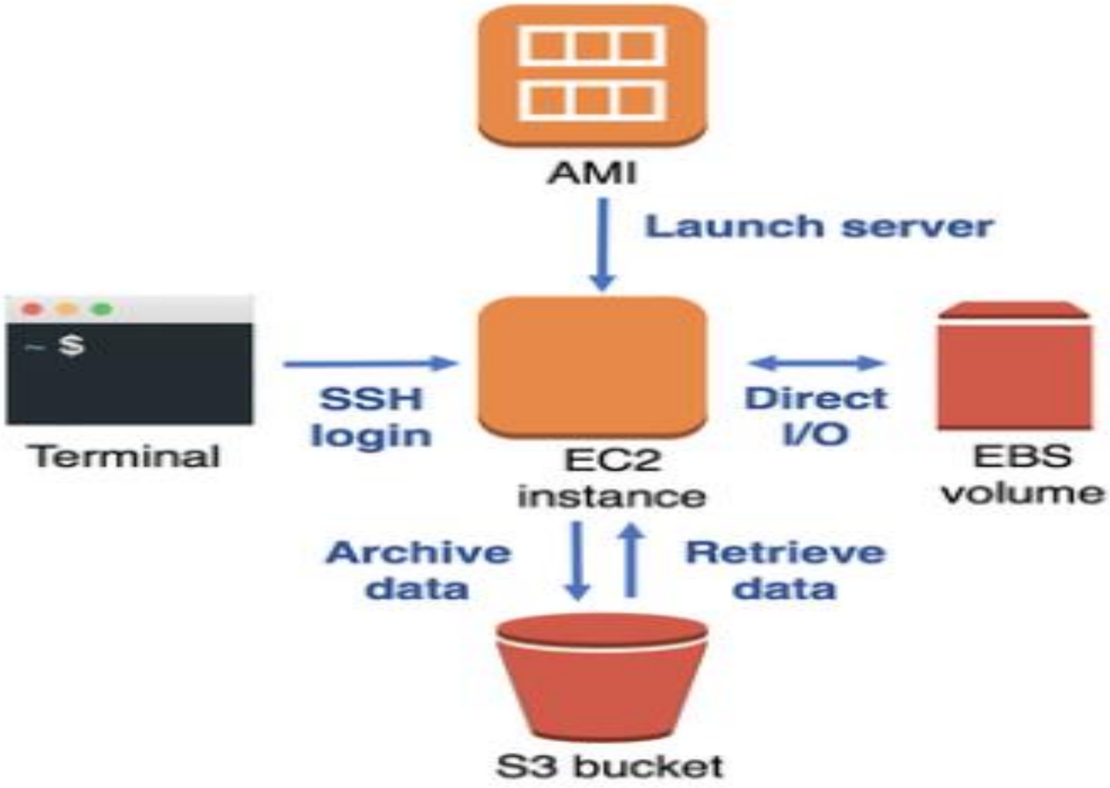
Important

Customers in sovereign or government clouds don't have access to Integrated Apps. They will use Centralized Deployment instead. Centralized Deployment is a similar deploy method, but doesn't expose connected add-ins and apps to the admin.

SharePoint app catalog deployment

A SharePoint app catalog is a special site collection that you can create to host Word, Excel, and PowerPoint add-ins. Because SharePoint catalogs don't support new add-in features implemented in the VersionOverrides node of the manifest, including add-in commands, we recommend that you use Centralized Deployment via the admin center if possible. Add-in commands deployed via a SharePoint catalog open in a task pane by default.

3.2 Single Node Architecture

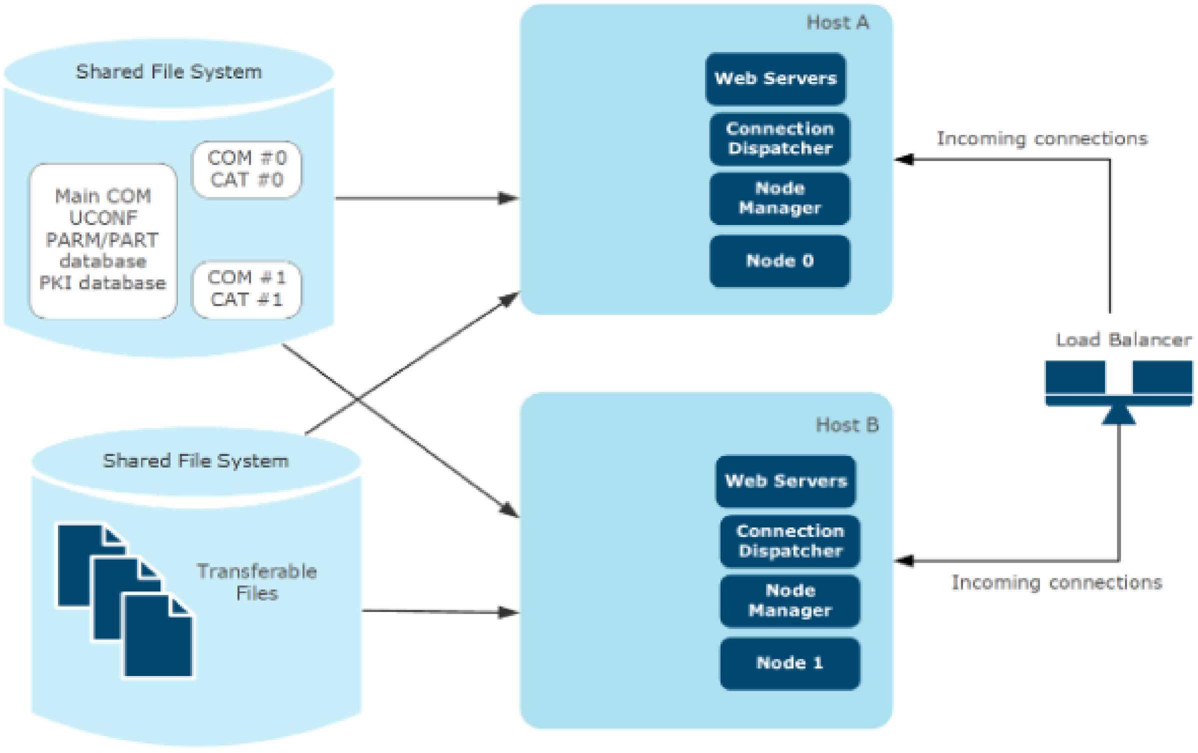


This architecture is a single node architecture. This is the most simple deployment topology.

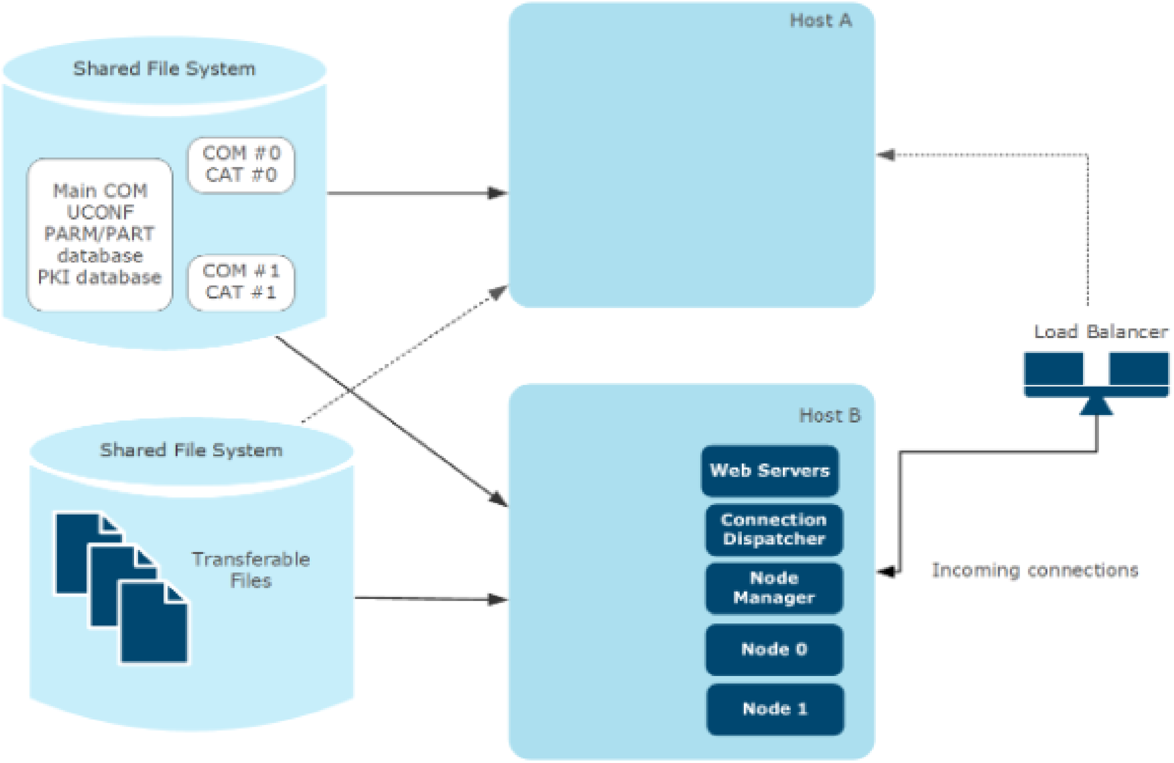
3.3) Multi-node architecture

The multi-node architecture is based on hosts, nodes, a shared file system and a load balancer. Regardless of the number of servers hosting the nodes from outside the cluster, all of the nodes are viewed as a single Transfer CFT instance.

- A **shared file system** (infrastructure), for multiple nodes to be able to access the same files using the same set configuration. The shared disk provides communication, configuration, partners, data flows, internal datafiles, and application transferable files.
- A **load balancer** (infrastructure), hardware or software, by which incoming connections can pass. The load balancer dispatches the incoming traffic between the different hosts. However, the outgoing traffic does not use the load balancer.
- One **connection dispatcher** per host (Copilot component), checks for incoming connections on the host it is running on and dispatches connections to nodes running on the same host. For z/OS platforms, refer to *VIPA load balancing* in the *Transfer CFT z/OS Installation and Operation Guide*.
- One **node manager** per host (Copilot component), which monitors all nodes. If a node goes down, the node manager detects the inactivity and restarts it if needed, while taking into account the activity of other node managers. The monitoring mechanism is based on locks provided by the file system lock manager or the resource lock manager. Additionally, the node manager has its own watchdog that is used to prevent incorrect behavior after a shared file system auto-unlock, for instance due to NFSv4 lease time. If the watchdog does not receive a keep-alive from the node manager, all local nodes are killed and relock is requested.
- One **synchronous communication media dispatcher** per host (Copilot component), which allows the use of the synchronous communication media feature in a multi-node environment.



If Host A goes down, then Host B takes over Node 1



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